Scottish & Southern Electricity Networks

TRANSMISSION

Creag Dhubh to Dalmally 275kV Connection

Environmental Impact Assessment

Volume 4 | Technical Appendix 10.1

Peat Survey Results Report

April 2022

Scottish & Southern Electricity Networks
TRANSMISSION

CONTENTS

List of Abbreviations

BGS	British Geological Survey
CGL	Card Geotechnics Limited
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	Environmental Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GIS	Geographic Information System
Humification	The process of decomposition of organic material that occurs in peat
IDW	Inversive Distance Weighted
JNCC	Joint Nature Conservation Committee
km	Kilometre
m	Metre
OHL	Overhead Line
'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'
'Peatland'	An ecosystem with a peat deposit that may currently support a vegetation that is peat forming, may not, or may lack vegetation entirely (Ramsar Convention, 1971).
SEPA	Scottish Environment Protection Agency
SPEN	Scottish Power Energy Networks
SNH	Scottish Natural Heritage
SSEN	Scottish and Southern Electricity Networks

1 INTRODUCTION

1.1 The Proposals

1.1.1 This Technical Appendix presents information relevant to the Creag Dhubh to Dalmally 275kV Connection. It should be read in conjunction with **EIAR Volume 2**, **Chapter 2: Description of the Proposed Development** for full details of the Proposed Development.

1.1.2 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.

1.1.3 The Applicant is proposing to apply for consent under Section 37 of the Electricity Act 1989 to construct and operate a 13.3 kilometre (km) double circuit 275 kV overhead line (OHL), supported by lattice steel towers between a proposed substation at Creag Dhubh and the existing Scottish Power Energy Networks (SPEN) 275 kV OHL from Dalmally to Inverarnan, near Glen Lochy, connecting via a Tie-In connection located between existing SPEN Towers YW17 and YW18(the 'Proposed Development'). The location of the Proposed Development is shown in **Figure 1.1: Location Plan and Overview (EIAR, Volume 3a).**

1.2 Requirement for the Report

1.2.1 Ramboll was commissioned by the Applicant to undertake peat depth and coring surveys to aid the design process and to inform an assessment of the nature and condition of the peatland for the Proposed Development.

1.2.2 This Technical Appendix has been produced in accordance with guidance published by Scottish Environmental Protection Agency (SEPA), NatureScot (formerly Scottish Natural Heritage), and the Scottish Government, which is referenced in the following sections.

1.2.3 This Technical Appendix is supported by the following:

- **Figure 10.2: Peat Depth Survey and Interpolated Peat Depths (EIAR Volume 3a**);
- **Figure 10.3: Surface Water Features** (**EIAR Volume 3a**);
- **Figure 10.4:Superficial Geology** (**EIAR Volume 3a**);
- **Figure 10.5: Bedrock Geology** (**EIAR Volume 3a**);
- **Figure 10.8: Soils Map of Scotland** (**EIAR Volume 3a**);
- **Annex 10.1.1: Peat Coring Data**; and
- **Annex 10.1.2: Core Sample Photographs**.

2 METHODOLOGY

2.1 Desk Study

2.1.1 A review desk top information was undertaken to understand the likely geology and ground conditions at the Proposed Development. This included a review of the following:

- online British Geological Survey (BGS) solid and superficial geological mapping[1];
- online NatureScot/Scottish Natural Heritage carbon and peatland map[2];
- habitat survey information from **Technical Appendix (TA) 6.1 (EIAR Volume 4)**; and
- hydrogeological and hydrology information from **Chapter 10 (EIAR Volume 2).**

2.2 Field Survey

2.2.1 Peat depth 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 minimise, as far as practicable, the potential direct and indirect effect on peat and carbon rich soils. Three rounds of peat survey were undertaken across the Proposed Development, based on the Proposed Development design. Surveys followed best practice guidance for developments on peatland[3,4] published at the time of the surveys.

2.2.2 The first survey was undertaken during March 2021 and included microsited peat depth probing at each tower location along the Proposed Development.

2.2.3 The second survey was undertaken in August 2021 and included:

- Towers: Peat probing was carried out at 10 m intervals along cardinal points for a total of 50 m from the centre of each tower location; and
- Access tracks: 50 m intervals along the track and at points every 10 m perpendicular to the centreline either side of the proposed access track.

2.2.4 Peat cores were taken using a Russian auger, with a sample volume of 0.5 l, and field tests and observations were undertaken to identify:

- Depth of acrotelm;
- Degree of humification (using Hodgson, 1974), to establish amorphous, intermediate, fibrous and content; and
- Degree of humification using the Von Post, (Hobbs, 1986) classification.

2.2.5 Samples were subsequently submitted to a soils testing laboratory to analyse each sample for Bulk Density, Loss on Ignition (Organic Content), Moisture Content, and pH.

2.2.6 A third survey was undertaken in November 2021 to provide additional peat probing where changes in the proposed design, specifically the proposed access tracks, had been undertaken.

[1] British Geological Survey Online Viewer (2021) https://mapapps.bgs.ac.uk/geologyofbritain/home.html [Accessed November 2021].
[2] Scottish Natural Heritage. (2016).Carbon and Peatland 2016 map (http://map.environment.gov.scot/soil_maps/) [Accessed November 2021].
[3] Scottish Government, Scottish Natural Heritage, SEPA. (2017). *Peatland Survey. Guidance on Developments on Peatland*, online version only.
[4] Scottish Renewables and SEPA (2012*). Development on Peatlands. Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste.*

Peat Probing

2.2.7 The Phase 1, Phase 2 survey are preliminary, low density survey and are carried out on a grid across the developable area (refer to **Figure 10.2, EIAR Volume 3a** showing grid form), with additional points taken as necessary. The probing was carried out using collapsible avalanche probes, allowing for probing greater than 6 m depth. This peat depth data along with other environmental and engineering constraints were used to inform the layout of the Proposed Development, including the towers and access tracks.

2.2.8 The survey points and field data were collected using a handheld Trimble GPS unit. Peat depth data was modelled using Inversive Distance Weighted (IDW) interpolation in GIS software, and a depth model generated using incremented peat depth categories.

2.2.9 The high-density probing during the Phase 3 survey was carried on the confirmed layout of the Proposed Development, known at the time of the survey. This included a 50 m micrositing zone where possible to allow for micrositing. Again, this was carried out using collapsible avalanche probes, allowing for probing greater than 6 m deep, and data collected using a handheld Trimble GPS unit.

2.2.10 Peat cores were taken using a Russian auger, with a sample volume of 0.5 l, and field tests and observations were undertaken. The probing results are included in **Annex 10.1.1**, and records taken include:

- depth of acrotelm;
- degree of humification (using Hodgson, 1974), to establish amorphous, intermediate, fibrous and content;
- degree of humification using the Von Post classification;
- fine fibre content, based on scale of F0 (none) to F3 (very high);
- coarse fibre content, based on scale of R0 (none) to R3 (very high);
- water content, based on scale of B1 (dry) to B5 (very wet); and
- substrate underlying the peat where this was possible.

