Technical Appendix 9.2: Peat Management Plan

Killean Wind Farm

Renewable Energy Systems Limited

Prepared by:

SLR Consulting Limited

No. 50 Stirling Business Centre, Wellgreen, Stirling,
FK8 2DZ

SLR Project No.: 405.064984.00001

4 July 2024

Revision: 2

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0	14 May 2024	R. Watson	A. Huntridge	A. Huntridge
1	29 May 2024	R. Watson	A. Huntridge	A. Huntridge
2	4 July 2024	R. Watson	A. Huntridge	A. Huntridge

Basis of Report

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1.0 Introduction

1.1 General

SLR Consulting Ltd (SLR) was commissioned by Renewable Energy Systems Ltd (RES) (the Applicant) to undertake a Stage 1 Outline Peat Management Plan (PMP) at the proposed Killean Wind Farm (the "Proposed Development"). The location and layout of the Proposed Development are detailed on **Figure 9.2.1** and **Figure 9.2.2** with the red line defining 'the site boundary'.

1.2 Proposed Development

It is anticipated that the Proposed Development would comprise the following;

- up to 9 three-bladed horizontal axis wind turbines of up to 180m tip height. The turbines would be nominally rated at 6.6 MW;
- permanent wind turbine foundations;
- associated low to medium voltage transformers and related switch gear would be located at each wind turbine;
- hardstand areas for erection of cranes at each wind turbine location;
- a network of on-site tracks including an access track, site entrance from the public road network, water crossings, passing places and turning heads;
- a substation compound containing electrical infrastructure, control building, welfare facilities and a communications mast;
- temporary concrete batching plant;
- a network of buried electrical and communication cables to be routed alongside the access tracks;
- borrow pits (dependent on availability of stone within the site); and
- temporary construction compound(s).

Full details of the Proposed Development are provided in **EIAR Chapter 2: Proposed Development Description** of the EIA Report.

The Proposed Development is located approximately 2km east of Tayinloan, on Killean Estate, Kintyre Peninsula.

This report utilises the data obtained from peat surveys conducted by SLR Consulting in January 2024 and May 2024 and others in July 2023.

The work has been undertaken by a team of Geotechnical Engineers and Geologists, with over 10 years' experience in undertaking peat assessments. The team was led by a Chartered Hydrogeologist with 30 years' consultancy experience and specialising in the assessment of soils, geology and water for renewable power projects in Scotland.

1.3 Objectives

The PMP outlines the overall approach of minimising disruption to peatland, and it aims to ensure that all further opportunities to minimise peat disturbance and peat excavation would be taken during detailed design and construction of the development.

The PMP has been developed to demonstrate that peat has been afforded significant consideration during the construction phase of the Proposed Development, should consent

be granted. It aims to propose mitigation measures that would minimise any impacts and support the long-term habitat restoration and management plans.

The PMP seeks to identify that appropriate proposals for re-use, re-instatement and restoration of excavated peat can be accommodated within the Proposed Development and associated with EIA Report **Technical Appendix 7.6 Outline Biodiversity Enhancement Management Plan (OBEMP)** proposals, without significant environmental or health and safety implications, to minimise risk in terms of carbon release and human health.

The purpose of this report is to ensure that there has been systematic consideration of peat management and to provide an initial quantitative assessment to guide the development process. Specifically, the report is intended to:

- Describe how, through site investigation and iterative design, the Proposed Development has been structured and designed to minimise, so far as reasonably practicable, the quantity of peat which will be extracted;
- Demonstrate that volumes of peat anticipated to be excavated by the Proposed Development have been considered; and
- Explain how excavated peat will be managed.

1.4 Role of the Peat Management Plan

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

1.4.1 Stage 1: Environmental Impact Assessment (EIA)

The Outline Peat Management Plan submitted as part of the EIA. From this initial report the PMP will be developed further into a Stage 2 Pre-Construction PMP.

1.4.2 Stage 2: Post Consent / Pre-Construction

As part of the EIA it will have been demonstrated that, based on the investigation and data collected, it is likely that the excavated materials for the Proposed Development can be managed in an appropriate manner. The peat mass balance calculations may be further developed, and prior to the relevant works commencing, because of any further or more detailed ground investigation or survey works required to inform detailed design, or that may be required under planning consent conditions.

1.4.3 Stage 3: Construction Stage

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

1.5 Legislation and Guidance

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

- National Planning Framework for Scotland 4 (NPF4) (Scottish Government, February 2023);
- SEPA Regulatory Position Statement - Developments on Peat (Scottish Environment Protection Agency, 2010);
- Good Practice during Windfarm Construction, 4th Edition (Scottish Renewables, Scottish Natural Heritage (now NatureScot), Scottish Environment Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science and AEECoW, 2019);
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (Scottish Renewables and SEPA, 2012);
- Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (Scottish Government, January 2017);
- Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads on Peat with reference to Wind Farm Developments in Scotland (Forestry Commission Scotland & Scottish Natural Heritage, 2010);
- The Waste Management Licensing (Scotland) Regulations 2011; and
- Developments on Peat and Off-Site Uses of Waste Peat (SEPA, 2017).

1.5.1 Requirements of National Planning Policy 4

The intent of Policy 5 (Soils) of National Planning Policy 4 (NPF4)[1] is "*to protect carbon rich soils, restore peatlands and minimise the disturbance of soils from development*".

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

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

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

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

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

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

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

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

This stage 1 PMP considers the protection and safeguarding of peat and seeks to fulfil the requirements of Policy 5(d) with further detail on peatland habitat and peatland restoration proposals provided in the **OBEMP, EIA Report Technical Appendix 7.6**.

1.5.2 Mitigation Hierarchy

SEPA[2,3] has provided a hierarchy of management approaches through which the effectiveness of the approach to peat management is optimised at development sites, as summarised below.

The objectives have been achieved by completion of the following and this terminology has been used throughout the report where applicable:

- **Prevention**: The best management option for waste peat is to prevent or limit its production. This can be done through avoidance by design, positioning infrastructure in shallower peat or through consideration of alternative construction methods or engineering solutions e.g., floated roads or piling solutions;
- **Reinstatement:** Placement (including partial reinstatement) of peat back into the original location of excavation; e.g. reinstatement of temporary hardstanding areas and temporary excavations, partial reinstatement of tracks;
- **Reuse (on-site)**: (onsite): Using excavated peat in construction away from the original location of excavation e.g; reuse for visual tie-in of verges or reuse in borrow pits to form long-term viable peat stores;
- **Restoration:** onsite or offsite for peatland restoration;
- **Recycling / Recovery / Treatment:** Where peat cannot be reused onsite or offsite for restoration, it may be used for agricultural benefit or treated/blended with other materials to form a soil substitute or used in other relevant works. This use would require a waste management license or registration as an exempt activity and compliance with the legal requirements;
- **Storage:** Temporary storage of peat onsite (for example, during short periods in the construction phase) and then reuse or reinstatement. Should the peat become unsuitable for reuse or reinstatement during storage, it would be classed as a waste material. Storage of peat up to a depth of 2 m is not classified as a waste and does not require authorisation from SEPA, however care must be taken to ensure that it does not cause environmental pollution.

