Creag Riabhach Wind Farm Extension

Technical Appendix 9.1: Outline Peat Management Plan

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ERG

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Contents

1. Introduction

This Peat Management Plan (PMP) provides information and guidance on the environmentally compliant re-use and management of excavated peat across the Proposed Development.

The document is a technical appendix to Chapter 9: Hydrology, Hydrogeology and Soils of the Environmental Impact Assessment Report (EIAR) and should also be read in conjunction with Technical Appendix 9.2: Peat Slide Risk Assessment (PSRA).

The information presented in this PMP should be used to inform the wider assessments carried out for the Proposed Development. The study has drawn on information collected as part of a peat study, including desk-based study followed by a phase one and phase two depth surveying exercise. The PMP estimates the total volumes of excavated peat likely to be produced by the Proposed Development and outlines suitable reusable methods in line with the regulatory requirements and industry good practice methods.

This strategy should be adopted to allow peat to be managed in a sustainable manner, minimising excavation via the adoption of appropriate construction methods. Targeted and appropriate re-use of pet as part of the reinstatement works shall also be a primary construction.

1.1. Regulatory Requirements

This document addresses the following requirements in line with the Scottish Environment Protection Agency (SEPA) Regulatory Position Statement – Developments on Peatland (2017):

- Prevention – The best management option for waste peat is to prevent its production; and
- Re-use – Developers should attempt to re-use as much of the peat produced on site as possible.

In general, the following guidance has fed into the design assumptions and subsequent selection of appropriate construction methods based on the distribution of peat depths across the site:

- Developments on Peatland: Guidance on the assessment of peat volumes, re-use of excavated peat and the minimisation of waste (A joint publication by Scottish Renewables, NatureScot, SEPA, Forestry Commission Scotland, 2012);
- Guidance on Developments on Peatland – Peatland Survey 2017. Scottish Government, NatureScot, SEPA;
- Floating Roads on Peat (Forestry Civil Engineering & SNH, 2010); and
- Good Practice During Wind Farm Construction (A joint publication by Scottish Renewables, NatureScot, SEPA, Forestry Commission Scotland, 2019), Version 4.

On the 11th January 2023 the Scottish Parliament voted to approve National Planning Policy Framework 4 (NPF4), with a view to formal adoption and publishing on the 13th February 2023. The adoption of NPF4 will ultimately supersede the existing NPF3 and Scottish Planning Policy (SPP) including polices related to peat and carbon rich soils. It is understood that the Scottish Government and key regulatory stakeholders are currently forming a working group to facilitate the prescription of specific policies and guidance drawn from NPF4. Of particular relevance to this PMP is Policy 5(d);

> *d) Where development on peatland, carbon-rich soils or priority peatland habitat is proposed, a detailed site specific assessment will be required to identify:*
>
> *i. the baseline depth, habitat condition, quality and stability of carbon rich soils;*
>
> *ii. the likely effects of the development on peatland, including on soil disturbance; and*
>
> *iii. the likely net effects of the development on climate emissions and loss of carbon.*

This assessment 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.

Whilst any specific implications affecting current policy and guidance are unconfirmed, its highlighted that the mitigation hierarchy is already a core principal of SPP in siting developments on peatlands. This PMP is aligned with current SPP requirements and associated good practice guidance.

1.2. Peat Definition

Peat is an organic material formed by the accumulation of plant matter at various stages of decomposition, formed over potentially many thousands of years. The characteristics of peat vary widely depending on factors such as the nature of the plant material that peat is derived from, the degree of decomposition, the type of peat bog and the quality of water sustaining the bog. In Scotland the Scottish Government[1] defines peat and deep peat as follows;

- **Organo-soils (or peaty soils)**: soils with an organic horizon <0.5 m thick;
- **Peat**: soils with an organic horizon greater than 0.5 m in thickness and an organic matter content exceeding 60%; and
- **Deep peat**: a peat as defined above, with a depth greater than 1.0m.

There are two distinct types of peat, termed acrotelmic and catotelmic peat. The interface between the two layers is controlled by the position of the water table. The upper layer of peat, the acrotelm, is typically fibrous and comprises the living and partially decomposed peat forming plant matter (vegetation). The thickness of the acrotelm is typically controlled by seasonal variations in the water table that creates cycles of aerobic and anaerobic conditions. The catotelm is situated below the minimum average depth of the water table resulting in permanent anaerobic decomposition of the plant matter and the formation of less fibrous, sometimes amorphous peat.

