



ORCHARD END WIND FARM, EAGLAND HILL, PILLING, LANCASHIRE

Archaeological Watching Brief



Oxford Archaeology North

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REG ORCHARD END WIND LTD

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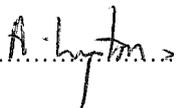
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SUMMARY

REG Orchard End Ltd submitted a planning application (2/09/00352/FULMAJ) to install two wind turbines at Eagland Hill, Pilling Moss, Lancashire (NGR SD 445 449). The Lancashire mosses are known to have been occupied during the prehistoric period due to several finds in the area dating as far back as the Mesolithic (10,000-4,000 BC). The potential for significant archaeological evidence remaining in the subsurface deposits led to the Lancashire County Archaeology Service (LCAS) advising that a condition requiring a permanent presence watching brief during all ground work operations be imposed on the planning permission. Consequently, Oxford Archaeology North (OA North) was commissioned to undertake the work between August and December 2012.

The ground works involved the stripping of topsoil to construct a haul road providing access off Skitham Lane to two turbines, a site compound and associated crane/piling pads, excavation of the turbine bases, excavation of cable trenches and substation area, and the topsoil strip of the substation area.

Two pits were observed during the topsoil strip for the haul road. The first pit, **104**, was likely to be a modern test pit, and the second pit, **107**, was very shallow, and probably a modern machine scrape or scar left by agricultural machinery. A single small animal bone was found within the fill, **108**, of this feature.

A possible palaeochannel, **111**, and ditch, **115**, were identified whilst excavating the cable trench on the higher ground near to the substation area. The ditch cut, **115**, was only clearly defined in one section of the cable trench as, in the south-facing side of the trench, it appeared to have been truncated by tree disturbance.

Artefactual evidence was sparse and, excluding the animal bone in fill **108**, consisted of a single sherd of post-medieval pottery post-dating the mid-nineteenth century, a horseshoe dating from the twentieth century and several hand-made bricks, all within the topsoil, **101**, along the haul road near to Skitham Lane.

No features of archaeological significance were found during the excavation of the turbine bases, although visibility was reduced by the extremely wet conditions experienced due to adverse weather and waterlogged ground. The finds and features were of low significance, with no recommendations for further work.

ACKNOWLEDGEMENTS

OA North would like to thank John Mills of REG Windpower for commissioning the project, Mike Patching of Wind and Wave Energy for his help and information, Carl Evans, site engineer, for his assistance during the site work, and the site staff of Askam Civil Engineering for their co-operation during the ground work operations. Thanks are also due to Doug Moir of Lancashire County Archaeology Service for his advice.

The watching brief was undertaken by Mike Birtles, who also wrote the report. The drawings produced by Mark Tidmarsh. The finds were examined by Christine Howard-Davis and Steve Rowland, and the palaeoenvironmental assessment was carried out by Elizabeth Huckerby. The project was managed by Emily Mercer, who also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF PROJECT

1.1.1 Renewable Energy Generation (REG) Orchard End Wind Ltd submitted a planning application (2/09/00352/FULMAJ) for a wind farm at Eagland Hill, Pilling, Lancashire. A desk-based assessment undertaken in 2004 of the site (OA North 2004) identified this former mossland as being improved and enclosed during the eighteenth century, with potential for prehistoric remains surviving in the sub-surface peat formations. There is also potential evidence for late medieval/early post-medieval activity across the site in the form of possible clay extraction pits and a possible brick clamp. Consequently, on advice from the Lancashire County Archaeology Service (LCAS), a condition (no 15) was attached to the planning permission requiring a permanent presence archaeological watching brief. Consequently, Oxford Archaeology North (OA North) was commissioned to undertake the work, which was carried out between August and December 2012. The following report documents the results of the archaeological watching brief.

1.2 LOCATION, TOPOGRAPHY AND GEOLOGY

1.2.1 The site lies in Eagland Hill to the west of Garstang (NGR centred SD 445 449; Fig 1). The access to the construction area was by a track leading from Skitham Lane to the south. Generally, the area is low-lying mossland undulating between approximately 4m AOD, rising to approximately 10m AOD. The land is a mixture of pasture and arable farmland, improved by the cutting of drainage ditches at the lower elevations.

1.2.2 The solid geology of Eagland Hill consists of Triassic red sandstone overlain by areas of boulder clay, the lower elevations consist of estuarine clays overlain by peat deposits (Middleton *et al* 1995).

1.3 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

1.3.1 OA North compiled a desk-based assessment for the site in 2004. An assessment of the potential impact on the archaeological resource was subsequently undertaken for the purposes of an Environmental Statement (ES) (Hyder 2009), to accompany the planning application, which identified a possible brick clamp within the south-eastern area of the site during a walkover survey. The assessments highlighted evidence for archaeological activity from the Mesolithic through to the modern day, and the following is a comprehensive précis of the archaeological potential of the area.

1.3.2 The area around Pilling Moss is rich with archaeological remains dating back to the Mesolithic. Animal bones, including groups of antlers, are reported to have been found in the deposits of blue/grey clay that underlie the peat (Middleton *et al* 1995, 54). The area is low lying and would therefore have been subject to marine sediments being deposited by fluctuating sea levels, obscuring any pre-existing sites (*op cit*, 55). Neolithic polished stone axes

have been found mainly from the northern part of Pilling Moss, particularly in concentrations associated with the discontinuous ridge that separated Pilling Moss from Cockerham. However, axes have also been found within and under the peat (*op cit*, 56). Pilling Moss is unique within Lancashire mosses for having human remains that are well-documented; a human head was discovered *c* 2m below the peat surface in 1824, accompanied by cylindrical jet beads, which are generally associated with the Bronze Age (*op cit*, 66). One of the most famous archaeological sites in the area is Kate's Pad, dated to the end of the Neolithic/Early Bronze Age, located to the west of Pilling Moss. Kate's Pad is comprised of at least three wooden trackways, demonstrating an important means of communication within the wetland environment (*op cit*, 62). Artefactual evidence from the Late Bronze Age/Iron Age declined after 1400 BC and raised mires in the lowland areas suggest an abandonment of the landscape (OA North 2004, 9).

- 1.3.3 There are two Roman roads in the area around Pilling Moss: sections of a Roman road leading from Walton-le-Dale to Lancaster have been identified some 5km to the east; a second road has been suggested following a north-east to south-west alignment, 1.5km east of the site (*op cit*, 9).
- 1.3.4 There are no medieval remains within the study area. Indeed, out of 28,881 acres of land included within the Parish of Garstang during the Domesday Survey, only 1500 acres were cultivated, the remainder being waste, moss and marsh. It is, however, possible that some of the drainage ditches, field systems and boundaries date to the medieval period (*op cit*, 10).
- 1.3.5 Settlement on the Lancashire Plain, as a whole, coincides largely with the drainage of the marshes during the nineteenth century; the land around Pilling was enclosed and cultivated from the mid-nineteenth century. Short-lived gravel and clay extraction is evident by pits marked on the Ordnance Survey first edition map with the clay apparently being used by the Lytham Hall estate for drainage tiles and pipes (*op cit*, 12).