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

3 Scottish Renewables, Scottish Environment Protection Agency. 2012. Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste.

- **Disposal (Waste):** Only after all other options have been explored and discounted would this option be considered.

Many of the issues associated with peat on a wind farm site can be accommodated by modifying the development layout to avoid potentially difficult or sensitive areas. Such areas would include:

- Areas of deep peat, requiring potentially large volumes of excavation;
- Areas of very wet peat (such as flushes, pool and hummock complexes and gullied peatland) which might be important for hydrological connectivity;
- Areas of moderate to steep slopes (where site infrastructure might increase the chance of peat instability); and
- Areas of sensitive habitat.

Design evolution for the Proposed Development has taken all the above points into consideration and the layout of infrastructure has been revised accordingly.

This is detailed in **EIA Report Chapter 3 Design Evolution and Alternatives**.

2.0 Baseline Conditions

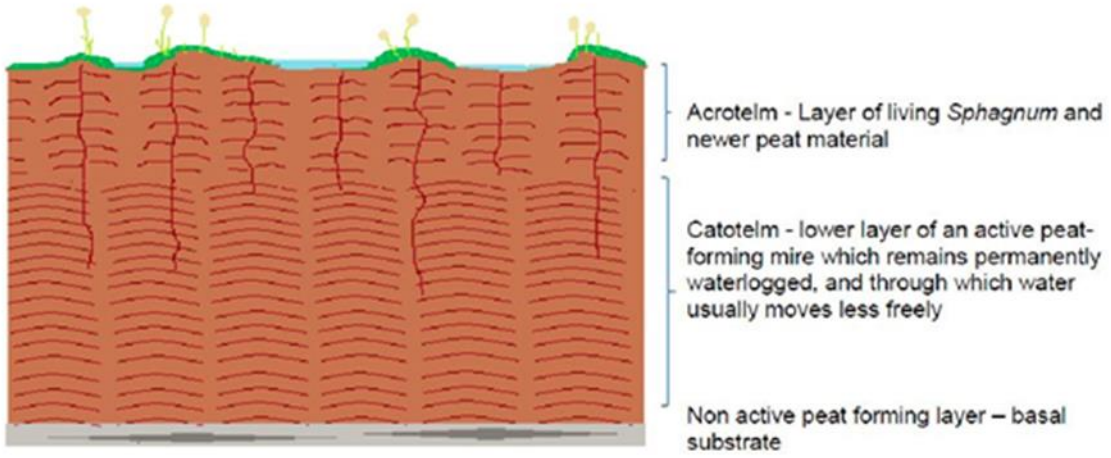
2.1 Definitions of Peat

Peat is defined as a material consisting of the partially decomposed remains of plant material and organic matter preserved over a period in a waterlogged environment resulting in anaerobic conditions, with a depth > 0.5m. Where the organic material is <0.5m depth then this is not defined as peat. This definition is supported by the following text presented in the following guidance;

- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland Section 3.3 which states that "*Peat soil is an organic soil which contains more than 60 percent of organic matter and exceeds 50cm in thickness."*
- Scottish Government. Scotland's Soils. Soil Survey of Scotland *"Peaty soils have an organic layer at the surface which is less than 50 cm thick"*
- The Macaulay Land Use Research Institute define shallow peat as having "*a prescribed depth of organic matter of 50 – 100 cm"*

Peat can be classed as two principal types, the acrotelm layer, and the catotelm layer as shown on **Plate 1-1**.

Plate 2-1: Drawing of two layered Structure of Active Bog Peatlands above Non-Active Peat



The acrotelm layer is found in the upper layer of peat where conditions are relatively dry and comprises living vegetation and partially decomposed plant material which are typically <0.5m in thickness. Hydraulic conductivity in this layer tends to be higher in relation to distance from the water table. The thickness of the acrotelm layer varies depending on topography such as steepness of slope, peat hags, and hummocks. In particular, the acrotelm layer can be affected during periods of drought or as a consequence of drainage. Fibrous in texture, the acrotelm layer has some tensile strength and is generally considered to be stable for storage and re-use.

The catotelm layer is found under the acrotelm layer and comprises decayed plant material and organisms and is denser and with a very low hydraulic conductivity. The catotelm layer sits below the water table resulting in permanent anaerobic conditions. The catotelm layer can be amorphous and may have lower tensile strength making it less suitable for storage and re-use.

For the purposes of this report deep peat has been defined as peat >1m in thickness.

2.2 Peat Classification

The Scottish Government Carbon and Peatland Map 2016[4] shows that most of the Proposed Development is mapped by Class 5 peat. This indicates that it is unlikely that peatland habitats are present in those areas and that soils are carbon-rich, however no peatland habitat recorded. Class 5 may also include areas of bare soil and deep peat may be present.

There is a very localised area of Class 3 peat in the north-west of the site, predominantly comprised of peaty soil with some peat soil. Class 3 peat deposits are not considered priority peatland although occasional peatland habitats can be found, most soils are carbon rich with localised areas of deeper peat.

Mineral soils are mapped across the site adjacent to watercourses.

To the east of the Proposed Development there are large expanses of mapped Class 1 peat deposits which have been avoided during the design process.

2.3 Peat Depth Survey

Peat depth surveys have been undertaken across a number of phases by SLR and others. The surveys carried out followed best practice guidance for developments on peatland[1,5,6].

Phase 1 peat probing resulted in probing on a 100m grid in developable areas to allow for initial assessment of the Proposed Development which was used in preliminary site layout designs. The Phase 2 peat probing involved detailed probing undertaken across the Proposed Development, focussing on access tracks, turbine locations and other site infrastructure in response to design changes. Probing was not possible in areas of dense forestry or areas of felled forestry or wind blown trees with no safe walking access and SLR acknowledge that there are some limited gaps in the probing dataset however the data is considered adequate to undertake this assessment.

Where surveys were undertaken by SLR, the thickness of the peat was assessed using a graduated peat probe, approximately 6 mm diameter and capable of probing depths of up to 10 m. This was pushed vertically into the peat to refusal and the depth recorded, together with a unique location number and the co-ordinates from a handheld Global Positioning System instrument (GPS). The accuracy of the GPS was quoted as ±2 m, which was considered sufficiently accurate for this survey. All data was uploaded into a GIS database for incorporation into various drawings and analysis assessments.

