Scottish & Southern Electricity Networks

TRANSMISSION

# Creag Dhubh to Inveraray 275 kV Connection Environmental Impact Assessment

# Volume 4 | Appendix 10.2

## Outline Peat Management Plan

**July 2022**

Scottish & Southern Electricity Networks
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# List of Abbreviations

| | |
|---|---|
| BGS | British Geological Survey |
| CEMP | Construction Environmental Management Plan |
| cm | Centimetre |
| 'Deep Peat' | A carbon-rich soil with a surface peat layer greater than 0.5 m thickness (in the context of the 2016 SNH/NatureScot Carbon and Peatland Map) or a peat layer of greater than 1 m thickness (in the context of the Scotland Soil Classification). It should be noted that there is no agreed definition of 'deep peat' |
| ECoW | Ecological Clerk of Works |
| EIA | Environmental Impact Assessment |
| GEMP | General Environmental Management Plans |
| GIS | Geographic Information Systems |
| IDW | Inverse Distance Weighted |
| JNCC | Joint Nature Conservation Committee |
| LOD | Limit of Deviation |
| km | Kilometre |
| m | Metre |
| OHL | Overhead Line |
| OPMP | Outline Peat Management Plan |
| 'Peat' | Dead and partially decomposed plant remains that have accumulated under waterlogged conditions (Ramsar Convention, 1971). An organic soil which contains more than 60 percent of organic matter and exceeds 50 cm in thickness (Macaulay Institute, 1984). It should be noted that there is no agreed definition of 'peat' |
| Plasticity | Defined as the ability of a soil to undergo deformation without cracking or fracturing |
| PLHRA | Peat Landslide Hazard Risk Assessment |
| PMP | Peat Management Plan |
| SEPA | Scottish Environment Protection Agency |
| SNH | Scottish Natural Heritage |
| SSEN | Scottish and Southern Electricity Networks |

# 1 Introduction

## 1.1 The Proposals

This Appendix presents information relevant to the Creag Dhubh to Inveraray 275 kV Connection. It should be read in conjunction with the **Volume 2** of the **EIA Report** for full details of the Proposed Development, as well as the following documents:

- **Technical Appendix 2.2: Outline Construction Environmental Management Plan (CEMP) (EIAR Volume 4);**
- **Technical Appendix 10.1: Peat Depth Survey Report (EIAR Volume 4);** and
- **Technical Appendix 10.3: Peat Landslide Hazard Risk Assessment (PLHRA) (EIAR Volume 4).**

Scottish Hydro Electric Transmission plc (the Applicant) who, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission), own, operate and develop the high voltage electricity transmission system in the north of Scotland and remote islands.

Due to the growth in renewable electricity generation in the north and north-east of Scotland, upgrade of the transmission network is required in order to provide the necessary increase in transmission capacity.

The Applicant is proposing to apply for consent under Section 37 of the Electricity Act 1989 to construct and operate a 9 km double circuit 275 kV OHL, supported by steel lattice towers between a proposed substation at Creag Dhubh and the recently constructed Inveraray-Crossaig 275 kV capable OHL circuit, in Argyll, Scotland (the 'Proposed Development'). The Proposed Development is shown in **Figure 2.1: Proposed Development (EIAR Volume 3a).**

## 1.2 Requirement for the Peat Management Plan (PMP)

Ramboll was commissioned by the Applicant to undertake peat depth and coring surveys, presented in **Technical Appendix 10.1: Peat Survey Results Report (EIAR Volume 4)**, to aid the design process and inform the Outline PMP (OPMP) for the Proposed Development, as presented here within.

This appendix has been produced in accordance with guidance published by Scottish Environment Protection Agency (SEPA), NatureScot and the Scottish Government, which is referenced in the following sections. This OPMP specifically refers to the overhead line and associated infrastructure.

A more detailed PMP will be undertaken post-consent following more extensive ground investigation and will specify the proposed peat and soil management methodologies to be employed during construction as part of the Construction Environmental Management Plan (CEMP).

