Technical Appendix 8.4

Outline Peat Management Plan

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TA 8.4 Outline Peat Management Plan

Contents

Annexes

Figures

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1 Introduction

1.1 Background

1.1.1 SLR Consulting Ltd (SLR) were commissioned by Spirebush Ltd (the Applicant), to undertake an Outline Peat Management Plan (PMP) at the proposed Hagshaw Energy Cluster – Western Expansion (the Proposed Development).

1.2 Proposed Development

1.2.1 The Proposed Development site comprises a total area of c.965 hectares (ha), split into two main development areas connected by the B743. The proposed wind turbines are located in the northern development area (Dungavel Forest), and the proposed solar development and long duration battery and energy storage system (BESS) is located in the southern development area (Netherwood). These two areas of the Proposed Development site will hereafter be referred to as 'the northern development area' and 'the southern development area'.

1.2.2 There is no peat in the southern development area, therefore this PMP report addresses the northern development area only, shown in **TA8.4 Figure 1**.

1.2.3 The northern development area is located within the western part of Dungavel Forest, bounded to the north by the operational Dungavel and Kype Muir Wind Farms, to the east by the Muirkirk and North Lowther Special Protection Area (SPA), to the south by the proposed Bankend III wind farm, and to the west by the B743, within South Lanarkshire.

1.2.4 The northern development area extends to approximately 750 ha, comprising commercial coniferous plantation and existing forestry tracks.

Wind Development

1.2.5 The Proposed Development comprises 18 wind turbines as well as associated infrastructure, located within the northern development area, shown in **TA8.4 Figure 2**.

1.2.6 Infrastructure associated with the wind turbine component of the Proposed Development will include:

- turbine foundations;
- crane hardstandings;
- on-site access tracks between turbines and from the point of access to the turbines, with watercourse crossings where needed;
- temporary construction compounds and laydown areas, with a concrete batching plant at one of the construction compounds;
- underground cabling between the wind turbines to the electricity substation and BESS compounds; and
- up to three borrow pits for excavation of stone to use in the construction of the Proposed Development.

1.3 Objectives

1.3.1 The aim of the Outline PMP, undertaken in accordance with best practice guidance [1,2,3,4,5,6] is to ensure that there has been systematic consideration of peat management and a quantitative assessment takes place throughout the development process. The Outline PMP is required to show:

- 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;
- That volumes of peat anticipated to be excavated by the Proposed Development have been considered; and
- How excavated peat will be managed.

2 Ground Conditions

2.1 Definitions of Peat

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

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

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

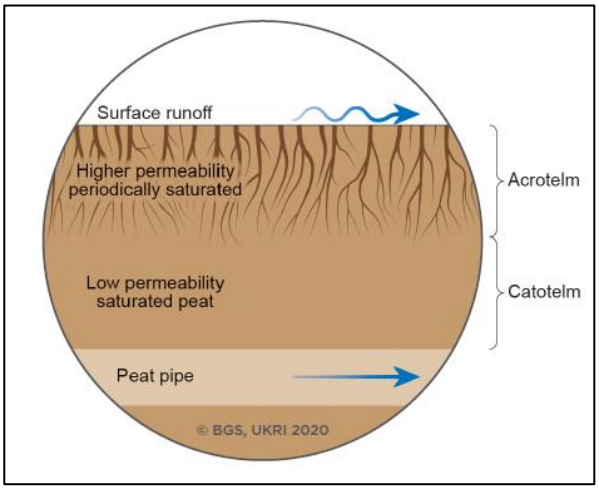
2.1.3 There are two principal types of peat:

- The upper (acrotelm) layer in which the water table fluctuates, which is fibrous and comprises plant roots etc. The acrotelm is relatively dry and has some tensile strength and its thickness typically ranges from 0.1 m to 0.6 m deep.
- The lower (catotelm) layer, which is saturated, sitting permanently below the water table. The catotelm layer is highly decomposed, generally becoming more amorphous/liquid in nature and

[1] *Scottish Renewables, SEPA (2012). Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, Version 1.*
[2] *SEPA (May 2017). SEPA Regulatory Position Statement – Developments on Peat and Off-site Uses of Waste Peat) SEPA Guidance., WST-G-052. Version 1.*
[3] *Scottish Renewables, Scottish Natural Heritage, SEPA, Forestry Commission Scotland, Historic Environment Scotland, Marine Scotland Science, AECoW (2024). Good Practice During Wind Farm Construction, 5th Edition.*
[4] *Scottish Government, Scottish Natural Heritage, SEPA (2017). Guidance on Developments on Peatland: Site Surveys.*
[5] *Energy Consents Unit Scottish Government (2017). Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments.*
[6] *NatureScot (2023) Advising on Peatland, Carbon-rich Soils and Priority Peatland Habitats*

losing structure with increasing depth. The structure of catotelmic peat tends to disrupt completely on excavation and handling.

Plate 2-1 Typical Peat Profile (BGS, UKRI, 2020)



2.2 Desk Study

Baseline Conditions

Superficial Geology

2.2.1 Published geological mapping from the British Geological Survey (BGS) at 1:50,000 scale indicates the majority of the northern development area is underlain by peat. Devensian till deposits are mapped in the west of the northern development area and along the Powbrone Burn and its tributaries. Alluvium and Glaciolfluvial deposits are also associated with Powbrone burn and its tributaries.

Soils

2.2.2 The NatureScot Carbon and Peatland Map (2016) shows that the majority of the northern development primarily comprises Class 5 peatland in the east and Class 4 peatland in the west, with isolated areas of Class 1 in the north and east, mineral soils are indicated in the south.

2.3 Peat Depth Assessment

2.3.1 Peat depth surveys have been undertaken at the Proposed Development, across several phases between June 2022 and January 2025.

2.3.2 A total of 8,896 probe locations were collected across the various survey stages. Due to design iterations resulting in changes to the development boundary, over 2,300 probes collected are now outside of the Proposed Development boundary.

Methodology

2.3.3 The surveys were carried out following best practice guidance for development on peatland[4].

2.3.4 The thickness of the peat/soils was assessed using a graduated fibre glass peat probe. This was pushed vertically into the peat/soil to refusal and the depth recorded using a handheld Trimble Global Positioning System instrument (GPS), reaching an accuracy of <1.5 m.

2.3.5 Alongside desk-based information, the 'feel' on refusal was used to interpret the underlying substrate. The following criteria was used in the field:

- Solid and abrupt refusal – Rock.

- Solid but less abrupt refusal with grinding or crunching sound – Granular (sands, gravel, weathered rock).
- Gentle refusal – Cohesive (Clay/Silt).

2.3.6 Depths recorded include mineral and peaty soils, where the probe was able to push through soft surface layers, to refusal on an underlying strata.

Peat Depth Analysis

2.3.7 A summary of the peat depths encountered during probing is detailed in **Table 2.1** below, and within **TA8.4 Figures 3 and 4**. The results show that deep peat (>1 m) is present across much of the eastern part of the northern development area, on flat lying ground, towards the southern boundary. The western part of the northern development area is largely absent of peat (>0.5 m).

2.3.8 The Proposed Development infrastructure has been through several design iterations, informed by site survey, and following consultation with SEPA. The Proposed Development infrastructure has avoided areas of deep peat so far as practicable, whilst taking into consideration other technical and environmental constraints. The existing forestry track network has been utilised where possible, and where tracks cross areas of peat in excess of 0.8 m, floated construction is proposed.

Peat Core Analysis

2.3.9 In order to gain additional information on the condition of the underlying peat deposits, peat cores were extracted at 6 locations on-site using a 'Russian auger', as shown on **TA8.4 Figure 4**.

