

# Appendix 9.4 Archaeological Coring Survey Report

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# Appendix 9.4 Archaeological Coring Survey Report

## ***Introduction***

This appendix details an archaeological watching brief and sediment recording exercise undertaken as part of a wider programme of peat probing and hand augering/coring within the site. The peat probing and coring were required to inform the peat and hydrology Environmental Impact Assessment (EIA) for the Proposed Development. The results of the archaeological watching brief and assessment of peat cores are required to inform the archaeological cultural heritage EIA Report Chapter. The cultural heritage element of the survey was carried out to assess the potential for survival of belowground archaeological deposits and structures. The peat coring method was chosen as an initial mitigation exercise in order to collate data and inform subsequent archaeological fieldwork strategies. The fieldwork was carried out between 29<sup>th</sup> October and 8<sup>th</sup> November 2018.

## ***Archaeological Background***

The site has been subject to minimal archaeological investigation and survey in the past and as such relatively few archaeological features are known within its boundaries. The earliest known feature is a subcircular stony feature of likely prehistoric date (Site 98). Other known features within the site largely comprise sites of likely post-medieval date recorded from historic mapping and/or aerial; photography and include enclosures (Sites 100,102 and 131), sheepfolds (Sites 101, 130, 132 and 134)) farmsteads/buildings (Sites 103 and 104) and a well (Site 104) (see Chapter 9 and Appendix 9.1 of EIA for further detail).

Approximately 250m west of the site is a Scheduled Monument known as Burgi Geos (Site 1). The monument is a promontory fort of Iron Age date and is a unique fortified settlement; with the combination of chevaux-de-frise and blockhouse, not known at any other site. The location of the monument is also considered remarkable as it must have always been a very remote site surrounded by very marginal land.

## ***Objectives***

The objectives of the archaeological watching brief of the coring programme within the site were:

- To accurately record the sedimentary stratigraphy observed within each sediment core.
- To establish the presence/absence of archaeological remains within each sediment core.
- To record and sample any archaeological deposits and finds encountered.
- To assess the ecofactual and environmental potential of sediments.
- To assess the archaeological potential of the sediments

## ***Methodology***

The fieldwork consisted of a programme of peat probing and hand coring, of areas of proposed infrastructure as outlined on draft proposed development plans. The areas targeted were pre-defined by peat specialists working within the site and informed by an earlier programme of peat probing. The archaeological element of the survey involved supervision and monitoring of the hand augering/coring in order to record the stratigraphy of the buried peat horizons and any potential anthropic indicators contained therein.

A steel 1m open chamber gouge auger was manually implanted into the ground and pushed gently through the top soil and underlying deposits until a resistant surface was encountered, or the auger chamber had been fully inserted. The initial 1m sample was extracted from the sampling point prior to reinsertion of the auger, in the same hole, to a depth of 1m further. Connecting rods, allowed depths of up to 5m (maximum depth of sediment encountered on site) of soft sediment to be penetrated, with contiguous samples being extracted and rapidly

assessed prior to reinsertion of the auger for the next sample. Auger penetration proceeded at each sampling point until mineral substrate was encountered. Extracted samples were visually examined and described using a simplified version of the Troels-Smith system of sediment classification (Troels-Smith, 1955; Table 1), and a Munsell soil chart (Munsell, 2000), which provides an objective method of sediment description, with any distinguishing features or stratigraphic layers being recorded. Measurements of the acrotelm (periodically saturated decomposing peat with a high permeability) and catotelm (permanently saturated dense peat with a low permeability) were taken visually and by analysing texture in the field. The descriptions were recorded on a proforma. This allowed the stratigraphy at each coring point to be broadly established. Each core was photographed in sections to provide a permanent record of the stratigraphy. The auger locations were recorded by the peat coring team using a GPS and are shown on Figure 9.4.1.