The purpose of the PMP is to:

- define the materials that will be excavated as a result of the Proposed Development, focusing specifically on the excavation of peat;
- report detailed investigations into peat depths affected by the Proposed Development;
- detail proposals for the management of excavated peat and other soils;
- determine volumes of excavated arisings and proposals for re-use or reinstatement using excavated materials; and
- detail management techniques for handling, storing and depositing peat for reinstatement.

The PMP is a 'live' document and will evolve during the different stages of the Proposed Development and as such will be subject to review to address:

- requirements to discharge future consent and planning conditions;
- detailed ground investigations and design development;
- unforeseen conditions encountered during construction;
- changes in best practice during the life of the Proposed Development; and
- changes resulting from the construction methods used by the Principal Contractor.

Whilst this OPMP provides a base standard for good practice, where avoidance or further minimisation of risks to the environment can be demonstrated through use of alternative methods or improvements to current practices, the Principal Contractor will implement these wherever possible.

The Stage 1 PMP has been prepared in accordance with appropriate guidance and best practice[1][2][3].

## 1.3 Limitations and Assumptions

The Site is predominantly covered with a varying thickness of peat and carbon-rich soils. The design of the Proposed Development has taken into consideration peat depths, along with other technical and environmental constraints, and the Proposed Development's infrastructure has been sited away from these areas, where possible.

Peat probing and mapping have been used to inform the design process at strategic points in the design evolution of the Proposed Development. However, there are some differences between the final design and the extent of the peat survey results based on design changes made through this process, as a result of micrositing etc[4].

However, the peat survey probing points do provide high resolution coverage of the Site, which revealed the peatland to be typically shallow (<1.0 m) but with pockets of deeper peat. It is considered that the peat depths collected, and interpolations derived from these data, are representative of the Site and have adequately informed the layout of the Proposed Development.

The peat excavation and reuse volumes included in this OPMP are intended as an initial indication. They are based on a series of design assumptions and estimates for the Proposed Development layout and peat depth sample data interpolated across discrete areas of the Site[1]. Such parameters can still vary over a small scale and therefore local topographic changes in the geological profile may impact the total accuracy of the volume calculations.

The OPMP is a 'live' document and would be further developed when the Principal Contractor has been appointed, post consent. Further peat probing would be undertaken along with detailed ground investigation surveys to finalise and inform the detailed PMP post consent, prior to construction works commencing. This approach informs the Proposed Development and can minimise impacts on deep peat.

[1] Scottish Government, Scottish Natural Heritage, SEPA (2017) *Peatland Survey. Guidance on Developments on Peatland*, on-line version only.

[2] Scottish Renewables and SEPA (2012). *Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste.*

[3] SEPA (2011). *Restoration Techniques Using Peat Spoil from Construction Works*.

[4] These changes are considered to be minor and not significant.

# 2 Peatland Condition

## 2.1 Definitions of Peat

Organic material less than 0.5 m depth is not defined as peat by the Scottish Government, NatureScot, and SEPA guidance *Peatland Survey. Guidance on Development on Peatland (2017)*[1], which states that 'peat soil is an organic soil which contains more than 60 per cent of organic matter and exceeds 50 centimetres (cm) in thickness'. This is also confirmed by The James Hutton Institute who define shallow peat as having a 'prescribed depth of organic matter of 50-100 cm', and the Forestry Commission who use 45 cm as the critical depth for peat to occur. On this basis, peat is classified as organic material over 0.5 m in depth.

Peat can be separated into three main layers: acrotelmic (the upper living layer), catotelmic (the middle to lower layer) and occasionally amorphous (lower layer) peat.

Acrotelmic peat is the living layer of peat including the peat turf or turve being a thin, floating vegetation mat layer. The acrotelm is generally found within the top layer of peat (often less than 0.5 m) depending on the degree of decomposition and fibrous nature of the peat (approximately H1 to H6 on the Von Post classification scale (see **Technical Appendix 10.1: Peat Depth Survey Results Report, EIAR Volume 4**). The acrotelm is generally of high permeability, decreasing with depth. The water table fluctuates in this layer and conditions vary from aerobic to anaerobic. Material may be fibrous or pseudofibrous (plant remains recognisable), spongy, and when excavated strength is lost but retains integral structure and can stand unsupported when stockpiled over 1 m.