2.3.10 The peat augering locations were taken at locations across the site, considered to be a representative cross section, characteristic of peat conditions at the Site. Cores were logged in line with the Von Post scale of humification. The results are indicative of a peat profile disturbed by commercial forestry, with variable conditions near surface, and more typical humified profile developing with depth.

2.3.11 **Table 2.1** shows a summary of the cores taken on-site, **Annex 2** provides a detailed review of the peat cores taken including pictures with relevant humification classifications.

Table 2.1 - Peat Coring Results

Peat Core ID	Location	Depth (m)	Von Post Classification
PA1	270426, 634279	0 – 0.5 0.5 – 1.0 1.0 – 1.5	H5 H3/H4 H3/H4
PA2	270187, 634417	0 – 0.5 0.5 – 1.0 1.0 – 1.5 1.5 – 2.0 2.0 – 2.5	H5 H6 H3/4 H3/4 H4/5
PA3	269547, 634298	0 – 0.5 0.5 – 1.0 1.0 – 1.5	H4 H2 H3
PA4	269293, 633901	0 – 0.5 0.5 – 1.0 1.0 – 1.5	H4/5 H3/4 H3/4
PA5	268193, 634721	0 – 0.5 0.5 – 1.0	H3 H4
PA6	267902, 634005	0 – 0.5 0.5 – 1.0 1.0 – 1.5	H4/5 H4 H3/4

Table 2-2 Peat Depth at Infrastructure Locations

Infrastructure Location		Average Probe Depth (m)
T1	Turbine	0.76
	Hardstand - Permanent	0.58
	Hardstand - Temp	0.51
T2	Turbine	0.66
	Hardstand - Permanent	0.78
	Hardstand - Temp	0.83
T3	Turbine	0.16
	Hardstand - Permanent	0.15
	Hardstand - Temp	0.36
T4	Turbine	0.35
	Hardstand - Permanent	0.3
	Hardstand - Temp	0.52
T5	Turbine	0.4
	Hardstand - Permanent	0.55
	Hardstand - Temp	0.37
T6	Turbine	0.91
	Hardstand - Permanent	0.87
	Hardstand - Temp	0.74
T7	Turbine	0.7
	Hardstand - Permanent	0.83
	Hardstand - Temp	0.89
T8	Turbine	0.18
	Hardstand - Permanent	0.75
	Hardstand - Temp	0.65
T9	Turbine	0.68
	Hardstand - Permanent	0.72
	Hardstand - Temp	0.71
T10	Turbine	0.39
	Hardstand - Permanent	0.41
	Hardstand - Temp	0.35
T11	Turbine	0.7
	Hardstand - Permanent	0.78
	Hardstand - Temp	0.93
T12	Turbine	1.14
	Hardstand - Permanent	0.68
	Hardstand - Temp	0.55
T13	Turbine	1.02
	Hardstand - Permanent	1.14

Infrastructure Location		Average Probe Depth (m)
	Hardstand - Temp	1
T14	Turbine	0.72
	Hardstand - Permanent	0.68
	Hardstand - Temp	1.07
T15	Turbine	0.75
	Hardstand - Permanent	0.62
	Hardstand - Temp	0.62
T16	Turbine	0.68
	Hardstand - Permanent	0.39
	Hardstand - Temp	0.53
T17	Turbine	1.52
	Hardstand - Permanent	1.1
	Hardstand - Temp	1.09
T18	Turbine	1.06
	Hardstand - Permanent	0.83
	Hardstand - Temp	0.87
SPEN Substation		0.45
Development Substation		0.42
SPEN Temporary Compound and BESS		0.42
Temporary Construction Compound (Site entrance)		0.1
Temporary Construction Compound (west of BP)		0.28
Borrow Pit 1		0.18
Borrow Pit 2		0.27
Borrow Pit 3		0.65
Turning Circle to T1		0.6
Turning Circle to T6		0.2
Turning Circle to T7		0.5
Turning Circle to T12		0.25
Turning Circle to T15		0.46
Track (all)		0.67
Excavated tracks in peat (0.5 - 0.8 m)		0.74
Floated tracks in peat (>0.8 m)		1.39

2.4 NatureScot Template (Peat Condition Information)

2.4.1 In its scoping response for the Proposed Development (20 March 2024), NatureScot referred to its guidance on peatland, carbon-rich soils and priority peatland habitats [6], and requested that the Applicant completes the template in Annex 1 of that guidance. This has been completed and can be found in **Annex 4** to this Technical Appendix.

2.5 Outline Peat Management Plan

2.5.1 This Outline PMP considers the excavation of peat and organic soils across the site resulting from construction of the Proposed Development. It considers the potential for minimising excavation and disturbance to avoid or reduce any unnecessary surplus of soil and peat.

2.6 Methodology

Design Principles

2.6.1 The Scottish Environmental Protection Agency (SEPA) has provided the following hierarchy of design principles to minimise the impacts associated with the excavation of peat:

- **Prevention:** The best management option for waste peat is to prevent or limit its production. This can be done through design, positioning infrastructure in shallower peat or through consideration of alternative construction methods or engineering solutions e.g., floated roads or piling solutions;
- **Reuse (on site or off site for peatland restoration:** Using excavated peat in construction or reinstatement (where suitable) e.g., restoration of temporary hardstand areas, verge reinstatement, screening, peatland restoration etc;
- **Recycling/Recovery/Treatment:** Where peat cannot be reused on site or off site 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 licence or registration as an exempt activity and compliance with the legal requirements;
- **Storage:** Temporary storage of peat on site (for example, during short periods in the construction phase) and then re-use. Should the peat become unsuitable for reuse during storage, it would be classed as a waste material; and
- **Disposal (Waste):** Only after all other options have been explored and discounted would this option be considered.

2.6.2 Three main stages within the development process are defined within the guidance and describe what data should be gathered and assessed to inform the site specific PMP:

- **Stage 1**: Environmental Impact Assessment (EIA);
- **Stage 2**: Post-consent/pre-construction; and
- **Stage 3**: Construction.

2.6.3 This report has been prepared in accordance with the requirements for **Stage 1**. In line with the above guidance, a detailed PMP would be prepared post-consent, in advance of construction and would be informed by detailed ground investigation.

3 Potential Sources of Peat During Construction

3.1.1 Reasonable efforts to minimise impact on peat and requirement for excavation of peat – while taking account of other constraints – have been made in the design process, informed by desk study, walkover observations and targeted peat depth survey work.

3.1.2 The following activities are likely to generate excavation of peat during the construction process:

- access tracks;
- wind turbine foundations;

- crane hardstands;
- substation and construction compounds;
- borrow pits; and
- cable trenching.

3.2 Access Tracks

3.2.1 As shown in **TA8.4 Figure 3**, existing forestry tracks are utilised so far as possible and the deepest areas of peat have been avoided by design. Where peat depth exceeds 0.8 m, floated track construction is proposed. General guidance suggests that tracks should be floated on areas of peat greater than 1 m. No excavation is required on floated tracks and therefore there is no associated peat excavation.

3.2.2 Appropriate drainage will be designed to mitigate disruption to natural hydrological drainage pathways.

3.2.3 Excavated access tracks in peat require complete excavation to a competent substrate. This peat would require storage ahead of reuse alongside the track in appropriate locations. Good practice in association with excavated tracks is as follows:

- trackside ditches should capture surface water before it reaches the road;
- nny additional interceptor drains associated with the track construction should be shallow and flat bottomed (and preferably entirely within the acrotelm to limit drawdown of the water table); and
- any stripped peat turves should be placed back in the invert and sides of the ditch to stabilise the banks and assist regeneration post track construction.

3.2.4 Access tracks are permanent infrastructure and therefore any excavated peat would be considered a loss, unless it can be re-used elsewhere on the site.