2. METHODOLOGY

2.1 INTRODUCTION

2.1.1 A Written Scheme of Investigation (WSI) (*Appendix 1*) was submitted by OA North in response to a request by the client, REG Orchard End Ltd. This was prepared in accordance with an informal brief provided by LCAS. The WSI was adhered to in full, and the work was consistent with the relevant IfA and English Heritage guidelines (Institute for Archaeologists 2008a, 2008b, 2012; English Heritage 2006).

2.2 WATCHING BRIEF

2.2.1 A permanent archaeological presence was maintained during ground works at all times. The purpose was to identify, investigate and record any archaeological remains encountered. The stripping of the topsoil was undertaken by a mechanical excavator, fitted with a wide toothless ditching bucket, although the nature of the deeper excavations required the use of a toothed bucket, particularly around piling works and cable trench excavations. Spoil was routinely checked for artefactual evidence.

2.2.2 A daily record of the nature, extent and depths of ground works was maintained throughout the duration of the project. All archaeological contexts were recorded on OA North's *pro-forma* sheets, using a system based on that of the English Heritage former Centre for Archaeology. A monochrome and digital photographic record was maintained throughout.

2.2.3 Due to the method by which the turbine bases were excavated (i.e. with various toothed buckets necessitated by restrictive working areas around steel piles) it was difficult to identify archaeological remains until the excavation of material had taken place. The recovery of finds was also hampered by atrocious weather conditions, which adversely affected visibility whilst the turbine bases were excavated.

2.3 FINDS

2.3.1 All finds were exposed, lifted, cleaned and bagged in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid for Finds*, 1998. All identified finds and artefacts were retained from all material classes, and were hand collected from stratified deposits for processing and assessment.

2.4 PALAEOENVIRONMENTAL ASSESSMENT

2.4.1 Six environmental bulk samples were collected during the watching brief for the assessment of plant remains with the aim that they would provide information about the environment and economy of the site. Orchard End Farm lies on Pilling Moss, which was surveyed by the North West Wetlands

Survey (NWWS, see Middleton *et al* 1995). Originally, the peat would have been much thicker, but most of the upper *Sphagnum imbricatum* peat has been removed in recent times, except for a small area south of Eagland Hill (*op cit*, 53). The stratigraphy of Pilling Moss was recorded as part of the NWWS, and a detailed palaeoenvironmental analysis was undertaken on cores from Fenton Cottage (SD40354495) and Brook Farm, both on nearby Stallmine Moss and Winmarleigh Moss (SD438476) a little to the north of Orchard End Farm (*ibid*).

- 2.4.2 **Quantification and Methodology:** one litre sub-samples were taken from each of the environmental bulk samples, to be wet-sieved, collected on 250 micron mesh and retained in water at OA North's offices. A representative sample from each was examined with a binocular microscope, and all readily identified plant remains were recorded. The total number of waterlogged and/or charred seeds and other identifiable items, such as cross leaved heath (*Erica tetralix*), were recorded as present (+) or frequent (++) . The components of the matrix were also noted and recorded as present (+) or frequent (++) . Plant nomenclature follows Stace (2010), and the results are shown in Table 1, *Section 3.4*.

2.5 ARCHIVE

- 2.5.1 A full professional archive has been compiled in accordance with the project WSI (*Appendix I*), and in accordance with current IfA and English Heritage guidelines. The paper and digital archive will be deposited in the Lancashire Historic Environment Records (HER) Office, Preston, on completion of the project. The material archive is of no archaeological significance and will not be retained.

3. WATCHING BRIEF RESULTS

3.1 INTRODUCTION

- 3.1.1 The following section provides a detailed summary of the deposits and results of the archaeological watching brief. A full list of the context numbers is detailed in *Appendix 2*.
- 3.1.2 The watching brief commenced on 14th August 2012. The excavation was completed in sections. The topsoil for a 5m wide haul road from Skitham Lane (SD 344450 444200; Fig 2) was removed in a northward direction for approximately 250m (SD 344375 444475). The haul road took a right turn heading east north-east for approximately 250m crossing the Momen Gutter. The haul road once again headed north for approximately 300m until the compound area (SD 344600 444875) Fig 2. The compound was stripped on 31st August 2012. The haul road from the compound to Turbine 2 (SD 344050 444830; Fig 2), including crane and fin pads, approximately 300m in length was completed by 19th September 2012.
- 3.1.3 An area 20m x 16m (SD 344500 445150; Fig 2) was stripped of all topsoil for a substation to a depth of 200mm below ground level, between 19th September 2012 and 24th September 2012.
- 3.1.4 The foundation excavation for Turbine 2 commenced on 20th September 2012 and was completed by the 1st October 2012. The foundation excavation for Turbine 1 commenced 2nd October 2012 and was completed by 9th October 2012. Further topsoil removal to complete a crane pad adjacent to Turbine 1 was carried out on 10th October 2012.
- 3.1.5 Approximately 875m of cable trench, running along the northern edge of the haul road from Turbine 2 fin pad (SD 344150 444740) to Turbine 1, and along the eastern edge of an extant track from the haul road to the substation, was excavated between 16th and 22nd October 2012. The final stage of this cable excavation was carried out on 10th and 11th December 2012.

3.2 RESULTS

- 3.2.1 The watching brief revealed no evidence of the brick clamp that was believed to have been identified in a previous walk over survey (Hyder 2009). Indeed, finds were sparse (see *Section 3.3*).
- 3.2.2 The first feature to be identified on the haul road just off Skitham Lane was a very regular-shaped pit (**104**) (Figs 2 and 3, and Plates 1 and 2) cut through dark greyish-brown topsoil (**101**) and natural light reddish-orange sand (**102**). The pit measured 2m long by 0.6m wide, with clean-cut horizontal sides at the top. The depth was 1.1m filled by a sandy deposit (**103**; Fig 3 and Plate 1) containing lenses of topsoil (**101**). This presence of soiled sandy backfill suggests it was the result of a probable test pit or similar modern excavation.



Plate 1: Test pit, **104**



Plate 2: South-facing section through pit **104**, showing deposit **103**

3.2.3 A second feature was identified in the lower elevated peaty deposit (**105**) along the haul road between Turbines 1 and 2. This sub-rectangular shallow pit (**107**; Figs 2 and 3, and Plate 3) measured 2m by 0.75 m and 0.16m deep. The loose backfill, a dark reddish-brown peaty-silty-sand, contained a single

small animal bone, possibly chicken (Steve Rowland pers comm). This feature is unlikely to be of any great antiquity, and is possibly a machine scrape or rut left by agricultural machinery in recent times.