**Table 1 – Troels Smith Methodology**

<b>Physical Features</b>	
Degree of darkness	Varies from 0 in the lightest occurring shades (eg. clear (Nigror) quartz sand and lake marl), through 1 (eg. calcareous clay), 2 (e.g. fresh swamp peat), 3
Degree of stratification	Visual or structural horizontal banding or layering. Varies (Stratification) from 0 where the deposit is completely homogeneous or breaks in all directions, to 4 which consists of clear thin layers or bands.
Degree of elasticity	The sediment’s ability to regain its shape after being (Elasticitas) squeezed or bent. Varies from 0 in plastic clay, sand, disintegrated peat etc. to 4 in fresh peat.
Degree of dryness	Deposits fall between 0 (clear water) and 4 (air dry material). (Siccitas) 1 indicates very wet runny sediment such as surface lake muds, 2 represents saturated sediments, the normal condition below the water table, while sicc. 3 indicates moist, unsaturated sediments.
Colour	Best determined by reference to Munsell soil colour charts. Changes in colour
Structure	The dominant structural feature (eg. fibrous, homogeneous)
Sharpness of boundary	The boundary can be diffuse (> 1cm: lim. 0), very gradual (Limes superior)(<1cm to > 2mm: lim. 1), gradual (< 2mm to >1mm: lim. 2), sharp (<1mm to > 0.5mm) or very sharp (< 0.5mm).
<b>Humicity:</b> The degree of humification or disintegration of organic (Humicitas) substances. It is measured by determination of the nature and amount of material passing through the fingers on squeezing; 0 (fresh peat yielding clear water), 1 (slightly decomposed peat yielding dark coloured, turbid water), 2 (decomposed peat yielding half its mass), 3 (very decomposed peat yielding three-quarters of its mass) and 4 (totally decomposed peat yielding almost all its mass).	
<b>Components</b>	
Mosses	Sphagnum is the most common peat-former.
Woody plants	Roots of trees and shrubs together with attached stumps and branches,
Herbs	Roots of herbaceous plants together with attached stems and leaves,
Woody detritus	Fragments of woody plants >2mm.

Herb detritus	Fragments of herbaceous plants >2mm.
Fine detritus	Fragments of woody or herbaceous plants <2mm.
Charcoal	Carbonised fragments of predominantly woody plants.
Organic lake mud	Homogeneous organic lake sediment composed of remains (Limus detrituosus)
Humus	Completely disintegrated organic substances and precipitated humic acids.
Organosilicates	Siliceous skeletons or skeleton fragments of diatoms, sponges etc.
Carbonates	Calcium carbonate or marl. Similar in colour and texture to L. siliceous but
Iron oxides	Iron oxides of various types and colours.
Clay (Argilla steatodes)	Mineral particles <0.002mm
Silt (Argilla granosa)	Mineral particles 0.002-0.06mm
Sand (Grana minora)	Mineral particles 0.06 - 2mm.
Gravel (Grana majora)	Mineral particles >2mm.

Description and, where appropriate, sampling of the cores allowed for the nature and character of the peat to be determined, contributing to our understanding of its palaeoenvironmental potential. Additionally, any areas of archaeological potential indicated by the presence of anthropic indicators such as charred materials or waterlogged wood fragments were sampled and recorded during coring.

Any visible anthropic indicators and/or wood fragments were sampled from each core. In addition, a 10% sampling strategy was enacted whereby a random sample of sediment within 10% of auger cores with a wide geographic distribution (Core Nos 3, 6, 9, 17, 24, 26, 29, 32, 40, 48, 49, 59, 72, 81, 83, 85, 99, 101, 104, 109, 112 and 113) were retained and removed to the AOC laboratory for wet-sieving and further examination by AOC's in-house palaeoenvironmental specialist.

The samples were gently disaggregated in water by hand in laboratory conditions using a floatation method designed to retrieve fragile macroplant remains (cf. Kenward et al. 1980). Once the sediment was broken down the wash-over was fed through a stack system of 300mm, 4mm, and 2mm sieves. All plant macrofossils were analysed at magnifications of x10 and up to x450 where necessary to aid identification. Identifications were confirmed using modern reference material and plant atlases stored at AOC (Schulz 2018; Schweingruber 1978).

## Results

A total of 120 peat auger cores were recorded. Details as recorded for each core are presented in Table 3. No sudden changes in the sub-peat surface which could indicate definitive anthropogenic structures were noted during the survey. No anthropic inclusions were noted within any of the cores extracted. The peat stratigraphy and boundary between acrotelm and catotelm varied across the site.

Average peat depths across the 120 cores was 1.67m although it was found to be highly variable. Peat depth was found to be greatest in the valleys systems of the burns that cross the site with depths of peat of over 4m recorded within cores 55, 85 and 112.

The preservation degree in the sediment cores and sub-samples analysed was generally good. The sampled sediments are all in saturated peat bog, which creates good preservation potential through anaerobic conditions. The rate of humification of peat in the sediment cores changed from between low and high humification and although more humification occurred away from the ground surface, layers of non-humified peat were present deep in the stratigraphy. This indicates differences in the saturation of the peat during different periods and may be indicative of changes in past climatic conditions.

Small preserved wood fragments were recovered from ten of the sampled auger cores (24, 26, 29, 40, 49, 81, 85, 109 and 112). The wood fragments were noted in the field in the majority of samples and recovered through wet sieving although wood within samples 26, 49 and 109 was recovered from random samples and not visible in the field. All wood samples recovered were examined by AOC Archaeology’s archaeobotanist. Not all samples could be identified to species owing to their small size and/or or preservation however fragments derived from six of the cores could be identified and were identified as either alder (*Alnus glutinosa*), willow (*Salix*) or hazel (*Corylus avellana*) species as summarised in Table 2.