A key aim of this PMP is to encourage the functionality of the peatland system following reinstatement. Peat should only be reused to create a suitable tie-in with surrounding vegetation and to reinstate adjacent ground which has been disturbed during construction. Peat must retain hydrological connectivity to remain functional.

2. Site Context

Information concerning the hydrology and hydrogeology of the site, including a summary of the distribution of mapped soil types are presented in Chapter 9 of the EIAR, which this technical appendix supports.

The following figures presented as part of the EIAR should be viewed in conjunction with this PMP.

- Figure 9.2: Carbon and Peatland Soils; and
- Figure 9.3: Interpolated Peat Depths.

The Proposed Development area consists of Class 1 and Class 2 peat which is discussed further in Chapter 9 of the EIAR. A large proportion of the Proposed Development comprises of juvenile and widely spaced forestry. Forestry drainage as well as other evidence of historical land drainage are presented (see Plate 2.1 and 2.2).

[1] https://soils.environment.gov.scot/media/1460/180319_definitions-of-carbon-rich-soil_agreed-text-for-website.pdf

Plate 2.1: Current ground cover near EXT-03. Widely spaced juvenile trees

Plate 2.2: Current ground cover near EXT-02

3. Approach to Design

The applicant has sought to minimise the potential impacts on peat through an iterative design process, optimising the distribution and orientation of the proposed infrastructure following the completion of each phase of assessment and surveying. The approach to design is aligned with Scottish Planning Policy, following the hierarchy of deep peat (>1.0m) avoidance and where this isn't possible, minimisation of impacts through design and mitigation.

The avoidance of peat as part of the design evolution was identified as a key objective from the outset. An initial desk study was used to inform the layout by identifying areas potentially contain peat, such as the British Geology Survey (BGS) 1:50,000 scale Superficial Geology Map, Scotland Soils Map, and NatureScot Carbon and Peatland Soils Map (2016). Examples of where subsequent targeted peat surveys resulted in the repositioning of infrastructure to avoid peat are as follows:

- Repositioning of EXT-02 to the north;
- Repositioning of EXT-03 to the north; and
- EXT-01 crane pad rotated to a north-east direction.

The Proposed Development will make use of the existing main access track of the Consented and Operational Creag Riabhach Wind Farm as well as the re-development of the existing construction compound area that will accommodate the Battery Energy Storage System (BESS). Where the results of detailed design indicate that micro-siting within the allocated micro-siting distance could achieve a reduction in the requirement for peat excavation, this would be investigated by the appointed Principal Contractor and where possible, implemented following approval with the Environmental Clerk of Works (ECoW), The Highland Council (THC) and SEPA.

4. Peat Conditions

4.1. Field Surveys

Peat depth surveys were undertaken to inform the PSRA and this PMP. The surveys comprised of x676 (no.) individual peat probes distributed across a Phase 1, 100 x 100 m grid, as well as Phase 2 (detailed) surveying at a higher resolution (10 x10 m) at turbine locations. Along track centrelines, peat depths were recorded at 50 m intervals with perpendicular offset points on either side, approximately 25 m from the centreline.

Surveys were undertaken in February 2022, October 2022, January 2023 and June 2023.

The distribution of survey points is shown in Volume 3a Figure 9.3: Interpolated Peat Depths.

4.2. Peat Depth & Distribution

Table 4.1 provides a summary of the peat depths recorded during the peat surveys and an interpolated peat depth map (Volume 3a Figure 9.3: Interpolated Peat Depths) shows the distribution of peat depths in relation to infrastructure elements.

Table 4-1: Peat Depth Survey

Peat Depth Range (m)	Results (no.)	% of Points
≤0.3	271	40.1
>0.3 - ≤0.5	106	15.7
>0.5 - ≤1	168	24.9
>1 - ≤2	108	16.0
> 2	23	3.3
TOTAL	**676**	**100**

Source: Natural Power

Table 4.1 shows that the highest proportion (40.1%) of recorded depths fell within the ≤0.3m range with the next highest proportion (24.9%) within the >0.5 - ≤1.0m. Over 81.6% of locations surveyed encountered peat depths <1.0 m in thickness.

The deepest areas of peat (>2.0m) were primarily located between EXT-03 and the main access track which resulted in the changes mentioned in Section 3.

4.3. Peat Characteristics

The peat survey also obtained peat cores which were logged according to the von Post scale of humification. Cores were also obtained from turbine locations.