Where the probing recorded less than 0.5m thick, this has been considered to be an organic/peaty soil rather than peat.

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

- Solid and abrupt refusal – rock;
- Solid but less abrupt refusal with grinding or crunching sound – sand or gravel or weathered rock;

4 Scottish Government, Carbon and Peatland Map 2016, Available online at: map.environment.gov.scot/soil_maps/

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

6 Scottish Natural Heritage (SNH), SEPA, Scottish Government & James Hutton Institute. (2014)’ Peat Survey Guidance; Developments on Peatland: Site Surveys’.

- Rapid and firm refusal – clay; or
- Gradual refusal – dense peat or soft clay.

2.4 Peat Depth Results

Peat is generally defined as a soil with a surface organic layer in excess of 0.5m[1,5]. Where the probing recorded less than 0.5m thick, it is considered to be a peaty soil (or organo-mineral soil). Soils with a peaty organic horizon over mineral soil are often referred to as 'peaty soils'. These organo-mineral soils are extensive across the UK uplands, but do not meet recognised definitions of peat as they are either shallower than true peat or have a lower carbon density.

The peat was found to vary across the Proposed Development in terms of thickness and coverage. When viewed in conjunction with the peat depth figures, it is evident that the peat is encountered across the Proposed Development. Deeper peat was generally encountered in flatter, lower gradient areas of the Proposed Development.

A total of 4,760 peat probes were undertaken across all survey phases, with the results summarised in Table A and detailed within the peat depth interpolation figures provided in **Figure 9.2.3**, **Figure 9.2.4** and **Figure 9.2.5**. The interpolation was undertaken using the Inverse Distance Weighting (IDW) methodology.

Table A: Peat Probing Results

Peat Thickness (m)	**No. of Probes**	**Percentage (of total probes undertaken on-site)**
0 (no peat)	270	5.7
0.01 – 0.49 (peaty soil)	2,644	55.5
0.50 – 0.99	899	18.9
1.00 – 1.49	429	9.0
1.50 – 1.99	265	5.6
2.00 – 2.49	120	2.5
2.50 – 2.99	60	1.3
3.00 – 3.49	26	0.5
3.50 – 3.99	20	0.4
> 4.0	27	0.6

2.5 Peat Extents

Peat deposits are present throughout the Proposed Development, predominantly situated in the south, east and localised areas of the north. Deep peat deposits across the Proposed Development are typically associated with topographic lows, hollows, gentle slopes and flatter expanses that facilitate the formation of peat.

Localised deep peat deposits are located near turbines T2, T3, T5, T6 and T7. These deposits are predominantly situated on flatter expanses, lower gradient slopes and local topographic lows between hummocks. Furthermore, there are more extensive blanket deep peat deposits out with the area of the Proposed Development to the south and east as noted indicated on **Figure 9.2.3**.

Observations from site visits and the habitat surveys indicate that some of the areas of peat across the Proposed Development are blanket bog. Areas of blanket bog are present in the south adjacent to T6 and the borrow pit search area. There is an area of blanket bog to the east of T2.

2.6 Peat Condition

Peat is described using BS5930[7] and the Von Post classification[8]. Seven peat samples were collected by SLR during Phase 2, using a peat auger and used to inform interpretations of the peat condition and underlying substrate.

Based on interpretations from probing and peat core samples, the peat within the Proposed Development is predominantly fibrous to pseudo-fibrous.

Based on field descriptions at augering points, most of the shallow peat would be classified as between H3 and H6 in the von Post classification, showing insignificant to moderate decomposition. Peat Core logs and photographs are presented within Annex B.

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

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

3.0 Potential Impacts on Peat During Construction

There are four main types of impact on peat which can occur during construction as indicated below;

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

The following activities are likely to generate peat and soils by excavation and stripping during the construction process and are further detailed below:

- Wind turbine foundations;
- Crane and ancillary hardstandings;
- Substation,
- Construction compounds;
- Access tracks; and
- Borrow pits.

3.1 Wind Turbines

Wind turbine foundations in peatlands would normally require full and permanent excavation of peat to competent strata, with temporary excavation of peat from a wider diameter to enable safe access to the base of the excavation.

The resulting peat generated could be considered as a permanent loss, unless satisfactory re-use and reinstatement could be achieved within the Proposed Development. Some of this peat would normally be reused to partially reinstate track shoulders, around crane hardstandings and turbine bases, dependent on the suitability of excavated turves and acrotelm peat layer.

3.2 Crane Hardstandings

In order to assemble the wind turbine and enable servicing during operation, crane pads are constructed adjacent to each wind turbine. These must be sufficient to take the weight of both the crane and turbine components, and therefore excavation to underlying competent strata is required.

Crane pads must remain in place for the life of the Proposed Development to enable routine inspection and maintenance. Peat generated from these excavations would be considered a permanent loss, unless satisfactory reuse could be achieved within the Proposed Development, dependent on the suitability of excavated turf and acrotelm peat layer.

3.3 Substations and Construction Compounds

The substation is a permanent infrastructure. Temporary compounds are provided during the construction phase to enable storage of construction materials, turbine components and fuel, temporary concrete batching plant, siting of welfare facilities and site offices.

Should peat be excavated during the construction of the proposed substation, this peat would be considered a permanent loss if it cannot be reinstated or reused onsite.

Due to their temporary nature, peat excavated for compounds and the concrete batching plant would normally be stored locally and then will be used to fully reinstate the temporary compounds and plant.

3.4 Access Tracks

Access tracks are required to enable passage of construction and servicing traffic around the Proposed Development. Over peatlands, the choice of access track design normally reflects the peat depths along the route, with shallow peat/organic soils <1 m deep excavated to competent strata (cut and fill tracks), and deeper peats overlain by floating tracks (with no excavation). Floating tracks are not planned as part of these development proposals as the track design has typically avoided peat >1m however further review of track design would be undertaken following confirmation of ground conditions following detailed site investigations.

Excavated access tracks are permanent infrastructure, peat excavated for cut and fill would be considered a permanent loss, unless the peat can be reused elsewhere within the Proposed Development.

In excavated tracks, the surface vegetation (i.e. habitat) would be lost unless stored and reused elsewhere, however the intention would be to reuse excavated turves on verges and track shoulders and hardstandings for verge restoration purposes.

