Technical Appendix 8.5: Outline Peat Management Plan

Technical Appendix 8.5: Outline Peat Management Plan

1.1 Introduction

1.1.1 The Outline Peat Management Plan (PMP) has been prepared in accordance with relevant guidance[1,2].

1.1.2 This Outline PMP should be read in conjunction with the Outline Construction Environmental Management Plan (CEMP) (**Technical Appendix 2.1: Outline Construction Environmental Management Plan (EIAR Volume 4)**) and the various other reports that contribute to it, including the Peat Depth Survey Report (**Technical Appendix 8.4: Peat Depth Survey Results (EIAR Volume 4)**) and Peat Landslide Hazard Risk Assessment (PLHRA) (**Technical Appendix 8.6: Peat Landslide Hazard Risk Assessment (EIAR Volume 4)**).

1.1.3 The Outline PMP describes principles and methods to be used by the Applicant when excavating, moving and reinstating peat. It includes a volumetric peat balance and contains requirements for the final PMP, that would be developed by the Contractor post consent, prior to construction. A final PMP would be produced by the Applicant's infrastructure Contractor.

1.1.4 The Proposed Development is a renewable energy development comprised of up to eight wind turbines, a Battery Energy Storage System (BESS) and associated infrastructure adjacent to Sullom Voe Oil Terminal (SVT) and the Shetland Gas Plant in Shetland, Scotland. The Proposed Development is described in **Chapter 2: Proposed Development (EIAR Volume 2)**.

1.1.5 The Proposed Development has been subject to a number of design iterations and evolution (**Chapter 3: Design Evolution and Alternatives (EIAR Volume 2)**) in response to constraints identified as part of the baseline studies. The design strategy has specifically had regard to following a mitigation hierarchy with respect to avoiding and minimising effects on carbon rich soils and peatlands. This includes siting the elements of the Proposed Development to avoid the deepest areas of peat as far as possible and thereby reducing the volume of peat to be excavated and reused.

1.1.6 'Organo-mineral soils' are defined as soils containing more than 20 % organic matter and not exceeding 0.5 m in depth. The design recommendation (refer to **Chapter 3: Design Evolution and Alternatives, (EIAR Volume 2)**) was to locate infrastructure outside areas of peat greater than 1 m in order to avoid impacts to deep peat. The design of the Proposed Development has largely avoided the deepest areas of peat across the Site, however, due to other design considerations and constraints, it has not been possible to fully avoid these areas.

1.1.7 The overarching aim of the PMP is to provide guidance and a framework for the Contractor to effectively reuse peat excavated during construction in order to maintain and improve peatland habitats, reduce the risks to water quality and volumes, and retain and use peat as close as possible to the point of extraction. The main requirement for the Contractor is to plan peat management in detail and incorporate its progressive reinstatement and restoration of adjacent peatland areas into the construction programme so that they take place concurrently, minimising time the peat is in temporary storage and avoiding double-handling of peat.

1.2 Summary of Peat Depth

1.2.1 Peat surveys were undertaken at the Site to understand the baseline peat conditions and potential constraints, and to inform the design of the Proposed Development to reduce, as far as practicable, the potential direct and indirect effects on peat and carbon rich soils.

1.2.2 The following surveys were undertaken on the following dates:

- Stage 1 peat probing was completed by Ramboll in April 2025; and
- Stage 2 peat probing and coring was completed by Fluid Environmental Consultants in July 2025 with an additional Stage 2 survey undertaken by CKOS Solutions Limited in February 2026 following design refinement.

1.2.3 Findings of the peat depth surveys are presented in **Technical Appendix 8.4: Peat Depth Survey Results (EIAR Volume 4)**. In summary a combined total of 3,242 peat depth probes were taken during the peat surveys, as shown in **Figure 8.8: Peat Depth Contour Plan (EIAR Volume 3a)**. This included 260 peat depth probes during the Stage 1 survey and 2,982 peat depth probes across the two Stage 2 surveys.

1.2.4 The findings of the Stage 1 site-wide low-density peat probing, along with Stage 2 targeted high-density probing and coring surveys found that the majority of the Site to be underlain by areas of deep peat (74 % of peat depth probes recorded peat depths greater than 1 m).