Catotelmic peat is the dead layer of peat found deeper than acrotelmic peat which has some remnant plant structures. Material has high water content and is permanently below the water table (saturated) therefore organic matter decomposes anaerobically. Some plant structures may be recognisable but are highly humified losing most of their characteristics (approximately H6 to H9 on the Von Post classification scale) and strength. Water flow through the catotelm is slow unless peat structures such as sink holes or peat pipes are present.

Finally, amorphous peat is highly decomposed organic material where all recognisable plant remains are absent (approximately H9 to H10 in the Von Post classification scale). These deposits are dark brown to black in colour, plastic, are low tensile strength and are unable to stand unsupported over 1 m when stockpiled.

## 2.2 Desk Study

The 1:625,000 and 1:50,000 scale geological mapping available from the British Geological Survey (BGS)1 shows the majority of the northern and central regions of the Site to be underlain by the Tayvallich Volcanic Formation of the Argyll Group comprising Metalava and Metatuff. Originally igneous rocks formed by eruptions of magma, were later altered by low-grade metamorphism and formed approximately 541 to 1000 million years ago. To the south of the Site, the BGS mapping shows similar aged rocks of the Crinan Grit Formation, quartzite and pellite metamorphic bedrock also of the Argyll Group.

Dalradian Supergroup, Metagabbro and Metamicrogabbro metamorphic rock is also noted to be present where igneous intrusions have occurred. A fault zone is shown to be present to the south west of Tower T21 trending north east to south west. The 1:50,000 BGS solid geology mapping is shown in **Figure 10.3, EIAR Volume 3a**.

The superficial geology of the Site predominantly comprises glacial deposits of Hummocky Till (diamicton), sands and gravels. Alluvial river terrace deposits are also shown to be present within

river valley formations to the east of the Site. BGS mapping shows peat deposits are located outside of the Proposed Development area. Areas of the Site, predominantly surrounding hill formations, are mapped as having no superficial deposits present which could indicate that rockhead is relatively shallow in these areas. The 1:50,000 BGS mapping is shown on **Figure 10.2, EIAR Volume 3a**.

The Scottish Natural Heritage carbon rich soils, deep peat and priority habitat mapping2 shows limited areas of peat to the north and south of the Site, predominantly located in areas of forestry. The peat deposits are shown to be either 'Class 2'[5] or 'Class 5'[6] soils, the former being defined as 'Nationally important carbon-rich soils, deep peat and priority peatland habitat'. Class 5 soils are defined as 'dominant vegetation cover is not a priority peatland habitat'. An extract of the Scottish Natural Heritage carbon rich soils, deep peat and priority habitat mapping is shown on **Figure 10.4, EIAR Volume 3a**.

## 2.3 Summary of Peat Depth

Most of the Site has either no peat present or has a shallow depth of peat soil present (84% <0.5 m in depth). Whilst the majority of the peat coverage is relatively shallow or absent, the maximum depth of peat recorded was 4.2 m, located approximately 150 m south of Tower T1. The mean peat depth recorded was 0.11 m. The design of the Proposed Development has considered peat depths, along with other technical and environmental constraints, and the Proposed Development's infrastructure has been sited away from these areas, where possible. Peatland habitats are also described in **EIAR Volume 2, Chapter 8: Ecology.**

## 2.4 Peatland Condition

Two peat depth surveys were undertaken at the Site, with a combined total of 2,183 peat probes taken. The results of the surveys were used to inform the design layout of the Proposed Development.