Access tracks have the potential to disrupt natural hydrological drainage pathways, appropriate drainage would be designed to mitigate this. For further information, see **EIA Report Technical Appendix 2.1: Outline CEMP.**

3.5 Cable Trenching

Electrical cabling is typically buried or ducted adjacent to the proposed access track network where practicable (cable trenching). The grid connection cable would similarly be buried or ducted within trenches along the final selected route. Where excavation is required for trenching, peat generated from these works is normally reinstated at its point of origin, and therefore is not considered a volume loss and re-use for reinstatement is a certainty.

3.6 Borrow Pits

Where access track and hardstanding construction materials are required, it is intended to source the material from Borrow Pits within the Proposed Development.

Peat overlying superficial deposits (Glacial Till) or bedrock are excavated and temporarily stored for the duration of construction, and then re-used for Borrow Pit restoration and post construction, and therefore re-use is required within the area of the Borrow Pits. Final borrow pit designs would be reviewed following detailed ground investigation to avoid extensive areas of deeper peat.

4.0 Peat Management and Mitigation

4.1 Mitigation by Design

The Proposed Development design required to take account of a number of environmental and technical constraints. The design sought to avoid areas of known or potential deep peat where possible, taking into account other environmental and technical factors such as constraints in relation to ecology, ornithology, archaeology, hydrology, topography and existing infrastructure.

The Proposed Development has largely avoided areas where peat is >1m and efforts have been made through the iterative design process to minimise the footprint of site infrastructure on peat >0.5m as far as practicable.

4.2 General Mitigation Measures

4.2.1 Excavation

Excavated peat should be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (more humified peat) typically up to 500mm thick in total, or as blocks of catotelm; the acrotelm should not be separated from its underlying peat;

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

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

4.2.2 Storage

The following good practice applies to the storage of peat:

- stripped materials should be carefully separated to keep peat and other soils apart;
- to minimise handling and haulage distances, excavated material should be stored local to the site of excavation or end point of restoration;
- peat turves should be stored in wet conditions or irrigated in order to prevent desiccation (once dried, peat would not rewet);
- stockpiling of peat should be in large volumes to minimise exposure to wind and sun (and desiccation), but with due consideration to slope stability, but should not exceed 1 m in height to maintain stability of stockpile;
- stockpiles should be isolated from watercourses or drains with appropriate bunding to minimise pollution risks;
- excavated peat and topsoil stored separately, should be stored to a maximum of 1 m thickness;
- stores of non-turf (catotelm) peat should be bladed off to reduce the surface area and desiccation of the stored peat; and

- peat storage areas should be monitored during periods of very wet weather, or during snowmelt, to identify early signs of peat instability.

4.2.3 Temporary Storage around Infrastructure

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

- peat should be stored around the infrastructure perimeter at sufficient distance from the cut face to prevent overburden induced failure;
- local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes should be avoided for peat storage; and
- drying of stored peat should be avoided by irrigation to mitigate against drying out (although this is unlikely to be significant for peat materials stored for less than 2 months).

For longer term storage requirements (e.g. at turbines, hardstandings, borrow pits and compounds), the following good practice applies:

- where practicable, peat generated from excavations should be transported directly to its allocated restoration location, to minimise the volume being stockpiled with the possibility of drying out;
- stores of catotelmic peat should be bladed off to reduce their surface area and minimise desiccation;
- where transport cannot be undertaken immediately, stored peat should be irrigated to limit drying and stored on a geotextile mat to promote stability; and
- monitoring of large areas of peat storage during wet weather or snowmelt should be undertaken to identify any early signs of peat instability.

Following temporary storage, peat is to be reused or reinstated. If the peat is unsuitable for reuse or reinstatement during storage, it would be classed as a waste material and disposed of.

4.2.4 Transport

The following good practice applies to transport:

- movement of turves should be kept to a minimum once excavated, and therefore it is preferable to transport peat planned for translocation and reinstatement to its destination at the time of excavation; and
- if Heavy Goods Vehicles (HGVs)/dump trucks that are used for transporting non-peat material are also to be used for peat materials, measures should be taken to minimise cross-contamination of peat with other materials.

4.2.5 Handling

Following refinement of the excavated peat model, a detailed storage and handling plan should be prepared as a detailed PMP forming part of the detailed Construction and Environmental Management Plan (CEMP), including:

- best estimate excavation volume at each infrastructure location (including peat volumes split into area/volume of ‘acrotelm’ or ‘turf’, and volume of catotelm);

- volume to be stored locally and volume to be transferred directly on excavation to restoration areas elsewhere (e.g. disused quarries, borrow pits or peatland habitat restoration areas) in order to minimise handling;
- location and size of storage area relative to infrastructure foundations/areas and natural peat morphology / drainage features; and
- irrigation requirements and methods to minimise desiccation of excavated peat during short term storage.

These parameters are best determined post-consent in light of detailed ground investigation with the final design areas for each element of infrastructure.

4.2.6 Restoration

Any peat not re-used or utilised for reinstatement or landscaping purposes will be considered for relocation and use in habitat enhancement. Excavated turves and acrotelmic peat may potentially be utilised to support restoration activities.

During restoration of peat onsite or offsite, the following best practice should be followed:

- carefully evaluate potential restoration sites, such as borrow pits for their suitability, and agree that these sites are appropriate with the Environmental Clerk of Works (ECoW), landowners and relevant consultees;
- consider early engagement with a specialist seeding contractor to aid reseeding works;
- undertake restoration and revegetation or reseeding work as soon as possible;
- where required, consider exclusion of livestock from areas of the Proposed Development undergoing restoration, to minimise impacts on revegetation; and
- as far as reasonably practicable, restoration should be carried out concurrently with construction rather than at its conclusion.

4.2.7 Monitoring and Inspection

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

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

Regular, frequent inspections of peat conditions during construction and restoration phases of work would be carried out by the Geotechnical Engineer and ECoW as follows:

- peat surface, peat profile and peat consistency conditions would be carried out as part of ground investigations prior to the start of construction. This information would provide detailed information on the baseline conditions for each part of the infrastructure footprint;

- re-use, restored and re-instated peat conditions would be inspected immediately after restoration to ensure that the methods detailed in the PMP had been correctly implemented and to inform any corrective actions should they be required; and
- the physical condition of peats would be retained as carefully as possible both at the peat storage and the peat restoration stages. This is particularly important for vegetation establishment.

4.3 Specific Mitigation

There are a number of ways in which detailed design and construction activities can be specified to minimise impacts on peatlands. The following section outlines briefly the likely mitigation required to minimise impact, based on the re-use of peat specific to key elements of the Proposed Development.