1.2.5 The peat depth survey results for the Site are summarised as follows:

- 8 no. samples (0.2 %) located on land with no peat present/absent;
- 216 no. samples (6.7 %) located on land with less than or equal to 0.5 m depth of peat (organo-mineral soil);
- 612 no. samples (18.9 %) located on land with between 0.51 m and 1.0 m depth of peat;
- 1043 no. samples (32.2 %) located on land with between 1.1 m and 1.5 m depth of peat;
- 757 no. samples (23.3 %) located on land with between 1.6 m and 2.0 m depth of peat;
- 473 no. samples (14.6 %) located on land with between 2.1 m and 3.0 m depth of peat;
- 103 no. samples (3.2 %) located on land with between 3.1 m and 4.0 m depth of peat;
- 26 no. samples (0.8 %) located on land with between 4.1 m and 5.0 m depth of peat; and
- 4 no. samples (0.1 %) located on land with greater than 5.0 m depth of peat.

1.2.6 The mean peat depth recorded across the Site was between 0.63 m and 2.69 m. The deepest areas of peat were recorded up to 6.0 m in the central part of the Site.

1.2.7 Whilst some of the areas of deepest peat in the centre of the Site have been avoided in the siting of the Proposed Development, it has not been possible to avoid areas of deep peat within the Site owing to the prevalence of areas of deep peat across the Site. **Table 8.4.1** in **Technical Appendix 8.4: Peat Depth Survey Results (EIAR Volume 4)** indicates the mean peat depth to be greater than 1 m but less than 2 m at the proposed locations for the permanent hardstandings associated with Turbines 2, 3, 4, 5 and 6, including the access track and construction compound locations.

1.2.8 The proposed location of the hardstanding for Turbine 8 and associated access track have mean peat depths greater than 2 m (mean peat depth of 2.7 m and maximum peat depth of 5.3 m, and mean peat depth of 2.2 m and maximum peat depth of 4.2 m respectively).

1.2.9 Floating track has been considered as part of the design process to minimise disturbance and excavation of peat in these sections but has not been possible due to the undulating topography of the Site. However, these would be considered further at detailed design stage post-consent, once detailed ground investigation has been undertaken and the design further refined.

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

[2] SEPA, (2011) Restoration Techniques Using Peat Spoil from Construction Works.

1.3 Limitations

1.3.1 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 refinement of infrastructure design etc.

1.3.2 However, the peat survey probing points do provide high resolution coverage of the Site. 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 and are sufficient to inform a robust Peat Landslide Hazard Risk Assessment (refer to **Technical Appendix 8.6: Peat Landslide Hazard Risk Assessment (EIAR Volume 4)**) and this outline PMP.

1.3.3 The peat excavation and reuse volumes included in this outline PMP are intended as an initial indication. The total peat volumes 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. 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.

1.3.4 The PMP is a 'live' document and would be developed into a final PMP post-consent and in advance of construction commencing, when the Contractor has been appointed. As part of this process, it is proposed that further peat depth probing and coring would be undertaken at infrastructure locations, particularly wind turbine locations, post-consent and during pre-construction ground investigation surveys. This additional data would be used to aid micrositing of wind turbines away from any pockets of deeper peat into the shallowest areas, thereby minimising impacts on peatland within the micrositing tolerances, and to gather further information on the characteristics of the peat deposits present. A finalised post-consent layout would be completed once detailed ground investigations have been undertaken and before construction works commence. This would demonstrate how any newly collected information has been used to inform the proposed layout and reduce impacts on features such as deep peat.

1.4 Peatland Condition

1.4.1 The mean depth of the acrotelm recorded from the peat core sample locations was 0.10 m, however the depths recorded across the samples were variable. A precautionary approach has therefore been used to assume an acrotelm depth of 0.5 m and it is recommended that the upper 0.5 m of excavated peat is used as peat turves/the top layer as part of the reinstatement programme as this captures much of the underlying seed bank material, which would aid vegetation regeneration and reduce the risk of erosion.

1.4.2 The peat across the Site is generally intermediate, with the majority of the samples assessed as having low fine fibre content and low coarse fibre content.

