



APPENDIX 7-1

GEOTECHNICAL & PEAT STABILITY ASSESSMENT REPORT



LEMANAGHAN WIND FARM, CO. OFFALY

Geotechnical & Peat Stability Assessment Report

Prepared for:

MKO Ltd



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Core House, Pouladuff Road, Cork, T12 D773, Ireland

T: +353 21 496 4133 | E: info@ftco.ie

CORK | DUBLIN | CARLOW

www.fehilytimoney.ie



Geotechnical & Peat Stability Assessment Report Lemanaghan Wind Farm

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Fehily Timoney and Company (FT) were engaged by McCarthy Keville O'Sullivan (MKO) to undertake a geotechnical assessment of the proposed Lemanaghan Wind Farm with

respect to peat stability. As part of the geotechnical assessment of the Proposed Project, FT completed a walkover survey at the site as well as a ground investigation comprising peat probes, boreholes and trial pits. The findings of the geotechnical and peat stability assessment showed that the site has an acceptable margin of safety and

is suitable for the proposed wind farm development.

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1. NON-TECHNICAL SUMMARY

Fehily Timoney and Company (FT) was engaged by McCarthy Keville O'Sullivan (MKO) on behalf of Lemanaghan Wind Farm DAC (the Applicant) to undertake a geotechnical and peat stability assessment of the proposed Lemanaghan Wind Farm. In accordance with planning guidelines compiled by the Department of the Housing, Planning and Local Government (Draft Guidelines, DoHPLG, 2019), where peat >0.5m in thickness is present on a proposed wind farm development, a peat stability assessment is required.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Wind Farm', 'Proposed Grid Connection', 'Proposed Project site' and the 'site'.

Site walkover surveys (including intrusive peat depth probing), desk study, stability analysis and risk assessment were carried out to assess the susceptibility of the site to peat failure following the principles in Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (PLHRAG, Scottish Government, 2nd Edition, 2017).

The findings, which involved a stability analysis of 281 locations across the Proposed Project site, carried out by FT to record peat depth, slope inclination, vegetation type and ground water, show that the site has an acceptable margin of safety and is suitable for the Proposed Project. The findings include recommendations and control measures for construction work in peat lands to ensure that all works adhere to an acceptable standard of safety. It is noted that there have been numerous wind farms successfully constructed on cutaway and cutover bog sites over the past 15 years without any issues relating to peat failure, such as Mount Lucas, Derrinlough and Cloncreen (Co. Offaly) and Bruckana (Co.'s, Kilkenny, Laois and Tipperary)

The site, which is typically flat, consists predominantly of bare locally re-vegetated cut-away peat and intact peat. The site was subject to historical peat extraction activities by Bord na Mona, with the cessation of peat extraction occurring in June 2020 and all stockpiled peat being removed the site by the end of 2023.

The Proposed Project comprises 15 no. wind turbines, a proposed onsite 220kv substation, and all associated infrastructure. A detailed description of the Proposed Project is included in Chapter 4 Description of the Proposed Project of the EIAR. The site is undulating with drainage channels running typically southwest-northeast. The land use within the Proposed Project site comprises predominately of vegetated peatlands (milled in some areas), along with forestry and agricultural lands. Several disused Bord na Mona rail lines also pass through the site.

Slope inclinations at the main infrastructure locations range from 2 to 4 degrees. The flat topography/nature of the terrain on site reflects the low risk of peat failure. Ground conditions comprised mainly of peat overlying till derived from limestone.

A combined total of 722 no. peat probes were carried by FT, MKO and Hydro-Environmental Services (HES), to determine peat depth across the site. Peat depth recorded from peat probing ranged from 0.1 to 6.2m with an average peat depth of 2.0m. Approximately 21% of the probes recorded peat depths of less than 1.0, approximately 36% of peat depth probes recorded peat depths of 1.0m to 2.0m, and approximately 23% of peat depth probes recorded peat depths of 3.0m. The remaining 20% of probes recorded peat depths of between 3.0 to 6.2m.

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The purpose of the stability analysis was to determine the stability i.e. Factor of Safety (FoS), of the peat slopes. The FoS provides a direct measure of the degree of stability of a peat slope. A FoS of less than 1.0 indicates that a slope is unstable; a FoS of greater than 1.0 indicates a stable slope. An acceptable FoS for slopes is generally taken as a minimum of 1.3. The stability analysis for this project, which analysed the turbine locations, internal roads and substation, resulted in FoS above the minimum acceptable value of 1.3 and hence the site has a satisfactory margin of safety.

The risk assessment uses the results of the stability analysis in combination with qualitative factors, which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability, to assess the risk of peat failure at the site. The results of the risk assessment are given in Appendix B.

A construction buffer zone plan based on qualitative factors identified during the site walkover is included as Drawings P20-216-0600-0004 to 0006.

The findings of the peat assessment (which combines the FOS and the risk assessment), which involved analysis of 281 peat probing no. locations collected by FT, showed that the Proposed Project site has an acceptable margin of safety and that the site is suitable for the Proposed Project. Notwithstanding the above, the management of peat stability and appropriate construction practices will be inherent in the construction phase of the Proposed Project to ensure peat failures do not occur on site.

In summary, the Proposed Project site has an acceptable margin of safety and is considered to be at **low** risk of peat failure providing appropriate mitigation measures and construction controls are implemented and is suitable for wind farm development.

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2. INTRODUCTION

2.1 Fehily Timoney and Company

Fehily Timoney and Company (FT) is an Irish engineering, environmental science and planning consultancy with offices in Cork, Dublin and Carlow. The practice was established in 1990 and currently has c.100 members of staff, including engineers, scientists, planners and technical support staff. FT deliver projects in Ireland and internationally in our core competency areas of Waste Management, Environment and Energy, Civils Infrastructure, Planning and GIS and Data Management.

FT have been involved in over 100 wind farm developments in both Ireland and the UK at various stages of development i.e. preliminary feasibility, planning, design, construction and operational stage and have established themselves as one of the leading engineering consultancies in peat stability assessment, geohazard mapping in peat land areas, investigation of peat failures and site assessment of peat.

This report was written by Doireann Tarrant, MSc. Doireann is a Senior Project Engineer with FT and has 2 years' experience in geotechnical engineering. This report was reviewed by Aaron Clarke, BSc, MSc, MCSM, PGeo, EurGeol. Aaron is a Chartered Principal Geologist with FT and has over 20 years' experience in engineering geology and geoscience projects.

Site visits were undertaken by Doireann Tarrant, MSc, and Julian Borlado, MSc. Julian is a Senior Project Engineer with FT and has over 10 years' experience in geotechnical engineering.

2.2 Project Description

FT was engaged in January 2021 by McCarthy Keville O'Sullivan (MKO) on behalf of Lemanaghan Wind Farm DAC (the Applicant) to undertake a geotechnical & peat stability assessment of the proposed Lemanaghan Wind Farm. As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Wind Farm', 'Proposed Grid Connection', 'Proposed Project site' and the 'site'.

The Proposed Project site is located approximately 3 kilometres (km) northeast of Ferbane and approximately 2.5 km southwest of the village of Ballycumber in Co. Offaly.

The site is relatively flat-lying with drainage channels running typically southwest-northeast. The site is bounded by the R436 regional round to the south with the Rosfaraghan road located partially within the site, and the L7001 local road to the north and east. The N62 national road runs in a north to south direction to the west of the site. Note that the L7002 runs through the site and splits the Proposed Project into a northernmost section and the main bog area. Land uses within the site are a mixture of bare cutover and cutaway peat and re-vegetation of bare peat. Several disused Bord na Mona rail lines also pass through the site.

The Proposed Project comprises 15 no. wind turbines, a proposed onsite 220kv substation, and all associated infrastructure. A detailed description of the Proposed Project is included in Chapter 4 Description of the Proposed Project of the EIAR.

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2.3 Peat Stability Assessment Methodology

FT undertook the assessment following the principles in Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (2nd edition, PLHRAG, 2017). The Peat Landslide Hazard and Risk Assessment Guide (PLHRAG) is used in this report as it provides best practice methods to identify, mitigate and manage peat slide hazards and associated risks in respect of consent applications for electricity generation projects.

The aforementioned best practice guide was produced following peat failures in the Shetland Islands, Scotland in September 2003, but more pertinently following the peat failure in October 2003, during the construction of a wind farm at Derrybrien, County Galway, Ireland.

This peat stability assessment has been undertaken considering peat failures that have occurred on wind farm sites located on peatland (such as recent failures at Shass Mountain 2020, Co. Leitrim and Meenbog 2020, Co. Donegal). The lessons learned from both peat slide events have been incorporated into the design of this Proposed Project and the construction methodologies to be implemented. The Meenbog failure occurred during the construction of a section of floating road on sidelong ground in an area of weak peat. The slope angles on the Proposed Project site are lower than those at Meenbog, and no significant areas of sidelong ground are present. It is important that the existing site drainage is maintained during construction to avoid a similar failure to that on Shass Mountain, which occurred following heavy rainfall, and this is referenced in the Risk Assessments. The peat failures which took place at Shass Mountain and Meenbog occurred on upland blanket bog; the Proposed Project site is a mixture of bare cutaway peat, re-vegetated bare peat, degraded raised bog, and remnants of high bog which is a significantly different topography than that found at Shass Mountain and Meenbog. It is also noted that there have been numerous wind farms successfully constructed on bogland sites over the past 15 years with any issues relating to peat failure, such as Derrinlough (Co. Offaly), Galway Wind Park and Arderroo Wind Farm (both Co. Galway).

A constraints study was initially undertaken by the Environmental, Hydrogeological and Ecological members of the design team to determine the developable area on the site, prior to the site reconnaissance by engineering geologists/geotechnical engineers from FT. The extent and depth of ground investigation and peat stability analysis by FT have been undertaken in accordance with guidance within Eurocode 7 and PLHRAG, 2017 to investigate peat slopes that have the potential to impact on the Proposed Project, as applicable. Sufficient peat depth data has been recorded during the site walkovers to enable the characterisation of the peat depth across the site, with additional detail at infrastructure locations. The peat stability assessment is undertaken within the site to identify peat slope at risk from the Proposed Project, and to identify peat slopes that may pose a risk to the Proposed Project.

The geotechnical and peat stability assessment at the site included the following activities:

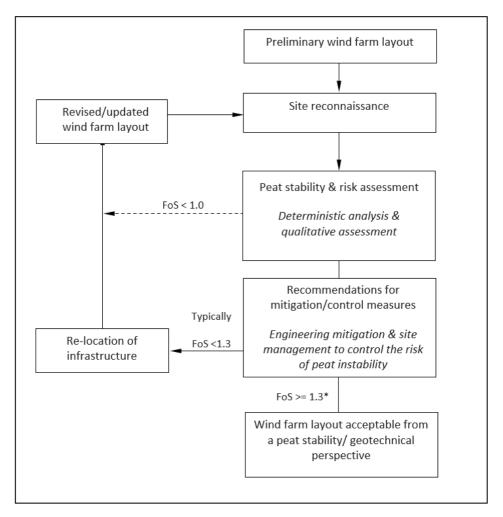
- 1. Desk study involving the review of publicly available soils and geology maps, records of historical peat failures, and aerial photography.
- 2. Site reconnaissance including shear strength and peat depth measurements undertaken following initial constraints study (by design team) to determine the proposed construction envelope within the site, i.e., the area within the overall site where development is possible following multidisciplinary review and assessment of constraints (refer to Chapter 3 of the EIAR).
- 3. Peat stability assessment of the peat slopes on site using a deterministic and qualitative approach.
- 4. Peat contour depth plan compiled based on the 722 no. peat depth probes carried out across the site by FT (2022), MKO (2024 and 2025) and HES (2021 and 2024).
- 5. Factor of safety plan compiled for the short-term critical condition (undrained) for 281 no. FoS points analysed along the proposed infrastructure envelope on site.

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- 6. Construction buffer zone plan identifies areas with an elevated or higher construction risk where mitigation/control measures will need to be implemented during construction to minimise the potential risks and ensure they are kept within an acceptable range.
- 7. A peat stability risk register was compiled to assess the potential design/construction risks at the infrastructure locations and determine adequate mitigation/control measures for each location to minimise the potential risks and ensure they are kept within an acceptable range, where necessary.
- 8. Review of ground investigation carried out at the site by Irish Drilling Ltd (IDL) and Fehily Timoney (FT) between 2021 and 2025.
- 9. Preliminary assessment of foundation type for turbines.
- 10. Commentary of founding details for other infrastructure elements such as internal roads, crane hardstands, onsite substation, temporary construction compound platforms and met mast foundation.

A flow diagram showing the general methodology for the peat stability assessment is shown in Figure 2-1. The methodology illustrates the optimisation of the wind farm layout based on the findings from the site reconnaissance and stability analysis and subsequent feedback.



^{*}An FoS of between 1.0 and 1.3 does not mean that a failure will occur, but that the area requires attention. Mitigation measures can be provided for areas with an FoS of between 1.0 and 1.3 to reduce the risk of failure.

Figure 2-1: Methodology for Peat Stability Assessment

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As for all construction projects, a detailed engineering construction design must be carried out by the appointed construction stage designer prior to any construction work commencing on site. This must take account of the consented project details and any conditions imposed by that consent. This must include a confirmatory peat stability assessment to account for any changes in the environment which may have occurred in the time leading up to the commencement of construction and a peat and spoil management plan to allow for the most appropriate geotechnical and environmental led solutions to be developed for the management of peat and spoil.

2.4 Peat Failure Definition

Peat failure in this report refers to a significant mass movement of a body of peat that would have an adverse impact on a proposed wind farm development or the surrounding environment. Peat failure excludes localised movement of peat that would occur below an internal road, creep movement or erosion type events.

The potential for peat failure at the Proposed Project site is examined with respect to wind farm construction and associated activity.

2.5 Main Approaches to Assessing Peat Stability

The main approaches for assessing peat stability for wind farm developments include the following:

- 1. Geomorphological
- 2. Qualitative (judgement)
- 3. Index/Probabilistic (probability)
- 4. Deterministic (factor of safety)

Approaches (1) to (3) listed above are considered subjective and do not provide a definitive indication of stability; in addition, a high level of judgement/experience is required which makes it difficult to relate the findings to real conditions. FT apply a more objective approach, the deterministic approach (as discussed in Section 2.6).

As part of FT's deterministic approach, a qualitative risk assessment is also carried out taking into account qualitative factors, which cannot necessarily be quantified, such as the presence of mechanically cut peat, quaking peat, bog pools, sub peat water flow, slope characteristics and numerous other factors. The qualitative factors used in the risk assessment are compiled based on FT's experience of assessments and construction in peat land sites and peat failures throughout Ireland and the UK. FT have been involved with in excess of 100 wind farm developments across Ireland and the UK at various stages of development, from preliminary feasibility stage through planning and from scheme development at tender design and detailed design stage, through to the construction and operational stages. This approach follows the guidelines for geotechnical risk management as given in Clayton (2001), as referenced in the best practice for Peat Landslide Hazard and Risk Assessment Guide (PLHRAG, 2017) and considers the approach of MacCulloch (2005).

The risk assessment uses the results of the deterministic approach in combination with qualitative factors, which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability to assess the risk of instability on a peat land site.

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2.6 Peat Stability Assessment – Deterministic Approach

The peat stability assessment is carried out across a wide area of peatland to determine the stability of peat slopes and to identify areas of peatland that are suitable for development; this allows the layout of infrastructure on a particular wind farm site to be optimised. The assessment provides a numerical value (factor of safety (FoS)) of the stability of individual parcels of peatland. The findings of the assessment discriminate between areas of stable and unstable peat, and areas of marginal stability where restrictions may apply. This allows for the identification of the most suitable locations for turbines, internal roads and infrastructure.

A deterministic assessment requires geotechnical information and site characteristics which are obtained from desk study and site walkover, e.g. properties of peat/soil/rock, slope geometry, depth of peat, underlying strata, groundwater, etc. An adverse combination of the factors listed above could potentially result in instability. Using the information above, a factor of safety is calculated for the stability of individual parcels of peatland on a site (as discussed in Section 7).

The FoS is a measure of the stability of a particular slope. For any slope, the degree of stability depends on the balance of forces between the weight of the soil/peat working downslope (destabilising force) and the inherent strength of the peat/soil (shear resistance) to resist the downslope weight, see Figure 2-2.

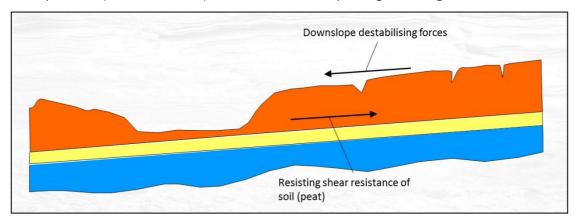


Figure 2-2: Peat Slope Showing Balance of Forces to Maintain Stability

The FoS provides a direct measure of the degree of stability of a slope and is the ratio of the shear resistance over the downslope destabilising force. Provided the available shear resistance is greater than the downslope destabilising force then the FoS will be greater than 1.0 and the slope will remain stable. If the FoS is less than 1.0 the slope is unstable and liable to fail. The acceptable factor of safety for assessment purposes is 1.3 (BS6031, 1981).

2.7 Applicability of the Factor of Safety (Deterministic) Approach for Peat Slopes

The factor of safety approach is a standard engineering approach in assessing slopes which is applied to many engineering materials, such as peat, soil, rock, etc.

The FoS approach is included in the Peat Landslide Hazard and Risk Assessments Best Practice Guide for Proposed Electricity Generation Developments (PLHRAG, 2017); see Section 5.3.1 of the guide. This guide provides best practice methods to identify, mitigate and manage peat slide hazards and associated risks in respect of consent applications for electricity generation projects.

Furthermore, the best practice guide notes that the results from the FoS approach 'has provided the most informative results' with respect to analysing peat stability (Section 5.3.1 of the guide).

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The FoS approach in this report includes undrained (short-term stability) and drained (long-term stability) analyses. The undrained condition is the critical condition for a development. The purpose of the drained analysis is to identify the relative susceptibility of rainfall-induced failures at the Proposed Project site.

Notwithstanding the above, the stability analysis used by FT in this report also includes qualitative factors to determine the potential for peat stability i.e. the analysis used does not solely rely on the factor of safety approach.

The deterministic analysis is considered an acceptable engineering design approach. This concurs with the best practice guide referenced above.

2.8 Assessment of Intense Rainfall and Extreme Dry Events on the Peat Slope

The deterministic approach carried out by FT examines intense rainfall and extreme dry events. The deterministic approach includes and undrained (short-term stability) and drained (long-term stability) analysis to assess the FoS for the peat slopes against a peat failure.

The drained loading condition applies in the long-term. This condition examines the effect of the change in groundwater level as a result of rainfall on the existing stability of the natural peat slopes. For the drained analysis the level of the water table above the failure surface is required to calculate the FoS for the peat slope.

In order to represent varying water levels within the peat slopes, a sensitivity analysis is carried out which assesses varying water level in the peat slopes i.e. water levels ranging from 0 to 100% of the peat depth is conducted, where 0% equates to the peat been completely dry and 100% equates to the peat being fully saturated.

By carrying out such a sensitivity analysis with varying water level in the peat slopes, the effects of intense rainfall and extreme dry events are considered and analysed. The results of which are presented in Section 7 of this report.

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3. DESK STUDY

3.1 Desk Study

The main relevant sources of interest with respect to the Proposed Project site include:

- Geological plans and Geological Survey of Ireland database
- Ordnance survey plans
- Literature review of peat failures

The Geological Survey of Ireland online dataset viewer (GSI, 2025) and geological plans (GSI, 1999) for the site were used to verify the soil and bedrock conditions.

The Ordnance Survey plans were reviewed to determine if any notable features or areas of particular interest (from a geotechnical point of view) are present on the site.

The desk study also includes a review of both published literature and GSI online dataset viewer (GSI, 2025) on peat failures/landslides in the vicinity of the site.

3.2 Soils, Subsoil & Bedrock

A review of the Geological Survey of Ireland online database and published documents from the GSI was carried out.

The GSI subsoils maps indicates that the Proposed Project site is underlain by a combination of predominantly cut over raised peat with small pockets of till derived from limestones, gravels derived from limestones, and an area of bedrock outcrop or subcrop.

In relation to bedrock, the Proposed Project site is underlain by 4 no. geological formations. The north and northwest of the site is predominantly underlain by the Waulsortian Limestone, described as massive un-bedded lime-mudstones. This is separated by northeast to southwest trending fault lines which separate the Waulsortian Limestone formation from the Ballysteen formation and Navan Beds, which comprises dark muddy limestone shale and dark limestone, mudstone and sandstone, respectively. There are 4 no. perpendicular fault lines across the east of the site which are orientated in a northwest to southeast direction. The geological formation in the south and southwestern portion of the site is Old Red Sandstone (undifferentiated) described as red conglomerate, sandstone & mudstone.

There is a quarry recorded approximately 5km southwest of the Proposed Project site.

No karst features were identified on the survey area. The nearest karst features were recorded 0.5km to the northeast of the site and consisted of 2 no. springs and 1 no. swallow hole. Additionally, there are 2 no. mushroom rocks (a surface karst related feature) located approx. 3-5km to the west of the site.

There are 2 no. dug wells located to the south of the site and 1 no. dug well located in the north of the site.

1 no. landslide event was recorded 2km south of the site which occurred in 1954. This failure is noted to have occurred in an area of glacial till.

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There are no geological heritage sites noted in the study area. The nearest geological heritage site is the Clonmacnoise Esker which is present 0.5km to the north and approx. 2km to the east of the study area.

3.3 Previous Failures

There are no recorded peat failures within the Proposed Project site (GSI, 2022). The nearest recorded peat failure is located in Kilmaleady Bog near Clara, approximately 10km northwest of the study area. This failure was described as a flow slide failure. It occurred in 1821 and there have been no other recorded failures since.

The landslide susceptibility of the site was classified by the GSI (2022) as 'low' susceptibility, which is expected given the flat terrain present.

The presence, or otherwise, of relict peat failures or clustering of relict failures within an area is an indicator that particular site conditions exist that pre-dispose a site to failure or not as the case may be. Hence based on the historical data reviewed and the terrain and ground conditions present on site it can be concluded that site conditions in the area of the Proposed Project site have a limited potential of peat failure.

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4. FINDINGS PF SITE RECONNAISSANCE

4.1 Site Reconnaissance

As part of the assessment of potential peat failure at the Proposed Project site, FT carried out a site reconnaissance in conjunction with the desk study review described in Section 3. This comprised walkover inspections of the site with recording of salient geomorphological features with respect to the Proposed Project, which included peat depth and preliminary assessment of peat strength. The information gathered from these site visits provide sufficient information for a site-wide assessment of the extent, depth and strength of peat present at the Proposed Project site.

The following salient geomorphological features were considered:

- Active, incipient or relict instability (where present) within the peat deposits
- Presence of shallow valley or drainage line
- Wet areas
- Any change in vegetation
- Peat depth
- Slope inclination and break in slope

The survey covered the proposed locations for the turbine bases and associated infrastructure.

The method adopted for carrying out the site reconnaissance relied on experienced practitioners carrying out a visual assessment of the site supplemented with measurement of slope inclinations.

4.2 Findings of Site Reconnaissance

The site reconnaissance comprised a walkover inspection of the site by engineers from FT on several different days from April 2021 to September 2024. Weather conditions for the site visits ranged from dry to wet. The dates of each site reconnaissance and the associated FT personal are listed below.

- 6th to 9th of April 2021 (Emily Archer)
- 5th to 8th of September 2022 (Alan Whelan and Karim Costa)
- 25th of October 2023 (Julian Borlado)
- 25th of September 2024 (Doireann Tarrant and Julian Borlado)

The findings from the site walkover have been used to optimise the layout of the infrastructure on site. The main findings of the site walkover of the Proposed Project site are as follows:

1. The site is typically covered in a layer of peat and is relatively flat. Peat depths vary across the site depending on mainly topography. Bare cutover and cutaway peat, re-vegetation of bare peat and degraded raised bog from historical peat extraction activities are present across the site (see Appendix A).

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- 2. A total of 722 no. peat depth probes were carried out by FT, MKO and HES on site. Peat depths recorded from peat probing across the site ranged from 0.1 to >6.0m with an average depth of 2.0m (Drawings P20-216-0600-0001 to 0003). Approximately 80% of peat depth probes recorded peat depths of less than 3.0m. A number of localised readings were recorded where peat depths were 3.5 to >6.0m.
- 3. The peat depths recorded at the turbine locations varied from 0.1 to 4.2m with an average depth of 1.6m. The ground investigation identified that at 8 no. turbine locations the peat was underlain by soft clay or silt deposits, ranging from 0.4m to 2.9m in thickness.
 - (1) With respect to the new proposed internal roads, peat depths ranged from 0 to 5.5m.
 - (2) Slope angles at the turbine locations ranged from 2 to 4 degrees. These slope angle readings were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment, such as the Silva Clino Master which has an accuracy of +/- 0.25 degrees and from contour survey plans for the site.
 - (3) The slope angle quoted typically reflects the slope within the footprint of each infrastructure location. The flat topography/nature of the terrain on site highlights the low risk of peat failure.
 - (4) Localised areas of ponded water were recorded. This is not unexpected given the ground conditions and the flat terrain present across the site.
 - (5) No evidence of past failures or any significant signs of peat instability were noted on site.
 - (6) A summary of the site walkover findings for the Proposed Project site are as follows:
 - (a) The site is typically covered in a layer of peat with typically flat terrain and open peatland. Peat depths recorded across the site by means of peat probing ranged from 0.1 to 6.0m with an average depth of 2.0m.
 - (b) A construction buffer zone plan has been produced for the site (Drawings P20-216-0600-0004 to 006). This shows areas on the site where no development is advised and areas with an elevated or higher construction risk. The above identified buffer areas are based on qualitative factors identified during the walkover survey e.g. relatively deep peat, quaking peat, mechanically cut peat, recent peat landslide, etc.
 - (c) The results of the peat depth probing, shear strength testing of the peat and qualitative factors identified on site have been used in the stability and risk assessments, see Sections 6, 7 and 8 of this report for details.
 - (d) Based on the findings from the walkover survey, the Proposed Project is considered to have a **low** risk of peat failure.

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5. GROUND INVESTIGATION

Ground investigations (GI) in the form of trial pits and rotary boreholes were carried out at the Proposed Project site by Fehily Timoney in April 2021 and by Irish Drilling Limited (IDL) in March 2022 and November 2023. A total of 28 trial pits were excavated by FT in April 2021. The ground investigations by IDL comprised a total of 19 no. trial pits in 2022 and the additional GI in 2024 comprised 10 no. rotary boreholes and 16 no. trial pits with associated laboratory testing.

The laboratory testing included the following:

- Classification testing for overburden material
- Minimum and maximum density values for overburden material
- Determination of dry density/moisture content relationship

The trial pits logs, photographs and associated laboratory testing are included within Appendix E, F and G of this report.

The purpose of the ground investigation was to assess the ground conditions at the main infrastructure locations and potential borrow pit locations across the site. A ground investigation location plan is included as Drawings P20-216-0600-007 to 0009) in this report.

5.1 Summary of Ground Conditions

The ground conditions at the Proposed Project site can be typically categorised into the following deposits:

Peat – Typically described as Very soft or firm black dark brownish amorphous or pseudo fibrous or fibrous PEAT. Peat thicknesses ranged from 0.2m to 4.9m from trial pits and 4.1 to 7.1m in the boreholes.

Lacustrine Clay & Silt – soft blueish-grey or yellowish brown silty very sandy or slightly sandy or slightly gravelly sandy silt with fibres or shell fragments. The thickness of the layer is variable across the site.

Fluvioglacial Sand and Gravel – Typically described as grey slightly sandy Gravel or sandy very silty Gravel or silty Sand with boulders and cobbles. Sand is fine to coarse, and gravel is angular to subrounded. The thickness of the layer is variable across the site.

Limestone Bedrock – Strong locally very strong thinly bedded grey and dark grey sparry bioclastic fine- and coarse-grained LIMESTONE massive dark blackish grey fine grained calp limestone. Upper 1.0 to 4.0m possible weathered rock described as subrounded to subangular fine to coarse assorted light grey and dark grey limestone GRAVEL with rare cobble some grey slightly sandy slightly gravelly silt. This is consistent with the GSI bedrock mapping which indicates that the site is underlain by dark muddy Limestone or Dark Limestone, Mudstone, Sandstone.

Groundwater was recorded in 44 no. of the trial pits on site and varied between 0.6 and 3.9m bgl.

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5.2 Summary of Laboratory Tests

Following completion of intrusive site investigations by FT and IDL laboratory testing was scheduled by FT and undertaken by Irish Drilling Ltd (IDL). Soil testing was carried out in accordance with BS1377 (1990) - *Methods of Test for Soils for Civil Engineering Purposes* in IDL's Materials Laboratory, accredited in accordance with the Irish National Accreditation Board (INAB).

The samples of the overburden material were analysed for a range of parameters which included Particle Size Distribution (PSD), Moisture Content and Atterberg Limits.

The results are summarised in Table 5-1. Atterberg limit tests carried out on the samples classify the material as Clay of low to high plasticity, or non-plastic (Silt). No elevated sulphate levels were detected in the samples tested. The results indicate that the fine-grained soils tested are predominantly low to intermediate plasticity Clays. The moisture content was typically lower for granular soils than cohesive soils.

Table 5-1: Laboratory Testing

Туре	N	Min	Max	Remarks
Natural Moisture Content (%)	28	6.1	62	Typical % lower from gravel dominated soil and higher for silt dominated soil.
Atterberg Limits	28	0	35	Low plasticity Silt and low-to-high plasticity Clay.
Particle Size Distribution	12			% passing 63 μm ranged from 5 to 95%
Point Load	3			Rock strength ranged from weak to very strong.
Dry Density/Moisture Content	5	1.96	2.17	
Soil Organic Content (%)	4	0.552	5.26	
Sulphate Total (%)	5	0.0148	0.0976	
Water Soluble Sulphate as SO4 (g/L)	5	0.0202	0.401	-
рH	5	8.08	8.57	-

5.3 Summary of Geotechnical Parameters

Table 5-2 contains characteristic geotechnical parameters for the main material types likely to be encountered on the Proposed Project site. Where direct measurement of parameters has not been carried out, established correlations with measured properties have been used to derive values. Characteristic values are defined as a cautious estimate of the value affecting the occurrence of limit state based on clause 2.4.5.2 from Eurocode 7.

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Table 5-2: Summary of Geotechnical Parameters

	Unit	Geotechnical Parameters			
Material Type/Strata	Weight	Undrained Drained Parameters		Parameters	
	γ (kN/m³)	c _u (kPa)	ф' (°)	c' (kPa)	
Peat	11	₆ (3)	25	4	
Lacustrine Soil	18	20	26	0	
Fluvioglacial – Sand & Gravel	20	-	32	0	

Notes

Note (1) The above parameters are indicative only and have been derived based on experience and from a review of the ground investigation carried out at the site.

Note (2) Where direct measurement of parameters has not been carried out, established correlations with measured properties have been used to derive values.

Note (3) A lower bound undrained shear strength, cu for the peat of 6kPa was selected. The lowest recorded value on the Proposed Project site was 12kPa hence a value of 6kPa is a conservative value.

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6. PEAT DEPTHS, STRENGTH & SLOPE AT PROPOSED INFRASTRUCTURE LOCATIONS

As part of the site walkover, peat depth, in-situ peat strength and slope angles were recorded at various locations across the site.

6.1 Peat Depth

Peat probes were carried out at/near to proposed turbine locations and internal roads and other main infrastructure elements to determine the peat depth on site. At all proposed turbine locations, up to 5 no. probes were carried out around the turbine location, and an average peat depth was calculated.

6.2 Peat Strength

The strength testing was carried out in-situ using a Geonor H-60 Hand-Field Vane Tester. From FT's experience hand vanes give indicative results for in-situ strength of peat and would be considered best practice for the field assessment of peat strength. Strength testing was carried out at selected locations across the site to provide representative coverage of indicative peat strengths. The results of the vane testing with depth are presented in Figure 6-1.

6.3 Slope Angle

The slope angles at each of the main infrastructure locations were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment, such as the Silva Clino Master and from contour survey plans for the Proposed Project site.

The slope angle quoted typically reflects the slope within the footprint of each proposed infrastructure location. It should be noted that slope angles derived from contour survey plans would be considered approximate, as such surveys are dependent on the density of survey data and do not always reflect local variations in ground topography. Slope angles recorded during the site reconnaissance by FT using handheld equipment would generally be deemed more accurate and representative of local topography.

6.4 Summary of Findings

Based on the peat depths recorded across the site by the peat probes carried out by FT, MKO and HES and the trial pits and boreholes excavated by FT and IDL, the peat varied in depth from 0.1 to >7.1m with an average depth of 2.0m. All peat depth probes carried out on site have been utilised to produce a peat depth contour plan for the site (Drawing P20-216-0600-0001 to 0003).

A summary of the peat depths at the proposed infrastructure locations is given in Table 6.1. The data presented in Table 6.1 is used in the peat stability assessment of the site.

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Peat Depth & Slope Angle at Proposed Infrastructure Locations **Table 6-1:**

Proposed Infrastructure	Easting	Northing	Peat Depth Range (m) (Note 1)	Average Peat Depth (m)	Slope Angle (°) (Note 2)
T01	614198	727373	3.1 – 3.6	3.5	3
T02	614481	726939	0.9 – 1.7	1.2	4
T03	614779	726516	1.5 – 2.2	1.8	4
T04	615314	727112	0.1 – 0.4	0.2	4
T05	615978	727580	0.7 – 1.3	1.0	3
T06	615647	727935	1.5 – 2.4	1.9	2
T07	614968	727549	1.8 – 2.7	2.2	3
T08	615375	728345	0.9 – 1.8	1.2	4
T09	616021	728746	1.0 – 1.7	1.3	3
T10	615717	729399	0.9 – 2.0	1.5	4
T11	616379	729349	0.9 – 1.7	1.2	3
T12	616415	728161	1.3 – 1.5	1.4	2
T13	616995	728608	0.7 – 2.0	1.3	4
T14	617357	728184	0.3 – 1.3	1.0	4
T15	617684	728906	3.6 – 4.1	3.8	3
Met Mast	614131	727021	1.8 – 3.2	2.5	4
Substation	614953	730887	5.0 – 7.1	5.5	3
Telecoms Tower	615004	730929	5.2 – 6.0	6.0	3
Steel Mast 1 (under OHL west)	614640	731161	1.00	1.0	2
Steel Mast 2 (under OHL east)	614687	731203	0.20	0.20	2
Steel Mast 3 (beside substation west)	614881	730908	5.30	5.30	2
Steel Mast 4 (beside substation east)	614915	730938	5.20	5.20	2
Crane Pad (under OHL)	614662	731177	0.4 – 0.7	0.6	2
Crane Pad (beside substation)	614881	730945	2.4 – 6.0	4.2	3
Tower Build Area (under OHL)	614634	731199	0.5 – 3.0	3.0	2
Tower Build Area (beside substation)	614921	730978	2.0 – 5.0	3.5	2

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Proposed Infrastructure	Easting	Northing	Peat Depth Range (m) (Note 1)	Average Peat Depth (m)	Slope Angle (°) (Note 2)
Construction Compound 1	612542	727781	2.5 – 5.4	3.9	3
Construction Compound 2	617278	728493	1.9 - 2.3	2.1	4
Construction Compound 3	614686	727316	0.6 – 2.2	1.2	3
Construction Compound 4	615684	729778	3.0 - 3.8	3.4	4
Construction Compound 5	614958	730828	2.0 - 5.5	4.0	2
Borrow Pit 1	614589	726681	1.6 - 4.2	2.9	6
Borrow Pit 2	615081	727017	0.2	0.2	4
Borrow Pit 3	615695	728507	0.6	0.6	4
Borrow Pit 4	615982	728959	0.7 - 1.2	1.0	4

Note (1) Based on probe results from the site walkovers. The range of peat depths for the infrastructure locations are typically based on a 10m grid carried out around the infrastructure element, where accessible.

Note (2) The slope angles at each of the main infrastructure locations were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment, such as the Silva Clino Master (which has an accuracy of +/- 0.25 degrees) and from contour survey plans for site. The slope angle quoted typically reflects the slope within the footprint of each infrastructure location.

Note (3) The data presented in the Table above is used in the peat stability assessment of the site.

In addition to probing, in-situ shear vane testing was carried out as part of the ground investigation. Strength testing was carried out at selected locations across the site to provide representative coverage of indicative peat strengths. The results of the vane testing with depth are presented in Figure 6-1.

The hand vane results indicate undrained shear strengths in the range 12 to 65kPa, with an average value of 43kPa. The strengths recorded would be typical of well drained peat present within the site.

Peat strength at sites of known peat failures (assuming undrained loading failure) are generally very low, for example the undrained shear strength at the Derrybrien failure (AGEC, 2004) as derived from back-analysis, was estimated at 2.5kPa. The recorded undrained strength at the Proposed Project site is significantly greater than the lower bound values for Derrybrien indicating that there is no close correlation to the peat conditions at the Derrybrien site and that there is significantly less likelihood of failure on the Proposed Project site.

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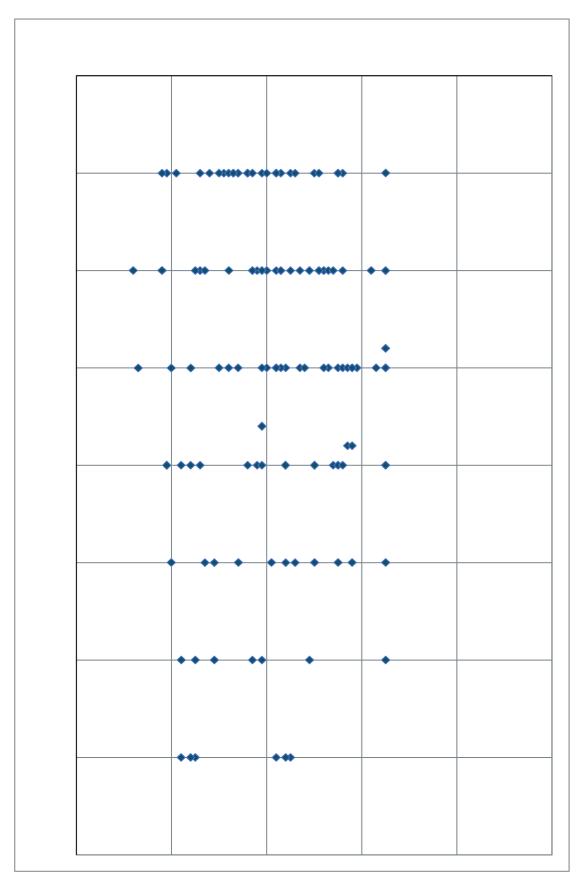


Figure 6-1: Undrained Shear Strength (cu) Profile for Peat with Dept

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7. PEAT STABILITY ASSESSMENTS

The peat stability assessment includes an assessment of the stability of the natural peat slopes for individual parcels across the Proposed Project site including at the proposed turbine, substation and me mast locations and along the proposed internal roads. The assessment also analyses the stability of the natural peat slopes with a surcharge loading of 10kPa, equivalent to placing 1m of stockpiled peat on the surface of the peat slope.

7.1 Methodology for Peat Stability Assessment

Stability of a peat slope is dependent on several factors working in combination. The main factors that influence peat stability are slope angle, shear strength of peat, depth of peat, pore water pressure and loading conditions.

An adverse combination of factors could potentially result in peat sliding. An adverse condition of one of the above-mentioned factors alone is unlikely to result in peat failure. The infinite slope model (Skempton and DeLory, 1957) is used to combine these factors to determine a FoS for peat sliding. This model is based on a translational slide, which is a reasonable representation of the dominant mode of movement for peat failures.

To assess the FoS for a peat slide, an undrained (short-term stability) and drained (long-term stability) analysis has been undertaken to determine the stability of the peat slopes on site.

- 1. The undrained loading condition applies in the short-term during construction and until construction induced pore water pressures dissipate.
- 2. The drained loading condition applies in the long-term. The condition examines the effect of the change in groundwater level as a result of rainfall on the existing stability of the natural peat slopes.

Undrained shear strength values (c_u) for peat are used for the total stress analysis. Based on the findings of the 2003 Derrybrien failure and other failures in peat, undrained loading during construction was found to be the critical failure mechanism.

A drained analysis requires effective cohesion (c') and effective friction angle (\emptyset ') values for the calculations. These values can be difficult to obtain because of disturbance experienced when sampling peat and the difficulties in interpreting test results due to the excessive strain induced within the peat. To determine suitable drained strength values a review of published information on peat was carried out. Table 7.1 shows a summary of the published information on peat together with drained strength values.

From Table 7.1 the values for c' ranged from 1.1 to 8.74kPa and \emptyset ' ranged from 21.6 to 43°. The average c' and \emptyset ' values are 4.5kPa and 30° respectively. Based on the above, it was considered to adopt a conservative approach and to use design values below the averages. For design the following general drained strength values have been used for the site:

$$c' = 4kPa$$

 $\phi' = 25^{\circ}$

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Table 7-1: List of Effective Cohesion and Friction Angle Values for Peat

Reference	Cohesion, c' (kPa)	Friction Angle, ø' (degs)	Testing Apparatus/ Comments
Hanrahan et al (1967)	5 to 7	36 to 43	From triaxial apparatus
Rowe and Mylleville (1996)	2.5	28	From simple shear apparatus
Landva (1980)	2 to 4	27.1 to 32.5	Mainly ring shear apparatus for normal stress greater than 13kPa
	5 to 6	-	At zero normal stress
Carling (1986)	6.5	0	-
Farrall and Habib	0	38	From ring shear and shear box apparatus. Results are not considered representative.
Farrell and Hebib (1998) 0.61		31	From direct simple shear (DSS) apparatus. Result considered too low therefore DSS not considered appropriate
Rowe, Maclean and	1.1	26	From simple shear apparatus
Soderman (1984)	3	27	From DSS apparatus
McGreever and	6	38	From triaxial apparatus using soil with 20% organic content
Farrell (1988)	6	31	From shear box apparatus using soil with 20% organic content
Hungr and Evans (1985)	3.3	-	Back-analysed from failure
Dykes and Kirk (2006)	3.2	30.4	Test within acrotelm
Dykes and Kirk (2006)	4	28.8	Test within catotelm
Warburton et al (2003)	5	23.9	Test in basal peat
Warburton et al (2003)	8.74	21.6	Test using fibrous peat
Hendry et al (2012)	0	31	Remoulded test specimen
Komatsu et al (2011)	8	34	Remoulded test specimen
Zwanenburg et al (2012)	2.3	32.3	From DSS apparatus
Den Haan & Grognet (2014)	-	37.4	From large DSS apparatus
O'Kelly & Zhang (2013)	0	28.9 to 30.3	Tests carried out on reconstituted, undisturbed and blended peat samples

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7.2 Analysis to Determine Factor of Safety (Deterministic Approach)

The purpose of the analysis was to determine the FoS of the peat slopes using infinite slope analysis. The analysis was carried out at the proposed turbine locations, along the proposed internal roads and at various locations across the Proposed Project site.

The FoS provides a direct measure of the degree of stability of the slope. A FoS of less than unity indicates that a slope is unstable, a FoS of greater than unity indicates a stable slope.

The acceptable safe range for FoS typically ranges from 1.3 to 1.4. The previous code of practice for earthworks BS 6031:1981 (BSI, 1981), provided advice on design of earthworks slopes. It stated that for a first-time failure with a good standard of site investigation the design FoS should be greater than 1.3.

As a general guide the FoS limits for peat slopes in this report are summarised in Table 7.2.

Table 7-2: Factor of Safety Limits for Slopes

Factor of Safety (FoS)	Degree of Stability		
Less than 1.0	Unstable (red)		
Between 1.0 and 1.3	Marginally stable (yellow)		
1.3 or greater	Acceptable (green)		

Eurocode 7 (EC7) (IS EN 1997-1:2005) now serves as the reference document and the basis for design geotechnical engineering works. The design philosophy used in EC7 applies partial factors to soil parameters, actions and resistances. Unlike the traditional approach, EC7 does not provide a direct measure of stability, since global FoS are not used.

As such, and in order to provide a direct measure of the level of safety on a site, EC7 partial factors have not been used in this stability assessment. The results are given in terms of FoS.

A lower bound undrained shear strength, c_u for the peat of 6kPa was selected for the assessment based on the c_u values recorded across the Proposed Project site. It should be noted that a c_u of 6kPa for the peat is considered a conservative value for the analysis and is not representative of all peat present across the Proposed Project site. In reality the peat generally has a higher undrained strength.

The formula used to determine the factor of safety for the undrained condition in the peat (Bromhead, 1986) is as follows:

$$F = \frac{c_u}{\gamma z \sin \alpha \cos \alpha}$$

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Where:

F = **Factor of Safety**

 c_u = Undrained strength

Bulk unit weight of material *γ* =

Depth to failure plane assumed as depth of peat z =

α = Slope angle

The formula used to determine the factor of safety for the drained condition in the peat (Bromhead, 1986) is as follows:

$$F = \frac{c' + (\gamma z - \gamma_w h_w) \cos^2 \alpha \tan \phi'}{\gamma z \sin \alpha \cos \alpha}$$

Where:

F = **Factor of Safety**

c' = Effective cohesion

Bulk unit weight of material *γ* =

Depth to failure plane assumed as depth of peat

 $y_w =$ Unit weight of water

 h_w = Height of water table above failure plane

Slope angle $\alpha =$

 ϕ' = Effective friction angle

For the drained analysis the level of the water table above the failure surface is required to calculate the FoS for the slope. Since the water level in cutover/cutaway peatland can be variable and can be recharged by rainfall, it is not feasible to establish its precise location throughout the site. Therefore, a sensitivity analysis using water level ranging between 0% and 100% of the peat depth was conducted, where 0% equates to the peat being completely dry and 100% equates to the peat been fully saturated.

The following general assumptions were used in the analysis of peat slopes at each location:

- 1. Peat depths are based on the maximum peat depth recorded at each location from the walkover surveys and ground investigation.
- 2. The slope angles used in the peat stability assessment were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment and from contour survey plans for the Proposed Project site. It should be noted that slope angles derived from contour survey plans would be considered approximate, as such surveys are dependent on the density of survey data and do not always reflect local variations in ground topography.
- 3. Slope angle at base of sliding assumed to be parallel to ground surface.



4. A lower bound undrained shear strength, c_u for the peat of 6kPa was selected for the assessment. The lowest recorded value on the Proposed Project site during the site walkover was 12kPa. It should be noted that a c_u of 6kPa for the peat is considered a conservative value for the analysis and is not representative of all peat present across the Proposed Project site. In reality, the peat has a significantly higher undrained strength as a result of the extensive drainage and extraction works which have been carried out on site.

For the stability analysis two load conditions were examined, namely

Condition (1): no surcharge loading

Condition (2): surcharge of 10 kPa, equivalent to 1m of stockpiled peat assuming a precautionary scenario

7.3 Results of Analysis

7.3.1 Undrained Analysis for the Peat

The results of the undrained analysis for the natural peat slopes are presented in Appendix C and the results of the undrained analysis for the most critical load case (load condition 2) are shown on Drawings P20-216-0600-0010 to 0012. The undrained analysis for load condition 2 is considered the most critical load case as most peat failures occur in the short term upon loading of the peat surface. The results from the main infrastructure locations are summarised in Table 7.3.

The calculated FoS for load condition 1 is in excess of 1.3 for each of the infrastructure locations (281 no. locations) analysed with a range of FoS of 2.44 to 86.01, indicating a low risk of peat instability.

The calculated FoS for load condition 2 is in excess of 1.3 for each of the infrastructure locations (281 no. locations) analysed with a range of FoS of 2.01 to 14.34, indicating a low risk of peatinstability.

Table 7-3: Factor of Safety Results (Undrained Condition)

Turbine No./Waypoint	Easting	Northing	Factor of Safety for Load Condition	
	3	3	Condition (1)	Condition (2)
T01	614198	727373	3.19	2.50
T02	614481	726939	5.07	3.19
Т03	614779	726516	3.92	2.69
T04	615978	615978 727580		6.16
T05	615647	727935	8.83	4.99
T06	615647	727935	7.17	5.06
T07	614968	727549	4.25	3.10
T08	615375	728345	4.79	3.08
T09	616021	728746	6.75	4.25
T10	615717	729399	4.31	2.87

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Turbine No./Waypoint	Easting	Northing	Factor of Safety for Load Condition	
rurbine No., waypoint	Lasting	Northing	Condition (1)	Condition (2)
T11	616379	729349	6.75	4.25
T12	616415	728161	11.47	6.88
T13	616995	728608	4.31	2.87
T14	617357	728184	6.63	3.75
T15	617684	728906	2.80	2.25
Met Mast	614131	727021	6.38	4.10
Substation	614953	730887	2.44	2.01
Telecoms Tower	615004	730929	2.87	2.46
Steel Mast 1 (under OHL west)	614640	731161	17.20	8.60
Steel Mast 2 (under OHL east)	614687	731203	86.01	14.34
Steel Mast 3 (beside substation west)	614881	730908	3.25	2.73
Steel Mast 4 (beside substation east)	614915	730938	3.31	2.77
Crane Pad (under OHL)	614662	731177	28.67	10.75
Crane Pad (beside substation)	614881	730945	4.10	3.31
Tower Build Area (under OHL)	614634	731199	5.73	4.30
Tower Build Area (beside substation)	614921	730978	4.92	3.82
Borrow Pit 1	614589	726681	34.55	5.76
Borrow Pit 2	615081	727017	34.55	5.76
Borrow Pit 3	615695	728507	45.92	9.18
Borrow Pit 4	615982	728959	57.40	9.57
Construction Compound 1	612542	727781	2.73	2.21
Construction Compound 2	617278	728493	4.54	2.97
Construction Compound 3	614686	727316	5.22	3.59
Construction Compound 4	615684	729778	3.13	2.65
Construction Compound 5	614958	730827	2.50	2.05



7.3.2 Drained Analysis for the Peat

The results of the drained analysis for the peat are presented in Appendix C. The results from the main infrastructure locations are summarised in Table 7.4. As stated previously, the drained loading condition examines the effect of rainfall and water on the existing stability of the natural peat slopes.

The calculated FoS for load condition 1 is in excess of 1.3 for each of the locations (281 no. locations) analysed with a range of FoS of 2.13 to 21.04 indicating a low risk of peat instability.

The calculated FoS for load condition 2 is in excess of 1.30 for each of the locations (281 no. locations) analysed with a range of FoS of 3.6 to 17.94, indicating a low risk of peat instability.

Table 7-4: Factor of Safety Results (Drained Conditions)

Turbine No./Waypoint	Easting	Northing	Factor of Safety for Load Condition	
raname may may point	20011116		Condition (1)	Condition (2)
T01	614198	727373	2.13	3.60
T02	614481	726939	10.05	8.80
T03	614779	726516	9.28	8.46
T04	615314	727112	21.04	10.77
T05	615978	727580	14.78	12.23
T06	615647	727935	18.13	16.73
T07	614968	727549	11.73	10.97
T08	615375	728345	9.86	8.72
T09	616021	728746	13.40	11.73
T10	615717	729399	9.54	8.56
T11	616379	729349	13.40	11.73
T12	616415	728161	21.00	17.94
T13	616995	728608	9.54	8.58
T14	617357	728184	11.09	9.17
T15	617684	728906	10.76	10.40
Met Mast	614131	727021	4.25	5.91
Substation	614953	730887	10.53	10.24
Telecoms. Tower	615004	730929	15.26	14.99
Steel Mast 1 (under OHL west)	614640	731161	24.82	19.09
Steel Mast 2 (under OHL east)	614687	731203	70.70	22.91
Steel Mast 3 (beside substation west)	614881	730908	15.52	15.17

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Turbine No./Waypoint	Easting	Northing	Factor of Safety for Load Condition		
, , , , , , , , , , , , , , , , , , , ,			Condition (1)	Condition (2)	
Steel Mast 4 (beside substation east)	614915	730938	15.56	15.20	
Crane Pad (under OHL)	614662	731177	32.47	20.52	
Crane Pad (beside substation)	614881	730945	16.08	15.56	
Tower Build Area (under OHL)	614634	731199	17.18	16.22	
Tower Build Area (beside substation)	614921	730978	16.63	15.90	
Borrow Pit 1	614589	726681	28.37	9.17	
Borrow Pit 2	615081	727017	28.37	9.17	
Borrow Pit 3	615695	728507	39.51	15.02	
Borrow Pit 4	615982	728959	47.16	15.28	
Construction Compound 1	612542	727781	8.97	8.31	
Construction Compound 2 617278		728493	9.69	8.65	
Construction Compound 3	614686	727316	13.15	11.63	
Construction Compound 4	615684	729778	6.93	6.62	
Construction Compound 5	614958	730827	11.39	11.09	

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8. PEAT STABILITY RISK ASSESSMENT

A peat stability risk assessment was carried out for the main infrastructure elements at the Proposed Project site. This approach considers guidelines for geotechnical/peat stability risk assessments as given in PLHRAG (2017) and MacCulloch (2005).

The risk assessment uses the results of the stability analysis (deterministic approach) in combination with qualitative factors, which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability, to assess the risk for each infrastructure element.

For each of the main infrastructure elements, a risk rating (product of probability and impact) is calculated and rated as shown in Table 8.1. Where a subsection is rated 'Medium' or 'High', control measures are required to reduce the risk to at least a 'Low' risk rating. Where a subsection is rated 'Low' or 'Negligible', only routine control measures are required.

Table 8-1: Risk Rating Legend

17 to 25	High: avoid works in area or significant control measures required
11 to 16	Medium: notable control measures required
5 to 10	Low: only routine control measures required
1 to 4	Negligible: none or only routine control measures required

A full methodology for the peat stability risk assessment is given in Appendix D.

8.1 Summary of Risk Assessment Results

The results of the peat stability risk assessment for potential peat failure at the main infrastructure elements is presented as a Geotechnical Risk Register in Appendix B and summarised in Table 8.2.

The risk rating for each proposed infrastructure element of the Proposed Project is designated Negligible following mitigation/control measures being implemented. Sections of internal roads to the nearest proposed infrastructure element will be subject to the same mitigation/control measures that apply to the nearest proposed infrastructure element.

Details of the required mitigation/control measures can be found in the Geotechnical Risk Register for each infrastructure element (Appendix B)

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Summary of Peat Stability Risk Register Table 8-2:

Proposed Infrastructure	Pre-Control Measure Implementation Risk Rating	Pre-Control Measure Implementation Risk Rating Category	Notable Control Measures Required	Post-Control Measure Implementation Risk Rating	Post-Control Measure Implementation Risk Rating Category
T1	Low	5 to 10	Yes	Negligible	1 to 4
T2	Negligible	1 to 4	No	Negligible	1 to 4
Т3	Negligible	1 to 4	No	Negligible	1 to 4
T4	Negligible	1 to 4	No	Negligible	1 to 4
T5	Negligible	1 to 4	No	Negligible	1 to 4
Т6	Negligible	1 to 4	No	Negligible	1 to 4
Т7	Low	5 to 10	Yes	Negligible	1 to 4
Т8	Negligible	1 to 4	No	Negligible	1 to 4
Т9	Negligible	1 to 4	No	Negligible	1 to 4
T10	Negligible	1 to 4	No	Negligible	1 to 4
T11	Negligible	1 to 4	No	Negligible	1 to 4
T12	Negligible	1 to 4	No	Negligible	1 to 4
T13	Negligible	1 to 4	No	Negligible	1 to 4
T14	Negligible	1 to 4	No	Negligible	1 to 4
T15	Negligible	1 to 4	No	Negligible	1 to 4
Met Mast	Negligible	1 to 4	No	Negligible	1 to 4
Substation	Low	5 to 10	Yes	Negligible	1 to 4
Telecoms Tower	Low	5 to 10	Yes	Negligible	1 to 4
Steel Mast 1 (under OHL west)	Medium	11 to 16	Yes	Negligible	1 to 4
Steel Mast 2 (under OHL east)	Low	5 to 10	Yes	Negligible	1 to 4
Steel Mast 3 (beside substation west)	Low	5 to 10	Yes	Negligible	1 to 4
Steel Mast 4 (beside substation east)	Low	5 to 10	Yes	Negligible	1 to 4
Crane Pad (under OHL)	Low	5 to 10	Yes	Negligible	1 to 4
Crane Pad (beside substation)	Low	5 to 10	Yes	Negligible	1 to 4
Tower Build Area (under OHL)	Low	5 to 10	Yes	Negligible	1 to 4

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Proposed Infrastructure	Pre-Control Measure Implementation Risk Rating	Pre-Control Measure Implementation Risk Rating Category	Notable Control Measures Required	Post-Control Measure Implementation Risk Rating	Post-Control Measure Implementation Risk Rating Category
Tower Build Area (beside substation)	Low	5 to 10	Yes	Negligible	1 to 4
Construction Compound 1	Low	5 to 10	Yes	Negligible	1 to 4
Construction Compound 2	Negligible	1 to 4	No	Negligible	1 to 4
Construction Compound 3	Negligible	1 to 4	No	Negligible	1 to 4
Construction Compound 4	Low	5 to 10	Yes	Negligible	1 to 4
Construction Compound 5	Negligible	1 to 4	No	Negligible	1 to 4
Borrow Pit 1	Low	5 to 10	Yes	Negligible	1 to 4
Borrow Pit 2	Negligible	1 to 4	No	Negligible	1 to 4
Borrow Pit 3	Negligible	1 to 4	No	Negligible	1 to 4
Borrow Pit 4	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - Main Entrance Road to T1 and T1/T2 Junction	Low	5 to 10	Yes	Negligible	1 to 4
Internal Road - T2 to T3	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T3 to R436 Entrance	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T2/T3 Junction to T5	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T5 to T6 to T6/T7 junction	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T5/T6 Junction to T12	Medium	11 to 16	Yes	Low	5 to 10
Internal Road - T12 to T14	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - Entrance R436 to CC	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T12/T14 Junction to T13 and T15	Negligible	1 to 4	No	Negligible	1 to 4

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Proposed Infrastructure	Pre-Control Measure Implementation Risk Rating	Pre-Control Measure Implementation Risk Rating Category	Notable Control Measures Required	Post-Control Measure Implementation Risk Rating	Post-Control Measure Implementation Risk Rating Category
Internal Road - T1/T2 Junction to T6/T7 Junction	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T6/T7 Junction to T8	Medium	11 to 16	Yes	Low	5 to 10
Internal Road - T8 to T9	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T8/T9 Junction to T11	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - T10 to Local Road Entrance	Negligible	1 to 4	No	Negligible	1 to 4
Internal Road - Local Road Entrance to Substation	Low	5 to 10	Yes	Negligible	1 to 4



INDICTATIVE FOUNDATION TYPE AND FOUNDATION DEPTH FOR TURBINES

9.1 **Summary**

Based on a review of the ground investigation information for site, a preliminary assessment of the likely foundation type and founding depths for each turbine location was carried out, where possible. A summary of this assessment is provided in Table 9-1.