4.3.1 Wind Turbine Foundations

Wind turbine foundations represent permanent excavation and the primary mitigation measure is to locate the wind turbines to avoid the areas of deepest peat, thereby reducing excavated volumes. Annex A details peat depths in relation to proposed infrastructure, The average peat depth at turbine locations is 0.2m and the positioning of the turbine locations for the Proposed Development has been guided by the results of the peat probing surveys.

4.3.2 Crane Hardstandings

In relation to crane hardstanding, guidance is to avoid their full reinstatement post-construction and these areas of the crane hardstanding would represent permanent excavation given the likelihood of re-use for maintenance activities associated with the wind turbines. The primary mitigation is to locate the crane hard standings to avoid the areas of deepest peat, thereby reducing excavated volumes. Annex A details peat depths in relation to proposed infrastructure. The average peat depth across hardstanding locations is 0.4m.

Peat is present at the location of the hardstanding at Turbine T2 however it is localised within the footprint with an average depth of 0.5m. In addition, there is a very localised area of peat present in the western extents of Turbine T7 hardstanding. However, the average peat depth across this hardstanding is 0.5m and the peat is very localised. The positioning of these aspects of the Proposed Development has been guided by the results of the peat probing surveys.

Areas of temporary hardstanding should be reinstated. Therefore, the following good practice guidance applies to reinstatement of compound areas:

- peat stripped from hardstanding areas would not be stored higher than 1 m and could require to be seeded in the short term to prevent drying out, if stored for long residence times;
- stripped turves are used for final reinstatement, however where turves are insufficient or vegetation regeneration requires reseeding, temporary fencing may be considered around hardstanding areas undergoing reinstatement in order to prevent grazing; and
- the choice of seed mix for reseeding should be appropriate to the ecological and hydrological conditions of the reinstated hard standing location and surrounding habitats and should be advised by the ECoW.

4.3.3 Access Tracks

There is guidance[9,10] available to support access track design in upland areas including peatlands. The guidance should be followed during the planning and construction of the Proposed Development. Guidance is generally focused on floating tracks and new and upgraded excavated tracks and is summarised below.

Based on the avoidance of significant areas of deep peat during design iterations the access tracks are typically present on more localised areas of peat <1.0m with the average depth of peat and soils recorded at 0.3m along new and upgraded tracks. Based on the site gradients it is anticipated that all tracks would be excavated tracks which would require reuse of peat and peaty soils for trackside shoulders and verge re-instatement to tie into existing habitats.

Excavated tracks require complete excavation of any soil and peat (where present) to a competent substrate. Excavated tracks would generally be undertaken where peat depths are less than 1m. The excavated peat would require temporary storage ahead of re-use elsewhere within the Proposed Development in accordance with guidance detailed in Section 4.2.3, which would ensure the integrity of the peat is retained and there is no peat loss. Good practice guidance relates mainly to drainage in association with excavated tracks:

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

Although excavation is normally undertaken in peat of minor thickness (< 1.0m), there is a possibility of minor slippage from the cut face of the peat mass. Accordingly:

- free faces should be inspected for evidence of instability (cracking, bulging, excessive discharge of water or sudden cessation in discharge); and
- where significant depths of peat are to be stored adjacent to an excavation, stability analysis should be conducted to determine Factor of Safety (FoS) and an acceptable FoS adopted for loaded areas.

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

9 Scottish Renewables, Scottish Natural Heritage, Scottish Environmental Protection Agency, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland, AEECoW (2019)., Good Practice During Wind Farm Construction. 4th Edition.

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

4.3.3.1 Re-use of Peat for Access Tracks

Excavated soil will generally be reused on site for partial track shoulder reinstatement and of constructed access tracks. Some limited reuse of peat for trackside verges can be considered using good practice at the margins of an access track under the following conditions:

- Peat is only re-used at the edges of tracks if:
  - there is valid need and it provides an environmental benefit, e.g. reduces or buffers runoff, encourages habitat restoration, stabilises verges, minimises visual impact;
  - re-used peat consists of turves and drier acrotelm peat only, which is anticipated on this site;
  - widths of reinstated verges are kept to a minimum, defined on a case by case basis and will be fully justified;
- Care should be taken when forming verges and landscaping with soil and peat so as not to over-deposit arisings to the detriment of the works. Therefore, low verges are used on the sides of the track to permit any surface water to drain naturally, and diffusely, where it arises;
- Reuse and reinstatement is only applied in stretches of low longitudinal track gradient (e.g. <5°) to ensure stability, with batters used to form stable slopes;
- Rapid revegetation of the soil and peat surface through the use of stored turves or re-seeding is encouraged to stabilise the reuse and reinstated areas and minimise erosion;
- Buffer zones are maintained around surface water bodies where no peat reuse or reinstatement is carried out; and
- Verges may also be suitable locations for burying cables to avoid excavating cable trenches in undisturbed peat material. If this is planned, then the verges should be constructed wider to accommodate the cabling.

Careful assessment and selection of peat by the ECoW to be used for reuse and reinstatement, in line with the guidelines set out above, will ensure that peat integrity is retained and there will be no loss of peat through this process.

4.3.4 Floating Access Tracks

The use of floating access track is a well-documented practice[10] to mitigate excavating excessive volumes of peat. Floating access tracks are not currently anticipated as part of these proposals. However, if following further, more detailed site investigations, a requirement for floating track is deemed necessary, the following guidance should be followed.

Over deeper peat (typically >1.0m), floating tracks are used to remove the requirement for peat excavation and limit disruption of hydrological pathways. The success of construction requires careful planning to take account of the unique characteristics of peat soils. Specific guidance is available on design, the duration and timing of construction, the sequence of construction and the re-use of peat on the shoulders of the floating access track. Floated tracks will be utilised where possible when peat depths of greater than 1.0m are identified along with shallow topography in the area (generally below 5%) and the section is long enough to make floating track appropriate.

4.3.5 Compound Areas

All compounds are considered temporary and peat would be used for reinstatement following completion of the construction phase.

In relation to compound areas, these would used for storage and maintenance activities associated with the construction phase of the Proposed Development. Therefore, the following good practice guidance applies to reinstatement of compound areas:

- peat stripped from compound areas would not be stored higher than 1 m and could require to be seeded in the short term to prevent drying out, if stored for long residence times;
- stripped turves are used for final restoration, however where turves are insufficient or vegetation regeneration requires reseeding, temporary fencing may be considered around compound areas undergoing restoration in order to prevent grazing; and
- the choice of seed mix for reseeding should be appropriate to the ecological and hydrological conditions of the restored compound location and surrounding habitats and should be advised by the ECoW.

