

Volume 5: Appendix 13.3 – Peat Depth Survey Report

CONTENTS

LIST OF ABBREVIATIONS	3
1 INTRODUCTION	4
1.1 The Proposals	4
1.2 Requirement for the Report	4
2 METHODOLOGY	5
2.1 Desk-based Initial Assessment	5
2.2 Survey Methodology	5
3 SURVEY RESULTS	7
3.1 Probe Depths	7
3.2 Peatland Condition	9
3.3 Peat Cores	11
4 SUMMARY	14

LIST OF ABBREVIATIONS

EIAR – Environmental Impact Assessment Report

JNCC – Joint Nature Conservation Committee

LUC – Land Use Consultants Ltd.

OHL – Overhead Line

SEPA – Scottish Environment Protection Agency

SNH – Scottish Natural Heritage

1 INTRODUCTION

1.1 The Proposals

1.1.1 This appendix presents information relevant to the Kintore to Tealing 400 kV Overhead Line (OHL) Connection (the Proposed Development). It should be read in conjunction with **Volume 2, Chapter 13: Hydrology, Hydrogeology, Geology and Soils**, **Volume 5, Appendix 13.4: Outline Peat Management Plan** and **Volume 1, Chapter 3: Project Description** of the EIAR.

1.1.2 This appendix is supported by the following figures (**Volume 3** of the EIAR), which also support the main EIAR chapter:

- **Figures 13.7.1 to 13.7.7: Carbon and Peatland Classification (NatureScot, 2016)**; and
- **Figures 13.8.1 to 13.8.26: Probe Depths**.

1.2 Requirement for the Report

1.2.1 The purpose of the peat survey was to establish an understanding of the extent of peat and peat depths along the Proposed Development and to optimise early design and layout to minimise both the extent of disruption to peat and the quantity of peat excavated. This report covers the methodology and output of the peat survey undertaken at the Site.

1.2.2 During the early corridor, routing and alignment stages of the project, areas of peat and peatland were avoided where practicable. However, due to other constraints some areas of peat could not be fully avoided for the Proposed Development.

1.2.3 The peat survey area was defined based on identifying areas where the NatureScot (2016) Carbon and Peatland Map¹ indicated that peat classes are present. Areas within Sections A, B, D, E and F of the Proposed Development were classed as having areas which could contain peat or peat soils (see **Volume 3, Figures 13.7.1 – 13.7.7: Carbon and Peatland Classification (NatureScot, 2016)**).

1.2.4 The Proposed Development comprises approximately 105.2 km of new 400 kV OHL between the existing Substation at Kintore (northwest of Aberdeen) and a proposed new 400 kV substation proposed near Tealing in Angus, just north of Dundee (called Emmock). The OHL will also connect to a proposed new proposed 400 kV substation, known as Hurlie substation, in Fetteresso Forest near Stonehaven in Aberdeenshire. The peat survey covers approximately 11.5 km of the Proposed Development, in areas where the desk-based review indicates peat may be present.

¹ NatureScot, 2016. Carbon and Peatland Map, Accessed 9 January 2025. [Online] Available at: <https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/soils/carbon-and-peatland-2016-map>.

2 METHODOLOGY

2.1 Desk-based Initial Assessment

- 2.1.1 The Carbon and Peatland Map (NatureScot, 2016) was consulted early in the project and areas of peat were avoided in the early phases of routeing and alignment design where practicable. All Class 1, 2 and 3 peat was able to be avoided during early design.
- 2.1.2 The map contains information on the likely peatland classes present within the survey area. The Carbon and Peatland map was developed to be used as “*a high-level planning tool to promote consistency and clarity in the preparation of spatial frameworks by planning authorities*”.
- 2.1.3 The Carbon and Peatland map shows that the majority of the Proposed Development is comprised of mineral soils, however there are five areas that comprise Class 4 and Class 5 peat. These are in Sections A, B, D, E and F of the Proposed Development, as shown in **Volume 3, Figures 13.7.1 – 13.7.7: Carbon and Peatland Classification (NatureScot, 2016)**; Class 4 and 5 descriptions are below:
- Class 4 - Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils. Predominantly mineral soil with some peat soil. Indicative vegetation is heath with some peatland.
 - Class 5 - 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. Peat soil, with no peatland vegetation.
- 2.1.4 The results of the desk-based assessment indicated that peat was likely to be present within the boundaries of the Proposed Development, within Sections A and B, near Douglstown, Sections D and E, near Fetteresso Forest, and Section F at the northern section of Proposed Development near Kintore. These areas comprise the peat survey area, which is shown in **Volume 3, Figures 13.7.1 – 13.7.7: Carbon and peatland classification (NatureScot, 2016)**; and the results are described herein.