3.3 Wind Turbine Foundations

3.3.1 Wind turbines in peatland would generally require full and permanent excavation of peat and soils to competent strata. Temporary excavation from a wider diameter would also likely be required to gain access to the base of the excavation.

3.3.2 Any peat excavated would be considered a loss, unless it can be re-used elsewhere on site. The average depth of peat on turbines is 0.71 m, with five of the turbines not sited on peat (>0.5 m).

3.4 Crane Hardstandings

3.4.1 Similarly, crane hardstandings require excavation to a competent stratum, with any excavated peat considered a loss if it cannot be reused on site. The average depth of peat on permanent hardstandings is 0.68 m and 0.69 m on temporary hardstandings.

3.4.2 The permanent features of the hardstanding would be considered a loss, without reinstatement elsewhere on site. Temporary laydown areas of the hardstanding would be reinstated at the earliest opportunity and not considered a loss.

3.5 Borrow Pits

3.5.1 The borrow pit search areas have been selected based on their morphology and anticipated proximity of bedrock to surface. Any excavated peat would require to be reused on site, most likely in the restoration and landscaping of the borrow pits post construction. The average depth of peat at the proposed search areas is 0.36 m, with two of the borrow pits averaging soil depths <0.3 m, and one location with an average probe depth of 0.67 m. Detailed ground investigation will be undertaken ahead of construction, following which preferred locations would be selected and detailed borrow pit design(s) would be developed (avoiding peat extraction).

3.6 Cable Trenching

3.6.1 Electric cabling would typically be buried/ducted in trenches alongside the proposed track network, where practicable. Should cables be buried within existing peat, excavated peat would generally be replaced at its point of origin and therefore not considered a loss.

4 Proposed Mitigation During Construction

4.1.1 There are four main types of impact on peat which can occur during construction. These are:

- Loss of structural integrity and peat strength, due to stripping off or damaging the surface vegetation turf, excavation, handling and transporting peat (particularly wet, subsurface peat).
- Erosion and gullying, caused by exposure and desiccation of bare peat surfaces primarily caused by water erosion, due to surface runoff after rainfall.
- Contamination, caused by leaks, spillages or inappropriate laydown of materials.
- 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.

4.1.2 A range of methods and control measures are described below which are designed to prevent these impacts from occurring. This best practice guidance should be adhered to throughout the construction phase.

4.2 Peat Excavation and Handling

4.2.1 As described previously there are two distinct layers of peat; the acrotelm (including the vegetated turves) and the catotelm. These distinct layers should be recognised during peat excavation and reuse activities.

Excavation

4.2.2 If peat is to be reused or reinstated with the intention that its supported habitat continues to be viable, the following good practice applies:

- Peat will be excavated as turves, including the acrotelm (surface vegetation) and a layer of adjoining catotelm (more humified peat) or as blocks of catotelmic peat.
- The acrotelm will not be separated from its underlying peat, if possible, the full depth of acrotelm layers from the top surface of the peat deposit should be excavated together.
- Turves will be as large as possible to minimise desiccation during storage.
- Peat derived from previously afforested areas will be transported and stored separately due to the high likelihood of disturbance/mixing of the peat structure during afforestation and felling alongside enhanced decomposition. There is also likely to be more limited surface vegetation within these turves.
- Basal peats are likely to be enriched in mineral matter and therefore will be excavated separate to the turves where depth allows.
- Mineral soils will be transported and stored separately to reduce the risk of contamination of excavated peat.
- The timing of excavation of peat will avoid periods of very wet weather and multiple handling of peat will be avoided to reduce the risk of peat losing its structural integrity.

Temporary Storage

4.2.3 Peat storage will only be required where reinstatement is not immediately possible, and all stored peat will be reinstated at the end of the construction phase. To ensure that the storage locations are suitable in terms of environment, construction practicality and safety, the precise location of temporary peat stockpiles will be determined at a site level following consideration and assessment of suitable areas by the Ecological Clerk of Works (ECoW) / Environmental Clerk of Works (EnvCoW), Geotechnical Engineer and contractor using the guiding principles below:

- Peat turves will be stored in wet conditions or irrigated to prevent desiccation (once dry, peat will not rewet).
- Vegetated turves will not be stacked on top of each other to avoid damage to seeds/vegetation.
- Stockpiling of peat will be in large volumes to minimise exposure to wind and sun but with due consideration for slope stability.
- Excavated peat and topsoil will be stored to a maximum of 1 m thickness (unless otherwise agreed by the Geotechnical Engineer).
- Stockpiles of peat will be isolated from any surface drains and a minimum of 50 m from watercourses, and stockpiles will not be located on areas of deep peat, in order to avoid increasing peat slide risks associated with additional loading.
- Stockpiles will include appropriate bunding to minimise any pollution risks where required. Excavated topsoil would be stored on geotextile matting to a maximum of 1 m thickness.
- Stores of non-turf (catotelm) peat will be bladed off to reduce the surface area and desiccation of the stored peat.
- Areas of steep peat/storage will be monitored during periods of wet weather, or during snow melt, to identify early signs of peat instability.

Temporary Storage Around Infrastructure

4.2.4 Where peat cannot be transferred immediately to an appropriate restoration area, short term storage will be required. The following good practice applies:

- Peat will be stored around the perimeter at sufficient distance from the cut face to prevent overburden induced failure.
- Local gullies, drainage lines, wet ground and steep slopes will be avoided.
- Stored upper turves (incorporating vegetation) will be organised and identified according to National Vegetation Classification (NVC) community (assisted by ECoW) for reinstatement adjacent to like communities in the intact surrounding peat blanket.
- Drying of stored peat will be avoided by irrigation (although this is unlikely to be significant for peat materials stored less than 2 months).

4.2.5 Where longer term storage is required (>2months) the following good practice applies:

- Peat generated will be transported directly to its allocated restoration area to minimise the volume being stockpiled, with the possibility of drying out.
- Stores of catotelmic peat will be bladed off to reduce surface area and minimise desiccation.
- Monitoring of large areas after wet weather or snow melt.

Transport

4.2.6 Movement of turves will be kept to a minimum once excavated, and therefore it is preferable to transport peat planned for translocation and reinstatement to its destination at time of excavation.

4.2.7 If HGVs are used for transporting non-peat material and excavated peat, measures will be taken to minimise the risk of cross-contamination.

Handling

4.2.8 A detailed storage and handling plan will be prepared by the Principal Contractor as part of the construction phase PMP, including:

- best estimate excavation volume at each infrastructure location (including peat volume split into acrotelm or 'turf' and catotelm);
- volume to be stored locally and volume to be transferred directly on excavation to restoration areas elsewhere to minimise handling;
- location and size of storage area relative to natural peat morphology and drainage features; and
- irrigation requirements and methods to minimise desiccation of excavated peat during short term storage.

4.2.9 These parameters will be determined by the contractor prior to construction.

Reinstatement and Restoration of Construction Disturbed Areas

- Undertake reinstatement/relocation and revegetation works as soon as possible.
- Where required, consider exclusion of livestock from areas of site undergoing restoration.
- As far as is reasonably practicable, restoration will be carried out concurrently with construction rather than at its conclusion.
- To ensure safe reuse, all peatland restoration works will be subject to assessment by a geotechnical specialist, ensuring that emplacement of peat will not increase the likelihood of peat instability.

5 Site Based Excavation and Management Assessment

5.1.1 This outline PMP has been undertaken as part of the EIA for the Proposed Development. The PMP aims to ensure that:

- there is a clear understanding of any peat on site;
- the total volume of peat that may be excavated is known;
- the design avoids areas of deep peat where possible; and
- the reuse of excavated materials is certain and minimised where possible, in line with industry good practice and guidance.