4.3.6 Substation

The substation will require permanent excavations prior to construction. The primary mitigation measure for all permanent structures has been to locate the relevant infrastructure to avoid the areas of deepest peat, thereby reducing excavated volumes of peat. All permanent excavations should follow the procedures detailed in Section 4.2.1 . The following good practice guidance applies to re-use of peat for restoration of these areas:

- stripped turves are used for final restoration, however where turves are insufficient or vegetation regeneration requires reseeding, temporary fencing may be considered around areas undergoing restoration in order to prevent grazing; and
- the choice of seed mix for reseeding should be appropriate to the ecological and hydrological conditions of the restored compound location and surrounding habitats and should be advised by the ECoW.

4.3.7 Borrow Pits

Peat is proposed for re-use within borrow pits for the purpose of re-use and restoration. This is subject to method of re-use being consistent with the environmental reinstatement objectives of the Proposed Development and does not present residual risks from pollution of the environment or harm to human health. Key issues for borrow pit restoration are:

- prevention of desiccation and carbon losses from peat used in the restoration;
- development of complete vegetation cover through emplacement of peat turves or seeding with an appropriate species; and
- fencing where required, to exclude grazing stock and to encourage vegetation establishment.

5.0 Peat Balance Assessment

Table B provides an estimate of peat and peaty soil volumes to be excavated and re-used during the construction of the Proposed Development. The peat and peaty soil excavation and re-use volumes are detailed for each infrastructure element in Annex A. The excavated materials data from Annex A indicates that the areas of infrastructure within the Proposed Development are typically located in areas of peaty soils with very limited infrastructure present in areas of peat >1.0m.

5.1 Excavated Volumes

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

- Interpolation of peat depth was undertaken using the Inverse Distance Weighting (IDW) interpolation method.
- An estimated acrotelm depth of 0.5m across all infrastructure based on peat depth survey results.
- The acrotelm volumes have been calculated based on the average peat depth across each item of infrastructure and linear infrastructure based on peat depth survey results.
- An assumption that the peat probe depths are representative of the actual depth of peat (validated by the peat coring).

The excavated volumes will comprise primarily acrotelmic peat and soils.

5.2 Reuse Volumes

The volume of peat to be reused around the Proposed Development is detailed in Table B and Annex A and based on the following assumptions:

- In appropriate locations around the infrastructure perimeter such as track verges, the edges of permanent structures a 1.5m wide strip either side of the track at a thickness of about 0.5m (turves and acrotelmic peat).
- In appropriate locations around the perimeter of turbine and hardstandings with a 1m wide strip and with an average peat depth of 0.5m.
- Reinstatement of temporary compound areas with an average peat depth of 0.5m to ensure integration with the adjacent habitat areas where possible which comprise blanket bog.
- Borrow pits to reuse peat with an average peat depth of 0.5m to ensure integration with the adjacent habitat areas where possible.

5.3 Net Peat Balance

Table B provides an estimate of peat volumes to be excavated and reused during the construction of the infrastructure identified in Table B.

Table B: Peat Balance Assessment

Infrastructure	Volume of Peat/Peaty Soils Excavated (m^3)	Volume of Peat/Peaty Soils Reused and Reinstated (m^3)
New Access Track	11,154	8,366
Upgraded Access Track	1,970	7,388
Passing Places	24	63
Turbine Bases - formation only	1,272	450
Crane Pads	6,930	563
Hardstanding - Ancillary Laydown Areas	3,348	4,185
Temporary Concrete Batching Plant	644	1,969
Temporary Construction Compound	472	1,959
Substation Compound	1,306	230
Borrow Pit 1	7,333	14,972
Borrow Pit 2	11,306	7,539
Borrow Pit 3	2,002	3,937
Borrow Pit 4	1,948	4,585
Borrow Pit 5	3,923	2,360
Borrow Pit 6	1,717	1,833
Total	55,350	60,395

The total volume of peat predicted to be excavated of 55,350m^3, does not exceed the intended total peat reuse volume of 60,395m^3, therefore no excess peat is required to be disposed off-site for the Proposed Development.

6.0 Waste Classification

This section of the Stage 1 PMP includes the method for dealing with peat which could potentially be classified as waste (only if the above volumes estimate significant quantities of catotelmic peat, which cannot be re-used).

Table C outlines where those materials that are likely to be generated on-site, fall within the Waste Management Licensing (Scotland) Regulations 2011.

Based on the results presented in Table C, it has been concluded that all of the materials to be excavated on-site would fall within the non-waste classification as the peat would be re-used on-site. Based on a detailed probing exercise and visual inspection of the peat, it is predominantly found to be fibrous and fairly dry within the top metre before becoming slightly more pseudo-fibrous with depth.

The majority of the excavated peat is therefore entirely re-useable as it is predominantly fibrous and easily re-used on-site. Areas of extensive deep peat have been avoided by design, where possible.

Table C: Excavated Materials – Assessment of Suitability

Excavated Material	Indicative Volume on Site by % of total excavated soils	Is there a suitable use for material	Is the Material required for use on Site	Material Classified as Waste	Re-use Potential	Re-use on Site
Turf (Surface layer of vegetation and fibrous matt) and Acrotelmic Peat	90	Yes	Yes	Not classified as waste	Yes	Will be re-used in reinstatement of access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral embankments of turbine bases, crane hardstandings and reinstatement of borrow pits.
Catotelmic peat	10	Yes	Yes*	Not classified as waste	Yes	Will be re-used in reinstatement of floated access track verges, cut and fill verges, road verges, side slopes and check drains. Peripheral embankments of turbine bases, crane hardstandings and reinstatement of borrow pits.
Amorphous Catotelmic Peat (amorphous material unable to stand unsupported when stockpiled >1m)	Not anticipated as it has been avoided by design.	Potentially	Potentially **	Potentially if not required as justifiable restoration of peatland habitat management works	Limited	If peat does not require treatment prior to re-use it can be used on-site providing adequate justification and method statements are provided and approved by SEPA. If it is unsuitable for use without treatment then it may be regarded as a waste. However every attempt to avoid this type of peat has been incorporated into the design.

*Significant volumes of catotelmic peat are considered unlikely to be excavated, however if encountered the field investigations have confirmed this material is predominantly fibrous and is considered suitable for reuse.

**Such uses for this type of material are limited, however there may be justification for use in the base of borrow pits to maintain waterlogged conditions and prevent desiccation of restored areas and in some habitat management works such as gully or ditch blocking where saturated peat is required to mimic mire type habitats and encourage establishment of sphagnum.

7.0 Conclusion

This Stage 1 PMP presents a pre-construction assessment of the estimated peat excavation and reuse volumes associated with the works phase of the construction of the Proposed Development. The PMP also provides the guiding principles which would be applied during the construction of the Proposed Development.