2.2.11 A peat depth probe was taken adjacent to the core location, and cores were photographed (refer to **Annex 10.1.2**).

2.2.12 Samples of known volume were taken for laboratory analysis. During laboratory analysis, the samples were weighed, dried, and a subsample taken for loss on ignition testing. The total moisture content was determined from weight measurements. Peat pH was also determined.

2.3 Limitations and Assumptions

2.3.1 The design of the Proposed Development has considered the presence of peat, along with other technical and environmental constraints, and infrastructure has been sited away from these areas, where possible.

2.3.2 Peat probing and mapping has 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. The safety of the surveyors was considered, particularly in areas of dense and recently felled plantation, areas of deep peat etc. and some proposed peat probe points may not have been recorded.

2.3.3 The peat survey probing points provide high resolution coverage of the developable area of the Site, and these revealed the peatland to be typically shallow (less than 1.0 m) but with several 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.

2.3.4 It was not possible to characterise the underlying substrate by correlating the probed and cored depth, due to the density of the peat.

2.3.5 The Proposed Development has been located away from the deep peat locations where practicable. It has not been possible to site all the towers out of deep peat based on the other environmental and technical constraints.

3 RESULTS

3.1.1 Baseline data are required to inform an assessment of the effects the Proposed Development would have on peat and carbon rich soils. This report presents baseline data collected from a desk-based review and field survey results.

3.2 Desk Study

3.2.1 The 1:625,000 and 1:50,000 scale geological mapping available from the British Geological Survey (BGS) (**Figure 10.3 and Figure 10.4, EIAR Volume 3a**) shows the majority of the Site to be underlain by glacial deposits of hummocky till (Diamicton till), sands and gravels. Alluvial river terrace deposits are also shown to be present within river valley formations. Small areas of peat, or areas absent of superficial geology are also shown, although no peat is shown on the mapping within the areas crossed by the Proposed Development. Areas absent of superficial deposits could indicate areas where rockhead is shallow.

3.2.2 These are underlain by psammite, semipelite and pelites of the Argyll Group, interspersed with areas of unnamed igneous intrusions. The majority of the central and eastern areas of the Proposed Development site is shown to be underlain by the Ardrishaig Phyllite Formation of the Argyll Group, comprising metamorphic quartzite, metalimestone and phyllitic semipelite. Dalradian Supergroup, metagabbro and metamicrogabbro metamorphic rock are also noted to be present where igneous intrusions have occurred.

3.2.3 Overlying the Ardrishaig Formation to the south west of the Proposed Development site are metamorphic quartzite rocks from the Crinan Grit Formation. The southernmost part of the Proposed Development site is underlain by rocks belonging to the Argyll Group, Tayvallich Volcanic Formation, including metalava and metatuff.

3.2.4 A fault zone is shown to be present to the south west of Tower 21 trending northeast to southwest.

3.2.5 The Applicant and their engineer, Balfour Beatty, commissioned Card Geotechnics Limited (CGL) to undertake a geotechnical ground Investigation in 2018 to inform the ground conditions assessment. Whilst the tower locations have been refined since this time the factual report produced concluded that the BGS mapping was broadly consistent with the rock encountered during the investigation. Exceptions to this were that the Crinan formation was not encountered to the south of the Proposed Development site and microgabro from the Dalradian Supergroup was encountered at Towers T12 and T13.

3.2.6 NatureScot carbon rich soils, deep peat and priority habitat mapping shows the area between T33 and Glen Lochy (Succoth Glen) as predominantly 'Class 5' soils[5], particularly in areas covered by commercial plantation, which are defined as mineral or peat soils with no peatland vegetation. Large areas of 'Class 2'[6] and 'Class 3'[7]' soils are present in the open areas around Creag a'Mhaol-diridh which are not dominated by commercial plantation. Class 2[6] soils are of national importance and are defined as peat soils with high potential to be restored to peatland. Further areas of Class 2[6] and 3[7] soils extend across open areas to the south of Achlian and on open land to the south of Cladich. This is shown in **Figure 10.1.3**.

[5] 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'.

[6] 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'.

[7] Class 3 soils are described as indicative of 'Predominantly peaty soil with some peat soil' with indicative vegetation defined as 'peatland with some heath'. Class description is described as 'dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon rich soils, with some areas of deep peat'.

3.3 Field Survey

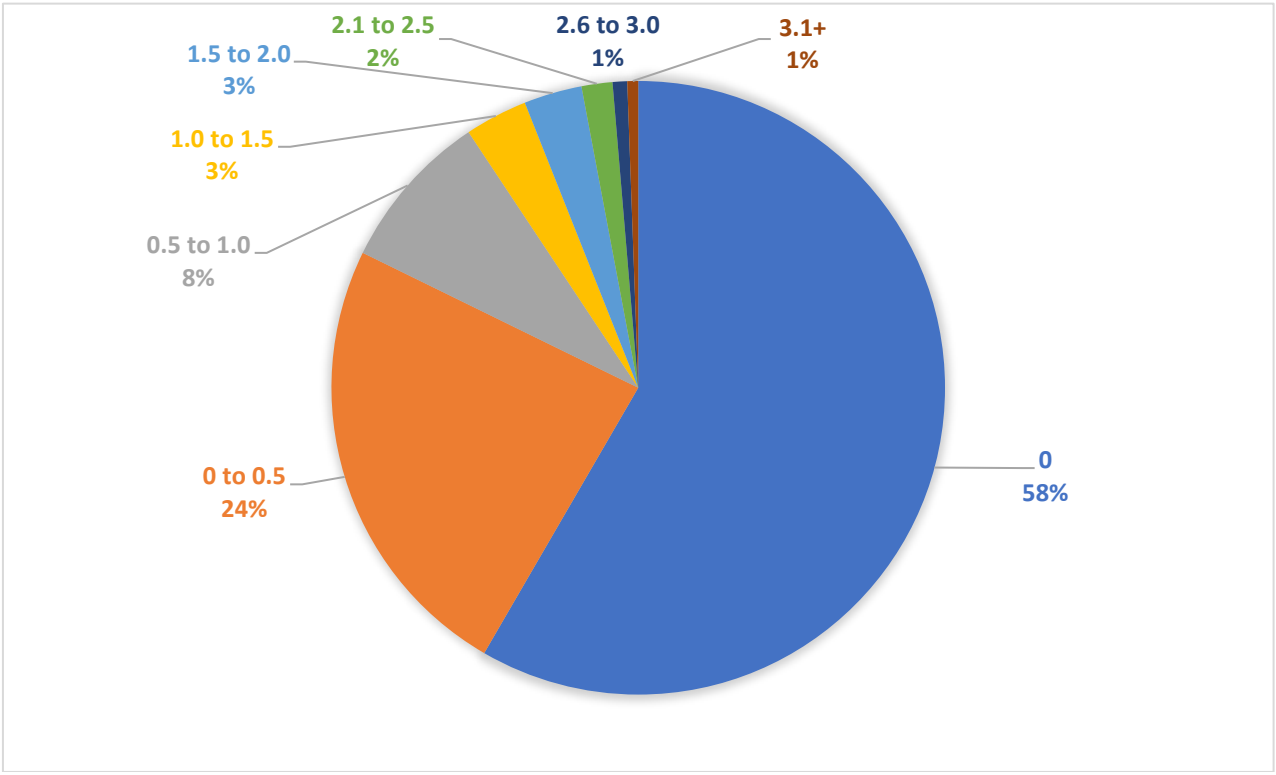
Peat Probing

3.3.1 During the peat depth probing surveys, a total of 2,090 peat depth probes were taken as shown in **Figure 10.1.1.**