5.1.2 The volumes of peat detailed within this report are to be considered indicative at this stage. The total excavation volumes are based on a series of assumptions for the Proposed Development and peat depth data averaged across discrete areas of the Proposed Development. Such parameters can still vary over small scale and therefore topographic changes in the bedrock profile, historical ground disturbance etc. may impact the total accuracy of the volume calculations. For the purposes of the

assessment, the assumed thickness of acrotelm is 0.5 m, with depths exceeding this considered catotelm.

5.2 Estimate Peat Extraction and Reuse Volumes

5.2.1 Encompassing all data gathered from peat probing, aerial photography reviews and site walkovers, the total predicted volume of excavated materials has been calculated, with estimates of reuse (see **Table 5.1**).

5.2.2 The total peaty soil/peat volumes are based on a series of assumptions for the Proposed Development and peat depth data averaged across discrete areas of the development. Such parameters can still vary over small scale and therefore topographic changes in the bedrock profile, historical ground disturbance etc. may impact the total accuracy of the volume calculations.

5.2.3 Turves and acrotelmic peat, and subject to on-site assessment, fibrous to pseudofibrous upper layers of catotelmic peat (excavated in blocks with adjoining acrotelm) will generally be suitable for restoration on infrastructure locations. Amorphous catotelm (material unable to stand unsupported when stockpiled >1 m) will not be used for reinstatement of turbine and track infrastructure, and will only be suitable for use in restoration proposed within borrow pits and in peatland restoration activities.

5.2.4 It's considered suitable to use upper layers of non-amorphous catotelm on track verges (provided it is covered by turves and connected hydrologically), especially on floated tracks where screening is required, and there is a requirement to maintain hydrological connectivity with the adjacent peat.

5.2.5 Amorphous catotelmic peat has been avoided by design, with floated track construction proposed over deep peat areas and all other excavations in peat generally less than 1 m thick. Therefore, the volume of amorphous catotelm used in reinstatement / restoration is likely to be minimal.

Reuse

5.2.6 This section of the PMP includes methods for dealing with peat which could potentially be classified as waste (only if the material cannot be reused).

5.2.7 Excavated peat from the construction process will be reused in the following ways:

- Reinstatement of temporary infrastructure;
- Appropriate landscaping of new infrastructure e.g., track sides, hardstand etc.
- Donor material for Forest to Bog restoration including for furrow blocking, reprofiling and ground smoothing activities.

Table 5.1 Excavation Materials Management Plan

Infrastructure Location	Average Peat Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Notes & Assumptions
Access Tracks					
Excavated Tracks on Peat (>0.5 m) Approximately 6.4 km of new excavated track (5 m width) is proposed on peat soils less than 0.8 m	0.74	Acrotelm: 16,027.5 Catotelm: 7,693.2 **Total: 23,720.7**	Acrotelm: 19,233 Catotelm: 6,411 **Total: 25,644**	The first stage of the hierarchy considered is **Prevention**. Utilising survey data collected during the EIA, the design avoided areas of peat, so far as possible, minimising the requirement to excavate peat. Additionally, forestry tracks were adopted where possible, and new track lengths were limited as far as practicable.	Assumes 5 m wide track. Sections of the route may require cut and fill, and these slopes would require restoration to minimise visual impact. Verge reinstatement either side of the tracks. Assumes up to 2.5 m verges, with an average height of 0.8 m. Only using acrotelm and fibrous catotelm, topped with turves. No amorphous catotelm will be used in verge reinstatement. Use of peat soils for reinstatement is only in sections of track where peat is present, ensuring hydrological connectivity with adjacent peatland.
Floated Tracks on Peat (>0.8 m) Approximately 2.7 km of track on peat >0.8 m depth will be floated.	1.39	Acrotelm: - Catotelm: - **Total: -**	Acrotelm: 8,190 Catotelm: 2,730 **Total: 10,920**	The first stage of the hierarchy considered is **Prevention**. Utilising survey data collected during the EIA, the design avoided areas of peat, so far as possible, minimising the requirement to excavate peat. Additionally, forestry tracks were adopted where possible, and new track lengths were limited as far as practicable.	Assumes 5 m wide track. Sections of the route may require cut and fill, and these slopes would require restoration to minimise visual impact. Verge reinstatement either side of the tracks. Assumes up to 2.5 m verges, with an average height of 0.8 m. Only using acrotelm and fibrous catotelm, topped with turves. No amorphous catotelm will be used in verge reinstatement.

Infrastructure Location	Average Peat Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Notes & Assumptions
				Where peat cannot be avoided, all tracks on peat >0.8 m are to be floated, avoiding excavation of peat.	Use of peat soils for reinstatement is only in sections of track where peat is present, ensuring hydrological connectivity with adjacent peatland.
Turning Circles Of the five turning circles proposed, two are located on peat (>0.5 m). The turning circles range in size from approximately 203 m2 and 433 m2.	0.55	Acrotelm: 361.3 Catotelm: 43.3 **Total: 404.6**	Acrotelm: 232.5 Catotelm: 77.5 **Total: 310**	The first stage of the hierarchy considered is **Prevention**. Utilising survey data collected during the EIA, the design avoided areas of peat, so far as possible, minimising the requirement to excavate peat. Additionally, forestry tracks were adopted where possible, and new track lengths were limited as far as practicable.	Reuse has been partly accounted for within the access track sections described above. Assumes verge restoration along 90 / 60 m stretch of outer side of turning head (the additional length not already accounted for). Turves, acrotelm and fibrous catotelm would be used, allowing for hydrological connectivity with adjacent peatland. No amorphous catotelm will be used in verge reinstatement.
Turbine Foundations					
18 turbines, with assumed base of 30 m diameter. Five of the turbines are not located on peat (>0.5 m) and therefore not included in the assessment.	0.71	Acrotelm: 7,983.45 Catotelm: 3,391.2 **Total: 11,374.65**	Acrotelm: 1,840.35 Catotelm: 613.45 **Total: 2,453.8**	The first stage of the hierarchy considered is **Prevention**. Utilising survey data collected during the EIA, the turbine design avoided areas of peat, so far as possible, minimising the requirement to excavate peat.	At turbine foundations topsoil would be stripped keeping top 200 mm of turf intact. This would be stored adjacent to the base working area and would be limited to 1m height. Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.

Infrastructure Location	Average Peat Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Notes & Assumptions
Crane Hardstandings					
Permanent 18 crane hardstandings, typically 78 m by 31 m. Four of the permanent hardstandings are not located on peat (>0.5 m) and therefore not included in the assessment.	0.68	Acrotelm: 26,286.55 Catotelm: 9,420.75 **Total: 35,707.31**	Acrotelm: 2,289 Catotelm: 763 **Total: 3,052**	The first stage of the hierarchy considered is **Prevention**. Crane hardstanding locations have been influenced by the turbine design iteration to avoid peat and steep slopes. Orientation and location of crane hardstands have been designed to avoid peat so far as practicable.	Assumes landscaping/edging along three sides of the hardstand (109 m), 2.5 m wide, 0.8 m high (average). Utilising fibrous acrotelm and catotelm, no amorphous catotelm will be used.
Temporary Three of the temporary hardstandings are not located on peat (>0.5 m) and therefore not included in the assessment.	0.69	Acrotelm: 11,059.96 Catotelm: 3,853.21 **Total: 14,913.97**	Acrotelm: 11,059.96 Catotelm: 3,853.21 **Total: 14,913.97**	The first stage of the hierarchy considered is **Prevention**. Crane hardstanding locations have been influenced by the turbine design iteration to avoid peat and steep slopes. Orientation and location of crane hardstands have been designed to avoid peat so far as practicable.	Given temporary nature of blade laydown and ancillary areas, any material excavated would be stored locally and re-instated on completion.
Substations, and Compounds					
None of the substation, or temporary construction compounds	-	-	-	The first stage of the hierarchy considered is	-