Most of the Site has either no peat or has a shallow depth of peat present (approximately 84% of peat probes recorded <0.5 m in depth). These areas of shallow peat can be considered as organo-mineral soils. These are further summarised as follows:

- 1,395 no. samples (64%) located on land with no peat/ absent;
- 442 no. samples (20%) located on land with less than or equal to 50 cm depth of peat or organomineral soil;
- 145 no. samples (7%) fell on land with between 51 cm and 100 cm depth of peat; and
- 201 no. samples (9%) located on land with more than 100 cm depth of peat.

The survey results indicate that the peat depth is variable ranging between 0.0 m and 4.2 m thickness. The peat thickness along the Proposed Development was found be mostly shallow, with some pockets of deep peat located east and south of Tower T1, and between Towers T2 and T3.

[5] Class 2 soils are described as indicative of 'Peat soil with occasional peaty soil' with indicative vegetation defined as 'peatland or areas with high potential to be restored to peatland'. Class description is described as 'nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential'.

[6] Class 5 soils are described as indicative of 'Peat Soil' with no indicative vegetation. Class description is described as 'soil information takes precedence over vegetation data. No peatland habitat recorded. May also include areas of bare soil. Soils are carbon rich and deep peat'.

The peat probe depth and interpolated contours[7] are shown on **Figure 10.1, EIAR Volume 3a**. The mean peat depth recorded was 0.11 m.

Overall, the peat sampled across the Site is relatively shallow or absent, however some deeper pockets were noted. The peat sampled was generally dry or semi-dry and in a state of weak to moderate state of decomposition. This has mostly resulted from commercial forestry and land drainage, which is present across the Site (refer to **Figure 10.1, EIAR Volume 3a**). This land use causes modification to soils from planting, management and felling activities. Changes to hydrology, also occur from artificial drainage measures, which are installed to prevent trees becoming waterlogged. As such, modification occurs to the integrity and composition of the peat and carbon rich soils.

The Proposed Development's infrastructure has been located away from these deeper peat locations where practicable, taking into account other environmental and technical constraints, or microsited to minimise potentially significant adverse effects. However, based on the other design and technical constraints, it has not been possible to site the Proposed Development entirely outwith areas of peat.

Further details of the peatland condition and findings from the peat surveys are included in the Peat Depth Survey Report (**Appendix 10.1, EIAR Volume 4**).

## 2.5 Classification of Peat

Peat was characterised as part of the peat survey which considered the physical properties of peat cores taken across the Proposed Development Site. The key measures of peat condition, which are important to establishing the appropriate type of reuse, are noted in **Table 2.1**. Overall, the sample results suggest that the acrotelm layer is shallow but it is recommended that the upper 0.5 m should be reused as part of the reinstatement programme, where this depth of material is available. Excavation of 0.5 m ensures that the acrotelm remains as intact as possible and captures much of the underlying seed bank material which would aid vegetation regeneration. With regards to the catotelm material within the Site, the results indicate that the majority of the material is fibrous.

**Table 2.1: Peat Classification**

| Peat Type | Key Measures and Survey Summary |
|---|---|
| Acrotelm | Depth - the depth of the acrotelm ranged from 0 cm to 50 cm. Due to the difficulties of excavating a thin layer of acrotelm, without causing significant damage, it is recommended that 0.5 m of surface peat is excavated (where possible) for reuse as acrotelm material. |
| Acrotelm/Catotelm | Degree of humification – most of the samples are classed as fibrous, which is suggestive of low humification in the samples. |
| | Fibrous content – the peat across the Proposed Development Site is generally fibrous in nature, with the samples assessed as having mostly low fine fibre content (F1) but ranging to moderate (F2). The majority of the sample locations were assessed as |

[7] The peat depth data was interpolated in GIS using an inverse distance weighting (IDW) approach.