Table 9-1: Summary of Indicative Turbine and Infrastructure Foundation Type and Founding Depths

Turbine No.	Foundation Type	Relevant GI	Indicative founding depth (m bgl)	Comment
T1	Gravity/Piled foundations	TP-T01	4.9	The site investigation works carried out indicate that gravity or piled foundation may be required.
T2	Gravity/Piled foundations	TP-T02	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Т3	Gravity/Piled foundations	TP-T03	4.1	The site investigation works carried out indicate that gravity or piled foundation may be required.
T4	Gravity/Piled foundations	TP-T04	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
T5	Gravity/Piled foundations	TP-T05	4.3	The site investigation works carried out indicate that gravity or piled foundation may be required.
Т6	Gravity/Piled foundations	TP-T06	3.8	The site investigation works carried out indicate that gravity or piled foundation may be required.
Т7	Gravity/Piled foundations	TP-T07	3.15	The site investigation works carried out indicate that gravity or piled foundation may be required.
Т8	Gravity/Piled foundations	TP-T08	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Т9	Gravity/Piled foundations	TP-T09	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
T10	Gravity/Piled foundations	TP-T10	3.6	The site investigation works carried out indicate that gravity or piled foundation may be required.
T11	Gravity/Piled foundations	TP-T11	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.

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Turbine No.	Foundation Type	Relevant GI	Indicative founding depth (m bgl)	Comment
T12	Gravity/Piled foundations	TP-T12	3.6	The site investigation works carried out indicate that gravity or piled foundation may be required.
T13	Gravity/Piled foundations	TP-T13	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
T14	Gravity/Piled foundations	TP-T14	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
T15	Gravity/Piled foundations	TP-T15	4.7	The site investigation works carried out indicate that gravity or piled foundation may be required.

It should be noted that confirmatory ground investigation will be carried out prior to construction at each proposed turbine location in the form of a borehole with in-situ SPT testing at 1.0m intervals in the overburden and follow- on rotary core through bedrock to confirm the foundation types and founding stratums assumed in Table 9-1. It is possible that following the completion of further ground investigation prior to construction that a number of the proposed turbine bases will be deemed suitable for gravity type foundations.

For gravity type turbine foundations, where the depth of excavation exceeds the required founding depth for the proposed turbine base, up-fill material consisting of granular fill (6N) shall be used to backfill the excavation to the required founding depth.

For the piled type turbine foundations, a typical piling type and configuration could be up to 16 no. 1200-1600mm diameter rotary bored piles.



10. FOUNDING DETAILS FOR OTHER INFRASTRUCTURE ELEMENTS

This section provides a summary of the founding details for various elements of the proposed infrastructure across the Proposed Project site. The detailed methodologies for the construction of these elements of the Proposed Project are included in Chapter 4 of the EIAR. A summary of this assessment is provided in 9.2.

Table 10-1: Summary of Infrastructure Foundation Type and Founding Depths

Turbine No.	Foundation Type	Relevant GI	Indicative founding depth (m bgl)	Comment
Substation	Gravity/Piled foundations	BHSS1 to BHSS4	10.0	The site investigation works carried out indicate that either gravity or a piled foundation will be required.
Tower Build Area (under OHL)	Gravity/Piled foundations	Peat Probes	4.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Tower Build Area (beside substation)	Gravity/Piled foundations	BHSS2	10.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Met Mast	Gravity/Piled foundations	TP-T02	3.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Telecoms Tower	Gravity/Piled foundations	BHSS4	8.5	The site investigation works carried out indicate that gravity or piled foundation may be required.
Steel Mast 1 & 2 (under OHL)	Gravity/Piled foundations	Peat Probes	1.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Steel Mast 3 & 4 (beside substation)	Gravity/Piled foundations	BHSS1	2.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Crane Pad (under OHL)	Gravity/Piled foundations	Peat Probes	4.0	The site investigation works carried out indicate that gravity or piled foundation may be required.
Crane Pad (beside substation)	Gravity/Piled foundations	BHSS1	11.0	The site investigation works carried out indicate that gravity or piled foundation may be required.

10.1 Internal Roads

Floating internal roads are the predominant road construction type proposed for the site which given the ground conditions and type of terrain present is deemed an appropriate construction approach.

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The total length of new proposed internal road to be constructed on site is 18.2km (see Drawings P20216-0600-0013 to 0015).

The typical make-up of the floated internal roads is a minimum stone thickness of 1000mm with at least one layer of reinforcing geogrid. The necessary stone thickness will be confirmed at detailed design stage.

Refer to the Peat and Spoil Management Plan (Appendix 4-4) for further details on the proposed internal roads on site.

10.2 Substation & Tower Build Areas Foundations

The substation and tower build areas will have a piled foundation due to the depth of peat exceeding 4.0m. A typical piling type and configuration could be up to 900mm diameter CFA piles. The platforms will be founded on competent material underlying the peat deposits.

Given the ground conditions present at the proposed substation and tower build areas, it is envisaged that the foundations will require to be founded on glacial till. The peat and lacustrine soils will not be a suitable founding stratum for the substation foundations.

Typical founding depth for substation and tower build areas platforms is likely to be 9.0-11.0mBGL.

10.3 Temporary Construction Compound Platforms

The construction compound platforms will be constructed using a floated technique.

The construction compound platforms are generally constructed using compacted Class 1/6F material on a suitable sub-formation to achieve the required bearing resistance.

The construction compound platforms will require to be founded on material underlying the peat deposits. Typical founding depth for construction compound platforms will require excavations from 0.8m to 1.4m bgl.

Alternatively, the compounds may be floated, with a stone thickness of 1000mm with at least one layer of reinforcing geogrid. The necessary stone thickness will be confirmed at detailed design stage.

10.4 Telecommunications Tower Platform

The telecommunications tower platforms will be constructed using a piled technique.

The telecommunications tower will have a piled foundation due to the depth of peat in this location exceeding 6.0m. A typical piling type and configuration could be up to 900mm diameter CFA piles. The telecommunications tower platform will be founded on competent material underlying the peat deposits.

Given the ground conditions present at the proposed telecom. tower, it is envisaged that the foundations will require to be founded on glacial till. The peat and lacustrine soils will not be a suitable founding stratum for the telecommunications tower.

Typical founding depth for telecommunications tower platform is likely to be 8.5mBGL.

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10.5 Steel Mast Foundations

The steel mast platforms will be constructed using a gravity or piled type foundation.

For a gravity foundation the steel mast foundation will be founded on a competent stratum below the peat. Typical founding depth for the steel mast gravity foundation is envisaged to be 1.5mbgl. At the underside of the steel mast foundation, a layer of structural up-fill (class 6N) will be required.

Alternatively, for a piled steel mast foundation where the depth of peat is >5.0m, a typical piling type and configuration could be up to 5 no. 900mm diameter rotary bored piles.

10.6 Met Mast Foundations

The met mast foundation will comprise gravity or piled type foundation.

For a gravity foundation the met mast foundation will be founded on a competent stratum below the peat. Typical founding depth for the met mast gravity foundation is envisaged to be 3.2mbgl. At the underside of the met mast foundation, a layer of structural up-fill (class 6N) will be required.

Alternatively, for a piled met mast foundation, a typical piling type and configuration could be up to 5 no. 900mm diameter rotary bored piles.

10.7 Crane Hardstands/Pads

The crane hardstands/pads will be constructed using the founded technique (i.e. not floated technique).

Crane hardstands/pads are constructed using compacted Class 1/6F material on a suitable sub-formation to achieve the required bearing resistance. The hardstands/pads will be designed for the most critical loading combinations from the crane.

The hardstands/pads will require to be founded on competent material underlying the peat deposits. The founding levels for the hardstands/pads will be variable across the site and will be determined at preconstruction stage.

The typical make-up of the hardstands/pads will include a minimum of 1000mm of granular stone fill with possibly a layer of geotextile and/or geogrid, if deemed necessary by the Designer

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11. SUMMARY AND RECOMMENDATIONS

11.1 Summary

The following summary is given.

FT was engaged by MKO to undertake a geotechnical and peat stability assessment of the Proposed Project site.

The findings of the peat assessment showed that the site has an acceptable margin of safety and is suitable for the Proposed Project. The findings include recommendations and control measures for construction work in peat lands to ensure that all works adhere to an acceptable standard of safety.

The site which is typically flat consists predominantly of bare locally re-vegetated cut-away peat and intact shallow peat. The site was subject to historical peat extraction activities by BnM, with the cessation of peat extraction occurring in 2020 and all stockpiled peat being removed the site by the end of 2023.

Karst features were identified in a desk study <0.5km from the site. No karst features were identified during the site walkovers or within the intrusive ground investigation. Confirmatory ground investigation at construction is recommended at each turbine base to confirm the presence or absence of karst at these locations. Should karst be recorded, a piled foundation solution for the affected turbine bases would be required.

Peat thicknesses recorded during the site walkovers ranged from 0.1 to 6.2m with an average peat depth of 2.0m. Approximately 21% of the probes recorded peat depths of less than 1.0m, with 36% of peat depth probes recorded peat depths of 1.0m to 2.0m, and 23% of peat depth probes recorded peat depths of 2.0m to 3.0m. The remaining 20% of probes recorded peat depths of between 3.0 to 6.2m. The boreholes carried out identified localised area of peat up to 7.1m, in the north of the site at the proposed onsite 220kV substation.

Slope inclinations at the main infrastructure locations range from 2 to 4 degrees.

An analysis of peat sliding was carried out at the main infrastructure locations across the Proposed Project site for both the undrained and drained conditions. The purpose of the analysis was to determine the Factor of Safety (FoS) of the peat slopes.

An undrained analysis was carried out, which applies in the short-term during construction. For the undrained condition, the calculated FoS for load conditions (1) and (2) for the locations analysed, showed that all locations have an acceptable FoS of greater than 1.3, indicating a low risk of peat failure. The undrained analysis would be considered the most critical condition for the peat slopes.

A drained analysis was also carried out, which examined the effect of in particular, rainfall on the existing stability of the natural peat slopes on site. For the drained condition, the calculated FoS for load conditions (1) & (2) for the locations analysed, showed that all infrastructure locations have an acceptable FoS of greater than 1.3.

The peat stability risk assessment at each infrastructure location identified a number of mitigation/control measures to reduce the potential risk of peat failure. Sections of internal roads to the nearest infrastructure element should be subject to the same mitigation/control measures that apply to the nearest infrastructure element. See Appendix B for details of the required mitigation/control measures for each infrastructure element.

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In summary, the findings of the peat assessment showed that the Proposed Project site has an acceptable margin of safety, is suitable for development of the Proposed Project and is considered to be at **low** risk of peat failure. The findings include recommendations and control measures for construction work in peat lands to ensure that all works adhere to an acceptable standard of safety.

11.2 Recommendations

The following recommendations are given.

Notwithstanding that the site has an acceptable margin of safety a number of mitigation/control measures are proposed to ensure that all works adhere to an acceptable standard of safety for work in cutover/cutaway peatlands. Mitigation/control measures identified for each of the infrastructure elements in the risk assessment will be taken into account and implemented throughout design and construction works (Appendix B).

Recommendations and guidelines given in FT's report 'Peat & Spoil Management Plan - Lemanaghan Wind Farm (FT 2023), included as Appendix 4-4 of the EIAR, should be implemented during the design and construction stage of the wind farm development.

To minimise the risk of construction activity causing potential peat instability the Construction Method Statements (CMSs) for the project will take into account, but not be limited, to the recommendations above. This will ensure that best practice guidance regarding the management of peat stability will be inherent in the construction phase

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DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

DRAWINGS

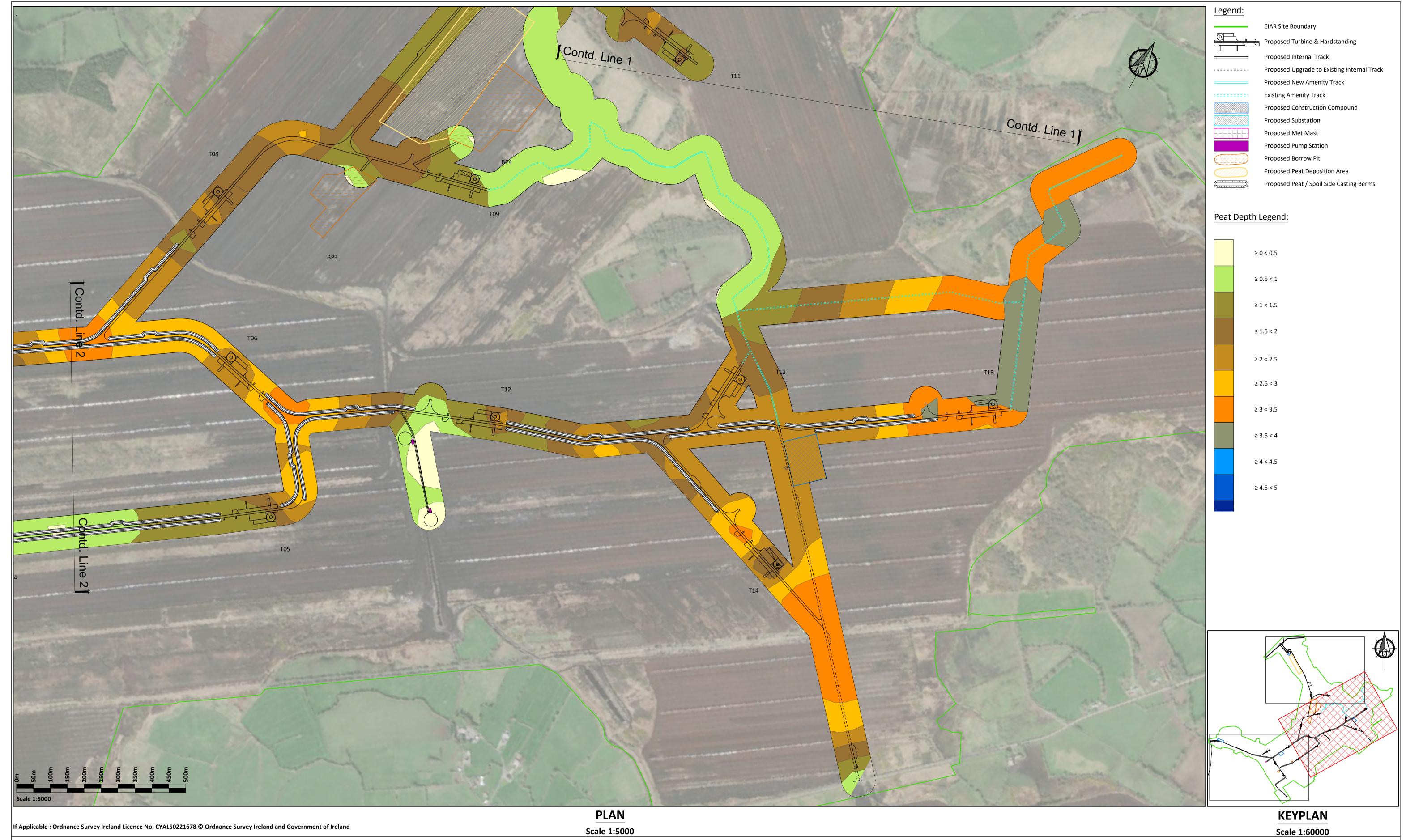






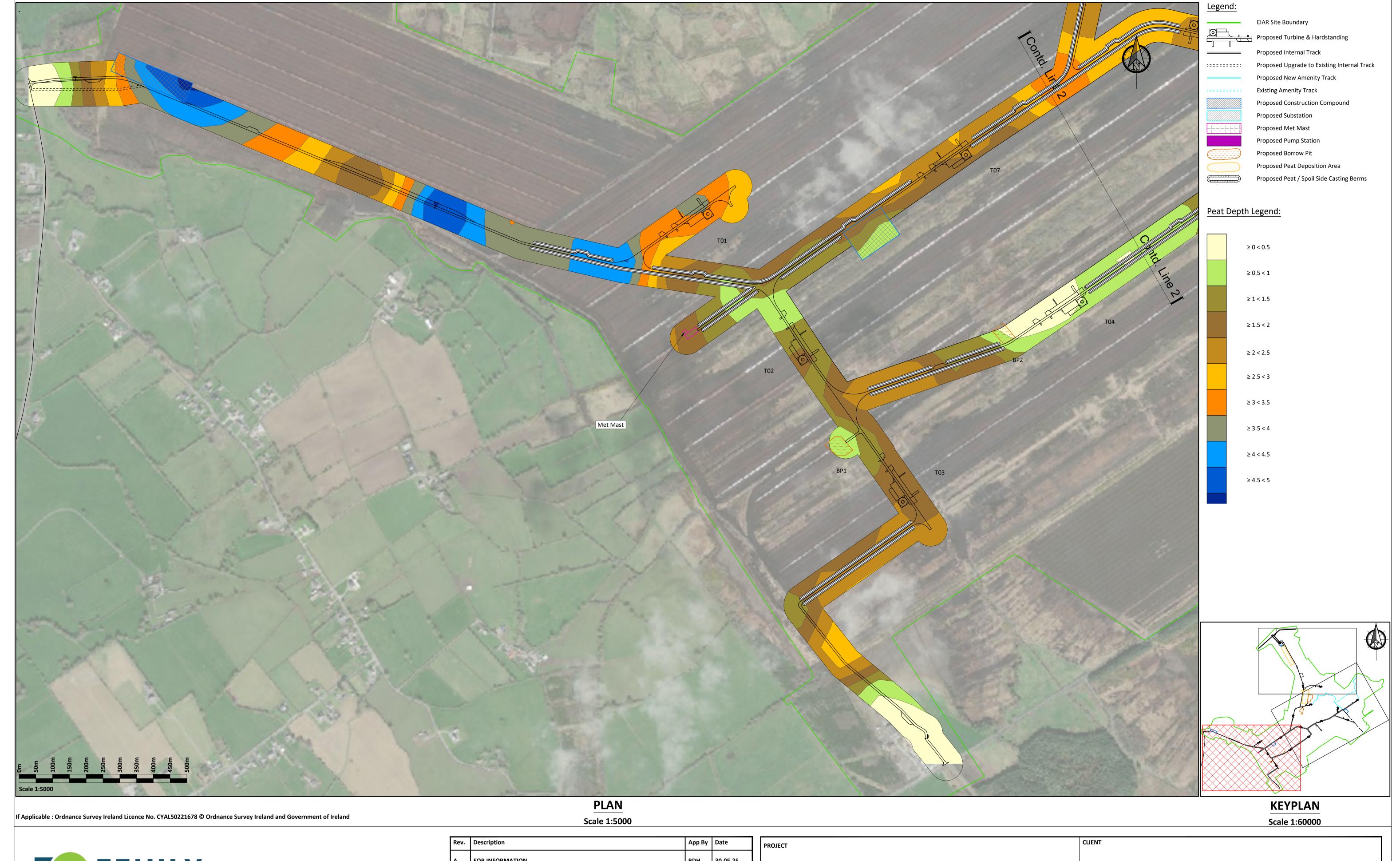
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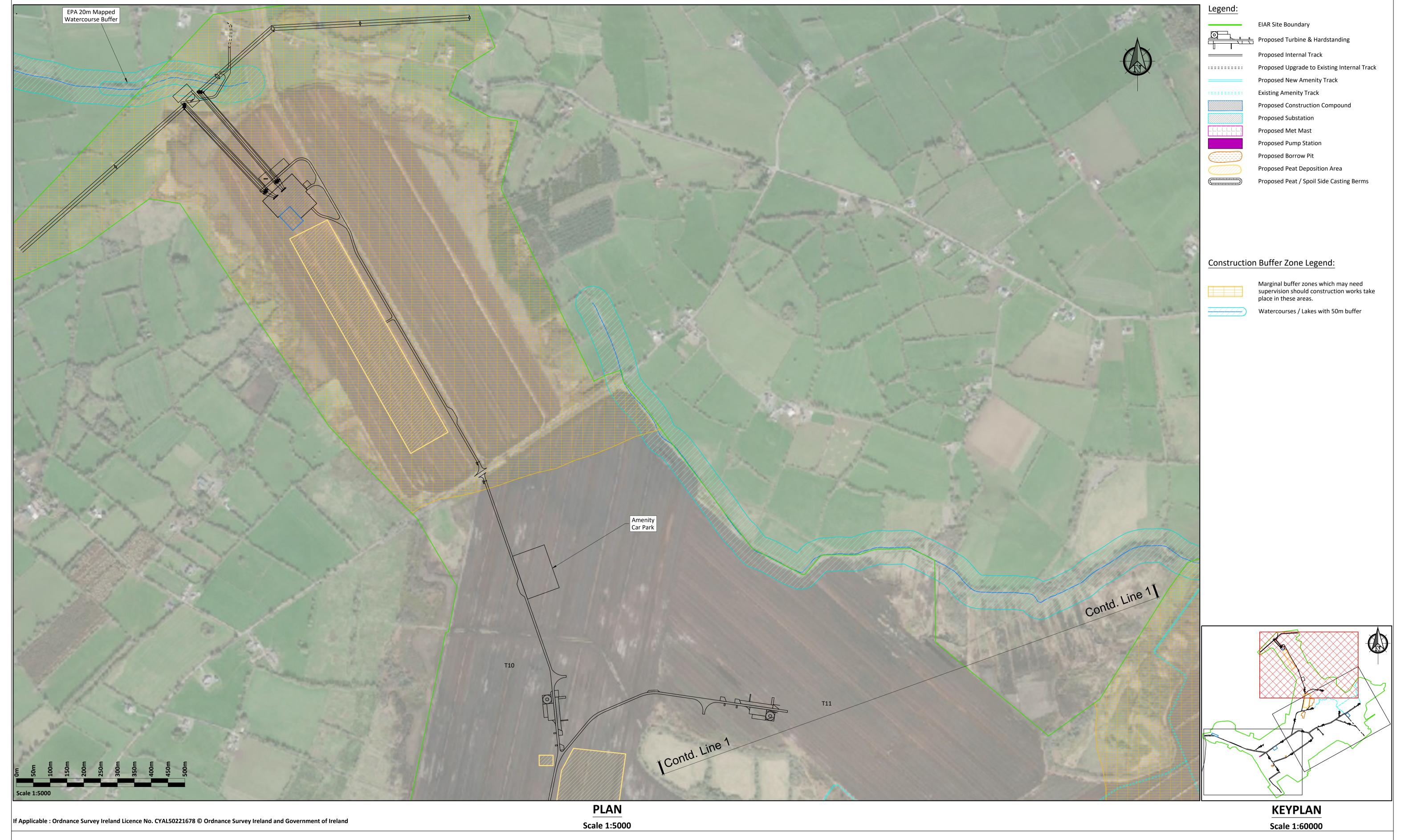
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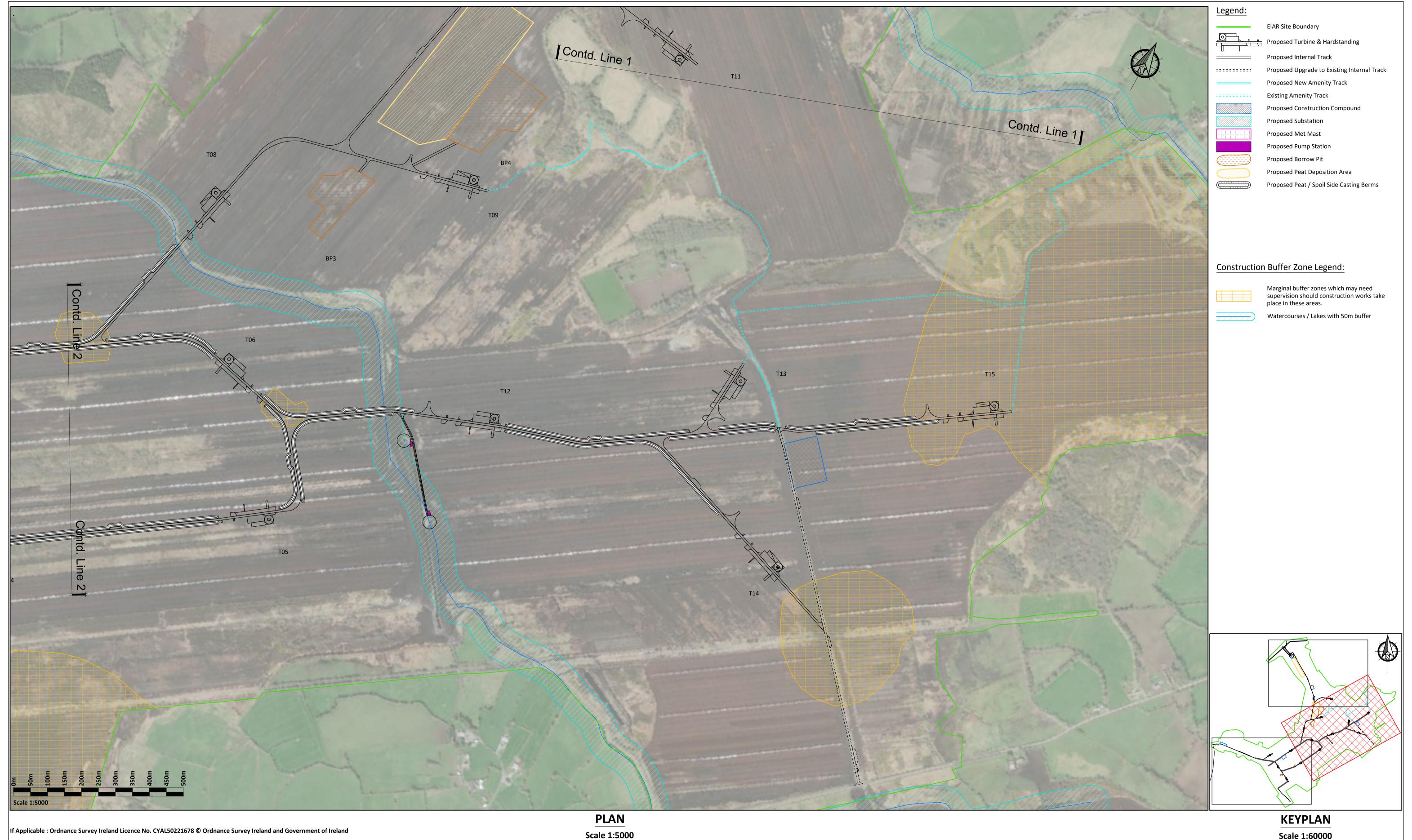
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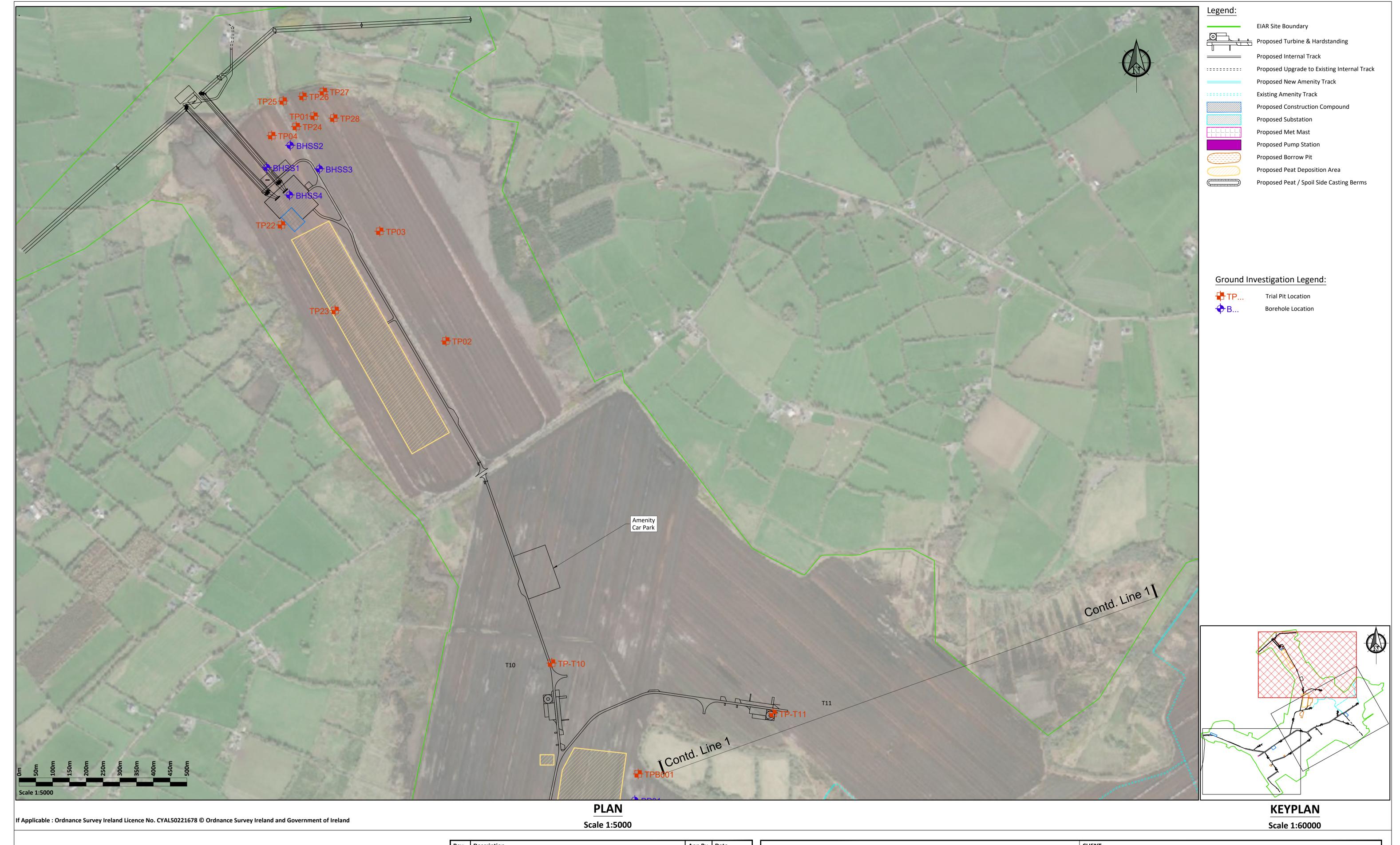
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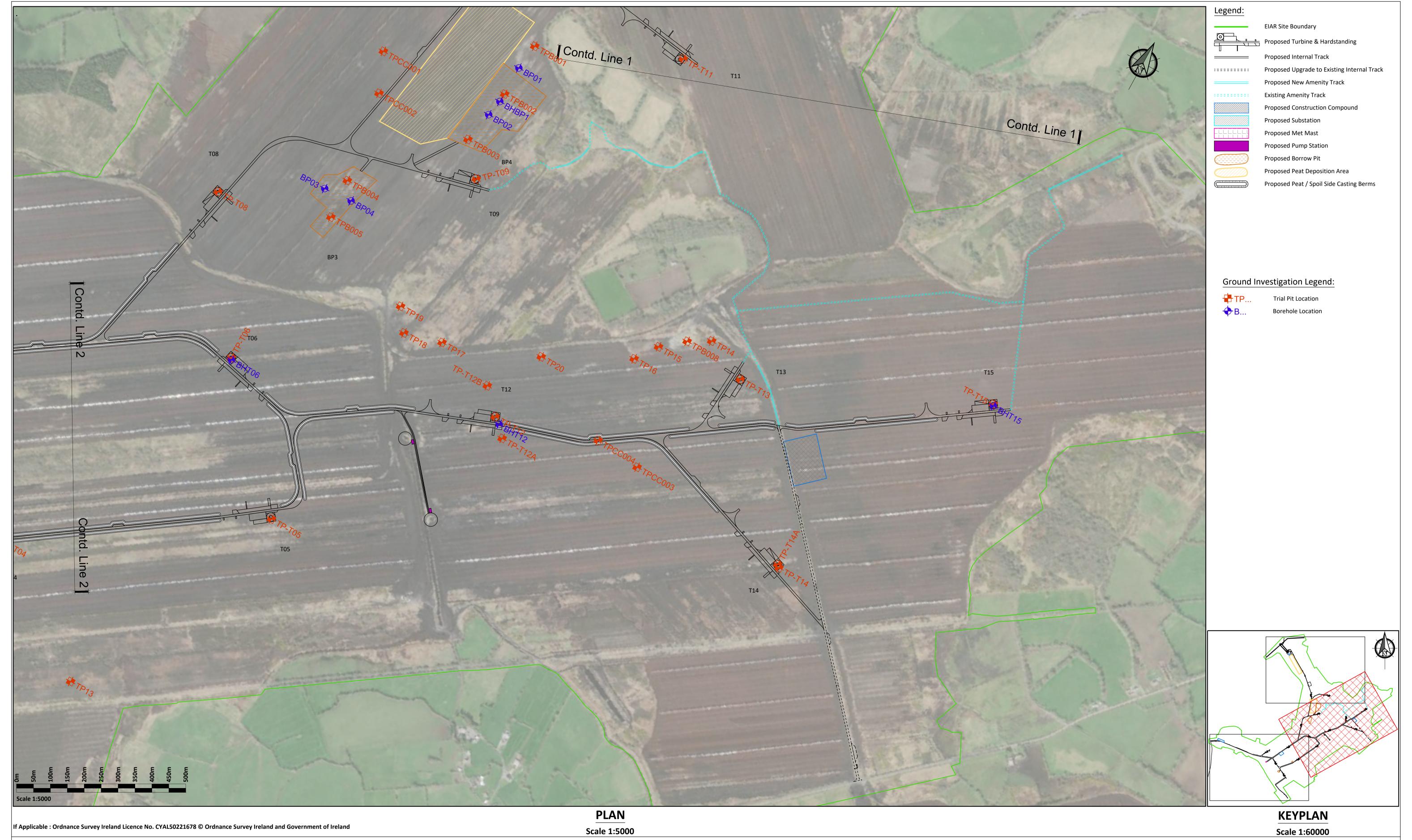
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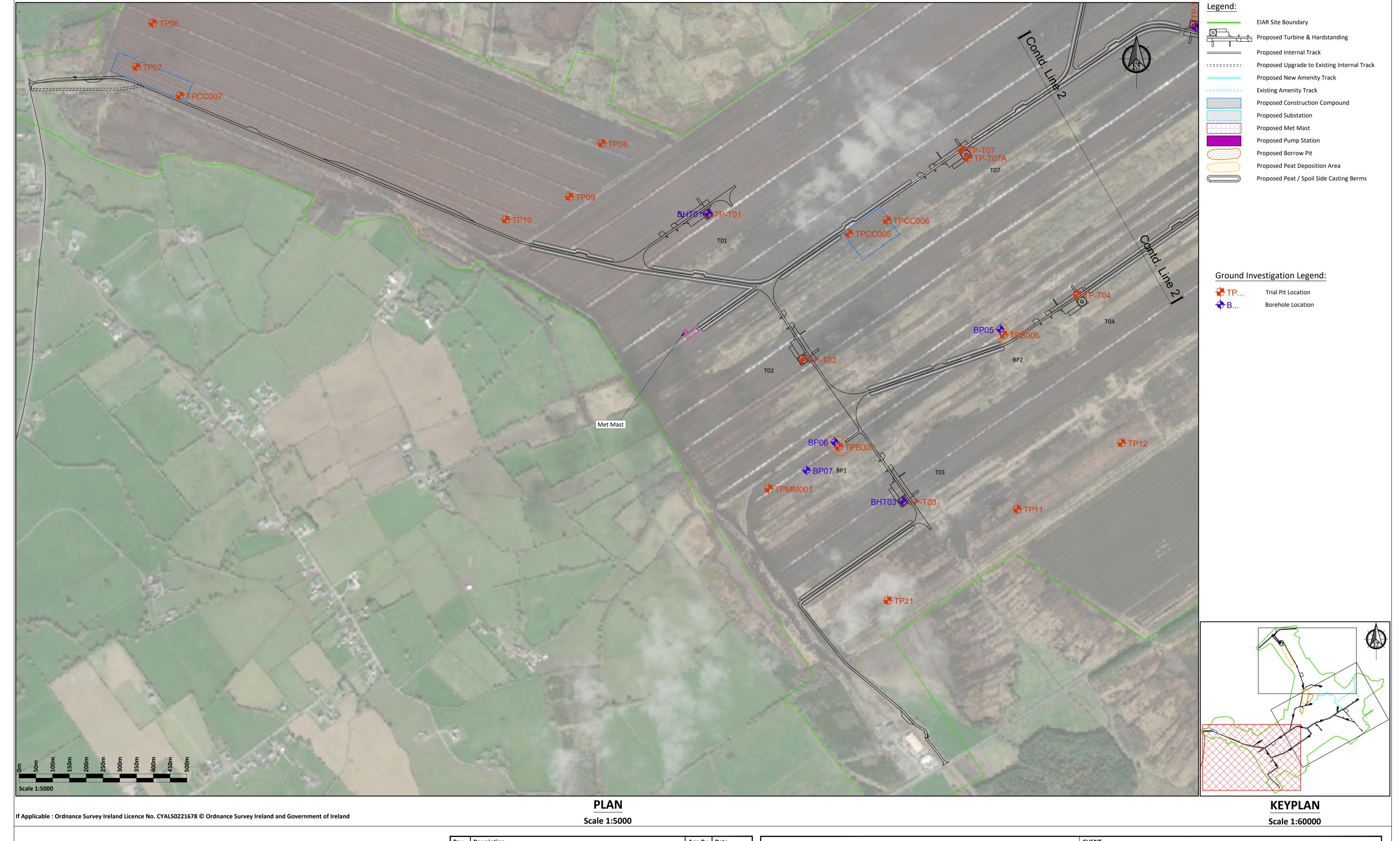
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DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX A

Photos from Site Walkover





Figure A- 1 Open worked peat



Figure A- 2 Open peatland with ponded water in drains



Figure A-3 Possible Rock outcrop at location of proposed borrow pit



Figure A- 4 Soil Profile of Peat overlying Glacial Till.



DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX B

Peat Stability Risk Register



Turbine T1 Location: Grid Reference (Eastings, Northings): 614198 727373 > 150 Distance to Watercourse (m) 3.10 - 3.60 Min & Max Measured Peat Depth (m): Control Required: Yes

		Pre	Pre-Control Measure Implementation					Post	Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 2.50 (u), 2.13 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible	
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible	
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible	
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
11	Relatively Deep Peat	5	1	5	Low	No		0	1	0	Not Applicable	

	Control Management to be lengther and all Diricht (and During Construction for T4
	Control Measures to be Implemented Prior to/and During Construction for T1
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
V	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Location:	Turb	Turbine T2			
Grid Reference (Eastings, Northings):	614481	726939			
Distance to Watercourse (m)	>	150			
Min & Max Measured Peat Depth (m):	0.90	0.90 - 1.70			
Control Required:	. No				

		Pre	-Control Mea	sure Imple	mentation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.19 (u), 8.80 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T2
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Turbine T3 Location: Grid Reference (Eastings, Northings): 614779 726516 Distance to Watercourse (m) > 150 1.50 - 2.20 Min & Max Measured Peat Depth (m): Control Required: No

		Pre	Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.69 (u), 8.46 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	3	1	3	Negligible	No		2	1	2	Negligible

	Control Measures to be Implemented Prior to/and During Construction for T3
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Turbine T4 Location: Grid Reference (Eastings, Northings): 615978 727580 Distance to Watercourse (m) > 150 0.10 - 0.40 Min & Max Measured Peat Depth (m): Control Required: No

		Pre-	Control Mea	sure Imple	ementation			Post	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 6.16 (u), 10.77 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T4
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Turbine T5 Location: Grid Reference (Eastings, Northings): 615647 727935 Distance to Watercourse (m) > 150 0.70 - 1.30 Min & Max Measured Peat Depth (m): Control Required: No

		Pre-	Control Mea	sure Imple	ementation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.99 (u), 12.23 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T5
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Turbine T6 Location: Grid Reference (Eastings, Northings): 615647 727935 > 150 Distance to Watercourse (m) 1.50 - 2.40 Min & Max Measured Peat Depth (m): Control Required: No

		Pre	e-Control Meas	sure Impler	nentation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 5.06 (u), 16.73 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T6
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Turbine T7 Location: Grid Reference (Eastings, Northings): 614968 727549 Distance to Watercourse (m) > 150 1.80 - 2.70 Min & Max Measured Peat Depth (m): Control Required: Yes

		Pre-	Control Mea	sure Imple	ementation			Post	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.10 (u),10.97 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	3	1	3	Negligible	No		2	1	2	Negligible
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	5	1	5	Low	No		3	1	3	Negligible

	Control Measures to be Implemented Prior to/and During Construction for T7
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Turbine T8 Location: Grid Reference (Eastings, Northings): 615375 728345 100 - 150 Distance to Watercourse (m) 0.90 - 1.80 Min & Max Measured Peat Depth (m): Control Required: No

		Pre	-Control Meas	sure Impler	nentation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.08 (u), 8.72 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T8
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Turbine T9 Location: Grid Reference (Eastings, Northings): 616021 728746 Distance to Watercourse (m) > 150 1.00 - 1.70 Min & Max Measured Peat Depth (m): Control Required: No

		Pre	e-Control Meas	sure Impler	nentation			Post	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.25 (u), 11.73 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T9
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Turbine T10 Location: Grid Reference (Eastings, Northings): 615717 729399 > 150 Distance to Watercourse (m) 0.90 - 2.00 Min & Max Measured Peat Depth (m): Control Required: No

		Pre-Control Measure Implementation						Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.87 (u), 8.56 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T10
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix E.
 Impact based on distance of infrastructure element to nearest watercourse.

Location:	Turbine T11
Grid Reference (Eastings, Northings):	616379 729349
Distance to Watercourse (m)	> 150
Min & Max Measured Peat Depth (m):	0.90 - 1.70
Control Required:	No

		Pre	Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.25 (u), 11.73 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T11
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Turbine T12
Grid Reference (Eastings, Northings):	616415 728161
Distance to Watercourse (m)	> 150
Min & Max Measured Peat Depth (m):	1.30 - 1.50
Control Required:	No

		Pre-Control Measure I			mentation			Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 6.88 (u), 17.94 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T12
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
V	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Turbi	Turbine T13				
Grid Reference (Eastings, Northings):	616995	728608				
Distance to Watercourse (m)	>	> 150				
Min & Max Measured Peat Depth (m):	0.70	- 2.00				
Control Required:		No				

		Pre	e-Control Meas	ure Impler	nentation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.87 (u), 8.58 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	3	1	3	Negligible	No		2	1	2	Negligible

	Control Measures to be Implemented Prior to/and During Construction for T13
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Turbine T14
Grid Reference (Eastings, Northings):	617357 728184
Distance to Watercourse (m)	> 150
Min & Max Measured Peat Depth (m):	0.30 - 1.30
Control Required:	No

		Pre-	Pre-Control Measure Implementation					Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.75 (u), 9.17 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No	·	0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T14
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainage measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
V	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties
vi	Inspection and approval of turbine base subformation by a competent person where a gravity type foundation base is constructed

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Turbii	1e 115
Grid Reference (Eastings, Northings):	617684	728906
Distance to Watercourse (m)	> 1	50
Min & Max Measured Peat Depth (m):	3.60	- 4.10
Control Required:	N	lo

		Pre-Control Measure Implementation					Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.25 (u), 10.40 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively Deep Peat	5	1	5	Low	No		3	1	3	Negligible

	Control Measures to be Implemented Prior to/and During Construction for T15
	Control incasures to be imperimented in not toraria builting constituetion for 110
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
V	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	N	Met Mast				
Grid Reference (Eastings, Northings):	614131	727021				
Distance to Watercourse (m)	> '	> 150 1.00 - 1.80				
Min & Max Measured Peat Depth (m):	1.00					
Control Required:	N	lo				

		Pre-	Control Mea	sure Imple	mentation			Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.10 (u), 11.63 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for Met. Mast
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
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- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:		Substation					
Grid Reference (Eastings, Northings):	614936	730963					
Distance to Watercourse (m)	> '	> 150					
Min & Max Measured Peat Depth (m):	5.0	5.0 - 7.1					
Control Required:	y	es					

		Pre-	Control Mea	sure Imple	ementation			Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 6.75 (u), 13.40 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	5	1	5	Low	No		3	1	3	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Substation
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required: - excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Telecor			
Grid Reference (Eastings, Northings):	615004	730929		
Distance to Watercourse (m)	> 1	150		
Min & Max Measured Peat Depth (m):	5.2	5.2 - 6.0		
Control Required:	y	es		

		Pre-	Pre-Control Measure Implementation					Post-Control Measure Implementat			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.46(u), 14.99 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively Deep Peat	5	1	5	Low	No		3	1	3	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (1)
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	on: Const. Comp. (*				
Grid Reference (Eastings, Northings):	612542	727781			
Distance to Watercourse (m)	> 1	50			
Min & Max Measured Peat Depth (m):	2.50	- 4.5			
Control Required:	y	es			

		Pre-	Control Mea	sure Imple	ementation			t-Control M	rol Measure Implementation		
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.21 (u), 8.31 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively Deep Peat	5	1	5	Low	No		3	1	3	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (1)
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Const. Co	Const. Comp. (2)				
Grid Reference (Eastings, Northings):	617278	728493				
Distance to Watercourse (m)	> 1	617278 728493 > 150 0.60 - 2.20				
Min & Max Measured Peat Depth (m):	0.60 -					
Control Required:	No)				

		Pre-C			Post-Control Measure Implementation						
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.59 (u), 11.29 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No	·	0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	1	1	1	Negligible	No		2	1	2	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (2)
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
V	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Const. Comp. (3)					
Grid Reference (Eastings, Northings):	614686	727316				
Distance to Watercourse (m)	>	614686 727316 > 150				
Min & Max Measured Peat Depth (m):	2	2.9				
Control Required:	N	No				

		Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation	
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.21 (u), 8.41 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	2	1	2	Negligible	No		2	1	2	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (3)
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Cons	Const. Comp. (4)				
Grid Reference (Eastings, Northings):	615684	729778				
Distance to Watercourse (m)	> 1	> 150				
Min & Max Measured Peat Depth (m):	5.0 t	5.0 to 5.5				
Control Required:	y	yes				

		Pre-	Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.65 (u), 15.12 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	5	1	5	Low	No		3	1	3	Negligible

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	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (4)
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
V	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Cons	Const. Comp. (5)					
Grid Reference (Eastings, Northings):	614958	730827					
Distance to Watercourse (m)	> 1	> 150					
Min & Max Measured Peat Depth (m):	1.9	1.9 - 2.3					
Control Required:	N	No					

		Pre-	Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.97 (u), 8.65 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

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	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (5)
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location: Borrow Pit					
Grid Reference (Eastings, Northings):	614493	726610			
Distance to Watercourse (m)	> 1	50			
Min & Max Measured Peat Depth (m):	1.6 to	1.6 to 4.2			
Control Required:	ye	S			

		Pre-Control Measure Implementation						Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.00 (u), 11.73 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	5	1	5	Low	No		2	1	2	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Borrow Pit 3
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Во	Borrow Pit 2					
Grid Reference (Eastings, Northings):	616791	728233					
Distance to Watercourse (m)	> 1	50					
Min & Max Measured Peat Depth (m):	0	0.2					
Control Required:	N	lo					

		Pre-	Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.00 (u), 11.73 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for Borrow Pit 4
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:		Borrow Pit 3				
Grid Reference (Eastings, Northings):	615647	728507]			
Distance to Watercourse (m)	> 1	50				
Min & Max Measured Peat Depth (m):	0	.6				
Control Required:	N	lo				

		Pre-	Pre-Control Measure Implementation					Pos	st-Control I	Measure Ir	mplementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 7.18 (u), 13.68 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for Borrow Pit 2
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:		Borrow Pit 4						
Grid Reference (Eastings, Northings):	615965	728933						
Distance to Watercourse (m)	> .	50						
Min & Max Measured Peat Depth (m):	0.7 t	o 1.2						
Control Required:	N	lo						

		Pre-	Control Mea	sure Imple	ementation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.92 (u), 9.28 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	1	1	1	Negligible	No		1	1	1	Negligible

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	Control Measures to be Implemented Prior to/and During Construction for Borrow Pit 1
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Ste	el Mast 1	I (under OHL)
Grid Reference (Eastings, Northings):	614640	731161]
Distance to Watercourse (m)	<	50	
Min & Max Measured Peat Depth (m):	1	.0	
Control Required:	y	es	

		Pre-	Control Mea	sure Imple	mentation			Post-Control Measure Implementation					
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating		
1	FOS = 8.60(u), 19.09(d)	1	4	4	Negligible	No		1	4	4	Negligible		
2	Evidence of sub peat water flow	3	4	12	Medium	No				1	4	4	Negligible
3	Evidence of surface water flow	2	4	8	Low	No		1	4	4	Negligible		
4	Evidence of previous failures/slips	0	4	0	Not Applicable	No	1	0	4	0	Not Applicable		
5	Type of vegetation	1	4	4	Negligible	No		1	4	4	Negligible		
6	General slope characteristics upslope/downslope from infrastructure location	2	4	8	Low	No	See Below	1	4	4	Negligible		
7	Evidence of very soft/soft clay at base of peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable		
8	Evidence of mechanically cut peat	0	4	0	Not Applicable	No	1	0	4	0	Not Applicable		
9	Evidence of quaking or buoyant peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable		
10	Evidence of bog pools	0	4	0	Not Applicable	No		0	4	0	Not Applicable		
11	Relatively deep peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable		

	Control Measures to be Implemented Prior to/and During Construction for Met. Mast
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Ste	Steel Mast 2 (under OHL)							
Grid Reference (Eastings, Northings):	614687	731203							
Distance to Watercourse (m)	<	50							
Min & Max Measured Peat Depth (m):	0	.2							
Control Required:	У	es							

		Pre-	Control Mea	sure Imple	mentation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 14.34(u), 22.91 (d)	1	4	4	Negligible	No	See Below	1	4	4	Negligible
2	Evidence of sub peat water flow	2	4	8	Low	No		1	4	4	Negligible
3	Evidence of surface water flow	2	4	8	Low	No		1	4	4	Negligible
4	Evidence of previous failures/slips	0	4	0	Not Applicable	No		0	4	0	Not Applicable
5	Type of vegetation	1	4	4	Negligible	No		1	4	4	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	4	8	Low	No		1	4	4	Negligible
7	Evidence of very soft/soft clay at base of peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
8	Evidence of mechanically cut peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	4	0	Not Applicable	No	-	0	4	0	Not Applicable
10	Evidence of bog pools	0	4	0	Not Applicable	No		0	4	0	Not Applicable
11	Relatively Deep Peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (1)
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Stee	Steel Mast 3 (Beside Substation)							
Grid Reference (Eastings, Northings):	614881	730908	1						
Distance to Watercourse (m)	> 1	> 150							
Min & Max Measured Peat Depth (m):	5.3	3							
Control Required:	ye	s							

		Pre-C	ontrol Measu	ure Implen	nentation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.73(u), 15.17 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	5	1	5	Low	No		2	1	2	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (2)
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Sto	Steel Mast 4 (Beside Substation)						
Grid Reference (Eastings, Northings):	614915	730938	1					
Distance to Watercourse (m)	> 150		7					
Min & Max Measured Peat Depth (m):		5.2						
Control Required:	yes							

		Pre-Control Measure Implementation						Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 2.77 (u), 15.20 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible	
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible	
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible	
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
11	Relatively deep peat	5	1	5	Low	No		2	1	2	Negligible	

I	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
V	Use of experienced contractors and trained operators to carry out the work;
V	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
/i	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
rii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
iii	No sidecasting of excavated peat or spoil on in-situ peat
x	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Crane	Crane Pad (North)					
Grid Reference (Eastings, Northings):	614662	731177					
Distance to Watercourse (m)	<	< 50					
Min & Max Measured Peat Depth (m):	0.4	0.4 - 0.7					
Control Required:	y	yes					

		Pre-	Control Mea	sure Imple	ementation			Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 2.65 (u), 15.12 (d)	1	4	4	Negligible	No	See Below	1	4	4	Negligible	
2	Evidence of sub peat water flow	2	4	8	Low	No		1	4	4	Negligible	
3	Evidence of surface water flow	2	4	8	Low	No		1	4	4	Negligible	
4	Evidence of previous failures/slips	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
5	Type of vegetation	2	4	8	Low	No		1	4	4	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	4	8	Low	No		1	4	4	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
8	Evidence of mechanically cut peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
9	Evidence of quaking or buoyant peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
10	Evidence of bog pools	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
11	Relatively deep peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable	

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	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (4)
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Cr	Crane Pad (substation)				
Grid Reference (Eastings, Northings):	614881	730945	1			
Distance to Watercourse (m)	> '	50				
Min & Max Measured Peat Depth (m):	2.4	- 6.0				
Control Required:	y	es				

		Pre-	-Control Mea	sure Imple	ementation			Post-Control Measure Implement			plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.97 (u), 8.65 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	5	1	5	Low	No		3	1	3	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Construction Compound (5)
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	То	Tower Building (North)						
Grid Reference (Eastings, Northings):	614634	731199						
Distance to Watercourse (m)	<	50						
Min & Max Measured Peat Depth (m):	0.5	- 3.0						
Control Required:	y	es						

		Pre-	Pre-Control Measure Implementation				Post-Con			ol Measure Implementation		
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 6.75 (u), 13.40 (d)	1	4	4	Negligible	No	See Below	1	4	4	Negligible	
2	Evidence of sub peat water flow	2	4	8	Low	No		1	4	4	Negligible	
3	Evidence of surface water flow	2	4	8	Low	No		1	4	4	Negligible	
4	Evidence of previous failures/slips	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
5	Type of vegetation	2	4	8	Low	No		1	4	4	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	4	8	Low	No		1	4	4	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
8	Evidence of mechanically cut peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
9	Evidence of quaking or buoyant peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
10	Evidence of bog pools	0	4	0	Not Applicable	No		0	4	0	Not Applicable	
11	Relatively deep peat	2	4	8	Low	No		1	4	4	Negligible	

	Control Measures to be Implemented Prior to/and During Construction for Substation
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
٧	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Tower Building (Substation)					
Grid Reference (Eastings, Northings):	614921	730978	1			
Distance to Watercourse (m)	> 1	50	1			
Min & Max Measured Peat Depth (m):	2.0 -	5.0				
Control Required:	ye	s				

		Pre-0	Pre-Control Measure Implementation				Post-Control Measure Imple				plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.00 (u), 11.73 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively deep peat	5	1	5	Low	No		2	1	2	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Borrow Pit 3
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required:
•	- excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle
	- temporary works designer may be required to provide excavation support design
	-daily detailed inspection of excavation faces
	-potential for greater water inflow into excavation requiring removal of water using pumping
	-increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
V	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/harsdtand excavation and monitored on a regular basis
viii	No sidecasting of excavated peat or spoil on in-situ peat
ix	No machinery to track directly on the peat surface

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix E.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	Main Entrance Road to T1 and T1/T2 Junction
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Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) > 150 Min & Max Measured Peat Depth (m): 1.5 to 5.4 Control Required:

		Pre-Control Measure Implementation						Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 1.76 (u), 2.05 (d)	1	1	1	Negligible	No		1	1	1	Negligible	
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible	
3	Evidence of surface water flow	3	1	3	Negligible	No		2	1	2	Negligible	
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	2	1	2	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
9	Evidence of quaking or buoyant peat	3	1	3	Negligible	No		2	1	2	Negligible	
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
11	Relatively Deep Peat	5	1	5	Low	No		3	1	3	Negligible	

	Control Measures to be Implemented Prior to/and During Construction for Main Entrance Road to T1 and T1/T2 Junction
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainge measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix D in PSA.
 Impact based on distance of infrastructure element to nearest watercourse.