1.4.3 The results of the Von Post classification indicate that the majority of the samples tested scored between H4 and H8, indicating slight to strong rates of decomposition.

1.4.4 The mean water content of the peat at all sample locations was between wet and moderately wet. This is consistent with the potential high degree of modification to the peatland through artificial drainage, cuttings, and grazing which has caused drying, oxidation, and erosion of peat and carbon-rich soils, which has likely increased carbon release.

1.5 Estimated Peat Balance

1.5.1 The volume of peat excavated and to be reinstated has been estimated based on the following data and assumptions:

- Review of interpolated peat model generated using Ordnance Survey 5 m Digital Terrain Model;
- Peat depth survey data from probing during the Phase 1 and 2 surveys;
- Excavations would take place only within the earthworks footprint of the Proposed Development;
- Peat would shrink on replacement due to some inevitable dewatering during handling and compaction at placement;
- Improvement to areas of degraded or existing peatland would be undertaken as part of habitat management and restoration proposals (as detailed in **Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**). These would be confirmed and developed further as part of the detailed PMP and habitat management plans prior to construction;
- Assumed that peat excavated from temporary infrastructure such as the construction compound and cable runs could be reinstated, and therefore not considered as part of the permanent excavation volumes;
- One borrow pit is proposed as part of the Proposed Development; and
- A proportion of acrotelm peat would become unsuitable for reuse as the top layer due to unavoidable damage to vegetation during the excavations.

1.5.2 Specific design assumptions used to estimate the peat volumes to be excavated and reinstated are:

- The area for construction of the wind turbine foundations has been estimated to be a maximum diameter excavation to allow for an excavated working area around the concrete foundation (refer to **Chapter 2: Description of Proposed Development (EIAR Volume 2)**. A concrete foundation slab of approximately 22 m diameter would sit on the underlying rock or suitable substratum with a founding depth of 3.5 m (dependant on ground conditions). With regard to backfilling at these foundations, it has been assumed that an area of the 'compacted backfill between foundation and excavation face', would partially comprise of peat. Peat would not be used to backfill the excavation void over the 22 m diameter plan footprint of the foundation due to its potential low strength; instead, rockfill, sands, or gravel would be required to backfill, but could be used outside of this area. The area of potential peat backfill equates to 625 m² per wind turbine. As above, the founding depth would be up to 3.5 m, however for the majority of the Site it has been assumed a depth of up to 2.0 m can be used as an approximation to backfill excavations to ground level.
- It has been assumed a restoration area of 650 m² per turbine could be used for surface reinstatement of peat around each turbine (based on a thickness of 0.2 m).
- A crane hardstanding would be required at each wind turbine location, which would be maintained during the operational phase of the Proposed Development. It has been assumed that one length and one width of each hardstanding would be available for peat reinstatement during construction, with verges 3 m in width.
- A substation compound with a total footprint up to 5,000 m^2 would be required. Within this area, it is assumed that two lengths and one width would be available for peat reinstatement, with verges 3 m in width.
- A BESS Compound with a total footprint of 5,000 m^2 would be required. Within this area, it has been assumed that two lengths and one width would be available for peat reinstatement, with verges 3 m in width.

1.5.3 New access tracks would be flanked by low angle landscaped verges that would seek to provide visual continuity and topographical tie-in between the access tracks and the surrounding peatland. The verges used for finishing and landscaping of the new access tracks would be extended to 2.5 m either side of the full track width (e.g. running width and track shoulders).

1.5.4 **Table 8.5.1** provides estimates of the volumetric peat balance for the Proposed Development. These volumes would be subject to review and updated following detailed ground investigation, detailed design and micrositing as part of the post-consent process, prior to construction.