Plate 3: North-facing section through machine scrape **107**, showing fill **108** and peat **105**



Plate 4: Cable trench cut into base of Turbine 1 showing clay deposit **110**, and blue/grey estuarine clay **109**

- 3.2.4 The positions of Turbines 1 and 2 (Fig 2) were excavated to a depth of 2.95m below current ground level. The base of the excavations revealed an estuarine clay horizon (**109**; Plate 4), which was overlain by a 0.35m deep layer of mid reddish-brown clay (**110**; Plate 4) containing organic fibrous material, possibly rooting from the early peat formations or organic deposits resulting from fluctuations in estuarine sea levels. There were no finds or features of archaeological interest in the turbine foundation excavations.



Plate 5: Oblique view of north/south-aligned palaeochannel **III** in section, with deposits **II2** and **II3** visible

- 3.2.5 A possible palaeochannel (**III**; Plate 5) was identified whilst excavating the cable trench to the substation. This feature had a width of 16m but the depth was not defined, mainly due to water ingress, but also because the base was not visible within the limit of excavation. This feature contained a secondary deposit (**II2**; Plate 5) consisting of dark brownish clayey-silt with a thickness of 0.24m sealed by a 0.2m thick layer of peat (**II3**; Plate 5), which was the same as **105**.
- 3.2.6 The final feature to be identified was a linear ditch (**II5**; Figs 2 and 3, and Plate 6). This 1m deep feature measured 2.3m wide, and was cut into the natural boulder clay, **II4**, and a shale or alluvial deposit, **II7**. The feature was only visibly defined in the north-facing section, as the south-facing section appeared to have suffered truncation by a tree throw/bowl. The fill **II6** (Fig 3 and Plate 6) was a mixture of backfilled natural clay (**II4**) and topsoil (**101**). There were no finds of archaeological significance within the ditch deposit or the overlying topsoil (**101**). This feature lies within an area previously identified (OA North 2004) as containing possible marl pits, and it is feasible that this feature is associated with clay extraction.



Plate 6: North-facing section through ditch **115**, showing fill **116**, natural clay **114**, and shale **117**

3.3 FINDS

3.3.1 Only three objects were recovered in the course of the works. One is a large horseshoe from topsoil **101**, which is of relatively recent form and it most likely to be of twentieth-century date. A single body fragment of refined white earthenware pottery is likely to be of similar date, and certainly could not be earlier than the mid-nineteenth century. The third find is a single animal bone from the fill (**108**) of probable agricultural cut **107**. The finds are effectively of no archaeological significance.

3.4 PALAEOENVIRONMENTAL ASSESSMENT RESULTS

3.4.1 The plant remains identified in the two samples (Samples 1 and 3) from peat deposit **105** are characteristic of that seen in a cottongrass (*Eriophorum*) and sedge (*Carex*) peat, with wood fragments and ericaceous remains, including cross leaved heath and cranberry (*Vaccinium oxycoccus*). This type of peat is widespread in the Over Wyre area of Lancashire (Middleton *et al* 1995). Only a few seeds were identified in the two samples and the bulk of the material was organic debris.

3.4.2 Sample 2, from the fill, **108**, of a probable agricultural cut, **107**, contained amorphous plant remains and frequent small wood fragments, together with some cottongrass. The plant remains were extensively humified, and the fill deposit had some characteristics of a buried organic soil with large quantities of very fine organic and minerogenic material. A number of unknown seeds were recorded in fill **108** and are possible seeds of crowberry (cf *Empetrum*

nigrum), which grows on peaty and rocky moors, bogs and mountain tops (Stace 2010), the latter clearly unlikely at this site.

- 3.4.3 Palaeochannel fill, **112** (Sample 4) was a sandy deposit with amorphous plant remains, rooty material, wood and charcoal fragments, and insect remains. There were also quite large numbers of rush (*Juncus*) seeds, with relatively frequent charcoal fragments present.
- 3.4.4 The two remaining samples, a peat deposit, **113**, sealing **112** (Sample 5), and a backfill deposit, **116**, of ditch **115** (Sample 6) contained little in the way of organic remains. Peat deposit **113** did contain a higher number of amorphous plant remains, and wood and charcoal fragments than **116**, but they were not frequent.

Sample number	1	2	3	4	5	6
Context number	105	108	105	112	113	116
Matrix components						
Amorphous plant remains	++	++	++	++	+	+
Monocotyledenous remains	++	++	++			
Rooty material				+	+	+
Wood fragments	++	++	++	+	+	
Roundwood	++		++		+	
Charcoal		+		+	+	
<i>Sphagnum</i> leaves - bog moss	+	+	+			
Fungal scerotia				+		
Stem bases sedges/grasses/rushes			+			
Leaf fragments						
Insect remains	+	+		+		
Earthworm egg cases		+				
Sand/gravel				++		
Silt/clay		++				
Brick fragments ?		+				
Identifiable plant remains						
<i>Alnus glutinosa</i> seed - alder		+				

<i>Betula</i> seed - birch	+		+			
<i>Calluna vulgairs</i> - heather leaves *		+				
<i>Carex</i> nutlets with three sided seeds sedges			+			
<i>Chenopodium album</i> - fat-hen		+				
<i>Erica</i> cf <i>tetralix</i> - cross-leaved heath leaves	++					
<i>Eriophorum</i> stems - cottongrasses	++					
<i>Juncus</i> sp - rushes				++		
Poaceae with seeds 2-4mm - grasses			+			
<i>Stellaria</i> cf <i>palustris</i>		+				
<i>Urtica dioica</i> - common nettle			+			
<i>Vaccinium oxycoccus</i> - cranberry leaves	+					
Unknown seeds		+	+			

Table 1: Assessment of the plant remains, recorded as present + or frequent ++

- 3.4.5 The plant remains recorded in the bulk samples are similar to those identified during the gross stratigraphic survey of Over Wyre (Middleton *et al* 1995). The plant remains in the peat deposit **105** appear similar to the cottongrass (*Eriophorum*)/sedges (*Carex*) and heather/heath (*Calluna/Erica*) peats recorded at Fenton Cottage, Winmarleigh Moss and Brook Farm, and many other coring sites above the fen car peat (*ibid*, Wells *et al* 1997). The earliest cottongrass/sedge and heather/heath peats that had been recorded were from the late Neolithic, but they also appear at various other, more recent times, in the past when climatic conditions became drier.
- 3.4.6 The only other sample with any significant plant remains was fill **108**. The plant remains are characteristic of cottongrass, sedge and heather/heath peat with wood fragments but with a high minerogenic content. Fill **108** is possibly a buried organic soil and, without scientific dating, it is not possible to accurately ascertain its age, except that it is more than likely to be post-Neolithic as Pilling Moss was only formed after the Lytham VI marine transgression (Tooley 1978, Middleton *et al* 1995, Wells *et al* 1997).
- 3.4.7 There is no potential for further analysis of the samples.