The upper layers of peat encountered were typically H5 or H6, being generally dark brown, moderately to strongly decomposed with high fine fibre content, low coarse content and some amorphous material. Decomposition increased with depth becoming more amorphous.

Whilst no specific attempt has been made to differentiate between acrotemlic and catotelmic peat, alteration of the surface of the peat arising from the historic land use such as forestry and land drainage has resulted in horizons being poorly defined, perhaps ranging in depth from 0.2 m to 0.5 m bgl.

Further information on peat condition is presented in Volume 4 Technical Appendix 9.2: Peat Stability Risk Assessment.

4.4. Modifying Influences

At the time of writing a temporary peat storage cell associated with the Consented and Operation Creag Riabhach Wind Farm is situated within the survey area immediately south of the proposed BESS and is bisected by the proposed access track to EXT-02 and EXT-03.

The temporary cell will be reinstated by the time the proposed development has been consented, however is currently bisected by a proposed track associated with the proposed development. For the purposes of this assessment, it is assumed the peat depths in this area will be reinstated to be 0.5 to 1.0 m thickness.

5. Potential Impacts on Peat During Construction

The initial construction phase for wind energy projects will often include soil and peat stripping and excavation activities associated with the construction of hardstands, such as turbine foundations and tracks.

There are four primary type of impact on peat that can occur during the construction phase. These are:

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

General good practice methods are detailed in this PMP, designed to mitigate these potential impacts from occurring.

6. Peat Management

6.1. Peat Management Principles

A hierarchy of peat management approaches is provided in Scottish Renewables and SEPA guidance documents (See Section 1.1) that recommend the following:

- **Prevention** – prevent or minimise peat excavation/disturbance through considered design that avoids or minimises wind farm infrastructure within areas of peat. Where avoidance is not possible, minimise excavation of peat using engineering solutions such as floating roads.
- **Re-Use/Reinstatement** – re-use extracted peat close to its original location in the reinstatement or restoration of temporary infrastructure, road verges and borrow pits. Peat may also be used where appropriate to improve or restore peatland habitats.
- **Recycle/Recover/Treat** – while the priority should always be to prevent and re-use peat on site there may be situations in which there may still be a surplus of excavated peat. Where demonstrated that it is suitable for use peat, may be blended, dewatered or treated to improve its properties to support re-use on site.
- **Temporary storage** – store the peat temporarily during construction prior to re-use in on site reinstatement or restoration activities.

The design of the wind farm layout evolved throughout the assessment of the Proposed Development in response to consultations, desk studies, field surveys and technical assessments undertaken by a range of disciplines in support of the EIAR.

6.2. Minimising Peat Excavation

The Development was designed through an iterative approach informed by site surveys and constraints mapping, with peat being a significant factor. The proposed positioning of turbines and alignment of access tracks has sought to minimise the need for peat excavation in the first instance. In this regard, the Proposed Development has prioritised the use of existing tracks.

6.3. Proposed Re-Use

In line with SPP and associated good practice guidance, the primary design aim is to avoid peat and therefore peat excavation. However, due to engineering, logistical, or to avoid other environmental constraints, the placement of Proposed Development infrastructure on peat is unavoidable. Therefore, the Proposed Development must minimise the effects of disturbance through design and mitigation, namely reinstatement of peat that allows it to remain part of the peatland system and not for it to degrade and lose function as a means of carbon sequestration.

The principles of peat re-use and reinstatement at the Proposed Development are as follows:

- The placement of catotelmic peat in locations that encourages catotelmic peats functionality within the peatland system (i.e. connected to the water table); and
- The placement of acrotelmic peat and turves over the top of catotelmic peat. Acrotelmic peat and turves can also be used in track verge dressing but must be prioritised to cover reinstated catotelmic peat.

In following these principles, the following must be considered:

- The placement of catotelmic peat must be in a location that will encourage the retention of water and thus decrease the risk of the peat drying, oxidising and degrading;
- The placement of catotelmic peat must not form topographic highs situated at an elevation above the likely surrounding water table;
- The source of the catotelmic peat should be from excavations / temporary storage as local as possible in order to minimise transport distances; and
- The placement of catotelmic peat must not result in any geotechnical instability.

It is highlighted in all cases that where peat depths are <0.5 m in thickness at specific infrastructure element locations, a minimum of 0.5 m of peat shall be used for reinstatement and will be done in a manner to ensure the peat remains functional.