2.2 Survey Methodology

- 2.2.1 The survey methodology follows current guidance for peatland survey in Scotland². Consultation with Scottish Environment Protection Agency (SEPA) was undertaken throughout the EIA phase regarding the peat survey requirements. Due to the length of the Proposed Development, the peat survey was undertaken on several dates as shown in **Table 13.1.1: Peat survey dates**.

Table 13.1.1: Peat survey dates

Date	Section of Route	Weather Conditions
21 February 2024	Section E – Fetteresso Forest	Overcast and dry
18 March 2024	Section A and B	Dry and warm
3 – 4 April 2024	Section A, B, E and F	Wet with heavy rainfall
5 June 2024	Section F	Sunny and warm
16 - 17 July 2024	Section E – Durriss Forest	Overcast with showers
9 - 11 December 2024	Section E – Durriss Forest	Sunny and cold
7 – 8 January 2025	Section E – Fetteresso and Durriss Forest	Cold and heavy snow showers. Cores were collected but peat depth surveys were aborted due to lying snow. The ground conditions at the time of the survey will not affect the results of the cores.
3 – 5 February 2025	Section E – Fetteresso and Durriss Forest	Cold and mainly dry. No snow lying.

- 2.2.2 The following methods were employed for the peat survey:

² Scottish Government, Scottish Natural Heritage, SEPA, 2017. *Peatland Survey. Guidance on Developments on Peatland*. [Online] Available at: <https://www.gov.scot/publications/peatland-survey-guidance/>.

- Low resolution (Phase 1) survey – The peat survey areas were probed at a 100 m spacing along the OHL centreline, with a 50 m and 100 m buffer. A 100 m grid spaced Phase 1 survey was also carried out in Fetteresso Forest, which covers part of the Proposed Development.
- High resolution (Phase 2) survey - Where the Phase 1 probing identified peat depths exceeding 50 cm, the tower locations were probed at a higher resolution on a 10 x 10 m grid (ie the Phase 2 survey). In some locations, detailed Phase 2 peat probing was carried out around proposed towers and wider Phase 1 peat probing was not carried out (due to the length of the Proposed Development). This was accepted by SEPA during consultation³, however SEPA noted that probing should be undertaken within the likely microsites limit of any consent, (ie 50 m buffer). A 100 x 100 m area was probed around each proposed tower to cover any microsites. A peat core was taken at each tower location within the peat survey area, where peat was present.
- Proposed tracks (in areas where peat was found to be present) were probed along the track centreline every 50 m with 10 m offsets on either side.
- The peat survey was carried out using an extendable fibreglass utility probe capable of sampling up to 5 m depth. Probe depths over 5 m were recorded as 5 m.
- The peatland condition was assessed at each probing location. The peatland condition categories were based on those used in the NatureScot (2016) *Peatland Condition Survey*⁴ guidance. The peatland condition categories are:
 - Actively eroding
 - Drained
 - Forested / previously forested
 - Modified
 - Near natural
 - Not peatland

2.2.3 The field survey was undertaken by a team with the appropriate experience of assessing hydrology, hydrogeology, geology, soil, and peat.

2.2.4 A total of 2,826 probes were collected across the survey period within the peat survey areas by Kaya Consulting. An additional 192 probe depths were provided by SSEN Transmission covering the area under the existing OHL in Durris Forest, which were collected by ITP Energised in October 2022 for the East Coast OHL upgrade. This provides additional survey data under existing infrastructure and was merged with the survey dataset. It is noted that these 192 probes do not have any peatland condition data.

³ Meeting with SEPA on 8 August 2024.