4. CONCLUSION

4.1 DISCUSSION

- 4.1.1 The mossland of this area, consisting of deep peaty deposits, has been identified as containing potential artefactual evidence or deposits dating from the Mesolithic period onwards. Fluctuations in sea levels would have deposited estuarine marine sediments from the Mesolithic through to the Early Bronze Age in the general area. However, Pilling Moss, specifically, was formed after the Neolithic period. The topographically-higher, drier land, with clay sub-strata had the best potential to yield significant archaeological remains as this would have provided islands for settlement overlooking the wetter, low-lying areas that would have provided attractive hunting grounds, such as that of the site. However, although deeply-stratified, well-preserved peat deposits were evident, no finds of archaeological significance were identified.
- 4.1.2 Despite the low level of archaeological findings from the watching brief it is suggested that any further work in and around the site should be subject to additional archaeological investigation given the high archaeological potential for surviving organic remains in the surrounding area.

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ILLUSTRATIONS

FIGURES

Figure 1: Site location map

Figure 2: Location plan of groundworks and archaeological features

Figure 3: Plans and section of features **104**, **107** and **115**

PLATES

Plate 1: Test pit, **104**

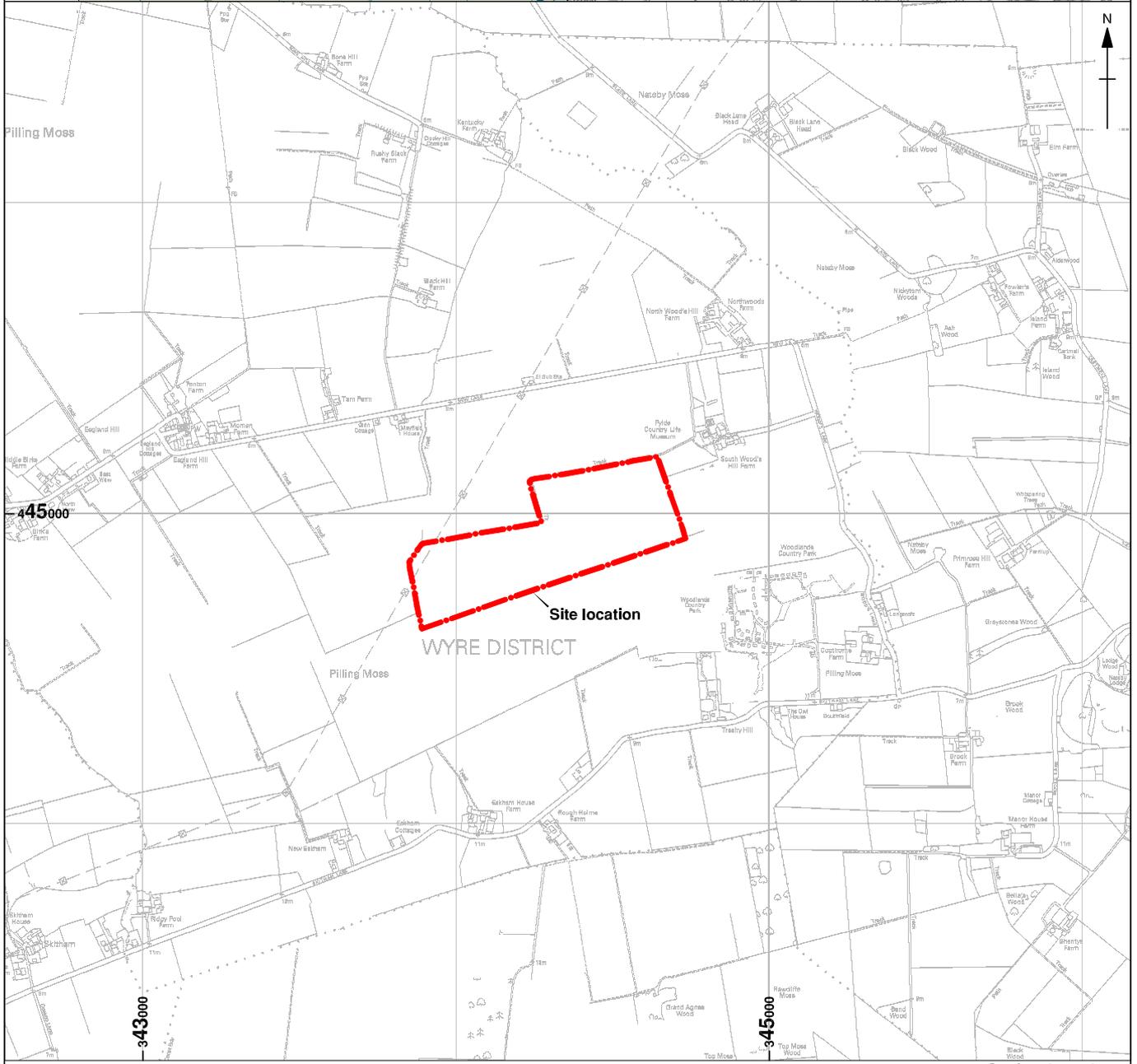
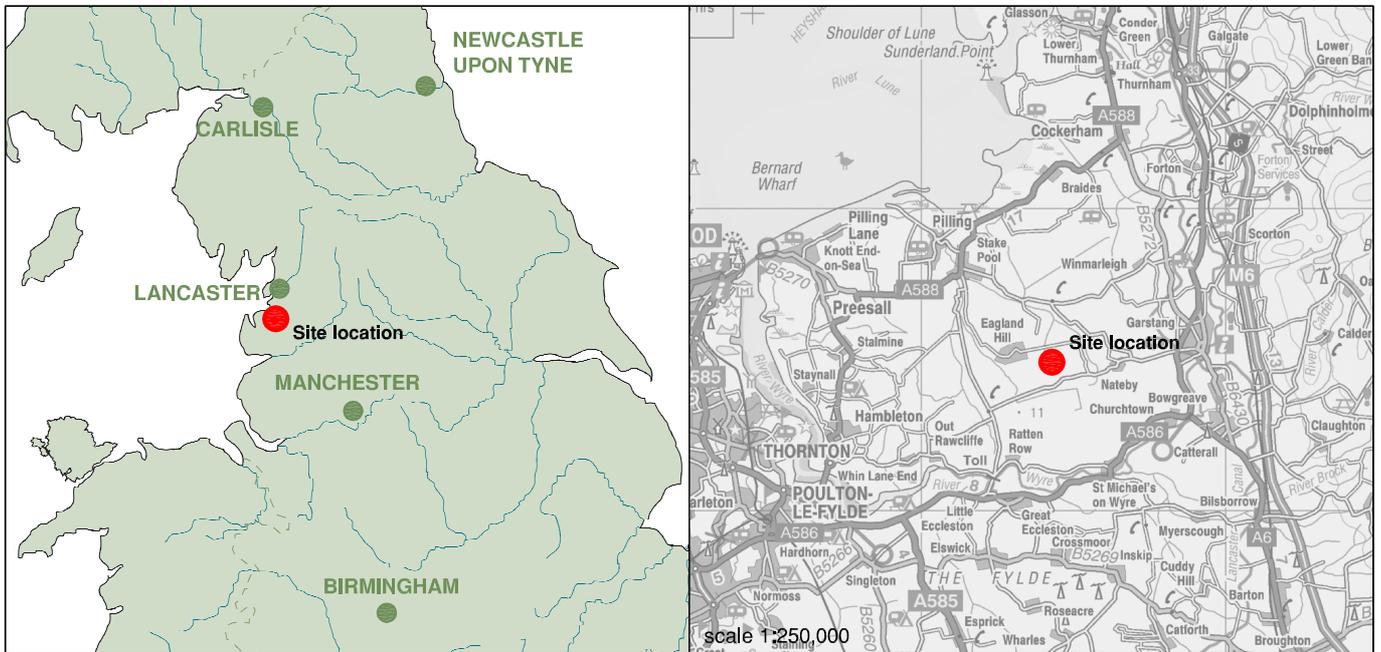
Plate 2: South-facing section through pit **104**, showing deposit **103**