A breakdown of assumptions related to how peat will be reused for different infrastructure elements is presented below;

- **Turbines & Crane pads:** peat would be reinstated over the section of the turbine foundation that is not part of the permanent crane pad to a depth of 0.75 m. Due to the underlying foundation limiting downward infiltration and elevated level of surrounding soils, catotelmic peat reinstatement would be prioritised for the lower part of the reinstatement but would be covered with acrotelmic peat & turves, ~0.25 m thickness. Additional acrotelmic reinstatement would also be undertaken on the surrounding batter slopes to ensure suitable tie-in with the surrounding vegetation and habitat;
- **Access tracks:** The verges of new cut access tracks will be reinstated to ensure visible tie-in with surrounding vegetation and habitat but also to ensure stability and functionality of the re-used peat. The reinstatement batter will vary due to the cut / fill / slope angle requirements but its assumed an average of ~4 m wide along either side of the track and 1 m high. The use of catotelmic peat is expected to be minimal, and only where it will be connected to the water table (lower sections of the slope) and would still require to be covered with acrotelmic peat / tuves;
- **BESS:** The BESS footprint is permanent and will not be reinstated with peat. The batter slopes for the two access tracks and peripheral slope for the BESS footprint would be dressed with acrotelmic peat, tuves and vegetation to minimise any effects of upgradient dewatering;
- **BESS Bund:** The BESS Bund will be created primarily using rock / substrate material. This would then be covered by glacial till, or a medium with suitably low infiltration capacity. Catotelmic peat would then be placed up to a maximum thickness of ~1.7 m, and would be covered with ~0.25 m of acrotelmic peat and turves. Integrated rock and substrate features would be used to maintain stability. Acrotelmic peat and tuves would be used to dress edge slopes to minimise dewatering. The re-use of catotelmic peat in this way would facilitate its placement beneath the water table, which would be maintained by the low infiltration capacity of the underlying

substrate. This is likely to achieve more effective catotelmic peat reinstatement than re-use in batter slopes. The final arrangements of peat re-use in the BESS bund would be confirmed at the detailed design stage, however a conceptualisation of the core principles is presented below in Plate 6.1.

These assumptions have been used to inform peat mass balance calculations presented in Section 7.

Source: <Insert Source text here>

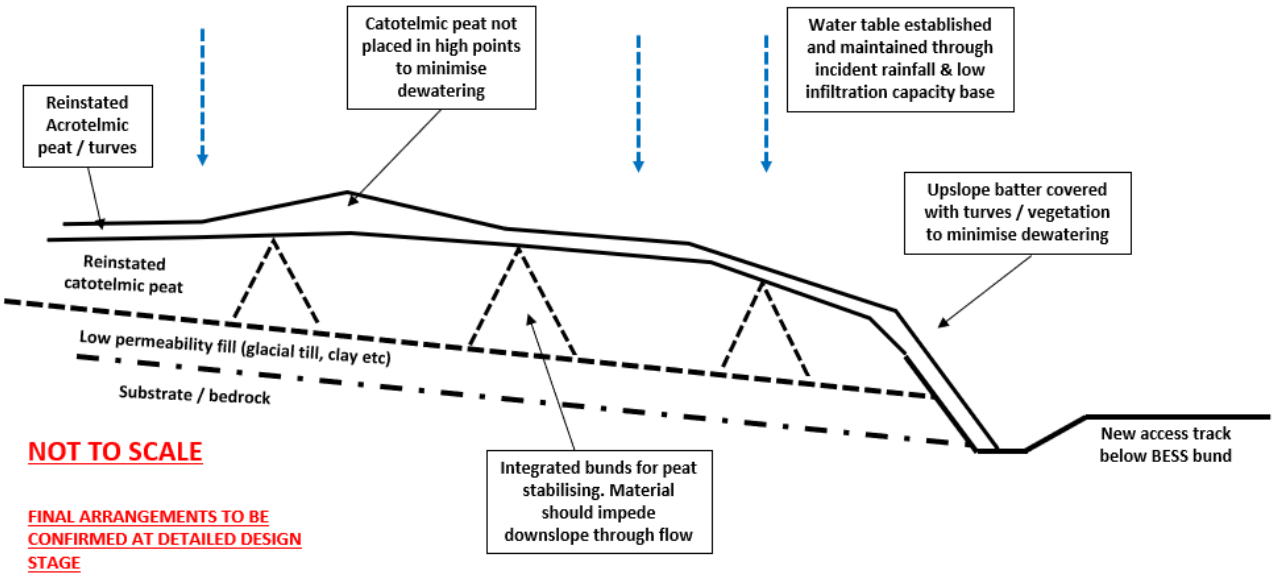

Plate 6.1: Conceptual cross section indicating the principles of peat re-use in the BESS Bund.

