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Awel y Môr Onshore Denbighshire

Outline Written Scheme of Investigation for Archaeological Investigation

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Awel y Môr Onshore Denbighshire

Outline Written Scheme of Investigation for Archaeological Investigation

1 INTRODUCTION

1.1 Project and planning background

1.1.1 Wessex Archaeology has been commissioned by GoBe Consultants Ltd on behalf of Awel y Môr Offshore Wind Farm Limited ('the Applicant'), to produce an outline written scheme of investigation (WSI) that sets out the in-principle measures which will be implemented for proposed archaeological investigations to be completed prior to the construction of the proposed Onshore elements of the Awel y Môr Offshore Windfarm (AyM), a sister project to Gwynt y Môr Offshore Wind Farm. This is an outline document that, by reference to the assessments reported in the Environmental Statement (ES), sets out the key elements that will be secured in the final WSI which will be agreed with Denbighshire County Council (DCC), in consultation with Clwyd Powys Archaeological Trust (CPAT) prior to any construction works commencing, following a successful Development Consent Order Application. The Awel y Môr Offshore Windfarm is proposed off of the coast of North Wales at Rhyl and the Onshore construction activities will be located within the Order Limits (OL) shown on **Figure 1**, which extend from the coast at Rhyl to the National Grid Substation to the south east of Bodelwyddan.

1.1.2 This outline WSI has been prepared as part of the submission of the Development Consent Order application for a Nationally Significant Infrastructure Project (NSIP) to be submitted to the Secretary of State. The final WSI will be submitted to the Secretary of State as soon as practicable after the DCO is made.

1.2 Scope of document

1.2.1 This outline WSI covers two main elements. The first part sets out the aims of the post-consent archaeological investigations, and the methods and standards that will be employed. At present these works comprise archaeological trench evaluation for the onshore works, which are designed to inform the nature and extent of further archaeological mitigation. This part also includes aims and methodologies for geoarchaeological boreholes. In format and content, it conforms to current best practice, as well as to the guidance in *Management of Research Projects in the Historic Environment* (MoRPHE, Historic England 2015a) and the Chartered Institute for Archaeologists' (CIfA) *Standard and guidance for archaeological field evaluation* (CIfA 2014a).

1.2.2 Archaeological trial trench evaluation is required to sample the length of the onshore elements of the project to assess the potential for archaeological remains to be present, and to inform any further mitigation which might be required. A focused pre-consent trial trenching campaign had been planned for Q4 2021/Q1 2022 but due to weather and ground conditions this was not achievable; in agreement with CPAT this WSI therefore provides the detailed scope of the proposed works which are now planned for the post-consent/pre-construction phase of the project. The purposive geoarchaeological borehole survey is required to map and characterise the superficial geological deposits across the foreshore

and around the River Clwyd, identifying areas of geoarchaeological and archaeological potential.

- 1.2.3 The second part of this document comprises a Further Mitigation Strategy. This is a high level approach outlining the approaches to achieving preservation by record where harm is unavoidable and the protocols to be followed with regard to further assessment, mitigation and monitoring during detailed design and construction. It is intended that any further mitigation works would have their own Detailed WSIs which will specify their nature, location and scope.
- 1.2.4 This document will be submitted to the Development Control Archaeologist at the Local Planning Authority (currently Clwyd-Powys Archaeological Trust (CPAT) on behalf of DCC) for approval.

1.3 Location, topography and geology

- 1.3.1 The northern extent of the onshore Export Cable Corridor (ECC) makes landfall on the beach between Rhyl and Prestatyn. To the south of the coastal area beyond the sea wall is the Rhyl Golf Course, Holiday Park and the railway. To the south of the railway embankment is an area of low lying poorly drained ground with a number of drainage ditches cut through it. The route steadily inclines to the south to a height of around 15m aOD near Rhydorddwy Goch Farm and then gradually drops away again towards the River Clwyd to approximately 3m aOD. On the southern side of the River Clwyd the land begins to rise again to approximately 11m aOD close to Pengwern, and continues to rise to the south to approximately 21m aOD at Faenol-Bropor. The southern part of the onshore ECC to the north and south of Glascoed Road lies between 48-58m aOD.
- 1.3.2 The northern part of the onshore ECC is characterised by small fields bound by drainage ditches reflecting the low-lying nature of the landscape and the need for suitable drainage. This is less apparent in the southern part of the onshore ECC particularly as the land rises out of the river valley where the land is better drained.
- 1.3.3 Following the end of the last ice age, sea levels began to rise as the ice sheets retreated, and as such there were many periods of marine transgression and regression forming landsurfaces during the stable periods which frequently became inundated. This formed Holocene peat deposits which have been known to become exposed on the foreshore at Rhyl which can provide preservation of organic and palaeoenvironmental remains. Peat deposits, tree stumps and a log were observed during the foreshore walkover survey in December 2021 and are discussed in more detail below.
- 1.3.4 Due to the length of the onshore ECC and the changing environment, low lying coastal areas to higher inland areas, the superficial geology of the route is varied. The northern part of the route, at the landfall in Route Section A (Route Sections are shown on **Figure 1**), are Marine Beach deposits of sand. Route Section B is underlain by Tidal Flat deposits of clay, silt and sand in its northern part and Devensian till deposits in its southern part. Route Section C is largely underlain by Devensian till deposits with areas of Devensian Glaciofluvial sheet deposits of sand and gravel around Bryn Cwnin Farm. The northern part of Route Section D is a mix of Devensian Glaciofluvial sheet deposits, Devensian till and Tidal Flat Deposits. The southern part of Route Section D and the northern part of Section E around the River Clwyd are Tidal Flat Deposits. The southern part of Route Section E and the entirety of Route Sections F and G are underlain by Devensian till deposits.
- 1.3.5 Bedrock geology across the northern part of the route comprises Permian Rocks of interbedded sandstone and conglomerate with the southern part of the route comprising

Warwickshire group siltstone, sandstone and subordinate mudstone (British Geology Viewer).