| Peat Type | Key Measures and Survey Summary |
|---|---|
| | having a moderate coarse fibre content (R2), with the remainder being low coarse fibre content (R1). |
| | Water content - were generally noted to be dry or semi-dry, with some samples containing some moisture, which is consistent with the high degree of modification to the peatland integrity and composition through artificial drainage and overplanting with coniferous plantation forest. This can cause drying, oxidation, and erosion of peat and carbon-rich soils, which have likely increased carbon release. |
| | Von Post - indicate that the majority of the samples tested scored relatively high on the Von Post scale (H4+) indicating weakly to well decomposed peat. Areas of the Proposed Development site have historically been intensively managed with significant areas of commercial forestry plantation and felling, with artificial drainage measures used. In some areas diffuse natural drainage systems were also noted. Within the commercial plantation and forestry areas it was noted that the acrotelmic peat was highly modified as a result of planting and felling activities. No evidence of peat erosion or instability were generally noted within the forestry areas |

## 2.6 Estimated Peat Balance

The volume of peat required to be excavated and reinstated due to the Proposed Development has been estimated based on the following data and assumptions:

- peat depth survey data from probing undertaken at the Site;
- excavations take place only within the footprint of the Proposed Development;
- peat will shrink on replacement due to some inevitable dewatering during handling and compaction at placement;
- potential for use of floating access tracks would be used based on engineering constraints in addition to traditional excavated tracks;
- temporary peat excavated for temporary infrastructure such as the construction compound and laydown could be reinstated, and therefore not considered as part of the permanent excavation volumes; and
- for the purpose of the assessment and in the absence of any peat characteristic information it is assumed that the top 0.5 m is characterised as acrotelmic peat, with catotelmic peat below that.

Specific design assumptions used to estimate the peat volumes to be excavated and reinstated due to the Proposed Development are:

- The proposed excavation footprints for 34 self-supporting fabricated steel lattice towers. It has been assumed that an area of 50 m x 50 m of disturbance would be required at each tower location and 80 m x 80 m for angle towers;
- Tower locations that cannot be relocated or microsited to avoid deep peat would utilise a piled foundation solution, where practicable, and no significant peat volumes would be excavated. For the purpose of this assessment this has been assumed for towers located on >1.5 m of peat;

- Construction of approximately 8.34 km of new permanent track, with a minimum running width of 4.5 km. Upgrades to 1.16 km of existing access tracks would be required;
- Where possible, these would use 'floating' construction techniques where these are located over deep peat. It is assumed that no significant volumes of peat would be excavated and temporary access tracks could be reinstated on completion of construction works; construction activities would be undertaken in accordance with the good practice measures included within the Applicants General Environmental Management Plans (GEMPS) (**Appendix 2.3, EIAR Volume 4**).

Construction compound sites (temporary/permanent) have not been identified at this stage. This will be the responsibility of the principal contractor, who will identify suitable sites and apply for separate planning permission.

**Table 2.2** provides an estimate of the volumetric peat excavation for the Proposed Development. These volumes would be subject to review and updated following ground investigation, and detailed design as part of the post-consent process, prior to construction.

**Table 2.2: Estimated Peat Volume to be Excavated**

| Element | Estimated Total Peat Volume to be Excavated ($m^3$) | Estimated Acrotelmic Peat Volume to be Excavated ($m^3$) | Estimated Catotelmic Peat Volume to be Excavated ($m^3$) |
|---|---|---|---|
| Towers | 37,500 | 22,500 | 14,750 |
| Permanent Access Tracks | 18,765 | 18,765 | 0 |
| Temporary Access Tracks | 0 | 0 | 0 |
| **TOTAL** | **56,015** | **41,265** | **14,750** |

**Table 2.3** provides an estimate of the potential reinstatement opportunities for the Proposed Development.

**Table 2.3: Estimated Peat Volume to be Reinstated**

| Element | Area to be Restored ($m^2$) | Average Depth of Restoration Area (m) | Volume of Acrotelmic Peat Reinstatement ($m^3$) | Volume of Catotelmic Peat Reinstatement ($m^3$) | Total Reinstatement ($m^3$) |
|---|---|---|---|---|---|
| Towers | 85,000 | 0.5 | 22,500 | 14,750 | 37,250 |
| Permanent Access Tracks | 83,400 | 0.5 | 41,700 | 0 | 41,700 |
| Temporary Access Tracks | 0 | 0 | 0 | 0 | 0 |
| **TOTAL** | | | **64,200** | **14,750** | **78,950** |