Plate 3: North-facing section through machine scrape **107**, showing fill **108** and peat **105**

Plate 4: Cable trench cut into base of turbine 1, showing dirty clay deposit **110** and blue/grey estuarine clay **109**.

Plate 5: Oblique view of north/south-aligned palaeochannel **111** *in section*, with deposits **112** and **113** visible

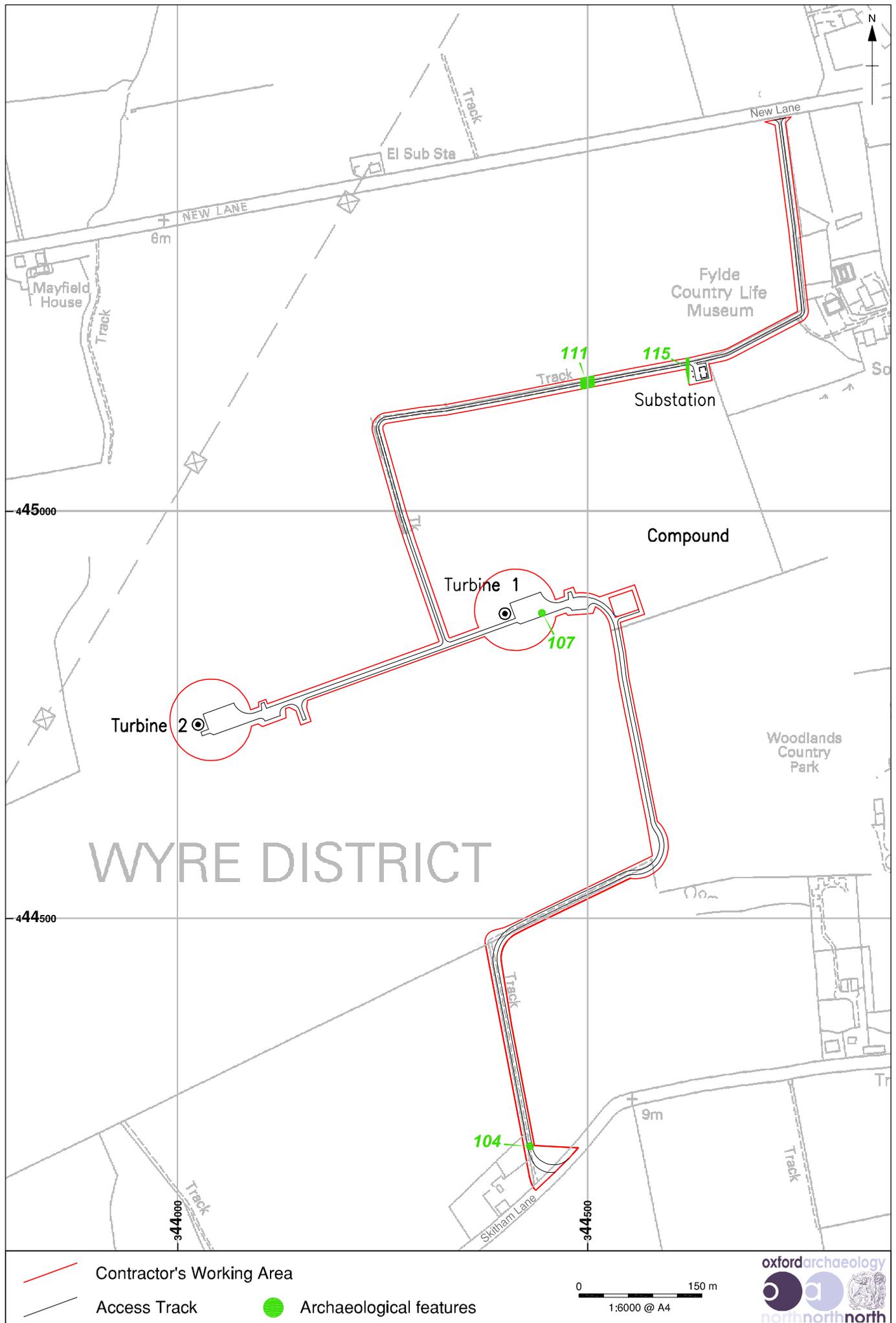
Plate 6: North-facing section through ditch **115**, showing fill **116**, natural clay **114**, and shale **117**



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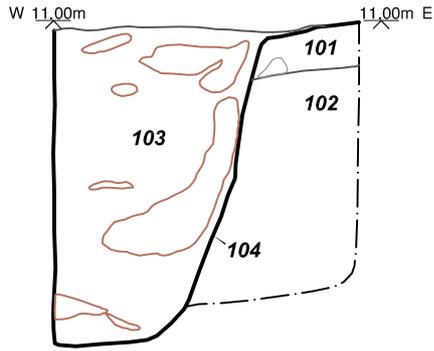


Figure 1: Site location

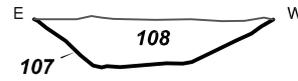


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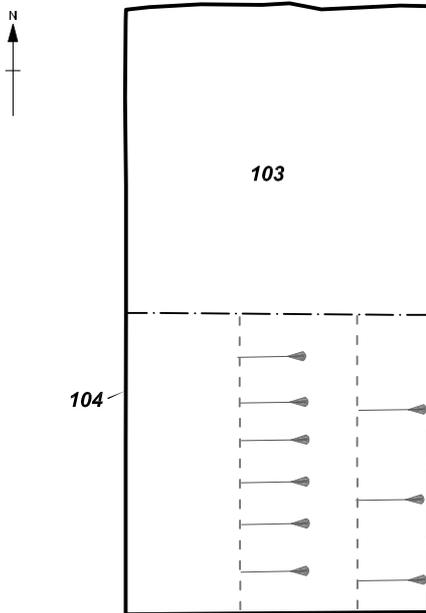
Figure 2: Location plan of groundworks and archaeological features