**Table 2 – Wood Species identification by core**

Core Identification Number	Depth of sample	Wood Species Identification
24	2m	Willow
29	1.8m	Alder
49	2.9m	Hazel roundwood
85	4.15m	Willow roundwood
101	2.5m	Alder roundwood
109	3.7m	Alder

## Discussion

No definitive archaeological features or artefacts were identified during the peat auger core survey.

Although no features were identified by the survey it is recognised that in terms of the size of the overall site area, the core density was fairly low, and at this resolution with a core diameter of 0.05m the chance of encountering buried settlement remains using a coring strategy remains relatively low. As such it is possible that archaeological features or deposits may still be buried beneath the site.

Small preserved wood fragments were recovered from cores 24, 26, 29, 40, 49, 81, 85, 109 and 112 and this indicates the former presence of woodland in the site. The location of cores containing wood fragments shows a trend towards shallow slopes; a concentration of three cores (24, 26 and 29) in the north-east of the site indicates the existence of former woodland on the north-west facing slopes of the Hills of Vigon and Markamouth in close proximity to the prehistoric fort at Burgi Geos (Site 1) and the medieval and post-medieval settlement at Vigon (Sites 90-96). Two wood samples were recovered from cores on the shallow slopes of the valley of the River Burn (Core 40 and 109), with a third (Core sample 112) recovered from adjacent to the nearby Burn of Kedillsmires in the centre of the site where peat deposits extended to a depth of 4.65m. Wood was also recovered from cores 81 and 85 which were extracted from the north-east of the site on a low plateau west of Kussa Waters. The identification of species of wood from six of these cores allows for the type of woodland to be more clearly defined. Alder and willow are frequently found in damp wetland areas and the occurrence of these species is indicative of areas of damp open ground. Hazel was an early colonist following the last glaciation and tolerates a wide range of soil conditions (Martynoga 2011).

Peat typically accumulates at approximately 0.5 - 1mm per year which means a 1 metre depth of peat can take 1,000 years to form (IUCN 2014). Variations in peat growth rates occur according to changes in climate and topographic situation although on a very general note it can be assumed, given that wood fragments were typically found at depths of 2-3m, that woodlands existed within the site over 2000 years ago. The deepest deposits were found to be 4.6 to 5m deep and thus potentially represent a timespan dating back into prehistory over 4000 years. Given the known deterioration climate in Shetland in the late Neolithic/Early Bronze Age and later woodland clearance it is tempting to equate the occurrence of wood fragments at depths with a period prior to woodland clearance and perhaps associated with a warmer climate more suitable to woodland growth. Woodland clearance has been documented from numerous sites across Mainland Shetland such as Catta Ness, Nannasting, on Mainland where woodland was cleared by about 1400BC, probably for rough grazing and never recovered in that area. Extensive clearance and virtual destruction of the woodland also occurred at Kebister, Dallican Water and Gunnister Water between 1400 and 1100BC (Dickson and Dickson 2000, 66).

The locations of the cores were dictated by the proposed location of Proposed Development infrastructure within the site which has been proposed, where possible, to avoid the lower valleys of the burn systems that cross the site. Core 112 sited adjacent to the burn of Kedillsmires extended to a depth of 4.65m and it is considered likely that deposits adjacent to other burns with the site will also be deeper than those encountered on upper slopes. It is also most likely that trees would have thrived in more sheltered valley location where they would be shielded from the wind. It is thus possible areas of deeper peat may mask preserved prehistoric archaeological deposits.

The mitigation strategy outlined in EIA Chapter 9 will allow for the investigation and if necessary protection of any archaeological remains uncovered during the construction phase of the Proposed Development