Location:	T2 to T3
Grid Reference (Eastings, Northings):	Varies
Distance to Watercourse (m)	> 150
Min & Max Measured Peat Depth (m):	0.3 to 2.2
Control Required:	No

Control Required:

		Pre-Control Measure Implementation				Post-Control Measure Impleme					plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.0 (u), 3.19 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T2 to T3
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix D in PSA.
 (3) Impact based on distance of infrastructure element to ne

Location:	T3 to R436 Entrance

Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) > 150 Min & Max Measured Peat Depth (m): 0.2 to 2.8 No Control Required:

		Pre-	Pre-Control Measure Implementation					Posi	Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating		
1	FOS = 1.87 (u), 1.71 (d)	1	1	1	Negligible	No		1	1	1	Negligible		
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible		
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible		
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible		
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible		
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable		

	Control Measures to be Implemented Prior to/and During Construction for T3 to R436 Entrance
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix D in PSA.
 Impact based on distance of infrastructure element to nearest watercourse.

T2/T3 Junction to T5 Location:

Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) > 150 Min & Max Measured Peat Depth (m): 0.2 to 2.4 Control Required: No

	Pre-Control Measure Implementation					Post	t-Control M	leasure Im	plementation		
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.38 (u), 2.42 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No	1	1	1	1	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No	1	0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T2/T3 Junction to T5
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix D in PSA.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location:	T5 to T6 to T6/T7 junction
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Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) > 150 Min & Max Measured Peat Depth (m): 1.8 to 3.4 Control Required:

		Pre-Control Measure Implementation					Post	Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 3.02 (u), 10.91 (d)	1	1	1	Negligible	No		1	1	1	Negligible	
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible	
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible	
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
11	Relatively Deep Peat	4	1	4	Negligible	No		2	1	2	Negligible	

	Control Measures to be Implemented Prior to/and During Construction for T5 to T6 to T6/T7 junction
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix D in PSA.
 Impact based on distance of infrastructure element to nearest watercourse.

Location:	T5/T6 Junction to T12
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Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) < 50 Min & Max Measured Peat Depth (m): 0.3 to 2.7 Control Required:

		Pre-Control Measure Implementation					Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.1 (u), 10.97(d)	1	4	4	Negligible	No		1	4	4	Negligible
2	Evidence of sub peat water flow	1	4	4	Negligible	No		1	4	4	Negligible
3	Evidence of surface water flow	2	4	8	Low	No		1	4	4	Negligible
4	Evidence of previous failures/slips	0	4	0	Not Applicable	No		0	4	0	Not Applicable
5	Type of vegetation	2	4	8	Low	No		1	4	4	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	4	8	Low	No	See Below	1	4	4	Negligible
7	Evidence of very soft/soft clay at base of peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
8	Evidence of mechanically cut peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
10	Evidence of bog pools	0	4	0	Not Applicable	No		0	4	0	Not Applicable
11	Relatively Deep Peat	3	4	12	Medium	No		2	4	8	Low

	Control Measures to be Implemented Prior to/and During Construction for T5/T6 Junction to T12
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 Probability assessed as per Table A and B of Appendix D in PSA.
 Impact based on distance of infrastructure element to nearest watercourse.

Location:	T12 to T14					

Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) > 150 Min & Max Measured Peat Depth (m): 1.1 to 2.5 No Control Required:

		Pre-Control Measure Implementation						Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 2.87 (u), 9.17 (d)	1	1	1	Negligible	No		1	1	1	Negligible	
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible	
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible	
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable	

	Control Measures to be Implemented Prior to/and During Construction for T12 to T14
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- Note
 (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix D in PSA.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Entrance R436 to CC Location:

Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) > 150 Min & Max Measured Peat Depth (m): 0.6 to 3.5 Control Required:

		Pre-Control Measure Implementation						Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	
1	FOS = 2.9 (u), 8.65 (d)	1	1	1	Negligible	No		1	1	1	Negligible	
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible	
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible	
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible	
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible	
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable	
10	Evidence of bog pools	0	1	0	Not Applicable	No	Ī	0	1	0	Not Applicable	
11	Relatively Deep Peat	3	1	3	Negligible	No		2	1	2	Negligible	

	Control Measures to be Implemented Prior to/and During Construction for R436 to CC
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix D in PSA.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location: T12/T14 Junction to T13 and T15

Grid Reference (Eastings, Northings): Varies Distance to Watercourse (m) > 150 Min & Max Measured Peat Depth (m): 1.7 to 3.8 Control Required:

		Pre-Control Measure Implementation						Posi	Post-Control Measure Implementation				
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating		
1	FOS = 2.39 (u), 8.58 (d)	1	1	1	Negligible	No		1	1	1	Negligible		
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible		
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible		
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible		
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible		
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable		
11	Relatively Deep Peat	3	1	3	Negligible	No		2	1	2	Negligible		

	Control Measures to be Implemented Prior to/and During Construction for T12/T14 Junction to T13 and T15
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

- (1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
 (2) Probability assessed as per Table A and B of Appendix D in PSA.
 (3) Impact based on distance of infrastructure element to nearest watercourse.

Location: T1/T2 Junction to T6/T7 Junction

Grid Reference (Eastings, Northings):

Distance to Watercourse (m)

Min & Max Measured Peat Depth (m):

Control Required:

Varies

> 150

1.2 to 3.7

		Pre-	Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.38 (u), 11.15 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	3	1	3	Negligible	No		2	1	2	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	3	1	3	Negligible	No		2	1	2	Negligible
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively Deep Peat	3	1	3	Negligible	No		1	1	1	Negligible

	Control Measures to be Implemented Prior to/and During Construction for T1/T2 Junction to T6/T7 Junction
i	Maintain hydrology of area as far as possible;
ii	Installation of appropriate drainge measures to alleviate ingress of surface water into excavations
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Location: T6/T7 Junction to T8

Grid Reference (Eastings, Northings):

Distance to Watercourse (m)

Min & Max Measured Peat Depth (m):

Control Required:

Varies

< 50

0.9 to 3.7

yes

		P	Pre-Control Measure Implementation					Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.4(u), 8.27 (d)	1	4	4	Negligible	No		1	4	4	Negligible
2	Evidence of sub peat water flow	1	4	4	Negligible	No	1	1	4	4	Negligible
3	Evidence of surface water flow	2	4	8	Low	No	1	1	4	4	Negligible
4	Evidence of previous failures/slips	0	4	0	Not Applicable	No	1	0	4	0	Not Applicable
5	Type of vegetation	2	4	8	Low	No	1	1	4	4	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	4	8	Low	No	See Below	1	4	4	Negligible
7	Evidence of very soft/soft clay at base of peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
8	Evidence of mechanically cut peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	4	0	Not Applicable	No		0	4	0	Not Applicable
10	Evidence of bog pools	0	4	0	Not Applicable	No		0	4	0	Not Applicable
11	Relatively Deep Peat	3	4	12	Medium	No		2	4	8	Low

	Control Measures to be Implemented Prior to/and During Construction for T6/T7 Junction to T8
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Location:

Grid Reference (Eastings, Northings):
Distance to Watercourse (m)

Min & Max Measured Peat Depth (m):
Control Required:

No

		Pre-	Pre-Control Measure Implementation					Post	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.02 (u), 9.41 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively Deep Peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T8 to T9
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Location: T8/T9 Junction to T11

 Grid Reference (Eastings, Northings):
 Varies

 Distance to Watercourse (m)
 > 150

 Min & Max Measured Peat Depth (m):
 0.7 to 2.5

 Control Required:
 No

		Pre-	Pre-Control Measure Implementation					Post	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 3.08 (u), 8.72 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T8/T9 Junction to T11
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Location: T10	to Local Road Entrance
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Grid Reference (Eastings, Northings):

Distance to Watercourse (m)

Min & Max Measured Peat Depth (m):

Control Required:

Varies

> 150

1.1 to 2.9

		Pre-	Pre-Control Measure Implementation					Post	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.21 (u), 6.87 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Relatively Deep Peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for T10 to Local Road Entrance
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Location:	Local Road Entrance to Substation
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Grid Reference (Eastings, Northings):

Distance to Watercourse (m)

Min & Max Measured Peat Depth (m):

Control Required:

Varies

> 150

3.7 to 5.5

		Pre-	Control Mea	sure Imple	ementation			Pos	t-Control M	leasure Im	plementation
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 1.82 (u), 10.11 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	2	1	2	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	0	1	0	Not Applicable	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	0	1	0	Not Applicable	No		0	1	0	Not Applicable
10	Evidence of bog pools	0	1	0	Not Applicable	No		0	1	0	Not Applicable
11	Deep Peat	5	1	5	Low	No		3	1	3	Negligible

	Control Measures to be Implemented Prior to/and During Construction for Local Road Entrance to Substation
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v.	Ground settlement monitoring points to be installed at 50m intervals at either side of the road



DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX C

Calculated FOS for Peat Slopes on Site



Infinite Slope Analysis

Assumptions as follows:

(1) Undrained analysis assumed to give worst case, using infinite slope:

Infinite slope analysis (undrained)

FoS = Cu/[γ .z.sin β cos β]

where, β = slope angle
Cu = undrained strength z = depth of sliding layer γ = bulk unit weight

Turbine No./Waypoint	Slope	Design c'	Bulk unit weight of Peat	Unit weight of Water	Depth of In situ Peat	Friction Angle	Surcharge Equivalent Placed Fill	Equivalent Total Depth of Peat (m)	Factor of Safety	for Load Condition
	α (deg)	c' (kPa)	γ (kN/m³)	γ _w (kN/m³)	(m)	ø' (deg)	Condition (2)	Condition (2)	Condition (1) 100% Water	Condition (2 100% Wate
T1 - C	3	4	10.0	10.0	3.60	25	1.0	4.6	2.13	3.60
T1 - N	3	4	10.0	10.0	3.60	25	1.0	4.6	11.02	10.56
T1 - S	3	4	10.0	10.0	3.60	25	1.0	4.6	11.02	10.56
T1 - E	3	4	10.0	10.0	3.10	25	1.0	4.1	11.37	10.76
T1 - W T2 - C	3 4	4	10.0 10.0	10.0	3.40 1.00	25 25	1.0 1.0	4.4 2.0	11.15 12.42	10.64 9.54
T2 - N	4	4	10.0	10.0	1.70	25	1.0	2.7	10.05	8.80
T2 - S	4	4	10.0	10.0	0.90	25	1.0	1.9	13.06	9.69
T2 - E	4	4	10.0	10.0	0.90	25	1.0	1.9	13.06	9.69
T2 - W T3 - C	4	4	10.0 10.0	10.0 10.0	1.40 2.20	25 25	1.0	2.4 3.2	10.77 9.28	9.06 8.46
T3 - N	4	4	10.0	10.0	1.80	25	1.0	2.8	9.86	8.72
T3 - S	4	4	10.0	10.0	1.60	25	1.0	2.6	10.26	8.88
T3 - E	4	4	10.0	10.0	1.50	25	1.0	2.5	10.50	8.97
T3 - W T4 - C	4	4	10.0 10.0	10.0 10.0	1.80 0.10	25 25	1.0 1.0	2.8 1.1	9.86 64.15	8.72 11.89
T4 - N	4	4	10.0	10.0	0.40	25	1.0	1.4	21.04	10.77
T4 - S	4	4	10.0	10.0	0.10	25	1.0	1.1	64.15	11.89
T4 - E	4	4	10.0	10.0	0.20	25	1.0	1.2	35.41	11.46
T4 - W T5 - C	3	4	10.0 10.0	10.0 10.0	0.20 1.30	25 25	1.0	1.2 2.3	35.41 14.78	11.46 12.23
T5 - N	3	4	10.0	10.0	1.20	25	1.0	2.2	15.28	12.38
T5 - S	3	4	10.0	10.0	0.70	25	1.0	1.7	19.83	13.40
T5 - E T5 - W	3	4	10.0 10.0	10.0 10.0	0.80 1.00	25 25	1.0 1.0	1.8 2.0	18.46 16.55	13.15 12.72
T6 - C	2	4	10.0	10.0	2.10	25	1.0	3.1	18.81	17.05
T6 - N	2	4	10.0	10.0	2.40	25	1.0	3.4	18.13	16.73
T6 - S	2	4	10.0	10.0	1.60	25	1.0	2.6	20.52	17.76
T6 - E T6 - W	2	4	10.0 10.0	10.0 10.0	2.00 1.50	25 25	1.0 1.0	3.0 2.5	19.09 21.00	17.18 17.94
T7 - C	3	4	10.0	10.0	2.70	25	1.0	3.7	11.73	10.97
T7 - N	3	4	10.0	10.0	1.80	25	1.0	2.8	13.15	11.63
T7 - S	3	4	10.0	10.0	2.10	25	1.0	3.1	12.54	11.37
T7 - E T7 -W	3	4	10.0 10.0	10.0	2.20 2.10	25 25	1.0 1.0	3.2 3.1	12.38 12.54	11.29 11.37
T8 - C	4	4	10.0	10.0	0.90	25	1.0	1.9	13.06	9.69
T8 - N	4	4	10.0	10.0	1.80	25	1.0	2.8	9.86	8.72
T8 - S	4	4	10.0	10.0	0.90	25	1.0	1.9	13.06	9.69
T8 - E T8 -W	4	4	10.0 10.0	10.0 10.0	1.10 1.20	25 25	1.0 1.0	2.1 2.2	11.89 11.46	9.41 9.28
T9 - C	3	4	10.0	10.0	1.00	25	1.0	2.0	16.55	12.72
T9 - N	3	4	10.0	10.0	1.00	25	1.0	2.0	16.55	12.72
T9 - S	3	4	10.0	10.0	1.50	25	1.0	2.5	14.00	11.96
T9 - E T9 - W	3	4	10.0 10.0	10.0	1.30 1.70	25 25	1.0 1.0	2.3 2.7	14.78 13.40	12.23 11.73
T10 - C	4	4	10.0	10.0	2.00	25	1.0	3.0	9.54	8.58
T10 - N	4	4	10.0	10.0	1.70	25	1.0	2.7	10.05	8.80
T10 - S T10 - E	4	4	10.0	10.0	1.80 1.10	25	1.0	2.8	9.86	8.72
T10 - W	4	4	10.0 10.0	10.0 10.0	0.90	25 25	1.0 1.0	2.1 1.9	11.89 13.06	9.41 9.69
T11 - C	3	4	10.0	10.0	1.10	25	1.0	2.1	15.86	12.54
T11 - N	3	4	10.0	10.0	1.00	25	1.0	2.0	16.55	12.72
T11 - S	3	4	10.0 10.0	10.0 10.0	1.70 1.50	25	1.0 1.0	2.7 2.5	13.40 14.00	11.73
T11 - E T11 - W	3	4	10.0	10.0	0.90	25 25	1.0	1.9	17.40	11.96 12.93
T12 - C	2	4	10.0	10.0	1.50	25	1.0	2.5	21.00	17.94
T12 - N	2	4	10.0	10.0	1.30	25	1.0	2.3	22.18	18.34
T12 - S T12 - E	2	4	10.0 10.0	10.0 10.0	1.50 1.30	25 25	1.0 1.0	2.5 2.3	21.00 22.18	17.94 18.34
T12 - W	2	4	10.0	10.0	1.40	25	1.0	2.4	21.55	18.13
T13 - C	4	4	10.0	10.0	0.90	25	1.0	1.9	13.06	9.69
T13 - N	4	4	10.0	10.0	1.00	25	1.0	2.0	12.42	9.54
T13 - S T13 - E	4	4	10.0 10.0	10.0 10.0	1.70 0.70	25 25	1.0 1.0	2.7 1.7	10.05 14.88	8.80 10.05
T13 - W	4	4	10.0	10.0	2.00	25	1.0	3.0	9.54	8.58
T14 - C	4	4	10.0	10.0	1.10	25	1.0	2.1	11.89	9.41
T14 - N	4	4	10.0	10.0	1.00 1.20	25	1.0	2.0	12.42	9.54
T14 - S T14 - E	4	4	10.0 10.0	10.0 10.0	1.30	25 25	1.0 1.0	2.2 2.3	11.46 11.09	9.28 9.17
T14 - W	4	4	10.0	10.0	0.30	25	1.0	1.3	25.83	11.09
T15 - C	3	4	10.0	10.0	3.60	25	1.0	4.6	11.02	10.56
T15 - N	3	4	10.0	10.0	3.60	25	1.0	4.6	11.02	10.56
T15 - S T15 - E	3	4	10.0 10.0	10.0 10.0	4.10 3.90	25 25	1.0 1.0	5.1 4.9	10.76 10.86	10.40 10.46
T15 - W	3	4	10.0	10.0	4.00	25	1.0	5.0	10.81	10.43
Met - C	3	4	10.0	10.0	1.80	25	1.0	2.8	13.15	11.63
Met - N Met - S	3	4	10.0 10.0	10.0 10.0	1.00 1.20	25 25	1.0 1.0	2.0 2.2	16.55 15.28	12.72 12.38
Met - S	3	4	10.0	10.0	1.20	25	1.0	2.2	13.15	11.63
Met - W	3	4	10.0	10.0	1.40	25	1.0	2.4	14.36	12.09
TC1_1	3	4	10.0	10.0	2.90	25	1.0	3.9	11.54	10.86
TC1_2	2	4	10.0	10.0	5.40 4.50	25	1.0	6.4	15.48	15.15
TC1_3 TC1_4	2	4	10.0 10.0	10.0 10.0	4.50 2.50	25 25	1.0 1.0	5.5 3.5	15.90 8.97	15.44 8.31
TC1_4	3	4	10.0	10.0	4.20	25	1.0	5.2	10.72	10.37
TC2_1	3	4	10.0	10.0	1.80	25	1.0	2.8	13.15	11.63
TC2_2	3	4	10.0	10.0	2.20	25	1.0	3.2	12.38	11.29
TC2_3 TC2_4	3	4	10.0 10.0	10.0 10.0	0.60	25 25	1.0 1.0	1.6 1.6	21.65 21.65	13.68 13.68
TC2_4	3	4	10.0	10.0	0.80	25	1.0	1.6	18.46	13.68

Turbine No./Waypoint	Slope	Design c'	Bulk unit weight of Peat	Unit weight of Water	Depth of In situ Peat	Friction Angle	Surcharge Equivalent Placed Fill	Equivalent Total Depth of Peat (m)	Factor of Safety f	or Load Condition
	α (deg)	c' (kPa)	γ (kN/m³)	γ _w (kN/m³)	(m)	ø' (deg)	Condition (2)	Condition (2)	Condition (1)	Condition (2
TC3 2	3	4	10.0	10.0	1.30	25	1.0	2.3	100% Water 14.78	100% Wate
TC3_2	3	4	10.0	10.0	1.70	25	1.0	2.7	13.40	11.73
TC3 4	3	4	10.0	10.0	1.10	25	1.0	2.1	15.86	12.54
TC3_5	3	4	10.0	10.0	1.40	25	1.0	2.4	14.36	12.09
TC4_1	3	4	10.0	10.0	1.60	25	1.0	2.6	13.68	11.84
TC4_2	3	4	10.0	10.0	1.30	25	1.0	2.3	14.78	12.23
TC4_3	3	4	10.0	10.0	1.70	25	1.0	2.7	13.40	11.73
TC4_4	2	4	10.0	10.0	2.50 3.30	25	1.0 1.0	3.5	17.94	16.63
TC4_5 BP01	3	4	10.0 10.0	10.0 10.0	0.70	25 25	1.0	4.3 1.7	16.83 19.83	16.02 13.40
BP02	4	4	10.0	10.0	1.20	25	1.0	2.2	11.46	9.28
BP03	3	4	10.0	10.0	0.60	25	1.0	1.6	21.65	13.68
BP04	4	4	10.0	10.0	0.60	25	1.0	1.6	16.25	10.26
BP05	4	4	10.0	10.0	0.20	25	1.0	1.2	35.41	11.46
BP06	6	4	10.0	10.0	0.10	25	1.0	1.1	42.91	7.93
BP07	3	4	10.0	10.0	2.40	25	1.0	3.4	12.09	11.15
R1							AT THIS LOCATIO			
R2	5	4	10.0	10.0	0.20	25	1.0	1.2	28.37	9.17
R3 R4	3	4	10.0 10.0	10.0 10.0	2.50 3.60	25 25	1.0 1.0	3.5 4.6	8.97 11.02	8.31 10.56
R5	3	4	10.0	10.0	4.20	25	1.0	4.6 5.2	10.72	10.56
R6	2	4	10.0	10.0	4.50	25	1.0	5.5	15.90	15.44
R8	4	4	10.0	10.0	3.60	25	1.0	4.6	8.27	7.92
R10	3	4	10.0	10.0	2.80	25	1.0	3.8	11.63	10.91
R11	7	4	10.0	10.0	1.80	25	1.0	2.8	5.63	4.98
R12	6	4	10.0	10.0	1.50	25	1.0	2.5	7.00	5.98
R14	3	4	10.0	10.0	5.40	25	1.0	6.4	10.31	10.09
R16	4	4	10.0	10.0	3.70	25	1.0	4.7	8.22	7.89
R18 R20	3	4	10.0 10.0	10.0 10.0	3.90 4.80	25 25	1.0 1.0	4.9 5.8	8.14 10.49	7.84 10.22
R21	4	4	10.0	10.0	1.90	25	1.0	2.9	9.69	8.65
R22	4	4	10.0	10.0	1.70	25	1.0	2.7	10.05	8.80
R23	4	4	10.0	10.0	0.70	25	1.0	1.7	14.88	10.05
R24	3	4	10.0	10.0	1.80	25	1.0	2.8	13.15	11.63
R25	3	4	10.0	10.0	1.40	25	1.0	2.4	14.36	12.09
R26	3	4	10.0	10.0	1.20	25	1.0	2.2	15.28	12.38
R27	3	4	10.0	10.0	1.80	25	1.0	2.8	13.15	11.63
R28	3	4	10.0	10.0	2.20	25	1.0	3.2	12.38	11.29
R29	3	4	10.0	10.0	2.40	25	1.0	3.4	12.09	11.15
R31 R32	3	4	10.0 10.0	10.0 10.0	1.90 1.90	25 25	1.0 1.0	2.9 2.9	12.93 12.93	11.54 11.54
R33	3	4	10.0	10.0	2.10	25	1.0	3.1	12.54	11.37
R34	2	4	10.0	10.0	3.00	25	1.0	4.0	17.18	16.22
R35	2	4	10.0	10.0	3.70	25	1.0	4.7	16.45	15.79
R36	3	4	10.0	10.0	2.70	25	1.0	3.7	11.73	10.97
R37	3	4	10.0	10.0	1.80	25	1.0	2.8	13.15	11.63
R38	4	4	10.0	10.0	2.60	25	1.0	3.6	8.88	8.27
R39	3	4	10.0	10.0	0.90	25	1.0	1.9	17.40	12.93
R40 R41	3	4	10.0	10.0	2.50 1.40	25	1.0	3.5	11.96	11.08
R42	3	4	10.0 10.0	10.0 10.0	1.40	25 25	1.0 1.0	2.4 2.9	14.36 12.93	12.09 11.54
R43	2	4	10.0	10.0	2.00	25	1.0	3.0	19.09	17.18
R44	3	4	10.0	10.0	2.80	25	1.0	3.8	11.63	10.91
R45	3	4	10.0	10.0	1.30	25	1.0	2.3	14.78	12.23
R46	3	4	10.0	10.0	1.50	25	1.0	2.5	14.00	11.96
R47	3	4	10.0	10.0	1.70	25	1.0	2.7	13.40	11.73
R48	3	4	10.0	10.0	1.30	25	1.0	2.3	14.78	12.23
R49	3	4	10.0	10.0	1.40 1.40	25	1.0	2.4	14.36	12.09
R50 R51	3	4	10.0 10.0	10.0 10.0	1.40	25 25	1.0 1.0	2.4 2.3	14.36 14.78	12.09 12.23
R52	3	4	10.0	10.0	1.10	25	1.0	2.3	15.86	12.23
R53	3	4	10.0	10.0	2.50	25	1.0	3.5	11.96	11.08
R54	4	4	10.0	10.0	1.80	25	1.0	2.8	9.86	8.72
R55	5	4	10.0	10.0	2.00	25	1.0	3.0	7.63	6.87
R57	4	4	10.0	10.0	2.10	25	1.0	3.1	9.41	8.52
R59	4	4	10.0	10.0	2.90	25	1.0	3.9	8.65	8.14
R61	2	4	10.0	10.0	3.70	25	1.0	4.7	16.45	15.79
R63	3	4	10.0	10.0	4.10 4.70	25	1.0	5.1	10.76	10.40
R65 R67	3	4	10.0 10.0	10.0 10.0	5.30	25 25	1.0 1.0	5.7 6.3	10.53 10.34	10.24 10.11
R69	2	4	10.0	10.0	5.50	25	1.0	6.5	15.44	15.12
R71	3	4	10.0	10.0	4.70	25	1.0	5.7	10.53	10.24
R73	3	4	10.0	10.0	3.00	25	1.0	4.0	11.45	10.81
R75	3	4	10.0	10.0	0.70	25	1.0	1.7	19.83	13.40
R76	4	4	10.0	10.0	1.00	25	1.0	2.0	12.42	9.54
R77	4	4	10.0	10.0	1.80	25	1.0	2.8	9.86	8.72
R78	3	4	10.0	10.0	1.00	25	1.0	2.0	16.55	12.72
R79	3	4	10.0	10.0	2.50	25	1.0	3.5	11.96	11.08
R80	3	4	10.0 10.0	10.0 10.0	1.10 1.40	25 25	1.0 1.0	2.1	15.86 14.36	12.54 12.09
R81 R82	3	4	10.0	10.0	1.40	25 25	1.0	2.4 2.3	14.36	12.09
R83	3	4	10.0	10.0	1.70	25	1.0	2.3	13.40	11.73
R84	3	4	10.0	10.0	2.00	25	1.0	3.0	12.72	11.45
R85	4	4	10.0	10.0	1.10	25	1.0	2.1	11.89	9.41
R86	3	4	10.0	10.0	1.70	25	1.0	2.7	13.40	11.73
R87	4	4	10.0	10.0	0.90	25	1.0	1.9	13.06	9.69
R88	3	4	10.0	10.0	2.10	25	1.0	3.1	12.54	11.37
R89	3	4	10.0	10.0	1.50	25	1.0	2.5	14.00	11.96
R90	3	4	10.0	10.0	0.60	25	1.0	1.6	21.65	13.68
R91	2	4	10.0	10.0	3.80	25	1.0	4.8	16.37	15.74
R92 R93	3	4	10.0 10.0	10.0 10.0	2.80 2.80	25 25	1.0 1.0	3.8 3.8	11.63	10.91 10.91
									11.63	

Calcu	lated Fo	S of N	atural Peat	Slopes fo	or Leman	aghan	Wind Farr	n - Drained	Analysis	
Turbine No./Waypoint	Slope	Design c'	Bulk unit weight of Peat	Unit weight of Water	Depth of In situ Peat	Friction Angle	Surcharge Equivalent Placed Fill	Equivalent Total Depth of Peat (m)	Factor of Safety	for Load Condition
	α (deg)	c' (kPa)	γ (kN/m³)	$\gamma_{\rm w} (kN/m^3)$	(m)	ø' (deg)	Condition (2)	Condition (2)	Condition (1) 100% Water	Condition (2) 100% Water
R95	2	4	10.0	10.0	2.40	25	1.0	3.4	18.13	16.73
R96 R97	2 2	4	10.0 10.0	10.0 10.0	1.80 3.10	25 25	1.0 1.0	2.8 4.1	19.72 17.05	17.45 16.15
R98	2	4	10.0	10.0	3.40	25	1.0	4.4	16.73	15.96
R99 R100	3	4	10.0 10.0	10.0	2.70 2.30	25 25	1.0 1.0	3.7 3.3	11.73 12.23	10.97 11.22
R101	3	4	10.0	10.0	1.70	25	1.0	2.7	13.40	11.73
R102	3	4	10.0	10.0	0.30 1.30	25	1.0	1.3	25.83	11.09
R103 R104	3	4	10.0 10.0	10.0 10.0	1.60	25 25	1.0 1.0	2.3 2.6	14.78 13.68	12.23 11.84
R105	2	4	10.0	10.0	1.10	25	1.0	2.1	23.78	18.81
R106 R107	2	4	10.0 10.0	10.0	1.90 2.50	25 25	1.0 1.0	2.9 3.5	19.39 17.94	17.31 16.63
R108	3	4	10.0	10.0	1.60	25	1.0	2.6	13.68	11.84
R109 R110	3	4	10.0 10.0	10.0 10.0	1.70 2.10	25 25	1.0 1.0	2.7 3.1	13.40 12.54	11.73 11.37
R111	3	4	10.0	10.0	2.50	25	1.0	3.5	11.96	11.08
R112	4	4	10.0	10.0	2.00	25	1.0	3.0	9.54	8.58
R113 R114	3	4	10.0 10.0	10.0 10.0	2.30	25 25	1.0 1.0	3.3 3.4	12.23 12.09	11.22 11.15
R115	3	4	10.0	10.0	2.30	25	1.0	3.3	12.23	11.22
R116 R117	3	4	10.0 10.0	10.0	2.70 3.80	25 25	1.0 1.0	3.7 4.8	11.73 10.91	10.97 10.49
R118	3	4	10.0	10.0	2.90	25	1.0	3.9	11.54	10.49
R119	3	4	10.0	10.0	2.80	25	1.0	3.8	11.63	10.91
R120 R122	3 4	4	10.0 10.0	10.0	3.60 1.90	25 25	1.0 1.0	4.6 2.9	9.69	10.56 8.65
R124	3	4	10.0	10.0	2.10	25	1.0	3.1	12.54	11.37
R125 R126	2	4	10.0 10.0	10.0 10.0	2.80 3.10	25 25	1.0 1.0	3.8 4.1	17.45 17.05	16.37 16.15
R128	2	4	10.0	10.0	3.50	25	1.0	4.5	16.63	15.90
R130 R132	3 4	4	10.0 10.0	10.0	2.80 0.60	25 25	1.0	3.8 1.6	11.63	10.91 10.26
R133	3	4	10.0	10.0 10.0	2.00	25	1.0	3.0	16.25 12.72	11.45
R134	3	4	10.0	10.0	2.00	25	1.0	3.0	12.72	11.45
R135 R136	3 8	4	10.0 10.0	10.0 10.0	2.10 1.50	25 25	1.0 1.0	3.1 2.5	12.54 5.25	11.37 4.48
R137	5	4	10.0	10.0	0.90	25	1.0	1.9	10.45	7.75
R138 R139	6	4	10.0	10.0	0.30	25 COLINTERED	1.0 AT THIS LOCATIO	1.3	17.26	7.40
R140	3	4	10.0	10.0	1.60	25	1.0	2.6	13.68	11.84
R141	2	4	10.0	10.0	2.60	25	1.0	3.6	17.76	16.54
R142 R144	3 2	4	10.0 10.0	10.0	1.80 3.50	25 25	1.0 1.0	2.8 4.5	13.15 16.63	11.63 15.90
R145	4	4	10.0	10.0	1.30	25	1.0	2.3	11.09	9.17
R146 R147	3 4	4	10.0 10.0	10.0 10.0	3.00 1.80	25 25	1.0 1.0	4.0 2.8	11.45 9.86	10.81 8.72
R148	5	4	10.0	10.0	0.20	25	1.0	1.2	28.37	9.17
R149	4	4	10.0	10.0	0.20	25	1.0	1.2	35.41	11.46
R150 R151	4	4	10.0 10.0	10.0	0.90	25 25	1.0	1.9 1.2	13.06 35.41	9.69 11.46
R152	2	4	10.0	10.0	3.40	25	1.0	4.4	16.73	15.96
R153 R154	3 2	4	10.0 10.0	10.0	2.20 3.10	25 25	1.0 1.0	3.2 4.1	12.38 17.05	11.29 16.15
R155	3	4	10.0	10.0	2.40	25	1.0	3.4	12.09	11.15
R156	3	4	10.0	10.0	1.30	25	1.0	2.3	14.78	12.23
R157 R158	3	4	10.0 10.0	10.0 10.0	1.30 1.00	25 25	1.0 1.0	2.3 2.0	14.78 16.55	12.23 12.72
R159	3	4	10.0	10.0	1.30	25	1.0	2.3	14.78	12.23
R160 R161	3	4	10.0 10.0	10.0 10.0	0.70 0.90	25 25	1.0 1.0	1.7 1.9	10.93 8.50	9.74 8.71
R162	3	4	10.0	10.0	0.30	25	1.0	1.3	25.51	12.73
R163	3	4	10.0	10.0	1.00 0.30	25	1.0	2.0	7.65	8.28
R164 R165	3	4	10.0 10.0	10.0 10.0	0.30	25 25	1.0 1.0	1.3 1.2	25.51 38.27	12.73 13.79
R166	5	4	10.0	10.0	0.50	25	1.0	1.5	9.21	6.62
R167 R168	5 4	4	10.0 10.0	10.0 10.0	1.90 1.10	25 25	1.0	2.9 2.1	2.42 5.23	3.43 5.91
R169	3	4	10.0	10.0	2.40	25	1.0	3.4	3.19	4.87
R171	3	4	10.0	10.0	2.40 1.40	25	1.0	3.4	3.19	4.87
R172 R173	3	4	10.0 10.0	10.0 10.0	1.40	25 25	1.0 1.0	2.4 2.4	5.47 5.47	6.90 6.90
R174	3	4	10.0	10.0	1.30	25	1.0	2.3	5.89	7.20
R175 R176	3	4	10.0 10.0	10.0 10.0	0.30 1.80	25 25	1.0 1.0	1.3 2.8	19.16 4.25	9.55 5.91
R177	3	4	10.0	10.0	2.20	25	1.0	3.2	3.48	5.17
R178	5	4	10.0	10.0	1.30	25	1.0	2.3	3.54	4.32
R180 R181	4	4	10.0 10.0	10.0	1.80 1.60	25 25	1.0 1.0	2.8 2.6	3.19 3.59	4.43 4.78
R182	3	4	10.0	10.0	2.30	25	1.0	3.3	3.33	5.02
R183 R184	3	4	10.0 10.0	10.0 10.0	1.90 2.00	25 25	1.0 1.0	2.9 3.0	4.03 3.83	5.71 5.52
R185	4	4	10.0	10.0	2.20	25	1.0	3.2	2.61	3.88
R186	4	4	10.0	10.0	1.10	25	1.0	2.1	5.23	5.91
R187 R188	5	4	10.0 10.0	10.0 10.0	2.80 2.70	25 25	1.0 1.0	3.8 3.7	2.05 1.71	3.27 2.69
R189	5	4	10.0	10.0	0.50	25	1.0	1.5	9.21	6.62
R190	6	4	10.0	10.0	0.30	25	1.0	1.3	12.83	6.37
R191 R192	5	4	10.0	10.0	0.20 NO PEAT EN	25 COUNTERED	1.0 AT THIS LOCATIO	1.2 N	23.04	8.28
R193		ı			NO PEAT EN	COUNTERED	AT THIS LOCATIO	N		1
R194 R195	3	4	10.0 10.0	10.0 10.0	4.60 3.00	25 25	1.0 1.0	5.6 4.0	1.66 2.55	2.96 4.14
CELY	3	4	10.0	10.0	3.00	25	1.0	4.0	2.33	4.14

Calculated FoS of Natural Peat Slopes for Lemanaghan Wind Farm - Drained Analysis Turbine No./Waypoint Slope Design c' Bulk unit weight Unit weight Depth of In Friction Surcharge **Equivalent Total Factor of Safety for Load Condition** οf of Water situ Peat Angle Equivalent Depth of Peat (m) Placed Fill α (deg) c' (kPa) ø' (deg) Condition (2) Condition (2) Condition (1) Condition (2) $\gamma (kN/m^3)$ $\gamma_w (kN/m^3)$ (m) 100% Water 100% Water R196 3.40 10.0 3.76 3.70 R197 4.7 10.0 10.0 25 1.0 2.07 3.52 R198 3 10.0 10.0 4 0 2.55 4.14 R199 4 4 10.0 10.0 2.80 25 1.0 3.8 2.05 3.27 PSA 001 1.90 1 4 10.0 10.0 25 1.0 2.9 38.78 34.62 PSA 002 1 4 10.0 10.0 1 70 25 1.0 27 40.20 35.20 PSA 003 1 4 10.0 10.0 1.90 25 1.0 2.9 38 78 34 62 PSA 004 4 10.0 10.0 2.00 25 1.0 3.0 38.18 34.36 PSA 005 4 10.0 10.0 2.80 25 1.0 3.8 34.90 32.75 PSA 006 4 10.0 10.0 0.40 25 1.0 1.4 21.04 10.77 PSA 007 4 10.0 10.0 2.00 25 3.0 38.18 34.36 1 1.0 PSA 008 4 10.0 10.0 2.20 25 1.0 37.13 33.88 1 3.2 3 60 25 PSA 009 3 4 10.0 10.0 1.0 46 11.02 10.56 PSA 010 1 4 10.0 10.0 1.50 25 1.0 2.5 42.00 35.88 PSA 011 1 4 10.0 10.0 0.40 25 1.0 1.4 84.02 43.09 PSA 012 1 4 10.0 10.0 5.80 25 1.0 6.8 30.67 30.09 PSA 013 4 10.0 10.0 6.00 1.0 7.0 30.54 29.99 25 4 10.0 10.0 2.80 25 1.0 3.8 34.90 32.75 PSA 014 1 PSA 015 10.0 10.0 5.70 25 1.0 6.7 30.74 30.14 1 4 2.80 25 PSA 016 4 1.0 8.18 4 10.0 10.0 3.8 8.72 10.0 4.00 32.45 31.30 PSA 017 1 4 10.0 25 1.0 5.0 PSA 018 1 4 10.0 10.0 5.00 25 1.0 6.0 31.30 30.54 PSA 019 1 4 10.0 10.0 4 10 25 1.0 5.1 32.31 31.21 PSA 020 1 4 10.0 10.0 4.50 25 1.0 5.5 31.81 30.88 PSA 021 4 10.0 10.0 5.80 25 1.0 6.8 30.67 30.09 1 32.75 10.0 10.0 34.90 PSA 022 1 2.80 25 1.0 3.8 PSA 023 1 4 10.0 10.0 4.10 25 1.0 32.31 31.21 5.1 5.60 PSA 024 25 30.81 30.19 4 10.0 10.0 1.0 6.6 1 5.00 25 4 10.0 10.0 1.0 PSA 025 6.0 31.30 30.54 1 Substation 2 4 10.0 10.0 5.70 25 1.0 6.7 15.37 15.07 Telecomm. Tower 2 4 10.0 10.0 6.00 25 1.0 7.0 15.26 14.99 Steel Mast 1 (under OHL) 2 4 10.0 10.0 1.00 25 1.0 2.0 24.82 19.09 Steel Mast 2 (under OHL) 4 10.0 10.0 0.20 25 1.0 1.2 70.70 22.91 Steel Mast 3 (Beside substation) 4 10.0 10.0 5.30 25 1.0 6.3 15.52 15.17 Steel Mast 4 (beside substation) 2 4 10.0 10.0 5.20 25 1.0 6.2 15.56 15.20 4 0.6 25 1.0 32.47 Crane Pad (north) 2 10.0 10.0 1.6 20.52 Crane Pad (substation) 4 10.0 4.2 25 16.08 15.56 2 10.0 1.0 5.2 Tower Building (North) 2 4 10.0 10.0 3.0 25 1.0 4 0 17.18 16.22 Tower Building (substation) 2 4 10.0 10.0 3.5 25 1.0 4.5 16.63 15.90 Borrow Pit 1 5.0 4 10.0 10.0 0.2 25 1.0 1.2 28.37 9.17 Borrow Pit 2 5.0 4 10.0 10.0 0.2 25 1.0 1.2 28.37 9.17 Borrow Pit 3 3.0 10.0 10.0 0.3 25 1.0 39.51 15.02 4 10.0 0.2 25 47.16 Borrow Pit 4 3.0 10.0 1.0 1.2 15.28 Construction Compound 2 10.0 10.0 1.90 25 1.0 2.9 9.69 8.65 4 3 25 1.0 2.8 Construction Compound 3 4 10.0 10.0 1.80 13.15 11.63 Construction Compound 4 5.0 4 10.0 10.0 3.4 26 1.0 4.4 6.93 6.62 Construction Compound 5 3.0 10.0 10.0 46 27 1.0 5.6 11.39 11.09

Minimum =	1.66	2.69
Maximum =	84.02	43.09
Average =	16.01	12.59

⁽¹⁾ Assuming a bulk unit weight of peat of 10 (kN/m³)

⁽²⁾ Assuming a bulk unit weight of peat of 10 (kN/m)

(2) Assuming a surcharge equivalent to fill depth of 1.0m.

⁽³⁾ Slope inclination (β) based on site readings and contour survey plans of site.

⁽⁴⁾ FoS is based on slope inclination and shear test results obtained from published data.

⁽⁵⁾ Peat depths based on probes carried out by FT.

⁽⁶⁾ For load conditions see Report text.

⁽⁷⁾ Minimum acceptable factor of safety required of 1.3 for first-time failures based on BS: 6031:1981 Code of practice for Earthworks.

Turbine No./Waypoint	Slope	al Peat Slo	Bulk unit weight	Peat Depth	Surcharge Equivalent		for Load Conditio
Turbine No./Waypoint	Slope	strength	of Peat	Peat Depth	Placed Fill Depth (m)	Factor of Safety	for Load Conditio
	β (deg)	c _u (kPa)	γ (kN/m³)	(m)	Condition (2)	Condition (1)	Condition (2
T1 - C	3	6	10	3.6	4.6	3.19	2.50
T1 - N T1 - S	3	6	10 10	3.6 3.6	4.6 4.6	3.19 3.19	2.50 2.50
T1 - E	3	6	10	3.1	4.0	3.70	2.80
T1 - W	3	6	10	3.4	4.4	3.38	2.61
T2 - C	4	6	10	1	2.0	8.62	4.31
T2 - N T2 - S	4	6	10 10	1.7 0.9	2.7 1.9	5.07 9.58	3.19 4.54
T2 - E	4	6	10	0.9	1.9	9.58	4.54
T2 - W	4	6	10	1.4	2.4	6.16	3.59
T3 - C	4	6	10	2.2	3.2	3.92	2.69
T3 - N	4	6	10 10	1.8	2.8	4.79 5.39	3.08 3.32
T3 - S T3 - E	4	6	10	1.6 1.5	2.6 2.5	5.75	3.45
T3 - W	4	6	10	1.8	2.8	4.79	3.08
T4 - C	4	6	10	0.1	1.1	86.22	7.84
T4 - N	4	6	10	0.4	1.4	21.56	6.16
T4 - S T4 - E	4	6	10 10	0.1	1.1 1.2	86.22 43.11	7.84 7.19
T4 - W	4	6	10	0.2	1.2	43.11	7.19
T5 - C	3	6	10	1.3	2.3	8.83	4.99
T5 - N	3	6	10	1.2	2.2	9.57	5.22
T5 - S T5 - E	3	6	10 10	0.7	1.7 1.8	16.40 14.35	6.75 6.38
T5 - W	3	6	10	1	2.0	11.48	5.74
T6 - C	2	6	10	2.1	3.1	8.19	5.55
T6 - N	2	6	10	2.4	3.4	7.17	5.06
T6 - S T6 - E	2	6	10 10	1.6 2	2.6 3.0	10.75 8.60	6.62 5.73
T6 - W	2	6	10	1.5	2.5	11.47	6.88
T7 - C	3	6	10	2.7	3.7	4.25	3.10
T7 - N	3	6	10	1.8	2.8	6.38	4.10
T7 - S T7 - E	3	6	10 10	2.1	3.1 3.2	5.47 5.22	3.70 3.59
T7 -W	3	6	10	2.1	3.1	5.47	3.70
T8 - C	4	6	10	0.9	1.9	9.58	4.54
T8 - N	4	6	10	1.8	2.8	4.79	3.08
T8 - S	4	6	10	0.9	1.9	9.58	4.54
T8 - E T8 -W	4	6	10 10	1.1	2.1 2.2	7.84 7.19	4.11 3.92
T9 - C	3	6	10	1	2.0	11.48	5.74
T9 - N	3	6	10	1	2.0	11.48	5.74
T9 - S	3	6	10	1.5	2.5	7.65	4.59
T9 - E T9 - W	3	6	10 10	1.3 1.7	2.3 2.7	8.83 6.75	4.99 4.25
T10 - C	4	6	10	2	3.0	4.31	2.87
T10 - N	4	6	10	1.7	2.7	5.07	3.19
T10 - S	4	6	10	1.8	2.8	4.79	3.08
T10 - E T10 - W	4	6	10 10	0.9	2.1 1.9	7.84 9.58	4.11 4.54
T11 - C	3	6	10	1.1	2.1	10.44	5.47
T11 - N	3	6	10	1	2.0	11.48	5.74
T11 - S	3	6	10	1.7	2.7	6.75	4.25
T11 - E T11 - W	3	6	10 10	1.5 0.9	2.5 1.9	7.65 12.76	4.59 6.04
T12 - C	2	6	10	1.5	2.5	11.47	6.88
T12 - N	2	6	10	1.3	2.3	13.23	7.48
T12 - S	2	6	10	1.5	2.5	11.47	6.88
T12 - E T12 - W	2	6	10	1.3 1.4	2.3	13.23	7.48
T13 - C	4	6	10 10	0.9	2.4 1.9	12.29 9.58	7.17 4.54
T13 - N	4	6	10	1	2.0	8.62	4.31
T13 - S	4	6	10	1.7	2.7	5.07	3.19
T13 - E	4	6	10 10	0.7 2	1.7	12.32 4.31	5.07
T13 - W T14 - C	4	6	10	1.1	3.0 2.1	4.31 7.84	2.87 4.11
T14 - N	4	6	10	1.1	2.0	8.62	4.11
T14 - S	4	6	10	1.2	2.2	7.19	3.92
T14 - E	4	6	10	1.3	2.3	6.63	3.75
T14 - W T15 - C	3	6	10 10	0.3 3.6	1.3 4.6	28.74 3.19	6.63 2.50
T15 - N	3	6	10	3.6	4.6	3.19	2.50
T15 - S	3	6	10	4.1	5.1	2.80	2.25
T15 - E	3	6	10	3.9	4.9	2.94	2.34
T15 - W Met - C	3	6	10 10	1.8	5.0 2.8	2.87 6.38	2.30 4.10
Met - N	3	6	10	1.0	2.0	11.48	5.74
Met - S	3	6	10	1.2	2.2	9.57	5.22
Met - E	3	6	10	1.8	2.8	6.38	4.10
Met - W TC1 1	3	6	10 10	1.4 2.9	2.4 3.9	8.20 3.96	4.78 2.94
TC1_1	2	6	10	5.4	3.9 6.4	3.96	2.94
TC1_3	2	6	10	4.5	5.5	3.82	3.13
TC1_4	4	6	10	2.5	3.5	3.45	2.46
TC1_5	3	6	10	4.2	5.2	2.73	2.21
TC2_1	3	6	10	1.8	2.8	6.38	4.10
TC2_2 TC2_3	3	6	10 10	2.2 0.6	3.2 1.6	5.22 19.13	3.59 7.18
TC2_4	3	6	10	0.6	1.6	19.13	7.18
TC2_5	3	6	10	0.8	1.8	14.35	6.38
TC3_1	3	6	10	1.2	2.2	9.57	5.22
TC3_2	3	6	10	1.3	2.3 2.7	8.83	4.99
TC3_3 TC3_4	3	6	10 10	1.7 1.1	2.7	6.75 10.44	4.25 5.47
TC3 5	3	6	10	1.4	2.4	8.20	4.78

Turbine No./Waypoint	Slope	Undrained shear	Bulk unit weight	Peat Depth	Surcharge Equivalent	Factor of Safety	for Load Condit
	5.5pc	strength	of Peat	. 230 осри	Placed Fill Depth (m)	or surety	Saa condi
	β (deg)	c _u (kPa)	γ (kN/m³)	(m)	Condition (2)	Condition (1)	Condition
TC4_1 TC4_2	3	6	10	1.6	2.6	7.18	4.42
TC4_2 TC4_3	3	6	10 10	1.3 1.7	2.3 2.7	8.83 6.75	4.99 4.25
TC4_4	2	6	10	2.5	3.5	6.88	4.92
TC4_5	2	6	10	3.3	4.3	5.21	4.00
BP01	3 4	6	10	0.7	1.7	16.40	6.75
BP02 BP03	3	6	10 10	1.2 0.6	2.2 1.6	7.19 19.13	3.92 7.18
BP04	4	6	10	0.6	1.6	14.37	5.39
BP05	4	6	10	0.2	1.2	43.11	7.19
BP06	6	6	10	0.1	1.1	57.72	5.25
BP07 R1	3	6	10 NO	2.4 PEAT ENCOUNTER	3.4 RED AT THIS LOCATION	4.78	3.38
R2	5	6	10	0.2	1.2	34.55	5.76
R3	4	6	10	2.5	3.5	3.45	2.46
R4	3	6	10 10	3.6	4.6	3.19	2.50 2.21
R5 R6	3 2	6	10	4.2 4.5	5.2 5.5	2.73 3.82	3.13
R8	4	6	10	3.6	4.6	2.40	1.87
R10	3	6	10	2.8	3.8	4.10	3.02
R11	7	6	10	1.8	2.8	2.76	1.77
R12 R14	6	6	10 10	1.5 5.4	2.5 6.4	3.85 2.13	2.31 1.79
R16	4	6	10	3.7	4.7	2.33	1.83
R18	4	6	10	3.9	4.9	2.21	1.76
R20	3	6	10	4.8	5.8	2.39	1.98
R21	4	6	10	1.9	2.9	4.54 5.07	2.97
R22 R23	4	6	10 10	1.7 0.7	2.7 1.7	5.07 12.32	3.19 5.07
R24	3	6	10	1.8	2.8	6.38	4.10
R25	3	6	10	1.4	2.4	8.20	4.78
R26 R27	3	6	10 10	1.2 1.8	2.2 2.8	9.57	5.22 4.10
R28	3	6	10	2.2	3.2	6.38 5.22	3.59
R29	3	6	10	2.4	3.4	4.78	3.38
R31	3	6	10	1.9	2.9	6.04	3.96
R32	3	6	10	1.9	2.9	6.04	3.96
R33 R34	3 2	6	10 10	2.1 3	3.1 4.0	5.47 5.73	3.70 4.30
R35	2	6	10	3.7	4.7	4.65	3.66
R36	3	6	10	2.7	3.7	4.25	3.10
R37	3	6	10	1.8	2.8	6.38	4.10
R38 R39	3	6	10 10	2.6 0.9	3.6 1.9	3.32 12.76	2.40 6.04
R40	3	6	10	2.5	3.5	4.59	3.28
R41	3	6	10	1.4	2.4	8.20	4.78
R42	3	6	10	1.9	2.9	6.04	3.96
R43	2	6	10	2	3.0	8.60	5.73
R44 R45	3	6	10 10	2.8 1.3	3.8 2.3	4.10 8.83	3.02 4.99
R46	3	6	10	1.5	2.5	7.65	4.59
R47	3	6	10	1.7	2.7	6.75	4.25
R48	3	6	10	1.3	2.3	8.83	4.99
R49 R50	3	6	10 10	1.4 1.4	2.4 2.4	8.20 8.20	4.78 4.78
R51	3	6	10	1.3	2.3	8.83	4.99
R52	3	6	10	1.1	2.1	10.44	5.47
R53	3	6	10	2.5	3.5	4.59	3.28
R54 R55	4 5	6	10	1.8 2	2.8	4.79 3.46	3.08
R57	4	6	10 10	2.1	3.0 3.1	4.11	2.30 2.78
R59	4	6	10	2.9	3.9	2.97	2.21
R61	2	6	10	3.7	4.7	4.65	3.66
R63	3	6	10	4.1	5.1	2.80	2.25
R65 R67	3	6	10 10	4.7 5.3	5.7 6.3	2.44	2.01 1.82
R69	2	6	10	5.5	6.5	3.13	2.65
R71	3	6	10	4.7	5.7	2.44	2.01
R73	3	6	10	3	4.0	3.83	2.87
R75 R76	3 4	6	10 10	0.7	1.7 2.0	16.40 8.62	6.75 4.31
R77	4	6	10	1.8	2.8	4.79	3.08
R78	3	6	10	1	2.0	11.48	5.74
R79	3	6	10	2.5	3.5	4.59	3.28
R80 R81	3	6	10 10	1.1 1.4	2.1 2.4	10.44 8.20	5.47 4.78
R82	3	6	10	1.4	2.4	8.83	4.78
R83	3	6	10	1.7	2.7	6.75	4.25
R84	3	6	10	2	3.0	5.74	3.83
R85	4	6	10	1.1	2.1	7.84	4.11
R86 R87	3 4	6	10 10	1.7 0.9	2.7 1.9	6.75 9.58	4.25 4.54
R88	3	6	10	2.1	3.1	9.58 5.47	3.70
R89	3	6	10	1.5	2.5	7.65	4.59
R90	3	6	10	0.6	1.6	19.13	7.18
R91	2	6	10	3.8	4.8	4.53	3.58
R92 R93	3	6	10 10	2.8	3.8 3.8	4.10 4.10	3.02 3.02
R94	2	6	10	3.1	4.1	5.55	4.20
R95	2	6	10	2.4	3.4	7.17	5.06
R96	2	6	10	1.8	2.8	9.56	6.14
R97	2	6	10	3.1	4.1	5.55	4.20
R98	2	6	10	3.4 2.7	4.4	5.06 4.25	3.91 3.10
R99 R100	3	6	10 10	2.7	3.7 3.3	4.25 4.99	3.10 3.48
	, ,	6	10	1.7	2.7	6.75	4.25

Turbine No./Waypoint	Slope		Bulk unit weight	Peat Depth	Surcharge Equivalent	Factor of Safety	for Load Condi
		strength	of Peat		Placed Fill Depth (m)		
D400	β (deg)	c _u (kPa)	γ (kN/m³)	(m)	Condition (2)	Condition (1)	Condition
R102 R103	3	6	10 10	0.3 1.3	1.3 2.3	28.74 8.83	6.63 4.99
R104	3	6	10	1.6	2.6	7.18	4.42
R105	2	6	10	1.1	2.1	15.64	8.19
R106 R107	2	6	10 10	1.9 2.5	2.9 3.5	9.05 6.88	5.93 4.92
R108	3	6	10	1.6	2.6	7.18	4.42
R109	3	6	10	1.7	2.7	6.75	4.25
R110	3	6	10	2.1	3.1	5.47	3.70
R111 R112	3 4	6	10 10	2.5	3.5 3.0	4.59 4.31	3.28 2.87
R113	3	6	10	2.3	3.3	4.99	3.48
R114	3	6	10	2.4	3.4	4.78	3.38
R115	3	6	10	2.3	3.3	4.99	3.48
R116 R117	3	6	10 10	3.8	3.7 4.8	4.25 3.02	3.10 2.39
R118	3	6	10	2.9	3.9	3.96	2.94
R119	3	6	10	2.8	3.8	4.10	3.02
R120	3	6	10	3.6	4.6	3.19	2.50
R122 R124	3	6	10 10	1.9 2.1	2.9 3.1	4.54 5.47	2.97 3.70
R125	2	6	10	2.8	3.8	6.14	4.53
R126	2	6	10	3.1	4.1	5.55	4.20
R128	2	6	10	3.5	4.5	4.92	3.82
R130 R132	3 4	6	10 10	2.8 0.6	3.8 1.6	4.10 14.37	3.02 5.39
R133	3	6	10	2	3.0	5.74	3.83
R134	3	6	10	2	3.0	5.74	3.83
R135	3	6	10	2.1	3.1	5.47	3.70
R136 R137	- 8 - 5	6	10 10	1.5 0.9	2.5 1.9	2.90 7.68	1.74 3.64
R138	6	6	10	0.3	1.3	19.24	4.44
R139			NO	PEAT ENCOUNTE	RED AT THIS LOCATION		
R140	3	6	10	1.6	2.6	7.18	4.42
R141 R142	3	6	10 10	2.6 1.8	3.6 2.8	6.62 6.38	4.78 4.10
R144	2	6	10	3.5	4.5	4.92	3.82
R145	4	6	10	1.3	2.3	6.63	3.75
R146	3	6	10	3	4.0	3.83	2.87
R147 R148	5	6	10 10	0.2	2.8 1.2	4.79 34.55	3.08 5.76
R149	4	6	10	0.2	1.2	43.11	7.19
R150	4	6	10	0.9	1.9	9.58	4.54
R151	4	6	10	0.2	1.2	43.11	7.19
R152 R153	3	6	10 10	3.4 2.2	4.4 3.2	5.06 5.22	3.91 3.59
R154	2	6	10	3.1	4.1	5.55	4.20
R155	3	6	10	2.4	3.4	4.78	3.38
R156	3	6	10	1.3	2.3	8.83	4.99
R157 R158	3	6	10 10	1.3	2.3	8.83 11.48	4.99 5.74
R159	3	6	10	1.3	2.3	8.83	4.99
R160	3	6	10	0.7	1.7	16.40	6.75
R161	3	6	10	0.9	1.9	12.76	6.04
R162 R163	3	6	10 10	0.3	1.3 2.0	38.27 11.48	8.83 5.74
R164	3	6	10	0.3	1.3	38.27	8.83
R165	3	6	10	0.2	1.2	57.40	9.57
R166	5	6	10	0.5	1.5	13.82	4.61
R167 R168	5 4	6	10 10	1.9 1.1	2.9 2.1	3.64 7.84	2.38 4.11
R169	3	6	10	2.4	3.4	4.78	3.38
R171	3	6	10	2.4	3.4	4.78	3.38
R172	3	6	10	1.4	2.4	8.20	4.78
R173 R174	3	6	10 10	1.4	2.4	8.20 8.83	4.78 4.99
R174 R175	4	6	10	0.3	1.3	28.74	6.63
R176	3	6	10	1.8	2.8	6.38	4.10
R177	3	6	10	2.2	3.2	5.22	3.59
R178 R180	5 4	6	10 10	1.3	2.3	5.32 4.79	3.00 3.08
R181	4	6	10	1.6	2.8	5.39	3.08
R182	3	6	10	2.3	3.3	4.99	3.48
R183	3	6	10	1.9	2.9	6.04	3.96
R184 R185	3 4	6	10 10	2.2	3.0 3.2	5.74 3.92	3.83 2.69
R185	4	6	10	1.1	2.1	3.92 7.84	2.69 4.11
R187	4	6	10	2.8	3.8	3.08	2.27
R188	5	6	10	2.7	3.7	2.56	1.87
R189 R190	5 6	6	10 10	0.5	1.5 1.3	13.82 19.24	4.61 4.44
R190 R191	5	6	10	0.3	1.3	34.55	5.76
R192			NO	PEAT ENCOUNTE	RED AT THIS LOCATION		
R193		·			RED AT THIS LOCATION	· · · · · · · · · · · · · · · · · · ·	-
R194	3	6	10	4.6	5.6	2.50	2.05
R195 R196	3	6	10 10	3.4	4.0 4.4	3.83 3.38	2.87 2.61
R197	3	6	10	3.7	4.7	3.10	2.44
R198	3	6	10	3	4.0	3.83	2.87
R199	4	6	10	2.8	3.8	3.08	2.27
PSA 001 PSA 002	1 1	6	10	1.90 1.70	2.9	18.10 20.23	11.86
PSA 002 PSA 003	1	6	10 10	1.70	2.7 2.9	20.23 18.10	12.73 11.86
PSA 004	1	6	10	2.00	3.0	17.19	11.46
PSA 005	1	6	10	2.80	3.8	12.28	9.05

Calculated FoS of Natural Peat Slopes for Lemanaghan Wind Farm - Undrained Analysis Undrained shea Bulk unit weight Peat Depth Surcharge Equivalent Factor of Safety for Load Condition strength of Peat Placed Fill Depth (m) ß (deg) Condition (1) c.. (kPa) y (kN/m³)(m) Condition (2) Condition (2) 2.00 2.20 PSA 007 10 3.0 17.19 11.46 PSA 008 6 10 3.2 15.63 10.75 PSA 009 3.60 6 10 4.6 3.19 2.50 PSA 010 1 22.92 13.75 1.4 PSA 011 1 6 10 0.40 85.96 24.56 5.93 5.06 PSA 012 6 5.80 6.8 PSΔ 013 1 6 10 6.00 7.0 5.73 4.91 PSA 014 2.80 1 6 10 3.8 12.28 9.05 PSA 015 10 5.70 6.7 6.03 5.13 PSA 016 10 2.80 3.8 3.08 2.27 4.00 PSA 017 10 5.0 8.60 6.88 6 PSA 018 6 10 5.00 6.0 5.73 PSA 019 6 10 4 10 5.1 8.39 6.74 4.50 PSA 020 10 5.5 7.64 6.25 PSA 021 1 6 10 5.80 6.8 5.93 5.06 PSA 022 1 6 10 2 80 3.8 12.28 9.05 PSA 023 10 4.10 8.39 6.74 PSA 024 1 6 10 5.60 6.6 6.14 5.21 PSA 025 1 6 10 5.00 6.0 6.88 5.73 5.70 10 6.7 3.02 2.57 Substation 6 Telecomm. Tower 10 6.00 7.0 2.46 Steel Mast 1 (under OHL) 6 10 1.00 2.0 17.20 8.60 10 0.20 1.2 14.34 Steel Mast 2 (under OHL) 6 86.01 Steel Mast 3 (Beside substation) 6 10 5.30 6.3 3.25 2.73 Steel Mast 4 (beside substation) 6 10 5.20 6.2 3.31 2.77 Crane Pad (north) 0.6 28.67 10.75 10 1.6 Crane Pad (substation) 10 4.2 4.10 3.31 Tower Building (North) 6 10 3.0 4.0 5.73 4.30 3.5 0.2 3.82 Tower Building (substation) 10 4.5 4.92 Borrow Pit 1 10 1.2 34.55 5.76 Borrow Pit 2 34.55 6 10 0.2 1.2 5.76 Borrow Pit 3 6 10 0.3 1.3 45.92 9.18 Borrow Pit 4 6 10 0.2 1.2 57.40 9.57 4.54 Construction Compound 2 4 6 10 1.9 2.9 2.97 3.59 Construction Compound 3 10 Construction Compound 4 6 10 4.4 2.03 1.57 Construction Compound 5 10 2.50 2.05

Minimum =	2.03	1.57
Maximum =	86.22	24.56
Average =	10.33	4.63

Notes:

- (1) Assuming a bulk unit weight for peat of 10kN/m³
- (2) Assuming a surcharge equivalent to fill depth of 1m of peat i.e. 10kPa.
- (3) Slope inclination (β) based on site readings and site contour plans.
 (4) A lower bound undrained shear strength, cu for the peat of 6kPa was selected for the assessment. It should be noted that a cu of 6kPa for the peat is considered a
- conservative value for the analysis and is not representative of all peat present across the site. In reality the peat has a significantly higher undrained strength. (5) Peat depths based on probes carried out by FT.
- (6) For load conditions see report text.



DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX D

Methodology for Peat Stability Risk Assessment



Methodology for Peat Stability Risk Assessment

A peat stability risk assessment was carried out for each of the main infrastructure elements at the proposed wind farm development. This approach takes into account guidelines for geotechnical/peat stability risk assessments as given in PLHRAG (2nd Edition, 2017) and MacCulloch (2005). The degree of risk is determined as a Risk Rating (R), which is the product of probability (P) and impact (I). How these factors are determined and applied in the analysis is described below.

The main approaches for assessing peat stability include the following:

- (a) Geomorphological
- (b) Qualitative (judgement)
- (c) Index/Probabilistic (probability)
- (d) Deterministic (factor of safety)

Approaches (a) to (c) listed above would be considered subjective and do not provide a definitive indication of stability; in addition, a high level of judgement/experience is required which makes it difficult to relate the findings to real conditions. FT apply a more objective approach, the deterministic approach. As part of FT's deterministic approach, a qualitative risk assessment is also carried out taking into account qualitative factors, which cannot necessarily be quantified.

Probability

The likelihood of a peat failure occurring was assessed based on the results of both the quantitative results of stability calculations (deterministic approach using factors of safety) and the assessment of the severity of several qualitative factors which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability.

The qualitative factors used in the risk assessment are outlined in Table A and have been compiled based on FT's experience of assessments and construction in peat land sites and peat failures throughout Ireland and the UK.

Table A: Qualitative Factors used to Assess Potential for Peat Failure

Qualitative Factor	Type of Feature/Indicator for each Qualitative Factor ⁽¹⁾	Explanation/Description of Qualitative Factor				
	No	Based on site walkover observations. Sub peat water flow generally occurs				
E ideas for hoose	Possibly	in the form of natural piping at the base of peat. Where there is a constriction or blockage in natural				
Evidence of sub peat water flow	Probably	pipes a build-up of water can occur at the base of the peat causing a				
	Yes	reduction in effective stress at the base of the peat resulting in failure; this is particularly critical during periods of intense rainfall.				

Qualitative Factor	Type of Feature/Indicator for each Qualitative Factor ⁽¹⁾	Explanation/Description of Qualitative Factor			
Evidence of surface water flow	Dry	Based on site walkover observations. The presence of surface water flow			
	Localised/Flowing in drains	indicates if peat in an area is well drained or saturated and if any			
	Ponded in drains	additional loading from the ponding of surface water onto the peat is likely.			
	Springs/surface water				
Evidence of previous failures/slips	No	Based on site walkover observations. The presence of clustering of relict			
	In general area	failures may indicate that particular pre-existing site conditions			
	On site	predispose a site to failure.			
	Within 500m of location				
Type of vegetation	Grass/Crops	Based on site walkover observations The type of vegetation presen			
	Improved Grass/Dry Heather	indicates if peat in an area is well drained, saturated, etc. Vegetation			
	Wet Grassland/Juncus (Rushes)	that indicates wetter ground may also indicate softer underlying peat			
	Wetlands Sphagnum (Peat moss)	deposits.			
General slope	Concave	Based on site walkover observations Slope morphology in the area of the			
characteristics upslope/downslope from infrastructure	Planar to concave	infrastructure location is an important factor. A number of recorded peat			
location	Planar to convex	failures have occurred in close proximity to a convex break in slope.			
	Convex				
Evidence of very soft/soft clay at base of	No	Based on inspection of exposures in general area from site walkover. Several reported peat failures identify			
peat	Yes	the presence of a weak layer at the base of the peat along which shear failure has occurred.			
Evidence of mechanically cut peat	No	Based on site walkover observations. Mechanically cut peat typically cut using a 'sausage' machine to extract			
	Yes	peat for harvesting. Areas which have been cut in this manner have been linked to peat instability. The mechanical cuts can notably reduce the intrinsic strength of the peat and also allow ingress of rainfall/surface water.			

Qualitative Factor	Type of Feature/Indicator for each Qualitative Factor ⁽¹⁾	Explanation/Description of Qualitative Factor		
Evidence of quaking or buoyant peat	No	Based on site walkover observations. Quaking/buoyant peat is indicative of highly saturated peat, which would		
	Yes	generally be considered to have a low strength. Quaking peat is a feature on sites that have been previously linked with peat instability.		
Evidence of bog pools	No	Based on site walkover observations. Bog pools are generally an indicator of areas of weak, saturated peat. Commonly where there are open		
	Yes	areas of water within peat these can be interconnected, with the result that there may be sub-surface bodies of water. The presence of bog pools have been previously linked with peat instability.		
Other	Varies	In addition to the above features/ indicators and based on site recordings the following are some of the features which may be identified: Excessively deep peat, weak peat, overly steep slope angles, etc.		

Note (1) The list of features/indicators for each qualitative factor are given in increasing order of probability of leading to peat instability/failure.

It should be noted that the presence of one of the qualitative factors alone from Table A is unlikely to lead to peat instability/failure. Peat instability/failure at a site is generally the combination of a number of these factors occurring at the same time at a particular location. The probability rating assigned to the quantitative and qualitative factors is judged on a 5-point scale from 1 (indicating negligible or no probability of failure) to 5 (indicating a very likely failure), as outlined in Table B.

Table B: Probability Scale

Scale	Factor of Safety	Probability		
1	1.30 or greater	Negligible/None		
2	1.29 to 1.20	Unlikely		
3	1.19 to 1.11	Likely		
4	1.01 to 1.10	Probable		
5	≤1.0	Very Likely		

Scale	Likelihood of Qualitative Factor leading to Peat Failure	Probability of Failure
1	Negligible/None	Least
2	Unlikely	
3	Probable	
4	Likely	
5	Very Likely	Greatest

Impact

The severity of the risk is also assessed qualitatively in terms of impact. The impact of a peat failure on the environment within and beyond the immediate wind farm site is assessed based on the potential travel distance of a peat failure. Where a peat failure enters a watercourse, it can travel a considerable distance downstream. Therefore, the proximity of a potential peat failure to a drainage course is a significant indicator of the likely potential impact.

The risk is determined based on the combination of hazard and impact. A qualitative scale has been derived for the impact of the hazard based on distance of infrastructure element to a watercourse (Table C).

The location of watercourses is based on topographic maps and supplemented by site observations from walkover survey. Note that not all watercourses are shown on maps.

Table C: Impact Scale

Scale	Criteria	Impact
1	Proposed infrastructure element greater than 150m of watercourse	Negligible/None
2	Proposed infrastructure element within 150 to 101m of watercourse	Low
3	Proposed infrastructure element within 100 to 51m of watercourse	Medium
4	Proposed infrastructure element within 50 m of watercourse	High
5	Proposed infrastructure element within 50 m of watercourse, in an environmentally sensitive area	Extremely High

Risk Rating

The degree of risk is determined as the product of probability (P) and impact (I), which gives the Risk Rating (R) as follows:

The Risk Rating is calculated from: R = P x I

Due to the 5-point scales used to assess Probability and Impact, the Risk Rating can range from 1 to 25 as shown in Table D.

Table D: Qualitative Risk Rating

			Proba	bility		
		1	2	3	4	5
Impact	5	5	10	15	20	25
	4	4	8	12	16	20
lm	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5

Risk Rating & Control Measures								
17 to 25	High: avoid working in area or significant control measures required							
11 to 16	Medium: notable control measures required							
5 to 10	Low: only routine control measures required							
1 to 4	Negligible: none or only routine control measures required							

The risk rating is calculated individually for each contributory factor. Control measures are required to reduce the risk to at least a 'Low' risk rating. The control measures in response to the qualitative risk ratings are included in the peat stability risk registers for each main infrastructure element in Appendix B.

The risk rating is calculated individually for each contributory factor. Control measures are required to reduce the risk to at least a 'Low' risk rating



DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX E

Preliminary Ground Investigation, FT 2021



	FEHILY TIMONEY					Tri	al F	Pit l	Log	g		Trialpit No		
	t Lamanad	han WF		Project P20-2			Co-ords:						eet 1 c Date /04/20	
ocat		v		F2U-2	10		Level: Dimension	ıs		3.	4	00	Scale	
Client							(m): Depth 4.00			ı	1:25 Logged EA	t		
Water Strike	Sample	s and In S	Situ Testing	Depth	Level	Legend		,	Stratum	Descrip	otion			
Str	Depth	Туре	Results	(m)	(m)	alk alk s					with branch	oo ond		
•	1.00	D		4.00		a sille sill				pit at 4.00 r				1 —
Rema	ırks: Peat sa	ample at 1ı			I	1	1							

Rate of water inflow: Medium Terminated due to instability

Stability: Instability - collapse of walls



FE	EHILY					al Pit Log	Trialpit No		
	COMPANY			Desire	4 N I -			Sheet 1	
Project Name:	Lemanagh	nan WF		Project P20-2			Co-ords: 615413.73 - 730466.70 Level:	Date 08/04/20	
Locatio	n: Co. Offaly	,		I			Dimensions 3.4	Scale)
							(m): φ	1:25 Logge	
Client:	Bord na M						4.30	EA	
Water Strike		Type	Results	Depth (m)	Level (m)	Legend	Stratum Description		
Remark	2.00	D ample at	2m	4.30		Alle Alle Alle Alle Alle Alle Alle Alle	rootlets and branches. Higher concentration vegetation from 3m	AT with of	2 -
.5	Termina	ated due	to end of reach o	of bucket				FEH	
Stability	r: Stable							TIMO & COM	NEY

Stability:

									Trialpit I	No
	FEHILY TIMONEY					Tri	ial Pit	Log	ТРЗ	
	& COMPANY			<u> </u>			la		Sheet 1	of 1
Projec Name		ghan Wi	F	Project P20-2				15.96 - 730793.09	Date 08/04/20	124
v arric				P20-2	10		Level: Dimensions	3.4	Scale	
.ocati	ion: Co. Offal	y					(m):		1:25	'
Client	:: Bord na	Mona					Depth	9.	Logge	d
	ı						4.90		EA	
Water Strike		1	n Situ Testing	Depth (m)	Level (m)	Legend	t l	Stratum Description		
\$ ₹	Depth	Туре	Results	(111)	(111)	alle alle s	Soft light brow	un damn mass DEAT with branche	as and	
						د عاد عاد عاد عاد د	roots	vn damp moss PEAT with branche	es anu	
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						2016, 2016, 2 16, 2016, 2016,	34			_
				4.70		312 312 3	d.	htly gravelly CLAY. Gravel is coar	so and	-
	4.80	В					sub-rounded	illy gravelly CLAT. Graver is coal	se and	_
				4.90			7	End of pit at 4.90 m		_
										5 —
Rema	rks Peat sar	mple at 2m	1							

Reat sample at 2111 Bulk bag sample at 4.8m Rate of water inflow: Medium Terminated due to end of reach of bucket

Stability: Stable



							Т	T	NI.
	FEHILY TIMONEY					Tri	ial Pit Log	Trialpit	4
	& COMPANY			During	.4 NI -		_	Sheet 1	
Projed Name		han WF		Project P20-2			Co-ords: 614894.38 - 731078.91 Level:	Date 09/04/2021	
Locati	on: Co. Offaly	,					Dimensions 3.4	Scale	9
Client							(m): Depth $\stackrel{Θ}{\leftarrow}$	1:25 Logge	
			Situ Testing	Depth	Level		4.70	EA	
Water Strike	Depth	Туре	Results	(m)	(m)	Legend	d Stratum Description		
	2.00	D		4.70		Alle Alle Alle Alle Alle Alle Alle Alle	and branches an	ootlets	2
Rema	rks: Peat sa	ample a	t 2m						5 -

Terminated due to end of reach of bucket

Stability: Stable



				Т					Trialpit l	No
	EHILY					Tri	al Pit	Log	TP5	
	COMPANY			4					Sheet 1	
Projec Name		ghan Wi	F	Projec			Co-ords: 61259	6.66 - 728119.21	Date	
Name	•			P20-2	16		Level: Dimensions	2.4	07/04/20	
.ocati	on: Co. Offal	у					(m):	3.4	Scale 1:25	
Client:	Bord na l	Mona					Depth 4.60	1.6	Logge EA	
er (e	Sample	s and I	n Situ Testing	Depth	Level	Lagana		Stratum Depariation		
Water Strike	Depth	Туре	Results	(m)	(m)	Legeno	l	Stratum Description		
WK WK	1.00	Type D	Results			alle alle alle alle alle alle alle alle		damp moss PEAT with rootlets		2
	4.40	В		4.20		a strategy	Soft grey grave	lly CLAY. Gravel is coarse and s	sub-	- - - - - - -
Poma	day D. I	amnle a	4.4.00	4.60				End of pit at 4.60 m		5 —

Peat sample at 1m Bulk bag sample at 4.4m Terminated due to end of reach of bucket

Stability: Stable



								Trialpit	No
	EHILY					Tr	ial Pit Log	TP	6
	COMPANY			Projec	st No		Co-ords: 612545.65 - 727943.21	Sheet 1 Date	
Project Name:	t Lemanagh	an WF		P20-2			Level:	07/04/2	
Locatio	on: Co. Offaly						Dimensions 3.4	Scale	
Locatio	on. Co. Onaly						(m): ω	1:25	
Client:	Bord na M	ona					4.50	Logge EA	
e. Ge	Samples	and In	Situ Testing	Depth	Level	Legend	Stratum Description	•	
Water Strike	Depth -	Туре	Results	(m)	(m)				
	1.50	D		4.50		alle	rootlets and branches rootlets and branches rootlets and branches	「 with	2 - 3 - 5 -
Remar	rks: Peat sar Rate of v	nple at 1. water infl					1	(

Terminated due to instability

Stability: Instability - collapse of walls



									Trialpit I	No
	FE HILY TIMONEY				Trial Pit Log					
_	COMPANY								Sheet 1	
Projec		าan WF	=	Projec			Co-ords: 612496.	01 - 727812.02	Date	
Name:	·			P20-2	16		Level:	2.4	07/04/20	
ocatio	on: Co. Offaly						Dimensions (m):	3.4	Scale 1:25	
Client:	Bord na M	 Iona					Depth	6.	Logge	
7110111.							4.50		EA	
Water		1	n Situ Testing	Depth	Level	Legeno	1	Stratum Description		
≋ੌਂ ਲੋਂ	Depth	Туре	Results	(m)	(m)	alle alle s	O of the late to a constant	filman DEAT		T
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										-
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										-
										5 —
Remai	rks: Peat sai	mple at	1.5m : 1.5m : Slow		I	I.	i			

Terminated due to end of reach of bucket

Stability: Stable



FEHILY TIMONEY & COMPANY						Tri	al Pit Log Trialpit No TP8 Sheet 1 of	
Project Lemanaghan WF			Project P20-2			Co-ords: 613882.98 - 727584.66 Date Level: 07/04/202		
Locatio	on: Co. Offaly	,		'			Dimensions 3.4 Scale (m): 1:25	
Client:	Bord na M	1ona		· ·			Depth Cogged EA	
Water Strike	1	Type	Situ Testing Results	Depth (m)	Level (m)	Legeno	Stratum Description	
	1.00	D		2.00		Silic	End of pit at 2.00 m	2

Rate of water inflow: Rapid Terminated due to instability

Stability: Instability - collapse of walls



$\overline{}$									Trialpit I	No
i i	FEHILY TIMONEY					Tri	ial Pit Log		TP9)
	& COMPANY			Projec	-+ NIO		Co. ordo: 612796 44 727425 20		Sheet 1	of 1
Projed Name	I emanagnan WE				16		Co-ords: 613786.41 - 727425.20 Level:		Date 07/04/20	121
_ocati		.,		<u> </u>			Dimensions 3.4		Scale	
_UUau	On. CO. Onary						(m):		1:25	
Client	: Bord na N	√lona					Depth - 4.00		Logge EA	a
e e	Samples	s and I	n Situ Testing	Depth	Level	Lagons	Stratum Description	-		
Water Strike	Depth	Туре	Results	(m)	(m)	Legend		1		
N 97	1.00	D		4.00		Alle,				1 2 3 4 5
Rema	rks: Peat sa	ample at f water ir	t 1m nflow: Slow							
	Termina	ated due	e to end of reach of buc	cket					EEH) Y

Stability:

Stable

FEHILY TIMONEY & COMPANY					T					
ot .	FEHILY				Trial Pit Log					
\						_		Sheet 1		
Lemanag	ghan WF	:	Projec			Co-ords: 613597.17 - 727357.58		Date		
j.			P20-2	16		Level: Dimensions 3	1	07/04/20 Scale		
ion: Co. Offal	У					(m):	*	1:25		
t: Bord na I	Mona				ļ			Logge EA	d	
Sample	s and Ir	า Situ Testing	Depth	Level	Larane					
Depth	Туре	Results	(m)	(m) (m)						
Depth 1.50	D	Results			Sile Sile Sile Sile Sile Sile Sile Sile	Soft light brown damp moss PEAT vibranches Soft light brown damp moss PEAT vibranches Firm grey silty, gravelly CLAY with coarse and sub-rounded. Cobbles a	with roots an	ıvel is	1 2 3	
L. Post on	male at 1 Fu								5 —	
	ion: Co. Offal :: Bord na l Sample Depth 1.50	ion: Co. Offaly :: Bord na Mona Samples and In Depth Type 1.50 D	Bord na Mona Samples and In Situ Testing Depth Type Results 1.50 D 3.50 B	Bord na Mona Samples and In Situ Testing Depth Type Results 1.50 D 3.50 B 3.40 3.60	ion: Co. Offaly Bord na Mona Stu Testing Depth Level (m)	ion: Co. Offaly : Bord na Mona Samples and In Situ Testing Depth (m) Level (m) Depth Type Results	Dimensions (m): Bord na Mona Samples and In Situ Testing	ion: Co. Offialy : Bord na Mona Samples and In Situ Testing Depth Type Results Depth Stratum Description	Samples and In Situ Testing Depth Type Results Depth Situ Type Results Soft light brown damp moss PEAT with roots and branches show the same process of th	

Bulk bag sample at 3.5m Rate of water inflow: Slow (trickle) Terminated due to instability

Stability: Instability - collapse of walls



								4 1	Trialpit I	No
ļ	FEHILY					Tri	ial Pit	t Log	TP1	1
	COMPANY			Projec				121.35 - 726494.87	Sheet 1	
Projec Name	t Lemanaç	ghan Wi	F	P20-2			Level:	1121.33 - 720494.07	07/04/20	
_ocati	on: Co. Offa	ly					Dimensions	3.4	Scale	;
							(m): Depth	9.	1:25 Logge	
Client							4.00		EA	
Water Strike	Sample Depth	Type	n Situ Testing Results	Depth (m)	Level (m)	Legend	t	Stratum Description		
≤ w	Бериі	Туре	Results			2) (1) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	Firm dark bro	own spongy pseudo fibrous PEA	Γ	_
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	3.50	В				<u>×</u> -×	4			-
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						X - X	1			_
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				4.00		×	7	End of pit at 4.00 m		4 _
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Remarks:

Peat sample at 1.5m Bulk bag at 3.5m Terminated due to end of reach of bucket

Stability: Stable



								Trialpit I	No
	FEHILY TIMONEY					Tri	ial Pit Log	TP1	2
	& COMPANY			Drain	· NI_			Sheet 1	
Projec Name		han W	F	Project P20-2			Co-ords: 615432.06 - 726691.52 Level:	Date 06/04/20	
ocati							Dimensions 3.4	Scale	9
							(m): $_{\mbox{\scriptsize ω}}$	1:25 Logge	
Client							4.30	EA	
Water Strike	Samples		In Situ Testing	Depth (m)	Level	Legend	d Stratum Description		
Š ₹	Depth	Туре	Results	(m)	(m)	जीह जीह ज		PEAT with	
						s als als als als a	roots and branches. Organic smell	L/ II III.	
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				4.30			End of pit at 4.30 m] =
									=
									=
									=
									5 —
Rema	arks: Peat sa		aken at 2.5m						
	Rate of	. water i	inflow: rapid						

Terminated due to instability

Stability: Instability - collapse of walls



							ial Dit I	Trialpit N	
	FEHILY					l ri	ial Pit Log	TP13	
	k COMPANY			Projec			Co-ords: 615697.81 - 726868.57	Sheet 1 c	of 1
Projec Name		ghan Wl	F	P20-2			Level:	06/04/20	21
.ocati	on: Co. Offal	ly					Dimensions 3.4 (m):	Scale	
Client	: Bord na	 Mona					Depth $\stackrel{\mathcal{O}}{\leftarrow}$	1:25 Logged	t
1			In Situ Testing		Τ. ,	$\overline{}$	4.20	EA	
Water Strike	Depth	Type	Results	Depth (m)	Level (m)	Legend	d Stratum Description		
> 0,				+	-	2) (c. 2) (c. 2)		PEAT	
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						X X	sub-angular	310113	, ‡
	4.00	В				× × ×			4 —
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				4.20		<u> </u>	End of pit at 4.20 m		
									 -
						<u></u>			5 —

Remarks:

Peat sample taken at 1.5m Bulk bag sample taken at 4m Terminated due to end of reach of bucket

Stability: Stable



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	FEHILY TIMONEY					Tri	ial Pit Log	Trialpit I	
	t Lemanadi	han Wi	=	Project P20-2	t No.		Co-ords: 616866.35 - 728667.15 Level:	Sheet 1 o Date 06/04/20	
Locati		,		20 2	10		Dimensions 3.4 (m):	Scale	;
Client	: Bord na M	lona					Depth 4.20	1:25 Logge EA	
ter	Samples	s and l	n Situ Testing	Depth	Level	Legend		LA	
Water Strike	Depth	Туре	Results	(m)	(m)	alk alk :			
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Rema	rks: Peat sa	ample t	aken at 2m		-	1	1		

Terminated due to end of reach of bucket



							Trialpit	No
F TI	E H I L Y MONEY					Tri	ial Pit Log TP1	
&	COMPANY						Sheet 1	
Project Name:	Lemana	ghan WF	=	Project P20-2			Co-ords: 616737.45 - 728576.44 Date Level: 06/04/20	
				1 20-2	10		Dimensions 3.4 Scale	
Locatio	on: Co. Offa	ly					(m): 1:25	
Client:	Bord na	Mona					Depth St. Logge 4.50	d
er Ke	Sample	es and Ir	n Situ Testing	Depth	Level	Legeno		
Water Strike	Depth	Туре	Results	(m)	(m)			
> 00	3.00	D B		0.30			Firm brown gravelly SILT. Gravel is sub-rounded	2 -
							End of pit at 4.50 m	-

Peat sample taken at 0.2 Bulk bag sample taken at 3m Terminated due to end of reach of bucket



FE	EHILY MONEY					Tri	al Pit Log Trialpit N	6
Project Name:	Lemana	ghan WF		Project P20-2			Sheet 1 or Co-ords: 616691.21 - 728510.75 Date Level: 06/04/202	
Locatio							Dimensions 3.4 Scale (m): 1:25 Depth ← Logged	ı
Client:	Bord na	Mona		T		T	2.50 EA	
Water Strike		1 1	Situ Testing	Depth	Level	Legeno	Stratum Description	
St %	Depth	Туре	Results	(m)	(m)	alk alk a		
	2.00	D		1.50				1
				2.50			End of pit at 2.50 m	4 —

Peat sample taken at 0.2m
Bulk bag sample taken at 2m
Terminated due to obstruction (large boulders)



												Tria	lpit N	lo
ļ	EHILY					Tri	al F	Pit L	_00	1		TI	P17	,
8	COMPANY											Shee		f 1
Projec Name	t Lemanaç	jhan WF	=	Project P20-2			Co-ords: Level:	616171.9	95 - 7282	77.14)ate 4/202	21
				F 20 - 2	10		Dimension	ns		3.4			cale	- 1
_ocati							(m): Depth		9.				:25 gged	
Client	Bord na l	Mona					3.10						EA	
Water Strike			n Situ Testing	Depth	Level (m)	Legend		5	Stratum D	escription	า			
ਝੌਂ ਲੋਂ	Depth	Туре	Results	(m)	(111)	alk alk a		rk brown s	ponav pse	udo fibrous	s PFAT			
▼	2.50	В		2.90		alke alke alke alke alke alke alke alke	Firm greggrained.	ey slightly s	silty, slightl	y sandy CL		d is fine		2 3
														5 —

Peat sample taken at 1m Bulk bag sample taken at 2.5m Rate of water inflow: Rapid Terminated due to obstruction (large boulders)



						T:	Trialpit No	
	FEHILY					ırı	al Pit Log TP18	
Projec	k COMPANY			Projec	t No.		Sheet 1 of 1 Co-ords: 616059.67 - 728247.39 Date	
Name	Lemanaç	ghan W	F	P20-2			Level: 06/04/2021	
_ocati	on: Co. Offa	ly					Dimensions 3.4 Scale (m): 1:25	
Client	: Bord na	Mona					Depth C Logged	
1			n Situ Testing				3.20 EA	
Water Strike	Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description	
> w	Ворит	1900	reduits			alte alte a		
						316 316 3 8 316 316	st(-
						alta alta a ta alta alta	14	-
	0.50	D				2) (c) 2)		-
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				0.75		2 21/2 21/2 21/2 21/2	Grey slightly silty, gravelly fine to medium grained SAND.	-
						× × ×	Gravels are sub-rounded.	-
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				3.20			End of pit at 3.20 m	-
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Peat sample taken at 0.5m Bulk bag sample taken at 3m Rate of water inflow: Rapid Terminated due to obstruction (large boulders)



	EHILY					Tri	al Pit Log Trialpit No TP19	
T &	COMPANY					• • •	Sheet 1 of 1	1
Projec	t Lemana	nhan W	F	Projec			Co-ords: 616012.43 - 728311.84 Date	
Name:	Lemana	gilali vv	ı	P20-2	16		Level: 06/04/2021	<u> </u>
Location	on: Co. Offa	ly					Dimensions 3.4 Scale (m): 1:25	
Client:	Bord na	Mona					Depth 3.00 Logged EA	
e.	Sample	s and I	n Situ Testing	Depth	Level	Lamana		
Water Strike	Depth	Туре	Results	(m)	(m)	Legend		
	0.20	D				alta alta a ta alta alta alta alta a ta alta al	I am dank storm, damp opongy pooddo iistodo i E. ii.	-
				0.30			Firm grey slightly silty CLAY	-
	2.50	В		3.00		N	Grey silty, sandy fine to coarse GRAVEL with cobbles. Sand is medium to coarse grained. Gravel and cobbles are sub-rounded.	2 — · · · · · · · · · · · · · · · · · ·
								-

Peat sample taken at 0.2m. Bulk bag sample taken at 2.5m. Rate of water inflow: Medium Terminated due to instability

Stability: Instability at 3m - Collapse of walls



							Trialpit No	
F	EHILY					Tri	al Pit Log TP20	
TI &	COMPANY						Sheet 1 of 2	1
Project	Lemana	ghan WF	-	Projec			Co-ords: 616448.57 - 728382.87 Date	
Name:				P20-2	16		Level: 06/04/2021 Dimensions 3.4 Scale	
Locatio	on: Co. Offa	ıly					(m): 1.25	
Client:	Bord na	Mona					Depth Cogged EA	
er Ke	Sample	es and li	Situ Testing	Depth	Level	Legend	Stratum Description	
Water Strike	Depth	Туре	Results	(m)	(m)			
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				0.50		× × ×	Brown sandy, silty medium to coarse sub-rounded	-
						× × ×	GRAVEL with cobbles. Sand is coarse grained and cobbles are sub-rounded.	=
						××××		-
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Peat sample taken at 0.4m Bulk bag sample taken at 2.5m Rate of water inflow: Rapid Terminated due to instability

Stability: Instability at 2.5 (Collapse of walls)



	FEHILY TIMONEY & COMPANY					Tri	al Pit Lo	g	Trialpit TP2 Sheet 1	1
Project Name		nan WF		Projec			Co-ords: 614735.10 - 7	26222.90	Date	!
ocati				P20-2	16		Level: Dimensions	3.4	07/04/20 Scale	
							(m): Depth	5	1:25 Logge	
Client							3.80		ĒĀ	
Water Strike		Type	Situ Testing Results	Depth (m)	Level (m)	Legend	Stratu	m Description		
•	1.50	D		3.80		Alle,	branches branches	of pit at 3.80 m	EAT with	2 — 3 — 5 — 5 — 5 — 5 — 5 — 5 — 5 — 5 — 5
Rema	rks: Peat sa	mple at	1.5m	ı	1	1	1			

Rate of water inflow: Medium Terminated due to instability

Stability: Instability - collapse of walls



	C C					Tri	al F	Pit I	ΩΩ		Trialpit I	
1	TIMONEY & COMPANY						aii	IL L	_09		Sheet 1	
Projec		ıhan Wi	 F	Projec			Co-ords:	614923.3	34 - 730812.	.56	Date	
Name	: Lomanag		1	P20-2	16		Level:			0.4	09/04/20	
_ocati	ion: Co. Offaly	y					Dimension (m):	1S		3.4	Scale 1:25	,
Client	: Bord na N	Mona					Depth 4.80		1.6		Logge EA	d
E 0	Sample	s and I	n Situ Testing	Depth	Level						LA	
Water Strike	Depth	Туре	Results	(m)	(m)	Legend			Stratum Des			
N S	2.00	D				Alle Alle Alle Alle Alle Alle Alle Alle		nt brown da	amp fibrous m	noss PEAT with	branches	2
	4.70	В		4.60 4.80		sile alle alle alle alle alle alle alle a	Firm gre	ey slightly s rounded 	sandy gravelly	y CLAY. Gravel i	s coarse	5
	Peat san											

Peat sample at 2m Bulk bag sample at 4.7m Rate of water inflow: slow Terminated due to end of reach of bucket



,	EHILY					Tri		oit No
Project Name		ghan WF		Project P20-2	t No.		Sheet	ate
Locati	on: Co. Offa	ly						25
Client:					I		Deptn ← Log	ged A
Water Strike	Sample Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description	
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	4.00	В		3.80		e, able, abl	SA S	4

Peat sample at 1.5m
Bulk bag sample at 4m
Rate of water inflow: Slow
Terminated due to end of reach of bucket



				$\overline{}$	-			Trialpit I	No
F	FEHILY TIMONEY					Tri	ial Pit Log	TP2	4
	COMPANY							Sheet 1	
Projec Name		jhan W	/F	Projec			Co-ords: 614967.02 - 731105.72	Date	
	•			P20-2	16		Level: Dimensions 3.4	08/04/20 Scale	
.ocati	on: Co. Offaly	y					(m):	1:25	
Client:	: Bord na N	Mona .					Depth $\frac{\omega}{\leftarrow}$	Logge	
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Water Strike	Depth	Type	In Situ Testing Results	Depth (m)	Level (m)	Legend	d Stratum Description		
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Rema	Rate of		at 3m inflow: Slow ie to instability					FEH	

Stability:

Instability - collapse of walls

FEHILY TIMONEY & COMPANY

									Trialpit N	No
	FEHILY					Tri	al Pit Log		TP2	
	COMPANY						0 1 04400040 704404		Sheet 1 d	
Projec Name		ghan W	F	Project P20-2			Co-ords: 614928.48 - 731181.63 Level:		Date 08/04/20	
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Client:	Bord na	Mona					Depth 4.80		Logged EA	d
er (e	Sample	s and I	n Situ Testing	Depth	Level	Lagana	Stratum Descri	ntion		
Water Strike	Depth	Туре	Results	(m)	(m)	Legend	Stratum Descri	ption		
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Rate of water inflow: Medium
Terminated due to end of reach of bucket



									Trialpit	No
	FEHILY					Tri	al Pit Log		TP2	
	COMPANY			<u> </u>					Sheet 1	
Projec Name		ghan W	F	Project P20-2			Co-ords: 614987.27 - 731195.42		Date 08/04/20	
				F20-2	10		Level: Dimensions 3.4	-	Scale	
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Client	Bord na l	Mona					Depth 4.60		Logge	d
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Rate of water inflow: Slow Terminated due to end of reach of bucket



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	FEHILY					Tri	al Pit Log	TP27	,
8.	COMPANY						_	Sheet 1 of	1
Projec Name:		ghan W	F	Projec			Co-ords: 615048.66 - 731209.52	Date	
ivame.	•			P20-2	16		Level: Dimensions 3.4	08/04/202	.1
Location	on: Co. Offa	ly					(m):	Scale 1:25	
Client:	Bord na	Mona					Depth $\stackrel{\Theta}{\leftarrow}$	Logged	
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Water Strike		1 1	n Situ Testing	Depth	Level	Legend	Stratum Description		
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						s site site site site s	u <mark>(</mark>		=
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						د غاند غاند غاند غاند ه			_
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				3.80		2016 2016 2		lb	_
	3.90	В				×	Soft grey silty slightly gravelly CLAY. Gravel is so rounded and coarse	ub-	=
				4.00		×	End of pit at 4.00 m		4 _
									=
									=
									_
									_
									-
									=
									_
									_
									5 —
Remai	Bulk b	sample at pag at 3.9 nated due	t 1m ∂m e to end of reach of buck	et				FEHIL	Y

Stability:

Stable

				\Box						Trialpit N	10
	FEHILY TIMONEY					Tri	ial Pit	Log		TP28	
	& COMPANY			_						Sheet 1 c	of 1
Projec Name		ghan W	F	Project P20-2			Co-ords: 61507 Level:	79.44 - 731130.80		Date 08/04/20	121
				F 20-2	10		Dimensions	3.4		Scale	
_ocati	ion: Co. Offal	У					(m):		\neg \bot	1:25	
Client	t: Bord na I	Mona					Depth 4.50	9.		Logged EA	Ł
<u>-</u> ۵	Sample	es and l	n Situ Testing	Danth	Laval	\Box	7.50			EA	
Vate ≀trike	Denth					Legend	I	Stratum Description	1		
Water Strike	Sample Depth	Type D	Results	Depth (m)	Level (m)	Silke Silke	Soft light brown	Stratum Description n damp fibrous moss PE			1 2 3
	4.40	В		4.20 4.50		te alle alle alle alle alle alle alle al	Firm grey silty s	slightly sandy gravelly Cl o-angular End of pit at 4.50 m	LAY. Gravel	is	4
				ļ							5 —
Rema	rks Peats	sample at	t 2m			*	-				

Bulk bag sample at 4.4m
Terminated due to end of reach of bucket





DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX F

Infrastructure Ground Investigation, IDL (2022)

			_	n Wind Fa	rm					TRIALPIT: TP-T01		
LOCATION: Co Offaly CLIENT: Bord na Mona ENGINEER: FTCO Ground level: m O.D. GROUNDWATER Sheet 1 of 1 Rig: Hitachi 12T Tracked Rev: DRAFT DATE: 23.3.22												
1				1						_		
Grou	ınd level: n	1 O.D.										
GR	OUNDWA er strikes: dry	ATE	R e to after:			PIT 1	DIREC DIMEN GED I	NSION	: 090-270	Shoring/Support: N/A Stability: Pit becoming unstable with 2.20 depth.		
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION		
-0						<u>// //</u>			Firm brown fibrous PEAT. H2 B3 R2 W1 TV2 TH2.			
1 2 3			3 1 (2)	4.20-4.60				4.20	1.90m: W3. Soft damp bluish grey CLAY.			
) ()			000000					4.60				
-5						END			TP terminated at 4.60m bgl. Unable to progress			
Ren	narks: T	P dry	on excav	ation. TP back	filled w	ith arisi	ngs.			Scale:		
A Y	,							in	rish drilling	1:25		
Y Mul	16							11	ısıı uı illilig	Fax		

1	OJECT: CATION			n Wind Fa	rm					TRIALPIT: TP-T02 Sheet 1 of 1
	ENT: B								Co-ordinates:	Rig: Hitachi 12T Tracked
ENC	GINEER	: FT	CO						E N	Rev: DRAFT
Grou	ind level: 1	m O.D.	R			<u> </u>			4.00	DATE: 23.3.22
1	er strikes: 3.00m	Ros	se to after: min	2.40m		PIT :	DIREC DIME GGED 1	NSION	1: 090-270 A	Shoring/Support: N/A Stability: Pit stable.
O Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION
0						71 7		0.09	Spongy black pseudo fibrous PEAT. H7 B2 F1 W0 TV2 TH2 A0.	
-						7 77 71 7	-		Firm brown fibrous PEAT. H2 B4 F1 W2 A2.	•
						71 7			HZ B4 F1 WZ AZ.	
						1, 11,				
-						7 7 7 7 7 1 7	-			
-						<u>// //</u>	-			
-1			≅B 1	1.00-1.60		71/71/				
			<i>1</i>	1.00-1.00		1, 11,				
			<i>5050503</i>			71 7	1			
- 1			<i>88888</i> 8			71 7 7 71				
			33 33 33 34 35 36 36 36 36 36 36 36 36 36 36 36 36 36	1.60-3.00		×0 ×		1.60	Soft damp greyish blue slightly gravelly SILT.	
			<i>5050503</i>			××°×			Soft damp greyish olde slightly gravelly SIL1.	
			<i>80000</i>			× ×				
-2			<i>368880</i>			× × ×	:		2.00m: firm.	
- 1			<i>5050505</i>			× a.			2.20m: large boulder or rock at eastern side of T	Р.
		1 ₹	<i>388888</i>			× × × ×				
			ososos			× _o ××				
			<i>9000</i>			××°×				
- 1			<i>388888</i>			^o×				
-3		<u> </u>	2000			× × END		3.00	3.00m: large boulder or rock at western side of	ГР.
L						Live			TP terminated at 3.00m bgl. Obstruction as larg	e boulder or rock.
-										
-										
4										
- 3										
<u> </u>										
5				<u>L</u>	L_		L			
Ren	narks: 1	ngress	of water	at 3.00m bgl f	rom nor	thern co	orner of	TP. TP b	ackfilled with arisings.	Scale:
onula a								ir	rish drilling	Ph.
4 🗰	6							11	ısıı uı ınıng	Fax

				n Wind Fa	rm					TRIALPIT: TP-T03
	CATION: IENT: Bo								Co-ordinates:	Sheet 1 of 1 Rig: Hitachi 12T Tracked
	GINEER:			•					E N	Rev: DRAFT
Grou	und level: n	n O.D.								DATE: 23.3.22
- 1			R e to after:			PIT 1	DIREC DIME GED	NSION	: 090-270 : 2.00 * 5.00m D B B C	Shoring/Support: N/A Stability: Pit stable.
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION
-0						<u> </u>		0.20	Firm black fibrous PEAT. H3.	
						711/71		0.20	Firm brown fibrous PEAT. H2 B3 R2 TV2 TH2.	
-						<u> </u>				
-						1, 11,				
						<u> </u>				
						<u> </u>				
-1			В1	1.00-1.50		1, 11,				
-			ososos			<u> </u>				
			00000			<u> </u>				
						<u> </u>				
						<u> </u>				
+						<u> </u>				
-2						<u> </u>				
						1, 11,				
						<u> </u>				
-						77 7			2.50 ··· W2	
-						<u>1, \1,</u>			2.50m: W3.	
-						<u> </u>				
7 14/22						<u> </u>				
SDT 7			≅ B 2	3.10-3.80		<u>'/ \'/</u>		3.10	Soft damp bluish grey slightly sandy CLAY.	
TDRL.			asasasa						g,g,,	
IRIS			sasasas							
22.GP			<i>30000</i>							
IIL 7 20			<i>80000</i>					3.80		
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22						END			TP terminated at 3.80m bgl. Maximum reach of	excavator.
31-4 S										
WF TF										
AHAN										
JANAG										
S LEN										
L RISE										
ջ « - 5										
≸ Ren	narks: T	P dry	on excav	ation. TP back	filled w	ith arisi	ngs.			Scale:
TRIAL P	Lan.							ir	rish drilling	1:25 Ph. Fax
F 15.55	Č.								··· ··· · · · · · · · · · · · · · · ·	rax

														T =	- FEG 1
PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly CLIENT: Bord na Mona Co-ordinates: TRIALPIT: TP-T04 Sheet 1 of 1 Rig: Hitachi 12T Tracket											P-T04				
											~ "				T. 1 1
		IENT: BO GINEER:			a						Co-ordi E 615,300		7,133.0	Rig: Hitachi 121	1 racked
┢		und level: n									_ 010,000) 	DATE: 28.3.22	
F	GR	OUNDW.	ATE	R			ріт	DIDE	ттом	J. AAA 1	20	3.3			N/A
	Wate 1st:	er strikes: 2.50m	Ros	e to after:			PIT :	DIME	NSION	V: 000-1 V: 2.40	su * 3.30m _D	A	_	Shoring/Support: 1 Stability: Pit unsta	ible.
	2nd: 3rd:						LOG	GED 1	BY:	MM	٦				
ſ															
	(E)		١.	les	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)				DESCRI	PTION	
	Depth (m)	Date	Water	Samples	epth	-situ	EG	leva O.I	epth						
_		<u> </u>	≩	Š	Ā	TF		国田	Q						
ŀ)						711/2			Grass a	nd moss over	PEAT.			
ŀ							<u> </u>								
L							1, 11,		0.40						
ſ							×××			Orangis content		gravelly SIL	Γ with mediun	n cobble content and med	lium boulder
╁							× ^ ×								
L							Č,×								
ſ							×°× ×								
ŀ	1) × ^ ×								
L															
							× ×								
ŀ							Č×	:							
L							×°× (×								
							> × × × ~ ×								
ŀ							×,×								
	,						^ × \$		2.00						
1	_									Wet blu	ish grey silty and medium	sandy round boulder cont	ed to subround ent. Cobbles a	ded fine to coarse GRAV re rounded to subrounded	EL with high cobble d. Boulders are
ŀ							P0 9x			rounded	l to subrounde	ed			
ļ			١.]							
			<u>‡</u>	B 1	2.50		END	-	2.50	TP tern	inated at 2.50	m bgl. Unab	le to progress	TP - sidewall collapse an	d ingress of water.
t												C	1 0	•	
ŀ															
77															
* - :	3														
S.GPJ IRISHURL.GD															
בופו															
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MAINAG															
۱ م ۱	,														
╙┗		narks: E	L Basal ir	l ngress of	water at 2.50n	l n bgl. TI	backfi	L lled with	arisings	L s.					Scale:
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Y H	St DRILL								ir	rish dı	illing				Ph.

			_	n Wind Fa	rm					TRIALPIT: TP-T05 Sheet 1 of 1
	CATION ENT: B								Co-ordinates:	Rig: Hitachi 12T Tracked
	GINEER:								E N	Rev: DRAFT
Grou	ind level: r	n O.D	D							DATE: 28.3.22
	er strikes: 3.00m		K se to after:			PIT 1	DIREC DIMEN GED 1	NSION	: 045-225 : 2.20 * 4.80m D	Shoring/Support: N/A Stability: Pit stable.
O Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION
-0			8 1	0.50-0.90				0.60	Firm black fibrous PEAT. H3.	
- -1			<i>asasasasa</i>			×° × × × × × × × × × × × × × × × × × ×		1.10	Firm brown fibrous PEAT. H2 B3 F2 R2 W1 A1. Soft damp bluish grey CLAY interbedded with to subrounded fine to medium.	layer of sandy gravelly silt. Gravel is rounded
		1 ₩	3 2 2000000000	2.00-2.30				3.00		
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22 BA C						END			TP terminated at 3.00m bgl. Obstruction as pos	
Ren	narks: I	ngress	of water	at 2.90m bgl.	TP back	filled w	ith arisin	ıgs.		Scale:
SIAL PI								ir	ish drilling	Ph. 25
E MAN	N. Carlotte							ır	ısıı uı iiiiig	Fax

	DJECT: CATION			n Wind Fa	rm					TRIALPIT: TP	P-T06
	ENT: B		•						Co-ordinates:	Rig: Hitachi 12T	Fracked
	SINEER								E N	Rev: DRAFT	
Grou	nd level: 1	n O.D.	D							DATE: 23.3.22	
1	r strikes: dry		K se to after:			PIT I	DIREC DIME GED	NSION	: 090-270 :: 2.00 * 4.20m D B	Shoring/Support: N Stability: Pit unstal 2.00 collapse.	J/A ble. Sidewall
O Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION	
-0 - - - - -1								140	Heather and grass over spongy black pseudo fil H7 B3 F0 R1 W0 A3.	orous PEAT.	
-2			в В 1	1.40-2.00		**************************************		1.40	Firm brown fibrous PEAT. H3 B2 F2 R2 W2 TV2 TH2 A2.		
APRIL 7 2022.GPJ IRISHDRI.GDT 7/4/22			B 2	3.50-4.00		× × × × × × × × × × × × × × × × × × ×		3.30	2.90m: W3. Calcareous SILT/MARL. Soft bluish grey CLAY.		
IRAL PIT VANE & WL RISES LEMANAGAHAN WITTPS FILE 1 APRIL 7 2022.GPJ IRISHDRI.GDJ 7/4/22 B M C C C C C C C C C C C C C C C C C C						END		4.00	TP terminated at 4.00m bgl. Unable to progress	TP - sidewall collapse.	
Rem	arks:	<u>Γ</u> P dry	on excav	 ation. TP back	filled w	l ith arisii	ngs.	<u> </u>			Scale:
											1:25
RA MINING								ir	ish drilling		Ph. Fax

	OJECT: CATION			n Wind Fa	rm					TRIALPIT: TP-T07 Sheet 1 of 1
	ENT: B		•						Co-ordinates:	Rig: Hitachi 12T Tracked
	GINEER:			•					E N	Rev: DRAFT
Grou	ınd level: n	n O.D.								DATE: 24.3.22
	OUNDW er strikes: 3.60m		R se to after:			PIT 1	DIREC DIMEN GED 1	NSION	: 090-270 : 2.00 * 4.20m D B	Shoring/Support: N/A Stability: Pit stable.
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION
0						<u> </u>		0.20	Firm black fibrous PEAT. H3 B2 F1 W0 TV2 TH2.	
- - -1 - - - - - -			1 1 1	0.20-1.00				0.20	Firm orangish brown fibrous PEAT. H2 B4 F1 W2 A2.	
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22		<u>+</u>	B 2	3.00-3.50		END		3.60	Soft bluish grey CLAY. Subrounded to rounded siltstone BOULDERS. TP terminated at 4.00m bgl. Obstruction as pro	bable rock or large boulders.
Ren	arks: I	ngress	of water	at 3.60m bgl.	TP back	filled w	ith arisin	ıgs.		Scale:
A P								•	iah duilling	1:25
E MANAGEMENT	5							ir	ish drilling	Fax

				n Wind Fa	rm					TRIALPIT: TP-T07A
	CATION: IENT: Bo		•						Co-ordinates:	Sheet 1 of 1 Rig: Hitachi 12T Tracked
	GINEER:			а					E N	Rev: DRAFT
Grou	und level: n	n O.D.							1	DATE: 24.3.22
			R e to after:			PIT 1	DIREC DIME GED 1	NSION	: 090-270 :: 2.00 * 4.20m D B B C	Shoring/Support: N/A Stability: Pit stable.
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION
-0						<u>/1 // //</u>			Firm black fibrous PEAT.	
L						1, 11,			H3.	
						71/2 V				
ħ l						77. 71. 77. 71.		0.50		
-						<u> </u>			Firm blackish brown fibrous PEAT. H3 B3 R2 W1 TV2 TH2.	
						71/7				
						1, 11,				
-1			≅ B 1	1.00-1.50		<u> </u>				
-			<i>30000</i>			<u> </u>				
			260505			1, 11,				
			3000			71/2			1.50 177	
- 1						<u> </u>			1.50m: W3.	
						1, 11,				
						<u> </u>		1.90	Soft damp slightly sandy gravelly CLAY. Grave	l is rounded to subrounded fine to coarse of
-2			₩B 2	2.00-2.60					siltstone.	
- 1			88888			<u></u>		2.20	Stiff bluish grev sandy gravelly CLAY with med	lium cobble content. Gravel is rounded to
			sasasas			<u> </u>			Stiff bluish grey sandy gravelly CLAY with med subrounded fine to coarse of siltstone. Cobbles a	are rounded to subrounded of siltstone.
			<i>388888</i>			8		2.60		
 			8			END		2.60	TP terminated at 2.60m bgl. Unable to progress	TP.
-										
14/22										
7 TOS										
DRL.G										
ENST -										
.GPJ										
7 2022										
- PRIL										
4 - -										
PS FI										
- WF										
SAHA)										
JANAC										
S LEN										
RISE(
≱ ĕ - 5										
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22	narks: T	P dry	on excav	I ration. TP back	filled wi	I ith arisi	ngs.	ļ		Scale:
F										1:25
TRIA PART	Car.							ir	rish drilling	Ph. Fax

	DJECT:		_	n Wind Fa	rm					TRIALPIT: TP-T08 Sheet 1 of 1
CLI	ENT: B	ord n	a Mon						Co-ordinates: E N	Rig: Hitachi 12T Tracked Rev: DRAFT
Grou	SINEER: nd level: r	n O.D.							F 14	DATE: 24.3.22
	OUNDW r strikes: 2.80m		R e to after:			PIT 1	DIREC DIME GED 1	NSION	1: 270-090 1: 2.00 * 4.80m D B	Shoring/Support: N/A T Stability: Pit unstable. Sidewall 2.00 collapse from 1.70m to 3.70m bgl.
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCR	RIPTION
0						<u> </u>		0.20	Firm black fibrous PEAT. H2 B3 F1 R3 W0 A0.	
						77 7 7 77 7 77		0.20	Firm brown fibrous PEAT. H3 B2 F1 R1 TV1 TH1 A2.	
						<u> </u>				
-1			3 1	1.00-1.50		<u> </u>				
			<i>sasasas</i>			<u> </u>		1.70	1.50m: H2.	
- -2 -			B 2	1.70-2.00		**************************************		1.70	Soft damp bluish grey slightly sandy gravelly Gravel is rounded to subrounded fine to coars subrounded.	clayey SILT with medium cobble content. e of siltstone. Cobbles are rounded to
		<u></u>				(2) × (3) × (4) ×		2.70	Wet greyish blue silty sandy rounded to suban	ngular fine to coarse GRAVEL with high
1 INSHIDEL.GOT 114/22		÷	8 3 88888888888888888888888888888888888	3.00-3.40					cobble content. Sand is coarse. Cobbles are ro	unded to subangular of siltstone.
- 2022.GF						Ø. = 7 Ø. ≥ 7 Ø. > 4		3.70		
I KAL PI VANE & WL KIGES LEMANASARAN WF 175 FILE I AFRIL 7 202.557 I KIGHDALIA.						END			TP terminated at 3.70m bgl. Unable to progres	ss TP due to ingress of water.
8 -5				1000						To -
S Rem	narks: I	ngress	of water	at 2.80m bgl.	TP back	tilled w	nth arisir	ngs.		Scale: 1:25
Y Jan Daulya							_	ir	rish drilling	Ph. Fax

	PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly TRIALPIT: TP-T09 Sheet 1 of 1													
	CLIENT: Bord na Mona Co-ordinates: Rig: Hitachi 12T Tra													
- 1	GINEER								E N	Rev: DRAFT				
Grou	und level: 1	n O.D							·	DATE: 24.3.22				
			R se to after:			PIT 1	DIREC DIMEN GED 1	NSION	: 000-180 : 2.00 * 4.20m D B	Shoring/Support: 1 Stability: Pit unsta 2.00 collapse.	N/A ible. Sidewall			
Oppth (m)	Date Water Samples Samples LEGEND Depth (m) Depth (m) Depth (m) Depth (m) Depth (m)													
-0 -						77 77 77 77 77 77 77 77		0.50	Firm black fibrous PEAT. H3.	eavelly silty CLAY with hi	gh cobble content			
- - -1			ज्ञB 1	1.10-1.70				1.10	Soft damp bluish grey slightly sandy slightly grand high boulder content. Cobbles are rounded rounded to subrounded of siltstone.					
			Basasasasasasasasasasasasasasasasasasas					1.70	Wet bluish grey gravelly silty medium to coarse fine to coarse of siltstone. TP terminated at 1.70m bgl. Unable to progress					
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22 A C C C C C C C C C C C C C C C C C C	narks: I	Assal i	naress of	water at 1.70r	n hơi Ti) hackfi	lled with	arising			Scale:			
> H	1441 NJ. 1	1	535 OI		11						1:25			
TRIA	G.							ir	ish drilling		Ph. Fax			

CLIENT: Bord na Mona ENCINEER: FTCO Ground level: m O.D. GROUNDWATER Water strikes: 3.70m 3rd: PIT DIRECTION: 000-180 PIT DIMENSION: 2.00 * 4.60m D D DATE: 2.422 Shoring-Support: N/A Stability: Pit stable. Stability: Pit stable. PIT DIMENSION: 2.00 * 4.60m D D DESCRIPTION DESCRIPTION DESCRIPTION DESCRIPTION 1 2.00 DESCRIPTION 1 1 1.00-1.50 D DESCRIPTION D					n Wind Fa	rm			_		TRIALPIT: TP-T10				
E N Rev: DRAFT				•						Co-ordinates:	Sheet 1 of 1 Rig: Hitachi 12T Tracked				
DATE: 24.3.22 Shoring Support: N/A Stability: Pit stable. Shor											_				
National Substitute Substit	Grou	und level: n	n O.D.							•	DATE: 24.3.22				
1	Wate 1st: 2nd:	er strikes: 3.70m					PIT 1	DIME	NSION	: 000-180 A : 2.00 * 4.60m D	2.00				
1	Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	LEGEND LEGEND Depth (m) Depth (m)							
1.00-1.50	-0						1, 11,		0.30	Firm black fibrous PEAT. H3 B3 F1 R3 W0 A0.					
1.00-1.50	-						7 717 717 7		0.30	Firm brown fibrous PEAT. H3 B2 F1 R1 TV1 TH1 A2.					
1.80m: blackish brown W3. 2.30-3.00 3.4. 3.4. 3.4. 3.4. 3.4. 3.4. 3.4. 3.4	-						<u> </u>								
1.80m: blackish brown W3. 1.80m: blackish brown W3. 2.30-3.00 2.30 3.50ft greyish blue organic SILT.	-1			В 1 <i>Видения</i>	1.00-1.50		<u> </u>								
1.80m: blackish brown W3. 2.30-3.00 2.30-3.00 2.30 2.30 2.30 3.00 3.	$\left \cdot \right $			<i>1000000000</i>			<u> </u>								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							<u> </u>			1.80m: blackish brown W3.					
Soft greyish blue organic SILT. Soft greyish blue organic SILT. Soft	-2						<u> </u>								
The state of the s	1			assessassassassassassassassassassassassa	2.30-3.00		× × × × × × × × × × × × × × × × × × ×		2.30	Soft greyish blue organic SILT.					
Wet greysh blue gravelly silty coarse SAND with medium cobble content and medium boulder content. Gravel is fine to medium. 3.70 TP terminated at 3.70m bgl. Unable to progress TP due to ingress of water.	HDRL.GDT 7/4			<u>©</u> 3	3 30 3 70		× × ½ × × × × ×		3.30						
TP terminated at 3.70m bgl. Unable to progress TP due to ingress of water. TP terminated at 3.70m bgl. Unable to progress TP due to ingress of water.	2022.GPJ IRIS		1	2000/08/2000	3.30-3.70)		3 70		th medium cobble content and medium				
Note the second state of water at 3.70m hol. TP backfilled with arisings	TPS FILE 1 APRIL 7		=				ENĎ			TP terminated at 3.70m bgl. Unable to progress	TP due to ingress of water.				
Demorks: Basal ingress of water at 3.70m hol. TP backfilled with arisings	ANAGAHAN WF														
Romarks: Basal incress of water at 3.70m hol. TP backfilled with arisings	L RISES LEMA														
TRamarks. Basal ingress of water at 3.70m hol. TP backfilled with arisings	≶ ∞ —5														
Scale	 Ren														
irish drilling Ph. Fax	TRIAL	And Co							ir	ish drilling	Ph.				

	PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly TRIALPIT: TP-T Sheet 1 of 1													
	LOCATION: Co Offaly CLIENT: Bord na Mona Co-ordinates: Rig: Hitachi 12T Tra													
	GINEER:								E N	Rev: DRAFT				
Grou	und level: n	n O.D	٠.							DATE: 24.3.22				
			R se to after:			PIT 1	DIREC DIMEN GED 1	NSION	: 135-315 : 2.00 * 4.20m D	Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 1.50m to 3.00m bgl.				
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Description depth (m) Description							
-0		₹						0.60	Spongy black pseudo fibrous PEAT. H4 B2 F0 R1 W2.					
- -1 -			<mark>жагагагагагагагагагагагагагагагагагагаг</mark>	1.00-1.30		7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		1.50	Firm brown fibrous PEAT. H2 and H3.					
2			30000000000000000000000000000000000000	1.50-2.00				3.00	Firm wet greyish blue gravelly sandy silty CLA content. Sand is medium. Gravel is rounded to s					
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22 A						END			TP terminated at 3.00m bgl. Unable to progress of water.	TP - obstruction as large boulder and ingress				
W Ren	narks: I	l ngress	of water	from peat at 0	.60m bg	l. TP ba	ckfilled	L with aris	ings.	Scale:				
AL DIT										1:25				
TRIA	**							ir	ish drilling	Ph. Fax				

	PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly TRIALPIT: TP-T1 Sheet 1 of 1													
	CLIENT: Bord na Mona Co-ordinates: Rig: Hitachi 12T Tra													
	SINEER:								E N	Rev: DRAFT				
Grou	nd level: r	n O.D.	D						: 225-045	DATE: 28.3.22				
	r strikes: 1.05m		ne to after:			PIT 1	DIREC DIME GED 1	Shoring/Support: N Stability: Pit unsta 2.50 collapse from g/l to	J/A ble. Sidewall 0.60m bgl.					
O Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION				
- - -1 - - - - - -		1	Taganananananananananananananananananana	1.20-1.50		* * * * * * * * * * * * * * * * * * *		1.20	Firm black fibrous PEAT. H3 B3 F1 R1. 0.40m: brown. Soft creamish grey calcareous SILT/MARL. Soft greyish blue organic CLAY.					
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22	narks: F	Basal ii	ngress of	water at 3.70n	n bgl. Ti	END	lled with	3.70	TP terminated at 3.70m bgl. Unable to progress	TP - sidewall collapse.	Scale:			
≸ Kem	iarks: 1	oasal 11	ngress of	water at 3./0n	n ogi. Ti	- Dackti	ned With	arisings	i.		Scale: 1:25			
TRIALE								ir	rish drilling		Ph. Fax			

	PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly TRIALPIT: TP-T1 Sheet 1 of 1													
	LOCATION: Co Offaly CLIENT: Bord na Mona Co-ordinates: Rig: Hitachi 12T Tra													
	IENT: BO GINEER:			1					E N	Rev: DRAFT				
	und level: n								I	DATE: 28.3.22				
GR	OUNDW er strikes: dry	ATE	R e to after:			PIT 1	DIREC DIMEN GED 1	NSION	: 090-270 : 2.20 * 4.00m D	Shoring/Support: N/A Stability: Pit stable.				
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION				
-0						77 77 77 77		0.20	Spongy black pseudo fibrous PEAT. H4.					
-								0.20	Firm blackish brown fibrous PEAT. H3.					
-1			≅ β 1	1.00-1.30		× ×		1.00	Soft creamish grey calcareous SILT/MARL.					
-			<u>esereseres.</u>			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			g -,					
-2			3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1.70-2.00		×		1.70	Soft bluish grey CLAY.					
PJ IRISHDRL.GDT 7/4/22								3.50						
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22						END			TP terminated at 3.50m bgl. Unable to progress	TP - excavator sinking into peat.				
₹Ren	narks: T	TP dry	on excav	ation. TP back	filled w	ith arisi	ngs.	-		Scale:				
IRIAL PI	· Maria							ir	1:25 Ph. Fax					
	CE.								ish drilling	1 41/				

	PROJECT: Lemanaghan Wind Farm TRIALPIT: TP-T													
	LOCATION: Co Offaly CLIENT: Bord na Mona Co-ordinates: Rig: Hitachi 12T Track													
	IENT: BO GINEER:			a					Co-ordinates: E N	Rig: Hitachi 12T Tracked Rev: DRAFT				
	und level: n									DATE: 28.3.22				
GR	OUNDW er strikes: 2.00m	ATE	R se to after:			PIT :	PIT DIRECTION: 090-270 PIT DIMENSION: 2.00 * 4.80m LOGGED BY: MM A.80 A.80 B. 2.00 Shoring/Support: Stability: Pit stall							
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRI	PTION				
-0						71 1		0.06	Spongy black pseudo fibrous PEAT.					
	1.80 Ly WL WL WL WL WL WL WL WL WL WL WL WL WL													
IRAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022 GPJ IRISHDRLGD 7/4/22 CPJ IRISHDR 7/4/22 CPJ IRISHDR 7	narks: I	ngress	of water	at 2.00m bgl.	TP back	filled w	ith arisin	gs.		Scale:				
≽ Ken	пагкѕ: Т	ngress	oi water	ai 2.00111 Dgl.	1 F Dack	ниеа W	iui arisin	ıgs.						
irish drilling Ph. Fax										Ph.				
	8							11	ion willing	Fax				

	PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly TRIALPIT: TP-T13 Sheet 1 of 1												
	ENT: Bo		•						Co-ordinates:	Rig: Hitachi 12T	Tracked		
ENG	GINEER:	FT	CO						E N	Rev: DRAFT			
	nd level: n								420	DATE: 28.3.22			
	r strikes: 2.00m		se to after:			PIT 1	DIREC DIMEN GED I	NSION	: 045-225 : 2.20 * 4.30m D	Shoring/Support: N Stability: Pit stable 2.20	N/A e.		
Oepth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests								
						<u> </u>		0.20	Firm black fibrous PEAT. H3.				
- - -			1 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900 - 1900	0.20-1.00		77 7 7 77 7 7 77 7 7 77 7 7 77 7 7 77 7			Spongy brown pseudo fibrous PEAT. H4 B3 F1 R1 W1.				
-		<u>\\</u>	B 2	1.30-2.00		END		2.00	Damp bluish grey sandy silty rounded to subrot cobble content and high boulder content. Sand subrounded of siltstone. Boulders are rounded t	unded fine to coarse GRA' is medium. Cobbles are ro to subrounded of siltstone.	VEL with high ounded to		
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 74/22 B													
Rem	arks: I	ngress	of water	at 2.00m bgl.	TP back	filled w	l ith arisin	ıgs.			Scale:		
TRIAL PI								ir	ish drilling		1:25 Ph. Fax		

	PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly TRIALPIT: TP-T1 Sheet 1 of 1													
	CLIENT: Bord na Mona Co-ordinates: Rig: Hitachi 12T Tra													
1	GINEER								E N	Rev: DRAFT				
Gro	und level: 1	n O.D	D							DATE: 28.3.22				
	ter strikes: 2.70m :		K se to after:			PIT 1	DIREC DIMEN GED 1	NSION		Shoring/Support: N/A Stability: Pit stable.				
Oppth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	IPTION					
-0 - - - -1			8 1	0.20-1.30		7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		1.30	Spongy black pseudo fibrous PEAT. H4. 1.00m: W2.					
			asoasoasoasoas	1.30-1.80		900		1.80	Boulder or possible rock on SW of TP. Soft bluish grey silty CLAY.					
-2 -		<u></u>				- X - X - X - X - X - X - X - X - X - X		2.70						
TRIAL PIT VANE & WL RISES LEMANAGAHAN WF TPS FILE 1 APRIL 7 2022.GPJ IRISHDRL.GDT 7/4/22 LA CALL COLOR COLO		±				END			TP terminated at 2.70m bgl. Obstruction as both	alders.				
Rer	narks: 1	ngress	of water	at 2.70m bgl.	TP back	filled w	ith arisin	ıgs.		Scale:				
AL PIT	1:25													
TR M	Wag.							ir	rish drilling	Ph. Fax				

1	ROJECT: Lemanaghan Wind Farm OCATION: Co Offaly TRIALPIT: TP-T14A Sheet 1 of 1														
CLI	ENT: BO	ord n	a Mona							Co-ordinates: E N		Rig: Hitachi 12T Rev: DRAFT	Tracked		
Grou	nd level: n	n O.D.								4.40		DATE: 28.3.22			
1	OUNDW. r strikes: 1.90m		K se to after:			PIT I PIT I LOG	DIREC DIMEN GED 1	Shoring/Support: Stability: Pit stab	N/A le.						
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)		DESCRIPTION					
-0 - - -			В 1 В 1	0.20-0.60				0.80	Firm b H3.	lack fibrous PEAT.					
-1 - -			B 2	0.80-1.20		* * * * * * * * * * * * * * * * * * *		1.70		eyish blue silty CLAY with m	edium boul	der content. Boulders ar	e of siltstone.		
-		<u>↓</u>				× _o × × × × ×		1.90		ravelly SILT.					
-2 - - -3 - - - - - - - - - - - - - -															
Ren	arks: E	l Basal ii	ngress of	water at 1.90n	l n bgl. TI	l P backfi	lled with	arisings					Scale:		
oming.	irish drilling Ph. Fax														

PROJECT: Lemanaghan Wind Farm LOCATION: Co Offaly Sheet 1 of 1													
LOCATION: Co Offaly CLIENT: Bord na Mona Co-ordinates: Rig: Hitachi 12T Trac													
	IENT: BO GINEER:			a						Rev: DRAFT			
Grou	und level: n	n O.D.								DATE: 23.3.22			
GR	OUNDW er strikes: dry	ATE	R e to after:			PIT 1	DIREC DIME GED 1	NSION	: 225-045	Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse.			
Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	DESCRIPTION ODD:						
-0						<u> </u>		0.20	Firm black fibrous PEAT. H3.				
						71 1		0.20	Firm brown fibrous PEAT. H3 B2 F1 R1 W3 TV1 TH1 A1.				
-						<u> </u>			III BETTRI WOTTH III III.				
ļ l						<u>', \',</u>							
						<u> </u>							
						<u> </u>							
-1			₩B 1	1.00-1.80		1, 11,							
-			<i>5050505</i>			<u> </u>							
			<i>80000</i>			71 7 7 7							
			ososa			1, 11,							
 			sasasas			<u> </u>							
-			200			<u> </u>							
-2						1, <u>\1,</u>							
						<u> </u>							
						71/7							
- 1						<u> </u>							
-						1, 11,							
L						71/7							
						<u> </u>							
3			≅ β 2	3.10-3.80		1, 11,			2.10 W2				
<u> </u>			20000	3.10-3.80		<u> </u>			3.10m: W2.				
_			Sasasas			77 7							
5			3030303			1, 11,							
7707 .			<i>9000000</i>			<u> </u>							
-			8			71/2							
4						<u>1, 11,</u>							
						<u> </u>							
						<u> </u>		4.40					
-						END		4.40	TP terminated at 4.40m bgl. Unable to progress T	P - sidewall collapse.			
-													
5-5													
3 - 4 - 5 Ren	narks: T	P dry	on excav	ation. TP back	l filled w	l ith arisi	ngs.			Scale:			
- i								•	• 1 1 111•	1:25			
Ž MA	N.							ir	ish drilling	Fax			



DESIGNING AND DELIVERING A SUSTAINABLE FUTURE

APPENDIX G

Infrastructure Ground Investigation, IDL (2024)



IRISH DRILLING LIMITED



LOUGHREA, CO. GALWAY, IRELAND

CONTRACT DRILLING SITE INVESTIGATION

Phone: (091) 841 274 Fax: (091) 847 687

email: <u>info@irishdrilling.ie</u>

LEMANAGHAN WIND FARM PHASE 3

SITE INVESTIGATION CONTRACT FACTUAL REPORT

MKO, Tuam Road, Galway, H91 VW84. Fehily Timoney & Company, Consulting Engineers, Unit 6, Bagenalstown Industrial Park, Royal Oak Road, Bagenalstown, Co. Carlow, R21 XW81.

	Prepared by	Approved by	Rev. Issue Date:	Revision No.
	Ronan Killeen	Declan Joyce	9 th February 2024	23 _OY_108/02
Signature				

Directors: DECLAN JOYCE, B.E., M. Eng. Sc., C.Eng., M.LE.L., RONAN KILLEEN, B.E., C.Eng., M.I.E.I., (Secretary)

Operations Manager: BRENDAN KENNEDY Registered Office: OLD GALWAY ROAD, LOUGHREA, CO. GALWAY Registered No. 379801

FOREWORD

The borehole and trial pit records have been compiled from an examination of the samples by a Geotechnical Engineer and from the Drillers' descriptions.

The report presents an opinion on the configuration of the strata within the site based on the borehole and trial pit results. The assumptions, though reasonable, are given for guidance only and no liability can be accepted for changes in conditions not revealed by the boreholes and trial pits.

The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Site Investigations with precedence given to IS EN 1997-2 where applicable.



Contents:

1.0 Introduction

2.0 The Site & Geology

3.0 Fieldwork

4.0 Laboratory Testing

Book 1 of 1

Appendix 1 Borehole Records (Rotary Core)

Appendix 2 Trial Pit Records

Appendix 2A Groundwater Readings

Appendix 3 Laboratory Test Results

Appendix 4 Photographs (Rotary Core)

Appendix 5 Photographs (Trial Pits)

Appendix 6 Site Plan

Appendix 7 AGS Data



1.0 Introduction.

Irish Drilling Ltd. (IDL) was instructed by Fehiliy Timoney & Partners, Consulting Engineers, on behalf of MKO, to carry out a site investigation at the site of the proposed Lemanaghan Wind Farm Project.

This site investigation was carried out to provide detailed factual geotechnical information of the underlying ground conditions at the location of the proposed works.

The fieldwork commenced on October 24th 2023 and was completed on November 24th 2023.

2.0 Site & Geology

The site is located near Ferbane, County Offaly.

The site is agricultural in nature and the fieldwork was carried out predominantly on peatlands owned by Bord na Mona.

Weather conditions in general were quite variable with the majority of the fieldwork carried out over a typical winter period in Ireland.

Geological Survey maps of the area indicate that the site is underlain by Siltstone, Sandstone and Limestone Rock Formations.

A Site Plan, prepared by the client's representatives to show approximate fieldwork locations, is included with this report.

3.0 Fieldwork.

The following plant was mobilised to site to carry out fieldwork operations:

1nr. LD400 Tracked Rotary Core Drilling Rig. 1nr Hitachi 130 Wide-Tracked Excavator.

Fieldwork carried out to date has included the following:

Ten rotary core boreholes were carried out to establish overburden conditions and rockhead and to establish the nature and integrity of the underlying rock.

The rotary core boreholes were carried out as 'stand-alone' rotary core boreholes using wireline drilling techniques to recover soil and rock core samples.

HQ size drill strings ((64mm core diameter, 96mm hole diameter) were used to recover soil and/or rock core samples.

A water based flush system was used as the drilling medium while a biodegradable polymer gel was also used where necessary to aid the drilling and soil / rock recovery process.

The samples were stored in wooden boxes and returned to the laboratory where there were logged and photographed by a Geotechnical Engineer and presented for testing.

In-situ testing consisting of Standard Penetration Tests were carried out in the overburden in a number of boreholes at regular intervals.



A 50mm diameter standpipe was installed in the following boreholes and as instructed by the Client's Engineer, to allow for monitoring of groundwater levels over a prolonged period of time: BH BP01, BH SS01, BH SS03, BH T01, BH T03, BH T06, BH T12 and BH T15.

The rotary core boreholes were carried out to depths ranging from 8.50m to 19.20m below ground level.

Detailed engineering logs for the rotary core boreholes completed are included with this report in Appendix 1.

Groundwater readings were recorded on February 8th 2024 using a manual hand-held dip meter and the records of same are included as Appendix 2A.

Sixteen trial pits were excavated on site using a tracked excavator.

The pits were logged and photographed by an Engineer with observations made on ground conditions, pit stability, water ingress and services encountered.

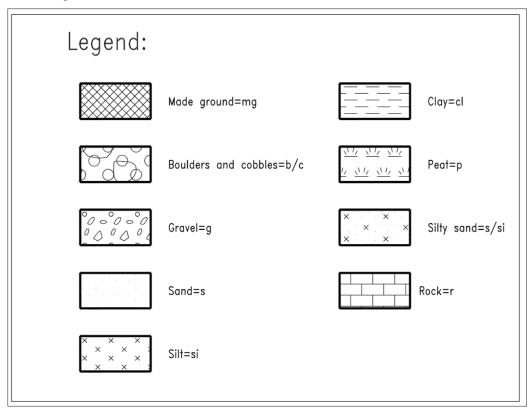
Small and bulk disturbed soil samples were recovered at each change in strata and returned to the laboratory and presented for testing.

In-Situ tests consisting of shear vane tests were also carried out where possible in cohesive soils and a summary of the shear vane test results are included on the trial pit logs.

The pits were excavated to depths ranging from 1.70m to 4.90m below ground level.

Detailed engineering logs for the trial pits completed are included with this report in Appendix 2.

The following Key Legend Table details the symbology used on the engineering logs to describe ground conditions encountered:





Ground conditions encountered during the completion of the fieldwork were typical and as expected for this region and predominantly consisted of Peat overlying Glacial Tills.

The Glacial Tills in general consisted of bluish grey slightly sandy silt/clay and/or silty clayey sands and gravels and/or slightly gravelly sandy silt/clay with cobbles and boulders.

Soft brown peat was also encountered in many of the trial pits at depths ranging from 0.20m to 4.90m below ground level.

Intact bedrock was encountered in the rotary core boreholes at depths varying from 1.70m to 15.70m below ground level.

Weathered bedrock was also encountered in a number of the boreholes at shallower depths. Bedrock in general is described as strong locally very strong thinly bedded fine to coarse-grained limestone.

For detailed descriptions of the ground conditions encountered please refer to the engineering logs included as Appendix 1 and Appendix 2 of this report.

The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Site Investigations with precedence given to IS EN 1997-2 where applicable.

The borehole and trial pit locations were set out on site using a Trimble CU Bluetooth GPS Surveying Unit and the co-ordinates are included on the logs presented in the appendices.

All fieldwork co-ordinates are reported to Irish Transverse Mercator (ITM) with Reduced Levels recorded relative to Malin Head Datum and with an accuracy level of + or - 0.10m.

4.0 Laboratory Testing

Representative samples recovered from the boreholes and trial pits were scheduled for testing in the laboratory.

The test schedules were prepared by the Client's Engineer and included some or all of the following tests on disturbed soil samples:

- Moisture Content.
- * Atterberg Limits.
- * Particle Size Distribution.
- * Sedimentation.
- * Organic Content.
- * Chemical (BRE SD1 Suite B).
- Chemical (Chloride Content).
- * Compaction.

The test schedules included some or all of the following tests on rock core samples:

- * Point Load.
- * UCS.
- Natural Water Content.
- * Slake Durability.
- Water Absorption.
- * Magnesium Sulphate Soundness.
- * LA Abrasion.

The test schedules were carried out predominantly at the IDL Laboratory located at Loughrea, County Galway.



A number of specialist tests not available at the IDL laboratory were carried out by designated laboratories on a subcontract basis as follows:

Laboratory chemical tests were carried out by Alcontrol Laboratories, UK. Specialist rock tests (Magnesium Sulphate Soundness and LA Abrasion) Tests were carried out by Structural Soils Laboratories, UK.

Soil samples in general were recovered from the excavation of trial pits. Rock core samples were recovered from the completion of rotary core boreholes and the records of soil and rock core laboratory test results carried out on same are reported in Appendix 3.

The soil and rock descriptions as noted on the borehole and trial pit logs are in general visual descriptions as observed and logged by our Engineers and are described in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Site Investigations.

Soils descriptions (cohesive or otherwise) are also initially assessed based on the texture and 'feel' of the soil materials as witnessed by our Geotechnical Engineers and in accordance with IS EN 1997-2 and BS5930:2015+A1:2020.

Where laboratory classification tests have been carried out on soil or rock samples then these visual descriptions have been amended accordingly to take into account the results of these classification tests.

The records of all fieldwork, laboratory test results and photographs are included in the appendices of this Factual Report.

Ronan Killeen Chartered Engineer Irish Drilling Limited February 9th 2024



Appendix 01 Borehole Records (Rotary Core)



Project Lemanaghan	Wind Farm	Lo	cation	DRILLHOLE No
		C	o Offaly	BHBP1
Job No	Date 14-11-23	Ground Level (m OD)	Co-Ordinates ()	рпре і
2023OY108	14-11-23	54.16	E 615,975.0 N 728,983.4	
Engineer	•			Sheet 1 of 1
FTCO				Status FINAL

	I	FTCO								Status FINAL	
ĺ	RU	N DE	ΓAILS				S	STRATA			Instrument/
	Depth	TCR (SCR)	(SPT) Fracture	Red'cd	T 1	Depth (Thick-		DES	CRIPTION		kfill
	Date	RQD	Index	Level	Legend	ness)	Discontinuities	Detail	Mair	l	Inst Bac
	0.00						0.00 - 1.70 : overburden.		Open hole drilling. No r	recovery.	
	- -	-									
	- - -	-				(1.50)					
	1.50			52.66 52.46	°— °	1.50			Subangular fine and me	dium assorted grev	60
	- -	100 (71)	6			_	1.70 - 8.50 Discontinuities, m spaced, locally very closely at	nedium	limestone GRAVEL with clay.	th a little brown	
	2.50	31			H		spaced, dipping 8 to 10°, step with 0.5 to 1mm thick grey si	pped, rough,	Strong locally very strong	ng thinly bedded	
	2.50		6				2.10 - 2.25 Joint, subvertical	dip,	grey and dark grey spar and coarse grained LIM	ry bioclastic fine ESTONE.	
	- - 					-	stepped, rough, with 0.5 to 2r grey silt smear, open.	mm thick			
	- -	100 (97)				<u> </u>					
		95	5								
	4.10					-					
					Ш						
		100	4			-			4.60-4.70m: weak.		
	- -	(97) 95				(, 00)			4.70m: medium strong.		
	5.50					(6.80)					
	. 5.50		3								
	-	400									
	-	100 (97)				-					
		95	3			-					
9/2/24	7.10										
AGS 4_0_4.GDT_9/2/24	-										
0.4		100 (97)	3								
GS 4	- -	96			Ш						
	[4.11 8.50		1	45.66		8.50					
ا⊆											
23.GP	- -					<u> </u>					
7 20.	- -					-					
E DEC	- -					Ė					
C ALL FILE DEC 1 2023.GPJ	-	Dri	lling Progr	ess and	Wate	r Obser	vations	Rotary	Flush	CENIED AT	
징			inng i rogi		asing			Rotary	T TUBIL	GENERAL	

FILE DEC 1 2023 GPJ ID GINT AGS 4 0 4 GDT 9/2/24	7.10	100 (97) 96		3	45.66		8.50									
J.		Dril	lling	Progre			bservation				Rotary 1	Flush			GENERAL	
RC	Date	Tin	ne	Depth	Depth Cas	sing Dia	Core Dia mm	Wa Strike	ater Standing	From (m)	To (m)	Type	Return	(%)	REMARKS	
4 UK DH (SPTS) LEMANAGHAN RC	14/11/23	16.0	00	8.50	1.50	96				0	8.5	Water	100	50r BH on	nm standpipe instal terminated at 8.50 REs instruction.	lled. m bgl
IDL AGS4	All dimer met Scale	nsions i tres 1:62.5	in C	lient: MK	.0		Method Plant U	l/ CS-	-14					Driller DC	Logged By EAT	Γ



Project Lemanaghan V	Wind Farm	L	ocation		DRILLHOLE No	
			Co Offaly		BHSS	•4
Job No	Date 08-11-23	Ground Level (m OD)	Co-Ordinates ()		БПЭЗ)
2023OY108	08-11-23	56.61	E 614,879.4	N 730,982.5		
Engineer					Sheet 1 d	of 2
FTCO					Status FINAL	

RU	N DE	ΓΑΙΙ	S						STRA	ATA				int/
Depth	TCR	(5	SPT)	Red'cd		Depth					CRIPTI	ON		 um
Date	(SCR) RQD		icture idex	Level	Legend	(Thick- ness)	Discontinu	ities	Det				ain	nstr
0.00	RQD		iden			-		0 : overburde	n.		Open ho Drillers	le drilling. N Comment: P	lo recovery.	O S Instrument
						(3.00)								
3.00		3.00	(0)	53.61	<u> </u>	3.00					Very sof	t black amoi	phous PEAT.	
	4				\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \	- - - - - - - - - - - - - - - - - - -								
5.60	13	5.60	(0)		<u> </u>	()								
7.10	-	7.10	(5)	49.51	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	7.10					Loose gr clayey m	ey slightly s nedium GRA	andy peaty very VEL. Sand is fine.	
8.60	33	9.60	(50/235m	48.11	0 -7: 0	(1.40)					Subroun	ded to subar	gular fine to coarse	0
-	40 - -	8.60	(30/23311		% (X	- - - - -					assorted GRAVE gravelly is subrou	light grey ar L with some silt. Sand is unded to sub ed light grey	d dark grey limestone grey slightly sandy fine to coarse. Gravel angular fine to coarse and dark grey	
	Dri	ling	Progre				vations]	Rotary			GENERAI	
Date	Tir	ne	Depth		Casing D		Dia V m Strike	Vater Standing	From (m)	` ′		Return (%)	REMARK	
				3.00					0 3.4	3.4 14.6	Water Water	100	50mm standpipe ins BH terminated at 14 bgl on REs instruction	.60m
All dime me Scale	ensions intres 1:62.5	n Cl	ient: MK	.O			ethod/ CS ant Used	5-14	l I	I	<u> </u>	Dril DC	ler Logged By	AT



Project Lemanaghan V	Wind Farm	Lo	cation	DRILLHOLE No			
		(Co Offaly	BHSS1			
Job No	Date 08-11-23	Ground Level (m OD)	Co-Ordinates ()		рпээл		
2023OY108	08-11-23	56.61	E 614,879.4	N 730,982.5			
Engineer			•		Sheet	2 of 2	
FTCO					Status FIN	AL	

RU		TAILS						STRATA				ent
Depth	TCR	(SPT) Fracture	Red'cd	· 1	Depth			DE	SCRIPTI	ON		lun.
Date	(SCR) RQD	Index	Level	Legend	(1nick- ness)	Discontinui	ies	Detail		Mai	n	Instrument
10.10				80x0								0
11.60	93 (31) 25	12		*	11.20	spaced, loca 10 to 12°, st	lly closely spepped, rough	uities, medium baced, dipping , with 0.5 to	grey and	I dark grey biograined LIME	ong thinly bedded clastic fine and STONE with	
- - ·	100 (98)				- - ·		grey silt smea 5 weak fissil		rounded grained	fine and medichert nodules.	um gravel sized fine	000
13.10	84	8			_(3.40)	11.86 - 11.8 12.15 - 12.2 stepped, rougrey silt sme	6 weak fissil 0 Joint, dipp gh, with 0.5 ear, open.	e. ing 45°, to 1mm thick				00000
	100 (98) 91	6				12.60 - 12.6 grey.	0 medium str	rong silty dark				000
08.11 14.60	91	3	42.01		14.60	14.30 - 14.3	5 Joint, dipp	ing 45°, to 1mm thick				000
		T. D.						D				
		ling Progr					otor		ry Flush		GENERAL	,
Date	Tin		_	Casing 1 Di	a Core	m Strike	ater Standing	From (m) To	(m) Type	H H	REMARKS	
08/11/23	16.0	00 14.60]	50mm standpipe insta BH terminated at 14.0 ogl on REs instruction	60m



Project Lemanaghan V	Wind Farm		Location		DRILLHOLE No
			Co Offaly	BHSS2	
Job No	Date 24-11-23	Ground Level (m OD)) Co-Ordinates ()		БПЭЭZ
2023OY108	24-11-23	55.89	E 614,948.	7 N 731,048.7	
Engineer			•		Sheet 1 of 2
FTCO					Status FINAL

FICO							Status FINAL
RUN DETA	AILS				STRATA		7
Depth CSCR) RQD	(SPT) Fracture	Red'cd Level	. 1	Depth	DESC	CRIPTION	
Date RQD	Index	Level	Legend	ness)	Discontinuities Detail	Main	
0.00					0.00 - 9.80 : overburden.	Open hole drilling. No ru Drillers Comment: PEA'	ecovery. T.
				-(4.00)			
4.00	00 (0)		<u> </u>	4.00 (1.00) 5.00		Very soft black amorpho	ous PEAT.
53	60 (9)		× × × × × × × × × × × × × × × × × × ×	(1.50)		Firm dark blackish grey SILT. Sand is fine.	slightly sandy
7.10	10 (23)			6.50	medium dense.	Subrounded to subangul assorted light grey and d GRAVEL with cobbles. assorted light grey and d limestone.	ar fine to coarse lark grey limestone Cobbles are of lark grey
8.60	60 (25/10mm	n)		9.80	0.00 11.60N		
D :11:				01	9.80 - 11.60 Non-intact as possible	1	

INT AGS 4 0 4.GDT 9/2/24		53	7.10	(23)			.30)	dium der	nse.			assorted GRAVE	light grey EL with col light grey	and dark obles. Co	grey limestone bbles are of grey	
FILE DEC 1 2023.GPJ ID GINT AGS 4 0	8.60	47 (14)	8.60	(25/10mr	46.09		9.80	<u>0 - 11.60</u>	Non-intact	as possible						
ALL							bservatio		otor		Rotary	1	I =		GENERAL	
N R	Date	Tir	ne	Depth	Depth	Dia	mm	Strike	ater Standing	From (m)			Return (%	<u>(a)</u>	REMARKS	
4 UK DH (SPTS) LEMANAGHAN RC					4.00	96				0	11.6	Water	100	termi	packfilled. BH inated at 11.60m instruction.	bgl on
IDL AGS4	All dime met Scale	res	in Cl	lient: MK	0		Method Plant U		-14				D De	riller C	Logged By EA	Γ



Project Lemanaghan	Wind Farm		Location		DRILLHOLE No
Lemanagnan	wind raim		Co Offaly		BHSS2
Job No	Date 24-11-23	Ground Level (m OD	O) Co-Ordinates ()		рпээг
2023OY108	24-11-23	55.89	E 614,948.7	N 731,048.7	
Engineer		•	•		Sheet 2 of 2
FTCO					Status FINAL
DINDETAILS			CTD ATA		12

	rico								Status TINAL	
RU	N DE	ΓAILS					STRATA			Instrument/ Backfill
Depth	TCR (SCR)	(SPT) Fracture	Red'cd	, ,	Depth		DES	CRIPTION		kfill
Date	RQD	Index	Level	Legend	(Thick- ness)	Discontinuities	Detail	Ma		Inst Bac
10.10	100	NI NI	45.69 45.49 45.04		10.20 10.40 10.85	weathered rock.		Possible weathered roo Strong dark grey fine recovered as angular f sized clasts. (continue	grained limestone ine to coarse gravel d)	
24.1111.60	(28)	2 NI	44.29		(0.75)			Possible weathered ro Strong dark grey fine recovered as very stiff gravelly silt. Gravel is coarse of dark grey fir	grained limestone dark grey slightly angular fine to ne grained limestone.	
								Very strong thinly bed bioclastic fine and med LIMESTONE.	dium grained	
-					-			Possible weathered roo Strong dark grey fine recovered as stiff dark gravelly silt. Sand is fi is angular fine to coars grained limestone.	grained limestone grey slightly sandy ine to coarse. Gravel	
					- - - - - - -					
					-					
					-					
					- - - - -					
					-					
					-					
: - - -					- - - - - -					
! - - - - - - -					-					
<u> </u>	Dril	lling Progr	ess and	 Wate	r Obser	vations	Rotary	Flush	GENERAL	

FILE DEC 1 2023.GPJ ID GINT AGS 4 0 4.GDT 9/2/24															
ALL		Drilli	ng Progre				ons]	Rotary 1	Flush			GENERAL	
N RC	Date	Time	Depth	Depth Ca	sing Dia	Core Dia mm	Strike	ater Standing	From (m)	To (m)	Type	Return (%)	REMARKS	
4 UK DH (SPTS) LEMANAGHAN RC	24/11/23	16.00	11.60										termi	ackfilled. BH nated at 11.60m b instruction.	gl on
IDL AGS4	All dimen metr Scale 1	res :62.5	Client: MK	(O		Method Plant U	d/ CS- Jsed	-14				Dri DC		Logged By EAT	,



Project Lemanaghan V	Wind Farm	I	ocation	DRILLHOLE No
			Co Offaly	BHSS3
Job No	Date 13-11-23	Ground Level (m OD)	Co-Ordinates ()	рпооз
2023OY108	13-11-23	56.40	E 615,036.4 N 730,978.	5
Engineer				Sheet 1 of 2
FTCO				Status FINAL

RU		ΓAILS			<u> </u>			STRA						_ Fig.
Depth	TCR (SCR)	(SPT) Fracture	Red'cd Level	egend	Depth Thick-					CRIPTIO				<u> </u>
Date	RQD	Index	Level	Legend (ness)	Discontin		Det	ail			Iain		Ins
0.00					-	0.00 - 10.9	90 : overburde	n.		Drillers C	le drilling. N Comment: P rse gravel si	EAT.	very.	Instrument
	-				(5.00)									
5.00	5 -	5.00 (0)	51.40	× × × × × × × × × × × × × × × × × × ×	5.00				_	Firm darl	k grey SILT	<u>.</u>		
7.10	7 -	7.10 (0)	, , ,	× × × × × × × × × × × × × × × × × × ×	(3.60)									
8.60	33	8.60 (11)	1		8.60				_	assorted GRAVEI slightly g Gravel is	light grey ar L with some gravelly silt. subrounded assorted lig	nd dark grey s Sand i I to sub	Tine to coarse grey limestone lightly sandy s fine to coarse. coangular fine to y and dark grey	000
		lling Prog							Rotary				GENERAI	_
Date	Tir	ne Dept		asing Di		Dıa m Strik	Water e Standing	From (m)		1	Return (%)		REMARKS	
			5.00	96				0 7.6	7.6 14.6	Water Water	100	BH t	n standpipe inst erminated at 14 n REs instructio	.60n
All dime me Scale	tres	n Client: N	ſКО		M	ethod/ C	S-14			'	Dril DC	ler	Logged By	AT



Project Lemanaghan V	Wind Farm	L	ocation		DRILL	HOLE No
			Co Offaly		DL	ISS3
Job No	Date 13-11-23	Ground Level (m OD)	Co-Ordinates ()		БГ	1333
2023OY108	13-11-23	56.40	E 615,036.4	N 730,978.5		
Engineer					Sheet	2 of 2
FTCO					Status FIN	JAL

	I	TCO											Status FINAL	
	RU	N DE	ΓAILS							STRA	TA			ent/
	Depth	TCR (SCR)	(SPT) Fracture	Red'cd	Legend	Dep (Thick	oth				DES	CRIPTION		Instrument/ Backfill
Da		RQD	Index	Level	1	11000)	Dis	scontinuit	ies	Deta	ail	Main	1	Inst
Ē	10.10		10.10 (50/16	Omm)	0.x0 0	Ė								
Ė		100			\$ \tau \tau \tau \tau \tau \tau \tau \tau									制
Ė		(47) 45		45.50	1× 0. ×	10.	10.	90 - 14.60	0 Discontin	uities, medi	um	Strong locally very strong	ng thinly bedded	
ŧ	11.60					<u>-</u>	10	to 12°, ste	epped, roug	paced, dipp h, with 0.5 t	ing o	grey and dark grey silty medium grained LIMES	bioclastic fine and STONE.	
Ė	11.60		5		\Box		2m	m thick d	ark grey sil	t smear.		C		
F		100				-								
Ē		100 (98) 96										12.20m: medium strong	.	
ŧ		70	2			(3.70)							
F	13.10						12.	90 - 13.1:	5 Joint, sub ight, open a	vertical dip,				
ŧ			2			-	ind	uced fron	n 13.10m to	13.15m bg	1.			
E		100 (96) 92	2			-						13.80-13.80m: medium	strong.	制。
F		92				-								
13.11	14.60		4	41.80		14.	60 14.	10 - 14.10	0 firm dark	grey silt.				
Ē														
ŧ						-								
E														
Ė						_								
E														
ŧ						-								
121216														
						-								
1														
5						-								
						Ē								
2														
25.52														
<u> </u>						Ė								
						-								
		Dri	lling Prog	ress and	l Wate	r Obs	ervati	ons		F	Rotary	Flush	GENERAL	
	Date	Tir	ne Dept	n Dept	Casing h D	oia C	ore Dia mm	Strike Wa	ater Standing	From (m)	To (m	Type Return (%)	REMARKS	

E DEC 1 2023 GPJ ID GINT AGS 4 0 4 GDT 9/2/24														
ALL FILI		Drillin	g Progre			bservation]	Rotary	Flush			GENERAL
Z RC	Date	Time	Depth	Cas Depth	sing Dia	Core Dia mm	Strike	ater Standing	From (m)	To (m)	Type	Return	(%)	REMARKS
4 UK DH (SPTS) LEMANAGHAN RC	13/11/23	16.00	14.60										50r BH bgl	nm standpipe installed. terminated at 14.60m on REs instruction.
IDL AGS4	All dimen metr Scale 1	sions in es :62.5	Client: MK	0		Method Plant U	sed CS	-14					Driller DC	Logged By EAT



Project Lemanaghan V	Wind Farm		Loca	tion		DRILI	HOLE No
			Co	Offaly		DI	HSS4
Job No	Date 23-11-23	Ground Level (m OD))	Co-Ordinates ()		ОГ	1004
2023OY108	23-11-23	56.16		E 614,947.3	N 730,901.4		
Engineer						Sheet	1 of 1
FTCO						Status FII	NAL

1.	100							Status FINAL	
		TAILS				STRATA		1	ent/
Depth	TCR (SCR)	(SPT) Fracture	Red'cd		Depth	DES	CRIPTION		Instrument/ P Backfill
Date	RQD	Index	Level	Legend	(Thick- ness)	Discontinuities Detail	Main		Inst Bac
0.00						0.00 - 8.40 : overburden.	Open hole drilling. No r Drillers Comment: PEA	ecovery. T.	
	-				(4.00)				
4.00	100	4.00 (0)	52.16 51.16		(1.00)		Very soft dark brownish PEAT.	n black amorphous	
5.60	37	5.60 (7)	31.10	× × × × × × × × × × × × × × × × × × ×	(2.10)		Firm greyish brown SIL	Т.	
7.10	38	7.10 (17)	49.06		7.10		Subrounded to subangul assorted light grey and of GRAVEL with cobbles silt. Cobbles are of light	lar fine to coarse lark grey limestone and a little grey grey limestone.	
8.40	100 (69) 38	6 NI 14	47.76		8.40	8.40 - 10.00 Discontinuities, closely spaced, locally medium spaced, dipping 10 to 12°, stepped, rough, with 0.5 to 10mm thick dark grey silt smear. 9.00 - 9.00 firm dark grey silt.	Very strong locally strongrey and dark grey sligh fine grained LIMESTON	tly bioclastic silty	
23.1110.00			46.16		10.00				
	D '1	1' D	-	33 7 4		.· D. /	1		

ID GINT AGS 4 0 4 GDT 9/2/24	7.10	38	7.10	(17)	×		7.10 30) 8.40				-	assorted GRAVE silt. Cob	light grey ar L with cobb bles are of li	nd dark les and ght gre		
DEC 1 2023.GPJ	23.1110.00	100 (69) 38		6 NI 14	46.16		.60) spa	ced, local to 12°, ste nm thick	Discontinui lly medium epped, rough dark grey si irm dark gre	spaced, dip n, with 0.5 th lt smear.	ping	grey and	ong locally s I dark grey sl ned LIMEST	lightly 1	ninly bedded bioclastic silty	
ALLF			Ť		ss and V						Rotary	1			GENERAL	
N RC	Date	Tin	ne	Depth	Cas Depth	Dia_	Core Dia	Strike	ater Standing	From (m)	To (m)	Type	Return (%)		REMARKS	
4 UK DH (SPTS) LEMANAGHAN	23/11/23			10.00	4.00	96				0	10	Water	100	termi	ackfilled. BH nated at 10.00m t nstruction.	ogl on
IDL AGS4	All dime met Scale	tres	n C	lient: MK	0		Method Plant U		-14				Dril DC	ler	Logged By EA7	Γ



Project Lemanaghan V	Wind Farm	I	Location	DRILLHOLE No
			Co Offaly	BHT01
Job No	Date 22-11-23	Ground Level (m OD)	Co-Ordinates ()	БПІЛІ
2023OY108	22-11-23	50.52	E 614,198.9 N 727,375.1	
Engineer				Sheet 1 of 2
FTCO				Status FINAL

DIT	NI DE	TAILC					CTD ATA			4
KU.	TCR	TAILS			Danish		STRATA	CDIDTION		Instrument/
Depth Date	(SCR)	(SPT) Fracture	Red'cd Level	Legend	Depth (Thick-			CRIPTION		it i
	RQD	Index	Level		ness)	Discontinuities	Detail		ain	Ľ,
0.00	-				(2.00)	0.00 - 6.60 : overburden	•	Open hole drilling. N Drillers Comment: P	o recovery. EAT.	00000
3.00			47.52		3.00					
4.10	27 - -	3.00 (0)	46.42		(1.10) - 4.10			Very soft black amor	phous PEAT.	0000
	33	4.10 (8)			(1.50)			Firm bluish grey slig gravelly CLAY. Sand		
5.60	40	5.60 (14)	44.92	0000	(1.00)			Medium dense subro fine to coarse assorte grey limestone GRA	d light grey and dark	
6.60	100		43.92		6.60	6.60 - 10.20 Discontinui	tica madium	Very strong thinly be	ddad away anamy	-14
7.00	(92) 48	4			1. 1. 1. 1. 1. 1.	spaced, locally closely s 12 to 14°, stepped, rough 1 mm thick dark grey silt	paced, dipping n, with 0.5 to smear.	bioclastic fine and m LIMESTONE.	edium grained	
	100 (93) 54	5				6.80 - 7.20 Joint, vertica rough, with 0.5 to 2mm smear, open. 7.80 - 8.10 Joint, subver stepped, rough, with 0.5	thick grey silt tical dip, to 1mm thick			
8.60	100	3			(3.60)	grey silt smear, open, ov thick white calcitic vein. 8.20 - 8.60 Joint, vertica rough, with 0.5 to 1 mm smear, open, between 30	er 10 to 15mm Il dip, stepped, thick grey silt			
	(98) 97	6			- - - - - - -	calcitic vein.	T			
	Dri	lling Progr	ess and	Wate	r Obser	vations	Rotary	/ Flush	GENIEDAI	

LE DEC 1 2023.GPJ ID GINT AGS 4 0 4.GDT 9/2/24	8.60	100 (93) 54 100 (93) 54		4536		(3	sp. 12 1n 6.8 rou sm 7.8 ste ste 4.60) gr thi 8.2 rou sm	aced, loca to 14°, ste m thick d 30 - 7.20 J 1gh, with 0 16ar, open. 30 - 8.10 J 19pped, rough 2v silt sme ck white of 20 - 8.60 J 1gh, with 0	oint, subver gh, with 0.5 ear, open, over calcitic vein oint, vertica 0.5 to 1 mm between 30	paced, dipp n, with 0.5 t smear. Il dip, stepp thick grey s tical dip, to 1mm thi er 10 to 15 thick grey s	oring oed, silt ick mm oed, silt	very str bioclast LIMES	ong thinly be	edded g	grained of	
ALL FIL		Dril	lling	Progre	ss and V				,]	Rotary	1	T		GENERAL	
N N	Date	Tin	ne	Depth	Cas Depth	ing Dia	Core Dia	Strike	ater Standing	From (m)	To (m)	Type	Return (%)		REMARKS	
84 UK DH (SPTS) LEMANAGHAN RC					3.00	96				0 3	3 10.2	Water Water	100	BH to	n standpipe installed erminated at 10.20m n REs instruction.	1. 1
IDL AGS	All dime me Scale		ın C	lient: MK	О		Metho Plant U		-14				Dril DC	ler	Logged By EAT	



Project Lemanaghan V	Wind Farm		Location		DRILLHOLE No
			Co Offaly		BHT01
Job No	Date 22-11-23	Ground Level (m OD)) Co-Ordinates ()		БПІЛІ
2023OY108	22-11-23	50.52	E 614,198.9	9 N 727,375.1	
Engineer			·		Sheet 2 of 2
FTCO					Status FINAL
RUN DETAILS			STRATA		ent/

		CAILS (SPT)			Denth			STRATA		PTION				Instrument/
Depth Date	TCR (SCR) RQD	(SPT) Fracture Index	Red'cd Level	Legend (T	hick-	D:		Detail)ESCKI	IF I ION	3.6			stru
.1110.20	RQD	Index	40.32	ne	ss) 10.20	Discontinuit	ies	Detail			Ma	ın		<u>F</u>
.1110.20			40.32		10.20									 *
				l E										
				l E										
				F										
				l E										
				E										
				[
				l E										
				l E										
				F										
				F										
•														
				-										
	Dril	ling Prog	ress and	Water (Obser	vations		Rot	tary Flu	ısh		(GENERAL	,
Date 22/11/23 All dimemer Scale	Tin		1 Denth	Casing 1 Dia	Core		ater Standing				rn (%)	I	REMARKS	5
22/11/23	16.0				'''	Saine	Zumumg					50mm s	standpipe insta	allec
												BH terr	ninated at 10.2 REs instruction	20m
												ogi oli I	ALS HISH HUHO!	11.
All dime	nsions i	n Client: M	IKO		M	ethod/ CS-	.14				Drille	er	Logged By EA	
me	tres 1:62.5				D1	ant Used					DC		. 20 21	_

ALL		Drilling	Progres	s and V	Vater O	bservatio	ons]	Rotary 1	Flush				GENERAL
צ	Date	Time	Depth	Cas Depth	ing Dia	Core Dia mm	Wa Strike	ter Standing	From (m)	To (m)	Type	Return	ı (%)		REMARKS
1 UK DH (SP1S) LEMANAGHAN	22/11/23	16.00	10.20	•										BH to	n standpipe installed. erminated at 10.20m n REs instruction.
Š	All dimens	cione in C	1: MIZ (`		M . 41	1/ 00	1.4					D.:11		I 1 D



Project Lemanaghan V	Wind Farm		Loca	tion		DRILI	HOLE No
			Co	Offaly		Ы	HT03
Job No	Date 20-11-23	Ground Level (m OD	((Co-Ordinates ()		DI	1103
2023OY108	20-11-23	49.64		E 614,779.9	N 726,517.4		
Engineer						Sheet	1 of 2
FTCO		Status FII	NAL				

Engine															Sheet I of	1 2
]	FTCO													S	Status FINAL	
RU	N DE	ΓAΙΙ	LS							STRA	ATA					Instrument/
Depth	TCR (SCR)	(S	SPT) acture	Red'cd	Legend	Dep (Thick	oth				DESC	CRIPTI	ON			Instrume
Date	RQD		ndex	Level	Legena	ness)	Dis	continuit		Det	ail			Iain		Ins
0.00						(3.00		0 - 12.90	: overburde	n.			ole drilling. N Comment: P		overy.	00000000000000000000000000000000000000
3.00	3.00 (6) 46.64 3. 3.00 (6) 46.64 3.						00				-	Firm blu	nish grey SIL	Л.		
5.60	33 -	5.60	(9)		× × × × × × × × × × × × ×											000000000
7.10	50	7.10	(10)	42.54	x x x x 0 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(1.50	10				_	Firm gre	ey slightly gra	avelly	sandy CLAY.	
8.60	50	8.60	(50/75mi	41.04 n)		8.	lim No	estone bo grev spar	O Core Run: ulder 320m ry bioclasti nm in lengtl	m in length c limestone	. 1	Subrounded to subangular fine to medium assorted light grey and dark grey limestone GRAVEL with cobbles and boulders. Cobbles are of grey bioclastic limestone.				
	Dri	lling	Progre	ess and							Rotary	Flush			GENERAI	
Date	Tir	ne	Depth	Depth	Casing 1 D	ia C	ore Dia mm	Strike Wa	nter Standing	From (m)	To (m	Type	Return (%)		REMARKS	
				3.00						0 3.9 Water 100 50mm standpipe install BH terminated at 19.20 bgl on REs instruction.					.20m	

_4.GDT 9/2/24	7.10	50	7.10	(10)	x	× × - ×	7.10				-	Firm gre	ey slightly	gravelly	sandy CLAY.	
E DEC 1 2023.GPJ ID GINT AGS 4 0	8.60	50	8.60	(50/75mi	41.04 = 41.04 = 0		lim No	estone bo grey spai	0 Core Run: oulder 320m rry bioclasti mm in lengt	m in length c limestone	. 1	assorted GRAVE	light grey L with co	and dark	fine to medium grey limestone boulders. tic limestone.	
ALL FIL		Dri	lling	Progre	ess and V	Vater O	bservati				Rotary	Flush			GENERAL	K VD! Z
	Date	Tir	ne	Depth	Cas Depth	sing Dia	Core Dia	Strike	ater Standing	From (m)	To (m) Type	Return (%	1/6)	REMARKS	
4 UK DH (SPTS) LEMANAGHAN RC					3.00	96				0 3.9	3.9 19.2	Water Water	100	BH t	n standpipe insta erminated at 19.2 n REs instruction	20m
IDL AGS4	All dimer met Scale		in C	lient: Mŀ	KO		Method Plant U		-14				D De	riller C	Logged By EA	Т



Project Lemanaghan V	Wind Farm	Lo	cation		DRILL	HOLE No
		(Co Offaly		DL	HT03
Job No	Date 20-11-23	Ground Level (m OD)	Co-Ordinates ()		ВΓ	1103
2023OY108	20-11-23	49.64	E 614,779.9 N 726	5,517.4		
Engineer			•		Sheet	2 of 2
FTCO	Status FIN	JAL				

KUI		ΓAILS	1					STRATA				4
Depth	TCR (SCR)	(SPT) Fracture	Red'cd	Lecond	Depth (Thick-			DES	CRIPTIC	ON		
Date	RQD	Index	Level	Legend	ness)	Discontinuit	ies	Detail		Ma	in	Justrument/
10.10	50				(4.30)	11.60 - 11.6 slightly bioc boulder 290	lastic sparry	limestone	assorted l GRAVEL	ight grey and with cobble are of grey bi	gular fine to medium I dark grey limestone is and boulders. oclastic limestone.	
-	33 (6)	11.60 (24)		00000	-	medium der	nse.					000000
13.10			36.74		12.90	12.90 - 15.7 rock.	0 Non-intact	as weathered	green crys	strong thinly stalline fine a	bedded light greyish and medium grained	0000
14.60	80 (45)	NI			(2.80)				as angula	r fine to coar ts with a littl	limestone recovered se gravel and cobble e green silt and a	ν_{-}
-	100 (31) 9		33.94		15.70	15.70 - 19.2	() Discontin	uities verv	Medium	strong thinly	bedded light greyish	
16.10	100	5			- - - - - -	closely and of medium spacestepped, rou green silty fi	closely space ced, dipping gh, with 0.5 ne and medi	ed, locally 10 to 12°, to 3mm thick um sand smear	green crys	stalline fine a	ned medium grained SED LIMESTONE.	00000
	100 (74) 33	_			(3.50)	and minor or powder. 16.60 - 16.7 stepped, rou	rangish brow 5 Joint, subv gh, with 0.5	vertical dip, to 1mm thick				0000
17.60	100	10			- (3.30) - - - - -	open. 17.40 - 17.6 stepped, rou	0 Joint, subv gh, with 0.5	to 1mm thick				0000
	(84) 58	11				green silty fr and minor or powder, ope 18.30 - 18.3	rangish brow n.	um sand smear n iron stain and				0000
D.1119.20		2	30.44		19.20	weak fissile fine and med 18.90 - 18.9	with a little lium sand. 0 with 10 to	orangish brown 20mm x 5mm x				0
	Dri	lling Progr	ess and	Water	r Ohser	<u>5 to 15mm d</u>	leep vugs.	Rotar	y Flush		CENIED	
Date	Tin			Casing			ater Standing	From (m) To (1		Return (%)	GENERAI REMARKS	
20/11/23	+			n °D	ia <u>m</u>	m Strike	Standing	1000 (11)	inj Type I		50mm standpipe inst BH terminated at 19 bgl on REs instruction	talle
All dime	nsions	in Client: M	VO.		M	ethod/ CS-	14			Drille	er Logged By	