Table 8.5.1: Estimated Peat Volume to be Excavated

Element	Estimated 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)
Turbine 1 foundation, crane pad and hardstanding	2,281	1,880	401
Turbine 2 foundation, crane pad and hardstanding	4,593	1,880	2,713
Turbine 3 foundation, crane pad and hardstanding	3,590	1,880	1,710
Turbine 4 foundation, crane pad and hardstanding	6,575	1,880	4,695
Turbine 5 foundation, crane pad and hardstanding	4,831	1,880	2,951
Turbine 6 foundation, crane pad and hardstanding	3,519	1,880	1,639
Turbine 7 foundation, crane pad and hardstanding	1,859	1,782	77
Turbine 8 foundation, crane pad and hardstanding	6,519	1,880	4,639
Permanent substation compound	4,900	2,500	2,400
Permanent BESS compound	4,900	2,500	2,400
New cut access tracks (permanent)	98,478	31,767	66,711
TOTAL	**142,044**	**51,709**	**90,336**

1.5.5 The estimated peat excavation volumes in **Table 8.5.1** are considered to be conservative and include peaty/organo-mineral soils. **Table 8.5.2** provides an estimate of the potential reinstatement opportunities for the Proposed Development.

Table 8.5.2: Estimated Peat Volume to be Reinstated

Element	Opportunity Area to be Restored (m^2)	Average Depth of Restoration Area (m)	Total Reinstatement Volume Opportunity (m^3)
Turbine foundation – surface	5,200	0.2	1,040
Turbine foundation – backfill	5,000	2.0	10,000
Crane and hardstanding verges	3,600	0.5	1,800
Hardstanding reinstatement	8,928	1.0	8,928
Permanent substation compound and BESS verges	1,500	0.5	750
New access track verges	39,500	0.5	19,750
Borrow pit restoration	3,435	0.6	2,061
Construction compound reinstatement	10,000	0.76	16,100

Table 8.5.2: Estimated Peat Volume to be Reinstated

Element	Opportunity Area to be Restored (m^2)	Average Depth of Restoration Area (m)	Total Reinstatement Volume Opportunity (m^3)
TOTAL	**77,163**	**N/A**	**60,429**

1.5.6 At this stage it is estimated that the Proposed Development would result in the excavation of approximately 142,044 m^3 of peat including peaty/organo-mineral soils (comprising approximately 51,709 m^3 acrotelmic peat and 90,336 m^3 of catotelmic peat).

1.5.7 Potential reinstatement opportunities for excavated peat, comprising temporary infrastructure reinstatement, and borrow pit restoration are estimated to be 60,429 m^3.

1.5.8 There is potential for large landscape-scale peatland restoration within the Land Under Applicant's Control, specifically blocking of drainage features around areas which are considered to have once had numerous bog pools. Hagg reprofiling/infilling, gully and drainage ditch blocking and peat cutting reprofiling/infilling are also all suitable peatland restoration techniques for use within the Land Under Applicant's Control.

1.5.9 Peatland features, such as erosion features, drainage ditches, 'flushes' and peat cuttings have been mapped in detail (as shown in **Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**). All of these features are proposed for restoration as part of the Outline Biodiversity Enhancement and Habitat Management Plan (OBEHMP) except where they coincide with the permanent parts of the Proposed Development footprint.

1.5.10 The proposed peatland restoration includes:

- Sensitive restoration of all of the areas mapped as Actively Eroding within the Land Under Applicant's Control. This would result in the restoration of approximately 84.5 ha of bog habitat;
- Reinstating 8.5 ha of reseeded grassland into blanket bog habitat;
- Restoring approximately 52.0 km of erosion features and gullies within the Land Under Applicant's Control to arrest or limit peat erosion and carbon loss, to encourage vegetation cover of the peatland, return to encourage a natural drainage pattern. This would provide the opportunity for the re-use of 52,000 m^3 of excavated peat and mineral soil for restoration, based on a conservative estimate assuming erosion features and gullies averaging 1 m wide and 1 m in depth;
- Blocking approximately 27.7 km of drainage ditches and approximately 40.9 km of former drains with flush like habitat in the Land Under Applicant's Control to restore the natural drainage pattern of the peatland and encourage revegetation. This would provide the opportunity for the re-use of 68,600 m^3 of excavated peat and mineral soil for restoration, based on a conservative estimate assuming drainage features and ditches averaging 1 m wide and 1 m in depth;
- Restoring approximately 0.8 km of peat cutting by infilling lost peat, reprofile edge, and by encouraging vegetation cover of the peatland and a return to encourage a natural drainage pattern. This would provide the opportunity for the re-use of 6,000 m^3 of excavated peat and mineral soil for restoration, based on a conservative estimate assuming peat cuttings averaging 5 m wide and 1.5 m in depth; and
- Restoring erosion features, peat cuttings, drainage ditches, and flush like features would rewet an estimated 213.4 ha of habitat around the mapped features within the Land Under Applicant's Control.