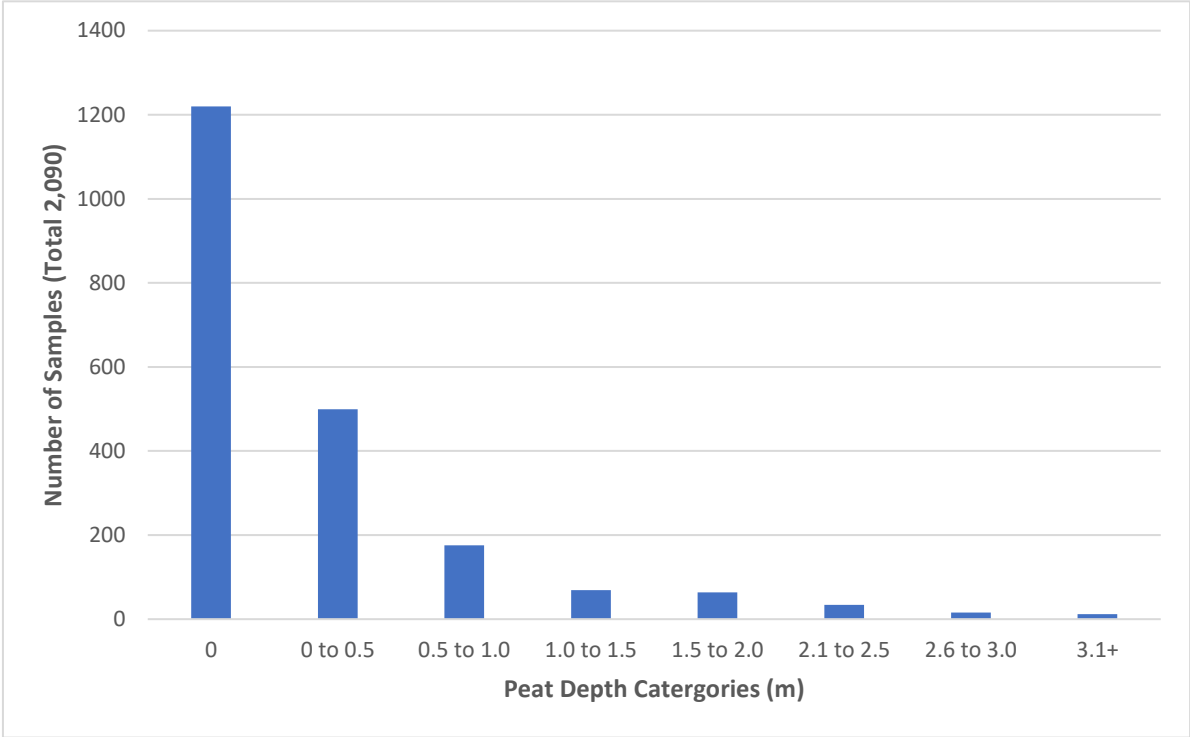
3.3.2 **Figure 10.2 (EIAR Volume 3a)** shows the results of the peat depth survey at the Site, as well as the specific depth class at each sample location. **Figure 10.2 (EIAR Volume 3a)** is based on IDW data interpolation and consequently the peat depth contours and boundaries are to a degree indicative.

3.3.3 Graph 10.1 and Graph 10.2 below present the percentage and frequency of peat probe results within the specific peat depth categories recorded during the peat depth probe surveys.

Graph 10.1: Percentage Peat Depth (m) Categories (All Surveys Combined)



Graph 10.2: Peat Depth Frequency Distribution



3.3.4 As shown on Graph 10.1 and Graph 10.2, most of the developable area of the Site has either no peat present or has a shallow depth of peat present (approximately 82 % of peat probes were <0.5 m in depth). These areas of shallow peat can be considered as organo-mineral soils. These are further summarised as follows:

- 1,220 no. samples (58 %) located on land with no peat/ absent;
- 499 no. samples (24 %) located on land with less than or equal to 50 cm depth of peat or organomineral soil;
- 176 no. samples (8 %) on land with between 51 cm and 100 cm depth of peat; and
- 195 no. samples (9 %) located on land with more than 100 cm depth of peat.

3.3.5 The peat thickness along the Proposed Development was found be mostly shallow (where present), with some deep pockets of peat near Tower 15 and between Towers 31A and 36A. The peat probe depth and interpolated contours are shown on **Figure 10.2 (EIAR Volume 3a).** The mean peat depth recorded was 0.8 m.

3.3.6 A summary of the areas of deep peat recorded (>0.5 m) thickness is presented in **Table 10.1.**

Table 10.1: Areas of Deep Peat

Tower/Infrastructure	Maximum Peat Depth (m)	Tower/Infrastructure	Maximum Peat Depth (m)
Tower 1	1.7	Tower 31	1.8
Tower 2A	2.5	Tower 32	1.8
Tower 3A	1.6	Tower 33	1.8
Tower 4A	2.7	Tower 34	3.3
Tower 5B	1.2	Tower 35	0.8

Table 10.1: Areas of Deep Peat

Tower/Infrastructure	Maximum Peat Depth (m)	Tower/Infrastructure	Maximum Peat Depth (m)
Tower 7	0.6	Permanent Track T1 to T2A	1.7
Tower 8	0.6	Temporary Track T2A to T3	2.0
Tower 13	0.8	Permanent Track T13 to T15	0.8
Tower 14	0.8	Permanent Track T15 to T16A	0.9
Tower 15	2.5	Permanent Track T19 to T20	2.7
Tower 16	0.8	Permanent Track T20 to T22A	0.9
Tower 19	1.8	Permanent Track T23 to T24	0.6
Tower 20	3.4	Permanent Track T24 to T25	1.3
Tower 21A	0.8	Temporary Track T26 to T27	0.6
Tower 22A	0.7	Temporary Track T30B to T31A	1.3
Tower T23	1.0	Permanent Track T31A to T32	2.8
Tower 24	0.6	Permanent Track T32A to T33A	1.8
Tower 25	1.8	Permanent Track to T33A	4.3
Tower 26	1.0	Temporary Track to T34A	3.3
Tower 28	1.3	Temporary Track to T37A	2.0
Tower 29	0.7	Temporary Track T37A to T39A	2.7
Tower 30B	1.3	Permanent Track to T40A	1.2

Core Sample Results

3.3.7 At each core sample location, a peat depth probe was taken adjacent to the core sample to compare the probed depth against cored depth, and the results are presented in **Table 10.2**.