Table 3: Coring results using Troels Smith/Von Post sediment classification

Aoc No	Identification			Depth (metres)					Troels Smith Scale Descriptor				Boundary				Colour				Notes	Photo
	Fluidic No	X Coordinates	Y Coordinates	Total	Acrotelm	Catotelm	3rd layer	4th layer	Acrotelm	Catotelm	3rd layer	4th layer	Acrotelm	Catotelm	3rd layer	Acrotelm	Catotelm	3rd layer	4th layer			
1	7554	451210	1199924	1.8	0.1	1.8			D3-S0-E0-D0-H0	D3-S0-E0-D2-H1	D3-S0-E0-D3-H2		Diffuse	Diffuse		Dark Reddish Brown 3/3	Yellowish Brown 5/8	Very Dark Brown 2/2		Black silt and gravel at 1.8m above substrate	1, 2	
2	7390	451133	1200063	1.7	0.1	1	1.6	1.7	D3-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	Gradual	Diffuse	Gradual	Dark Reddish Brown 3/3	Dark Red 3/6	Dark Brown 3/2	Black 2.5/1	Peat increasingly decomposed with depth. No fibres in 4th layer.	3, 4	
3	7395	451162	1200083	1.6	0.2	1	1.45	1.6	D3-S0-E0-D0-H0	D3-S0-E1-D1-H1	D3-S0-E0-D2-H2		Sharp	Gradual	Diffuse	Dark Reddish Brown 3/3	Strong Brown 4/6	Dark Brown 3/2	Black 2.5/1	1cm layer of grit at base on top of substrate	5, 6	
4	7487	451172	1200123	2.3	0.15	0.5	2	2.3	D3-S0-E0-D1-H1	D3-S0-E0-D2-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Gradual	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Yellowish Brown 4/6	Dark Brown 3/2	Very Dark Red 2.5/2	Peat increasingly decomposed with depth. Very few fibres in 4th layer.	7, 8, 9	
5	7470	451112	1200142	1.5	0.1	1	1.5		D3-S0-E0-D1-H1	D3-S0-E0-D1-H1	D3-S0-E0-D3-H3		Gradual	Diffuse		Dark Reddish Brown 3/3	Yellowish Brown 5/8	Very Dark Brown 2/2		Substrate encountered at 1.5m	10, 11, 12	
6	1436	451077	1200206	1.35	0.1	0.6	1.1	1.35	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	Gradual	Diffuse	Sharp	Dark Reddish Brown 3/3	Yellowish Brown 5/8	Dark Brown 3/2	Very Dark Brown 2/2	5cm of silt recorded at base of core directly above substrate	13, 14, 15	
7	7625	451071	1200336	1.65	0.15	0.5	1.1	1.65	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	Gradual	Gradual	Diffuse	Dark Reddish Brown 3/3	Yellowish Brown 5/8	Dark Brown 3/2	Very Dark Brown 2/2	Increasingly darker and decomposed with depth. Peat directly on substrate	16, 17	
8	6876	451141	1200365	1.25	0.2	0.7	1	1.25	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D3-S0-E0-D4-H3	Diffuse	Diffuse	Gradual	Dark Reddish Brown 3/3	Diffuse	Gradual	Dark Yellowish Brown 3/6	Base very decomposed and crumbly/ Lighter in colour than elsewhere	18, 19	
9	6789	451257	1200462	1	0.25	0.6	1		D2-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H3		Diffuse	Gradual		Yellowish Brown 5/8	Dark Yellowish Brown 4/6	Dark Brown 3/4		More decomposed with depth. Peat directly on top of substrate	20	
10	4571	451321	1200426	1.6	0.1	1	1.4	1.6	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	Diffuse	Diffuse	Gradual	Dark Reddish Brown 3/3	Dark Yellowish Brown 4/6	Dark Yellowish Brown 3/6	Very Dark Greyish Brown 3/2	Decomposed and sticky at base. Directly on top of bedrock	21, 22	
11	4353	451426	1200209	2.4	0.2	0.6	2.1	2.4	D3-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D4-H4	Sharp	Diffuse	Gradual	Very Dusky Red 2.5/2	Dark Reddish Brown 3/4	Very Dusky Red 2.5/2	Black 2.5/0	Decomposed at base. Thin 2cm layer of silty gravel at base above bedrock	23, 24, 25, 26	
12	7626	451554	1200185	2.25	0.15	2.15	2.25		D3-S0-E0-D2-H1	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3		Gradual	Diffuse		Dark Reddish Brown 2.5/2	Dark Reddish Brown 3/3	Very Dark Brown 2/2		Orange mottles (fine organic fibre) present in 3rd layer	27, 28	
13	2547	449678	1200215	1.35	0.15	1	1.35		D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Diffuse	Diffuse		Very Dark Brown 2/2	Dark Reddish Brown 3/3	Strong Brown 4/6		4cm of silty grit at base of core above bedrock	29, 30, 31	
14	2534	449676	1202945	1.2	0.2	0.9	1.15		D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Brown 3/2	Brown 5/4		5cm of silty grit at base of core above bedrock	32, 33, 34	