⁴ NatureScot, 2016. *Peatland Condition Survey guidance*. [Online] Available at: <https://www.nature.scot/doc/peatland-action-peat-depth-and-peat-condition-survey-guidance-and-recording-form-guidance>.

3 SURVEY RESULTS

3.1 Probe Depths

- 3.1.1 The Scottish Government guidance document on peat landslide hazard and risk assessment (Scottish Government, 2017)⁵ defines peat as a soil greater than 50 cm in depth, with an organic matter content of more than 60%. Soils of less than 50 cm depth are classified as organo-mineral soils, with soils less than 30 cm not classified as peat. This is further evidenced by Joint Nature Conservation Committee (JNCC) (2011)⁶, Scottish Natural Heritage (SNH) (*Bruneau, et al, 2014*)⁷ and the James Hutton Institute (2019)⁸. Recent guidance from NatureScot (2023)⁹ defines carbon-rich soils as peat soils and peaty soils. Peat soils in Scotland are defined as soil with a surface peat layer with more than 60% organic matter and of at least 50 cm thickness. Peaty soils can have a shallower peat layer (<50 cm) at the surface (NatureScot, 2023). **Table 13.1.2: Peat survey statistics** shows that the majority of probe depths (73.5%) are in the range 0 – 30 cm and are not peat.

Table 13.1.2: Peat survey statistics

Probe depth range (cm)	Number of Probes	Percentage of total probes
<= 30	2219	73.5%
> 30 - 50	530	17.6%
> 50 - 100	112	3.7%
> 100 - 200	104	3.4%
> 200 - 300	44	1.5%
> 300 - 400	9	0.3%
Total	3,018	100%

- 3.1.2 **Volume 3, Figures 13.8.1 – 13.8.26: Probe Depths** shows the spatial distribution of the peat along the Proposed Development. The deepest peat is within Section E (Slug Road to Meikledams) at Durriss Forest, where depths of up to 400 cm were found (see **Volume 3, Figures 13.8.1 – 13.8.26: Probe Depths**). The deepest peat surveyed is largely concentrated within Section E, with the remainder of the Proposed Development is mostly constrained to depths shallower than 50 cm. Micrositing of tower locations and tower working areas has been undertaken to avoid the deeper areas of peat where possible.
- 3.1.3 A summary of the extent of peat and probes depths for each section of the OHL is provided in **Table 13.1.3: Summary of peat survey results**.

⁵ Scottish Government, 2017. *Peat Landslide Hazard and Risk Assessments Best Practice Guide for Proposed Electricity Generation Developments*. Scottish Government. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2017/04/peat-landslide-hazard-risk-assessments-best-practice-guide-proposed-electricity/documents/00517176-pdf/00517176-pdf/govscot%3Adocument/00517176.pdf%20Joint%20Nature%20Conservation%20Committee,%202011.%20Towards%20an%20assessment%20of%20the%20state%20of%20UK%20Peatlands,%20JNCC%20report%20No.>

⁶ Joint Nature Conservation Committee, 2011. *Towards an assessment of the state of UK Peatlands, JNCC report No. 445*. Available at: <https://data.jncc.gov.uk/data/f944af76-ec1b-4c7f-9f62-e47f68cb1050/JNCC-Report-445-FINAL-WEB.pdf>

⁷ Bruneau, P.M.C & Johnson, S.M., 2014. *Scotland's peatland - definitions & information resources*. Scottish Natural Heritage Commissioned Report No 701. Available at: <https://www.nature.scot/sites/default/files/2025-06/naturescot-commissioned-report-701.pdf>

⁸ James Hutton Institute (JHI), 2019. *Organic Soils*. [Online] Available at: <https://www.hutton.ac.uk/learning/exploringscotland/soils/organicsoils>.

⁹ NatureScot, 2023. *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*. [Online] Available at: <https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management>.