2 CONSULTATION

- 2.1.1 During the development of the Awel y Môr project application consultation has been undertaken on the archaeological aspects of the Environmental Impact Assessment (EIA), which included a commitment to present an outline WSI with the final Development Consent Order (DCO) application. Complete records of the consultation undertaken are presented in the relevant chapter of the Environmental Statement, however a brief record of consultation specifically in the context of this WSI is presented here for ease of reference.
- 2.1.2 Between November 2021 and February 2022 consultation was undertaken via correspondence with representatives of CPAT. The consultation focussed on a proposed pre-application trial trenching campaign, including the scope and contingency measures should the campaign not mobilise successfully. Initial agreement was reached via email on the 16th December, with a final photographic record of inadequate ground conditions issued on the 3rd February 2022; each mobilisation was preceded by a site condition evaluation the week prior to mobilisation, the 2nd February evaluation preceding anticipated mobilisation on the 7th February.
- 2.1.3 Communications between representatives of the Applicant and representatives of CPAT confirmed that in the event of access or ground conditions being inadequate the campaign could be deferred to the post-consent phase. Pre-requisites of the deferral were agreed as including a comprehensive record of attempted mobilisation and evidence base, and a robust WSI to contain the necessary commitments for undertaking the trial trenching campaign and the requisite further mitigation measures post consent and in advance of works commencing.
- 2.1.4 Appendix 1 to this document contains the WSI for the trial trenching campaign, as agreed with CPAT on 19th November 2021, whilst Appendix 6.5.8.5.5 to this document (application ref: 6.5.8.5.5) contains the photographic evidence base confirming ground conditions to not be adequate for trial trench evaluation. The final evaluation conducted on the 2nd February 2022, in advance of the anticipated mobilisation on the 7th February, concluded that conditions remained unsuitable for trench evaluation and future trenching in advance of application would be impeded by concerns raised by the landowner (damage to surfaces risking *Listeria monocytogenes* during the lambing season) and statutory advisers (risk of interaction with emerging Great Crested Newt); this was reported to CPAT on 3rd February.

3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

3.1 Introduction

- 3.1.1 The archaeological and historical background was assessed in a desk-based assessment (Wessex Archaeology 2022a), supplemented by geophysical survey, foreshore walkover survey and watching brief on geotechnical investigations. A summary of the results is presented below, with relevant entry numbers from the Clwyd-Powys Archaeological Trust (CPAT) Historic Environment Record (HER) and the National Heritage List for England (NHLE) included where relevant. Additional sources of information are referenced, as appropriate. Route Sections mentioned below are shown on **Figure 1**.

3.2 Previous investigations related to the proposed development

Geophysical Survey (2021)

- 3.2.1 Geophysical survey (detailed gradiometer survey) was undertaken along the route of the Onshore ECC and the Substation. This covered an area of approximately 121ha (Wessex Archaeology 2022).
- 3.2.2 Route Section A comprises the foreshore area and as such was excluded from the survey. Geophysical survey results from within Route Section B to the south of the railway line revealed a probable former field boundary and a number of pit-like features which were interpreted as being of possible archaeological origin. As no intrusive investigation of these features has been undertaken to date, the presence, date and significance of these features is unconfirmed.
- 3.2.3 A number of features of possible archaeological origin were identified through the geophysical survey within Route Section C. A possible enclosure was suggested to the south of Dyserth Road, however it was also noted that due to the weak response this could be as a result of modern ploughing rather than of archaeological origin. It has been suggested that within Route Section C parallel linear trends could be as a result of ridge and furrow cultivation. To the north of Bryn Cwnin Farm possible penannular anomalies which could relate to either Bronze Age ring ditches or an Iron Age to Roman roundhouse were identified. Without further investigation the date and presence of these features is confirmed. To the south of this possible associated linear features were also identified as well as a possible series of pits and to the south west a rectilinear feature was also identified. To the south of Bryn Cwnin Farm further linear and curvilinear anomalies were identified.
- 3.2.4 Further penannular and rectilinear anomalies were identified to the south east of Bryn Cwnin Farm. A number of pit-like features of possible archaeological origin were identified throughout Route Section C.
- 3.2.5 Within Route Section D curvilinear and rectilinear anomalies were identified through the geophysical survey of possible archaeological origin. A number of smaller possible pit-like features were also identified within Route Section D. Without further investigation the presence, date and significance of these features remains unconfirmed.
- 3.2.6 A possible former drain or field boundary was identified within the southern part of Route Section E. Other responses within this section are thought to date to modern services or geological variations
- 3.2.7 Two large parallel curving linear anomalies were identified in the northern part of Route Section E, south of Abergele Road. These may form a boundary feature or an enclosure. Further south within Route Section E to the north east of Fferm, two parallel linear anomalies were identified and to the south west of Fferm a rectilinear anomaly, linear anomalies and a possible pit-like feature were identified.
- 3.2.8 Within the southern part of Route Section E, a number of interconnected linear and curvilinear features were identified during the geophysical survey although this area has now been excluded from the Order Limits (OL). To the south of this, within the OL, a small curvilinear anomaly and a series of small discrete anomalies were identified as possible archaeology. Further south along the route anomalies relating to a possible field system of unknown date were identified.
- 3.2.9 At the southern end of Route Section E, a possible circular anomaly and possible linear anomalies were identified. Further curvilinear, linear and penannular anomalies of possible

archaeological origin were noted to the north east of this, north of Princes Gorse, although this area has now been excluded from the OL.

- 3.2.10 A number of geophysical anomalies of possible archaeological origin were noted at Faenol-Bropor and in the substation area. Semi-circular and linear anomalies were noted east of the entrance to Faenol Bropor and further south a series of semi-circular, rectilinear possible pit alignment and linear features which could be indicative of settlement evidence.
- 3.2.11 To the west of the area for the proposed substation eight possible circular anomalies were identified which could be indicative of Iron Age to Roman roundhouses due to their position close to the known roman road in this area. Numerous other possible linear anomalies surround these features suggesting further settlement evidence. To the east is another concentration of anomalies which are also possible ring ditch anomalies surrounded by a sub-rectangular enclosure. In the southern part of Route Section F, linear anomalies and another possible circular anomaly have been identified.
- 3.2.12 In the northern part of Route Section G, a number of anomalies of possible archaeological origin have been identified including a rectilinear anomaly and an amorphous positive response. Further south, to the south of Waen Meredydd a semi-circular ring ditch and a former field boundary were identified as geophysical anomalies. Linear and curvilinear anomalies of possible archaeological origin were noted further west.