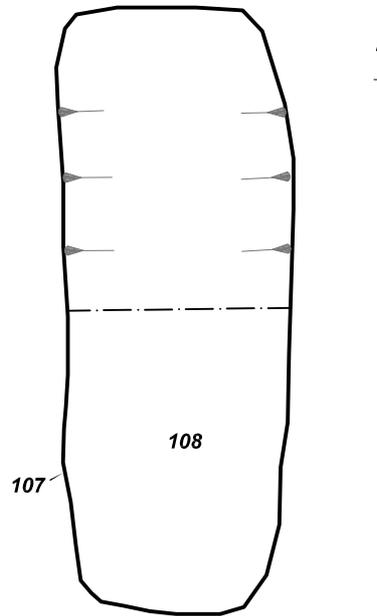
South-facing-section through Pit **104**



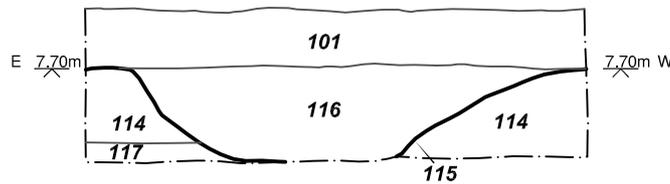
North-facing-section through Pit **107**



Plan of Pit **104**



Plan of Pit **107**



North-facing-section through Ditch **115**

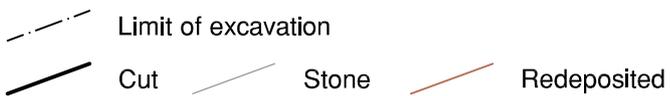


Figure 3: Plans and sections of features **104**, **107** and **115**

APPENDIX 1: WRITTEN SCHEME OF INVESTIGATION

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Following the submission of an Environmental Statement (ES) to accompany the planning application (2/09/00352/FULMAJ) for a proposed wind farm at Orchard End Farm, Pilling, Lancashire (SD 445 449), planning permission has been granted with a number of conditions. One such condition concerned the archaeological potential of the proposed wind farm site, as identified in a desk-based assessment undertaken in 2004 (OA North 2004) and subsequently included as part of the ES (Hyder 2009). The site was part of Pilling Moss until at least the eighteenth century. However, it was improved and enclosed during the nineteenth century, which led to the numerous straight-sided fields now seen across the area. The fact that it was a moss until relatively recently implies that there may be surviving below-ground prehistoric remains of which there is considerable evidence for such activity in the area. Furthermore, there is also evidence for late medieval/early post-medieval activity across the site in the form of possible clay extraction pits and a possible brick clamp. The archaeological potential identified is of local significance.

1.1.2 The archaeological condition, as requested by Lancashire County Archaeology Service (LCAS), is to maintain a permanent presence watching brief during any groundworks associated with the proposed scheme. This requires all soil stripping activities to be undertaken under direct archaeological supervision, using a tracked machine with a toothless ditching blade. The aim is to preserve by record any such archaeological features in mitigation of the proposed wind farm.

1.1.3 REG Orchard End Ltd (hereafter the client) has requested that Oxford Archaeology North (OA North) submit a Written Scheme of Investigation (WSI) in response to the condition, for approval by LCAS, and undertake the required strip, map and sample exercise during groundworks for the construction of the wind farm. However, should significant archaeological remains be identified during the programme of strip, map and sample, it may be necessary to produce an updated project design for a programme of detailed archaeological excavation, archive processing, and post-excavation assessment.

1.2 OXFORD ARCHAEOLOGY NORTH

1.2.1 Oxford Archaeology North has considerable experience of sites of all periods, having undertaken a great number of small and large scale projects throughout Northern England during the past 30 years. Evaluations, assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables.

1.2.2 OA North has the professional expertise and resources to undertake the project detailed below to a high level of quality and efficiency. OA North is an Institute for Archaeologists (IFA) registered organisation, registration number 17, and all its members of staff operate subject to the IFA Code of Conduct (2008).

2 AIMS AND OBJECTIVES

2.1 In accordance with the National Planning Policy Framework (NPPF) '*Local planning authorities should...require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible*' (Para 114, DCLG 2012). Based on the archaeological knowledge of the site to date, and the resultant understanding of the assets' importance (OA North 2004; Hyder 2009), LCAS have advised that a suitable form of mitigation in this instance would be to preserve by record by employing a strip, map and sample methodology. This will identify any buried features and deposits of archaeological significance. The purpose is to consequently

record and investigate a proportion of any such subsoil deposits that may be threatened by the proposed development in a manner that will allow their extent, nature, quality and significance to be identified, and any requirements for more detailed investigation to be established.

2.2 To these ends, the following programme of archaeological work has been designed. The results will provide information as to whether more detailed works are required during the fieldwork or post-excavation stages of the project. The required stages to achieve these ends are as follows:

- **Strip, map and record:** to archaeologically supervise the development-related stripping of soil deposits down to the surface of the underlying natural; to record the position by survey of any archaeological features and deposits revealed; and subsequently sample-excavate a proportion of the identified features and deposits to investigate their quality, extent and significance. Thereafter, any further appropriate programme of detailed investigation can be agreed upon and devised accordingly.
- **Report and archive:** a written and illustrated report will present the results of the archaeological investigation. It would make an assessment of the significance of the data generated by this programme within a local and regional context and will make recommendations for any appropriate schemes of analysis.

3 METHOD STATEMENT

3.1 STRIP, MAP AND SAMPLE

3.1.1 **Overview:** the programme of archaeological work will accurately record the location, extent, and character of any surviving archaeological features and/or deposits within the area of the proposed groundworks. A permanent archaeological presence will be maintained during the stripping of all topsoil and any subsoil deposits during the developmental groundworks for the purpose of construction, down to the upper surface of the natural boulder clay geology, or to the limit of development excavation, whichever is uppermost.

3.1.2 **Plant:** as part of the archaeological condition set by LCAS, the groundworks under archaeological supervision must utilise a tracked mechanical excavator fitted with a wide (preferably a minimum 1.8m) toothless ditching bucket. The machine can be as large as is considered appropriate by the groundworks contractor, but it must be capable of sensitive excavation. All mechanical excavators will operate under the supervision of suitably experienced archaeologists, the number of whom will be dictated by the number and dispersal of the operating excavators. Dumpers may be used for the removal of arisings, but they, together with any other plant running between the compound and point of excavation, must run along clearly defined areas of pre-stripped underlying natural or haul roads that have been shown to have no buried archaeological remains. The stripping of these routes would conform to the guidelines presented below (*Section 3.1.3*). Plant should never run across areas of ground that have been stripped of topsoil and any subsoil until the area has been inspected and cleared by the attending archaeologist.