1.5.11 It should be noted that the habitat restoration proposals included in **Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)** are not all reliant on the re-use of surplus peat generated from the Proposed Development.

1.5.12 On this basis, the habitat restoration measures outlined above would provide approximately 12.4 ha and 126,600 m^3 of specific additional opportunities for reinstatement of excavated peat and mineral soils. On this basis, there are sufficient opportunities for the re-use of excavated peat and mineral soils from the Proposed Development in reinstatement and habitat restoration proposals.

1.5.13 In addition, the planned restoration work outlined in the OBEHMP (**Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**) would include at least 247.9 ha (1:6.4x multiplier of the total predicted loss of blanket bog) 'active' peatland restoration.

1.5.14 If the peatland restoration actions, identified within this outline PMP and the OBEHMP, are taken forward, which would only happen if the Proposed Development is consented, then these changes in habitat and hydrology, i.e. impeding the flow of water and wetting up areas of blanket bog, are likely to have a beneficial effect on bog habitat. These actions would:

- Reduce carbon loss;
- Secure the carbon store;
- Wet up vegetation;
- Restore hydrological conductivity;
- Provide ecological enhancement; and
- Potentially create additional areas where carbon is actively being sequestered.

1.5.15 Based on the compensation ratios and enhancement proposals included within the OBEHMP (refer to **Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4**) there is also potential to incorporate peatland restoration within the land under the Applicant's control.

1.6 Classification of Peat

1.6.1 Peat was characterised as part of the Stage 2 peat surveys which considered the physical properties of peat cores taken across the Site. The key measures of peat condition, which are important to establishing the appropriate type of reuse, are noted in **Table 8.5.3**. Overall, the sample results suggest that the acrotelm layer is variable in depth, and 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.

1.6.2 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 all material is mostly intermediate and fibrous in nature.

Table 8.5.3: Peat Classification

Peat Type	Key Measure and Survey Summary – Survey Results
Acrotelm	Depth - the mean depth of peat recorded during the surveys was between 0.63 m and 2.69 m. The maximum peat depth recorded was 6.0 m. The mean depth of the acrotelm from the peat core sample locations was 0.1 m but this was recorded to be variable across the samples. A precautionary approach has therefore been used and the depth of the acrotelm has been assumed as 0.5 m for the purpose of ensuring acrotelmic peat is used as peat turves/the top layer during peat reinstatement.
Acrotelm and Catotelm	Humification and fibrous content - the peat across the Site is generally intermediate, with the majority of the samples assessed as having low fine fibre content (F1) and low coarse fibre content (R1).
	Water content - the mean water content of the peat at all sample locations was between wet and moderately wet (B3 to B4).
	Von Post - the results of the Von Post classification indicate that the majority of the samples tested scored between H4 and H8, indicating slight to strong rates of decomposition.

1.7 Requirements for the Detailed Peat Management Plan

1.7.1 The Contractor would be required to update the outline PMP prior to the construction phase commencing, based on additional information such as the results of ground investigation and detailed design. As part of this update, the Contractor would be required to ensure excavated peat and other soils are reused on-site, subject to the conditions and methods of reinstatement described in the outline PMP. The final PMP would detail the following:

- A construction timetable and highlight any seasonal considerations;
- Comply with SEPA construction site licence, as required;
- Include 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 reduce pollution;
- Detail measures to enable sediment management in emergency situations, to cope with high rainfall and runoff;
- Detail how construction would be scheduled around key Site constraints (such as the breeding seasons for protected species). Where scheduling is not practical it would state what other mitigation could be put in place; and
- Detail how construction would be scheduled to benefit Site restoration.

1.8 Project Phasing

1.8.1 There are three distinct project phases, construction, operation, and decommissioning. Key activities for each phase are described in the following sections.