Geoarchaeological Watching Brief (2021)

- 3.2.13 Geoarchaeological monitoring was undertaken upon geotechnical boreholes and test pits in November and December 2021. This comprised monitoring the drilling/excavation of nineteen boreholes and three test pits. No archaeological finds or features were observed during the watching brief, although such remains can be hard to identify within the small areas monitored. Deposits of apparent paleoenvironmental potential were encountered, with the peat deposits in two of the boreholes (BH301 just south of the railway line and BH601 just north of the River Clwyd) signalling the potential for the presence of anaerobic preservation conditions within parts of the proposed route (Wessex Archaeology 2022c).

Inter-tidal Walkover Survey (2021)

- 3.2.14 An inter-tidal walkover survey was carried out in December 2021 at low tide. Historic assets on the foreshore were mapped, described and photographed. These included peat deposits, tree stumps, tree roots, logs and concrete and pillars. Peat deposits were identified upon the foreshore at 5001, 5002, 5003 and 5005 which were in many cases described as being above a layer of clay. Tree stumps, roots and logs were also recorded on the foreshore at 5003, 5006, 5007 and 5008 as further evidence of the fossil forest previously recorded on the foreshore at Rhyl (Wessex Archaeology 2022a).

Trial Trench Evaluation (2022)

- 3.2.15 Trial trench evaluation had been planned for December 2021- January 2022, however due to poor ground conditions, these works have not been able to take place at the time of writing. Weekly site visits took place to assess the Site conditions. These trenches are now proposed to form part of the archaeological works to take place post-consent based upon the final design.

3.3 Archaeological and historical context

Route Section A: Intertidal (MLW to MHW) and Route Section B: Intertidal (MHW) to B4118

- 3.3.1 Recent foreshore surveys undertaken by CPAT in 2018 and by Wessex Archaeology in December 2021 has identified a number of historic assets on the foreshore. Peat deposits were identified upon the foreshore in December 2021 at 5001, 5002, 5003 and 5005 which were in many cases described as being above a layer of clay. Tree stumps, roots and logs were also recorded on the foreshore at 5003, 5006, 5007 and 5008 as further evidence of the fossil forest previously recorded on the foreshore at Rhyl. The proximity of the onshore ECC to the Irish Sea would likely have made this landscape attractive for early prehistoric populations, and there is evidence of Mesolithic and Neolithic settlement at Prestatyn and Rhyl, indicating the exploitation of coastal resources (CPAT 1998, Report no. 266).
- 3.3.2 Archaeological investigations on the beach at Rhyl, to the west of the onshore ECC (CPAT 2019, Report no. 1582) have identified that the existing sea defences have been built on an embankment of medium dense to dense sandy gravel, with a variable cobbles and fine content. The beach sands typically comprised slightly gravelly fine to coarse sands with shell fragments. The underlying geological background beneath this surface consisted of:
- Tidal flat deposits – organic silty clays with subordinate peat and sand layers
 - Glaciofluvial deposits
 - Glacial Till deposits
 - Weathered sandstone
- 3.3.3 Where there were lenses of peat and other organic remains identified within the geology, these have the potential to preserve important evidence relating to coastal change and human activity during the Mesolithic and later prehistoric periods. These types of archaeological remains are expected to run through this section of the onshore ECC.
- 3.3.4 In the wider area, along the coast to the north east, worked flint and chert of Mesolithic date have been recovered from several locations around Prestatyn as well as shell middens of Mesolithic date indicating the consumption of mussels. Mesolithic 'Fossil Forests' have been identified on the Welsh coastline at Rhyl, Borth, Cardigan Bay and Conwy. The Mesolithic fossil forest was first recorded at Rhyl in 1893 and was recorded as 'thirty trees rooted as they grew, whilst there are a number of horizontal trunks which appear to rest as they fell' (North Wales Chronicle, 11 February 1893). The tree stumps were recorded again in 1912 when 200 tree stumps were recorded between Rhyl Pier and halfway between Rhyl and Prestatyn. In 1918, 100 tree stumps were noted (CPAT 2019). During the mid-holocene the forests were present along the coast for around 2000 years, in areas which are now only exposed at low tide and peat beds have been known to outcrop on the foreshore at Rhyl at low tide. Objects dating to the prehistoric periods such as bone, shell and bronze have been found on the Welsh coastline dating to the Neolithic and Bronze Age.
- 3.3.5 The Burbo Bank Offshore Wind Farm Extension onshore cable connection found Bronze Age remains in the northernmost part of the onshore ECC near the shore at Rhyl which comprised mainly boundary ditches and scatters or groups of pits and postholes. It was suggested that domestic structures could be in the vicinity. The gullies were identified as being agricultural in nature and may be an indication of former Bronze Age field boundaries. Many of the pits contained evidence of burning and therefore could be associated with domestic activity. The Bronze Age activity extended across a 2km section of the onshore

ECC suggesting that the activity extended over a large area just in from the present shoreline (Oxford Archaeology 2016).