Table 10.2: Comparison of Peat Probe and Coring Depth

Sample ID	Probed Depth (cm)	Cored Depth (cm)	Difference Probed to Cored (cm)
RAM-PC-01	210	50	160
RAM-PC-02	210	100	110
RAM-PC-03	210	150	60
RAM-PC-04	210	200	10
RAM-PC-05	270	50	220
RAM-PC-06	270	100	170
RAM-PC-07	270	150	120
RAM-PC-08	270	200	70
RAM-PC-09	80	50	30

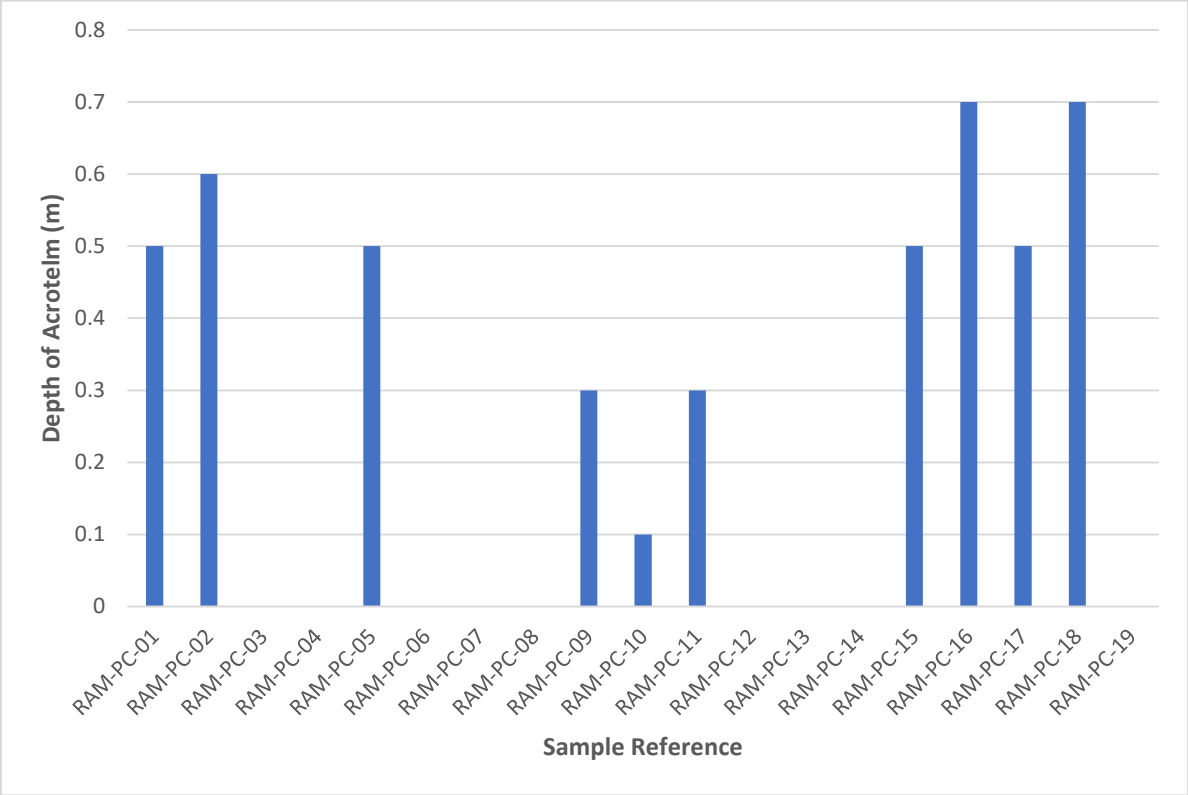
Table 10.2: Comparison of Peat Probe and Coring Depth			
RAM-PC-10	70	50	20
RAM-PC-11	270	50	220
RAM-PC-12	270	100	170
RAM-PC-13	270	150	120
RAM-PC-14	270	200	70
RAM-PC-15	120	50	70
RAM-PC-16	120	100	20
RAM-PC-17	170	50	120
RAM-PC-18	170	100	70
RAM-PC-19	170	150	20

3.3.8 The results indicate that the peat probing potentially overestimates the true peat depths, as coring indicates that there is a potential mean overestimation of 97 cm. This is due to the density of peat and underlying substrate and the diameters of the peat probe and Russian auger, whereby the probe is narrower and is easier to penetrate deeper into the peat layers.

Depth of Acrotelm

3.3.9 **Graph 10.3** shows that acrotelm was recorded in just over half of the sample locations, with a mean depth of 0.25 m. The other sample locations indicated no discernible acrotelm. It is recommended that for the purposes of construction and subsequent reinstatement, that where a sufficient peat depth exists, the top 50 cm of material should be treated as acrotelm. This approach will allow excavation of intact turves for reinstatement purposes where they are present, which will in turn facilitate quicker regeneration of disturbed areas. Even if little vegetation is present within this top layer, it should still be treated as acrotelmic material as it may contain a seedbank, particularly in open habitats, which will aid re-vegetation of reinstatement areas.

Graph 10.3: Depth of Acrotelm

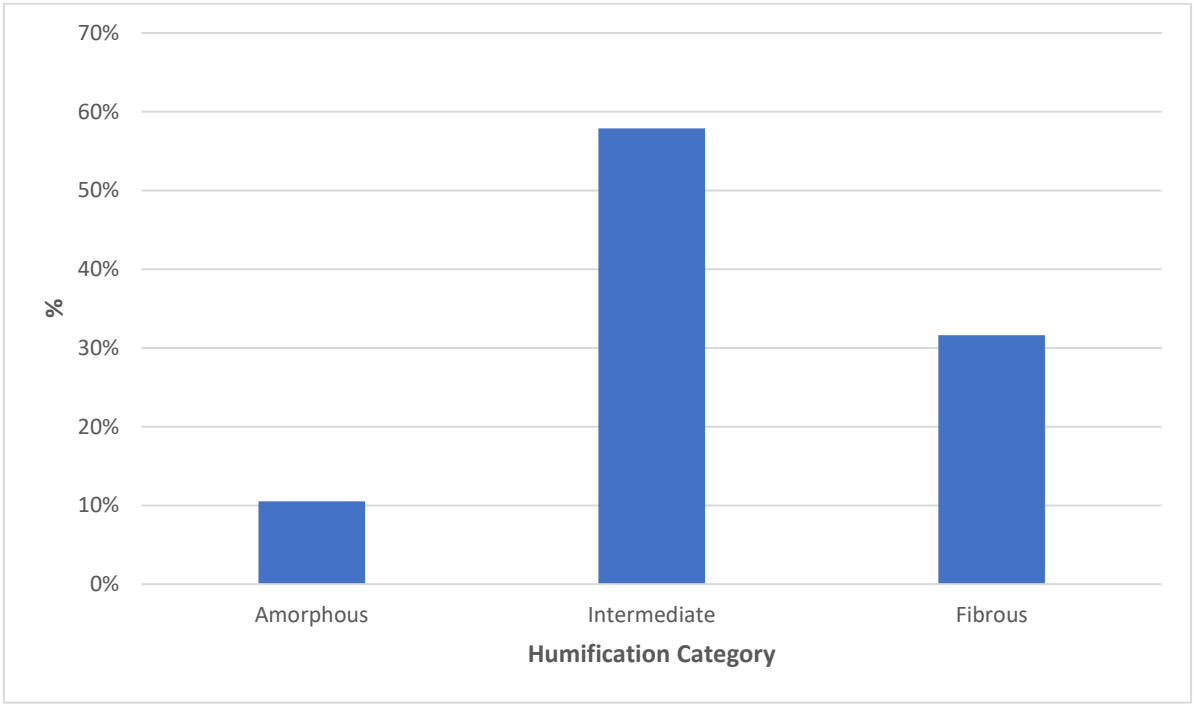


Degree of Humification

3.3.10 The degree of humification was recorded in the field with each 0.5 m sub-sample being categorised as either fibrous, intermediate, or amorphous peat (see Section 2: Methodology).