Construction

1.8.2 The key activities to be undertaken during the construction phase include:

- Prepare the final PMP referring to the detailed design and additional Site information (such as ground investigation);
- Set-out peat stripping areas;
- Set-out temporary peat and no peat soil storage areas;
- Set-out receptor areas for direct translocation of peat as per detailed peat translocation plan;
- Strip peat in pre-defined phases;
- Put peat and other soils into temporary storage;
- Translocate peat where pre-planned;
- Reinstate the peat and other soils that have been in temporary storage; and
- Monitor vegetation and stability of reinstated soil around the infrastructure, restored peatland areas, and soils to be stored for the duration of the construction period.

Operation

1.8.3 During this phase no peat excavation is anticipated.

Decommissioning

1.8.4 Peat management during decommissioning would follow the same principles as during the construction. It is not expected that disturbance of adjacent peat would be required upon the removal of turbine hardstandings. Restoration of turbine hardstandings would be achieved using suitable soils or peat that is available on-site, but this would be confirmed as part of the wider Decommissioning Plan.

1.8.5 The main mitigation measure relating to decommissioning would be blocking of any artificial ditches (that were created during construction and were required during the operation of the Proposed Development) to facilitate rewetting of adjacent peatland. It is likely that the main tracks would remain in place to facilitate ongoing access to the Site. However, this would be subject to further appraisal of the best environmental option and discussions with landowners and other users of the Site.

1.9 Monitoring and Record Keeping

1.9.1 An Ecological Clerk of Works (ECoW) 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 would be complied with.

1.9.2 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.

1.10 Peat and Mineral Soil Handling Methods

1.10.1 This section provides guidance to help the Contractor in both planning and executing the construction works at the Proposed Development. Peat would be excavated and could be stored temporarily in an appropriate location as set out previously where temporary storage is necessary. Careful handling of the peat would also be required to ensure its suitability for reuse.

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

- How to reduce the area of impact;
- How to avoid areas of higher quality bog 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;
- How to avoid unnecessary intrusive work wherever possible;
- Drainage measures and design and use of appropriate techniques to maintain local hydrology; and
- Plans for the deposition of peat on Site to be agreed with the Applicant and the ECoW.

It would be necessary for the final PMP to detail the methods and timing involved in handling, storing and using peat for reinstatement, all of which would be dependent on the equipment adopted for the construction activities. 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 reduce 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;
- 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 in order to reduce the risk of peat becoming wet and unconsolidated, thereby reducing pollution or peat slide risk;
- Acrotelmic material would be replaced as intact as possible once construction is complete; and
- To reduce handling and transportation of peat, acrotelmic and catotelmic materials 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.

1.10.3 The handling of peat should be monitored by the ECoW and the Applicant to ensure the above principles are adopted and implemented during construction of the Proposed Development.

Reducing Damage to Existing Vegetation

1.10.4 To reduce 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.

1.10.5 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.

1.10.6 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.

Planning of Peat Reinstatement

1.10.7 Peat reinstatement would be undertaken using methods to reduce double handling of peat and the distances between source and receptor areas. 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 translocation plan would be included in the final PMP. The final PMP would include peat management recommendations as per SEPA guidance.

1.10.8 When peat is disturbed or translocated artificially it is prone to drying because fragmentation lets the water 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 is likely to create problems such as peat floods, water pollution, and peat landslides.

1.10.9 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 being easily eroded as the water would not be held effectively by the peat alone, it would naturally flow sideways.

Temporary Peat Storage

1.10.10 It is anticipated that during construction, on most occasions, peat and peaty soil would only be handled once and would be directly placed at its end use locations. However, during construction a degree of temporary peat storage would be required before the excavated material could be re-used in restoration and placed in its end use location.

1.10.11 It would be necessary for the final PMP to detail the methods and timing involved in temporary storage, where this is required. It is likely that a degree of temporary peat storage would be required, for instance in association with stripping areas of any area used for temporary land take; this material would then be used in the subsequent restoration of this temporary construction area.