6.4. Suitability for Re-Use

The characteristics of the excavated peat (e.g. fibrosity and water content) determines its suitability for re-use with the wettest most amorphous peat generally being the least suitable. The von Post classification undertaken indicated that humification values were typically ~H5-H6.

For the purpose of this PMP it has been assumed that the top 0.5m will be acrotelmic peat consisting of fibrous peat and the surface vegetation. The following assumptions have been made with regard of the characteristics of the peat and the intended suitable reuses at the Development:

- **Acrotelmic peat / peat soils** – when stripped with the vegetation, intact turves of acrotelmic peat or peaty soils will be suitable for surface reinstatement, dressing back and tying in infrastructure to the surrounding vegetation and habitats.
- **Fibrous catotelmic peat** – most suitable for reinstatement beneath the replaced acrotelm. It may also be used as a surface layer with careful site selection and management to control erosion and encourage vegetation recovery (e.g. seeding, translocation of vegetation and fencing to deter deer grazing).
- **Amorphous peat** – peat of this type will only be suitable for reinstatement of excavations beneath a surface vegetation layer. However, the volume of amorphous peat that will require removal is anticipated to be small given that infrastructure has avoided the need to excavated deep peat where possible.

Where peat stripped at infrastructure footprints contains significant volumes of residual forest materials such as brash or stumps, efforts will be made to minimise mixing and consequential damage to the peat. However, it is acknowledged this may not be possible in every instance and the presence of residual forest materials may reduce the peats suitability for reinstatement. Nonetheless, handling of peat containing residual forest materials will follow good practice, and will aim to be reused in a way to maximise its reinstatement potential.

7. Peat Mass Balance

7.1. Introduction

The estimate of excavated peat volume has been completed following a desk-based appraisal of the Development layout supplemented by digital terrain analysis. There has been further refined spatial analysis of the peat depth data set using GIS software.

Information on infrastructure footprints were defined by the Applicant and are presented accompanying the assessment information.

Depths recorded to be greater than 0.5m are considered to be peat, with the upper 0.5m being acrotelmic peat and depths beyond 0.5m considered to be catotelmic peat.

It should be noted that this assessment has not accounted for excavation volumes of glacial sub-soils or weak bedrock material which may be deemed unsuitable for incorporation into foundations and hardstand elements.

Where factors which contribute to the bulking of the peat deposit are mitigated the total volume of excavated peat may be reduced through:

- Reduction of peat handling with re-use of peat undertaken as close as possible to the excavation site;
- Maintaining the integrity of the excavated peat mass including preservation of the surface acrotelm layer as far as is practicable; and

Prevent the drying and desiccation of excavated peat deposits through timely re-vegetation and preservation of the surface hydrology systems.

7.2. Estimation of Excavated Peat Volumes

The activities which would generate volumes of peat are as follows:

- Formation of cut track which would involve the removal and temporary storage of turves, as appropriate, followed by excavation down to formation level. The running width of the track is 4 m. The excavation footprint includes drainage and the need for batters;
- Construction of the turbine foundations and crane hardstandings, which would require the excavation of peat and subsoil to expose underlying bedrock or other suitable founding stratum, and in some cases excavation of rock to form a suitable level platform for construction. The depth of the excavation in superficial soils would be dependent on the ground conditions and depth to bedrock, but it has been assumed that the full depth of peat would be excavated from the full development area of each turbine, hardstanding, and associated excavation footprint modelled by the project civil engineer. The modelled extent for cranepad and tubine excavation footprints is ~3711 m2;
- Excavation of trenches for underground cabling between the turbines and the substation, which would be up to 3 m wide and approximately 1.2 m deep. These would be carefully reinstated with the stored peat once the cables have been laid. No peat excavation volumes for cable trenches are presented as it is assumed that all excavated peat will be re-used during cable reinstatement;
- The construction of the BESS would involve the re-development of the existing construction compound that is associated with the Consented and Operational Creag Riabhach Wind Farm. There will be no peat excavation requirement associated with the formation of the BESS; and
- The BESS platform will be bounded in the south by a landscaping feature to reduce its visibility from the south. This feature (herein referred to as the “BESS Bund”) will occupy a footprint of ~6331 m^2.