15	4386	449702	1203070	1.6	0.2	1.4	1.6		D3-S0-E0-D2-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3		Diffuse	Diffuse		Very Dark Brown 2/2	Dusky Red 3/2	Dark 2.5/0		5cm of crumbly gritty silt on bedrock	35, 36	
16	4559	449403	1203137	3.05	0.15	0.5	2	3	D3-S0-E0-D0-H0	D3-S0-E0-D1-H2	D3-S0-E0-D3-H3		Gradual	Gradual	Diffuse	Dark Reddish Brown 3/3	Yellowish Brown 5/8	Black Red 2.5/4	Weak Red 4/2	5cm of silty grit at base with bedrock below	37, 38, 39, 40	
17	7625	451071	1200336	0.8	0.2	0.8			D2-S0-E0-D0-H0	D3-S0-E0-D1-H1			Diffuse			Yellowish Brown 5/8	Very Dark Brown 2/2			Waterlogged area - core deposits saturated	41, 42	
18	6067	449624	1203365	2.15	0.2	1	1.7	2.15	D3-S0-E0-D2-H0	D3-S0-E0-D3-H2	D3-S0-E0-D3-H2	D4-S0-E0-D3-H3	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Red 3/6	Weak Red 4/2	Black/Very Dark Grey 2.5/0	Very decomposed at base	43, 44, 45, 46, 47	
19	1981	449153	1203369	0.9	0.2	0.5	0.9		D3-S0-E0-D1-H1	D3-S0-E0-D1-H2	D3-S0-E0-D1-H2		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Yellowish Brown 4/6	Very Dark Brown 2/2		Bedrock at base in saturated area	48, 49	
20	2004	449057	1203457	0.5	0.1	0.3	0.5		D2-S0-E0-D2-H1	D2-S0-E0-D2-H2	D3-S0-E0-D2-H2		Diffuse	Gradual		Dark Yellowish Brown 4/6	Dark Yellowish Brown 4/6	Very Dark Brown 2/2		Very decomposed at base with very few fibres	50	
21	5846	449146	1203641	1.65	0.2	0.8	1.4		D3-S0-E0-D2-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Diffuse	Diffuse	Sharp	Dark Reddish Brown 3/3	Very Dusky Red 2.5/2	Dark Grey 3/0		25cm of gritty silt immediately above bedrock	51, 52	
22	5880	448930	1203670	1.25	0.2	0.8	1.25		D3-S0-E0-D2-H0	D3-S0-E0-D3-H1	D4-S0-E0-D4-H3		Diffuse	Gradual		Dark Reddish Brown 3/3	Dark Brown 3/2	Very Dark Brown 2/2		1cm of silty grit at bottom of core on top of bedrock	53, 54	
23	1271	448950	1203529	1.55	0.2	1.2	1.55		D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Diffuse	Gradual		Dark Reddish Brown 3/3	Dark Brown 3/2	Very Dark Greyish Brown 3/2		Very decomposed peat at base of core directly on bedrock	55, 56	
24	2275	448732	1203675	2	0.2	0.9	1.7	2	D3-S0-E0-D2-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Sharp	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Brown 3/4	Dark Brown 3/2	Black 2/0	Small piece of wood found at 1.6m (sampled)	57, 58, 59, 60	
25	2201	448635	1203588	2.75	0.15	1	2.4	2.75	D3-S0-E0-D1-H0	D3-S0-E0-D2-H1	D3-S0-E0-D3-H2	D4-S0-E0-D4-H3	Sharp	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Brown 3/4	Dark Brown 3/2	Very Dark Grey 3/0	Very decomposed at base	61, 62, 63, 64, 65	
26	4497	448593	1203395	1.9	0.15	1	1.8		D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Brown 3/4	Dark Brown 3/2		10cm of silty grit at bottom on top of bedrock	66, 67, 68, 69	
27	2493	448447	1203097	0.75	0.2	0.75			D3-S0-E0-D2-H0	D3-S0-E0-D2-H1			Diffuse			Dark Reddish Brown 3/3	Dark Brown 3/4				70, 71	
28	2382	448331	1203037	0.85	0.2	0.55	0.85		D3-S0-E0-D2-H0	D3-S0-E0-D3-H2	D4-S0-E0-D3-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Brown 3/4	Black 2/0		Very decomposed at base (no fibres) above bedrock	72, 73	
29	4503	448156	1202614	1.8	0.1	1.1	1.65	1.8	D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	D4-S0-E0-D4-H4	Sharp	Diffuse	Sharp	Strong Brown 4/6	Dark Brown 3/4	Dark Brown 3/4	Black 2/0	Wood at 1.4m. Mineral material also present towards base (sampled)	74, 75, 76, 77	
30	4597	448303	1202204	0.65	0.1	0.3	0.55		D3-S0-E0-D2-H0	D3-S0-E0-D3-H2	D4-S0-E0-D4-H3		Gradual	Diffuse		Dark Reddish Brown 3/3	Dark Brown 3/2	Very Dark Greyish Brown 3/2		10cm of gritty sand at base of core and above bedrock	78, 79	
31	3748	448362	1201990	2.45	0.15	1.3	2.15	2.35	D3-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	Diffuse	Diffuse	Sharp	Dark Reddish Brown 3/3	Dark Brown 3/4	Dark Yellowish Brown 4/6	Very Dark Grey 3/1	Very decomposed with very rare fibres	80, 81, 82, 83, 84	