3.1.3 **Stripping techniques:** the following guidance should be observed at all times, but should not have a massive impact on the resources required for the initial stripping of the site. The topsoil can be removed by as many 'takes' of the bucket as is seen appropriate by the machine driver, but the final 'take' should aim to leave a smooth, even and clean surface, with a minimum of smearing, polishing and rutting, across a wide area which can then be inspected by the attendant archaeologist for any features of archaeological interest. The archaeologist will also monitor the exposed soil in order to collect any topsoil finds. Where there is a subsoil interface horizon above the surface of the natural boulder clay, this too will be removed by machine, ensuring that the final 'take' leaves the uppermost surface of the boulder clay smooth, even and clean, with a minimum of smearing, polishing and rutting. It is assumed that the contractor will not want to mix topsoil and any subsoil, and that a significant proportion of the site will be stripped of topsoil before subsoil is removed. However, if this is not to be the case, an area of at least 10m square should be stripped of topsoil, before it is stripped of any subsoil.

- 3.1.4 The surface of the underlying natural will again be inspected for archaeological finds. It should be borne in mind that over the course of several days, archaeological features can ‘weather-out’ and become visible as the minerals within their fills oxidise (i.e. rust) upon exposure to the air. This means that features such as ditches, pits and the gullies of timber houses may only be visible after several days. For these reasons, it may be some days before an archaeologist is able to clear seemingly archaeologically blank areas of the site.
- 3.1.5 **Archaeological supervision and discoveries:** as indicated, one or more archaeologist will supervise the machining. Should archaeological remains be identified, the archaeologist will stop the machine in order that they can make an examination. In the very rare event that the findings are extremely fragile, the archaeologist may cease excavation within that part of the site, and move the machine to another area, where it can resume supervised works. Ordinarily, the archaeologist will utilise the machine to strip the soil from around the feature of archaeological interest, gradually expanding this area until the limits of the archaeological find are defined.
- 3.1.6 A different methodology may be required on top of the peat. Here, it may be necessary to employ a lighter machine that can run on the surface of the peat, and commence gradual excavation, in spits as prescribed for the peat (*Section 3.2.5*) down to the level of the archaeological remains.
- 3.1.7 Should any archaeological features or deposits be identified, either as a result of stripping, peat removal, or weathering out, they will be demarcated with netlon fencing or barrier tape. These areas should not be transgressed. Along with the client, LCAS will be informed of the discovery of the features, and will be kept abreast of the results of subsequent exploratory investigations. Putative archaeological features and/or deposits identified, together with the immediate vicinity of any such features, will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the soil conditions. These features will be planned using a differential GPS, which is accurate to +/- 0.25m, or Total Station. Altitude information will be established with respect to Ordnance Survey Datum. A selection of the features will be sample-excavated in order to ascertain depths, state of preservation, complexity, function, date and significance.
- 3.1.8 All such investigation of intact archaeological deposits will be exclusively manual. Selected discrete features, such as pits and postholes, would be subject to 50% examination (i.e. half-sectioned), linear features will be subject to a 25% sample where the fill is found to be non-uniform, and 10% where the fill is uniform, and extensive layers will, where possible, be sampled by partial rather than complete removal. It is hoped that in terms of the vertical stratigraphy, maximum information retrieval will be achieved through the examination of sections of cut features. All excavation will be undertaken with a view to avoiding damage to any archaeological features, which appear worthy of preservation *in situ*.
- 3.1.9 **Recording Strategy:** all information identified in the course of the site works will be recorded stratigraphically, using a system adapted from that used by Centre for Archaeology Service of English Heritage, with sufficient pictorial record (plans, sections, and digital photography) to identify and illustrate individual features. Primary records will be available for inspection at all times. Results, comprising a full description and preliminary classification of features or materials revealed, will be recorded on *pro-forma* context sheets, and will be accompanied with sufficient pictorial record to identify and illustrate individual features. Sections will be generated and features will be planned accurately at appropriate scales. An indexed photographic record, utilising digital imaging, will be undertaken simultaneously and all frames will include a visible, graduated metric scale. The site archive will include both a photographic record and accurate large scale plans and sections at an appropriate scale (1:50, 1:20 and 1:10). All artefacts and ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute for Archaeologists guidelines) in order to minimise deterioration.
- 3.1.10 **Significant archaeological findings:** should remains of high archaeological significance be encountered, it is likely that a more formal process of excavation and a revision to the present project design would be required. This will more accurately reflect the nature of the discovery,

and the attendant academic aims and objectives, both in terms of the fieldwork requirements, and of the post-excavation programme, which may include detailed analysis and publication. All such works would be submitted to the client as a variation to the present scope of works.

- 3.1.11 **Treatment of finds:** all finds will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines, in this case the Museum of Lancashire. All identified finds and artefacts will be retained, although certain classes of building material can sometimes be discarded after recording if an appropriate sample is retained on advice from the recipient museum's archive curator.
- 3.1.12 **Treasure:** any gold and silver artefacts recovered during the course of the excavation will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.
- 3.1.13 **Human Remains:** any human remains uncovered will be left *in situ*, covered and protected. No further investigation will continue beyond that required to establish the date and character of the burial. LCAS and the local Coroner will be informed immediately. If removal is essential, the exhumation of any funerary remains will require the provision of a Ministry of Justice licence, under section 25 of the Burial Act of 1857. It is likely that the discovery of human remains will necessitate a revision to this project design and to the present agreed resources. The removal of human remains will be carried out with due care and sensitivity under the environmental health regulations.
- 3.1.14 **Environmental sampling:** the recovery of adequate samples of environmental material can provide useful information for an understanding of processes acting upon the site and for placing the site within a wider ecological context. Bulk sediment samples of *c* 40 litres will be collected from any suitable (undisturbed, uncontaminated and of non-modern origin) deposits or features of demonstrable anthropological origin for the recovery of plant and faunal remains.
- 3.1.15 **Samples for absolute dating:** should deposits, or material within deposits, suitable for radiocarbon assay be encountered, samples will be taken wherever possible. These would include well-stratified artefacts and ecofacts, but also suitable material collected from environmental samples through flotation and, in the case of ceramics, from any bulk sieving, wet sieving and hand-collection. Samples for archaeomagnetic dating would be taken in conjunction with specialist advice if any core structural stones demonstrably associated with hearth, kiln or furnace features were identified during the course of siteworks.
- 3.1.16 **Welfare facilities:** it is assumed that OA North would have access to such facilities that are available to the groundwork contractors. However, where this is not possible, OA North can hire appropriate welfare facilities, with all costs, including those for delivery, collection, maintenance, cleaning, fuel and water, charged to the client as an agreed variation.
- 3.1.17 **Fencing/hoarding requirements:** the requirement for, and nature of any, fencing of the evaluation trenches will be established in consultation with the client prior to the commencement of the evaluation. Where fencing were not required, open trenches will be demarcated along their long edges by spoil heaps, and at their short ends by orange netlon fencing. Should the hire and erection of heras fencing or similar by OA North staff be required, costs for manpower and materials can be included as an agreed variation.