Through a process of continued design refinement (focused on minimising peat excavation volumes) and adoption of best practice working methods, the development is expected to achieve an overall peat balance. Thus, all excavated material would be required for reuse as part of the works and no surplus peat is anticipated.

The PMP addresses the following peat related issues:

- The depth and condition of peat deposits at site;
- The volumes of peat that are predicted to be excavated and its suitability for reuse;
- The capacity to reuse the peat onsite;
- Peat handling and temporary storage; and
- Restoration and monitoring of peatland habitat.

The figures detailed within this report are to be considered indicative, at this stage. The total peat volumes are based on a series of assumptions for the layout of the Proposed Development and the results of multiple phases of peat probing. Such parameters can still vary over small scale areas and therefore topographic changes in the bedrock profile could impact the total accuracy of the volume calculations.

The various calculations presented here would be updated and expanded upon as part of detailed design works, taking account of pre-construction site investigations and micro-siting, to confirm actual quantities of arising peat. The Applicant would achieve an actual balance between arising peat and reinstatement by prioritising the areas for reinstatement, following advice from the project ECoW and Geotechnical Engineer. It is anticipated that a detailed, construction phase PMP would be developed, which would be maintained and updated in conjunction with a Geotechnical Risk Register. The implementation of the detailed PMP would ensure a robust commitment to excavating, storing and reinstating peat in a manner that follows best practice and ensures the protection of peat throughout the construction and post-construction phases.

Figures

Technical Appendix 9.2: Peat Management Plan

Killean Wind Farm

Renewable Energy Systems Limited

SLR Project No.: 405.064984.00001

Annex A Excavated Materials Calculations

Technical Appendix 9.2: Peat Management Plan

Killean Wind Farm

Renewable Energy Systems Limited

SLR Project No.: 405.064984.00001

Infrastructure on Peat	Area (m^2)	Average Depth of Peat (m)	Number	Total Excavated Volume Acrotelm Peat (m^3)	Total Excavated Volume Catotelm Peat (m^3)	Total Excavated Volume Peat (m^3)	Length (m)	Width (m)	Area (m^2)	Average Thickness of Peat (m)	Number	Total Re-use Volume Acrotelm Peat (m^3)	Total Re-use Volume Catotelm Peat (m^3)	Total Re-use Volume of Peat (m^3)	Notes
New Access Track	27885	0.40	1	13943		11154	5577	1.5	8366	0.50	2	8366		8366	
Upgraded Access Track	9850	0.20	1	1970		1970	4925	1.5	7388	0.50	2	7388		7388	
Passing Places	60	0.20	2	24		24	25	1	25	0.50	5	63		63	
Turbine Bases - formation only	707	0.20	9	1272		1272	100	1	100	0.50	9	450		450	
Crane Pads	1925	0.40	9	8663		6930	125	1	125	0.50	9	563		563	Permanent area only
Hardstanding - Ancillary Laydown Areas	930	0.40	9	4185		3348	-	-	930	0.50	9	4185		4185	Includes temporary clearance areas
Temporary Concrete Batching Plant	3937	0.16	1	644		644	-	-	3937	0.50	1	1969		1969	
Temporary Construction Compound	3918	0.12	1	472		472	-	-	3918	0.50	1	1959		1959	
Substation Compound	5997	0.22	1	1306		1306	230	2	460	0.50	1	230		230	
Borrow Pit 1	29943	0.24	1	7333		7333	-	-	29943	0.50	1	7486	7486	14972	
Borrow Pit 2	15077	0.75	1	7539	3768	11306	-	-	15077	0.50	1	3769	3769	7539	
Borrow Pit 3	7874	0.25	1	2002		2002	-	-	7874	0.50	1	1969	1969	3937	
Borrow Pit 4	9169	0.21	1	1948		1948	-	-	9169	0.50	1	2292	2292	4585	
Borrow Pit 5	4720	0.83	1	2360	1563	3923	-	-	4720	0.50	1	1180	1180	2360	
Borrow Pit 6	3666	0.47	1	1833		1717	-	-	3666	0.50	1	917	917	1833	
Totals				**55493**	**5331**	**55350**						**42783**	**17612**	**60395**	

Total Excavated Volume Acrotelm Peat (m^3)	**55493**
Total Excavated Volume Catotelm Peat (m^3)	**5331**
Total Excavated Volume Peat (m^3)	**55350**
Total Re-use Volume Acrotelm Peat (m^3)	**42783**
Total Re-use Volume Catotelm Peat (m^3)	**17612**
Total Re-use Volume of Peat (m^3)*	**60395**
Net Balance (m^3)	**-5045**

Annex B Peat Core Data

Technical Appendix 9.2: Peat Management Plan

Killean Wind Farm

Renewable Energy Systems Limited

SLR Project No.: 405.064984.00001

4 July 2024

Peat Core Log

Hole No. **PC04**

Sheet 1 of 1

Project: Killean Wind Farm	Client: RES		Dates: 08-02-2024
Project No: 405.064984.00001		Approved By:	Coordinates: E: 173218.00 N: 643860.00
Location: Killean	Hole Type: HA	Level:	Vertical Scale: 1:11

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description	
	1	C	0.00 - 1.00		1.00			Dark brown fibrous PEAT. (H3, B2)	1
					1.40			Dark brown fibrous PEAT. (H4, B3)	
					2.00			Dark brown pseudo-fibrous PEAT. (H5, B3)	
		C	1.00 - 2.00					Peat Core Complete at 2.00m	2

Remarks:

Peat Core Log

Hole No.
PC05
Sheet 1 of 1

Project: Killean Wind Farm	Client: RES		Dates: 08-02-2024
Project No: 405.064984.00001		Approved By:	Coordinates: E: 172187.00 N: 645203.00
Location: Killean	Hole Type: HA	Level:	Vertical Scale: 1:11

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description	
	1	C	0.00 - 1.00		1.00			Reddish brown fibrous PEAT. (H3, B4)	1
					1.75			Reddish brown fibrous PEAT. (H4, B4)	
								Peat Core Complete at 1.75m	
		C	1.00 - 2.00						2

Remarks:

Peat Core Log

Hole No.
PC01
Sheet 1 of 1

Project: Killean Wind Farm	Client: RES		Dates: 08-02-2024
Project No: 405.064984.00001		Approved By:	Coordinates: E: 172312.00 N: 645411.00
Location: Killean	Hole Type: HA	Level:	Vertical Scale: 1:11

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description
					0.50			Brown fibrous PEAT. (H3, B2)
					0.90			Brown fibrous PEAT. (H4, B2)
					1.00			Dense grey silty SAND
	1	C	0.00 - 1.00					Peat Core Complete at 1.00m