Project Lemanaghan V	Wind Farm	1	Location		DRILLHOLE No
			Co Offaly		ВНТ06
Job No	Date 17-11-23	Ground Level (m OD)	Co-Ordinates ()		БП100
2023OY108	17-11-23	48.57	E 615,652.4	N 727,929.7	
Engineer					Sheet 1 of 2
FTCO	Status FINAL				

	N DET)T)	ı		De4			S	TRA		ND IDEE:	22.1			nent
Depth Date	TCR (SCR)	(SF Frac	ture	Red'cd Level	Legend (Depth (Thick-						CRIPTIO				
0.00	ŘQĎ	Inc	lex	Level	1 	ness)	Disconti	nuities .60 : overbur	den.	Deta		Open hol Drillers (e drilling. N Comment: P	lain lo reco EAT.	very.	/Instrument/
						(3.00)										
3.00	36	3.00 ((2)	45.57	0	3.00						Firm darl sandy CI	k brownish ; AY.	grey sli	ghtly gravelly	
4.10	73 -	4.10 ((6)			-										
5.60	100	5.60 ((9)			-										0000000000
7.10	93	7.10 ((10)			(8.60)										7000000000
8.60	13	8.60 ((10)			-										
	Dril	ling F	rogre	ss and	Water	Obser	vations			I	Rotary 1	Flush			GENERAI	
Date	Tin	ne l	Depth	Depth	Casing Di	Core a m	Dia m Stri	Water ke Standin	Froi	n (m)	•		Return (%)		REMARKS	S
				3.00			561			0 3.2	3.2 19.1	Water Water	100	50mr BH to bgl o	n standpipe inst erminated at 19. n REs instructio	allecallecallecallecallecallecallecalle
All dime met Scale	nsions i	n Clie	ent: MK	O		M	ethod/ (ant Used	CS-14					Dril DC	ler	Logged By EA	

ALL		Drilling	Progres	ss and V	Vater Ol	bservatio	ons		I	Rotary 1	Flush				GENERAL
צב	Date	Time	Depth	Cas Depth	ing Dia	Core Dia mm	Wa Strike	iter Standing	From (m)	To (m)	Type	Return	ı (%)		REMARKS
I UK DH (SPTS) LEMANAGHAN				3.00	96				0 3.2	3.2 19.1	Water Water	100	0	BH to	n standpipe installed. erminated at 19.10m n REs instruction.
Š	All dimone	ions in G	1			N (4)		1.4					D '11		I 1D



Project Lemanaghan V	Wind Farm	I	Location	DRILLHOLE No	
			Co Offaly	ВНТ06	
Job No	Date 17-11-23	Ground Level (m OD)	Co-Ordinates ()		БП100
2023OY108	17-11-23	48.57	E 615,652.4	N 727,929.7	
Engineer					Sheet 2 of 2
FTCO					Status FINAL

RU		TAILS					STR	ATA			_ \$
Depth	TCR (SCR)	(SPT) Fractur	Red'cd	, ,	Depth			DES	CRIPTION		_
Date	RQD	Index	Level	Legend	(Thick- ness)	Discontinuities	D	etail	Mai	n	Justiniment/
10.10	100	10.10 (7)							Firm dark brownish gre sandy CLAY. (continue	ey slightly gravelly ed)	
11.60	73	11.60 (34)	36.97	**************************************					Dense subrounded to st coarse assorted light gr limestone GRAVEL wi	ubangular fine to ey and dark grey th a little grey silt.	
14.20	54 80		33.97								
	(10)								Weathered rock. Medium strong locally	very strong thickly	0
15.20									hedded grey bioclastic	fine and medium	0
16.10	100 (14) - 100 (57) 21	NI			(4.50)	bioclastic limes length.	Core Run: 1 No gretone boulder 290n	nm in	grained limestone recordine to coarse gravel cosized clasts with a little silt and orangish brown powder.	bble and boulder orangish brown iron stain and	
17.60	21	INI				rock.	Ion-intact as weath ubvertical 35mm thein.				000000
7.11 19.10	100 (21)		29.47		19.10						
7.1119.10	Dri	lling Pro	gress and	Wate	r Obser	vations		Rotars	/ Flush	CENIED A I	
Date	Tiı	_ <u> </u>		Casing		Dia Wate	From (n			GENERAL REMARKS	
17/11/23	+				na m	iii strike S	tanding	, (**	5	50mm standpipe inst BH terminated at 19. gl on REs instructio	alle
All dime me Scale	nsions	in Client:	MKO		M	[ethod/ CS-14	II L		Driller	Logged By	_



Project Lemanaghan V	Wind Farm	I	ocation	DRILLHOLE No
			Co Offaly	BHT12
Job No	Date 16-11-23	Ground Level (m OD)	Co-Ordinates ()	БПП2
2023OY108	16-11-23	48.04	6.8	
Engineer				Sheet 1 of 2
FTCO				Status FINAL

FICO						Status TINAL	
RUN DETAILS				STRATA			ent/
Depth TCR (SPT) Date (SCR) Fractur	Red'cd Legend (Depth		DES	CRIPTION		Instrument/
RQD Index	Level Legend (ness) D	Discontinuities	Detail	Mair		Inst Bac
0.00		- 0).00 - 8.10 : overburden.		Open hole drilling. No r Drillers Comment: PEA	recovery. T.	Instrume
3.00	45.04	3.00					
3.00 (7) 36 - 4.10 4.10 (7)	× × 1 × × 1 × × 1 × × 1 × × 1 × × 1	-			Firm dark brownish gre	y SILT.	
5.60 (13)	× ×	(3.70)					
7.10 7.10 (39)	41.34 × × 1 80 × 80	6.70 - (1.40) t	becoming dense.		Medium dense subroun fine to coarse assorted l grey limestone GRAVE silt.	ight grey and dark L with a little grey	
100 (97) 82 9.70 5		8 sq sq sq ss ss 8 st	3.10 - 12.90 Discontinuity paced, locally very close paced, dipping 10 to 12 mooth, with 0.5 to 5mm ilt smear. 3.60 - 8.75 Joint, subvert tepped, rough, with 0.5 grey silt smear, open.	ely and closely , planar, thick dark grey	Very strong locally strongrey and dark grey silty grained LIMESTONE. 9.70m: medium strong.	hioclastic fine	
	gress and Water	Observat	tions	Rotary	Flush	GENERAL	1/ L.K.
Date Time De		Core Di			n) Type Return (%)	REMARKS	

S 4_0_4.GDT_9/2/24	7.10	75 - -	7.10	(39)	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	×	.40) be	coming d	ense.			fine to c	oarse asso	orted ligh	I to subangular it grey and dark with a little grey	
E DEC 1 2023.GPJ ID GINT AGS 4_0	9.70	100 (97) 82		7	J. J. J. J. J. J. J. J. J. J. J. J. J. J		8.1 spa spa sm silt 8.6 ste	ced, loca ced, dipp ooth, with smear. 0 - 8.75 J	Discontinua illy very clos ing 10 to 12 n 0.5 to 5mm oint, subver gh, with 0.5 ar, open.	sely and clo 2°, planar, n thick dark tical dip,	sely c grey	grey and grained	ong locall I dark gre LIMESTO medium st	y silty bio ONE.	thinly bedded oclastic fine	
ALL FIL		Dril	lling	Progre	ss and W	Vater O	bservati				Rotary	Flush			GENERAL	17 1 8 3
RC	Date	Tin	ne	Depth	Cas Depth	ing Dia	Core Dia	Strike	ater Standing	From (m)	To (m)	Туре	Return (%)	REMARKS	
4 UK DH (SPTS) LEMANAGHAN RC					3.00	96				0 3.4	3.4 14.6	Water Water	100	BH	nm standpipe insta terminated at 12.9 on REs instruction	90m
IDL AGS	All dime mer Scale	tres	in Cl	lient: MK	0		Method Plant U		-14					Oriller OC	Logged By EA	Т



Project Lemanaghan V	Wind Farm		Loca	ntion	DRILLHOLE No		
			Co	Offaly	В	HT12	
Job No	Date 16-11-23	Ground Level (m OD))	Co-Ordinates ()			ппг
2023OY108	16-11-23	48.04		E 616,435.5	N 728,146.8		
Engineer						Sheet	2 of 2
FTCO						Status FI	NAL

I	FTCO								Status FINAL	
RU	N DE	ΓAILS					STRATA			Instrument/
Depth	TCR (SCR)	(SPT) Fracture	Red'cd	Legend	Depth (Thick-		DES	CRIPTION		trum
Date	RQD	Index	Level	Legend	ness)	Discontinuities	Detail	Mai	n	Inst Bac
11.30	100 (95) 82	12			(4.80)	10.15 - 10.15 stiff dark g	grey silt.	Very strong locally stro grey and dark grey silt grained LIMESTONE. 10.50-10.60m: weak.	ong thinly bedded y bioclastic fine (continued)	
-	100 (97) 91	5			-			12.10-12.30m: weak.		
T6.1112.90		4	35.14		12.90					
	Drill	ling Progr	ass and	Water	Observe	vations	Potors	, Eluch	CENEDAL	
		lling Progr	ess and	Water	Core	Vations Dia Woter		Flush	GENERAL	
Date	Tin	ne Depth	Depth	Casing 1 Di	a Core mr	Dia Water n Strike Standing	From (m) To (m	n) Type Return (%)	REMARKS	

FILE DEC 1 2023.GPJ ID GINT AGS 4_0_4.GDT 9/2/24																	
ALL		Dril	ling	Progre		Water O					Rotary	Flush				GENERAL	
N RC	Date	Tin	ne	Depth	Depth Ca	ising Dia	Core Dia	Strike	ater Standing	From (m)	To (m)	Type	Return	(%)		REMARKS	•
4 UK DH (SPTS) LEMANAGHAN RC	16/11/23	16.0		12.90											50mm BH te bgl on	a standpipe insta rminated at 12.9 REs instruction	n.
IDL AGS4	All dimer met Scale 1	nsions i res l:62.5	n C	lient: MK	O		Metho Plant	od/ CS- Used	-14					Drille DC	er	Logged By EA	T



Project Lemanaghan V	Wind Farm	I	Location	DRILLHOLE No
			Co Offaly	BHT15
Job No	Date 15-11-23	Ground Level (m OD)	Co-Ordinates ()	БПІЗ
2023OY108	15-11-23	51.72	E 617,686.7 N 728,902.7	
Engineer				Sheet 1 of 2
FTCO				Status FINAL

	V DE		'TAT			Donal.			STRA		OD IDAT	N T			nen
Depui (TCR (SCR)	Fra	acture	Red'cd Level	Legenal	Depth Thick-					CRIPTIC				
	ŘQD		ndex	Level	r	ness)	Discontinui 0.00 - 9.00		Det	ail	Open hole Drillers C	M drilling. N omment: Pl	ain o reco EAT.	very.	Instrument
						(4.50)									
4.50	18	4.50	(0)	47.22		4.50					Firm dark	grey slight	ly sand	iy CLAY.	
5.60	47 -	5.60	(9)			(3.60)									
7.10	60	7.10	(24)	43.62		8.10							1 (·	
9.80	100 (13)	8.60	(50/75mm	n) 42.72		(0.90) 9.00	9.00 - 13.60 closely and 10 to 12°, st 1 mm thick I smear, non-	very closely epped, rougl ight brownis	spaced, dip n, with 0.5 th h grey silt	oping to	assorted li GRAVEL slightly sa fine to coa subangula	ght grey an with rare on help slightly arse. Gravel of fine to co lark grey ling	d dark obble grave is sub arse of	ine to coarse grey limestone some grey elly silt. Sand is brounded to assorted light ie. Cobble is of	10
	Dril	ling	Progre	ess and	Water	Obser			1	Rotary	Flush			GENERAI	<u> </u>
Date	Tin	Ť	Depth		Casing 1 Dia			ater Standing	From (m)			Return (%)		REMARK	
			1	4.50		1111	iii Suike	Standing	0	14.6	Water	100	BH to	n standpipe ins erminated at 14 n REs instruction	.60m
All dimer met Scale	nsions i	n Cl	ient: MK	(O		M	ethod/ CS	-14				Drill DC	er	Logged By	

AL.		Drilling	Progres			bservatio	ons]	Rotary I	Flush			GENERAL
צ	Date	Time	Depth	Cas Depth	ing Dia	Core Dia mm	Wa Strike	iter Standing	From (m)	To (m)	Type	Return (%)		REMARKS
1 UK DH (SP1S) LEMANAGHAN				4.50	96				0	14.6	Water	100	BH t	m standpipe installed. erminated at 14.60m n REs instruction.
۱۲	All dimensions in Client MVO Method/ CC 14											Duit	1	Lagrand Dry



Project Lemanaghan V	Wind Farm		Loca	ntion	DRILLHOLE No		
			Co	Offaly	В	HT15	
Job No	Date 15-11-23	Ground Level (m OD))	Co-Ordinates ()		DI	ппэ
2023OY108	15-11-23	51.72		E 617,686.7	N 728,902.7		
Engineer						Sheet	2 of 2
FTCO						Status FI	NAL

Engine	er													Sheet 2 of	2
]	FTCO													Status FINAL	
RU	N DET	TAILS							STRA	ATA					ent/
Depth	TCR	(SPT)	Red'cd		Dept	th				DESC	CRIPTI	ION			Instrument/ Backfill
Date	(SCR) RQD	Fracture Index	Level	Legend	(Thick- ness)	Dis	scontinuit	ies	Det	ail		M	lain		Instrumer
11.40	100 (23) - 100 (17)	NI			(4.60)	dip thic ope	stepped ck light bi en, non-in	0 Probable , rough, wit rownish gre ttact as wea 0 Non-intac vel sized cl	h 0.5 to 1m y silt smear thered rock.	ertical m	Strong l greyish grained as angul	brown crysta dolomitised	lline lime arse	g thinly bedded of fine and medium stone recovered gravel and cobble	
13.60	100 (24) 12 100 (95)		38.12		13.6	13. spa	ced, loca	0 Discontin lly closely s epped, smoo	paced, dipp	oing	grev silt	ocally very st y bioclastic f LIMESTON	fine :	g thinly bedded and medium	
15.11 14.60	79	6	37.12		- 14.6	1m	m thick g	rey silt sme	ar.		gramoa	ENVIEW FOR			
Date	Dril Tin	ling Progr		Wate		ervatione Dia		ater Standing	From (m)	Rotary To (m)		Return (%)		GENERAL REMARKS	
15/11/23	+		1	1 L	ла	mm	Strike	Standing		15 (111)	-71-5	(,0)	50	mm standpipe insta I terminated at 14.6	
													bo	1 terminated at 14.6 1 on REs instruction)UIII 1

E DEC 1 2023 GPJ ID GINT AGS 4 0 4 GDT 9/2/24														
ALL FILI		Drillin	g Progres			bservation				Rotary	Flush			GENERAL
Z RC	Date	Time	Depth	Cas Depth	sing Dia	Core Dia mm	Strike	ater Standing	From (m)	To (m)	Type	Return ((%)	REMARKS
4 UK DH (SPTS) LEMANAGHAN RC	15/11/23	16.00	14.60										50m BH t bgl c	m standpipe installed. erminated at 14.60m on REs instruction.
IDL AGS4	All dimen metr Scale 1	sions in ces :62.5	Client: MK	0		Method Plant U	Sed CS	-14					Driller DC	Logged By EAT



Appendix 02 Trial Pit Records

LO	OJECT: CATION IENT: M	: Co	_	n Wind Fa	rm				TRIALPIT: TPB001 Sheet 1 of 1 Co-ordinates: Rig: Hyundai	
1	GINEER:		CO			1			E 615,986.0 N 729,176.4 Rev:	
GR	:	ATE				PIT	DIRECT DIME	NSION	V: 5.00m * 1.80 D Stability: Pit unstable. Sidewall collapse.	
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
-0						7 7 1/2 71 1/2 1/2	54.82	0.50	H6 P3 F2 P2 W2 TV2 TH2 A0	
E						<u> </u>			Firm orangish brown fibrous PEAT. H2 B3 F3 R2 W2 TV0 TH0 A1.	
-1		ı	MANE B 1 D 2	1.00 1.00-1.20 1.00-1.20	19mm vane 81 kN/m² 90 kN/m² 107 kN/m	× ·×	54.42	0.90	Firm to stiff light grey slightly sandy SILT with fibres.	
_2		<u></u>	□ D 2	2.00-2.20		**************************************	53.82	1.50	Soft light grey sandy gravelly SILT with occasional cobbles. Gravel is subangular to rounded fine to coarse. Cobbles are subrounded.	
			3 4 4	2.00-2.20		8 × 3	53.02	2.30	Wet light grey slightly silty SAND and subangular to rounded fine to coarse GRAVEL with frequent cobbles and occasional boulders. Cobbles are subrounded of	
<u>-</u> 3) 1703	3.20-3.40			s l		limestone. Boulders are subrounded of limestone. Boulders are up to 700mm in length. Sand is medium.	
-				3.20 3.10						
- 4						END	51.12	4.20		
- - -5 -										
- -6 -										
-7										
- - -8										
- -										
-9 -9										
10										
<u> </u>	narks: S	light	inflow of	water at 1.50n	I n bgl. TI	l P backfi	l lled with	arisings		
one one								Irisl	n drilling LTD 1:50	

LO CL	OJECT: CATION IENT: M GINEER:	: Co KO	Offaly	n Wind Fa	rm				Co-ordinates E 615,976.7	s: N 729,008.5	TRIALPIT: TPB002 Sheet 1 of 1 Rig: Hyundai Rev:	?
GR		ATE				PIT	DIREC DIME GGED 1	NSION	V: 4.50m * 2.00 D	A B C	Shoring/Support: N/A Stability: Pit unstable. Sider collapse.	wall
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)		DESCRI	PTION	Instrument/ Backfill
-0 - - - - - - - - - - - - - - - - - -		<u></u>	1	0.80-1.00		× × × × × × × × × × × × × × × × × × ×		0.30	fibres. Cobbles are subanguin length. Wet light grey very silty ver with frequent cobbles and fr	T with frequent coblar. Boulders are sub-	obles and frequent boulders and pangular. Boulders are up to 650mm to rounded fine to coarse GRAVEI obbles are subrounded of limestones are up to 600mm in length.	
- -4 - - -5 - - -6												
7 - 1 - 8 - 1 - 9 - 1 - 1 - 9 - 1 - 1 - 9 - 1 - 1												
Rei	marks: F	leavy	inflow of	water at 0.65r	l n bgl. T	D backfi	lilled with		drilling LTD		Scale:	:50

LO	CATION	: Co	_	n Wind Fa	rm				She	HALPIT: TPB003 eet 1 of 1
	ENT: M		CO						Co-ordinates: Rig E 615,946.7 N 728,838.9 Rev	g: Hyundai
	GINEER: und level: 5					1				ГЕ: 25.10.23
GR	OUNDW. er strikes: dry	ATE	R e to after:			PIT 1	DIME	CTION NSION BY: DI	: 0° A A B A B A B A B A B A B A B A B A B	Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse.
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTIO	Instrument/ Backfill
-0					19mm	× × ×	51.99	0.20	Plastic black amorphous PEAT. Soft greenish grey slightly sandy CLAY with fibres.	<u> </u>
-			ANE B 1 D 2	0.40 0.40-0.60 0.40-0.60	19mm vane 62 kN/m² 73 kN/m² 7.3 kN/m²	× × × × × ×	51.49	0.70		
-1 -1 -		<u>‡</u>	B 3 B 4	1.20-1.40 1.20-1.40	7.3 kN/m²				Grey silty very sandy sandy angular to rounded fine to frequent cobbles and occasional boulders. Cobbles are subrounded. 1.50-2.10: saturated.	o coarse GRAVEL with e subrounded. Boulders are
-2						12 1 C	50.09	2.10	1.30-2.10. Saturated.	<u> </u>
TRIALPIT LEMANAGHAN TPS FILE 1 NOV 3 2023.GPJ ID GINT AGS 4 0.4.GDT 9/2/24										
Ren	narks: H	leavy	inflow of	water at 1.201	n bgl. Tl	P backfi	lled with	arisings		Scale:
TRIALP								Irish	drilling LTD	1:50 Ph. Fax

ENGINEER: FTCO E 615,693.6 N 728,560.3 Ground level: 51.82m O.D.	Rev: DATE: 25.10.23 Shoring/Support: N/A Stability: Pit unstable. Sidewall
GROUNDWATER Water strikes: Rose to after: 1st: dry 2nd: 3rd: PIT DIRECTION: 0° A PIT DIMENSION: 5.00m * 2.00 D LOGGED BY: DF C	B collapse.
Depth Depth Samp Samp Samp Depth Dep	RIPTION Instrument,
-0	
Light grey coarse SAND and angular to sub- frequent cobbles and occasional boulders. C limestone. Boulders are subangular to subro	obbles are angular to subangular of
-3 - 48.82 3.00 END	
-5 - - - - - - - -	
950 ID GINT AGS 4 0 4	
PS FILE 1 NOV 3 2023/6	
Remarks: Ingress of water at 1.70m bgl. TP backfilled with arisings. Irish drilling LTD	Scale: 1:50 Ph. Fax

LO CL	OJECT: CATION IENT: M GINEER:	: Co KO	Offaly	n Wind Fa	rm				Co-ordinates: E 615,703.9 N 728,441.5		TRIALPIT: Sheet 1 of 1 Rig: Hyundai Rev:	ГРВ005	
GR	:	ATE				PIT	DIME	CTION NSION BY: DI	: 6.00m * 2.50 D	B	collapse.	t: N/A astable. Sidewall	
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESC	CRI	PTION		Instrument/
0 1 2 3 4 5 6 8 9 10		1	VANE	0.40 0.60-0.80 0.60-0.80	19mm vane 62 kN/m² 65 kN/m²	X X X X X X X X X X X X X X X X X X X	49.71	0.20 0.80 1.50	Reeds over plastic black amorphous PEAT Firm grey slightly sandy clayey SILT with matter. Boulders are angular of limestone. Soft light grey sandy gravelly SILT with from the consubrounded. Boulders are up to 800mm in 1.20: Large boulder - extended pit to progout the light grey silty very sandy coarse GRACOBBLES and angular to subrounded BO fine to coarse. Boulders are up to 800mm in 1.20: Large boulde	requerarse. lengteress.	nt cobbles and frequen Cobbles are subrounde th. and angular to subrou ERS. Gravel is angular	t boulders. d. Boulders are	
Ren	narks: S	eepag	ge of wate	r at 0.80m bgl	. Heavy	inflow o	of water		bgl. TP backfilled with arisings. drilling LTD			Scale: 1:50 Ph. Fax	

LO	OJECT: CATION IENT: M	: Co	_	n Wind Fa	rm				Co-ordinates:		TRIALPIT: TPE Sheet 1 of 1 Rig: Hyundai	3006
Gro GR	:	53.33m ATE	1 O.D.			PIT I	DIREC DIME GGED 1	NSION	N: 5.00m * 1.80 D	4.4	Rev: DATE: 24.10.23 Shoring/Support: N/A Stability: Pit unstable collapse.	A e. Sidewall
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DF	ESCRII	PTION	Instrument/
TRIALPIT LEMANAGHAN TPS FILE 1 NOV 3 2023 GPU ID GINT AGS 4 0 4 GDT 9/2/24			1 2 2 Eval	0.70-0.90			53.13 52.78 51.33	0.20 0.55 2.00	Reeds over plastic black amorphous PE Firm grey SILT with fibres. Light grey gravelly silty medium to coa cobbles. Gravel is subangular to subrou to rounded. Cobble content increasing with depth. Wet grey silty coarse SAND and subrou cobbles. Cobbles are subrounded of lim	arse SANI unded fine	e to coarse. Cobbles are sub	ent
L LEMANAGHAN TPS FI	marks:	Modera	ate inflow	v of water at 2.	10m bgl	. TP bac	ckfilled v	with arisi	ings.		s	Scale:
TRIALPI	Neg.							Irisl	n drilling LTD		Ph Fa	

LO	OJECT: CATION IENT: M	: Co	_	n Wind Fa	rm				TRIALPIT: Sheet 1 of 1 Co-ordinates: Rig: Hyunda		
	GINEER:		CO						E 614,588.9 N 726,680.1 Rev:	ш	
GR		ATE				PIT I	DIREC DIME GED	NSION	V: 4.80m * 1.80 D Stability: Pi		
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION		Instrument/ Backfill
-0						×° ×	52.01 51.76	0.20	Plastic black amorphous PEAT. H9. Stiff brown gravelly SILT with rootlets. Gravel is angular fine to c		
- - -1			3 81	0.70-0.90		© ×	31.76	0.15	Grey silty coarse SAND and angular to subangular fine to coarse Grequent cobbles. Cobbles are subrounded.	GRAVEL with	
- - - -2							50.31	e to coarse			
-		₹	3 ³ ²	2.10-2.30			49.81	2.40	Orangish brown slightly silty very sandy angular to subangular fin GRAVEL with frequent cobbles. Cobbles are subangular. Bluish grey coarse SAND and angular to subrounded fine to coars frequent cobbles and occasional large boulders. Cobbles are subro	e GRAVEL with	
- -3 - -			∑B 3	3.10-3.30					limestone. Boulders are of limestone. Boulders are up to 1600mm	in length.	
- -4 -						END	48.21	4.00			
- -5 -											
- - -6 -											
SDT 9/2/24											
INT AGS 4_0_4.G											
TRIALPIT LEMANAGHAN TPS FILE 1 NOV 3 2023.GPJ ID GINT AGS 4 0 4.GDT 9/2/24 BB 0											
TPS FILE 1 NOV											
-10											
Ren	narks: S	Seepag	ge of wate	er at 2.40m bgl	TP bacl	kfilled v	with aris		a dvilling I TD	Scale: 1:50	
T. T.	N. Carlotte							ırısi	n drilling LTD	Fax	

LO	CATION:	Co	_	n Wind Fa	rm				TRIALPIT: TPB008 Sheet 1 of 1	
	ENT: M		GO						Co-ordinates: Rig: Hyundai E 616,802.9 N 728,630.8 Rev:	
	GINEER: und level: 5					<u> </u>			DATE: 26.10.23	
GR	OUNDW. er strikes: dry	ATE				PIT I	DIME	CTION NSION BY: DI	Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse.	1
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
-0 -1 -12			33 1 S 2 S 2 S 2 S 3 S 2 S 3 S 3 S 3 S 3 S 3	0.60-0.80		× × × × × × × × × × × × × × × × × × ×	53.04 52.14 51.64 50.84	2.40	MADE GROUND: Grass over black sandy gravelly PEAT. MADE GROUND: Black peaty SAND and subrounded fine to coarse GRAVEL. Grey SAND and subrounded to rounded fine to coarse GRAVEL. Grey silty medium to coarse SAND and coarse GRAVEL with occasional large boulders. Boulders are angular. Brown slightly sandy SILT. Sand is fine.	
-3 - - - - -4 - - - - - - - -		<u>‡</u>	3 3	3.40-3.60		× × O O O O O O O O O O O O O O O O O O	49.34	3.90	Dark grey coarse SAND and subangular to rounded fine to coarse GRAVEL with occasional large boulders. Boulders are up to 1200mm in length.	
TRIALPIT LEMANAGHAN TPS FILE 1 NOV 3 2023.GPJ ID GINT AGS 4 0 4.GDT 9/2/24 Ball Clark Control of the control o										
-10 Ren	narks: H	leavv :	inflow of	water at 3.90r	n bgl. Ti	P backfi	lled with	arisings	Scale:	
TRIALPIT L									1:50 a drilling LTD)

LO	OJECT: I	: Co	_	n Wind Fa	rm					Cox	ordinat	toe•		Sł		PIT: of 1 yunda		PCC	001		
1	GINEER:		CO								5,601.6		,946.0		ev:	, unua 	_			_	
	und level: 5													DA	ATE: 2	5.10.23					
	er strikes: dry		se to after:			PIT	DIME	CTION NSION BY: DI	N: 5.00n	ı * 1.80	D	A		Ĭ ¥	Shori Stabi colla	ing/Supplity: Pit	port: N t unstal	N/A ble. Sid	ewall		
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)					DESCRI	IPT	ION					Instrument/	Backfill
-0 - - - -1 -		_	3 1 2 2	1.10-1.30 1.10-1.30		× × × × × × × × × × × × × × × × × × ×	51.21	1.10	H2 B2	F3 R1 W	1 TV0 TI		ly organic S	SILT.	Gravel	is suba	ngular	fine to			
- -2 -		<u></u>	∑ 33	2.20-2.40	l	× . ×	50.66	2.20	with fro Boulde	equent col rs are sub	bbles and rounded	d occasion to rounde	ubangular to al boulders. d. unded fine rounded.	. Cobl	bles are	subrou	nded to	o round	ed.		
-3			3 4 €	3.80-4.00					cobbles	. Cobbles	s are subi	rounded to	orounded.								
1 1 5 1 1 6 1 1 7 1 1 8 1 1 1 9 1 1 1 0						END	47.91	4.40													
<u> </u>	narks: N	/loder	ate inflow	of water at 1.	65m bgl	. TP bac	ckfilled v	vith arisi	ings.									Scale	:: 1:50		_
DAU	N.							Irisł	ı drill	ing L	TD							Ph. Fax			_

ROJECT: OCATION		_	n Wind Fa	rm					TRIALPIT: TPCC Sheet 1 of 1	C002
CLIENT: N NGINEER		CO						Co-ordinates: E 615,651.5 N 728,830.7	Rig: Hyundai Rev:	
GROUNDWATER Water strikes: 1st: dry 2nd: 3rd: PIT DIRECTION: 0° A Shoring Stability collapse					DATE: 25.10.23 Shoring/Support: N/A Stability: Pit unstable. Si collapse.	idewall				
LOGGED BY: DF LOGGED BY: DF C LOGGED BY: DF C DESCRIPTION DESCRIPTION DESCRIPTION			Instrument/							
	DESCRIPTION Sample									
	2 3 4 -	3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2.10-2.25 2.10-2.25		× 1/2 × 1/2 × 0 × × 1/2 × 0 × × 1/2 × 0 × × 1/2 × 0 × × 1/2 × 0 ×	48.45	2.05	Soft grey slightly gravelly sandy SILT with fib.	res.	
	_	∑ ³ 4	3.00-3.20		½ × × × × × × × × × × × × × × × × × × ×	47.10	3.40	2.80-3.40: becoming slightly gravelly.		= - - - - - -
0 cemarks:	Seepag with ar	ge of water	r at 1.00m bgl	. Seepag	e of wat	ter at 1.8	0m bgl.	Moderate inflow of water at 2.05m bgl. TP backf	illed Sca	
DANILIE							Irisł	drilling LTD	Ph. Fax	1:50

LO	CATION:	Co	_	n Wind Fa	rm							Sheet 1 of 1	TPCC003	
	IENT: M GINEER:		CO							ordinates: 5,854.1 N	728,234.2	Rig: Hyundai Rev:		
Grou	und level: 4 OUNDW/ er strikes: dry	8.20m ATE	1 O.D.		PIT DIRECTION: 90 PIT DIMENSION: 4.80m * 1.80 LOGGED BY: DF SPT					В	DATE: 26.10.23 Shoring/Suppo Stability: Pit st	rt: N/A table.		
Depth (m)	Date	LOGGED BY: DF LOGGED BY: DF DESCRIPTION						Instrument/ Backfill						
TRIALPIT LEMANAGHAN TPS FILE 1 NOV 3 2023.GPU ID GINT AGS 4 0 4.GDT 9/2/24		→	VANE B 2 3 VANE B 4	0.50 1.00-1.20 2.60-2.80 2.60-2.80 2.70 3.80-4.00	33mm vane 16 kN/m² 18 kN/m² 17 kN/m² 33mm vane 37 kN/m² 40 kN/m² 46 kN/m²	×°×× ×°× ×°× ×°× ×°× ×°× ×°× ×°	47.60 46.00 45.65	2.20 2.55 3.40	Spongy dark bro H6 B2 F2 R2 W	wn pseudo fib 1 TV0 TH0 A ULDERS. ightly gravelly	rous PEAT. 0. v sandy SILT with	shell fragments. ar BOULDERS. Bou	lders are up to	
-10			L											
Ren Ren	narks: H	leavy	inflow of	water at 3.40i	n bgl. TI	P backfi	lled with		drilling L	TD			Scale: 1:50 Ph. Fax	

LOC	CATION	: Co		n Wind Fa	rm							Sheet 1 of 1	PCC004	
	ENT: M GINEER:		CO							o-ordinates: 616,715.1 N	728,247.0	Rig: Hyundai Rev:		
GRO	ond level: 4 OUNDW: er strikes: dry	ATE				PIT	DIREC DIME GGED	NSION	V: 4.80m * 1	80 D	A B	,-	N/A ole.	
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)			DESCRI	PTION	Instrument/	
-0 -1 -1 -234567891 -0 Rem			B 1 D 4 VANE B 5 O 6	2.40-2.60 2.90-3.00 2.90-3.00 3.20 3.40-3.60 3.40-3.60	33mm vane 16 kN/m² 17 kN/m² 30 kN/m² 35 kN/m²	× × × × × × × × × × × × × × × × × × ×	45.43 45.28 43.78		Spongy dark H7 B1 F2 R3 Very soft yel Soft bluish g	brown pseudo fi W2 TV0 TH0 / W2 TV0 TH0 / W2 TV0 TH0 / W3 TV0 TH0 / W4 TV0 TH0 / W4 TV0 TH0 / W4 TV0 TH0 / W5 TV0 TH0 / W6 TV0 TV0 TH0 / W6 TV0 TV0 TV0 TV0 TV0 TV0 TV0 TV0 TV0 TV0	AO. LT with fibres and	ing organic material.		
-10 Rem	narks: ¹	ΓP dry	on excav	ation. TP back	cfilled wi	ith arisi	ngs.						Scale: 1:50	
Y Marie	5							Irisl	n drilling	LTD			Ph. Fax	_

	ROJECT:		_	n Wind Fa	rm				TRIALPI Sheet 1 o	
	LIENT: M		GO.						Co-ordinates: Rig: Hyu E 614,619.1 N 727,316.2 Rev:	ndai
	NGINEER: ound level: 5					<u> </u>			E 614,619.1 N 727,316.2 Rev:	(0.23
GI	ROUNDW. ter strikes: : dry l:	ATE				PIT I		NSION	: 90° A Shoring Stability collapse	/Support: N/A :: Pit unstable. Sidewall : from 2.90m bgl.
Depth (m)	Date	Water	Samples	Depth (m)	LOGGED BY: DF C SPT (N) GRAPH (M) O.D. O.D. DESCRIPTION Tests T					Instrument/
-0 - - - -1		Table of the bound of								
- - -2			2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2.20-2.40 2.20-2.40		<u> </u>	49.36	2.10	Spongy dark brown pseudo fibrous PEAT. H4 B2 F2 R2 W2 TV0 TH0 A0. 1.90: with tree trunks. Light grey fibrous sandy very silty GRAVEL with frequent co medium to coarse. Cobbles are angular to subangular.	bbles. Gravel is angular
-3 -3 -		<u>‡</u>	3 ³ ⁴	3.10-3.30			1	2.90	Damp light grey slightly sandy angular to subangular medium with frequent cobbles and occasional boulders. Cobbles are su subrounded. Boulders are angular of limestone. Boulders are a length.	bangular to
-4 - -						END	46.96	4.50	3.90-4.50: becoming dark grey.	
TRIALPIT LEMANAGHAN TPS FILE 1 NOV 3 2023.GPJ ID GINT AGS 4 0 4.GDT 9/2/24 S										
Re	emarks: S	l Slight i	inflow of	water at 3.50n	n bgl. TF	backfil	lled with	arisings		Scale:
TRIALF	Mula							Irisł	drilling LTD	1:50 Ph. Fax

Reed over plastic black amorphous PEAT. H8 B2 F1 R0 W TV0 TH0 A1. Spongy brown pseudo fibrous PEAT. H5 B2 F2 R1 W1 TV0 TH0 A0. Soft light grey slightly gravelly sandy SILT with occasional cobbles and decaying organic material. Gravel is angular fine to coarse. Cobbles are angular. Soft light grey slightly sandy gravelly SILT with occasional large boulders. Boulders are of limestone. Boulders are up to 1200mm in length. Wet grey slightly sandy angular to subangular fine to coarse GRAVEL with frequent.		OJECT:		_	n Wind Fa	rm						TRIALPIT: T Sheet 1 of 1	PCC006	
Ground level: 9a/17m G.D. GROUNDWATER Water strikes: Ist: dry 37d: DESCRIPTION PIT DIRECTION: 90° PIT DIR										I	7 354 5			
PIT DIRECTION: 90° PIT DIR										E 614,/33.2 N /2	1,354.5			
DESCRIPTION Section Part	GR Wate 1st: 2nd:	OUNDW. er strikes: dry	ATE	R		PIT DIMENSION: 4.40m * 1.80 DELOGGED BY: DF						N/A table. Sidewall		
48.77 1.40 Soft light grey slightly sandy gravelly SILT with occasional large boulders. Boulders are of limestone. Boulders are up to 1200mm in length. 130 1.60-1.80 1.60-1.	Depth (m)	Date	LOGGED BY: DF LOGGED BY: DF C DESCRIPTION Description						Instrument/					
A 5.2 0.65 HS B F 2 RI WI TVO THO AD. The state of the s	- 0		Reed over plastic black amorphous PEAT. H8 B2 F1 R0 W TV0 TH0 A1. Spongy brown pseudo fibrous PEAT. H5 B2 F2 R1 W1 TV0 TH0 A0. Soft light grey slightly gravelly sandy SILT with occasional cobbles and decaying											
Soft light grey slightly sandy gravelly SILT with occasional large boulders. Boulders are of limestone. Boulders are up to 1200mm in length. 47.67 2.50 Wet grey slightly sandy angular to subangular fine to coarse GRAVEL with frequent large boulders. Cobbles are angular to subangular. Boulders are of limestone. Boulders are up to 1000mm in length.	- -1		Reed over plastic black amorphous PEAT. H8 B2 F1 R0 W TV0 TH0 A1. Spongy brown pseudo fibrous PEAT. H5 B2 F2 R1 W1 TV0 TH0 A0. Soft light grey slightly gravelly sandy SILT with occasional cobbles and decaying organic material. Gravel is angular fine to coarse. Cobbles are angular.				I decaying							
47.67 2.50 Wet grey slightly sandy angular to subangular fine to coarse GRAVEL with frequent large boulders are up to 1000mm in length. END END Wet grey slightly sandy angular to subangular. Boulders are of limestone. Boulders are up to 1000mm in length.	- - -2		‡	3 3 4	1.60-1.80 1.60-1.80		**************************************		1.40	Soft light grey slightly sandy grave are of limestone. Boulders are up to	elly SILT with to 1200mm in	occasional large bould length.	ers. Boulders	
END END	-			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	2.80-3.00		× × × × × × × × × × × × × × × × × × ×	47.67		large boulders. Cobbles are angula	ar to subangula	ne to coarse GRAVEL var. Boulders are of limes	with frequent stone.	
Remarks: Ingress of water at 2.00m bgl. TP backfilled with arisings. Scale: 1:50 Ph. Ph.	-4 -4 -5 -6 -													
	Ren Karphi Lev	narks: I	ngress	of water	at 2.00m bgl.	TP back	filled w	ith arisir		n drilling I TD			1:50 Ph.	

LO CL		: Со КО	Offaly										726.4	1	Sheet	1 of 1		PCC	C007	
Gro GR	und level: 5 OUNDW. er strikes: dry	4.55n ATE	1 O.D.			PIT I	DIME	CTION NSION BY: DI	N: 4.50n	n * 1.80	D	A C	→	I	DATE:	24.10.23 oring/Sup bility: Pi	port:	N/A le.		
Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) In Situ Vane Tests		Elevation m O.D.	Depth (m)					DESCI	RIP	ΓΙΟΝ					Instrument/ Backfill
			VANE	0.50 0.80-1.00	33mm vane 12 kN/m² 14 kN/m²	2	52.55		Spongy	brown ps	eudo fibro	ous PEA								
10	narks: T	P dry	on excav	ation. TP back	cfilled w	ith arisi	ngs.											Sca		
	4							Irisł	n drill	ing L'	ГD							Ph. Fax	1:50	

LO	CATION:	Co		n Wind Fa	rm					Sheet 1 of 1	M001
	IENT: M GINEER:		CO						Co-ordinates: E 614,379.8 N 726,554.	Rig: Hyundai Rev:	
GR	ound level: 5 OUNDWA er strikes: dry	ATE			PIT DIRECTION: 90° PIT DIMENSION: 4.60m * 1.80 LOGGED BY: DF SPT (N) In Situ Vane C DES				: 4.60m * 1.80 D	DATE: 24.10.23 Shoring/Support: N/A Stability: Pit stable.	
Depth (m)	Date	Water	Samples	Depth (m)	(N) In Situ	LEGEND	Elevation m O.D.	Depth (m)	DES	SCRIPTION	Instrument/ Backfill
-0 -1 -112 -2	DESCRIPTION VANE VANE 0.50 VANE 0.50 Spongy orangish brown pseudo fibrous PEAT. H4 B2 F3 R2 W1 TV0 TH0 A0. Spongy orangish brown pseudo fibrous PEAT. H4 B2 F3 R2 W1 TV0 TH0 A0.										
-3 -			VANE	2.20	vane 70 kN/m² 72 kN/m² 73 kN/m²	 		3.70	are rounded.		obbles
TRIALPIT LEMANAGHAN TPS FILE 1 NOV 3 2023,GPJ ID GINT AGS 4 0 4,GDT 9/224	nauka. S	- ₩	5 5	3.80-4.00 3.80-4.00		END	46.44	4.50	Stiff brown and grey slightly sandy lamin		
Ken Ken	narks: S	iight i	iniiow of	water at 5.50n	n ogl. TF	- packfil	ned with		drilling LTD	Ph. Fax	ale: 1:50



Appendix 02A Groundwater Readings

IRISH DRILLING LTD. Loughrea Co. Galway	Contract: Lemanaghan Wind F	arm Phase 3		
Tel: (091) 841274 Fax: (091) 847687	Date: Tested by:	09/02/2024 DF	Sheet No. Checked:	RK

Water Levels in Standpipes

Date

Boreholes	08/02/2024	Remarks
BP 1	1.48m	50mm standpipe
SS 1	1.52m	50mm standpipe
SS 3	1.10m	50mm standpipe
T 01	0.15m	50mm standpipe
T 03	1.25m	50mm standpipe
T 06	0.43m	50mm standpipe
T 12	1.30m	50mm standpipe
T 15	0.92m	50mm standpipe

Remarks:

All readings record depth from ground level to top of water level.



Appendix 03 Laboratory Test Results

	2023OY108
Project Name	Lemanaghan Wind Farm
	2023OY108_1,2,3

Client	
Due Date	06/11/2023 15:11
Scheduled Date	06/11/2023 15:11

Remarks hydrometer to be undertaken ONLY if the PSD shows >15%

ar Pyknometer Pyknometer		Awaiming Tressure 18st about 18st	tti	Natural water content of rock sample	Nater absorption	Aagnesium sulphate soundness	.os Angeles abrasion sub'd code
Cocation	ure Condition Value lensity/moisture content relationship lensity/moisture content relationship lensity may be a manage of the management of the management lensity le	ve	a) Rock	ontent of rock sample	absorption	ium sulphate soundness	les abrasion
Cocation Cocation	ure Condition Value lensity/moisture content relationship lensity/moisture content relationship lensity may be a manage of the management of the management lensity le	Abreming Pressure 1951 Abvening Pressure 1951 Small Direct Shearbox Ring shear Test Trexial Quick Undrained Specify Cell Pressure) Triexial UV Multi Specimen Consolidated Drained Triexial Test Consolidated Undrained Triexial Test Consolidated Undrained Triexial Test Consolidated Drained Triexial Test Consolidated Drained Triexial Test Consolidated Undrained Triexial Test Consolidated Undrained Triexial Test Consolidated Undrained Triexial Test Consolidated Drained Triexial Test Consolidated Drained Triexial Test Consolidated Drained Triexial Test Consolidated Drained Triexial Test Consolidated Triexial Test Consolidated Drained Triexial Test Consolidated Test Consolidated Triexial Test Consolidated Triexial Test Consolidated Test Consolidated Test Consolidated Test Consolidated Triexial Test Consolidated Test Consolidated Test Consolidated Test Consolidated Test Consolidated Test Consolidated Test Consolidated Test Consolidated Test Consolidated Test Consolid	axial Multis	ontent of rock sample	absorption	ium sulphate soundness	les abrasion
BHBP1 0.00 1.50 C 14/11/23 Image: Control of the control of the	Moisture Condition Value Dry density/moisture content relations! CBR Consolidation A B B B B B B B B B B B B B B B B B B	Sweming Pressure 1 test Aboundon Yanarbox Ring shear Test Triexial Oulok Undrained Specify Cell Pressure) Triexial UMulti Stage Triexial UMulti Specimen Consolidated Drained Triexial Test Consolidated Undrained Triexial Test	Consolidated Undrained Triaxial Multis Rock Uniaxial compression Point Load	tural water content of rock sample ke durability	absorption	ium sulphate soundness	les abrasion
BHBP1 1.50 2.50 C 14/11/23				Nai Sla	Water	Magnes	Los Angele Sub'd code
BHBP1 2.50 4.10 C 14/11/23							
BHBP1 4.10 5.50 C 14/11/23			1				
			1 1				
BHBP1 5.50 7.10 C 14/11/23			1				
BHBP1 7.10 8.50 C 14/11/23							
BHSS1 7.10 8.60 C 7.1-8.6 08/11/23 als sent 25.01.24							ALS 240126-71
BHSS1 0.00 3.00 C 08/11/23							
BHSS1 3.00 5.60 C 08/11/23							
BHSS1 5.60 7.10 C 08/11/23							
BHSS1 7.10 8.60 C 08/11/23 1 1							
BHSS1 8.60 10.10 C 08/11/23							
BHSS1 10.10 11.60 C 08/11/23							
BHSS1 11.60 13.10 C 08/11/23							
BHSS1 13.10 14.60 C 08/11/23							
BHSS2 0.00 4.00 C 24/11/23							
BHSS2 4.00 5.60 C 24/11/23							
BHSS2 5.60 7.10 C 24/11/23							
BHSS2 7.10 8.60 C 24/11/23							
BHSS2 8.60 10.10 C 24/11/23		 					
BHSS2 10.10 11.60 C 24/11/23	 	 					
BHSS3 0.00 5.00 C 13/11/23	 	 	+++			\vdash	
BHSS3 5.00 7.10 C 13/11/23	 	 				\vdash	
BHSS 7.10 8.60 C 13/11/23	 	 				\vdash	
BHSS3 8.60 10.10 C 13/11/23	 	 					
BHSS3 10.10 11.60 C 13/11/23	 	 	1				
BHSS3 11.60 13.10 C 13/11/23	 	 	1 1				
BHSS3 13.10 14.60 C 13/11/23	 	 	1				
BHSS4 0.00 5.00 C 13/11/23							
BHSS4 5.00 7.10 C 13/11/23	 	 					
BHSS4 7.10 8.60 C 13/11/23	 		1 1 1				

Project ID	2023OY108
Project Name	Lemanaghan Wind Farm
Schedule ID	2023OY108 1.2.3

Remarks hydrometer to be undertaken ONLY if the PSD shows >15%

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	1	Sample D	Details	1		1		Clas	sification				Che	emica	al / C	oncr	ete		Cor	npacti		Comp	ressil	oilit	Stre	ngth	(Tota	1) :	Stres	s)	Rock	Oth	her					
Location	Depth (m)	Base Depth	Sample Type	Sample Ref	Date Sampled	Storage	Moisture Content	Atterberg 4 Point	Particle Density by Gas Jar	Particle Defisity by Small Pykholneter Particle Size Distribution	Hydrometer	Organic Content	Loss On Ignition	BRE SD1 (Suite B)	Sulphate Water Gravimetric	Carbonate Titration	Chloride Content	Chloride Content Acid	Compaction Heavy	Condition	Dry density/moisture content relationsl	CBR	Consolidation s a n s s a A	Swelling Pressure Test aboratory Vane test	Small Direct Shearbox	Ring shear Test Triaxial Quick Undrained	(Specify Cell Pressure)	Triaxial UU Multi Specimen	Consolidated Undrained Triaxial Test	Consolidated Undrained Triaxial Multi Rock Uniavial compression	Point Load	Natural water content of rock sample		Slake durability	Water absorption	Magnesium sulphate soundness	Los Angeles abrasion	gub'd code
BHSS4	8.60	10.10	С		13/11/23																																	
BHSS4	10.10	11.60	С		13/11/23																																	
BHSS4	11.60	13.10	С		13/11/23																																	
BHSS4	13.10	14.60	С		13/11/23																																	
BHT01	4.10	5.60	С	4.1-5.6	22/11/23	als sent	25.01	.24				1		1			1																					ALS 240126-71
BHT01	0.00	3.00	С		22/11/23																																	
BHT01	3.00	4.10	С		22/11/23																																	
BHT01	4.10	5.60	С		22/11/23		1	1																														
BHT01	5.60	6.60	С		22/11/23																																	
BHT01	6.60	7.00	С		22/11/23																																	
BHT01	7.00	8.60	С		22/11/23																																	
BHT01	8.60	10.20	С		22/11/23																																	
BHT03	7.10	8.60	С	7.1-8.6	20/11/23	als sent	25.01	.24				1		1			1																					ALS 240126-71
BHT03	0.00	3.00	С		20/11/23																																	
BHT03	3.00	5.60	С		20/11/23																																	
BHT03	5.60	7.10	С		20/11/23																																	
BHT03	7.10	8.60	С		20/11/23		1	1																														
BHT03	8.60	10.10	С		20/11/23																																	
BHT03	10.10	11.60	С		20/11/23																																	
BHT03	11.60	13.10	С		20/11/23														П						П				\prod									
BHT03	13.10	14.60	С		20/11/23													П																				
BHT03	14.60	16.10	С		20/11/23													П																				
BHT03	16.10	17.60	С		20/11/23														\prod														Ì					
BHT03	17.60	19.20	С		20/11/23																																	
BHT06	5.60	7.10	С	5.6-7.1	17/11/23	als sent	25.01	.24				1		1			1	П																				ALS 240126-71
BHT06	0.00	3.00	С		17/11/23														П						П				\prod									
BHT06	3.00	4.10	С		17/11/23													П																				
BHT06	4.10	5.60	С		17/11/23																																	
BHT06	5.60	7.10	С		17/11/23		1	1											П						Ħ				\prod									

Project ID	2023OY108
	Lemanaghan Wind Farm
Schedule ID	2023OY108_1,2,3

Remarks hydrometer to be undertaken ONLY if the PSD shows >15%

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		Sample D	etails					Clas	sificat	on			Che	emica	I / Co	oncr	ete		Con	npact	ion	Comp	ressi	bilit	Stre	ngth	(Tota	al)	Stre		Ro	ck	Othe	er	_				
Location	Depth (m)	Base Depth	Sample Type	Sample Ref	Date Sampled	Storage	Moisture Content	Atterberg 4 Point	Particle Density by Gas Jar	Particle Density by Small Pyknometer Particle Size Distribution	Hydrometer	Organic Content	Loss On Ignition	BRE SD1 (Suite B)	Sulphate Water Gravimetric	ph	Chloride Content	Chloride Content Acid	Compaction Heavy	Moisture Condition Value	Dry density/moisture content relationsl	CBR	Consolidation s a n s s a d	Swelling Pressure Test	Small Direct Shearbox	Ring shear Test Triaxial Quick Undrained	(Specify Cell Pressure)	Triaxial UU Multi Specimen	Consolidated Drained Triaxial Test	Consolidated Undrained Triaxial Multis	Rock Uniaxial compression	Point Load	Natural water content of rock sample	Slake durability	Water absorption	Magnesium sulphate soundness	Los Angeles abrasion	poo p,qnS	
BHT06	7.10	8.60	С		17/11/23																									11				<u> </u>		₩			
BHT06	8.60	10.10	С		17/11/23														Ш						$\perp \downarrow$					\perp				<u> </u>		Щ.			
BHT06	10.10	11.60	С		17/11/23													Ш	Ш								Ш			Ш						Щ.			
BHT06	11.60	13.10	С		17/11/23														Ш															<u> </u>		Щ			
BHT06	13.10	14.20	С		17/11/23														Ш											Ш									
BHT06	14.20	15.20	С		17/11/23																															<u> </u>			
BHT06	15.20	16.10	С		17/11/23																																		
BHT06	16.10	17.60	С		17/11/23																																		
BHT06	17.60	19.10	С		17/11/23																																		
BHT12	0.00	3.00	С		16/11/23																																		
BHT12	3.00	4.10	С		16/11/23																																		
BHT12	4.10	5.60	С		16/11/23																																		
BHT12	5.60	7.10	С		16/11/23																																		
BHT12	7.10	8.10	С		16/11/23																																		
BHT12	8.10	9.70	С		16/11/23																											1							
BHT12	9.70	11.30	С		16/11/23													Ħ							Ħ		Ħ			Ħ	1	1				1			
BHT12	11.30	12.90	С		16/11/23					1	1					1		Ħ	Ħ		İ			Ħ				$\dagger \dagger$		Ħ		1				t			
BHT15	5.60	7.10	С	5.6-7.1	15/11/23	als sent	25.01	.24		1	T	1		1		T	1	tt	Ħ			1		H	$\dagger \dagger$		h	$\dagger \dagger$	1	$\dagger \dagger$					1	†		ALS 2401	26-71
BHT15	0.00	4.50	C		15/11/23						T					T		Ħ	Ħ			1		H	Ħ		Ħ	$\dagger \dagger$		T						1			
BHT15	4.50	5.60	С		15/11/23													П	\sqcap				T		\Box			Ħ	T										
BHT15	5.60	7.10	С		15/11/23		1	1		1	1																												
BHT15	7.10	8.60	С		15/11/23																																		
BHT15	8.60	9.80	С		15/11/23																																		
BHT15	9.80	11.40	С		15/11/23																									Ш									

Project ID	2023OY108
Project Name	Lemanaghan Wind Farm
Schedule ID	2023OY108 1,2,3

Remarks hydrometer to be undertaken ONLY if the PSD shows >15%

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	1	Sample D	Details	ı	1			Clas	sification				Che	emica	I / Co	oncre	ete		Cor	npact	-		press	bilit	Str	engt	th (To	otal)	St	ress)	R	ock	Oth	er						_
Location	Depth (m)	Base Depth	Sample Type	Sample Ref	Date Sampled	Storage	Moisture Content	Atterberg 4 Point	Particle Density by Gas Jar Particle Density by Small Pyknometer	Particle Size Distribution	Hydrometer	Organic Content	Loss On Ignition	BRE SD1 (Suite B)	Sulphate Water Gravimetric	ph	Chloride Content	Chloride Content Acid Compaction Light	Compaction Heavy	y nammy Value	ty/moistur	CBR	Consolidation	0	Laboratory Vane test Small Direct Shearbox	Ring shear Test	I riaxial Quick Undrained (Specify Cell Pressure)	Triaxial UU Multi Stage	Consolidated Drained Triaxial Test	Consolidated Undrained Triaxial Test Consolidated Undrained Triaxial Multi	Rock Uniaxial compression	Point Load	Natural water content of rock sample	Slake durability	Water absorption	-	Magnesium sulphate soundness	Los Angeles abrasion	opo p.qnc	
BHT15	11.40	12.40	С		15/11/23																																			_
BHT15	12.40	13.60	С		15/11/23					1					$\vdash \vdash$	-			+		1		Н	\sqcup	-	Н			+							-	-			_
BHT15	13.60	14.60	С		15/11/23					+	-	1	1		$\vdash \vdash$	+		H	+	+	-	-	₩	+	+	\vdash	-	\vdash	+	+	<u> </u>		0	0	0		0	0		-
Combined Roo Combined Roo		+								+	-	-	-		H	-		H	H	+	╁	\vdash	\vdash	+	+	H	-	H	+	+	<u> </u>		0	0	0	_	0	0		_
TPB001	1.00	1.20	В	1	25/10/22		1	1	_	1	1	1			\vdash	-		\vdash	+	+	+	1	\forall	+	+	H		\vdash	+	+			U	U	U		U	U		\dashv
TPB001	1.00	1.20	D D	2	25/10/23 25/10/23			•							\vdash	-		\vdash	H	+	+	1	H	+	+	H		\vdash	+	+					-		+	_		\dashv
TPB001	2.00	2.20	В	3	25/10/23					+					H	+		\vdash	H		+		H	+		H		\vdash	+	+					-	+	+			\dashv
TPB001	2.00	2.20	D	4	25/10/23					t	1	1			H	+		H	Ħ	+	+	\vdash	Ħ	H	+	H	-	H	+	\dashv	<u> </u>				1	+	\dashv	_		-
TPB001	3.20	3.40	В	5	25/10/23		1			1	1				H	+		H	Ħ	+	1		tt	H	+	H	+	H	+	+	 			 	1	+	\dashv			\dashv
TPB002	0.80	1.00	В	1	25/10/23		1			1	1				${\mathsf H}{\mathsf T}$	-		\vdash	$\dagger\dagger$			0*	$\dag \dag$	$\dagger \dagger$		H		+	$\dagger \dagger$	+						+	+			\dashv
TPB003	0.40	0.60	В	1	25/10/23		1	1		1	1	1						\vdash	Ħ		1	Ť	tt	Ħ		Ħ			$\dagger \dagger$								1			\dashv
TPB003	0.40	0.60	D	2	25/10/23										tt	\top		H	Ħ	\dagger	T		tt	Ħ	\top	Ħ		H	$\dagger \dagger$	\top			t		+	\dagger	\dashv	1		\exists
TPB003	1.20	1.40	В	3	25/10/23		1			1	1	t			tt	\top		H	Ħ	\dagger	1		tt	Ħ	\top	Ħ		H	$\dagger \dagger$	\top			t		+	\dagger	\dashv	1		\dashv
TPB003	1.20	1.40	В	4	25/10/23													Ħ	ff	1			Ħ	T	1	Ħ		Ħ	$\dagger \dagger$	1						t	1			ヿ
TPB004	0.40	0.60	В	1	25/10/23		1	1		1		l			\sqcap				Ħ		1		\sqcap	Ħ		Ħ			T	1	Ì					T				
TPB004	0.40	0.60	D	2	25/10/23					1		l			\sqcap				Ħ		1		\sqcap	Ħ		Ħ			T	1	Ì					T				\exists
TPB005	0.60	0.80	В	1	25/10/23		1	1		1	1	1														Ħ			T											コ
TPB005	0.60	0.80	D	2	25/10/23											1			Ħ		1		Ħ	Ħ		Ħ			$\dagger \dagger$											\neg
TPB005	1.80	2.00	В	3	25/10/23		1			1	1				Ħ				Ħ		1	1	П			Ħ														
TPB006	0.70	0.90	В	1	24/10/23		1			1	1				Ħ			H	\sqcap	1	1		\sqcap	Ħ		Ħ		H	T	1			İ			T	1			\neg
TPB006	2.00	2.20	В	2	24/10/23		1			1	1				Πİ				\sqcap				Ħ	\Box		П				1						T	1			ᆿ
TPB007	0.70	0.90	В	1	24/10/23										Πİ				\sqcap	1	1	1	П	\Box		П				1						T	1			
TPB007	2.10	2.30	В	2	24/10/23		1			1	1												П			П										T				
TPB007	3.10	3.30	В	3	24/10/23														Ħ							П														
TPB008	0.60	0.80	В	1	26/10/23																					П														
TPB008	1.60	1.80	В	2	26/10/23		1			1	0*								Ħ	1	1	1	П			П														
TPB008	3.40	3.60	В	3	26/10/23														П																					\exists
TPCC001	1.10	1.30	В	1	25/10/23		1	1																																コ