- 3.3.6 The Agricultural Revolution and associated developments in technological innovation saw the enclosure of the medieval open field system and the construction of more farmstead buildings nationwide. Rhyl Marsh was enclosed in 1842 and the Tithe Mapping indicates that the landscape had been fully enclosed by 1845 (National Library of Wales 2021). This agricultural development is reflected in the development of the Rhyd-wen (or Rhydorddwy-wen) dating to the 17th century and Rhydorddwy Fawr Farmhouse dating to the mid-19th century, to the west and east of the onshore ECC respectively.
- 3.3.7 The existing railway line that runs through Route Section A of the onshore ECC route has been identified on the First Edition Ordnance Survey mapping as the London and North Western Railway (Chester and Holyhead Branch), with historic documentation indicating that the company was merged with the Chester and Holyhead Railway in 1858. It has been in continuous use since then, running through to Rhyl train station (which opened in 1848 and has 2 platforms available for passengers), to the west of the OL.
- 3.3.8 Historic mapping indicates that the rest of this section of the onshore ECC has been part of an extensive agricultural landscape from the mid-19th century to the present, with many of the field boundaries to the south of the railway line having remained intact since at least 1845, when the Rhyl Tithe map was drawn (not replicated). 1910 Ordnance Survey mapping indicates Salam bungalow had been constructed at the edge of the foreshore within the OL. There also seems to have been smaller structures within the north-western boundary of the onshore ECC, which likely indicate outbuildings associated with a small farmstead outside of the onshore ECC. The Rhyl Golf Club is known to have been established in 1890 and is one of the oldest surviving golf clubs in north Wales, although in its early form covered a smaller area to the west of the OL. The course was extended and reopened in 1908 by which time the links extended into the OL. Prior to this this part of the OL comprised small irregular parcels of land bound by drainage ditches.
- 3.3.9 By 1938 Ordnance Survey mapping, there had been further developments to the north of the railway line, with the Rhyl Coast Road constructed by this time, that runs east to west parallel to the railway line that is still used today, as well as shifting field boundaries and the construction of houses to the east of the onshore ECC. There is an undated point for a brewery located close to the eastern boundary of the OL that has been indicated to have been 19th century in date, but there is no historic mapping that suggests it was still extant by the First Edition Ordnance Survey mapping if it was there at all (152294).
- 3.3.10 1960-1963 Ordnance Survey mapping shows the continuation of the Rhyl Golf Links within Route Section A of the onshore ECC, to the north of the Rhyl Coastal Road with the area to the south of the road being turned in the Robin Hood Holiday camp. These areas have continued with these uses up until the present day.
- 3.3.11 LiDAR data covering Route Section A just covers the beach area and no potential archaeological features are identified from the LiDAR data in that area. Some potentially raised areas can be seen within the OL within Route Section B immediately south of the railway line. These may measure between 30-60m across but may be very slight raises as these could not be identified on the Site visit. These may be of natural origin, however, should they be of archaeological origin, their coastal position could suggest that these may have been salterns related to salt making on the coast. No other potential archaeological features were identified from the LiDAR data in Route Section B.

Route Section C: B5118 to A525

- 3.3.12 The proximity of the onshore ECC to the Irish Sea would likely have made this landscape attractive for early prehistoric populations, and there is evidence of Mesolithic and Neolithic settlement at Prestatyn and Rhyl, indicating the exploitation of coastal resources (CPAT 1998, Report no. 266). The absence of extensive prehistoric activity within this landscape could relate to the lack of previous targeted intrusive archaeological investigations, and therefore raises the possibility that there remains a background potential for further, as yet undiscovered archaeological remains within the OL.
- 3.3.13 Romano-British activity is also limited within the north-eastern region of Wales, with research suggesting that there is a lack of evidence of Romano-British settlement patterns and urban centres (Archaeoleg 2003). However, Bryn Cwnin Cropmark (102650) has been interpreted as a Romano-British enclosure located 125m to the south east of the OL. A visit was conducted in 1995 and the site was considered flat with no above ground expression of the cropmark. A 'C' shape cropmark can be seen in this location on the 2006 aerial images however, it cannot be identified on any of the other more recent aerial images. The LiDAR data in this area shows a sub-rectangular feature of unknown origin to the south of the HER point, but this is unlikely to relate to the cropmark. No other possible archaeological features could be identified from the LiDAR in Route Section C. A roman coin was found within the OL in the southern part of Route Section C, at Bryn Cwybr (106448).
- 3.3.14 It is likely that the landscape continued to be predominantly agricultural in nature during the early medieval and medieval periods, made of a regularly formed fields containing ridge and furrow. Ridge and furrow would have been a crucial part of the medieval feudal system where peasant workers were given strips of land by knights and lords of the manors, in exchange for a percentage of their produce for sustenance.
- 3.3.15 Tithe Mapping indicates that the landscape within Route Section C had been fully enclosed by 1845 (National Library of Wales 2021). This agricultural development is reflected in the development of Bryn Cwnin Farm within the southern section of Route Section C. The current farmhouse is Grade II listed and dates to 1820 although fragments of earlier buildings suggest that the farm had been established well before that time. An associated range of farm buildings (also Grade II listed) are thought to date to the late 18th century. The remainder of Route Section C is characterised on the historic maps by small and medium square and rectangular fields with a few pockets of woodland. A number of the fields on the first edition map have small square ponds/depressions. A small number of these are labelled as gravel pits and as such it may be that small scale gravel extraction was taking place in this area. The low-lying nature of the area would have resulted in disused gravel pits filling with water to create ponds.
- 3.3.16 In the later part of the 20th century some of the smaller fields within Route Section C were amalgamated to create larger fields, although the majority of the field layout continued from the end of the 19th century.

Route Section D: A525 to A547

- 3.3.17 There is evidence of early prehistoric evidence within Route Section D, with areas of Mesolithic activity (35030 and 81662) identified situated close to the River Clwyd near Rhuddlan. The river would have provided the natural resources which would have made this landscape attractive for early prehistoric populations. During this period this area would have been 10km inland of the former Mesolithic coastline. As a result of rising sea levels, an estuary formed at the mouth of the River Clwyd between Abergele and Rhyl. Finds from the Rhuddlan area include worked flint, hazelnut shells and other charred plant remains some of which came from small pits.