Table 7.1 below provides an estimate of the peat volumes to be excavated, as well as assumptions used in developing these estimates. It also provides estimates of volumes of acrotelmic and catotelmic peat that will be disturbed.

Table 7.1: Anticipated Peat Volumes to be Excavated

Infrastructure			Excavation Volumes				
Element	Length (m)	Footprint (m^2)	Average Peat Depth (m)	Volume Acrotelm (m^3)	Volume Catocelm (m^3)	Total Excavation Volume (m^3)	Notes / Assumptions (Refer to Section 7)
EXT-01 foundation & crane pad	-	3711	0.82	1856	1177	3033	Proposed turbines and crane pad hardstand area is combined due to overlap and includes additional working areas to accommodate for levelling / batter slopes.
EXT-02 foundation & crane pad	-	3711	0.62	1856	433	2288	
EXT-03 foundation & crane pad	-	3711	1.02	1856	1939	3795	
New track spur to EXT-01	232	1392	0.26	356	0	356	Depth measured for track to EXT-01 is average thickness of <0.5 m so would be classed as an organo-soil. To avoid potential underestimation of peat excavation volumes, the thickness of organo-soil is assumed to be acrotelmic peat.
New track spur to EXT-03	789	4734	1.18	2367	3225	5592	
New track between EXT-02 & EXT-03	368	2208	0.53	1104	65	1169	
BESS & Construction Compound	-	7824	0	0	0	0	The BESS footprint already exists as part of the consented and operational Creag Riabhach Wind Farm construction compound.
BESS Bund	-	6331	1.15	3166	4115	7281	The bund for the BESS is currently a combination of undisturbed ground and a temporary peat cell associated with the consented and operational Creag Riabhach Wind Farm.
			Total (m^3)	**12561**	**10954**	**23514**	

The calculations presented in Table 7.1 indicated the Proposed Development will require the excavation of 13,307 m3 of acrotelmic peat, 11,925 m3 of catotelmic peat, with a total peat excavation requirement of 25,231 m3.

7.3. Estimation of Peat Re-Use Volumes

Peat re-use volume calculations have been completed exercising the reinstatement criteria presented in Section 6. Table 7.2 summarises the potential reinstatement and re-use volumes for acotelmic and catotelmic peat at the Proposed Development.

Table 7-2: Summary of Likely Peat Re-use

Construction Element	Peat Reinstatement Volume (m^3)		Total Peat Reinstatement Volume (m^3)
	Acrotelmic Peat	Catotelmic Peat	
Turbine & crane pads	2478	236	2714
Access tracks	5556	0	5556
BESS & BESS Bund	3611	10763	14373
Total Peat Re-Use (m^3)	11645	10998	22643

Table 7-3 provides an overall peat balance calculation comparing total excavation requirements with peat re-use potential at the Proposed Development.

Table 7-3: Estimate of peat balance (excavation versus re-use volumes)

Construction Element	Peat Excavation Volume (m^3)	Potential Peat Re-use Volume (m^3)	Surplus (+) or Capacity (-) (m^3)
Turbine & crane pads	9117	2714	+6403
Access tracks	7117	5556	+1561
BESS & BESS Bund	7281	14373	-7093
Total	**23514**	**22643**	**+871**

Comparing the total capacity for peat re-use with total volume of excavated peat, it is indicated that the Development will have sufficient capacity to accommodate the majority of excavated peat on site (apart from a very minor surplus, ~3% of total anticipated excavation volume).

On the basis of the peat balance calculations provided, measures for the recycling, other recovery and disposal of waste peat are therefore not required.

It should be recognised that this PMP provides an outline of the potential re-use opportunities and peat mass balance for the Development. It should therefore be updated after the detailed design / balance of plant (BoP) tender stage once the final infrastructure locations are known, and a contractor has been appointed. The final PMP should be updated in accordance with Stage 2 of the development process and should form the basis against which the site will be monitored by the ECoW and BoP Construction Manager.

8. Good Practice Control Measures

8.1. Introduction

The purpose of this section of the PMP is to detail how the management of peat will be controlled and to specify how peat will be protected and peat integrity conserved throughout all stages of the construction works.

Where possible during detailed design the excavated peat volumes will be minimised by micro-siting wind farm infrastructure to avoid areas of deeper peat.