## 2.7 Requirements for the Detailed Peat Management Plan

The Principal Contractor would be required to update this OPMP prior to the construction phase commencing, based on additional information such as the results of further ground investigations and detailed design. As part of this update the following key activities are anticipated:

- update the PMP with relevant measures as set out in SSEN Transmission's General Environmental Management Plans (GEMPS) as included in **Technical Appendix 2.3, EIAR Volume 4** with specific reference to 'Working in Sensitive Habitats' and 'Soil Removal, Storage and Reinstatement';
- ensure the excavated peat is placed in peat storage areas at the infrastructure location ready for the restoration phase;
- reuse some of the excavated peat, on-site, as indicated in **Table 2.3**. The PMP should specify where the contractor intends to reuse peat on site and provide estimates of the quantities that will be used. The reuse of peat will be subject to the conditions and methods of reinstatement described in the PMP and relevant GEMPs; and
- remaining peat will be used for habitat restoration.

The final PMP would include the following:

- project background, such as the Proposed Development description, peat-related planning conditions attached to the consent, and peat management recommendations;
- confirmation of excavated peat volumes based on completion of ground investigation and review of detailed design;
- review of peat restoration opportunities, including any restoration requirements;
- a construction timetable and highlight any seasonal considerations;
- comply with SEPA construction site licence, as required;
- a detailed method statement for peat and mineral soil handling, including specification of equipment to be used;
- measures to be put in place to deal with weather related events (flash floods, peat slide, snow melt, dust);
- appropriate use of track and road material, and other hard-standing material to minimise pollution;
- detail measures to enable sediment management in emergency situations, to cope with high rainfall and runoff;
- scheduling of peat restoration works would be undertaken in line with SPPs and GEMPs, according to agreed methodologies and with guidance and supervision from a suitably experienced Ecological Clerk of Works (EcoW);
- scheduling of construction to benefit site restoration; and
- a record keeping system of what the final PMP will include.

## 2.8 Monitoring and Record Keeping

An ECoW, experienced in working with peat, would be appointed by the contractor prior to commencement of the construction phase. They would be responsible for monitoring compliance against the final PMP and other relevant documents such as the final CEMP. They would also be responsible for ensuring the legislative requirements are complied with.

The contractor and the ECoW would be responsible for maintaining clear records during the construction phase such as depths and types of peat excavated, plans showing peat storage areas and locations of reinstated peat.

## 2.9 Peat and Mineral Soil Handling Methods

This section provides guidance to help the contractor in both planning and executing the construction works for the Proposed Development. Working in peat cannot be avoided because parts of the Site is underlain by peat of variable depth and thickness (refer to **EIAR Volume 3a: Figure 10.1**). Careful handling of the peat would also be required to ensure its suitability for reuse.

The contractor would provide a detailed method statement for works in peat habitats, including but not limited to:

- how to minimise the area of impact;
- how to avoid/work around areas of higher quality vegetation (with the assistance of the ECoW);
- means of access to areas of work and to areas where peat would be reused;
- methods of peat removal;
- managing water in the peat and pollution prevention;
- where to avoid unnecessary intrusive work wherever possible; and
- drainage measures and design and use of appropriate techniques to maintain local hydrology.