32	3743	448360	1201870	0.9	0.1	0.5	0.9		D3-S0-E0-D2-H0	D3-S0-E0-D3-H2	D4-S0-E0-D3-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Yellowish Brown 5/8	Dark Brown 3/3		Black silt mixed in with peat at lower 10cm	85, 86	
33	2801	449002	1201654	0.75	0.2	0.45	0.75		D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D1-H3		Diffuse	Sharp		Dark Reddish Brown 3/3	Dark Yellowish Brown 4/6	Dark Greyish Brown 3/2		Very wet at base overlying bedrock	87, 88	
34	2721	449120	1201599	0.75	0.1	0.35	0.75		D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Yellowish Brown 4/6	Dark Yellowish Brown 4/6		Last two layers homogenous distinguishable only by No of fibres	89	
35	4543	449257	1201563	1.5	0.15	1	1.5		D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Yellowish Brown 3/3	Dark Yellowish Brown 3/3		10cm of black silty grit at base of core overlying bedrock	90, 91	
36	4404	449569	1201624	1.65	0.15	1.55	1.65		D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D4-S0-E0-D4-H4		Diffuse	Gradual		Dark Reddish Brown 3/3	Dark Brown 3/4	Black 2/0		Base very decomposed with no structural fibres	92, 93	
37	737	449575	1201722	1.45	0.1	1.2	1.45		D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dusky Red 3/2	Very Dusky Red 2.5/2		Base very decomposed with no structural fibres	94, 95, 96	
38	742	449618	1201853	1.5	0.15	1	1.5		D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D3-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Brown 3/2	Dark Yellowish Brown 4/6		5cm of black silty grit at base overlying bedrock	97, 98, 99	
39	6429	449630	1201924	2.2	0.15	1	2	2.2	D3-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D2-H3	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Brown 3/3	Dark Brown 3/3	Very Dark Brown 2/2	Very decomposed at base with very few fibres	100, 101, 102, 103	
40	6449	449591	1201942	1.7	0.15	1	1.7		D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Diffuse	Diffuse		Dark Brown 3/4	Dark Yellowish Brown 3/6	Very Dark Brown 2/2		5cm of silty grit at base overlying bedrock	104, 105, 106	
41	4399	449576	1202142	2.45	0.1	1.1	2	2.45	D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Yellowish Brown 5/8	Dark Brown 3/3	Dark Yellowish Brown 4/4	Base very decomposed and sticky no fibres	107, 108, 109, 110	
42	3481	449640	1202314	1.9	0.1	1.4	1.9		D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Reddish Brown 3/3	Very Dusky Red 2.5/2		Sticky with minimal fibres at base	111, 112, 113	
43	3570	449704	1202488	1.55	0.15	1	1.45	1.55	D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	D4-S0-E0-D3-H4	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Reddish Brown 3/3	Dark Brown 3/2	Black 2/0		114, 115, 116, 117	
44	6198	449522	1202500	2	0.2	1	2		D3-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2		Diffuse	Diffuse		Dark Reddish Brown 3/3	Dark Brown 3/4	Dark Brown 3/4		Saturated at base	118, 119, 120	
45	6381	449562	1202676	1.8	0.1	1.1	1.7	1.8	D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3	D4-S0-E0-D4-H4	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dusky Red 3/2	Very Dusky Red 2.5/2	Black 2/0	5cm gritty silt overlying bedrock	121, 122, 123	
46	8637	451299	128930	0.75	0.15	0.45	0.65	0.75	D2-S0-E0-D1-H0	D3-S0-E0-D1-H2	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Diffuse	Diffuse	Diffuse	Yellowish Brown 5/8	Dark Reddish Brown 2.5/4	Dark Yellowish Brown 4/6	Very Dark Brown 2/2	Black, sticky and decomposed at base	124, 125	
47	4358	451434	1199039	1.7	0.25	1.4	1.7		D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D3-H3		Gradual	Diffuse		Dark Reddish Brown 3/3	Dark Brown 3/4	Very Dark Greyish Brown 3/2		5cm of sandy silt overlying bedrock	126, 127, 128	
48	4357	451264	1199087	1.1	0.25	0.7	0.9	1.1	D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3		Gradual	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Brown 3/2	Dark 2/1	Very Dark Brown 2/2	Black, sticky and decomposed at base	129, 130, 131, 132	
49	4590	451064	1199383	2.9	0.25	1.4	2.3	2.9	D3-S0-E0-D1-H0	D3-S0-E0-D2-H2												