- 3.3.18 Excavations that took place in the area (35030) in advance of the Rhuddlan bypass identified scatters of flint and chert flakes in a context of brown clay layer containing gravel, as well as timbers, hazelnuts and snail shells in upper grey clay associated with a nearby barrow pit. A Neolithic axe was also found to the east of the onshore ECC at Rhuddlan (102029). Furthermore, excavations at Gwindy Street in Rhuddlan (81662) found a total of 38 flints and charts, tools in which included scarper, fabricator and utilised/retouched pieces. These excavations indicate that there is potential for further as yet undiscovered early prehistoric remains to be present within the OL. In the wider area potential Neolithic occupation sites have been indicated at Prestatyn and Dyserth.
- 3.3.19 The position of Route Section D around the River Clwyd and the proximity of the onshore ECC to the north Welsh coastline, suggests that the landscape would have likely been attractive to these prehistoric populations for its accessibility to natural resources. Across the north-eastern region of Wales, there have been many later prehistoric settlement sites identified purely through cropmarks with little excavation undertaken, and therefore intrusive archaeological works may enhance our understanding of the prehistoric communities in Wales (Archaeoleg 2003).
- 3.3.20 This is supported by the Bronze Age activity within the landscape, which includes excavations that identified domestic refuse tip (55749), as well as a further pit containing pottery (57747) both within the town of Rhuddlan. Furthermore, fieldnames implicitly suggest that there was a Bronze Age cairn (101478) located in the landscape of the southern part of the onshore ECC. Excavations for Burbo Bank Extension Offshore Wind Farm close to the coast at Rhyl also discovered Bronze Age remains. These suggest the presence of a Bronze Age community within the landscape, or at least that the area was visited by communities during the period.
- 3.3.21 An Iron Age enclosure is recorded 230m to the north west of the onshore ECC within Route Section D, this has been identified from aerial photographs and is believed to be a possible defended enclosure (101858; CPAT 2008). Romano-British activity is limited within the north-eastern region of Wales, with research suggesting that there is a lack of evidence of Romano-British settlement patterns and urban centres (Archaeoleg 2003). However Roman remains have been found at Rhuddlan, although the nature of the remains is unclear.
- 3.3.22 Rhuddlan was one of the principal centres of activity in the area during the medieval period. The burh of Cledemutha (the name perhaps derived from 'Clwydmouth;') is documented as having been constructed by Edward the Elder in 921AD. Excavations have revealed that Rhuddlan was enclosed by a large ditch and bank earthwork (the town ditch), may represent the late Saxon Burh. Earlier evidence dating to the Roman period may indicate that Rhuddlan was already an important early medieval centre before the construction of the late Saxon burh.
- 3.3.23 The historic maps marked the Site of the Battle of Morfa Rhuddlan which was a battle between the Welsh and the Saxons in 795, where the Welsh were defeated and their King Carradog was slain by the Saxons. The exact location of the battle is unknown although the label on the 1st edition Ordnance Survey is position over Gipsy Lane which lies within the OL.
- 3.3.24 There have been a number of targeted excavations within Rhuddlan that have been able to trace the development of the town through the medieval period. During the 11th century a much smaller area of Norman occupation was established in the north western corner of the Saxon Burh. A motte and Bailey Castle was also built in 1073AD by Robert of Rhuddlan. After Edward's defeat of an uprising at Rhuddlan in 1277AD, Edward built a large stone

castle in the north western corner of the former Saxon burh and established it as a new town. Around the same period the course of the River Clwyd was straightened by a new channel to allow sea-going vessels access to Rhuddlan from the sea, establishing it as a port. Excavations at Rhuddlan have revealed the remains of a stone-built Norman church, medieval houses and other timber buildings, burgage plots, defensive ditches and pottery kilns.

- 3.3.25 The historic maps show that the area around the River Clwyd was formed of a part marshland and part reclaimed area on the first edition map. By the 2nd edition map the area around the River Clwyd had been entirely enclosed as small irregular fields delineated by drainage ditches. This field layout has continued to the present day.
- 3.3.26 A former branch line of the London and North Western Railway line was aligned to the south of the River Clwyd known as the Vale of Clwyd Branch line. A station was located to the west of the OL south of Rhuddlan at Marsh Lane and another station to the north west known as Foryd Station. Just beyond Foryd Station the line connected to the Chester to Holyhead branch line at Foryd Junction. The line had been established by the 1st edition Ordnance Survey map but by the 1970s Rhuddlan Station is shown to have been removed and the line dismantled. The onshore ECC of the former railway line is now an access track.
- 3.3.27 The LiDAR data covering Route Section D shows a number of natural channels close to the River Clwyd, however no features of potential archaeological origin could be identified to the north of the Clwyd. One field on the southern side of the River Clwyd may show an area of ridge and furrow beyond the limits of the OL.

Route Section E: A547 to A55

- 3.3.28 The absence of extensive prehistoric activity within this landscape could relate to the lack of previous targeted intrusive archaeological investigations, and therefore raises the possibility that there remains a background potential for further, as yet undiscovered archaeological remains within the immediate vicinity of the onshore ECC.
- 3.3.29 Romano-British activity is also limited within the north-eastern region of Wales, with research suggesting that there is a lack of evidence of Romano-British settlement patterns and urban centres (Archaeoleg 2003). However, there has been Romano-British rural settlement identified at Rhuddlan, in close proximity to the River Clwyd, and there is a conjectural Romano-British Road, that runs east to west across the landscape to the south of St Asaph originally connecting Chester to Caernarfon. Due to the proximity to this major routeway, this would suggest that the area through which the onshore ECC is routed would have been a part of the Romano-British agricultural hinterland, with smaller rural settlements to support the agricultural production within the landscape.
- 3.3.30 Archaeological assessment undertaken in advance of the Burbo Bank Extension Offshore Wind Farm comprised a large number of archaeological trial trenches along its route. Approximately 1.1km to the east of Route Section E a series of large drainage ditches were discovered to the south of Rhuddlan and close to the River Clwyd. Samples from the base of one of the ditches provided a 5th-6th century date which suggests that land reclamation may have taken place earlier than previously supposed and that the area around it may have been used for crop. The ditch had been recut several times indicating that it was in use for some time (Oxford Archaeology 2016).
- 3.3.31 This agricultural development of Route Section E is reflected by the number of farmsteads constructed during this period including Tyddyn Isaf which lies adjacent to the OL and is Grade II listed (80758). The farmhouse dates to the mid to late 19th century and

incorporates an older house into its rear wing. The tithe map created in the 1840s shows the original farmhouse when it was in a tenancy of the Bodelwyddan Estate. The land to the immediate east of Tyddyn Isaf is recorded as having previously been ridge and furrow, although this had no above ground expression during the walkover survey.