Infrastructure Location	Average Peat Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Notes & Assumptions
are located on peat, and therefore not included within the assessment.				**Prevention**. All locations have avoided peat.	
Borrow Pits					
Of the three proposed borrow pit search areas in the northern development area, only one is located on peat exceeding 0.5 m. The remaining two are not likely to comprise peat.	0.65	Acrotelm:4,819 Catotelm: 1,112.25 **Total: 5,932**	Acrotelm: 12,224 Catotelm: 4,521 **Total: 16,745**	The first stage of the hierarchy considered is **Prevention**. Avoidance of peat - borrow pits were sited in locations avoiding thick peat, where bedrock is expected to be near surface. Each borrow pit would be designed following ground investigation (avoiding peat extraction), with dimensions reduced from the search area which is considered the maximum extent.	Excavated peat, including catotelmic peat and acrotelmic turves, will be used to appropriately restore the borrow pits. The design of borrow pit floor levels and restoration profiles shall be depending on the depth of superficial deposits and the quality of rock recorded across the proposed borrow pit. The natural sequence of glacial deposits and peat shall be maintained throughout restoration. The use of catotelmic peat is considered to be appropriate for restoration within the borrow pit excavation. Where catotelmic peat needs to be confined due to its low shear strength after reworking, reinstatement using a peat cell approach may be used. Suitable subsoil material or site won general fill material would be used to encapsulate peat material. Peat cells would be subject additional geotechnical assessment and supervision to ensure stability, and mitigate against the risk of a peat slide. The aim of the restoration of borrow pits is to achieve a self-sustaining hydrological system that retains the carbon stored within the peat deposits. The geometry of the

Infrastructure Location	Average Peat Depth (m)	Estimated Volume of Excavated Peat (m^3)	Estimated Volume of Potential Peat Reuse (m^3)	Hierarchy Adherence*	Notes & Assumptions
					borrow pit shall be such that retention of rainwater once restored will prevent the peat drying out. This could be achieved by the excavation and/or formation of impervious bunds (peat cells) or by combining the two approaches. Monitoring is an essential element of success management of the peatland habitats.
Peatland Restoration					
Forest to Bog Restoration An area of up to 56 ha of land is included within the habitat management area, of which up to 52,300m^2 includes furrow infilling as part of proposed forest to bog restoration.	-	-	Acrotelm: 18,305 Catotelm: 7,845 **Total: 26,150**	**Reuse** is the first principle of the hierarchy which has been utilised. Excavated material from infrastructure can be used locally to infill furrows, avoiding the need for temporary storage.	Approximately 104,600 m of furrows have been identified within an area identified for forest to bog restoration. Calculations are based on an assumed furrow dimension of 0.5 m x 0.5 m, with furrows spaced roughly 3 m apart. Turves, fibrous acrotelm and catotelm can be used near surface, with amorphous catotelm at the base. Calculations are based on furrows only, and do not include for additional potential to block drains, reprofile hags and fill areas of bare peat.
Total	-	Acrotelm: 66,538.51 Catotelm: 25,513.91 **Total: 92,052.43**	Acrotelm: 73,373.81 Catotelm: 26,814.16 **Total: 100,187.97**	-	-

5.2.8 Amorphous catotelmic peat is not expected to be excavated in large quantities during construction of the Proposed Development. It is likely that acrotelmic peat excavated from previously afforested and felled areas is likely to be more degraded and mixed peat profile where peat has been overturned during ploughing. Based on the values indicated, there is a balance of materials with no surplus peat anticipated to be generated on site – see **Annex 3**. Should further ground investigation information become available, the calculations would require revision.

6 Monitoring and Inspection

6.1.1 The construction phase of the Proposed Development would be supported by a Geotechnical Engineer and ECoW/EnvCoW or other suitably qualified person. 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 (at a minimum) during stockpile creation and storage.

6.1.2 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; and
- light re-grading to correct any areas of surface erosion, etc.

6.1.3 Regular, frequent inspections of peat conditions during construction and restoration phases of work would be carried out by the Geotechnical Engineer and ECoW/EnvCoW 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.
- Restored 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.
- The physical condition of peat would be retained as carefully as possible both at the peat storage and the peat restoration stages. This is particularly important for vegetation establishment.
- Within three months of completion of works in any area, the ECoW/EnvCoW inspects the reinstatement efforts to determine satisfactory placement of sub-soil, topsoil and turves.
- The ECoW (or other qualified person) undertakes a final inspection of all reinstated areas at the end of the first growing season following completion of reinstatement.
- The ECoW/EnvCoW should complete a daily diary of onsite activities which would be compiled within a monthly ECoW report which will include information relating to peat reinstatement, these reports will be available at the request of the Planning Authority.

7 Conclusion

7.1.1 The Outline PMP has been developed in line with best practice guidance. The PMP addresses the following peat related issues:

- The depth of peaty soils/peat deposits at site;
- The volumes of peaty soils/peat that are predicted to be excavated and its suitability for reuse;
- The capacity to reuse the peat onsite; and
- Peat handling and temporary storage.

7.1.2 A series of good practice standards detailed within this report relating to excavation, handling and storage of peat should be utilised to maintain the structural integrity of excavated peat and its suitability for reuse.

7.1.3 It has been concluded that all the materials to be excavated on site would fall into the non-waste classification as all of the topsoil and peaty soils would be re-used on site. Based on the probing exercise and observations on site, the excavated materials are likely to comprise predominately organic topsoil and acrotelmic peat, with limited amorphous catotelmic deposits present. Thick peat deposits are limited across the site and have been avoided by design.

7.1.4 All excavated material is expected to be entirely reusable, with no surplus of peat anticipated.

7.1.5 The figures detailed within this report are to be considered indicative at this stage. Post consent, the Outline PMP and Construction Environmental Management Plan (CEMP) will be updated with information gathered during detailed ground investigation.

Annex 1 – Figures

Annex 2 – Peat Core Data

ID:	Photo 1	Von Post Classification:	H2
Location:	270426, 634279	Underlying Substrate:	N/A
Description:	Auger Location 1	Logged By:	BN / AD
Depth (m):	0 – 0.5	Date:	24/05/2024

ID:	Photo 2	Von Post Classification:	H3
Location:	270426, 634279	Underlying Substrate:	N/A
Description:	Auger Location 1	Logged By:	BN / AD
Depth (m):	0.5-1.0	Date:	24/05/2024

Annex 2: Site Photographs

ID:	Photo 3	Von Post Classification:	H3/H4
Location:	270426, 634279	Underlying Substrate:	N/A
Description:	Auger Location 1	Logged By:	BN / AD
Depth (m):	1 – 1.5	Date:	24/05/2024

Annex 2: Site Photographs

ID:	Photo 1	Von Post Classification:	H2
Location:	270187, 634417	Underlying Substrate:	N/A
Description:	Auger Location 2	Logged By:	BN / AD
Depth (m):	0 – 0.5	Date:	24/05/2024

ID:	Photo 2	Von Post Classification:	H3
Location:	270187, 634417	Underlying Substrate:	N/A
Description:	Auger Location 2	Logged By:	BN / AD
Depth (m):	0.5-1.0	Date:	24/05/2024

ID:	Photo 3	Von Post Classification:	H3/4
Location:	270187, 634417	Underlying Substrate:	N/A
Description:	Auger Location 2	Logged By:	BN / AD
Depth (m):	1.0 – 1.5	Date:	24/05/2024