Table 3: Coring results using Troels Smith/Von Post sediment classification

Identification				Depth (metres)					Troels Smith Scale Description				Boundary			Colour				Notes	Photo				
Aoc No	Fluidec No	X Coordinates	Y Coordinates	Total	Acrotelm	Catotelm	3rd layer	4th layer	Acrotelm	Catotelm	3rd layer	4th layer	Acrotelm	Catotelm	3rd layer	Acrotelm	Catotelm	3rd layer	4th layer						
93	6924	451674	1201689	1.85	0.2	1	1.85		D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2					Diffuse	Diffuse		Very Dusky Red 2.5/2	Dark Reddish Brown 3/4	Dark Reddish Brown 3/4		Peat still very fibrous at base	266, 267	
94	1030	452212	1201099	2.25	0.15	0.5	1.7	2.2	D3-S0-E0-D1-H0	D3-S0-E0-D2-H1	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3	Sharp	Diffuse	Diffuse	Black 2.5/1	Dark Reddish Brown 3/4	Dark Reddish Brown 2.5/2	Very Dark Grey 3/1				Last 50cm grey/gleyed	268, 269, 270	
95	1029	452264	1201168	1.8	0.15	0.5	1.4	1.8	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D2-H3	Sharp	Diffuse	Diffuse	Black 2.5/1	Dark Yellowish Brown 4/6	Very Dark Brown 2/2	Very Dark Greyish Brown 3/2					271, 272, 273	
96	8420			1.9	0.15	1.5	1.9		D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2		Diffuse	Diffuse	Diffuse	Black 2.5/0	Dark Reddish Brown 3/4	Dusky Red 3/2					2cm layer of grit at base	274, 275	
97	4520	452115	1201449	2.2	0.15	0.7	1.7	2.2	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D4-H4	Diffuse	Diffuse	Sharp	Dark Reddish Brown 3/3	Dark Red 3/2	Dark Reddish Brown 3/4	Black 2.5/0				4cm layer of grit at base	276, 277, 278, 279	
98	3894	451762	1202081	2.3	0.1	0.8	1.9	2.3	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3	Gradual	Diffuse	Diffuse	Very Dusky Red 2.5/2	Dark Reddish Brown 2.5/4	Dark Brown 3/2	Very Dark Brown 2/2				Grassy, fibrous lumps at base	280, 281, 282, 283	
99	3854	451724	1202184	1.65	0.2	0.8	1.45	1.65	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Sharp	Gradual	Diffuse	Dark Reddish Brown 3/3	Dark Yellowish Brown 4/6	Very Dark Greyish Brown 3/2	Black 2/1				Very decomposed at base	284, 285, 286	
100	1682	451058	1201519	1.65	0.2	0.8	1.1	1.65	D3-S0-E0-D2-H0	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Sharp	Diffuse	Diffuse	Black 2.5/0	Dark Reddish Brown 3/4	Dark Dusky Red 2.5/2	Black 2/0				Very decomposed at base	287, 288, 289	
101	1742	451060	1201389	2.5	0.15	1.65	2.3	2.45	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3	D4-S0-E0-D3-H4	Sharp	Gradual	Sharp	Very Dusky Red 2.5/2	Dark Reddish Brown 2.5/4	Dark Brown 3/2	Black 2/0				Wood at 2.3m. 5cm of sandy grit at base.	290, 291, 292, 293	
102	418	450599	1201681	2.25	0.15	1.5	2.25		D3-S0-E0-D0-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3		Diffuse	Diffuse	Diffuse	Black 2.5/0	Very Dusky Red 2.5/2	Very Dark Brown 2/2					Fibrous clumps at 1.5m	294, 295, 296, 297	
103	391	450563	1201556	1.5	0.15	0.6	1.3	1.5	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3	D4-S0-E0-D2-H4	Sharp	Diffuse	Sharp	Black 2.5/0	Yellowish Red	Dark Reddish Brown 3/3	Black 2.5/1				No fibres at base	298, 299, 300	
104	313	450396	1201116	1.1	0.3	0.5	1	1.1	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H4	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Brown 4/3	Very Dark Brown 2/2	Very Dark Brown 2/2				Rare fibres in last 10cm	301, 302, 303	
105	349	450427	1200990	1.5	0.15	0.5	1.1	1.5	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D4-S0-E0-D4-H4	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Very Dark Brown 2/2	Very Dark Brown 2/2	Black 2/1				No fibres in last 10cm	304, 305	
106	4478	450399	1200744	1.2	0.2	0.7	1.2		D3-S0-E0-D2-H0	D3-S0-E0-D2-H0	D3-S0-E0-D2-H0		Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Brown 3/2	Dark Yellowish Brown 3/4					Rare fibres in last 10cm	306, 307, 308	
107	4434	450471	1200730	0.7	0.2	0.4	0.5	0.6	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3	D3-S0-E0-D2-H4	Gradual	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Yellowish Brown 3/4	Very Dark Brown 2/2	Very Dark Greyish Brown 3/2				10cm gritty silt at base	309, 310	