Table 13.1.3: Summary of peat survey results

Section	Carbon and Peatland Class	Peat survey area (tower numbers)	Summary of probe penetration depth	Comment
Section A				
Tealing to Upper Hayston	Mineral Soil	N/A	N/A	No peat identified
Upper Hayston to Nether Drumgley	Class 4 and 5	S167 – S164	0 – 50 cm	Shallow mineral soils found at each tower location. Classified as non-peatland
Section B				
Nether Drumgley to Woodside	Class 4	S163 – S161	0 – 50 cm	Shallow mineral soil found at each tower location. Classified as non-peatland
Woodside to Hoodston	Mineral Soil	N/A	N/A	No peat identified
Section C				
Hoodston to Haughhead	Mineral Soil	N/A	N/A	No peat identified
Section D				
Haughhead to Tannachie	Mineral Soil	N/A	N/A	No peat identified
Tannachie to Hurlie	Class 4	S4 – S2	0 – 50 cm	Shallow mineral soil found at each tower location. Classified as non-peatland
Section E				
Hurlie to Slug Road	Class 4 and 5	S1, N96 – N91, N86	0 – 50 cm	Shallow mineral soil found at each tower location. Classified as non-peatland
Slug Road to Meikledams	Class 4 and 5	N85 – N80 N79 – N77 N76 – N72	0 – 100 cm 0 – 400 cm 0 – 50 cm	Peat depths up to 345 cm found within Durris Forest. A 400 cm depth was recorded just north of tower N78. Some areas of shallower depths, sometimes greater than 50 cm, found elsewhere in the section. Micrositing has been undertaken based on the peat surveys and the working area modified to minimise excavation as much as practicable based on other constraints. Peatland condition was classified as forested/previously forested at all probe locations within Durris Forest.
Meikledams to West Park	Mineral Soil	N/A	N/A	No peat identified
Section F				
West Park to Newhall	Mineral Soil	N/A	N/A	No peat identified

Section	Carbon and Peatland Class	Peat survey area (tower numbers)	Summary of probe penetration depth	Comment
Newhall to West Cullery	Class 5	N45	All depths at tower N45 are 0 – 50 cm Small number of > 50 cm probes further north at former tower position.	Shallow area of peaty soils associated with Gormack Burn boggy area. Peatland condition was classified as either modified or non-peatland. Micrositing has been undertaken and working area modified to avoid excavation of peat soils. The tower and working area are not in peat soils.
West Cullery to Kinnernie Burn	Mineral Soil	N/A	N/A	No peat identified
Kinnernie Burn to Kintore	Class 5	N14 – N11	0 – 50 cm	Shallow mineral soils found at each tower location. Classified as non-peatland

3.2 Peatland Condition

3.2.1 **Table 13.1.4: Peatland condition assessment based on the peat survey** shows the results of the peatland condition assessment obtained during the peat survey.

3.2.2 The majority of the peat survey area is split between three categories, with 11.3% of the assessed locations classified as ‘Modified’ peatland, 37.3% classified as ‘Forested / previously forested’ (see **Photo 13.1.1: Forested / previously forested area within Fetteresso Forest (Section E)**) and 51.4% classified as ‘Not peatland’ (see **Photo 13.1.2: Agricultural fields in Section B**).

3.2.3 The surveyed area is split between areas of grassland being used for agricultural purposes and areas of commercial forestry, much of which is previously forested having been felled. Small areas of modified peatland were found among saturated boggy areas.

Table 13.1.4: Peatland condition assessment based on the peat survey

Peatland Condition	Number of probes	Percentage of total probes
Actively eroding	0	0.0
Drained	0	0.0
Forested / previously forested	1,053	37.3
Modified	320	11.3
Near natural	0	0.0
Not peatland	1,453	51.4
Total	2,826	100%

Photo 13.1.1: Forested / previously forested area within Fetteresso Forest (Section E)



Photo 13.1.2: Agricultural fields in Section B



3.3 Peat Cores

- 3.3.1 Where peat was identified on the NatureScot (2016) Carbon and Peatland map, cores were taken at tower locations to provide an assessment of peat condition and peat soils. **Table 13.1.5: Peat core survey results** show the results of the peat core survey and the locations of the cores are shown in **Volume 3, Figures 13.7.1 – 13.7.7: Carbon and peatland classification (NatureScot, 2016)**. **Photos 13.1.3 – 13.1.5** display examples of cores taken as part of the peat survey.