3.3.11 **Graph 10.4** summarises the degree of humification, which indicates that most of the samples are classed as intermediate. This is suggestive that there is a degree of humification present.

Graph 10.4: Degree of Humification

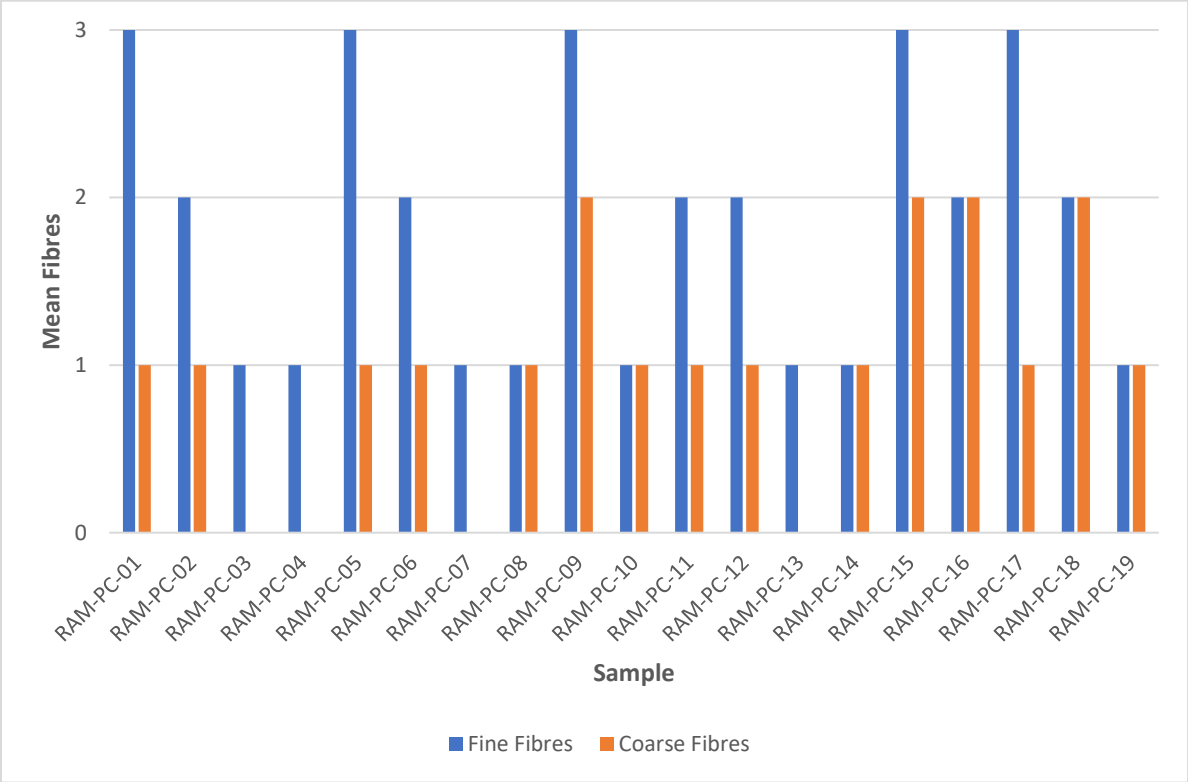


Fibrous Content

3.3.12 The fibrous content was recorded in the field, in accordance with the methods discussed in the methodology section, with each 0.5 m sub-sample categorised for coarse and fine fibre content. The proportions of course and fine fibres within the peat samples were derived in the field according to the Hobbs scale, where F0/R0 indicate no fine/coarse fibre content to F3/R3 which is indicative of high fine/coarse fibre content respectively. The results indicate that the fine fibre contents are spread between low (F1) (eight samples) and high (F3) (five samples) (with six samples containing moderate fine fibres (F2).

3.3.13 The majority of the sample locations were assessed as having a low coarse fibre content (R1), with four locations having a moderate coarse fibre content (R2). These results are summarised in **Graph 10.5.**

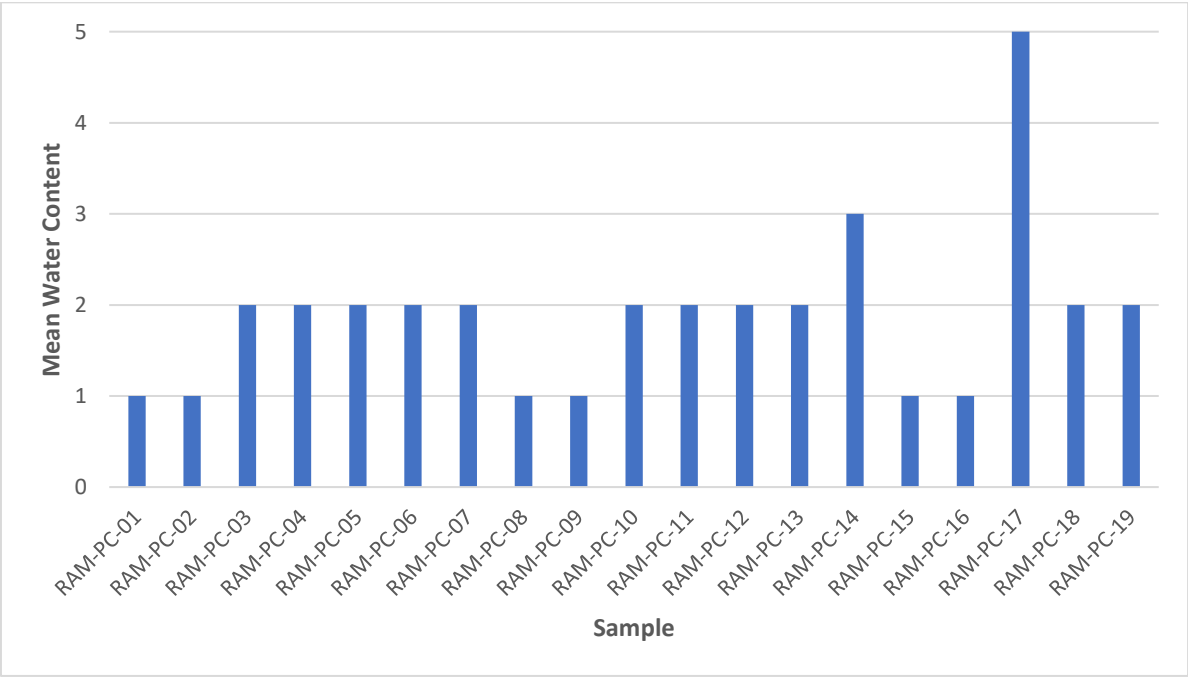
Graph 10.5: Fibrous Content



Water Content

3.3.14 The water content of the samples was determined in the field using the Hobbs scale, where B1 is dry and B5 is very wet. The results are summarised in **Graph 10.6**.