Project ID	2023OY108
Project Name	Lemanaghan Wind Farm
Schedule ID	2023OY108_1,2,3

Client	MKO
Due Date	06/11/2023 15:11
Scheduled Date	06/11/2023 15:11

Remarks hydrometer to be undertaken ONLY if the PSD shows >15%

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		Sample [Details	ı	1			Clas	sificatio				Che	mica	I / Co	ncre	ete	- (Com	pactio		Compr	essib	ilit	Stren	gth (Total) S	tress)) R	ock	Oth	er	1			
Location	Depth (m)	Base Depth	Sample Type	Sample Ref	Date Sampled	Storage	Moisture Content	Atterberg 4 Point	Particle Density by Gas Jar	Particle Size Distribution	Hydrometer	Organic Content	Loss On Ignition	BRE SD1 (Suite B)	Sulphate Water Gravimetric Carbonate Titration	ph	Chloride Content	Compaction Light	Compaction Heavy Compaction Vibrating Hammer	Moisture Condition Value	Dry density/moisture content relations	CBR	P re s s ur e s	Swelling Pressure Lest Laboratory Vane test	Small Direct Shearbox Ring shear Test	Triaxial Quick Undrained	(Specify Cell Pressure) Triaxial UU Multi Stage	Triaxial UU Multi Specimen Consolidated Drained Triaxial Test	Consolidated Undrained Triaxial Test	Rock Uniaxial compression	Point Load	Natural water content of rock sample	Slake durability	Water absorption	Magnesium sulphate soundness	Los Angeles abrasion	Sub'd code
TPCC001	1.10	1.30	D	2	25/10/23											-		-					\perp			+	+										
TPCC001	2.20	2.40	В	3	25/10/23					-	-				\vdash	-		+	+					+	\vdash	+	+	-	H	-	1						
TPCC001	3.80	4.00	В	4	25/10/23					-					H	-		+	-				++	-	-	++	+	-	H	-							
TPCC002	0.50	0.70	В	1	25/10/23		4	4								-		+								++											
TPCC002	2.10	2.25	В	2	25/10/23		1	1	-						\vdash	-		+	-					\perp	\vdash	+	+			_							
TPCC002	2.10	2.25	D	3	25/10/23											-		+	-			-			H	+	+	-	H	-							
TPCC002	3.00	3.20	В	4	25/10/23		1	1		-						-		+	-					\perp	-	+	+	-	Н	-							
TPCC003	1.00	1.20	В	1	26/10/23											-		+	-			-			H	+	+	-	H	-							
TPCC003	2.60	2.80	В	2	26/10/23		1	1		_																11				_							
TPCC003	2.60	2.80	D	3	26/10/23					_																11				_							
TPCC003	3.80	4.00	В	4	26/10/23													11								11											
TPCC004	0.40	0.60	В	1	26/10/23													Ш								\sqcup											
TPCC004	2.40	2.60	В	2	26/10/23													\sqcup								Ш				<u> </u>							
TPCC004	2.90	3.00	В	3	26/10/23													Ш								\sqcup											
TPCC004	2.90	3.00	D	4	26/10/23													\sqcup								Ш				<u> </u>							
TPCC004	3.40	3.60	В	5	26/10/23		1	1																													
TPCC004	3.40	3.60	D	6	26/10/23																					Ш											
TPCC005	1.30	1.50	В	1	24/10/23													Ш																			
TPCC005	2.20	2.40	В	2	24/10/23		1	1										Ш																			
TPCC005	2.20	2.40	D	3	24/10/23																																
TPCC005	3.10	3.30	В	4	24/10/23																																
TPCC006	0.70	0.90	В	1	24/10/23		1	1																													
TPCC006	0.70	0.90	D	2	24/10/23																																
TPCC006	1.60	1.80	В	3	24/10/23		1	1																													
TPCC006	1.60	1.80	D	4	24/10/23																																
TPCC006	2.80	3.00	В	5	24/10/23																					\sqcap											
TPCC007	0.80	1.00	В	1	24/10/23																																
TPCC007	3.00	3.20	В	2	24/10/23																					\sqcap											

Project ID	2023OY108
Project Name	Lemanaghan Wind Farm
Schedule ID	2023OY108 1.2.3

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Turnaround

		Sample [Details					Clas	sificat	ion			C	hemi	ical /	Cond	crete		Co	ompa	ction	Ço.	mpre	ssibili	S	trenç	gth (T	otal)	(Stregt Effective Stress	ti	Rock	< C	Other								
Location	Depth (m)	Base Depth	Sample Type	Sample Ref	Date Sampled	Storage	Moisture Content	Atterberg 4 Point	Particle Density by Gas Jar	Particle Density by Small Pyknometer	Particle Size Distribution	nyarorineter	Organic Content	Eoss On Ignition	BRE 3D (Suite B) Sulphate Water Gravimetric	Carbonate Titration	ph Chloride Content	Chloride Content Acid	Compaction Light Compaction Heavy	on Vibrati	Moisture Condition value	Diy density/moistale content relations	Consolidation	s a n s s a d Swelling Pressure Test	Laboratory Vane test	Small Direct Shearbox Ring shear Test	Triaxial Quick Undrained	Triaxial UU Multi Stage	Triaxial UU Multi Specimen Consolidated Drained Triaxial Test	Consolidated Undrained Triaxial Test	Consolidated Undrained Triaxial Multis	₫ .		Natural water content of rock sample	Slake durability	Water absorption	Magnesium sulphate soundness	Los Angeles abrasion		apos p.q.s	ano a cone	
TPMM001	1.00	1.20	В	1	24/10/23																																					
TPMM001	2.10	2.30	В	2	24/10/23		1	1																																		
TPMM001	2.10	2.30	D	3	24/10/23																																					
TPMM001	3.80	4.00	В	4	24/10/23		1	1																																		
TPMM001	3.80	4.00	D	5	24/10/23																																					
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		1			1		-					_	_	_	_	\vdash	_	\perp		\vdash	_	_	_	lacksquare	\sqcup		lacksquare	\bot		\bot		_					<u> </u>	₩				
	_	1			1		-			-	-	-	-	-	-	\vdash	-	\dashv	-	\vdash	+	+	+	₩	\vdash	-	\vdash	+	-	+	-	-					-	+	1		—	_
	Tests sche	duled:		<u> </u>	 		27	19	0	0 1	2 1	1	7	0 !	5 0) ()	O 5	5 0	0.0	0 :	3 5	5 :	3 0	0.0	0	0 0	0 0) ()	0 0) ()	0 3	3	9	2	2	2	2	2		()	
	Tests comple		e:		08/02/24		27	19	0	0 1	2 1	1	7	_	5 0	0	0 5		0 0	-	3 5	5 3	3 0	0 0	0			0 (0 0		0 3	-	9	0	0	0	0	0				
	In progress						0	0			0	0	0	(0		C)																2	2	2	2	2				

Combined Sample 1: BP BH1: 1.7-4.1m, BP SS1: 11.0-14.6m,
Combined Sample 2: BH SS3: 10.9-14.6, BHT15: 9.0-14.6m, BH T12: 8.1-12.9m

DRILLING **Summary of Classification Test Results** Project Name Project No. 2023OY108 Lemanaghan Wind Farm Sample Density LL PL Ы Particle Passino 425µm bulk dry density Hole No. Soil Description Remarks Ref Top Base Туре % % % Mg/m3 Mg/m3 % % Core: Dark grey peaty very clayey BHSS1 С 41 24 17 CI 7.10 8.60 52.0 56 medium GRAVEL. Core: Dark grey peaty gravelly BHT01 С 41.0 16 CI 4.10 5.60 83 36 20 CLAY. Core: Grey slightly gravelly sandy BHT03 7.10 8.60 С 12.0 99 28 17 11 CL CLAY. Core: Dark grey slightly gravelly BHT06 5.60 7.10 С 17.0 99 34 18 16 CL sandy CLAY. BHT15 5.60 7.10 С Core: Grey slightly sandy CLAY. 16.0 98 29 20 9 CL Greenish-grey slightly sandy TPB001 1.00 1.20 В 29.0 99 42 22 20 CI Light grey very gravelly very silty TPB001 5 3.20 3.40 В 96 57 medium SAND Brownish-grey very silty very TPB002 1 0.80 1.00 В 18.0 34 sandy coarse GRAVEL. TPB003 В CI 1 0.40 0.60 Grenish-grey slightly sandy CLAY 40.0 98 48 25 23 Grey Grey silty very sandy coarse TPB003 3 1.20 1.40 В 8.8 32 GRAVEL. Light greyish-brown slightly sandy TPB004 CL 1 0.40 0.60 В 23.0 60 33 21 12 gravelly SILT. CI TPB005 В 27 0.60 0.80 Grey slightly sandy clayey SILT. 35.0 98 49 22 1 Light grey silty very sandy coarse **TPB005** В 3 1.80 2 00 28 90 GRAVEL Brownish-grey silty SAND and **TPB006** В 0.70 0.90 10.0 40 1 GRAVEL. **TPB006** Grey silty SAND and GRAVEL. 2 В 2.00 2.20 37 6.8 Light greyish-brown silty SAND **TPB007** 0.70 0.90 В 11.0 1 and GRAVEL. Light greyish-brown silty very **TPB007** 2 В 10.0 2.10 2.30 31 sandy coarse GRAVEL. Dark grey silty medium SAND and TPB008 2 1.80 В 1.60 6.1 24 coarse GRAVEL Greenish-grey slighlty sandy TPCC001 1.10 1.30 В 19.0 54 31 21 10 CL 1 gravelly SILT. Dark grey slightly gravelly sandy TPCC002 2 2.10 2.25 В 62.0 99 65 30 35 СН SILT. Light grey slightly gravelly sandy TPCC002 В ИL 4 3.00 3.20 23.0 96 21 15 6 SILT.

All tests performed in accordance with BS1377:1990 unless specified otherwise

В

В

В

В

В

2.80

3.60

2.40

0.90

1.80

TPCC003

TPCC004

TPCC005

TPCC006

TPCC006

2

5

2

3

2.60

3.40

2.20

0.70

1.60

ı	Key	w = water content, LL = Liquid Lin	mit, PL = Plastic Limit, PI = Plasti	city Index	Date Printed	Approved By	Table	
		Density test	Liquid Limit	Particle density				1
ı		Linear measurement unless :	4pt cone unless :	sp - small pyknometer	08/02/2024 08:59	k		1
ı		wd - water displacement	1pt - single point test	gj - gas jar			sheet	
ı		wi - immersion in water	NP - Non Plastic		QC From No: R1			1

16.0

20.0

18.0

45.0

16.0

90

100

72

100

93

25

32

28

45

20

17 8

17 15

18 10

22 23

15 5

CL

CL

CL

CI

ML

Dark grey slightly gravelly sandy

Grey very silty coarse GRAVEL.

Grey slightly gravelly sandy SILT.

Grey slightly sandy gravelly SILT.

Dark grey sandy SILT.

SILT.

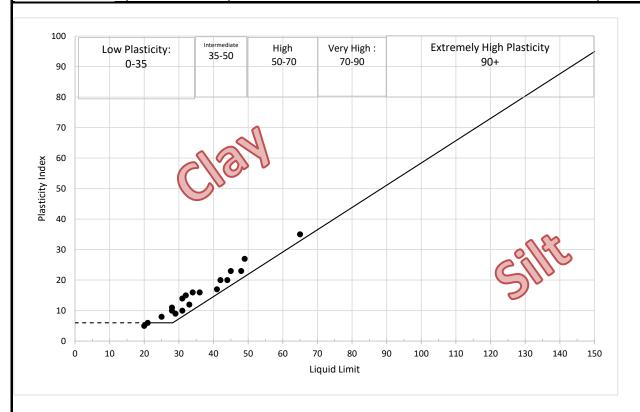
ASH	DRIL	LING.				Summary	of Cla	ass	ificat	ion T	est R	esu	ılts			
Project N	lo. 2023OY10		Project	Name			Lema	ınagh	an Win	d Farm						
Hole N	lo.	Samı	ole			Soil Description	Dens bulk	ity dry	W	Passing 425µm	LL	PL	PI	Particle density	F	Remarks
1101011	Ref	Тор	Base	Туре		Con Becompact	Mg/n		%	%	%	%	%	Mg/m3		tomano
TPMM0	01 2	2.10	2.30	В		Grey slightly gravelly sandy SILT			21.0	99	31	17	14		CL	
TPMM0	01 4	3.80	4.00	В		Dark brownish-grey sandy CLAY			31.0	100	44 -1pt	24	20		CI	
																_
																_
All tests	performed ir	ı accordan	ce with E	3S1377	7:1990	unless specified otherwi	se									
		tent, LL =	Liquid Li			astic Limit, PI = Plasticity			Date F	Printed		Appr	oved	Ву	Table	
Lir	ensity test near measureme I - water displace			Liquid I 4pt con 1pt - sir	e unles	s: sp-	icle density small pyknon gas jar	neter)2/2024		Y	sC	Ь	sheet	1
wi	- immersion in	water		NP - No	on Plast	ic			QC F	rom No	: R1					2



Plasticity (A-Line) Chart	Project Number
Lemanaghan Wind Farm	

Project Name: Lemanaghan Wind Farm
Location:

2023OY108



Abreviations in the remarks column of the Classification Summary Sheet: C = Clay, M = Silt

Plasticity abeviations: L = Low, I = Intermediate = H = High, V = Very High, E = Extremely High.

The letter O is added to the symbol of any material containing a significant proportion of organic material.

Chart taken from BS5930: 2010

SH DRIL	IN	P	ARTICL	E SIZ	E D	ISTR	IBU	TION	1		Job Ref	e/Pit No.				B00 ²	
Site Name	E D	Lemanagha	n Wind Fa	ırm							Sample					1	
Soil Description Specimen	on	Greenish-grey	/ slightly sa	Specim		<u> </u>					Depth, r				1	1.00	
Reference				Depth	CII					m	Sample	Туре				В	
Test Method		BS1377:Part	2:1990, cla	uses 9.2	and 9	9.5					KeyLAB	3 ID		I	DL120	02311	061
CLAY	/ Fir	SILT ne Medium	Coarse	Fine	<u> </u>	SAND		Coarse	. Fine	e	GRAVEL Medium	Coars	e	COBBLES	6 6	BOULD	ERS
100						<u></u>					TITI T	1 1					
90																	
80		 															
70																	
60																	
50																	
50 40																	
30	+																
20	+																
10																	
					i li												
0.001		0.01		0.1		Dr	orticle	1	mm		10			100			10
0.001		0.01		Sedin	nenta		article	1 Size	mm	rv M		mple. a		100		620	10
	Size							1 Size		ry M	10	mple, g		100		620	10
0.001	Size	ving T	0.	Sedin cle Size mm 0630		ation % Pass 95	sing	1 Size	Dı Sampl	e Pr	lass of sa			100		Iry ma	
0.001 Particle mm	Size	wing % Passing 100	0.000 0.000	Sedin cle Size mm 0630 0565		95 90 90	sing	1 Size	Sample Very co Gravel	e Pr	lass of sa			100		Iry ma	
0.001 Particle	Size	w ing % Passing	0.0 0.0 0.0 0.0	Sedin cle Size mm 0630 0565		ation % Pass 95 90	sing	1 Size	Dı Sampl ı Very co	e Pr	lass of sa			100		Iry ma	
0.001 Particle mm 75 63 50 37.	Size n	% Passing 100 100 100 100	0.0 0.0 0.0 0.0 0.0	Sedin cle Size mm 0630 0565 0400 0284 0201 0144		### ##################################	sing	1 Size	Sample Very co Gravel Sand	e Pr	lass of sa			100		0 0 5	
0.001 Particle mm 75 63 50 37 28	s Size	% Passing 100 100 100 100 100 100 100	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075		95 90 90 85 75 70 65	sing	1 Size	Sample Very co Gravel Sand Silt Clay	e Pre	lass of sa			100		0 0 5 53	
0.001 Particle mm 75 63 50 37.:	s Size	% Passing 100 100 100 100 100 100	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053		95 90 90 85 75 70 65	sing	1 Size	Sample Very co Gravel Sand Silt Clay	e Pre	oportions	r	nm	100	% d	0 0 5 53 41	SS
0.001 Particle mm 75 63 50 37. 28 20 14 10 6.3	s Size n	% Passing 100 100 100 100 100 100 100 100 100 1	r 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053 0038 0027		95 90 90 85 75 70 65 60 55	sing	1 Size	Sample Very co Gravel Sand Silt Clay Gradin D100 D60 D30	e Pre	oportions	1	nm nm	100	% d	0 0 5 53	SS
0.001 Particle mm 75 63 50 37.4 28 20 14	s Size n	% Passing 100 100 100 100 100 100 100 100 100 1	r 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053		95 90 90 85 75 70 65 60 55	sing	1 Size	Sample Very co Gravel Sand Silt Clay Gradin D100 D60 D30 D10 Uniforn	e Proparse	oportions e nalysis	1 1 1	nm nm	100	% d	0 0 5 53 41	SS
0.001 Particle mm 75 63 50 37.3 28 20 14 10 6.3 5 3.33	Size n	% Passing 100 100 100 100 100 100 100 100 100 1	r 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053 0038 0027		95 90 90 85 75 70 65 60 55	sing	1 Size	Sample Very co Gravel Sand Silt Clay Gradin D100 D60 D30 D10 Uniforn	e Proparse	oportions a nalysis	1 1 1	nm nm	100	% d	0 0 5 53 41	SS
0.001 Particle mm 75 63 50 37.: 28 20 14 10 6.3 5 3.33 2 1.1: 0.6	Size n	100 100 100 100 100 100 100 100 100 100	r 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053 0038 0027 0016	y (as	95 90 90 85 75 70 65 50 35	sing	1 Size	Sample Very configuration of the Sand Silt Clay Gradin D100 D60 D30 D10 Uniform Curvate Remark	e Proparse	oportions e nalysis Coefficient Coefficient	1	mm nm nm		% d	0 0 5 53 41	SS
0.001 Particle mm 75 63 50 37.3 28 20 14 10 6.3 5 3.33 2 1.11	Size n	% Passing 100 100 100 100 100 100 100 100 100 1	r 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053 0038 0027	y (as	95 90 90 85 85 75 65 60 55 50	sing	1 Size	Sample Very configuration of the Sand Silt Clay Gradin D100 D60 D30 D10 Uniform Curvate Remark	e Proparse	oportions e nalysis	1	mm nm nm		% d	0 0 5 53 41	SS
0.001 Particle mm 75 63 50 37.: 28 20 14 10 6.3 5 3.33 2 1.1; 0.6 0.42 0.3 0.21	Size n	**No Passing** **Passing** 100 100 100 100 100 100 100 100 100	r 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053 0038 0027 0016	y (as	95 90 90 85 75 70 65 50 35	sing	1 Size	Sample Very configuration of the Sand Silt Clay Gradin D100 D60 D30 D10 Uniform Curvate Remark	e Proparse	oportions e nalysis Coefficient Coefficient	1	mm nm nm		% d	0 0 5 53 41	SS
0.001 Particle mm 75 63 50 37.: 28 20 14 10 6.3 5 3.3: 2 1.1: 0.6 0.42 0.3	Size n	**No string** **Resing** **Passing** 100 100 100 100 100 100 100 100 100	r 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedin cle Size mm 0630 0565 0400 0284 0201 0144 0106 0075 0053 0038 0027 0016	y (as	95 90 90 85 75 70 65 50 35	sing	1 Size	Sample Very configuration of the Sand Silt Clay Gradin D100 D60 D30 D10 Uniform Curvate Remark	e Proparse	oportions e nalysis Coefficient Coefficient	1	mm nm nm		% d	0 0 5 53 41	SS

18/01/2024 09:25

6	DRILL			PA	RTICL	E SIZ	E DIS	TRII	3UT	ION			Job	Ref			\perp	2	0230	OY10	80
Z.	M I T E	700											Bor	ehole	/Pit N	lo.			TPE	3001	
Site	e Name		Lemana	ighan \	Wind Fa	ırm							San	mple I	No.				,	5	
Soi	I Description	n	Light gre	y very g	gravelly v	ery silty	medium	SAN	D.				Dep	oth, m	1				3.	20	
	ecimen ference					Specim Depth	ien					m	San	mple T	Гуре				I	В	
Tes	st Method		BS1377:I	Part 2:1	1990, cla	uses 9.2	and 9.5	5					Key	/LAB	ID			ID	L1202	23110	065
	CLAY	Fir		ILT dium	Coarse	Fine		SAND	Co	oarse	Fir	ne	GRA\		Coa	arse	COE	BLES	ВС	DULDE	RS
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	90													_	4					+	\square
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	70																				
2	70																				
: :	60																			++	
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								i	1	l !		i			il	i i i		i			
	0.001	<u> </u>	0.0	01		0.1		Par	ticle S	1 Size	mm		10				10	00			10
	0.001		0.0	01		Sedin	nentatio			-		ory Ma		of san	nple.	a	10	00	11	32	10
	-				III .				ticle S	-		Ory Ma		of san	nple,	g	10	00	11	32	10
	0.001		eving		0.0	Sedin cle Size mm 0630		on Passi 32	ticle S	-	D Samp	le Pro	ass o		nple,	g	10		% dry	/ mas	
	Particle S		wing % Pas	ssing	0.0 0.0	Sedir cle Size mm 0630 0562		Passi 32 30	ticle S	-	Samp Very c	le Pro	ass o		nple,	g	10		% dry	/ mas	
	0.001 Particle 9 mm 75 63		% Pas	ssing	0.0 0.0 0.0	Sedin cle Size nm 0630 0562 0400		Passi 32 30 28 27	ticle S	-	Samp Very c Grave Sand	le Pro	ass o		nple,	g	10		% dry	/ mas 0 26 12	
	0.001 Particle 5 mm 75 63 50	Size	% Pas 10 10	ssing	0.0 0.0 0.0 0.0	Sedir cle Size nm 0630 0562 0400 0284 0203		Passi 32 30 28 27 24	ticle S	-	Samp Very c Grave Sand Silt	le Pro	ass o		nple,	g	10		% dry	/ mas 0 26 12	
	0.001 Particle 9 mm 75 63	Size	% Pas	ssing 00 00 00	0.0 0.0 0.0 0.0	Sedin cle Size nm 0630 0562 0400		Passi 32 30 28 27	ticle S	-	Samp Very c Grave Sand	le Pro	ass o		nple,	9	10		% dry	/ mas 0 26 12	
	0.001 Particle 5 mm 75 63 50 37.5 28	Size	% Pas 10 10 10 10 95 9°	ssing 00 00 00 00 55	0.0 0.1 0.1 0.1 0.1 0.1 0.1	Sedin cle Size nm 0630 0562 0400 0284 0203 0144 0106 0076		Passi 32 30 28 27 24 24 20	ticle S	-	Samp Very c Grave Sand Silt Clay	le Pro coarse	ass o	ions	nple,				% dry	/ mas 0 26 12	
	0.001 Particle S mm 75 63 50 37.5 28 20 14	Size	% Pas 10 10 10 10 98 97	ssing 00 00 00 00 5 1	0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedin cle Size nm 0630 0562 0400 0284 0203 0144 0106 0076		Passi 32 30 28 27 24 24 20 19	ticle S	-	Samp Very c Grave Sand Silt Clay	le Pro coarse	ass o	ions	nple,	mm			% dry	/ mas 0 26 21 1	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3	Size	% Pas 10 10 10 10 99 89 88 88	ssing 00 00 00 00 11 9 8	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedin cle Size mm 0630 0562 0400 0284 0203 0144 0106 0076 0054 0038 0027		Passi 32 30 28 27 24 24 20 19 17 14	ticle S	-	Samp Very of Grave Sand Silt Clay Gradii D100 D60 D30	le Pro coarse	ass o	ions	nple,				% dry	/ mas 0 26 12 21 1 1 549	
	0.001 Particle 5 mm 75 63 50 37.5 28 20 14 10 6.3	Size	% Pas 10 10 10 10 99 89 88 86 86	ssing 00 00 00 00 5 1 9 8 6 4	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedin cle Size mm 0630 0562 0400 0284 0203 0144 0106 0076 0054 0038		Passi 32 30 28 27 24 24 20 19 17	ticle S	-	Samp Very of Grave Sand Silt Clay Gradii D100 D60 D30 D10	le Pro coarse	oporti	s	nple,	mm			% dry	/ mas 0 26 22 1 1 1 549 565	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3	Size	% Pas 10 10 10 10 99 89 88 88	ssing 00 00 00 00 55 11 99 88 66 44 99	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedin cle Size mm 0630 0562 0400 0284 0203 0144 0106 0076 0054 0038 0027		Passi 32 30 28 27 24 24 20 19 17 14	ticle S	-	Samp Very of Grave Sand Silt Clay Gradii D100 D60 D30	le Procoarse	oporti	s	nple,	mm			% dry 2 4 2 1 0.5 0.00 0.00 3	/ mas 0 26 12 21 1 1 549	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18	Size	% Pas 100 100 100 100 95 88 88 86 75 74	ssing 00 00 00 00 55 1 9 8 6 4 9 4 8	0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sedin cle Size nm 0630 0562 0400 0284 0203 0144 0106 0076 0054 00038 0027	%	Passi 32 30 28 27 24 24 20 19 17 14 13 9	ticle S	-	Samp Very of Grave Sand Silt Clay Gradin D100 D60 D30 D10 Unifori Curvat	ng An	oporti	s	nple,	mm			% dry 2 4 2 1 0.5 0.00 0.00 3	7 mas 0 26 12 21 1 1 549 565 0175	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6	Size	% Pas 100 100 100 100 99 88 88 86 79 74 68	ssing 00 00 00 55 1 9 8 6 4 9 4 8 1	0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sedin cle Size mm 0630 0562 0400 0284 0203 0144 0106 0076 0054 0038 0027 0016	%	Passi 32 30 28 27 24 24 20 19 17 14 13 9	ticle S	-	Samp Very of Grave Sand Silt Clay Gradii D100 D60 D30 D10 Unifori Curvat	ng An	ass o	s s		mm mm mm			0.5 0.00 0.00 3	/ mas 0 26 12 21 11 549 565 50175 10	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18	Size	% Pas 100 100 100 100 95 88 88 86 75 74	ssing 00 00 00 00 00 55 1 9 8 6 4 9 4 8 1 7	0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sedin cle Size nm 0630 0562 0400 0284 0203 0144 0106 0076 0054 00038 0027	%	Passi 32 30 28 27 24 24 20 19 17 14 13 9	ticle S	-	Samp Very of Grave Sand Silt Clay Gradin D100 D60 D30 D10 Unifori Curvat	ng An	ass o	s s		mm mm mm			0.5 0.00 0.00 3	/ mas 0 26 12 21 11 549 565 50175 10	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3 0.212	5	% Pas 100 100 100 100 96 88 88 86 87 76 66 67 56 41	ssing 00 00 00 00 55 1 9 8 6 4 9 4 8 1 7 0 1	0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sedin cle Size mm 0630 0562 0400 0284 0203 0144 0106 0076 0054 0038 0027 0016	%	Passi 32 30 28 27 24 24 20 19 17 14 13 9	ticle S	-	Samp Very of Grave Sand Silt Clay Gradii D100 D60 D30 D10 Unifori Curvat	ng An	ass o	s s		mm mm mm			0.5 0.00 0.00 3	/ mas 0 26 12 21 11 549 565 50175 10	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3 0.212 0.15	5	8 Pas 10 10 10 10 10 99 88 88 86 87 74 68 67 50 41	ssing 00 00 00 00 55 11 99 88 66 44 99 41 88 11 77 00 11 66	0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sedin cle Size mm 0630 0562 0400 0284 0203 0144 0106 0076 0054 0038 0027 0016	%	Passi 32 30 28 27 24 24 20 19 17 14 13 9	ticle S	-	Samp Very of Grave Sand Silt Clay Gradii D100 D60 D30 D10 Unifori Curvat	ng An	ass o	s s		mm mm mm			0.5 0.00 0.00 3	/ mas 0 26 12 21 11 549 565 50175 10	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3 0.212	5	% Pas 100 100 100 100 96 88 88 86 87 76 66 67 56 41	ssing 00 00 00 00 55 11 99 88 66 44 99 41 88 11 77 00 11 66	0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Sedin cle Size mm 0630 0562 0400 0284 0203 0144 0106 0076 0054 0038 0027 0016	%	Passi 32 30 28 27 24 24 20 19 17 14 13 9	ticle S	-	Samp Very of Grave Sand Silt Clay Gradii D100 D60 D30 D10 Unifori Curvat	ng An	ass o	s s	ordance	mm mm mm			0.5 0.00 0.00 3	/ mas 0 26 12 21 11 549 565 50175 10	

QC From No:R2

		DRI,			Д.	DTIC	. –	C17		107	-DI			ON.				Jo	b R	ef					202	230	Y108	3
IRL	* 4	DRILL	200		PA	RTIC	LE ;	SIZ	ΕD	15	IKI	BU	, , ,	ON				В	oreh	ole/F	Pit N	0.			T	РΒС	02	
Si	te Nar	me	_	Leman	aghan \	Wind F	arm											S	amp	le No	٥.					1		
S	oil Des	scription	Ì	Brownis	sh-grey v	ery silty	very	/ san	dy co	arse	e GF	RAVI	EL.					D	epth	, m						0.8	0	
	ecimo eferen							ecim	ien								m	Si	amp	le Ty	/ре					В		
Te	est Me	ethod		BS1377	7:Part 2:1	1990, cl	auses	s 9.2	and	9.5								K	eyLA	AB ID)			ı	DL1	2023	1106	66
	_	CLAY			SILT						AND								AVE				cc	BBLES	3	BOL	LDER	s
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IR'S	T TE D					'11\\\-				Borehole	e/Pit No.		_	TPB003	3
Site 1	Name	Lemanaghar	า Wind Fa	rm	<u> </u>					Sample	No.			1	
Soil [Description	Grenish-grey s	slightly san	dy CLAY.						Depth, m	n	T		0.40	
	cimen erence	1		Specimen Depth	١			r	m	Sample	Туре	\top		В	
	Method	BS1377:Part 2	2:1990, claı	-	nd 9.5	5				KeyLAB	ID		IDL	.1202311	1068
	CLAV	SILT		 T	S	SAND				GRAVEL			BBLES	POLILD	NEDC .
100		ine Medium	Coarse	Fine		ledium	Coarse	Fine		Medium	Coarse	*****	BBLES	BOULD	ERS
9(•		_										
	30														
70	70		++++											$\dashv \dashv$	
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2	20		$\perp \perp \perp \perp$												
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		0.01		0.1		Partio	1 cle Size	mm	<u> </u>	10	<u> </u>	1	00		100
	0.001						•	mm	<u> </u>	10	<u>i il ! I</u>	1	00		100
	0.001 Sie	eving	Partic	Sedime		on	cle Size		y Ma	10	mple, g	10	00	683	100
	0.001						cle Size	Dry		iss of sar	mple, g	1			
	0.001 Sie Particle Size	eving	0.0	Sedimercle Size		on Passinç 91	cle Size	Dry	Pro		mple, g	11		6 dry ma	
	O.001 Sie Particle Size mm	eving % Passing	0.0 0.0	Sedimer cle Size mm 0630 0512		Passing 91 91	cle Size	Dry Sample Very coa	Pro	iss of sar	mple, g	10		6 dry ma	
	O.001 Sie Particle Size mm	eving	0.0 0.0 0.0	Sedimel cle Size nm 0630 0512 0362		91 91 91 91	cle Size	Dry	Pro	iss of sar	mple, g	1		6 dry ma	
	O.001 Sie Particle Size mm	eving % Passing 100	0.0 0.0 0.0 0.0	Sedimer cle Size mm 0630 0512		Passing 91 91	cle Size	Dry Sample Very coa	Pro	iss of sar	mple, g	1		6 dry ma 0 1	
	O.001 Sie Particle Size mm 75 63	eving % Passing 100 100	0.0 0.0 0.0 0.0	Sedimer cle Size nm 0630 0512 0362 0256		91 91 91 91 91	cle Size	Sample Very coa Gravel Sand	Pro	iss of sar	mple, g			6 dry ma 0 1 8	
	75 63 50 37.5 28	eving % Passing 100 100 100	0.0 0.0 0.0 0.0 0.0	Sedimer cle Size nm 0630 0512 0362 0256 0181		Passing 91 91 91 91 91	cle Size	Sample Very coa Gravel Sand Silt Clay	e Proparse	oss of sar	mple, g			6 dry ma 0 1 8 23	
	75 63 50 37.5 28	eving % Passing 100 100 100 100 100 100 100 100	0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedimer cle Size mm 0630 0512 0362 0256 0181 0128 0094 0067		91 91 91 91 91 91 91 91 88	cle Size	Sample Very coa Gravel Sand Silt Clay	e Proparse	oss of sar	mple, g	11		6 dry ma 0 1 8 23	
	75 63 50 37.5 28 20	eving % Passing 100 100 100 100 100 100 100 100 100	n 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedimer cle Size mm 0630 0512 0362 0256 0181 0128 0094 0067 0047		91 91 91 91 91 91 91 91 88 86	cle Size	Sample Very coa Gravel Sand Silt Clay Grading D100	e Proparse	oss of sar	mn			6 dry ma 0 1 8 23	
	75 63 50 37.5 28 20 14	eving % Passing 100 100 100 100 100 100 100 100 100 1	n 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedimer cle Size mm 0630 0512 0362 0256 0181 0128 0094 0067 0047 0034		91 91 91 91 91 91 91 91 91 77	cle Size	Sample Very coa Gravel Sand Silt Clay Grading D100 D60	e Proparse	oss of sar	mn	n		6 dry ma 0 1 8 23	
	75 63 50 37.5 28 20 14 10 6.3	eving % Passing 100 100 100 100 100 100 100 100 100 1	n 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Sedimer cle Size mm 0630 0512 0362 0256 0181 0128 0094 0067 0047 0034 0025		91 91 91 91 91 91 91 91 91 77	cle Size	Sample Very coa Gravel Sand Silt Clay Grading D100 D60 D30	e Proparse	oss of sar	mn mn mn	n n n		6 dry ma 0 1 8 23	
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	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18	eving % Passing 100 100 100 100 100 100 100 100 100 99 99 99 99	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedimer cle Size nm 0630 0512 0362 0256 0181 00128 00094 00067 00047 00034 00025 00014	%	91 91 91 91 91 91 91 91 91 63	cle Size	Sample Very coa Gravel Sand Silt Clay Grading D100 D60 D30 D10 Uniformi	Proparse Analytity Corre Co	portions alysis	mn mn mn	n n n		6 dry ma 0 1 8 23	
	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2	eving % Passing 100 100 100 100 100 100 100 100 100 99 99	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sedimer cle Size mm 0630 0512 0362 0256 0181 0128 0094 0067 0047 0034 0025 0014 e density e density	%	91 91 91 91 91 91 91 91 91 63	cle Size	Sample Very coa Gravel Sand Silt Clay Grading D100 D60 D30 D10 Uniformi Curvatur	Property Pro	portions alysis oefficient	mn mn mn		%	6 dry ma 0 1 8 23 69	ass

Operator	Checked	Approved	Sheet printed	1
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Site Name	DR	MILIA	P.A	RTICLE SIZE	DISTRIBUTION	,	Job Ref	2023OY108
Solit Description Grey Grey Sithy very sandy coarse GRAVEL Depth, m 1,20	2 M I T	17G					Borehole/Pit No.	TPB003
Specimen Reference	Site Name		Lemanaghan	Wind Farm			Sample No.	3
Seving Sedimentation Particle Size Par		ption	Grey Grey silty				Depth, m	1.20
CLAY					n	m	Sample Type	В
Sieving	Test Metho	od	BS1377:Part 2:	1990, clauses 9.2 a	and 9.5		KeyLAB ID	IDL12023110610
Sieving	CL	AY Fir		Coarse Fine				COBBLES BOULDERS
Sleving Sedimentation Particle Size mm Dry Mass of sample, g 1096	100							
Sieving	90							
Sieving Sedimentation Particle Size Mpassing Particle Size Mpassing Particle Size Mpassing M	80							
Sieving Sedimentation Particle Size mm Dry Mass of sample, g 1096								
Sieving								
Sieving	60							
Sieving	50							
Sieving	40							
Sieving	30							
Sieving	20							
Sieving	20							
Sieving Sedimentation Particle Size mm Particle Size mm Particle Size mm Particle Size mm Particle Size mm Particle Size mm Particle Size mm Particle Size mm Particle Size mm Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Particle Size Ms Part	10							
Sieving Sedimentation Particle Size mm Part	-		0.01	0.1	1		10	100 100
Particle Size mm		Sie	eving	Sedime	entation	Dry Moo	an of nample of	1006
Sample Proportions % dry mass			% Passing		% Passing	Dry Mas	ss or sample, g	1096
75 100 0.0409 17 63 100 0.0291 16 50 100 0.0208 13 37.5 100 0.0148 12 28 86 0.0109 11 20 72 0.0077 10 14 68 0.0055 10 10 64 0.0039 8 6.3 57 0.0028 7 5 54 0.0016 5 11.8 39 0.6 34 0.6 34 Particle density (assumed) 2.65 Mg/m3 Remarks Preparation and testing in accordance with BS1377 unless noted below Preparation and testing in accordance with BS1377 unless noted below				0.0630			oortions	·
63 100 0.0291 16 50 100 0.0208 13 37.5 100 0.0148 12 28 86 0.0109 11 20 72 0.0077 10 14 68 0.0055 10 10 64 0.0039 8 6.3 57 0.0028 7 5 54 0.0016 5 2 44 1.18 39 0.6 34 Particle density (assumed) 2.65 Mg/m3 8emarks Preparation and testing in accordance with BS1377 unless noted below		75	100					-
37.5				0.0291				25
28 86 0.0109 11 20 72 0.0077 10 14 68 0.0055 10 10 64 0.0039 8 6.3 57 0.0028 7 5 54 0.0016 5 3.35 49 0.0016 5 1.18 39 0.6 34 Particle density (assumed) Curvature Coefficient 920 Curvature Coefficient 1.6 Remarks Preparation and testing in accordance with BS1377 unless noted below 0.3 29 0.212 25 0.15 22 0.063 19								
14 68 0.0055 10 10 64 0.0039 8 6.3 57 0.0028 7 5 54 0.0016 5 3.35 49 44 1.18 39 0.6 34 Particle density (assumed) 0.3 29 0.212 25 0.15 22 0.063 19 D100 mm D300 mm 0.326 D10 mm 0.0084 Uniformity Coefficient 920 Curvature Coefficient 1.6 Remarks Preparation and testing in accordance with BS1377 unless noted below				_				
6.3 57 0.0028 7 5 54 0.0016 5 3.35 49 44 Uniformity Coefficient 920 2 44 Curvature Coefficient 1.6 1.18 39 Remarks 0.6 34 Particle density (assumed) Remarks 0.425 32 2.65 Mg/m3 0.3 29 Preparation and testing in accordance with BS1377 unless noted below 0.15 22 0.063 19				_				
5 54 0.0016 5 3.35 49 Uniformity Coefficient 920 2 44 Curvature Coefficient 1.6 1.18 39 Curvature Coefficient 1.6 0.6 34 Particle density (assumed) Remarks 0.425 32 2.65 Mg/m3 0.3 29 0.212 25 0.15 22 0.063 19 Particle density (assumed) 2.65 Mg/m3 Preparation and testing in accordance with BS1377 unless noted below								
3.35								
1.18 39 0.6 34 Particle density (assumed) 0.425 32 2.65 Mg/m3 0.3 29 0.212 25 0.15 22 0.063 19 Remarks Preparation and testing in accordance with BS1377 unless noted below Preparation and testing in accordance with BS1377 unless noted below		3.35	49		-	Uniformity Co	efficient	920
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0.15 22 0.063 19				-				
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C1. 11 (1	PA	RTICLE SIZE	DISTRII	BUTION	I	Job Ref		2	023OY108
DRILLING						Borehole	e/Pit No.		TPB005
Site Name	Lemanaghan \	Nind Farm				Sample	No.		1
Soil Description	Grey slightly sar	ndy clayey SILT.				Depth, n	า		0.60
Specimen Reference		Specime Depth	n		m	Sample	Туре		В
Test Method	BS1377:Part 2:1	1990, clauses 9.2 a	and 9.5			KeyLAB	ID	IDL	12023110616
CLAY	SILT		SAND			GRAVEL		COBBLES	BOULDERS
100 T	Fine Medium	Coarse Fine	Medium	Coarse	Fine	Medium	Coarse	OODDEEC	BOOLDERO
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0.001	0.01	0.1		1		10		100	100
0.001	0.01	0.1		ı					
			Par	ticle Size	mm	10		100	100
			Par	ticle Size	mm	10		100	100
	Sievina	T Sedime		ticle Size				100	
Particle Siz	Sieving	Sedime Particle Size	entation			lass of sar	mple, g	100	647
Particle Siz		Particle Size mm	entation % Passi		Dry M	lass of sar	mple, g		647
	Ŷ.	Particle Size mm 0.0591	entation % Passi 94		Dry M	lass of sar	mple, g		647 % dry mass
mm	e % Passing	Particle Size mm 0.0591 0.0466	% Passi 94 94		Dry M Sample Pr Very coarse	lass of sar	mple, g		647 % dry mass 0
	Ŷ.	Particle Size mm 0.0591	entation % Passi 94		Dry M	lass of sar	mple, g		647 % dry mass
75 63 50	9 % Passing 100 100 100	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169	94 94 92 90 88		Dry M Sample Pr Very coarse Gravel Sand Silt	lass of sar	nple, g		647 % dry mass 0 1 5 44
75 63 50 37.5	9 % Passing 100 100 100 100 100	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121	94 94 92 90 88		Dry M Sample Pr Very coarse Gravel Sand	lass of sar	mple, g		647 % dry mass 0 1 5
75 63 50 37.5 28	9 % Passing 100 100 100 100 100 100 100	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091	94 94 92 90 88 84		Sample Pr Very coarse Gravel Sand Silt Clay	lass of sar	mple, g		647 % dry mass 0 1 5 44
75 63 50 37.5	9 % Passing 100 100 100 100 100	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121	94 94 92 90 88		Dry M Sample Pr Very coarse Gravel Sand Silt	lass of sar	mple, g		647 % dry mass 0 1 5 44
75 63 50 37.5 28 20 14	9 % Passing 100 100 100 100 100 100 100 100 100 10	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034	94 94 92 90 88 84 77 73 67		Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60	lass of sar			647 % dry mass 0 1 5 44
75 63 50 37.5 28 20 14 10 6.3	9 % Passing 100 100 100 100 100 100 100 100 100 99	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034 0.0025	94 94 92 90 88 84 77 73 67 61		Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60 D30	lass of sar	mm mm mm		647 % dry mass 0 1 5 44 50
75 63 50 37.5 28 20 14 10 6.3	100 100 100 100 100 100 100 100 100 100	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034	94 94 92 90 88 84 77 73 67		Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60 D30 D10	lass of sar	mm		647 % dry mass 0 1 5 44 50
75 63 50 37.5 28 20 14 10 6.3	9 % Passing 100 100 100 100 100 100 100 100 100 99	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034 0.0025	94 94 92 90 88 84 77 73 67 61		Sample Pr Very coarse Gravel Sand Silt Clay Grading Al D100 D60 D30 D10 Uniformity	lass of sar oportions e nalysis	mm mm mm		647 % dry mass 0 1 5 44 50
75 63 50 37.5 28 20 14 10 6.3 5 3.35	100 100 100 100 100 100 100 100 100 99 99	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034 0.0025 0.0015	94 94 92 90 88 84 77 73 67 61 54		Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60 D30 D10	lass of sar oportions e nalysis	mm mm mm		647 % dry mass 0 1 5 44 50
75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6	100 100 100 100 100 100 100 100 100 99 99 99 99 99	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034 0.0025 0.0015 Particle density	94 94 92 90 88 84 77 73 67 61 54 44 (assumed)		Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60 D30 D10 Uniformity (Curvature (oportions e nalysis Coefficient Coefficient	mm mm mm		647 % dry mass 0 1 5 44 50
75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6	100 100 100 100 100 100 100 100 100 99 99 99 99 99	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034 0.0025 0.0015	94 94 92 90 88 84 77 73 67 61 54		Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60 D30 D10 Uniformity (Curvature (oportions e nalysis Coefficient Coefficient	mm mm mm		647 % dry mass 0 1 5 44 50
75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3	e % Passing 100 100 100 100 100 100 100 100 99 99 99 99 99 99 99 99 99 99 99 99	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034 0.0025 0.0015 Particle density	94 94 92 90 88 84 77 73 67 61 54 44 (assumed)		Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60 D30 D10 Uniformity (Curvature (oportions e nalysis Coefficient Coefficient	mm mm mm		647 % dry mass 0 1 5 44 50
75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6	100 100 100 100 100 100 100 100 100 99 99 99 99 99 99	Particle Size mm 0.0591 0.0466 0.0332 0.0237 0.0169 0.0121 0.0091 0.0065 0.0047 0.0034 0.0025 0.0015 Particle density	94 94 92 90 88 84 77 73 67 61 54 44 (assumed)		Sample Pr Very coarse Gravel Sand Silt Clay Grading A D100 D60 D30 D10 Uniformity (Curvature (oportions e nalysis Coefficient Coefficient	mm mm mm		647 % dry mass 0 1 5 44 50

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Site	e Nam	ne		Lema	naghan	Wind F	arm						Sample	No.		3
Soil	l Des	cription	1	Light g	grey silty	very sar	ndy coarse	GRAVI	EL.				Depth,	m		1.80
	ecime						Specim Depth	en				m	Sample	Туре		В
Tes	st Met	thod		BS137	7:Part 2	:1990, cl	auses 9.2	and 9.5	5				KeyLAE	3 ID	IC	DL12023110618
		CLAY			SILT				SAND				GRAVEL		COBBLES	BOULDERS
1	- 100 T		Fin	ne !	Medium	Coarse	e Fine	: M	ledium	Coars	se F	ine	Medium	Coarse		
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F	0.0	article S		eving	0.01 Passing	Par	Sedin ticle Size			\Box		Dry M	10	ımple, g	100	1320
F	0.0			eving			Sedin		on	\Box		-			100	
-	0.0	article S mm		eving % F	Passing		Sedin rticle Size mm 0.0630 0.0572		Passir 16 16	\Box	Sam Very	ple Pr	lass of sa		100	1320 % dry mass 0
- - -	0.0	article S		eving % F			Sedin ticle Size mm 0.0630		on Passir 16	\Box	Sam	ple Pr coarse	lass of sa		100	1320 % dry mass
•	0.0	75 63		% F	Passing 100 100 100		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206		Passir 16 16 15 14 13	\Box	Sam Very Grav Sanc Silt	ple Pr coarso	lass of sa		100	1320 % dry mass 0 63 21
- - - -	0.0	75 63 50 37.5		% F	Passing 100 100 100 70		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145		Passir 16 16 15 14 13	\Box	Sam Very Grav Sand	ple Pr coarso	lass of sa		100	1320 % dry mass 0 63 21
-	0.0	75 63		% F	Passing 100 100 100		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206		Passir 16 16 15 14 13	\Box	Sam Very Grav Sanc Silt Clay	ple Pr coarso rel	lass of sa		100	1320 % dry mass 0 63 21
-	0.0	75 63 50 37.5 28 20		% F	Passing 100 100 100 70 67 61 58		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077		Passir 16 16 15 14 13 13 11 9	\Box	Sam Very Grav Sand Silt Clay	ple Pr coarse el	lass of sa			1320 % dry mass 0 63 21 9 7
-	0.0	75 63 50 37.5 28 20 14		% F	Passing 100 100 100 70 67 61 58 53		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038		Passir 16 16 15 14 13 13 11 9 9	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D60	ple Pr coarse el	lass of sa	mm		1320 % dry mass 0 63 21 9 7
-	0.0	75 63 50 37.5 28 20		% F	Passing 100 100 100 70 67 61 58		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077		Passir 16 16 15 14 13 13 11 9	\Box	Sam Very Grav Sand Silt Clay	ple Pr coarse el	lass of sa	mm		% dry mass 0 63 21 9 7
-	0.0	75 63 50 37.5 28 20 14 10 6.3 5		% F	Passing 100 100 100 70 67 61 58 53 47 45 41		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038 0.0027		Passir 16 16 15 14 13 13 11 9 9 8	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D30 D10 Unife	ple Pr coarse el d	lass of sa	mm mm mm		1320 % dry mass 0 63 21 9 7 17 0.571 0.00889 1900
	0.0	75 63 50 37.5 28 20 14 10 6.3 5 3.35		% F	Passing 100 100 100 70 67 61 58 53 47 45 41 38		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038 0.0027		Passir 16 16 15 14 13 13 11 9 9 8	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D30 D10 Unife	ple Pr coarse el d	lass of sa roportions e nalysis	mm mm mm		1320 % dry mass 0 63 21 9 7
	0.0	75 63 50 37.5 28 20 14 10 6.3 5		% F	Passing 100 100 100 70 67 61 58 53 47 45 41		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038 0.0027	%	Passir 16 16 15 14 13 13 11 9 9 8 6	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D30 D10 Unife	ple Pr coarse el d	lass of sa	mm mm mm		1320 % dry mass 0 63 21 9 7 17 0.571 0.00889 1900
	0.0	75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425	ize	% F	100 100 100 70 67 61 58 53 47 45 41 38 34 30 28		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038 0.0027 0.0016	%	Passir 16 16 15 14 13 13 11 9 9 8 6	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D60 D30 D10 Unifc Curv	ple Pr coarse el d ding A	oportions e nalysis Coefficient	mm mm mm		1320 % dry mass 0 63 21 9 7 17 0.571 0.00889 1900 2.2
	0.0	75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3	Size	% F	Passing 100 100 100 70 67 61 58 53 47 45 41 38 34 30 28 26		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038 0.0027 0.0016	%	Passir 16 16 15 14 13 13 11 9 9 8 6	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D60 D30 D10 Unifc Curv	ple Pr coarse el d ding A	oportions e nalysis Coefficient	mm mm mm		1320 % dry mass 0 63 21 9 7 17 0.571 0.00889 1900 2.2
	0.0	75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425	Size	% F	100 100 100 70 67 61 58 53 47 45 41 38 34 30 28		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038 0.0027 0.0016	%	Passir 16 16 15 14 13 13 11 9 9 8 6	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D60 D30 D10 Unifc Curv	ple Pr coarse el d ding A	oportions e nalysis Coefficient	mm mm mm		1320 % dry mass 0 63 21 9 7 17 0.571 0.00889 1900 2.2
	0.0	75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3	Size	% F	100 100 100 70 67 61 58 53 47 45 41 38 34 30 28 26 21		Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0107 0.0077 0.0054 0.0038 0.0027 0.0016	%	Passir 16 16 15 14 13 13 11 9 9 8 6	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D60 D30 D10 Unifc Curv	ple Pr coarse el d ding A	oportions e nalysis Coefficient	mm mm mm		1320 % dry mass 0 63 21 9 7 17 0.571 0.00889 1900 2.2
	Pa	75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3 0.212 0.15	Size	% F	Passing 100 100 100 70 67 61 58 53 47 45 41 38 34 30 28 26 21 18	Parti	Sedin ticle Size mm 0.0630 0.0572 0.0407 0.0289 0.0206 0.0145 0.0077 0.0054 0.0038 0.0027 0.0016	%	Passir 16 16 15 14 13 13 11 9 9 8 6	\Box	Sam Very Grav Sanc Silt Clay Grac D100 D60 D30 D10 Unifc Curv	ple Pr coarse el ding Al) ormity (ature (arks	oportions e nalysis Coefficient	mm mm mm		1320 % dry mass 0 63 21 9 7 17 0.571 0.00889 1900 2.2

Site Name Lemanaghan Wind Farm Soil Description Specimen Reference Test Method BS1377:Part 2:1990, clauses states and states are states and states are states ar	men m Sample Type	TPB006 1 0.70 B IDL12023110619 COBBLES BOULDERS
Soil Description Specimen Reference Test Method BS1377:Part 2:1990, clauses 3	Depth, m men m Sample Type 2 and 9.5 KeyLAB ID SAND GRAVEL	0.70 B IDL12023110619 COBBLES BOULDERS
Specimen Reference Test Method BS1377:Part 2:1990, clauses 9 CLAY SILT Fine Medium Coarse F 100 90 80 70 40 30 20 10	men m Sample Type 2 and 9.5 KeyLAB ID SAND GRAVEL	B IDL12023110619
Test Method BS1377:Part 2:1990, clauses 6	2 and 9.5 KeyLAB ID SAND GRAVEL	IDL12023110619
CLAY SILT Fine Medium Coarse Fine	SAND GRAVEL	COBBLES BOULDERS
CLAY Fine Medium Coarse F 100 90 80 70 30 20 10		COBBLES BOULDERS
100 90 80 70 60 50 40 30 20	me Medium Coarse Fine Medium Coarse	
80 70 60 50 40 30 20		
80 70 60 50 40 30 20		
70 60 50 40 30 20		
60 50 40 30 20		
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0		
Dortinlo Ciza	Particle Size mm imentation Dry Mass of sample, g	727
mm % Passing mm	% Passing	
0.0630 0.0588	17 Sample Proportions Very coarse	% dry mass 0
75 100 0.0418 63 100 0.0297	14 Gravel Sand	40 43
50 100 0.0297 50 100 0.0211	13 Sand Silt	13
37.5 100 0.0150 28 100 0.0110	10 Clay	4
20 87 0.0078	8 Grading Analysis	
14 87 0.0055 10 83 0.0039		nm 1.98
6.3 77 0.0028		nm 0.255
5 73 0.0016 3.35 67	3 D10 m Uniformity Coefficient	nm 0.0158 130
2 60	Curvature Coefficient	2.1
1.18 53 Particle den	ity (assumed) Remarks	
0.6 44 Particle den 0.425 40 2.65	Mg/m3 Remarks Preparation and testing in accordance with	th BS1377 unless noted below
0.3 33 0.212 27		
0.212 27		
0.063 17		