Remarks:

Peat Core Log

Hole No.
PC02
Sheet 1 of 1

Project: Killean Wind Farm	Client: RES		Dates: 08-02-2024
Project No: 405.064984.00001		Approved By:	Coordinates: E: 172100.00 N: 645029.00
Location: Killean	Hole Type: HA	Level:	Vertical Scale: 1:11

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description	
					0.70			Dark brown fibrous PEAT. (H4, B3)	
	1	C	0.00 - 1.00		1.00			Dark brown pseudo-fibrous PEAT. (H5, B3) Peat Core Complete at 1.00m	1
									2

Remarks:

Peat Core Log

Hole No.
PC03
Sheet 1 of 1

Project: Killean Wind Farm	Client: RES		Dates: 08-02-2024
Project No: 405.064984.00001		Approved By:	Coordinates: E: 173045.00 N: 643983.00
Location: Killean	Hole Type: HA	Level:	Vertical Scale: 1:11

Water	Depth (m)	Sample Type	Depth	Recovery (%)	Depth (m) / Discontinuity Detail	Level (mAOD)	Legend	Stratum Description	
								Brown fibrous PEAT. (H3, B4)	
	1	C	0.00 - 1.00		1.00				1
								Brown fibrous PEAT. (H4, B4)	
					1.70				
								Brown pseudo-fibrous PEAT. (H6, B4)	
					1.90				
								Dense grey silty SAND	
		C	1.00 - 2.00		2.00				2
								Peat Core Complete at 2.00m	

Remarks:

Peat Auger 1
0 – 1.0m

Peat Auger 2
0 – 1.0m

SLR

Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

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

Project : Killean Wind Farm

Renewable Energy
Systems Ltd

Project No. :- 405.064984.00001

Date :- February 2024

Peat Auger 3
0 – 1.0m

Peat Auger 3
1.0 – 2.0m

SLR

Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

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

Project : Killean Wind Farm

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Systems Ltd

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Date :- February 2024

Peat Auger 4
0 – 1.0m

Peat Auger 4
1.0 – 2.0m

SLR

Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

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

Project : Killean Wind Farm

Renewable Energy
Systems Ltd

Project No. :- 405.064984.00001

Date :- February 2024

Peat Auger 5
0 – 1.0m

Peat Auger 5
1.0 – 1.75m

Suite 223ab
4 Redheughs Rigg
South Gyle
Edinburgh
EH12 9DQ

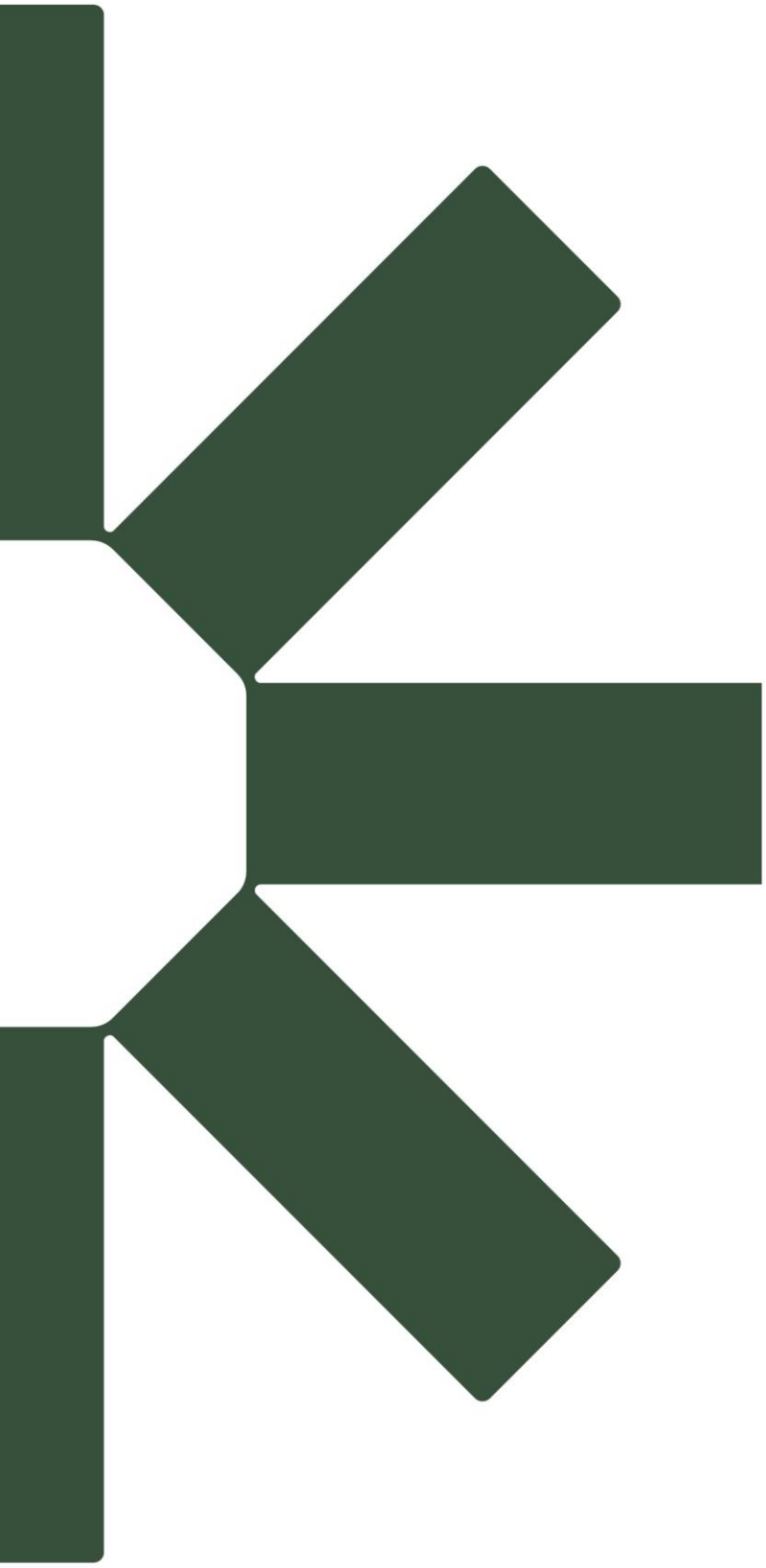
Tel: 0131 335 6830
Fax: 0131 335 6831
Web: www.slrconsulting.com

Project : Killean Wind Farm

Renewable Energy
Systems Ltd

Project No. :- 405.064984.00001

Date :- February 2024



Making Sustainability Happen