- 3.3.32 The onshore ECC route runs to the west of Pengwern Hall, which is a Grade II Listed former Georgian Hall. Now converted into a college for adults with additional needs, the building retains much of its original character. A number of the post-medieval historic assets within proximity to this part of the onshore ECC are related to the development of the Pengwern Hall, including the former coach house, former stables and features associated with the development of the gardens. The HER records that land at Pengwern may have been requisitioned by the army for use as a prisoner of war camp and latterly a camp for displaced persons (132201).
- 3.3.33 Close to the southern part of Route Section E, 420m to the east of the OL in the southern part of Route Section E, is the site of an army camp which is known to have been in existence by late 1914. This was a large, tented camp at St Asaph and was intended as a temporary construction, although it has been suggested that some of the buildings may have been timber. The camp was known as Gwernigron Camp and a sale of materials in October 1915 suggested that the camp had been closed by this time and the soldiers transferred to Kimmel Camp. There does not appear to be any traces of the camp on the ground or through aerial surveys (132162).
- 3.3.34 Within an area of woodland to the west of Pengwern farm are the remains of a Chain Radar Station at Erw'r-gaseg close to the OL, known as the Rhuddlan Chain Home Radar Station. The Chain Home Low was the system used by the RAF during WWII as an early warning system to detect aircraft flying as low as 500ft. The example at Rhuddlan is of the 'West Coast' type and is thought to have originally had two pairs of 325" guyed steel transmitting masts and two 240" wooden receiving towers. A single large building was identified within the woodland on the Site visit in April 2021 however internal access was not possible due to health and safety constraints. A follow up visit in January 2022 following the clearance of vegetation in the southern part of the woodland identified another structure, smaller outbuildings and concrete footings. The geophysical survey has identified some anomalies that could relate to the WWI use of the area for the radar station to the west of the wooded area. A series of anomalies forming a square with a possible branch to the north and east are thought to relate to the Chain Radar Station and could be the bases of former towers.
- 3.3.35 A single field within the OL within Route Section E (500m to the south of the northern extent of Route Section E) shows a number of regular and irregular striations, with some possible small mounds. It is possible that some or all of these features could be natural and some can be identified on the aerial images. The more irregular curving lines may be of natural origin; however, it is possible that the straighter more regular lines could be of archaeological origin.

Route Section F: A55 to B5381 (Substation)

- 3.3.36 The absence of extensive prehistoric activity within this landscape could relate to the lack of previous targeted intrusive archaeological investigations, and therefore raises the possibility that there remains a background potential for further, as yet undiscovered archaeological remains within the immediate vicinity of the onshore ECC. A possible standing stone is speculated on the HER records, 100m to the east of the OL, although little information is available (102568). Roman-British finds were discovered through metal detecting within Route Section F, within the OL (38624).

- 3.3.37 It is thought that St Asaph may have been the site of a monastery and episcopal see as early as 560AS by St Kentigern. St Asaph is thought to have succeeded Kentigern as bishop. The earlier settlement was referred to as Llanuile (Llanelwy) in the Domesday book but around the middle of the 12th century the name was changed to St Asaph. In 1239 construction for a cathedral began but this was burned by the troops of Edward I in 1282.
- 3.3.38 It is likely that the landscape continued to be predominantly agricultural in nature during the early medieval and medieval periods, with extensive evidence of ridge and furrow in regularly formed fields being identified in the southern part of the onshore ECC. The HER records that almost all of the area within the OL was previously ridge and furrow identified from aerial photographs and LiDAR although this was only visible within a single field to the south east of Faenol-Bropor Farmstead within the OL.
- 3.3.39 Faenol-Bropor is a farmstead surrounded by the OL, but the farm buildings themselves are excluded from the OL. The Barn to the north west of the farmhouse is Grade II listed (1378) and dates to the late 18th century and may have originally been a stable. The farmhouse is thought to be contemporary but this is not a listed structure. The tithe map of 1840 shows that the farmstead just comprised the large barn and the farmhouse at this time. The farm was part of the estate of Lord Mostyn at this time. The agricultural fields which surround and are associated with the farmstead retain their historic character through the presence of hedgerow boundaries, grazing fields and the surviving area of ridge and furrow. This area of ridge and furrow could be identified on the Site visit and can also be seen clearly on the LiDAR image. No other potential archaeological features could be identified on the LiDAR image within Route Section F.
- 3.3.40 The post-medieval period saw the development of small hamlets in villages. The Agricultural Revolution and associated developments in technological innovation saw the enclosure of open fields and the construction of more farmstead buildings nationwide. Tithe Mapping indicates that the landscape had been fully enclosed by 1845 (National Library of Wales 2021).
- 3.3.41 The onshore ECC and Substation Construction area runs along the boundary of the Bodelwyddan Castle Park, with the parkland lying outside the OL to the west. Documentary evidence suggests that the estate originated at least in the 15th century and the current layout of the estate dates to the mid-19th century which included refurbishment of the estate wall and formal garden. The house and pleasure grounds lie on the western side of the park and to the east and south east are fishpond, mill and related ponds. Although the grounds are now closed to the public, the castle structure continues to be used as a Hotel and is Grade II* listed. A number of structures within the grounds of the Bodelwyddan estate are also listed including the terrace wall, garden structures and part of the estate wall. Bodelwyddan Castle Park is included on the non-statutory Cadw register of Landscapes Parks and Gardens of Special Historic Interest in Wales as Grade II.
- 3.3.42 The grounds also contain the scheduled monument relating to WWI practice trenches which extend beyond the scheduled area over several hectares (FL186). These were initially excavated for practice to excavate the trenches and then subsequently used for infantry combat training. Frontline trenches are identifiable from their crenelated shape with zig zag communication lines linking back to the reserve lines. It appears that several distinct groups were created perhaps as opposing lines. Circular craters across much of the area indicate that the practice was intended to be as realistic as possible, replicating the battlefield landscape. Overlooking the training area is what is thought to be a remote command post on slightly higher ground (CPAT 2014).