1.10.12 The final method statement for this temporary storage of peat would be based on the following guiding principles:

- Temporary storage of peat should be reduced. Where required it should be temporarily stored in stockpiles/bunds adjacent to and surrounding each infrastructure Site.
- Acrotelm, catotelm, and any clay/glacial till or other substrata should be stored separately and appropriately to ensure no mixing of materials and to prevent cross-contamination.
- Suitable storage areas should be sited in areas with lower ecological value, low stability risk areas and at a minimum distance of 50 m from watercourses. Identified suitable areas would form part of the final PMP and would be agreed in advance with the ECoW.
- Peat turves should 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 reduces 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, should be bladed off to reduce surface area and desiccation of the stored peat.
- Stores of peat, particularly catotelmic material, should be inspected regularly (at least 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 should be taken as necessary on the advice from a suitably qualified engineer.
- In dry weather periods, consideration should be given to watering stored turves and peat to prevent drying out, wastage and erosion.
- Pollution prevention measures should be installed around peat storage areas.
- Reinstatement would, in all instances, be undertaken at the earliest opportunity to reduce storage of turves and other materials.
- Timing the construction work, as much as possible, to avoid periods when peat materials are likely to be wetter.
- Where practical, transportation of peat on-site, from excavation to temporary storage and restoration locations, should be reduced.

1.11 Reinstatement of Peat

Access Tracks

1.11.1 The reinstatement would be carried out progressively with peat excavated from other areas placed directly on the sides of the tracks. This would take place everywhere where the cut tracks pass through peat. The surplus peat, not reinstated along the verges, would be either directly translocated to the receptor areas or stored temporarily in designated areas.

1.11.2 The construction of the 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 should then be placed. Up to 0.5 m of acrotelm would be used to reinstate the track verges.

1.11.3 Following construction of the section of 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, this would be done in a manner to ensure works tie in with the surrounding topography, landscape and ground conditions, and only where this is required and would not result in adverse environmental effects.

Turbine Foundations and Hardstanding

1.11.4 Once the wind turbine foundation has been constructed, depending on the target depth of reinstated peat, some catotelmic peat could be replaced around the turbine base excavations (subject to detailed foundation construction requirements), and re-turfed with acrotelm. Peat would be placed into any areas disturbed by the construction activities, around the crane hardstandings, rotor assembly hardstandings and other areas used in the construction phase. Other hardstanding areas, such as around the substation compound would also include areas for re-use of acrotelm.

Temporary Compounds and Cable Runs

1.11.5 The temporary construction compounds would be restored following removal of the stone hardstanding. The peat would be reinstated to be flush with the adjacent ground. Similarly, cable runs would be reinstated using peat as excavated, to ensure that the soil horizons would be replaced as removed.

Borrow Pit Restoration

1.11.6 As part of the borrow pit restoration, it is assumed that a thickness of 0.6 m of peat can be reused provided that it presents no residual pollution risks or harm to human health (an increased thickness of peat can be used if located within a deeper thickness of peat). The excavated peat would need to be suitable for restoration purposes to achieve the establishment of peatland habitats and a functional hydrological regime would need to be established in the borrow pit restoration to prevent desiccation of peat. This would include the reuse of both acrotelmic and catotelmic peat.

Ditch Backfilling and Habitat Restoration

1.11.7 Where possible, ditches and other cut areas, such as haggs, should be considered for reinstatement.

1.11.8 This would be explored further as part of the final PMP, but it is assumed that there is potential to reinstate peat excavated in these areas. This would also include the consideration of other areas of the Site that could be used for the suitable reuse of peat as part of habitat and peatland improvements.

1.11.9 The ECoW would monitor back-filling works to check compliance with relevant documents (such as PMP and CEMP). The main parameters for ditch backfilling that would be required are:

- Areas with relatively dry peat would be chosen;

- Works would be carried out during a period of dry weather;
- Specialist low-ground pressure tracked dumpers would be used;
- Bog mats would be used where required;
- Both source and receptor areas would have good vegetation cover;
- Site supervision by the ECoW would enforce changing routes to avoid damage to vegetation;
- Acrotelm excavated from the source location would be kept vegetated side up; and
- Excavated catotelm would be used in ditch-backfilling shall be of H6-H8 level of decomposition