ID:	Photo 4	Von Post Classification:	H3/4
Location:	270187, 634417	Underlying Substrate:	N/A
Description:	Auger Location 2	Logged By:	BN / AD
Depth (m):	1.5 – 2.0	Date:	24/05/2024

Annex 2: Site Photographs

ID:	Photo 5	Von Post Classification:	H4/5
Location:	270187, 634417	Underlying Substrate:	N/A
Description:	Auger Location 2	Logged By:	BN / AD
Depth (m):	2.0 – 2.5	Date:	24/05/2024

Annex 2: Site Photographs

ID:	Photo 1	Von Post Classification:	H2
Location:	269547, 634298	Underlying Substrate:	N/A
Description:	Auger Location 3	Logged By:	BN / AD
Depth (m):	0 – 0.5	Date:	24/05/2024

ID:	Photo 2	Von Post Classification:	H2
Location:	269547, 634298	Underlying Substrate:	N/A
Description:	Auger Location 3	Logged By:	BN / AD
Depth (m):	0.5-1.0	Date:	24/05/2024

ID:	Photo 3	Von Post Classification:	H2
Location:	269547, 634298	Underlying Substrate:	N/A
Description:	Auger Location 3	Logged By:	BN / AD
Depth (m):	1 – 1.5	Date:	24/05/2024

Annex 2: Site Photographs

ID:	Photo 1	Von Post Classification:	H2
Location:	269293, 633901	Underlying Substrate:	N/A
Description:	Auger Location 4	Logged By:	BN / AD
Depth (m):	0 – 0.5	Date:	24/05/2024

ID:	Photo 2	Von Post Classification:	H2/3
Location:	269293, 633901	Underlying Substrate:	N/A
Description:	Auger Location 4	Logged By:	BN / AD
Depth (m):	0.5-1.0	Date:	24/05/2024

Annex 1: Site Photographs

ID:	Photo 3	Von Post Classification:	H3
Location:	269293, 633901	Underlying Substrate:	N/A
Description:	Auger Location 4	Logged By:	BN / AD
Depth (m):	1 – 1.5	Date:	24/05/2024

ID:	Photo 1	Von Post Classification:	H2
Location:	268193, 634721	Underlying Substrate:	N/A
Description:	Auger Location 5	Logged By:	BN / AD
Depth (m):	0 – 0.5	Date:	24/05/2024

ID:	Photo 2	Von Post Classification:	H2/3
Location:	268193, 634721	Underlying Substrate:	N/A
Description:	Auger Location 5	Logged By:	BN / AD
Depth (m):	0.5-1.0	Date:	24/05/2024

Annex 1: Site Photographs

ID:	Photo 1	Von Post Classification:	H2
Location:	267902, 634005	Underlying Substrate:	N/A
Description:	Auger Location 6	Logged By:	BN / AD
Depth (m):	0 – 0.5	Date:	24/05/2024

ID:	Photo 2	Von Post Classification:	H2
Location:	267902, 634005	Underlying Substrate:	N/A
Description:	Auger Location 6	Logged By:	BN / AD
Depth (m):	0.5-1.0	Date:	24/05/2024

Annex 1: Site Photographs

ID:	Photo 3	Von Post Classification:	H2/H3
Location:	267902, 634005	Underlying Substrate:	N/A
Description:	Auger Location 6	Logged By:	BN / AD
Depth (m):	1.0 – 1.5	Date:	24/05/2024

Annex 3 – Excavated Materials Calculator

		Excavated										Reuse Opportunities										
	Infrastructure	Length (m)	Width (m)	Number	Area (m2)	Average Peat Depth (m)*	Average Depth Acrotelm (m)	Average Depth Catotelm (m)	Total Volume Excavated (m3)	Total Volume Acrotelm Excavated (m3)	Total Volume Catotelm Excavated (m3)	Length (m)	Width (m)	Area (m2)	Average Depth (m)	Number	Depth of Acrotelmic (m)	Max Depth of Catotelm (m)	Total Re-use Volume (m3)	Acrotelm Reuse Volume (m3)	Catotelm Reuse Volume (m3)	Notes
Access Tracks	Cut Track on Peat (>0.5m)	6411.00	5.00	1	32055.00	0.74	0.50	0.24	23720.70	16027.50	7693.20	6411.00	2.5	16027.5	0.80	2	0.60	0.20	25644.00	19233.00	6411.00	Assumes verge reinstatement, up to 2.5m wide, on both sides of track with an average height of 0.8m.
	Floated Track (no excavation)	2730.00	5.00	0	0.00	1.39	0.50	0.89	0.00	0.00	0.00	2730.00	2.5	6825	0.80	2	0.60	0.20	10920.00	8190.00	2730.00	Assumes verge reinstatement, up to 2.5m wide, on both sides of track with an average height of 0.8m.
	Turning Circle to T1	-	-	1	433.00	0.60	0.50	0.10	303.10	259.80	43.30	90.00	2.5	225	0.80	1	0.60	0.20	180.00	135.00	45.00	Perimeter (3 sides) of 90m
	Turning Circle to T6	-	-	0	445.00	0.20	0.20	0.00	0.00	0.00	0.00	90.00	2.5	225	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	Turning Circle to T7	-	-	1	203.00	0.50	0.50	0.00	101.50	101.50	0.00	65.00	2.5	162.5	0.80	1	0.60	0.20	130.00	97.50	32.50	Perimeter (3 sides) of 65m
	Turning Circle to T12	-	-	0	443.00	0.25	0.25	0.00	0.00	0.00	0.00	90.00	2.5	225	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	Turning Circle to T15	-	-	0	433.00	0.46	0.46	0.00	0.00	0.00	0.00	90.00	2.5	225	0.80	0	0.60	0.20	0.00	0.00	0.00	-
Turbine Foundations	T1	30.00	30.00	1	706.50	0.76	0.50	0.26	720.63	536.94	183.69	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T2	30.00	30.00	1	706.50	0.66	0.50	0.16	579.33	466.29	113.04	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T3	30.00	30.00	0	0.00	0.16	0.16	0.00	0.00	0.00	0.00	94.38	2.5	235.9425	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T4	30.00	30.00	0	0.00	0.35	0.35	0.00	0.00	0.00	0.00	94.38	2.5	235.9425	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T5	30.00	30.00	0	0.00	0.40	0.40	0.00	0.00	0.00	0.00	94.38	2.5	235.9425	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T6	30.00	30.00	1	706.50	0.91	0.50	0.41	932.58	642.92	289.67	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T7	30.00	30.00	1	706.50	0.70	0.50	0.20	635.85	494.55	141.30	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T8	30.00	30.00	0	0.00	0.18	0.18	0.00	0.00	0.00	0.00	94.38	2.5	235.9425	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T9	30.00	30.00	1	706.50	0.68	0.50	0.18	607.59	480.42	127.17	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T10	30.00	30.00	0	0.00	0.39	0.39	0.00	0.00	0.00	0.00	94.38	2.5	235.9425	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T11	30.00	30.00	1	706.50	0.70	0.50	0.20	635.85	494.55	141.30	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T12	30.00	30.00	1	706.50	1.14	0.50	0.64	1257.57	805.41	452.16	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T13	30.00	30.00	1	706.50	1.02	0.50	0.52	1088.01	720.63	367.38	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T14	30.00	30.00	1	706.50	0.72	0.50	0.22	664.11	508.68	155.43	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T15	30.00	30.00	1	706.50	0.75	0.50	0.25	706.50	529.88	176.63	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T16	30.00	30.00	1	706.50	0.68	0.50	0.18	607.59	480.42	127.17	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T17	30.00	30.00	1	706.50	1.52	0.50	1.02	1794.51	1073.88	720.63	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.