It would be necessary for the final PMP to detail the methods and timing involved in handling, storing and using peat for reinstatement. The final method statement for this should be based on the following principles:

- the surface layer of peat and vegetation (acrotelm) would be stripped separately from the catotelmic peat. Where possible this would involve an excavation depth of 0.5 m and the creation of turves;
- the turves should be as large as practicably possible to minimise desiccation effects during storage;
- the turves should be kept wet but not saturated, and not allowed to dry out when in temporary storage;
- contamination of excavated peat with other substrate materials (e.g., gravels, clays or silts) should be avoided and these materials stored separately where excavated;
- acrotelmic material would be stored separately from catotelmic material even if some of this layer appears to be lacking vegetation, since it may contain a seedbank that is useful for re-establishing vegetation;
- any risk of peat slide must be considered by a suitably qualified engineer and where risk is identified protective measures developed and agreed with the Applicant before further construction works take place. Reference should be made to the findings of the PLHRA **(Technical Appendix 10.3, EIAR Volume 4)** and subsequent detailed assessment;
- careful handling would be essential to retain any existing structure and integrity of the excavated materials and thereby maximise the potential for excavated material to be reused;
- plan all works to reduce the need for double handling the peat;
- movement of excavated turves and peat should be kept to a minimum and it is preferable to transport peat intended for translocation to its final destination at the time of excavation;

- less humified catotelmic peat (consolidated peat), which maintains its structure upon excavation, should be kept separate from any highly humified amorphous peat;
- consider the timing of excavation activities to avoid very wet weather periods to reduce the risk of peat becoming wet and unconsolidated, thereby reducing pollution or peat slide risk;
- acrotelmic material for reuse within the Site would be replaced as intact as possible once construction is complete; and
- to minimise handling and transportation of peat, acrotelmic and catotelmic materials for re-use within the Site would be replaced, as far as is reasonably practicable, in the location from which it was removed. Acrotelmic material must be placed on the surface.

The handling of peat should be monitored and supervised by the ECoW to ensure the above principles are adopted and implemented during construction of the Proposed Development. Based on the current project programme, it is anticipated that the peat excavation and soil stripping activities would be undertaken at the beginning of the construction period, over an approximate six month period.

## 2.10 Minimising Damage to Existing Vegetation

To minimise damage to the existing vegetation, construction plant required for reinstatement and landscaping works would be positioned on constructed access tracks, hardstanding areas or existing disturbed areas wherever possible. Areas to be excavated would be clearly marked on the plans and then on the ground to ensure that no work is undertaken outside the construction footprint.

Tracked, low ground-pressure, long reach excavators would be used for peat handling and reinstatement works. A low ground-pressure excavator would be used if the extent of the long reach arm is insufficient. Other machinery, such as tippers, would also be tracked and low-ground pressure type when required to travel on soft ground and the use of ground protection mats could be required.

Reinstatement of vegetation would be focused on natural regeneration utilising peat vegetated turves (acrotelm). In the unlikely event that the quantity of excavated acrotelm turves is not sufficient, a nurse moorland grass seed mix would be used. The species mixture would be specified in the final PMP and could include lowland species to encourage early establishment.

## 2.11 Planning of Peat Reinstatement

Peat reinstatement and restoration would be undertaken using methods to minimise double handling of peat and the distances between source and receptor areas where practicable. Peat translocation, reinstatement and restoration would be carried out concurrently with other elements of the Proposed Development's construction. To achieve this, a detailed peat restoration plan would be included in the final PMP along with peat management recommendations as per SEPA guidance.

When peat is disturbed or translocated artificially it is prone to drying because fragmentation allows water to drain away and prevents it from accumulating. To create conditions suitable for wet bog restoration, the reinstated peat needs to be kept wet, otherwise, the vegetation would dry out, the peat would shrink and crack, and would ultimately be eroded by water and wind, which would make the restoration unsuccessful and likely to create problems such as peat floods, water pollution, and peat landslides.

The main principle of keeping the water close to the reinstated surface (maintenance of high-water table) is to use natural and artificial enclosures to slow down the horizontal flow of water. For the enclosure to work, the peat surface needs to be flush with or only slightly (<0.3 m) above the level of

adjacent land (to allow for settlement). If the level of translocated peat is substantially higher, then it would be at high risk of drying out and easily eroded as water would not be held effectively by the peat alone, it would naturally flow sideways.