3.2 REPORT

- 3.2.1 One bound copy, together with a digital copy on CD, of the final report will be submitted to the client within eight weeks of the completion of the present scope of fieldwork. One digital copy will be forwarded to LCAS. The report will include:
- a site location plan related to the national grid;
 - a front cover to include the planning application number and the NGR;

- the dates on which the work was undertaken;
- a concise, non-technical summary of the results;
- an explanation to any agreed variations to the WSI, including any justification for any analyses not undertaken;
- a description of the methodology employed, work undertaken and results obtained;
- plans and sections at an appropriate scale showing the location and position of deposits and finds located;
- photographs as appropriate;
- a list of and dates for any finds recovered and a description and interpretation of the deposits identified;
- a description of any environmental or other specialist work undertaken and the results obtained;
- a summary of the impact of the development on any archaeological remains and, where possible, a model of potential archaeological deposits within as-yet unexplored areas of the development site;
- the report will also include a complete bibliography of sources from which data has been derived;
- a summary of the archive.

3.2.2 This report will be in the same basic format as this project design. Recommendations concerning any subsequent mitigation strategies and/or further archaeological work following the results of the field evaluation will not be included in the report, but can be provided in a separate communication.

3.2.3 **Confidentiality:** all internal reports to the client are designed as documents for the specific use of the client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.

3.3 ARCHIVE

3.3.1 The results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). The project archive will include summary processing and analysis of all features, finds, or palaeoenvironmental data recovered during fieldwork, which will be catalogued by context.

3.3.2 The deposition of a properly ordered and indexed project archive in an appropriate repository is essential and archive will be provided in the English Heritage Centre for Archaeology format and a synthesis will be submitted to the Lancashire Historic Environment Records (HER), Preston (the index to the archive and a copy of the report). OA North practice is to deposit the original record archive of projects with the appropriate Record Office (in this instance, that at Preston).

3.3.3 All artefacts will be processed to MAP2 standards and will be assessed by our in-house finds specialists. The deposition and disposal of any artefacts recovered in the evaluation will be agreed with the legal owner and an appropriate recipient museum, in this case the Museum of Lancashire. Discussion regarding the museum's requirement for the transfer and storage of

finds will be conducted prior to the commencement of the project, and LCAS will be notified of the arrangements made.

3.3.4 **OASIS:** an OASIS form will be completed as part of the works.

4 HEALTH AND SAFETY

4.1 OA North provides a Health and Safety Statement for all projects and maintains a Company Safety Policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). A written risk assessment will be undertaken in advance of project commencement and copies will be made available on request to all interested parties. OA North will liaise with the client/main contractor to ensure all current and relevant health and safety regulations are met. All OA North site staff are CSCS accredited and would adhere to all of the client's health and safety regulations.

4.2 Full regard will, of course, be given to all constraints (services etc) during the fieldwork as well as to all Health and Safety considerations.

4.3 **Contamination:** any contamination issues must also be made known to OA North in order that adequate PPE can be supplied prior to commencement. Should any presently unknown contamination be discovered during excavation, it may be necessary to halt the works and reassess the risk assessment. Any specialist safety requirements may be costed as a variation.

4.4 **Insurance:** OA North has professional indemnity to a value of £2,000,000, employer's liability cover to a value of £10,000,000 and public liability to a value of £15,000,000. Written details of insurance cover can be provided if required.

5 OTHER MATTERS

5.1 WORK TIMETABLE

5.1.1 **Strip, map and record:** the duration of the strip, map and record is dependent on the programme for the client's groundworks contractors, together with the time required to investigate any archaeological features.

5.1.2 **Report and archive:** approximately six to eight weeks will be required for the compilation of the report following the completion of the fieldwork, although an interim statement can be forwarded within one to two weeks if required.

5.2 STAFFING PROPOSALS

5.2.1 The project will be under the overall charge of **Emily Mercer** (OA North Project Manager) to whom all correspondence should be addressed.

5.2.2 The programme of fieldwork will be undertaken under the direction of one or more OA North field staff highly experienced in this type of fieldwork. Health and Safety advice will be provided by Murray Cook (OA North Project Manager).

5.2.3 The processing, assessment and analysis of any environmental samples would be undertaken under the auspices of Elizabeth Huckerby (OA North Environmental Manager). Elizabeth has unparalleled experience of the environmental archaeology of the North West.

5.2.4 Assessment of any finds from the excavation will be undertaken by OA North's in-house finds specialist Christine Howard-Davis (OA North Finds Manager). Christine has extensive knowledge of all finds of all periods from archaeological sites in northern England, and is a recognised expert in the study of post-medieval artefacts.

5.3 PROJECT MONITORING

5.3.1 Monitoring of the project will be undertaken by LCAS, who will be afforded access to the site at all times.

BIBLIOGRAPHY

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Standing Conference of Archaeological Unit Managers (SCAUM), 1997 *Health and Safety for Field Archaeologists Manual*, 3rd Edition, Southampton

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APPENDIX 2: SUMMARY OF DEPOSITS

Context	CATEGORY	FORM	DESCRIPTION
101	Deposit	Layer	Topsoil
102	Deposit	Layer	Natural sand
103	Deposit	Fill	Mixture of natural sand 102 and topsoil 101 used to backfill modern pit 104
104	Cut	Pit	Modern regular-shaped rectangular pit
105	Deposit	Layer	Peat deposit
106	Deposit	Layer	Natural boulder clay, mid yellow-orange
107	Cut	Pit	Machine scrape or agricultural indent
108	Deposit	Fill	Fill of 107
109	Deposit	Layer	Natural alluvial estuarine silt deposit. Light blue-grey sandy-silt containing 75% well-sorted rounded pebbles
110	Deposit	Layer	Dirty alluvial silt, containing organic inclusions. Possibly from early Holocene sea level fluctuations
111	Cut	Linear	Possible palaeochannel
112	Deposit	Fill	Early sealing deposit in palaeochannel 111 . Dark brownish-grey, wet clayey-silt
113	Deposit	Fill	Peat deposit sealing 112
114	Deposit	Layer	Natural boulder clay. Mid orange-red
115	Cut	Linear	Linear ditch
116	Deposit	Fill	Mixture of natural clay (114) and topsoil (101) backfill of ditch 115
117	Deposit	Layer	Dirty wet alluvial/shale layer. Possible lens within natural clay 114