Graph 10.6: Water Content



3.3.15 The results indicate that most of the of the samples recorded are indicative of dry peat (B1) or semi-dry peat (B2). One sample was recorded as very wet (B5).

Von Post (Degree of Humification)

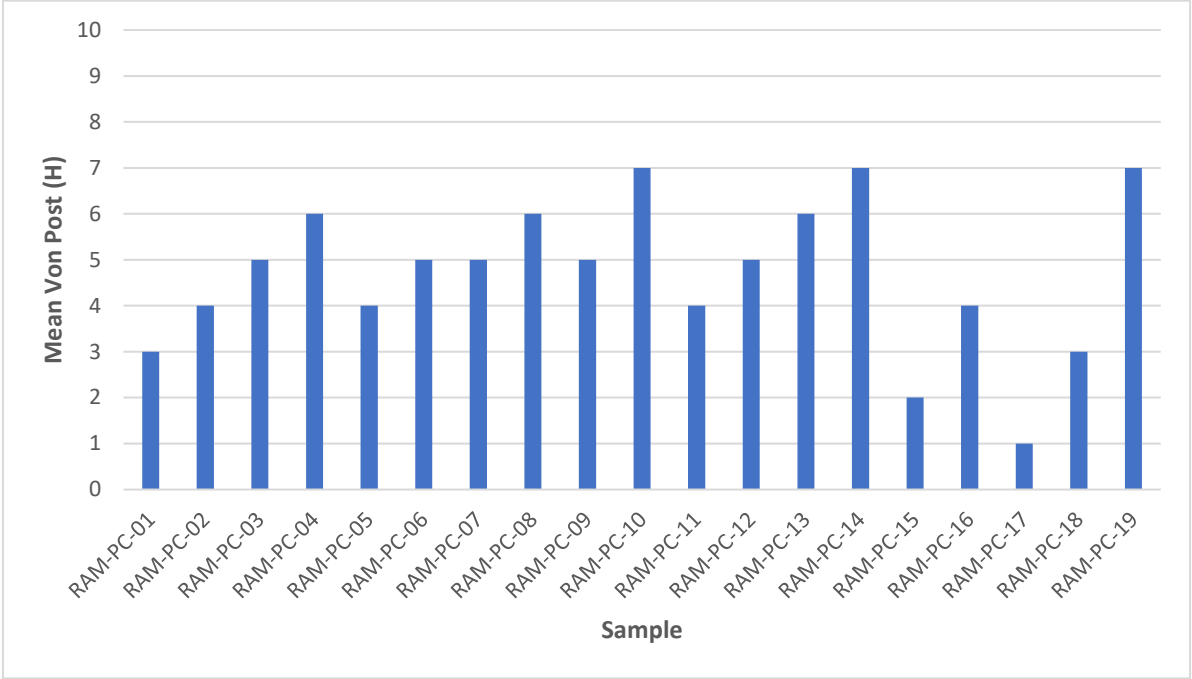
3.3.16 An estimate of the degree of humification according to the Von Post scale was carried out on samples at all core locations. This was undertaken using the criteria as shown in Table 10.3 below:

Table 10.3: Degree of Humification using Von Post

Von Post Score	Squeezed Liquid Appearance	Extruded Peat	Plant Residue	Humification Description
H1	Clear, colourless	None	Plant structure unaltered. Fibrous, elastic	Undecomposed
H2	Almost clear, yellow-brown	None	Plant structure distinct, almost unaltered	Almost undecomposed
H3	Slightly turbid, brown	None	Plant structure distinct, most remains easily identifiable	Very weakly decomposed
H4	Strongly turbid, brown	None	Plant structure distinct, most remains identifiable	Weakly decomposed
H5	Strongly turbid, contains a little peat in suspension	Very little	Plant structure clear but indistinct and difficult to identify	Moderately decomposed
H6	Muddy, much peat in suspension	One third	Plant structure indistinct but clearer in residue, most remains undefinable	Well decomposed
H7	Strongly muddy	One half	Plant structure indistinct	Strongly decomposed
H8	Thick mud, little free water	Two thirds	Plant structure very indistinct – only resistant material such as roots	Very strongly decomposed
H9	No free water	Nearly all	Plant structure almost unrecognisable	Almost completely decomposed
H10	No free water	All	Plant structure not recognisable, amorphous	Completely decomposed

3.3.17 The results are shown in **Graph 10.7** below, where the vertical axis refers to the Von Post scale of peat decomposition (on a scale of H1 to H10).

Graph 10.7: Mean Von Post



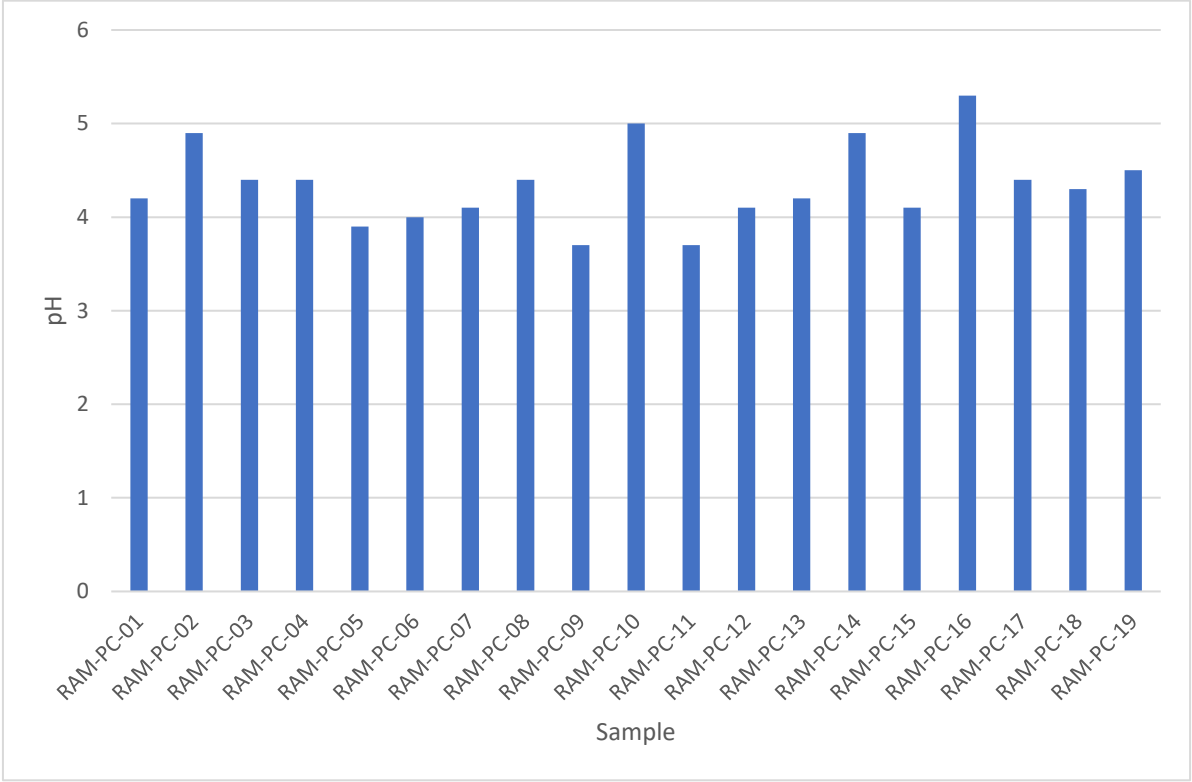
3.3.18 The results indicate that nearly all the samples were found to be scored relatively high on the Von Post scale (>H4) indicating a degree of decomposition. Seven of the samples were found to be >H5, indicating moderate decomposition with strong decomposition found in three of the samples.