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Site Name Lemanaghan Wind Farm Sample No. 2 Soil Description Grey sitry SAND and GRAVEL. Depth, m 2.00 Specimen Reference Specimen Depth m Sample Type B Test Method BS1377:Part 2:1990, clauses 9.2 and 9.5 KeyLAB ID IDL12023110620 CLAY SILT SAND GRAVEL BOULDERS CLAY Fine Medium Coarse Fine Med	DRILL	PAI	RTICLE SIZE I	DISTRIBUTI	ION	Job Ref	202	23OY108
Solit Description	ST DRILLING					Borehole/Pit No.	Т	PB006
Specimen Reference	Site Name	Lemanaghan V	Vind Farm			Sample No.		2
Test Method BS1377:Part 2:1990, clauses 9.2 and 9.5 KeyLAB ID IDL12023110620	Soil Description	Grey silty SAND	and GRAVEL.			Depth, m		2.00
CLAY Fine Medium Coarse Fine Mediu					m	Sample Type		В
Sieving	Test Method	BS1377:Part 2:19	990, clauses 9.2 and	d 9.5		KeyLAB ID	IDL12	2023110620
Sieving Sedimentation Particle Size mm Dry Mass of sample, g 1002	CLAY						COBBLES	BOULDERS
Sieving	FI	ne Medium	Coarse Fine	Medium Co	parse Fine	Medium Coarse	Ů i	
Sieving	00							
Sieving	90							
Sieving	80							
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Sieving Sedimentation Particle Size mm Particle Size mm Particle Size mm Particle Size mm Particle Size Mpm							! !	
Particle Size mm % Passing mm Particle Size mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % dry mass 75 100 0.0414 12 44 44 563 100 0.0294 11 50 10 0.0294 11 53 58nd 41 53 44 53 53 63 10 0.0148 10 53 50 10 0.0148 10 10 54		0.04	0.4			10	400	
Particle Size mm % Passing mm Particle Size mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % Passing mm % dry mass 75 100 0.0414 12 44 44 563 100 0.0294 11 50 10 0.0294 11 53 58nd 41 53 44 53 53 63 10 0.0148 10 53 50 10 0.0148 10 10 54		0.01	0.1		-	10	100	100
Sample Proportions % dry mass	0.001			Particle S	ize mm		100	
O.0582 13 13 14 12 15 100 0.0414 12 15 100 0.0294 11 15 15 18 10 100 0.0209 10 10 11 15 18 10 10 10 10 10 10 10	0.001 Sie	eving	Sedimen	Particle S	ize mm		100	
75 100 0.0414 12 63 100 0.0294 11 50 100 0.0209 10 37.5 100 0.0148 10 28 95 0.0109 9 20 89 0.0077 8 14 89 0.0055 7 10 84 0.0039 7 6.3 73 0.0028 5 5 69 0.0016 5 3.35 62 56 1.18 49 49 0.6 41 Particle density (assumed) 0.425 37 2.65 0.3 30 0.212 22 0.15 18	0.001 Sie Particle Size	eving	Sedimen Particle Size mm	Particle S tation % Passing	ize mm Dry M	ass of sample, g		1002
50 100 0.0209 10 37.5 100 0.0148 10 28 95 0.0109 9 20 89 0.0077 8 14 89 0.0055 7 10 84 0.0039 7 6.3 73 0.0028 5 5 69 0.0016 5 3.35 62 0.0016 5 1.18 49 0.6 41 Particle density (assumed) 0.3 30 0.212 22 0.15 18 Sitt 9 Clay 5 Clay 5 Grading Analysis D100 mm D60 mm D60 mm 0.298 D10 mm 0.0136 Uniformity Coefficient Curvature Coefficient 2.10 Curvature Coefficient Curvature Coefficient 2.3 Remarks Preparation and testing in accordance with BS1377 unless noted below	0.001 Sie Particle Size	eving	Sedimen Particle Size mm 0.0630	Particle S tation % Passing 14	ize mm Dry M Sample Pro	ass of sample, g		1002 dry mass
37.5	0.001 Sie Particle Size mm	% Passing	Particle Size mm 0.0630 0.0582	Particle Solution % Passing 14 13	Dry M Sample Province Very coarse	ass of sample, g		1002 dry mass 0
28 95 0.0109 9 20 89 0.0077 8 14 89 0.0055 7 10 84 0.0039 7 6.3 73 0.0028 5 5 69 0.0016 5 3.35 62 0.0016 5 1.18 49 0.6 41 Particle density (assumed) 2.3 0.3 30 0.212 22 0.15 18 Grading Analysis D100 mm D60 mm 0.298 D10 mm 0.298 D10 mm 0.0136 Uniformity Coefficient 2.3 Remarks Preparation and testing in accordance with BS1377 unless noted below	O.001 Sia Particle Size mm 75	% Passing	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294	Particle Solution % Passing 14 13 12	Dry M Sample Province Very coarse Gravel Sand	ass of sample, g		1002 dry mass 0 44
20	O.001 Sie Particle Size mm 75 63 50	% Passing 100 100 100	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209	Particle S tation % Passing 14 13 12 11 10	Dry M Sample Privery coarse Gravel Sand Silt	ass of sample, g		1002 dry mass 0 44 41 9
14 89 0.0055 7 10 84 0.0039 7 6.3 73 0.0028 5 5 69 0.0016 5 3.35 62 0.0016 5 1.18 49 0.6 41 Particle density (assumed) 0.425 37 2.65 Mg/m3 Particle density (assumed) 2.65 Mg/m3 Preparation and testing in accordance with BS1377 unless noted below and testing in accordance with BS1377 unless note	0.001 Sie Particle Size mm 75 63 50 37.5	% Passing 100 100 100 100 100	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148	Particle S tation % Passing 14 13 12 11 10 10	Dry M Sample Privery coarse Gravel Sand Silt	ass of sample, g		1002 dry mass 0 44 41 9
6.3 73 0.0028 5 5 69 0.0016 5 3.35 62 0.0016 0.0016 2 56 0.0016 0.00136 1.18 49 0.0016 0.0016 0.0016 1.18 49 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0016 0.0013	75 63 50 37.5	% Passing 100 100 100 100 100 95	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109	Particle S tation % Passing 14 13 12 11 10 10 9	Dry M Sample Provery coarse Gravel Sand Silt Clay	ass of sample, g oportions		1002 dry mass 0 44 41 9
5 69 0.0016 5 3.35 62 Uniformity Coefficient 210 2 56 Curvature Coefficient 2.3 1.18 49 Remarks 0.425 37 2.65 Mg/m3 0.3 30 0.212 22 0.15 18	75 63 50 37.5 28	% Passing 100 100 100 100 95 89	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077	Particle S tation % Passing 14 13 12 11 10 10 9 8	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ai	ass of sample, g oportions e		1002 dry mass 0 44 41 9
3.35 62 Uniformity Coefficient 210	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10	% Passing 100 100 100 100 95 89 89 89 84	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039	Particle S Itation % Passing 14 13 12 11 10 10 9 8 7	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60	ass of sample, g oportions and the sample of the sample	%	1002 dry mass 0 44 41 9 5
2 56 1.18 49 0.6 41 Particle density (assumed) 0.425 37 0.3 30 0.212 22 0.15 18 Curvature Coefficient Remarks Preparation and testing in accordance with BS1377 unless noted below	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3	% Passing 100 100 100 100 95 89 89 89 84 73	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028	Particle S Itation % Passing 14 13 12 11 10 10 9 8 7 7	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30	nalysis	%	1002 dry mass 0 44 41 9 5
0.6 41 Particle density (assumed) Remarks 0.425 37 2.65 Mg/m3 0.3 30 0.212 22 0.15 18 Remarks Preparation and testing in accordance with BS1377 unless noted below	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5	% Passing 100 100 100 100 95 89 89 84 73 69	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028	Particle S Itation % Passing 14 13 12 11 10 10 9 8 7 7	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10	nalysis mm mm mm	%	1002 dry mass 0 44 41 9 5 2.82 0.298 0.0136
0.425 37 2.65 Mg/m3 Preparation and testing in accordance with BS1377 unless noted below 0.3 30 0.212 22 0.15 18	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35	% Passing 100 100 100 100 95 89 89 84 73 69 62	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028	Particle S Itation % Passing 14 13 12 11 10 10 9 8 7 7	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ai D100 D60 D30 D10 Uniformity 0	nalysis mm mm Coefficient	%	1002 dry mass 0 44 41 9 5 2.82 0.298 0.0136 210
0.3 30 0.212 22 0.15 18	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18	9Ving % Passing 100 100 100 100 95 89 89 89 84 73 69 62 56 49	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016	Particle S tation % Passing 14 13 12 11 10 10 9 8 7 7 5 5	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ai D100 D60 D30 D10 Uniformity 0 Curvature C	nalysis mm mm Coefficient	%	1002 dry mass 0 44 41 9 5 2.82 0.298 0.0136 210
0.212 22 0.15 18	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6	% Passing 100 100 100 100 95 89 89 89 84 73 69 62 56 49 41	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (a	Particle S tation % Passing 14 13 12 11 10 10 9 8 7 7 5 5 assumed)	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity 0 Curvature 0 Remarks	ass of sample, g oportions and the sample of the sample	%	1002 dry mass 0 44 41 9 5 2.82 0.298 0.0136 210 2.3
0.15 18	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425	9Ving % Passing 100 100 100 100 95 89 89 84 73 69 62 56 49 41 37	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (a	Particle S tation % Passing 14 13 12 11 10 10 9 8 7 7 5 5 assumed)	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity 0 Curvature 0 Remarks	ass of sample, g oportions and the sample of the sample	%	1002 dry mass 0 44 41 9 5 2.82 0.298 0.0136 210 2.3
0.063 14	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3	% Passing 100 100 100 100 95 89 89 84 73 69 62 56 49 41 37 30	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (a	Particle S tation % Passing 14 13 12 11 10 10 9 8 7 7 5 5 assumed)	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity 0 Curvature 0 Remarks	ass of sample, g oportions and the sample of the sample	%	1002 dry mass 0 44 41 9 5 2.82 0.298 0.0136 210 2.3
	0.001 Sie Particle Size mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3 0.212	% Passing 100 100 100 100 95 89 89 84 73 69 62 56 49 41 37 30 22 18	Sedimen Particle Size mm 0.0630 0.0582 0.0414 0.0294 0.0209 0.0148 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (a	Particle S tation % Passing 14 13 12 11 10 10 9 8 7 7 5 5 assumed)	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity 0 Curvature 0 Remarks	ass of sample, g oportions and the sample of the sample	%	1002 dry mass 0 44 41 9 5 2.82 0.298 0.0136 210 2.3

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	DRI.		DA.	DTICI E SIZE	DISTRIBUTIO	NI	Job Ref	2023OY1	80
DRILLING CHARLES			PA	KIICLE SIZE	יטוז טפוא ו פוט	Borehole/Pit No.	TPB007		
Site Name Lemanaghar			Lemanaghan \	Wind Farm			Sample No.	2	
So	oil Description	า	Light greyish-bro	own silty very sandy	coarse GRAVEL.		Depth, m	2.10	
	ecimen eference			Specimen Depth		m	Sample Type	В	
Те	est Method		BS1377:Part 2:1	990, clauses 9.2 an	d 9.5		KeyLAB ID	IDL12023110622	
	CLAY		SILT		SAND		GRAVEL	COBBLES BOULDI	-DQ
	100 T	Fir	e Medium	Coarse Fine	Medium Coars	e Fine	Medium Coarse	BOOLD!	-110
	90						/		
	80						/		
:	70								
	60								
	50								
	40								
	30								
	20				-				
	10								
	0 -	_,_							
	0.001		0.01	0.1	1 Particle Size	mm	10	100	1000
			0.01	0.1	1 Particle Size	mm	10	100	100
	0.001		ving I	Sedimer	ntation		ass of sample, g	952	100
				Sedimer Particle Size mm	ntation % Passing	Dry M	ass of sample, g	952	
	0.001		ving I	Sedimer Particle Size	ntation		ass of sample, g		
	Particle S mm		ving % Passing 100	Sedimer Particle Size mm 0.0630 0.0572 0.0407	ntation % Passing 17 17 16	Dry M Sample Province Very coarse Gravel	ass of sample, g	952 % dry ma 0 53	
	0.001 Particle 5 mm 75 63		ving % Passing 100 100	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291	ntation % Passing 17 17 16 14	Dry M Sample Provery coarse Gravel Sand	ass of sample, g	952 % dry ma 0 53 30	
	0.001 Particle 5 mm 75 63 50		ving % Passing 100	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208	ntation % Passing 17 17 16 14 12	Dry M Sample Provery coarse Gravel Sand Silt	ass of sample, g	952 % dry ma 0 53	
	0.001 Particle 5 mm 75 63		% Passing 100 100 100	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291	ntation % Passing 17 17 16 14	Dry M Sample Provery coarse Gravel Sand Silt Clay	ass of sample, g oportions	952 % dry ma 0 53 30 13	
	75 63 50 37.5 28		ving % Passing 100 100 100 100 84 71	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077	ntation % Passing 17 17 16 14 12 12 10 10	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading A	ass of sample, g oportions	952 % dry ma 0 53 30 13	
	75 63 50 37.5 28 20		ving % Passing 100 100 100 100 84 71 69	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055	ntation % Passing 17 17 16 14 12 12 10 10 9	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading An D100	ass of sample, g oportions analysis	952 % dry ma 0 53 30 13 5	
	75 63 50 37.5 28 20 14		ving % Passing 100 100 100 100 84 71 69 65	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039	ntation % Passing 17 17 16 14 12 10 10 9 8	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60	ass of sample, g oportions analysis mm mm	952 % dry ma 0 53 30 13 5	
	75 63 50 37.5 28 20		ving % Passing 100 100 100 100 84 71 69	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055	ntation % Passing 17 17 16 14 12 12 10 10 9	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading An D100	ass of sample, g oportions analysis	952 % dry ma 0 53 30 13 5	
	75 63 50 37.5 28 20 14 10 6.3		ving % Passing 100 100 100 100 84 71 69 65 60	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028	ntation % Passing 17 17 16 14 12 12 10 10 9 8 5	Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30	ass of sample, g oportions analysis mm mm mm	952 % dry ma 0 53 30 13 5 6.25 0.384	
	75 63 50 37.5 28 20 14 10 6.3 5		ving % Passing 100 100 100 100 84 71 69 65 60 57 53 47	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028	ntation % Passing 17 17 16 14 12 12 10 10 9 8 5	Sample Provery coarse Gravel Sand Silt Clay Grading Au D100 D60 D30 D10	ass of sample, g oportions e nalysis mm mm mm Coefficient	952 % dry ma 0 53 30 13 5 6.25 0.384 0.0112	
	75 63 50 37.5 28 20 14 10 6.3 5 3.35 2		ving % Passing 100 100 100 100 84 71 69 65 60 57 53 47 42	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016	ntation % Passing 17 17 16 14 12 10 10 9 8 5 4	Dry M Sample Provery coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity Courvature Comments	ass of sample, g oportions e nalysis mm mm mm Coefficient	952 % dry ma 0 53 30 13 5 6.25 0.384 0.0112 560	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6	Size	ving % Passing 100 100 100 100 84 71 69 65 60 57 53 47 42 34	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (17 17 16 14 12 12 10 10 9 8 5 4	Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity (Curvature C	ass of sample, g oportions analysis mm mm mm Coefficient Coefficient	952 % dry ma 0 53 30 13 5 6.25 0.384 0.0112 560 2.1	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425	Size	ving % Passing 100 100 100 100 84 71 69 65 60 57 53 47 42 34 31	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (ntation % Passing 17 17 16 14 12 10 10 9 8 5 4	Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity (Curvature C	ass of sample, g oportions e nalysis mm mm mm Coefficient	952 % dry ma 0 53 30 13 5 6.25 0.384 0.0112 560 2.1	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3	Size	ving % Passing 100 100 100 100 84 71 69 65 60 57 53 47 42 34 31 27	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (17 17 16 14 12 12 10 10 9 8 5 4	Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity (Curvature C	ass of sample, g oportions analysis mm mm mm Coefficient Coefficient	952 % dry ma 0 53 30 13 5 6.25 0.384 0.0112 560 2.1	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425	Size	ving % Passing 100 100 100 100 84 71 69 65 60 57 53 47 42 34 31	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (17 17 16 14 12 12 10 10 9 8 5 4	Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity (Curvature C	ass of sample, g oportions analysis mm mm mm Coefficient Coefficient	952 % dry ma 0 53 30 13 5 6.25 0.384 0.0112 560 2.1	
	0.001 Particle S mm 75 63 50 37.5 28 20 14 10 6.3 5 3.35 2 1.18 0.6 0.425 0.3 0.212	Size	ving % Passing 100 100 100 100 84 71 69 65 60 57 53 47 42 34 31 27 23	Sedimer Particle Size mm 0.0630 0.0572 0.0407 0.0291 0.0208 0.0147 0.0109 0.0077 0.0055 0.0039 0.0028 0.0016 Particle density (17 17 16 14 12 12 10 10 9 8 5 4	Dry M Sample Pr Very coarse Gravel Sand Silt Clay Grading Ar D100 D60 D30 D10 Uniformity (Curvature C	ass of sample, g oportions analysis mm mm mm Coefficient Coefficient	952 % dry ma 0 53 30 13 5 6.25 0.384 0.0112 560 2.1	

18/01/2024 09:25

DRILL									Job Ref	202	23OY108
J. J. C.				ARTIC	LE SIZE D	ISTRII	BUTION		Borehole/Pit No.	Т	PB008
s	ite Name	_	Lemanaghan	Wind F	arm				Sample No.	2	
S	oil Descriptior	Dark grey silty	medium	SAND and coa	arse GR <i>A</i>	VEL.		Depth, m		1.60	
	pecimen eference				Specimen Depth			m	Sample Type		В
Т	est Method		BS1377:Part 2	:1990, cl	ause 9.2				KeyLAB ID	IDL12	2023110625
	CLAY Fine			Coarse	e Fine	SAND Medium	Coarse	Fine	GRAVEL Medium Coarse	COBBLES	BOULDERS
	100		e Medium								
	90								//////		
	70										
% guis	60										
Percentage Passing	50										
ercenta	40										
۵	30										
	20										
	10										
	0.001		0.01		0.1	Pai	1 ticle Size i	mm	10	100	1000
		Sie	ving		Sediment	ation		Dry M	Dry Mass of sample, g		860
	Particle S mm	Size	% Passing	Par	rticle Size mm	% Passi					
							_	Sample Pro Very coarse		%	dry mass 0
	75		100					Gravel			49
	63		100					Sand			47
	50 37.5		100 87	-			<u> </u>	Fines < 0.06	S3mm		5
	28		75	+				1 1103 \0.00	Joniiii	<u> </u>	J
	20		71					Grading A	nalysis		
	14		68					D100	mm		
	10		66	4				D60	mm		4.35
	6.3		63 61					D30 D10	mm		0.514
	3.35		57	+				Uniformity (mm_ Coefficient		18
	2		51	+				Curvature C			0.25
	1.18		44				<u> </u>				
	0.6		35					Remarks			
	0.3 12 0.212 9		24					Preparation and	d testing in accordance with BS	1377 unless no	ted below
			6	\dashv							
	0.063 5										
	Operator Checked			d	Approved				Sheet printed		1
					Dympna Darc	y B.Sc.		18/	/01/2024 09:25		QC From No:R2

Moisture Con						dition Value at Natural Moisture Content Summary of Results					
Project No. Project Name							- ,				
2023OY108											
Hole No.	Hole No.		Sample		Soil Description	Retained on 20mm sieve		Moisture Condition Value	Method of Interpretation	Remarks	
	Ref	Тор	Base	Type		%	%				
TPB006	1	0.70	0.90	В		19	12.9	4.2	Best fit line		
TPB007	1	0.70	0.90	В		18	11.2	3.8	Best fit line		
TPB008	2	1.60	1.80	В		9	7.3	17.7	Steepest straight line		
	1										
	-										
			-								
	<u> </u>			<u> </u>		Date Printed					
	Test performed in accordance with BS1377:Part4:1990, clause 5.4 unless							Approved By	Ch	Table	
annotated otherwise						18/01	/2024	13	こしい	sheet	

1					Job Ref	2023OY108
DRILLING	Californ	ia Bearing R	Ratio (CBR)	Borehole/Pit No.	TPB005
Site Name	Lemanaghan Wind Fa	rm			Sample No.	3
Soil Description	Light grey silty very sa	ndy coarse GRAV	ÆL.	Depth m	1.80	
Specimen Reference		Specimen Depth		m	Sample Type	В
Specimen Description		Борит			KeyLAB ID	IDL12023110618
Test Method	BS1377 : Part 4 : 1990), clause 7			CBR Test Number	1
Specimen Preparation Condition Details	REMOULDED	th specified stand	lard effort using	2.5kg	Soaking details Period of soaking Time to surface Amount of swell recor	Not soaked days days ded mm
	Dry o	emoved density lensity ture content	2.31 2.10 10.0	% Mg/m3 Mg/m3 %	Dry density after soak Surcharge applied	ing Mg/m3 2 kg 1 kPa
		Force v Per	netration Plots			
0.30						
0.20 - Z					grand Art	—*— Top data* Top values
Porce Applied		مر مر		***	**	Top correction Base data Base values
0.10						——— Base Correction
0.00	1 2	3 Penetra	4 5 ation mm	6	7 8	3
Results TOF BAS		2.5mm 5n 0.6 0	BR Values, % nm Highest 0.7 0.7 0.8 0.8	Average 0.8	Moisture Content % 10.0 10.5	
General remarks Lab Sheet Reference		Test specific rem	narks	Appr	18/01/2024	Fig No. 1 QC From R9 Sheet No 1

1					Job Ref	2023OY108
BY DRILLING	Californ	nia Bearing F	Ratio (CBR))	Borehole/Pit No.	TPB007
Site Name	Lemanaghan Wind Fa	rm	Sample No.	1		
Soil Description	Light greyish-brown sil	ty SAND and GRA	AVEL.		Depth m	0.70
Specimen Reference		Specimen Depth		m	Sample Type	В
Specimen Description			ı		KeyLAB ID	IDL12023110621
Test Method	BS1377 : Part 4 : 1990), clause 7			CBR Test Number	1
Specimen Preparation Condition Details	REMOULDED Recompacted w rammer	ith specified stand	ard effort using 2		Soaking details Period of soaking Time to surface Amount of swell recor	
	Dry o	density density ture content	2.25 1.99 13.0	% Mg/m3 Mg/m3 %	Dry density after soak Surcharge applied	ing Mg/m3 2 kg 1 kPa
0.14		Force v Per	netration Plots		مبر	
0.10					***	Top data Top values Top correction
0.06 Jones 4 J						Base data Base values Base Correction
0.00	1 2	3 Penetra	4 5 ation mm	6	7 8	3
Results	Curve	г	BR Values, %		Moisture	
TOF BAS	correction applied	2.5mm 5n	Highest 0.4 0.4 0.5 0.5	Average 0.5	Content % 13.0 12.5	
General remark	s	Test specific rem	narks	Appr	oved SCS	Fig No. 1 QC From R9 Sheet No 2
Lab Sheet Reference			18/01/2024			

DRIL	C.	aliforn	ia Roari	na P	atio	/ CRP	`	L	Job Ref	2023OY108
California Bearing Ratio (CBR) Lemanaghan Wind Farm							Borehole/Pit No.	TPB008		
Site Name	Lemanaghan Wind Farm					T	Sample No.	2		
Soil Description	Dark grey silty	/ medium	SAND and	coarse	GRA	VEL.			Depth m	1.60
Specimen Reference	1		Specimer Depth	n			m	\top	Sample Type	В
Specimen Description	+							T	KeyLAB ID	IDL12023110625
Test Method	BS1377 : Part	4 : 1990	, clause 7					土	CBR Test Number	1
pecimen Preparati	on							_		
Condition		ILDED						S	Soaking details	Not soaked
Details			th specified	standa	rd effo	ort using 2	2.5kg		Period of soaking	days
	rammer								Time to surface	days
B 4 a to viol .	:-! 20mm	-!				0	0/		Amount of swell record	
Materiai r	etained on 20mn	n sieve re	∍moved			9	%	υ	Ory density after soaking	ng Mg/m3
Initial Spe	ecimen details	Bulk /	density			2.05	Mg/m3	S	Surcharge applied	kg
······································			lensity			1.92	Mg/m3	-	7010.15. g	kPa
		-	ure content			6.7	%			
- 00			Force	v Pene	tratic	on Plots				
7.00		1	\Box							
					İ					
6.00			$\overline{}$	\longrightarrow		-+				
					i		1			
5.00		- <u></u>			- <u></u> -			<u> </u>		
5.00		\top		_			/	_		─ × Top data
Z					1		./			* Top values
4 00 4							+	—	$\overline{}$	·
Force Applied			- <i>p</i> /			×				—— Top correction
₹ 8 3.00 -					Ž		\longrightarrow			Base data
Por Por		پرا		$ \mathcal{A} $	ĺ					• Base values
		1		*	i					
2.00		*	/							—— Base Correctio
*					ĺ					
1.00	- John Williams	4-		\longrightarrow		-+	\longrightarrow			
					ĺ					
0.00					i					
0.00	1	2	3	4		5	6		7 8	
	Penetration mm									
Results		Curve	rve CBR Values, %					Moisture		
	co	orrection	2.5mm	5mr	m	Highest	Average	-	Content	
		applied						4	%	
TOP			12.0	20.0		20.0	4		7.9	
BAS	³E ∟		19.0	26.0	0	26.0		┙	6.7	
General remark	(S		Test specifi	ic <u>rema</u>	ırks_		Apr	prov	/ed	Fig No. 1
								- 1	k	QC From R9 Sheet No
			ı					ı		Sheet No 3
ab Sheet Reference							-	1	8/01/2024	<u> </u>

	Dry Density / Moisture Content Rel	ationship	Job Ref	2023OY108
IDL	Light Compaction	·	Borehole / Pit No	TPB001
Site Name	Lemanaghan Wind Farm		Sample No	5
Soil Description	Light grey very gravelly very silty medium	SAND.	Depth	3.20 m
Specimen Ref.	Specimen Depth	m	Sample Type	В
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg ra	ammer	Keylab ID	IDL1202311065
	•	Compaction	Test Reference/No.	
2.28 Dry Density, Mg/m3 2.18 1.98	4 8 12 16 Moisture Co	20 ntent, %	— — — 5 ° · · · · · · · · · · · · · · · · · ·	% Air Voids % Air Voids % Air Voids
Prepa	ration	Material us	ed was natural and a	ir dried
Mould			CBR	
	es Used	Comp	posite specimens test	ed
	al Retained on 37.5 mm Sieve % al Retained on 20.0 mm Sieve %		30	
	e Density - Assumed Mg/m³		2.65	
,			2.17	
	num Dry Density Mg/m³			
Optim	um Moisture Content %		7.4	
Operator (Checked Approved Remarks / Report Date:			QC Form R4
				Sheet 1 of 1

IDI	Dry Density / Moisture Content Rela	ationship	Job Ref	2023OY108		
IDL	Light Compaction	•	Borehole / Pit No	TPB003		
Site Name	Lemanaghan Wind Farm	Sample No	3			
Soil Description	Grey Grey silty very sandy coarse GRA	VEL.	Depth	1.20 m		
Specimen Ref.	Specimen Depth	m	Sample Type	В		
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg ra	ammer	Keylab ID	IDL12023110610		
		Compaction	Test Reference/No.			
Material R	pe	Material us	— — — 5 ° · · · · · · · · · · · · · · · · · ·			
Mavimum	n Dry Density Mg/m³		2.16			
			6.7			
Optimum	Optimum Moisture Content %					
Operator Che	cked Approved Remarks / Report Date:			QC Form R4 Sheet 1 of 1		

IDL		Dry Density / Moisture Content Relationship			Job Ref	2023OY108	
			Light Compaction	-	Borehole / Pit No	TPB006	
Site Name			Lemanaghan Wind Farm		Sample No	1	
Soil Descrip	ption	Brown	nish-grey silty SAND and GRAV	EL.	Depth	0.70 m	
Specimen F	Ref.		Specimen Depth	m	Sample Type	В	
Test Metho	od	BS1377:	Part 4:1990, clause 3.4, 2.5kg r	ammer	Keylab ID	IDL12023110619	
				Compaction	Test Reference/No.		
2.17 - 2.17 - 2.07 - 2.	Preparation Mould Type Samples I Material R Material R	oe e		Material us	— — — 5 ° · · · · · · · · · · · · · · · · · ·		
	Maximum Dry Density Mg/m³				2.03		
	Optimum	Moisture Content	%		9.4		
Operator	Che	cked Approved	Remarks / Report Date:			QC Form R4	
<u> </u>			<u> </u>			Sheet 1 of 1	

IDI	Dry Density / Moisture Content Rel	Job Ref	2023OY108				
IDL	Light Compaction	·	Borehole / Pit No	TPB007			
Site Name	Lemanaghan Wind Farm		Sample No	1			
Soil Description	Light greyish-brown silty SAND and GRA	AVEL.	Depth	0.70 m			
Specimen Ref.	Specimen Depth	m	Sample Type	В			
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg ra	ammer	Keylab ID	IDL12023110621			
2.29	Compaction Test Re						
2.19 ————————————————————————————————————			——— 5 5	% Air Voids % Air Voids			
1.79	4 8 12 16 Moisture Co	20 ntent, %	24 2	28 32			
Preparatio	on	Material us	ed was natural and a	ir dried			
Mould Typ			CBR				
Samples		Comp	posite specimens test	ed			
	tetained on 37.5 mm Sieve % Retained on 20.0 mm Sieve %		0 18				
	ensity - Assumed Mg/m³		2.65				
	n Dry Density Mg/m³		2.09				
	Moisture Content %		7.9				
Operator Che	cked Approved Remarks / Report Date:			QC Form R4 Sheet 1 of 1			

IDI		Dry Density / Moisture Content Relationship			Job	Ref	2023OY108			
IDL	•			compaction			Bore	ehole / Pit No	TPB008	
Site Name		ı	Lemanagl	nan Wind Farm	l		Sam	nple No	2	
Soil Description	on	Dark grey silty	y medium	SAND and coa	rse GRAVI	≣L.	Dep	th	1.60	m
Specimen Ref	f.		Specim	en Depth		m	Sam	nple Type	В	
Test Method		BS1377:Pa	art 4:1990,	clause 3.4, 2.5	kg ramme	r	Keyl	lab ID	IDL12023110	625
						Compaction	n Test F	Reference/No.		
	Preparation	8	1		6 e Content,	20 %	24 sed was	10		32
	Mould Type Samples Used					Com		CBR pecimens test	ed	1
	Material Retained on 37.5 mm Sieve %			%	00.111		0		1	
N	Naterial Retained	d on 20.0 mm Siev			%			9		
Р	Particle Density - Assumed Mg/m³			/m³		2	2.65]	
_ N	Maximum Dry Density Mg/m³					1	1.96]	
0)ptimum Moistu	ure Content			%			7.2		<u> </u>
Operator	Checked	Approved	Remarks	/ Report Date:					QC Form R	
<u> </u>	<u></u>	עוטעו							Sheet 1 of	1



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

Irish Drilling Limited Old Galway Road Loughrea Co. Galway

Attention: Dympna Darcy

CERTIFICATE OF ANALYSIS

Date of report Generation: 19 December 2023 Irish Drilling Limited **Customer:**

Sample Delivery Group (SDG): 231212-91 Your Reference: 2023OY108

Location: Lemanaghan Wind Farm

Report No: 714839 Order Number: 13229

We received 3 samples on Tuesday December 12, 2023 and 3 of these samples were scheduled for analysis which was completed on Tuesday December 19, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan Operations Manager







Validated

SDG: 231212-91 Client Ref.: 2023OY108 Report Number: 714839

Superseded Report: Location: Lemanaghan Wind Farm

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29091413	TPB001	B1	1.00 - 1.20	25/10/2023
29091418	TPB003	B1	0.40 - 0.60	25/10/2023
29091420	TPB005	B1	0.60 - 0.80	25/10/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

Superseded Report:

CERTIFICATE OF ANALYSIS

ALS

SDG: 231212-91 Client Ref.: 2023OY108 Report Number: 714839

Location: Lemanaghan Wind Farm

CHCITC IXCI.	202301100				
Results Legend X Test No Determination Possible	Lab Sample No(s)		29091413	29091418	29091420
Sample Types -	Custome Sample Refe		TPB001	TPB003	TPB005
UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere	ence	B1	B1	B1
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (n	1)	1.00 - 1.20	0.40 - 0.60	
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	er	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)	250g Amber Jar (ALE210)
	Sample Ty	/pe	S	S	S
Sample description	All	NDPs: 0 Tests: 3			
Total Occasio Octor	All	NDD 6	Х	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 3	24	3.7	
			Х	X	Х



SDG: 231212-91

Client Ref.: 2023OY108

CERTIFICATE OF ANALYSIS Report Number: 714839

Superseded Report:

Validated

Location: Lemanaghan Wind Farm

Sample Descriptions

Grain Sizes

very fine <0.0	0.0 fine 0.0	63mm - 0.1mm m	edium 0.1mm	n - 2mm coa	rse 2mm - 1	.0mm very coa	rse
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2	
29091413	TPB001	1.00 - 1.20	Light Brown	Silty Clay	None	None	
29091418	TPB003	0.40 - 0.60	Light Brown	Silty Clay	None	None	
29091420	TPB005	0.60 - 0.80	Grey	Silty Clay	Stones	None	

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



Superseded Report:

CERTIFICATE OF ANALYSIS



SDG: 231212-91 Client Ref.: 2023OY108 Report Number: 714839

Location: Lemanaghan Wind Farm

Results Legend # ISO17025 accredited.	Cust	tomer Sample Ref.	TPB001	TPB003	TPB005		
M mCERTS accredited. aq Aqueous / settled sample.		_					
diss.filt Dissolved / filtered sample. tot.unfiltTotal / unfiltered sample.		Depth (m) Sample Type	1.00 - 1.20 Soil/Solid (S)	0.40 - 0.60 Soil/Solid (S)	0.60 - 0.80 Soil/Solid (S)		
* Subcontracted - refer to subcontractor re		Date Sampled	25/10/2023	25/10/2023	25/10/2023		
** % recovery of the surrogate standard to efficiency of the method. The results of it compounds within samples aren't correct	check the	Sample Time Date Received	12/12/2023	12/12/2023	12/12/2023		
compounds within samples aren't correct recovery	ted for the	SDG Ref	231212-91	231212-91	231212-91		
(F) Trigger breach confirmed 1-4+§@ Sample deviation (see appendix)	L	ab Sample No.(s) AGS Reference	29091413 B1	29091418 B1	29091420 B1		
Component	LOD/Units	Method	ы	ы	D1		
Moisture Content Ratio (% of as	%	PM024	22	26	22		
received sample)							
Soil Organic Matter (SOM)	<0.35 %	TM132	1.11	1.18	0.965		
			@#	@#	@#		
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Validated

SDG: 231212-91 Client Ref.: 2023OY108 Report Number: 714839

Superseded Report: Location: Lemanaghan Wind Farm

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture, screens of soils for Asbestos Containing Material
TM132	ELTRA CS800 Operators Guide

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



ALS

SDG: 231212-91 **Client Ref**.: 2023OY108 Report Number: 714839

Location: Lemanaghan Wind Farm

Superseded Report:

Test Completion Dates

Lab Sample No(s)	29091413	29091418	29091420
Customer Sample Ref.	TPB001	TPB003	TPB005
AGS Ref.	B1	B1	B1
Depth		0.40 - 0.60	0.60 - 0.80
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Sample description	13-Dec-2023	13-Dec-2023	13-Dec-2023
Total Organic Carbon	19-Dec-2023	19-Dec-2023	19-Dec-2023



SDG: 231212-91 **Client Ref:** 20230Y108

Report Number: 714839 Superseded Report:

Location: Lemanaghan Wind Farm

Appendix General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

- 2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 6. NDP No determination possible due to insufficient/unsuitable sample.
- 7. Results relate only to the items tested.
- 8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.
- 9. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.
- 10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury
- 13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.
- 14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogran is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
8	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbe stos Type	Common Name		
Chrysof le	White Asbesbs		
Amosite	Brow n Asbestos		
Cro a dolite	Blue Asbe stos		
Fibrous Act nolite	-		
Fib to us Anthop hyll ite	-		
Fibrous Tremolite	-		

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 μ m diameter, longer than 5 μ m and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

Irish Drilling Limited Old Galway Road Loughrea Co. Galway

Attention: Dympna Darcy

CERTIFICATE OF ANALYSIS

Date of report Generation:01 February 2024 **Customer:**Irish Drilling Limited

Sample Delivery Group (SDG): 240126-71 **Your Reference:** 2023OY108

Location: Lemanaghan Wind Farm

 Report No:
 718867

 Order Number:
 13364

We received 5 samples on Friday January 26, 2024 and 5 of these samples were scheduled for analysis which was completed on Thursday February 01, 2024. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





ALS Laboratories (UK) Limited. Registered Office: Torrington Avenue, Coventry CV4 9GU. Registered in England and Wales No. 02391955.

Version: 3.6 Version Issued: 01/02/2024



Validated

SDG: 240126-71 Client Ref.: 2023OY108 Report Number: 718867

Superseded Report:

Location: Lemanaghan Wind Farm

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
29270163	BHSS1	C1	7.10 - 8.60	08/11/2023
29270167	BHT01	C1	4.10 - 5.60	22/11/2023
29270170	BHT03	C1	7.10 - 8.60	20/11/2023
29270172	BHT06	C1	5.60 - 7.10	17/11/2023
29270174	BHT15	C1	5.60 - 7.10	15/11/2023

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

Superseded Report:

CERTIFICATE OF ANALYSIS

ALS

SDG: 240126-71 Client Ref.: 2023OY108 Report Number: 718867

Location: Lemanaghan Wind Farm

Cheff Ref.	202301100				LUC	atioi	i. Le
Results Legend X Test N No Determination	Lab Sample	No(s)	29270163	29270167	29270170	29270172	29270174
Possible Sample Types -	Custome Sample Refe	BHSS1	внт01	внтоз	внт06	внт15	
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere	ence	Cl	C1	C1	Cl	C1
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (n	n)	7.10 - 8.60	4.10 - 5.60	7.10 - 8.60	5.60 - 7.10	5.60 - 7.10
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	1 kg TUB	1 kg TUB	1 kg TUB	1 kg TUB	1kg TUB	
	Sample Ty	S	S	S	S	S	
Ammoniacal N as NH4 in 2:1 extract	All	All NDPs: 0 Tests: 5					Х
Anions by Kone (soil)	All	NDPs: 0 Tests: 5	Х	X	X	Х	Х
Magnesium (BRE)	All	NDPs: 0 Tests: 5	X	X	X	Х	X
NO3, NO2 and TON by KONE (s)	All	NDPs: 0 Tests: 5	Х	X	X	Х	X
pH	All	NDPs: 0 Tests: 5	X	X	X	X	X
Sample description	All	X	Х	Х	X	Х	
Total Organic Carbon	All	NDPs: 0 Tests: 4		Х	X	Х	Х
Total Sulphate	All	NDPs: 0 Tests: 5	Х	Х	Х	Х	Х
Total Sulphur	All	NDPs: 0 Tests: 5	X	X	X	X	X
						_	



Validated

Superseded Report:

SDG: 240126-71 **Client Ref**.: 2023OY108

Report Number: 718867

Location: Lemanaghan Wind Farm

Sample Descriptions

Grain Sizes

very fine	<0.0	63mm	fine	0.063	8mm - 0.1mm	medium	0.1mm	- 2mm	coar	se	2mm - 1	.0mm very coa		irse
Lab Sample	No(s)	Custome	er Sample	Ref.	Depth (m)	Co	lour	Descrip	tion	Inc	lusions	Inclus	sions 2	
2927010	63		BHSS1		7.10 - 8.60	G	irey	Silty C	ay		None	N	one	
2927010	67		BHT01		4.10 - 5.60	В	ack	Silty C	ay		None	No	one	
292701	70		BHT03		7.10 - 8.60	G	irey	Clay	,		None	No	one	
292701	72		BHT06		5.60 - 7.10	G	irey	Clay			None	No	one	
292701	74		BHT15		5.60 - 7.10	G	irey	Clay	,		None	No	one	

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.





SDG: 240126-71 Client Ref.: 2023OY108 Report Number: 718867

Location: Lemanaghan Wind Farm

Superseded Report:

Possilts Logand	Cuel	tomor Comple Dof	PURCH	DUTO	DUTOO	PLITO	DUTAS	
Results Legend # ISO17025 accredited. M mCERTS accredited.	Cusi	tomer Sample Ref.	BHSS1	BHT01	BHT03	BHT06	BHT15	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfiltTotal / unfiltered sample.		Depth (m)	7.10 - 8.60	4.10 - 5.60	7.10 - 8.60	5.60 - 7.10	5.60 - 7.10	
 Subcontracted - refer to subcontractor repraction status. 	ort for	Sample Type Date Sampled	Soil/Solid (S) 08/11/2023	Soil/Solid (S) 22/11/2023	Soil/Solid (S) 20/11/2023	Soil/Solid (S) 17/11/2023	Soil/Solid (S) 15/11/2023	
** % recovery of the surrogate standard to ch efficiency of the method. The results of ind compounds within samples aren't correcte	lividual	Sample Time Date Received	26/01/2024	26/01/2024	26/01/2024	26/01/2024	26/01/2024	
recovery (F) Trigger breach confirmed		SDG Ref ab Sample No.(s)	240126-71 29270163	240126-71 29270167	240126-71 29270170	240126-71 29270172	240126-71 29270174	
1-44 §@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method	C1	C1	C1	C1	C1	
Moisture Content Ratio (% of as received sample)	%	PM024	12	14	12	13	11	
Sulphur, Total	<0.02 %	TM132	0.0761	<0.02	0.0506	<0.02	0.0567	
' '	10.02 /0	TIVITOL	@#	°°.02 @#	0.0000 @#	°0.02 @#	@#	
Soil Organic Matter (SOM)	<0.35 %	TM132		1.1 @#	0.657 @#	5.26 @#	0.552 @#	
pН	1 pH Units	TM133	8.08	8.23	8.57	8.44	8.31	
Culmbata asid salubla (tatal)	±0.0040.0/	TM004	@ M	@ M 0.026	@ M 0.0348	@ M 0.0148	@ M	
Sulphate, acid soluble (total)	<0.0048 %	TM221	0.0976 M	0.026 M	0.0348 M	0.0148 M	0.044 M	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.004 g/l	TM243	0.401	0.0382	0.0733	0.0202	0.138	
Chloride 2:1 water/soil extract BRE	<0.0025 g/l	I TM243	@ M 0.0111	@ M 0.0086	@ M 0.011	@ M 0.0069	@ M 0.0132	
	Ť		@ M	@ M	@ M	@ M	@ M	
Nitrate as NO3, 2:1 water soluble (BRE)	<0.0003 g/l	TM243	<0.0003	0.00177	<0.0003	0.000499	<0.0003	
Ammoniacal N as NH4 in 2:1 extract BRE	<0.0003 g/l	TM248	0.00538	0.00414	0.0075	0.00594	0.0073	
Magnesium (BRE)	<0.008 g/l	TM282	<0.008	<0.008	<0.008	<0.008	<0.008	
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Validated

SDG: 240126-71 Ro Client Ref.: 20230Y108

Report Number: 718867 Superseded Report:

Location: Lemanaghan Wind Farm

Table of Results - Appendix

Method No	Description
TM248	Determination of Ammonium BRE (2:1 Extract) on solids
TM282	Extraction of Magnesium by BRE Method
PM024	Soil preparation including homogenisation, moisture, screens of soils for Asbestos Containing Material
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM221	Determination of Acid Extractable Sulphate in Soils by ICP OES
TM243	Mixed Anions In Soils By Kone

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

Validated

CERTIFICATE OF ANALYSIS



SDG: 240126-71 Client Ref.: 2023OY108 Report Number: 718867

Superseded Report:

Location: Lemanaghan Wind Farm

Test Completion Dates

Lab Sample No(s)	29270163	29270167	29270170	29270172	29270174
Customer Sample Ref.	BHSS1	BHT01	BHT03	BHT06	BHT15
AGS Ref.	C1	C1	C1	C1	C1
Depth	7.10 - 8.60	4.10 - 5.60	7.10 - 8.60	5.60 - 7.10	5.60 - 7.10
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Ammoniacal N as NH4 in 2:1 extract	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024
Anions by Kone (soil)	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024
Magnesium (BRE)	31-Jan-2024	31-Jan-2024	31-Jan-2024	31-Jan-2024	31-Jan-2024
NO3, NO2 and TON by KONE (s)	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024
pH	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024	01-Feb-2024
Sample description	26-Jan-2024	26-Jan-2024	26-Jan-2024	26-Jan-2024	26-Jan-2024
Total Organic Carbon		31-Jan-2024	31-Jan-2024	31-Jan-2024	31-Jan-2024
Total Sulphate	31-Jan-2024	31-Jan-2024	31-Jan-2024	31-Jan-2024	31-Jan-2024
Total Sulphur	31-Jan-2024	31-Jan-2024	31-Jan-2024	31-Jan-2024	31-Jan-2024



SDG: 240126-71 **Client Ref:** 2023OY108

Report Number: 718867 Superseded Report:

Location: Lemanaghan Wind Farm

Appendix General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

- 2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
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- 10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
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- 13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.
- 14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogran is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
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If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

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The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbe stos Type	Common Name					
Chrysof le	WhiteAsbesbs					
Amosite	BrownAsbestos					
Cro a dolite	Blue Asbe stos					
Fibrous Act nolite	-					
Fib to us Anthop hyll ite	-					
Fibrous Tremolite	-					

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 μ m diameter, longer than 5 μ m and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

IDL		DR.	ULING						rength Index Tests ry of Results										
Project No.)23OY10		E 0	Project Na	ame						nan Wi								
Borehole	,	Sample		Specimen		Rock Type	Test see I		「ype (N/∠) pil		Dimensions			Force P	Equivalent diameter, De	Point Load Strength Index		Remarks (including water	
No.	Top Depth m	Base Depth m	Туре	Ref	Top m	and Test condition	Type (D, A, I, B)	Direction (L, P or U)	Failure Valid (Y/N)	Lne	W	Dps	Dps'	kN	g Equivale	Is MPa	Is(50) MPa	content if measured)	
BHBP1	2.50	4.1	С	3.4-3.53	3.40		D	U	YES		63.4		63.4	21.6	63.4	5.4	6.0	Very Strong	
BHBP1	4.10	5.5	С	4.6-4.7	4.60		D	U	YES		63.4		63.4	1.2	63.4	0.3	0.3	Weak	
BHBP1	5.50	7.1	С	6.8-7.0	6.80		D	U	YES		63.4		63.4	18.6	63.4	4.6	5.1	Very Strong	
BHSS3	10.10	11.6	С	11.0-11.14	11.00		D	U	YES		63.4		63.4	13.9	63.4	3.4	3.8	Strong	
BHSS3	11.60	13.1	С	12.5-12.64	12.50		D	U	YES		63.4		63.4	8.6	63.4	2.1	2.4	Strong	
BHSS3	13.10	14.6	С	13.7-13.8	13.70		D	U	YES		63.4		63.4	6.5	63.4	1.6	1.8	Medium Strong	
BHT12	8.10	9.7	С	8.8-9.0	8.80		D	U	YES		63.4		63.4	19.5	63.4	4.9	5.4	Very Strong	
BHT12	9.70	11.3	С	10.5-10.6	10.50		D	U	YES		63.4		63.4	2.8	63.4	0.7	0.8	Weak	
BHT12	11.30	12.9	С	12.1-12.3	12.10		D	U	YES		63.4		63.4	2.3	63.4	0.6	0.6	Weak	
Direction L - parallel to planes of weakness P - perpendicular to planes of weakness U - unknown or random Dimensions Dps - Distance between platens (platen separation) Dps' - at failure (see ISRM note 6) Lne - Length from platens to nearest free end								iamet	ral P	(W)	D _{ps}	Axia	P	L _r	BI	lock/irre	<u></u>	D _{ps}	
Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P Test performed in accordance with ISRM Suggested Methods : 2007, unless noted otherwise Detailed legend for test and dimensions, based on ISRM, is shown above. Size factor, F = (De/50)0.45 for all tests.									Date F	Printed 3/01/20	24	Appro	ved By	y)	Table sheet	1			

IDL	DRI	UMG		UN	IAXIAL CO	MPR	RESS	ION	TEST (ON RO	N ROCK - SUMMARY OF RESULTS						
Project No.		. 0	Project	t Name	9				l	\A/:I	F						
20230	DY108						`n a aim a		Lemanagh	nan wind	rarm						
		Sam	ple			Specimen Dimensions2			Bulk	Water	Unia	xial Com	pressio	n3			
Hole No.	Ref	Тор	Base	Туре	Specimen Depth (m)	Dia.	Length	H/D	Density2	Content 1	Condition	Stress Rate	Mode of	UCS	Remarks		
						mm	mm		Mg/m3	%		MPa/s	failure	MPa			
BHBP1		4.10	5.50	С	4.7	63.4	160.4	2.5	2.67		as received	0.1670	AC	38.6	Medium Strong		
BHSS3		11.60	13.10	С	12.2	63.4	158.5	2.5	2.70		as received	0.1354	AC	42.0	Medium Strong		
BHT12		9.70	11.30	С	9.7	63.4	160.0	2.5	2.73		as received	0.1854	AC	37.6	Medium Strong		
Notes 1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as tested for UCS 2 ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk densit 3 ISRM p153 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials									y		Mode of fai S - Single s AC - Axial	shear cleavage	F - Fragn				
above notes apply unless annotated otherwise in the remarks Test Specification International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007								Date Printed Approved By Table 18/01/2024 Sheet 1			1 sheet						



Appendix 04 Photographs (Rotary Core)

Irish Drilling Ltd: Core Photos:





Irish Drilling Ltd: Core Photos:







Irish Drilling Ltd: Core Photos:





Appendix 05 Trial Pit Photographs

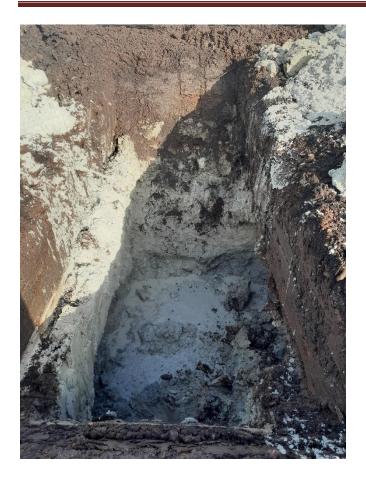


Figure 1 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb001,.jpg



Figure 2 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb001..jpg

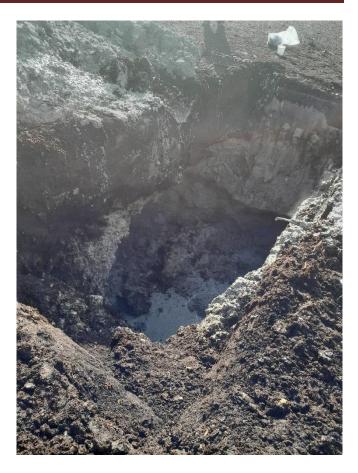


Figure 3 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb001.jpg



Figure 4 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb002,.jpg



Figure 5 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpb002..jpg



Figure 6 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb002.jpg



Figure 7 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb003,.jpg



Figure 8 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb003..jpg



Figure 9 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpb003.jpg

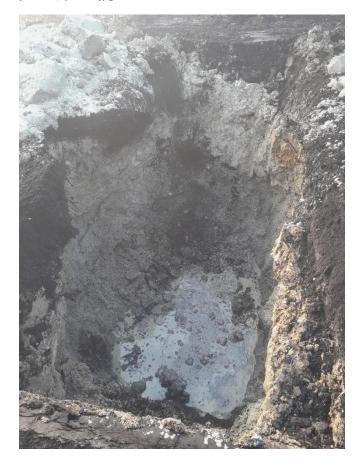


Figure 10 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpb004,.jpg



Figure 11 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb004..jpg



Figure 12 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb004.jpg



Figure 13 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpb005,.jpg



Figure 14 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb005..jpg



Figure 15 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb005.jpg

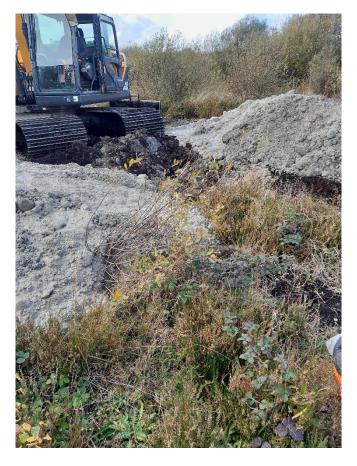


Figure 16 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb006,.jpg



Figure 17 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpb006..jpg



Figure 18 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb006.jpg



Figure 19 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb008,.jpg



Figure 20 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb008..jpg



Figure 21 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpb008.jpg



Figure 22 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc001,.jpg



Figure 23 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc001..jpg



Figure 24 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc001.jpg



Figure 25 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc002,.jpg



Figure 26 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc002..jpg



Figure 27 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc002.jpg



Figure 28 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc003,.jpg



Figure 29 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc003..jpg



Figure 30 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc003.jpg



Figure 31 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpcc004,.jpg

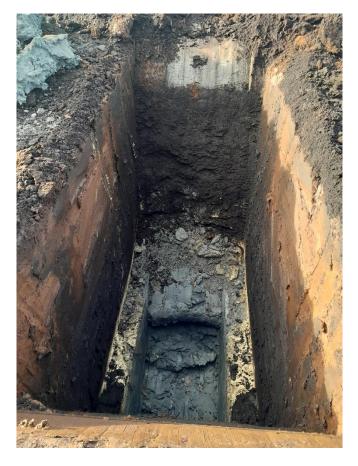


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Figure 33 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc004.jpg

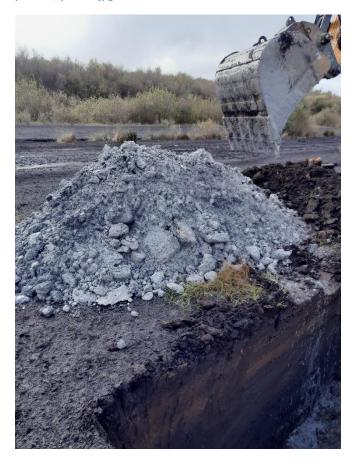


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Figure 35 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpcc005..jpg



Figure 36 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpcc005.jpg



Figure 37 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc006,.jpg



Figure 38 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc006..jpg



Figure 39 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpcc006.jpg

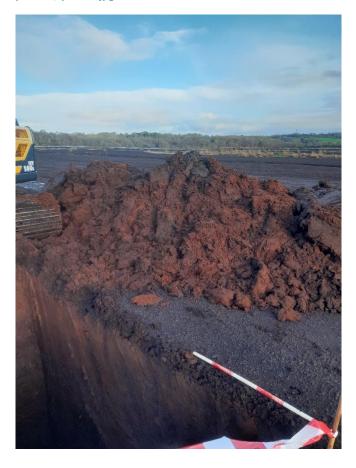


Figure 40 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc007,.jpg



Figure 41 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpcc007..jpg



Figure 42 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpcc007.jpg



Figure 43 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpmm001,.jpg



Figure 44 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpmm001..jpg



Figure 45 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpmm001.jpg



Figure 46 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpmm01,.jpg



Figure 47 H:\230Y108_Lemanaghan\lemanaghan tp photos\Tpmm01..jpg

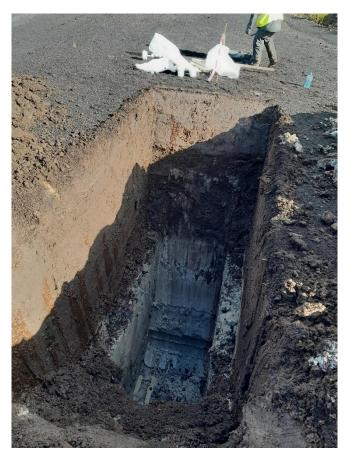


Figure 48 H:\23OY108_Lemanaghan\lemanaghan tp photos\Tpmm01.jpg



Appendix 06 Site Plans

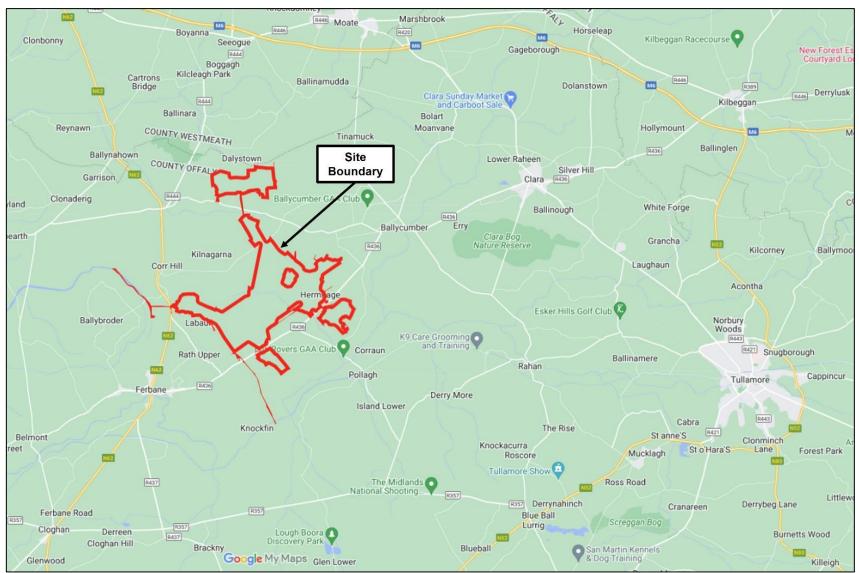


Figure 1 Site Location



Figure 2 Exploratory Hole Location Map



Appendix 07 AGS Data



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