Route Section G: B5381 to National Grid Substation

- 3.3.43 The absence of extensive prehistoric activity within Route Section G could relate to the lack of previous targeted intrusive archaeological investigations, and therefore raises the possibility that there remains a background potential for further, as yet undiscovered archaeological remains within the immediate vicinity of the onshore ECC. A possible cairn was noted in 1911, 340m to the south west of the OL, after a visit by RCAHM, where a mound of stones was speculated to be a possible cairn (101478). In the wider area a Neolithic chambered tomb lies to the south of Route Section G at Cefn Meiriadog, 1km to the south of the OL (Tyddyn Bleiddyn Burial Chamber Scheduled Monument; DE007). An Iron Age Hillfort is also located within the same area, approximately 1.2km to the south of Route Section G, known as Bedd-y- Cawr Hillfort (DE037).
- 3.3.44 The conjectural route of Romano-British Road runs east to west along Glascoed Road along the northern part Route Section G. The road lead west from the legionary fortress of Deva (Chester) to the forts at Canovium (Conwy) and Segontium (Caernarvon) (46826-46830/104607/104608/102985). This would suggest that the onshore ECC would have been a part of the Romano-British agricultural hinterland, with smaller rural settlements to support the agricultural production within the landscape. It has been suggested that St Asaph could be location of a documented Roman Fort recorded as Verae as this lies at the crossroads of two roman roads and links to an occupation site at Prestatyn.
- 3.3.45 The HER has recorded areas of ridge and furrow covering the entirety Route Section G of the onshore ECC, which has been recorded from aerial photographs and LiDAR imagery. There was no extant ridge and furrow within Route Section G identified during the walkover survey. The LiDAR data does not clearly show ridge and furrow within this section of the onshore ECC, although some regular linear lines can be seen in some fields which may relate to more modern deep ploughing methods. It is possible that evidence for ridge and furrow could exist as below ground archaeological features.
- 3.3.46 The tithe map within Route Section G shows a large number of irregular fields of different sizes, the larger of which are likely to have been amalgamated from the smaller earlier fields some of which can be seen on this map. In particular there are a small number of long thin strip fields which adjacent to the trackway which may have had earlier origins.
- 3.3.47 Comparison between the 1st edition Ordnance Survey map of the late 19th century and the 1960s Ordnance Survey map show that little had changed in terms of the field layout between these times with almost all of the field boundaries retained into the mid-20th century. The later part of the 20th century saw some amalgamation of the fields although much of the former rural and agricultural character was retained. No potential archaeological features could be identified from the LiDAR image within Route Section G.

4 ARCHAEOLOGICAL TRIAL TRENCH EVALUATION AIMS AND OBJECTIVES

4.1 General aims

- 4.1.1 The general aims (or purpose) of the evaluation, in compliance with the ClfA *Standard and guidance for archaeological field evaluation* (ClfA 2014a), are to:
- provide information about the archaeological potential of the site; and
 - inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.

4.2 General objectives

4.2.1 In order to achieve the above aims, the general objectives of the evaluation are to:

- determine the presence or absence of archaeological features, deposits, structures, artefacts or ecofacts within the specified area;
- establish, within the constraints of the evaluation, the extent, character, date, condition and quality of any surviving archaeological remains;
- place any identified archaeological remains within a wider historical and archaeological context in order to assess their significance; and
- make available information about the archaeological resource within the site by reporting on the results of the evaluation.
- inform any future mitigation works that may be required.

4.3 Site-specific objectives

4.3.1 Following consideration of the archaeological potential of the site and the regional research framework (IFA Wales 2008), the site-specific objectives of the evaluation are to:

- examine the results of the geophysical survey (Wessex Archaeology 2022b);
- All uncertain and possible archaeological anomalies recorded on the geophysics results should be adequately tested by investigative trenching to determine their function/date/level of preservation and relationships to adjacent anomalies;
- determine the dating for the ring-ditches identified through the geophysical survey;
- determine the presence/absence of the Roman road running parallel to, and beneath, Glascoed Road west of St Asaph where the cable could enter access pits for HDD (or other trenchless techniques);
- determine the extent/preservation of medieval/post-medieval ridge and furrow and assess if this has impacted on any earlier remains;
- assess whether there is further archaeological evidence that has not been identified within the previous gradiometer survey (Wessex Archaeology 2022b).

5 ARCHAEOLOGICAL TRIAL TRENCH EVALUATION-FIELDWORK METHODS

5.1 Introduction

- 5.1.1 Health and safety will override archaeological considerations in all works since, as stated in ClfA guidance, *Health and Safety regulations and requirements cannot be ignored no matter how imperative the need to record archaeological information; hence Health and Safety will take priority over archaeological matters* (ClfA 2014a, 11)
- 5.1.2 All works will be undertaken in accordance with the detailed methods set out within this WSI. Any significant variations to these methods will be agreed in writing with the Development Control Archaeologist and the client prior to being implemented.
- 5.1.3 The final location of the trenches will be agreed with the Development Control Archaeologist post consent, following detailed scheme design and will include the 40 trenches previously proposed and agreed as part of the WSI prepared in November 2021. The trench locations will be selected in order to sample known archaeological (and possibly archaeological) features, and also to sample areas where no known archaeology is present.

- 5.1.4 The results from these proposed trenches will inform the location and scope of any further archaeological mitigation works that may be required. Those works will be the subject of Detailed WSIs.

5.2 Setting out of the trenches

- 5.2.1 All trenches will be set out using a Global Navigation Satellite System (GNSS) in the proposed positions following detailed scheme design. Minor adjustments to the layout may be required to take account of constraints such as vegetation or located services, and to allow for machine manoeuvring. The trench locations will be tied into the Ordnance Survey (OS) National Grid and Ordnance Datum (OD) (Newlyn), as defined by OSTN15 and OSGM15.

5.3 Service location and other constraints

- 5.3.1 The client will provide information regarding the presence of any below/above-ground services, and any ecological, environmental or other constraints.
- 5.3.2 Before excavation begins, the evaluation area will be walked over and visually inspected to identify, where possible, the location of any below/above-ground services. All trial trench locations will be scanned before and during excavation with a Cable Avoidance Tool (CAT) to verify the absence of any live underground services.

5.4 Excavation methods

- 5.4.1 The trenches will be excavated using a 360° tracked excavator equipped with a toothless bucket. Machine excavation will be under the constant supervision and instruction of the monitoring archaeologist. Machine excavation will proceed in level spits of approximately 50–200 mm until either the archaeological horizon or the natural geology is exposed. Where necessary, the base of the trench/surface of archaeological deposits will be cleaned by hand.
- 5.4.2 A sample of the archaeological features and deposits identified will be hand-excavated, sufficient to address the aims of the evaluation. Spoil derived from machine stripping and hand-excavation will be visually scanned for the purposes of finds retrieval, and where appropriate will also be metal-detected by trained archaeologists. Artefacts and other finds will be collected and bagged by context.
- 5.4.3 If an exceptional number and/or complexity of archaeological deposits are identified, sample excavation will aim to be minimally intrusive, but sufficient to resolve the principal aims of the evaluation, to a level agreed with the Development Control Archaeologist at CPAT and the client.
- 5.4.4 If human remains are uncovered, the specific methods outlined below (section 5.9.2) will be followed.
- 5.4.5 Where complex archaeological stratification is encountered, deposits will be left *in situ* and alternative measures taken to assess their depth, as agreed with the Development Control Archaeologist. Where modern features are seen to truncate the archaeological stratification, these may be removed, where practicable, in a manner that does not damage the surrounding deposits to enable the depth of stratification to be assessed.