3.3.19 This is reflective of intensively managed areas of the Site with significant areas of commercial forestry plantation and felling, and 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.

pH of Samples

3.3.20 The pH values of the core samples were analysed in a laboratory, and the results provided in **Graph 10.8** below.

Graph 10.8: Mean pH

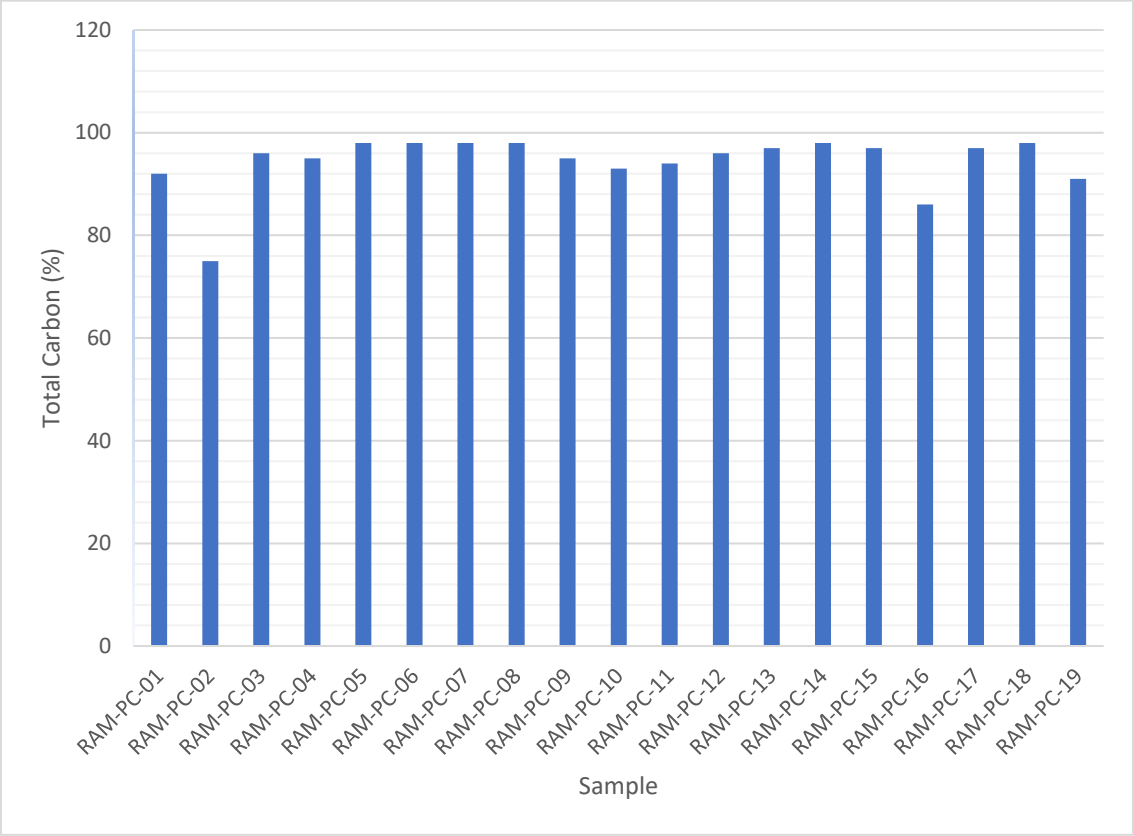


3.3.21 The mean pH value was 4.4, with a range between 3.7 and 5.3, which indicates that all samples are acidic in nature. This result is typical of peat and carbon rich soils.

Total Carbon (%)

3.3.22 The total carbon context was derived by laboratory analysis for each sample and is summarised in **Graph 10.9**. The results indicate a consistent high carbon content with a mean of 94 %.

Graph 10.9: Total Carbon (%)



Underlying Substrates

3.3.23 At each location, where possible, a broad characterisation was made of the underlying substrate below the peat horizon. It was not possible to characterise the underlying substrate by correlating the probed and cored depth, due to the density of the peat.

4 SUMMARY

4.1.1 The results of the peat surveys for the Proposed Development are summarised as follows:

- Overall, the peat depth is relatively shallow (<0.5 m) with several deeper pockets of peat present (>1.0 m). These were generally noted in vicinity of Tower 15 and between Towers 31A and 36A, where peat depths were up to 4.3 m thickness. The mean peat depth was 0.8 m across the proposed development site. peat depths are shown on **Figure 10.2, EIAR Volume 3a**;
- The Proposed Development has been located away from the deep peat locations where practicable. It has not been possible to site all the towers out of deep peat based on the other environmental and technical constraints. It is proposed that towers located in deep peat would be constructed using piled foundations where practicable to minimise peat excavated;
- Some permanent and temporary access tracks are located over deep peat. Micrositing has been used to minimise the volume of peat to be excavated/disturbed but some of these tracks can be 'floated' to minimise the volume of peat disturbed;
- The depth of the acrotelm from the sample locations is 25 cm, although it has been assumed for the purpose of assessment that the depth of acrotelm is 50 cm;
- The peat across the Proposed Development Site is generally intermediate in nature, with the samples assessed as having low to high fine fibre content (F1 to F3). The majority of the sample locations were assessed as having a low coarse fibre content (R1), with four locations having a moderate coarse fibre content (R2);
- The results of the Von Post indicate that the majority of the samples tested scored relatively high on the Von Post scale (H4+) indicating moderate decomposition, with several samples showing strong decomposition. 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;
- The mean water content of the peat at all sample locations was dry and semi-dry, 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;
- The peat was found to be acidic with a mean pH value of 4.6, and a range between 3.7 and 5.3, indicative of peat and carbon rich soils; and
- Laboratory analysis of samples indicates that the peat has a high total carbon content.