		Excavated										Reuse Opportunities										
	Infrastructure	Length (m)	Width (m)	Number	Area (m2)	Average Peat Depth (m)*	Average Depth Acrotelm (m)	Average Depth Catotelm (m)	Total Volume Excavated (m3)	Total Volume Acrotelm Excavated (m3)	Total Volume Catotelm Excavated (m3)	Length (m)	Width (m)	Area (m2)	Average Depth (m)	Number	Depth of Acrotelmic (m)	Max Depth of Catotelm (m)	Total Re-use Volume (m3)	Acrotelm Reuse Volume (m3)	Catotelm Reuse Volume (m3)	Notes
	T18	30.00	30.00	1	706.50	1.06	0.50	0.56	1144.53	748.89	395.64	94.38	2.5	235.9425	0.80	1	0.60	0.20	188.75	141.57	47.19	Assumes landscaping and edging around base circumference of 94.38 x 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
Hardstandings (Permanent)	T1 Hardstanding	78.00	31.00	1	2409.40	0.58	0.50	0.08	1590.20	1397.45	192.75	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T2 Hardstanding	78.00	31.00	1	2409.40	0.78	0.50	0.28	2553.96	1879.33	674.63	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T3 Hardstanding	78.00	31.00	0	2409.40	0.15	0.15	0.00	0.00	0.00	0.00	109.00	2.5	272.5	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T4 Hardstanding	78.00	31.00	0	2409.40	0.30	0.30	0.00	0.00	0.00	0.00	109.00	2.5	272.5	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T5 Hardstanding	78.00	31.00	1	2409.40	0.55	0.50	0.05	1445.64	1325.17	120.47	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T6 Hardstanding	78.00	31.00	1	2409.40	0.87	0.50	0.37	2987.66	2096.18	891.48	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T7 Hardstanding	78.00	31.00	1	2409.40	0.83	0.50	0.33	2794.90	1999.80	795.10	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T8 Hardstanding	78.00	31.00	1	2409.40	0.75	0.50	0.25	2409.40	1807.05	602.35	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T9 Hardstanding	78.00	31.00	1	2409.40	0.72	0.50	0.22	2264.84	1734.77	530.07	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T10 Hardstanding	78.00	31.00	0	2409.40	0.41	0.41	0.00	0.00	0.00	0.00	109.00	2.5	272.5	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T11 Hardstanding	78.00	31.00	1	2409.40	0.78	0.50	0.28	2553.96	1879.33	674.63	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T12 Hardstanding	78.00	31.00	1	2409.40	0.68	0.50	0.18	2072.08	1638.39	433.69	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T13 Hardstanding	78.00	31.00	1	2409.40	1.14	0.50	0.64	4288.73	2746.72	1542.02	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T14 Hardstanding	78.00	31.00	1	2409.40	0.68	0.50	0.18	2072.08	1638.39	433.69	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T15 Hardstanding	78.00	31.00	1	2409.40	0.62	0.50	0.12	1782.96	1493.83	289.13	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T16 Hardstanding	78.00	31.00	0	2409.40	0.39	0.39	0.00	0.00	0.00	0.00	109.00	2.5	272.5	0.80	0	0.60	0.20	0.00	0.00	0.00	-
	T17 Hardstanding	78.00	31.00	1	2409.40	1.10	0.50	0.60	4095.98	2650.34	1445.64	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T18 Hardstanding	78.00	31.00	1	2409.40	0.83	0.50	0.33	2794.90	1999.80	795.10	109.00	2.5	272.5	0.80	1	0.60	0.20	218.00	163.50	54.50	Assumes landscaping and edging around outside of hardstanding, 0.8 high (average) x 2.5m wide. Utilising predominately fibrous acrotelm and catotelm. No amorphous catotelm will be used.
	T1 Hardstanding	-	-	1	960.90	0.51	0.50	0.01	499.67	490.06	9.61	-	-	-	-	1	-	-	499.67	490.06	9.61	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T2 Hardstanding	-	-	1	960.90	0.83	0.50	0.33	1114.64	797.55	317.10	-	-	-	-	1	-	-	1114.64	797.55	317.10	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T3 Hardstanding	-	-	0	960.90	0.36	0.36	0.00	0.00	0.00	0.00	-	-	-	-	0	-	-	0.00	0.00	0.00	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T4 Hardstanding	-	-	1	960.90	0.52	0.50	0.02	518.89	499.67	19.22	-	-	-	-	1	-	-	518.89	499.67	19.22	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.

		Excavated										Reuse Opportunities										
	Infrastructure	Length (m)	Width (m)	Number	Area (m2)	Average Peat Depth (m)*	Average Depth Acrotelm (m)	Average Depth Catotelm (m)	Total Volume Excavated (m3)	Total Volume Acrotelm Excavated (m3)	Total Volume Catotelm Excavated (m3)	Length (m)	Width (m)	Area (m2)	Average Depth (m)	Number	Depth of Acrotelmic (m)	Max Depth of Catotelm (m)	Total Re-use Volume (m3)	Acrotelm Reuse Volume (m3)	Catotelm Reuse Volume (m3)	Notes
Hardstandings and Laydown (Temporary)	T5 Hardstanding	-	-	0	960.90	0.37	0.37	0.00	0.00	0.00	0.00	-	-	-	-	0	-	-	0.00	0.00	0.00	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T6 Hardstanding	-	-	1	960.90	0.74	0.50	0.24	941.68	711.07	230.62	-	-	-	-	1	-	-	941.68	711.07	230.62	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T7 Hardstanding	-	-	1	960.90	0.89	0.50	0.39	1229.95	855.20	374.75	-	-	-	-	1	-	-	1229.95	855.20	374.75	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T8 Hardstanding	-	-	1	960.90	0.65	0.50	0.15	768.72	624.59	144.14	-	-	-	-	1	-	-	768.72	624.59	144.14	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T9 Hardstanding	-	-	1	960.90	0.71	0.50	0.21	884.03	682.24	201.79	-	-	-	-	1	-	-	884.03	682.24	201.79	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T10 Hardstanding	-	-	0	960.90	0.35	0.35	0.00	0.00	0.00	0.00	-	-	-	-	0	-	-	0.00	0.00	0.00	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T11 Hardstanding	-	-	1	960.90	0.93	0.50	0.43	1306.82	893.64	413.19	-	-	-	-	1	-	-	1306.82	893.64	413.19	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T12 Hardstanding	-	-	1	960.90	0.55	0.50	0.05	576.54	528.50	48.05	-	-	-	-	1	-	-	576.54	528.50	48.05	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T13 Hardstanding	-	-	1	960.90	1.00	0.50	0.50	1441.35	960.90	480.45	-	-	-	-	1	-	-	1441.35	960.90	480.45	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T14 Hardstanding	-	-	1	960.90	1.07	0.50	0.57	1575.88	1028.16	547.71	-	-	-	-	1	-	-	1575.88	1028.16	547.71	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T15 Hardstanding	-	-	1	960.90	0.62	0.50	0.12	711.07	595.76	115.31	-	-	-	-	1	-	-	711.07	595.76	115.31	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T16 Hardstanding	-	-	1	960.90	0.53	0.50	0.03	538.10	509.28	28.83	-	-	-	-	1	-	-	538.10	509.28	28.83	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T17 Hardstanding	-	-	1	960.90	1.09	0.50	0.59	1614.31	1047.38	566.93	-	-	-	-	1	-	-	1614.31	1047.38	566.93	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	T18 Hardstanding	-	-	1	960.90	0.87	0.50	0.37	1191.52	835.98	355.53	-	-	-	-	1	-	-	1191.52	835.98	355.53	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
Substations	SPEN Substation	70.00	50.00	0	0.00	0.45	0.45	0.00	0.00	0.00	0.00	170		0		0			0.00	0.00	0.00	-
	Development Substation	100.00	70.00	0	0.00	0.42	0.42	0.00	0.00	0.00	0.00	270		0		0			0.00	0.00	0.00	-
Construction Compounds	SPEN Temporary Construction Compound and BESS	100.00	50.00	0	0.00	0.42	0.42	0.00	0.00	0.00	0.00	-	-	-	-	1	-	-	0.00	0.00	0.00	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	Temporary Construction Compound (Site Entrance)	80.00	30.00	0	0.00	0.10	0.10	0.00	0.00	0.00	0.00	-	-	-	-	1	-	-	0.00	0.00	0.00	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
	Temporary Construction Compound (West of BP)	100.00	100.00	0	0.00	0.28	0.28	0.00	0.00	0.00	0.00	-	-	-	-	1	-	-	0.00	0.00	0.00	All materials excavated will be temporarily restorated and reinstated at the earliest opportunity.
Borrow Pits	Borrow Pit 1	120.00	65.00	0	7870.00	0.18	0.18	0.00	0.00	0.00	0.00	120.00	65.00	7870	0.60	1	0.50	0.10	4722.00	3935.00	787.00	Excavated peat, including catotelmic peat and acrotelmic turves, will be used to appropriately restore the borrow pits. The design of borrow pit floor levels and restoration profiles shall be depending on the depth of superficial deposits and the quality of rock recorded across the proposed borrow pit. The natural sequence of glacial deposits and peat shall be maintained throughout restoration.
	Borrow Pit 2	100.00	100.00	0	7680.00	0.27	0.27	0.00	0.00	0.00	0.00	100.00	100.00	7680	0.60	1	0.50	0.10	4608.00	3840.00	768.00	Excavated peat, including catotelmic peat and acrotelmic turves, will be used to appropriately restore the borrow pits. The design of borrow pit floor levels and restoration profiles shall be depending on the depth of superficial deposits and the quality of rock recorded across the proposed borrow pit. The natural sequence of glacial deposits and peat shall be maintained throughout restoration.