108	180	450606	1200678	2.2	0.2	1.2	2	2.2	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3	D3-S0-E0-D2-H4	Diffuse	Diffuse	Diffuse	Black 2/0	Dark Brown 3/4	Dark Brown 3/2	Very Dark Brown 2/2				Thin layer of grit at base	311, 312, 313	
109	40	450700	1200768	3.7	0.2	1	2.6	3.7	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H4	Diffuse	Diffuse	Sharp	Dark Reddish Brown 3/3	Dark Brown 3/4	Dark Reddish Brown 3/2	Black 2/0				No fibres at base	314 - 319	
110	7162	451810	1201362	1.9	0.2	1.2	1.7	1.9	D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Diffuse	Diffuse	Diffuse	Dark Reddish Brown 3/3	Dark Reddish Brown 3/3	Dark Reddish Brown 2.5/3	Very Dark Brown 2/2				Rare fibres in last 20cm	320, 321, 322	
111	7310	451742	1201339	2	0.15	0.65	1.2	2	D3-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D2-H3	Diffuse	Diffuse	Diffuse	Black 2/1	Dark Yellowish Brown 4/6	Dark Brown 3/2	Dark Brown 3/3				Rare fibres in last 30cm	323, 324	
112	4429	450929	1200915	4.65	0.2	1.8	3.65	4.65	D3-S0-E0-D0-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D4-H4	Diffuse	Diffuse	Diffuse	Black 2/1	Dark Brown 3/4	Very Dark Greyish Brown 3/2	Black 2/0				Woody detritus 3.7m. Core in valley floor near river	325-332	
113	4447	450922	1200992	1.2	0.1	0.6	1	1.2	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D3-S0-E0-D2-H2	Diffuse	Diffuse	Diffuse	Black 2/1	Dark Reddish Brown 3/2	Dark Reddish Brown 3/2	Dark Brown 2/2					333, 334, 335	
114	865	451053	1200887	1.1	0.2	0.5	1	1.1	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D4-H4	Sharp	Diffuse	Sharp	Dark Reddish Brown 2.5/2	Dark Reddish Brown 3/4	Dark Brown 3/2	Black 2/1				5cm of grit at base	336, 337	
115	864	451111	1200927	1.85	0.15	0.5	1.6	1.8	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H4	Gradual	Diffuse	Diffuse	Black 2/0	Dark Brown 3/4	Dark Brown 3/2	Black 2/1				5cm of grit at base	338, 339, 340	
116	5457	451266	1200937	1.2	0.05	0.35	1.1	1.2	D3-S0-E0-D1-H0	D3-S0-E0-D2-H1	D3-S0-E0-D3-H2	D4-S0-E0-D4-H4	Sharp	Sharp	Sharp	Black 2/0	Strong Brown 4/6	Dark Brown 3/4	Black 2/1					341, 342	
117	5452	451342	451342	0.85	0.15	0.45	0.55		D3-S0-E0-D1-H0	D3-S0-E0-D1-H2	D3-S0-E0-D2-H3		Diffuse	Diffuse		Black 2/0	Dark Brown 3/4	Dark Brown 3/2						343, 344	
118	975	451530	1201045	0.6	0.1	0.35	0.6		D3-S0-E0-D2-H0	D3-S0-E0-D2-H2	D4-S0-E0-D3-H4		Diffuse	Gradual		Dark Reddish Brown 2.5/2	Very Dark Brown 2/2	Black 2/0					2cm of grit at base	345	
119	911	451557	1201112	1.3	0.2	0.55	0.75	1.2	D3-S0-E0-D2-H0	D3-S0-E0-D2-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H4	Diffuse	Gradual	Gradual	Dark Reddish Brown 2.5/2	Very Dusky Red 2.5/2	Dark Reddish Brown 3/4	Dark Reddish Brown 3/2					346, 347, 348	
120	1511	451727	1200924	1.6	0.2	1.15	1.6		D3-S0-E0-D1-H0	D3-S0-E0-D2-H2	D3-S0-E0-D2-H3		Sharp	Diffuse	Diffuse	Dark Reddish Brown 2.5/2	Dark Reddish Brown 3/4	Very Dark Brown 2/2					Rare fine fibres in last 10cm	349, 350	
121	1476	451800	1200817	1.75	0.2	0.7	1.5	1.75	D3-S0-E0-D1-H0	D3-S0-E0-D1-H1	D3-S0-E0-D2-H2	D4-S0-E0-D3-H3	Diffuse	Diffuse	Gradual	Black 2/1	Dusky Red 3/2	Very Dusky Red 2.5/2	Very Dark Brown 2/2					Rare fine fibres in last 25cm	351, 352, 352

## References

- Dickson, C and Dickson, J (2000) *Plants & People in Ancient Scotland* Tempus, Stroud Gloucestershire
- IUCN (2014) UK Committee Peatland Programme Briefing Note Complete set 1-10 <http://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/1-10%20Peatland%20Briefings%20-%205th%20November%202014.pdf> Accessed 10<sup>th</sup> January 2019.
- Kenward, H.K, Hall, A.R and Jones, A.K.G (1980) A tested set of techniques for the extraction of plant and animal microfossils from waterlogged archaeological deposits *Science and Archaeology* 22 3-15.
- Marynoga, F (2012) *A Handbook of Scotland's Trees*, Saraband, Glasgow
- Schulz, B. (2018). *Identification of trees and shrubs in winter using buds and twigs*. Royal Botanic Gardens, Kew.
- Schweingruber, F.(1978). *Microscopic Wood Anatomy* Swiss Federal Institute for Foreign Research. Birmensdorf.