Where peat excavation is unavoidable care must be taken when handling, transporting and stockpiling peat to protect the peat structure and strength as far as possible.

Where possible the movement of peat over long distances will be minimised and peat will be stored locally for re-use as soon as possible. Furthermore, double handling will be avoided as much as possible and a robust planning and monitoring programme will be developed to ensure that peat and mineral soils are not mixed.

8.2. Minimising Unnecessary Disturbance

The acrotelmic layer of the peat contains the living plant matter that protects the underlying catotelmic peat from drying and erosion. Therefore, it is important that measures are taken to avoid ripping up or rutting of the surface peat. In addition, unnecessary trafficking and appropriate scale plant will be used, such as 360º diggers rather than bulldozers to minimise any unnecessary compaction.

An access plan following the proposed access track routes will be developed and physically demarcated. The plan and demarcated route will provide a designated controlled route and a permissible corridor within which service vehicles and plant can operate prior to peat and topsoil stripping. The purpose of this is to protect in situ peat in areas that will not be affected by the Development layout and prevent unnecessary damage. The plan will also consider other constraints identified in the EIAR.

Access routes and working areas will be clearly delimited throughout the construction phase to ensure that peat compaction and damage in areas not directly involved in the works will be avoided. The construction works will be phased to ensure that peat is stripped ahead of the mineral substrate.

8.3. Excavation Methods

Peat stripping and excavation will generally follow good practice measures presented in Technical Appendix 3.1: Outline CEMP. It is recognised peat is a very different material compared to mineral or other soils, particularly wet amorphous peat. As a result, the stripping and excavation method(s) to be used in each part of the Proposed Development Site will be agreed in advance. Wherever possible, a 360º excavator will be used to strip the widest peat turves possible, with their vegetation intact. Ideally the turves should be a minimum of 0.5m thickness and with an area up to a maximum of ~1m^2. However, the depth and scale will depend on the depth, consistency and condition of the peat at each location and the plant used for stripping.

For the laying of electrical cables, it is anticipated that the cable trench will be excavated by stripping surface peat and laying the turves separately to catotelmic peat temporarily on a geotextile to protect the underlying vegetation. Where required, the mineral soils should be segregated from the peat and also placed on a barrier material prior to reinstatement.

8.4. Temporary Storage & Stockpiles

8.4.1. Introduction & Minimum Requirements

Consideration for the storage of peat has been undertaken with input gathered from the Scottish Renewables Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste.

The temporary storage of peat for long durations should be avoided where possible to minimise drying, weathering and erosion of the peat. Where possible the peat should be transported from the point of extraction to its re-use or reinstatement location. However. there are likely to be instances during construction where the peat will need to be temporarily stored prior to re-use or reinstatement (e.g. near the turbine for later reinstatement of the turbine base).

Stored peat would also be covered with turves in a manner to maximise coverage. In general, it shall be a priority to avoid a single site temporary peat storage area. A progressive construction method which re-cycles peat through excavation and timely re-instatement shall be adopted. However, some elements may require storage of peat prior to re-instatement at the end of the construction phase.

8.4.2. Anticipated Programme of Works

At this stage it is envisaged the programme of construction for the proposed development would progress as follows;

- Establishment of a temporary construction compound in the footprint of the proposed BESS;
- Excavation and lowering of the formation level in the proposed BESS to generate rock material;
- Excavation of BESS bund footprint;
- Progressive excavation of new tracks to EXT-01, EXT-02 and EXT-03; and
- Establishment of crane pads and turbine footprints at EXT-01, EXT-02 and EXT-03.

No peat excavation would be required to establish the BESS footprint. The remaining phases of works will require peat excavation.

8.4.3. Temporary Storage Requirements

The establishment of the BESS bund area in the early phase of the construction programme will minimise the need for repeated handling of catotelmic peat. The BESS bund would be used for temporary storage prior to permenant peat reinstatement (See Section 6.3).

On tracks and at turbines, stripped acrotelmic peat will be re-used locally as the construction progresses. The intact surface turves will be placed on roadside verges during construction and will not need to be stored elsewhere. Catotelmic peat would be re-used locally if environmental conditions allow, or transported for permenant reinstatement at the BESS bund.

There may be a requirement for some small-scale temporary storage of acrotelmic and catotelmic peat prior to permenant reinstatement. Any storage would be undertaken adhering to the minimum requirements presented in Section 8.4.1 and 8.4.4.