		Excavated										Reuse Opportunities										
	Infrastructure	Length (m)	Width (m)	Number	Area (m2)	Average Peat Depth (m)*	Average Depth Acrotelm (m)	Average Depth Catotelm (m)	Total Volume Excavated (m3)	Total Volume Acrotelm Excavated (m3)	Total Volume Catotelm Excavated (m3)	Length (m)	Width (m)	Area (m2)	Average Depth (m)	Number	Depth of Acrotelmic (m)	Max Depth of Catotelm (m)	Total Re-use Volume (m3)	Acrotelm Reuse Volume (m3)	Catotelm Reuse Volume (m3)	Notes
	Borrow Pit 3	100.00	80.00	1	7415.00	0.65	0.50	0.15	5932.00	4819.75	1112.25	100.00	80.00	7415	1.00	1	0.60	0.40	7415.00	4449.00	2966.00	Excavated peat, including catotelmic peat and acrotelmic turves, will be used to appropriately restore the borrow pits. The design of borrow pit floor levels and restoration profiles shall be depending on the depth of superficial deposits and the quality of rock recorded across the proposed borrow pit. The natural sequence of glacial deposits and peat shall be maintained throughout restoration.
Restoration	Forest to Bog Restoration	-	-	-	-	0.00	-	-	0.00	0.00	0.00	104600.00	0.50	52300	0.50	1	0.35	0.15	26150.00	18305.00	7845.00	Assumes furrows infilled (0.5m x 0.5m), with furrows eveery 3m within forest-to-bog restoration area. Doesn't include additional potential for blocking drains, reprofiling hags etc, where donor peat can be used.

	Total	Acrotelm	Catotelm
Total Excavated Volume (m3)	92052.43	66538.51	25513.91
Total Re-use Volume (m3)	100187.97	73373.81	26814.16
Net Balance (m3)	-8136	-6835	-1300

*Only locations comprising peat (>0.5m) have been included in the excavation volumes.

Annex 4 – Completed NatureScot Template

SITE VISIT TEMPLATE FOR THE ASSESSMENT OF PEATLAND ON PROPOSED DEVELOPMENT SITES
PLEASE USE THIS ASSESSMENT SHEET IN CONJUCTION WITH
Advising on carbon rich soils, deep peat and priority peatland habitats in development management - guidance for staff - 2023

Hagshaw Energy Cluster - Western Expansion: Phase 1

				ASSESSMENT CRITERIA - Within a 250m of development footprint																
				Peat Depth (cm)		Criteria 1 Raised bog	Criteria 2 Montane bog	Criteria 3 Blanket bog												
Infrastructure assessed label	Easting	Northing	NVC	as shown in ES	as measured during NaturScot site visit	Raised bog present supporting typical bog vegetation	Montane bog present supporting typical bog vegetation	Within a continous unit of blanket bog (>25ha)	Blanket bog support vegetation capable of peat forming	Few drains/peat cutting?	Peat forming spp/low disurbance?	Natural surface pattern?	absence of invasion by woodland/ scrub?	Abundant *Sphag* - rich ridges	*Sphagnum-B.nana* ridges	*S.fuscum* or *S.austinii* hummocks?*	Peat Mounds?	*Rhynchfusca*?	assessment result
				depth >50 cm = carbon rich soil		*Yes is good Likely national interest*	*Yes is good Possible national interest*	*Yes is good*	*Yes is good*	*Yes is good Two or more yes = possible national interest*				*Rare features. Yes is very good. No is neutral. One or more yes = possible national interest*						
						No -> check for other type of bog	*No -> check for other type of bog*	*No -> advise on mitigation measures*		*No -> check rare features*				*No -> advise on mitigation measures*						
T1	266556	635949	N/A Forestry	67		No	No	No	Yes	No	No	No	No	No	No	No	No	No	Not a national interest
T2	266843	635542	N/A Forestry	72		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T3	266986	635135	N/A Forestry	16		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T4	267094	634729	N/A Forestry	33		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T5	267526	634632	A1.2.2	48		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T6	268084	635338	A1.2.2	89		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T7	268223	634795	A1.2.2	77		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T8	267695	634272	A1.2.2	47		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T9	267848	633917	A1.2.2	70		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T10	268359	634251	A1.2.2/J4	38		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T11	268871	634104	A1.2.2	74		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T12	269463	634090	A1.2.2/J4	91		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T13	269992	634055	A1.2.2	108		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T14	270546	634398	A1.2.2	70		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T15	269727	635147	A1.2.2	69		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
T16	270324	635435	M19a/M25a	54		No	No	No	Yes	No	No	No	No	No	No	No	No	No	Not a national interest
T17	270629	635118	M19a/M25a/A1.2.2	110		No	No	No	Yes	No	No	No	No	No	No	No	No	No	Not a national interest
T18	271042	634990	A1.2.2	95		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
SPEN Substation	267262	634386	A1.2.2	45		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
Development Substation	267340	634345	A1.2.2	42		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
SPEN Temporary Compound and BESS	267405	634298	A1.2.2	42		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
Temporary Construction Compound (Site entrance)	267760	633691	A1.2.2	10		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
Temporary Construction Compound (west of BP)	267946	634156	A1.2.2	28		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
Borrow Pit 1	267229	634703	A1.2.2	18		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
Borrow Pit 2	268142	634131	A1.2.2	27		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
Borrow Pit 3	268900	633761	A1.2.2	65		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest
Access Tracks	-	-	All of the above	67		No	No	No	No	No	No	No	No	No	No	No	No	No	Not a national interest