Annex 10.1.1 – PEAT CORING DATA

Sample ID	RAM-PC-01	RAM-PC-02	RAM-PC-03	RAM-PC-04	RAM-PC-05	RAM-PC-06	RAM-PC-07	RAM-PC-08	RAM-PC-09	RAM-PC-10	RAM-PC-11	RAM-PC-12	RAM-PC-13	RAM-PC-14	RAM-PC-15	RAM-PC-16	RAM-PC-17	RAM-PC-18	RAM-PC-19
Infrastructure	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower	Tower
Planted/ Unplanted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted	Planted
Probed Depth	2.1	2.1	2.1	2.1	2.7	2.7	2.7	2.7	0.8	0.7	2.7	2.7	2.7	2.7	1.2	1.2	1.7	1.7	1.7
Cored Depth	0.5	1.0	1.5	2.0	0.5	1.0	1.5	2.0	0.5	0.5	0.5	1.0	1.5	2.0	0.5	1.0	0.5	1.0	1.5
Depth of Acrotelm	0.5	0.6	0.0	0.0	0.5	0.0	0.0	0.0	0.3	0.1	0.3	0.0	0.0	0.0	0.5	0.7	0.5	0.7	0.0
Colour	Light Brown	Light Brown	Mid Brown	Black Brown	Dark Brown	Mid Brown	Light Brown	Black Brown	Dark Brown	Black Brown	Dark Brown	Mid Brown	Dark Brown	Mid Brown	Yellow Brown	Yellow Brown	Yellow Brown	Mid Brown	Dark Brown
Depth of Sub Sample	0.5	1.0	1.5	2.0	0.5	1.0	1.5	2.0	0.5	0.5	0.5	1.0	1.5	2.0	0.5	1.0	0.5	1.0	1.5
Amorphous (0=No/1=Yes)	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1
Fibrous (0=No/1=Yes)	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0
Intermediate (0=No/1=Yes)	0	1	1	1	0	1	1	1	0	0	0	1	1	0	0	1	0	1	1

Sample ID	RAM-PC-01	RAM-PC-02	RAM-PC-03	RAM-PC-04	RAM-PC-05	RAM-PC-06	RAM-PC-07	RAM-PC-08	RAM-PC-09	RAM-PC-10	RAM-PC-11	RAM-PC-12	RAM-PC-13	RAM-PC-14	RAM-PC-15	RAM-PC-16	RAM-PC-17	RAM-PC-18	RAM-PC-19
Fine Fibres (F)	3	2	1	1	3	2	1	1	3	1	2	2	1	1	3	2	3	2	1
Coarse Fibres (R)	1	1	0	0	1	1	0	1	2	1	1	1	0	1	2	2	1	2	1
Water Content (B)	1	1	2	2	2	2	2	1	1	2	2	2	2	3	1	1	5	2	2
Von Post Scale (H)	3	4	5	6	4	5	5	6	5	7	4	5	6	7	2	4	1	3	7
% Moisture	76	89	90	91	88	92	90	90	80	87	90	91	92	93	86	85	90	89	88
pH	4.2	4.9	4.4	4.4	3.9	4.0	4.1	4.4	3.7	5.0	3.7	4.1	4.2	4.9	4.1	5.3	4.4	4.3	4.5
Total Carbon (%)	92	75	96	95	98	98	98	98	95	93	94	96	97	98	97	86	97	98	91
Substrate																			

ANNEX 10.1.2 – CORE SAMPLE PHOTOGRAPHS

RAM-PC-01 0.0-0.5m

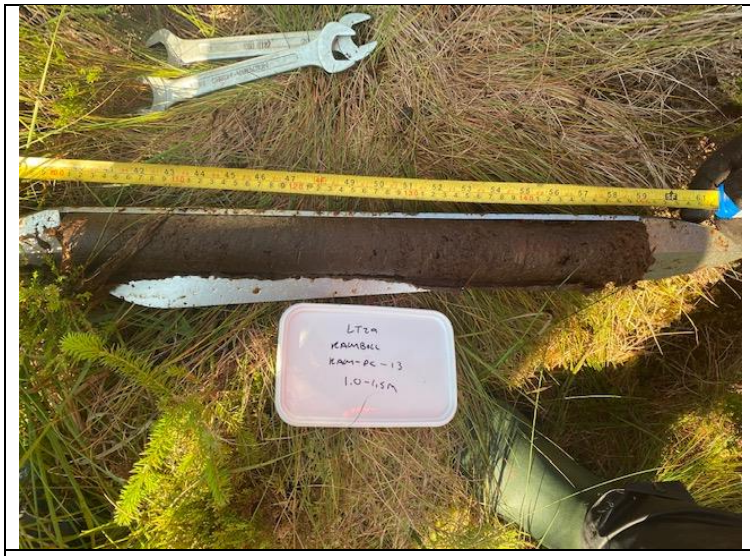
RAM-PC-02 0.5-1.0m

RAM-PC-03 1.0-1.5m	RAM-PC-04 1.5-2.0m
	
RAM-PC-05 0.0-0.5m	**RAM-PC-06 0.5-1.0m**

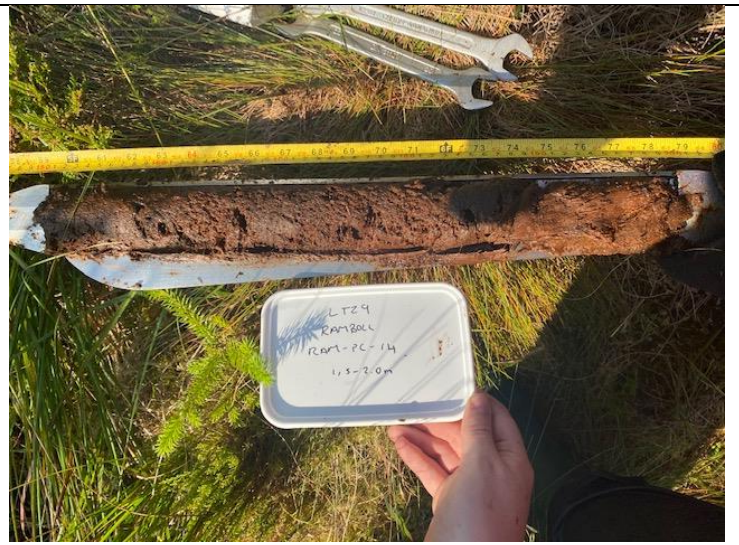
RAM-PC-07 1.0-1.5m

RAM-PC-08 1.5-2.0m

RAM-PC-09 0.0-0.5m	RAM-PC-10 0.0-0.5m
	
RAM-PC-11 0.0-0.5m	**RAM-PC-12 0.5-1.0m**



RAM-PC-13 1.0-1.5m



RAM-PC-14 1.5-2.0m

RAM-PC-15 0.0-0.5m	RAM-PC-16 0.5-1.0m
	
RAM-PC-17 0.0-0.5m	**RAM-PC-18 0.5-1.0m**

	
RAM-PC-19 1.0-1.5m	