8.4.4. Influencing Factors

Determining factors are associated with the peat stability, sensitive receptors, drainage and pollution prevention. Areas of deeper peat (>1.0m) and sensitive areas including Groundwater Dependent Ecosystems (GWDTE) shall be avoided for dedicated temporary storage areas.

It will be a priority to ensure that a future detailed site investigation provides information on the suitability of these temporary peat storage areas including the topographic profile, groundwater regime, and geotechnical properties of

deposits underlying the temporary storage sites. Furthermore, it may be necessary to undertake further peat stability calculations based on finalised placement of temporary peat storage areas.

Should any problems be observed during regular visual inspections of peat stockpiles, this would invoke implementation of an appropriate corrective action

Owing to the position of the site within an upland setting with consequentially high rainfall, it is anticipated that watering the stored peat through natural precipitation will be sufficient for the peat to remain damp, thus preventing drying out and desiccation and allowing the vegetation layer and seed bank to be sustained. This is an important element in the restoration of the landscape, providing continuity with surrounding local vegetation upon reinstatement. For the duration of the temporary storage it shall be necessary to periodically monitor the condition of the stored peat and ensure the stability is maintained should be undertaken by a suitably qualified geotechnical engineer. During prolonged dry spells artificial wetting could be undertaken, however, this will be done under the agreement and supervision of the ECoW and Principal Contractor with appropriate mitigation in place to ensure the protection of the stored peat, as well as any nearby receptors such as watercourses or GWDTE.

9. Monitoring & Inspection

The success of construction and the subsequent re-use of peat across the site will be monitored by the ECoW to ensure that effects on the peatland environment are appropriately understood and subsequently reduced via any remedial works that can be undertaken. The details of any required monitoring would be discussed and agreed with SEPA, NatureScot and the Local Planning Authority prior to commencement. Appropriate monitoring is important to:

- Provide reassurance that established in-place mitigation and reinstatement measures are effective and that the site is not having a significant adverse impact upon the local and/or wider environment;
- Indicate whether further investigation is required and, where pollution is identified or unsuccessful reinstatement, the need for additional mitigation measures to prevent, reduce or remove any impacts on the environment; and
- Understand the long-term effects of the site on the natural environment.

Due to the nature of the construction activities and the possibility that such works can increase the volume of dissolved and particulate matter from entering the natural drainage network a robust hydrological monitoring strategy will be implemented.

A reinstatement monitoring strategy can also be implemented, where surveys can be carried out to monitor the success of peat re-use and subsequent reinstatement. Complimentary to the hydrological monitoring highlighted above and best practise geotechnical monitoring, the success of vegetation reinstatement can provide an insight into the effects of the wind farm on the local environment. Full details of the environmental monitoring strategies will be finalised following consultation with SEPA, NatureScot and the Local Planning Authority.

10. Habitat Restoration

Details on habitat restoration, including proposals for peatland restoration are provided in Volume 4 Technical Appendix 6.2: Biodiversity Enhancement and Recreation Plan of the EIAR. The plan includes proposals that will aim to restore / enhance on-site peatlands into a peatland system capable of achieving carbon sequestration by restoration of blanket bog habitats and improved hydrological connectivity. Proposals include furrow and ditch blocking as well as ground smoothing and would also consider how to achieve biodiversity net-gain.

11. Disclaimer

The information presented in this PMP is based on the results of peat surveys carried out by a Third Party prior to EIAR submission and also further surveying by Natural Power in 2022.

It is highlighted that whilst attempts have been made to collect peat depth and condition information, further investigations can be carried out as part of detailed site investigation (post consent). This process can provide further information across all infrastructure locations, which should be used to further refine the peat excavation and reuse volumes provided in this report.

The PMP should be considered a live document throughout the planning process and any future pre-construction phases of works. As such, additional information can be incorporated following the results of detailed site investigations carried out prior to construction, as well as from any discussions with SEPA or other engaged stakeholders throughout the development process.

The peat extraction and re-use volumes are intended as a preliminary indication. The total peat volumes are based on a series of assumptions for the infrastructure layout and peat depth data averaged across discrete areas of the Proposed Development. Such parameters can still vary over a small scale and therefore local topographic changes in the bedrock profile may impact the total accuracy of the volume calculation.

The accuracy of these predictions may be improved though further detailed site investigation (post consent). It is therefore important that the PMP remains a live document throughout pre-construction and construction phases and is encapsulated within a wider CEMP The PMP and volumetric assessments can be updated as more accurate information becomes available.

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