Table 13.1.5: Peat core survey results

Core ID	Nearest Tower ID	Section	Core depth - cm	Acrotelm depth - cm	Catotelm depth - cm	Substrate	Notes
1	S170	A	30	N/A	N/A	Clay	No peat
2	S169	A	30	N/A	N/A	Clay	No peat
3	S168	B	15	N/A	N/A	Clay	No peat
4	S167	B	30	N/A	N/A	Clay	No peat
5	S4	D	10	N/A	N/A	Stoney mineral soil	Thin organic rich layer on mineral soil - no peat
6	N93	E	10	10	N/A	Gravel	Thin layer of ploughed peaty soil on gravel
7	N92	E	15	15	N/A	Stoney clay	N/A
8	N91	E	5	5	N/A	Stoney clay	Very thin organic layer on stoney clay
9	N79	E	50	50	N/A	Clay	Soil mixed and disrupted by forestry operations
10	N78	E	50	N/A	50	Peat	Soil very wet and full core not extracted
11	N77	E	100	N/A	100	Peat	Soil very wet and full core not extracted
12A	N45	F	30	0	30	Gravel	Churned soil
12B	N45	F	30	30	N/A	Clay	Crumbly peat soil
13	N14	F	10	N/A	N/A	Clay	No peat
14	N13	F	35	N/A	N/A	Clay	No peat
15	N12	F	10	N/A	N/A	Clay	No peat

Photo 13.1.3: Peat core (ID 11) taken near Tower N77 (Section E)



Photo 13.1.4: Peat core (ID 6) taken near Tower N93 (Section E)



Photo 13.1.5: Peat core (ID 7) taken near Tower N92 (Section E)



4 SUMMARY

- 4.1.1 Kaya Consulting Ltd was commissioned by Land Use Consultants Ltd (LUC) on behalf of SSEN Transmission to undertake a peat depth survey for the Proposed Development.
- 4.1.2 This report covers the methodology and output of the peat survey undertaken at the site. The purpose of the survey was to establish an understanding of the peat depths at the Site to optimise site design and layout to minimise both the extent of disruption to peat soils and the quantity of peat excavated. Peat was avoided during early routeing and alignment design, as much as possible based on desk-based review of the Carbon and Peatland Map (NatureScot, 2016) and British Geological Survey online mapping. All peat Classes 1, 2 and 3 were fully avoided.
- 4.1.3 Of the 105.2 km length of the Proposed Development (new 400 kV double circuit OHL), approximately 11.5 km was identified as being likely to contain peat or carbon rich soils (either Class 4 or Class 5); this area comprised the peat survey area. A total of 2,826 probes were collected across the survey area by Kaya Consulting, with an additional 192 probes provided by SSEN Transmission.
- 4.1.4 The results of the peat survey over the whole survey area are summarised below:
- 73.5% of probes were recorded as having a depth of less than or equal to 30 cm. These probes are not considered peat.
 - 17.6% of probes were recorded as having a depth of between 30-50 cm. These probes are not formally considered to be peat and are organo-mineral soils or peaty soils (if a peat layer is present).
 - 3.7% of probes were recorded as having a depth of between 50-100 cm and are peat soils.
 - 5.2% of the probes were recorded as having a depth of over 100 cm and are peat soils.
- 4.1.5 **Volume 3, Figures 13.8.1 to 13.8.26: Probe depths** show the spatial distribution of the peat and probe depths in the peat survey area. The deepest peat found along the Proposed Route is largely concentrated within Section E, with the remainder of the Route mostly constrained to depths shallower than 50 cm. The deepest peat within Section E is at Durris Forest, where depths of up to 400 cm were probed. Micrositing of tower locations and tower working areas has been undertaken to avoid the deeper areas of peat where possible. **Table 13.1.3: Summary of peat survey results** summarises the distribution of peat within each section of the Proposed Development.
- 4.1.6 Volumes of excavated peat and management of peat are calculated in **Volume 5, Appendix 13.4: Outline Peat Management Plan**.
- 4.1.7 **Table 13.1.4: Peatland condition assessment based on the peat survey** summarises the results of the peatland condition assessment obtained during the peat survey. Most of the surveyed route is split between three categories, with 11.3% of the assessed locations classified as 'Modified' peatland, 37.3% classified as 'Forested / previously forested' and 51.4% classified as 'Not peatland'.