## 2.12 Temporary Peat Storage

During construction temporary peat storage would be required before the excavated material could be re-used in restoration and placed in its end use location. The final method statement for this temporary storage of peat would be based on the following guiding principles:

- temporary storage of peat shall be minimised and where required would be temporarily stored in stockpiles/bunds adjacent to and surrounding each infrastructure site;
- acrotelm, catotelm, and any clay/glacial till or other substrate would be stored separately and appropriately to ensure no mixing of materials and to prevent cross-contamination;
- suitable storage areas shall be sited in areas with lower ecological value, low stability risk areas and at a minimum distance of 30 m from watercourses. Identified suitable areas would form part of the detailed PMP and would be agreed in advance with the ECoW;
- peat turves would be stored in wet conditions where possible (e.g., within waterlogged former excavations) or irrigated in order to prevent desiccation;
- larger stockpiles are preferable to numerous small stockpiles, which minimises exposure to sun and wind, which could lead to desiccation. Stockpiles would not exceed 2 m in height and would be sited with due consideration for slope stability. Benching of stored peat could be necessary to provide stability;
- stores of non-turf, i.e., catotelm, would be bladed off to reduce surface area and desiccation of the stored peat;
- stores of peat, particularly catotelmic material, would be inspected by the Principal Contractor weekly and following heavy rainfall or thaw conditions to check for any evidence of movement, tension cracks or instability in the stored peat. If there is any evidence of instability, appropriate remedial measures would be taken as necessary on the advice from a suitably qualified engineer;
- in dry weather periods, consideration shall be given to watering stored turves and peat to prevent drying out, wastage and erosion;
- pollution prevention measures would be installed around peat storage areas;
- reinstatement would, in all instances, be undertaken at the earliest opportunity to minimise storage of turves and other materials;
- timing the construction and reinstatement work, as much as possible, to avoid periods when peat materials are likely to be wetter; and
- where practical, transportation of peat on the site, from excavation to temporary storage and restoration locations, would be minimised.

# 3 Reinstatement of Peat

## 3.1 Towers/Tower Foundations

Peat excavated for towers and working areas would be stored as close to the tower as possible, so as to avoid double handling of materials. The construction of the towers involves the excavation of the acrotelm and catotelm, or top, organic layer of peaty soils, and some mineral subsoil. These would be separated on excavation, ensuring no mixing of the different peat layers, and different soil types. Once all the soil has been excavated and the higher bearing underlying subsoil has been reached, the tower foundation would then be constructed.

Up to 50 cm of acrotelm would be used to reinstate the surface vegetation and catotelm re-used to backfill excavations where practicable dependent on the type and depth of the foundation excavation.

Following construction of the tower, turves would be replaced along the excavation/working area edges to allow quicker re-vegetation. Acrotelm turves would be used for this purpose, only where required and would tie in with the surrounding topography, landscape and ground conditions to prevent adverse environmental effects.

Towers located in deep peat would be constructed using a piled foundation solution, where practicable, and it has been assumed that no specific restoration is required.

## 3.2 Permanent Access Tracks

The reinstatement of peat would be carried out progressively, with peat excavated from other areas placed directly on the sides of the access track. This will take place everywhere where the cut track passes through peat.

The construction of the access track involves the excavation of the acrotelm and catotelm, or top, organic layer of peaty soils, and some mineral subsoil. These would be separated on excavation, ensuring no mixing of the different peat layers, and different soil types. Once all the soil has been excavated and the higher bearing underlying subsoil has been reached, good quality aggregate would then be placed. Up to 50 cm of acrotelm would be used to reinstate the track verges.

Following construction of the section of the access track, turves would be replaced along the road edges to allow quicker re-vegetation and soften visual landscaping of the road edges. Acrotelm turves would be used for this purpose, only where required and would tie in with the surrounding topography, landscape and ground conditions to prevent adverse environmental effects.

Floated access tracks will be used in areas of deep peat, where practicable, and where there is no risk of affecting peat integrity or create risk of peat landslide.

## 3.3 Temporary Access Tracks

Temporary access tracks would be restored following removal of the stone hardstanding. Peat would be reinstated to be flush with the ground.