5.5 Recording

- 5.5.1 All exposed archaeological deposits and features will be recorded using an appropriate pro forma recording system.
- 5.5.2 A complete record of excavated archaeological features and deposits will be made. This will include plans and sections, drawn to appropriate scales (generally 1:20 or 1:50 for plans, 1:10 for sections) and tied to the OS National Grid.
- 5.5.3 A full photographic record will be made using digital cameras equipped with an image sensor of not less than 16 megapixels. This will record both the detail and the general context of the principal features and the site. Digital images will be subject to managed quality control and curation processes, which will embed appropriate metadata within the image and ensure long term accessibility of the image set. Photographs will also be taken of all areas, including access routes, to provide a record of conditions prior to and on completion of the evaluation.

5.6 Survey

- 5.6.1 The real time kinematic (RTK) survey of all trenches and features will be carried out using a Leica GNSS connected to Leica's SmartNet service. All survey data will be recorded in OS National Grid coordinates and heights above OD (Newlyn), as defined by OSTN15 and OSGM15, with a three-dimensional accuracy of at least 50 mm.

5.7 Monitoring

- 5.7.1 The client will inform the Development Control Archaeologist of the start of the evaluation and its progress. Reasonable access will be arranged for the Development Control Archaeologist to make site visits to inspect and monitor the progress of the evaluation. Any variations to the WSI, if required to better address the project aims, will be agreed in advance with the client and the Development Control Archaeologist.

5.8 Reinstatement

- 5.8.1 Trenches completed to the satisfaction of the client and the Development Control Archaeologist will be backfilled using excavated materials in the order in which they were excavated, and left level on completion. No other reinstatement or surface treatment will be undertaken.

5.9 Finds

General

- 5.9.1 All archaeological finds will be retained, although those of clearly very recent origin with negligible potential to provide information relevant to the project aims and objectives may be recorded on site and not retained. Where appropriate, soil samples may be taken and sieved to aid in finds recovery. Any finds requiring conservation or specific storage conditions will be dealt with immediately in line with *First Aid for Finds* (Watkinson and Neal 1998).

Human remains

- 5.9.2 In the event of discovery of any human remains (articulated or disarticulated, cremated or unburnt), all excavation of the deposit(s) will cease pending the process set out in the DCO or the Retained Archaeologist obtaining a Ministry of Justice licence (this includes cases where remains are to be left *in situ*).

- 5.9.3 Initially the remains will be left *in situ*, covered and protected, pending discussions between the client, the Retained Archaeologist's osteoarchaeologist and the Development Control Archaeologist regarding the need for excavation/removal or sampling. Where this is deemed appropriate, the human remains will be fully recorded, excavated and removed from site in compliance with the Ministry of Justice licence.
- 5.9.4 Excavation and post-excavation processing of human remains will be in accordance with the Retained Archaeologist's protocols and in-line with current guidance documents (eg, McKinley 2013) and the standards set out in ClfA Technical Paper 13 *Excavation and post-excavation treatment of cremated and inhumed remains*. Appropriate specialist guidance/site visits will be undertaken if required.
- 5.9.5 The final deposition of human remains subsequent to the appropriate level of osteological analysis and other specialist sampling/examinations will follow the requirements set out in the Ministry of Justice licence.

Treasure

- 5.9.6 The Retained Archaeologist will immediately notify the client and the Development Control Archaeologist on discovery of any material covered, or potentially covered, by the *Treasure Act 1996*. All information required by the *Treasure Act* (ie, finder, location, material, date, associated items etc.) will be reported to the Coroner within 14 days.

5.10 Environmental sampling

- 5.10.1 All sampling will be undertaken following the Retained Archaeologist's in-house guidance, which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015b).
- 5.10.2 Bulk environmental soil samples, for the recovery of plant macrofossils, wood charcoal, small animal bones and other small artefacts, will be taken as appropriate from well-sealed and dateable contexts. In general, features directly associated with particular activities (eg, pits, latrines, cesspits, hearths, ovens, kilns, and corn driers) should be prioritised for sampling over features, such as ditches or postholes, which are likely to contain reworked and residual material.
- 5.10.3 If waterlogged or mineralised deposits are encountered, an environmental sampling strategy will be devised and agreed with the Development Control Archaeologist as appropriate. Specialist guidance will be provided, with site visits undertaken if required.
- 5.10.4 Any samples will be of an appropriate size – typically 40 litres for the recovery of environmental evidence from dry contexts, and 10 litres from waterlogged deposits.
- 5.10.5 Following specialist advice, other sampling methods such as monolith, Kubiena or contiguous small bulk (column) samples may be employed to enable investigation of deposits with regard to microfossils (eg, pollen, diatoms) and macrofossils (eg, molluscs, insects), soil micromorphological or soil chemical analyses.

6 GEOARCHAEOLOGICAL BOREHOLE SURVEY

6.1 Aims and Objectives

- 6.1.1 This section outlines the program of geoarchaeological evaluation and reporting. The purposive borehole survey is required to map and characterise the superficial geological

deposits across the foreshore and around the River Clwyd, identifying areas of geoarchaeological and archaeological potential.

6.1.2 The specific aims and objectives of the borehole survey are as follows;

- Identify the presence of sequences of alluvium, peat and former land surfaces (e.g. soil or insipient soil horizons);
- Obtain representative samples through the deposits;
- Assess the geoarchaeological and archaeological significance of the deposits; and
- Make suitable, proportionate recommendations for further action

6.1.3 The project aims will be addressed by achieving the following objectives;

- Obtain representative samples through the sedimentary sequences in selected parts of the route;
- Deposit modelling of borehole and GI data to map the extent and depth of deposits;
- Make specific recommendations for further work, with a commitment to undertake these works, taking into account key research questions. Further works might include palaeoenvironmental assessment and radiocarbon dating of retained sequences and targeted archaeological evaluations.

6.2 Fieldwork methods

6.2.1 Drilling methods are likely to involve the use of a rotary rig with dynamic sampling head to extract sleeved cores one metre in length through superficial deposit (to refusal or solid geology) at locations within the onshore ECC, to form a transect from the foreshore inland (including the area of the proposed anchor zone) and at the River Clywd.

6.2.2 An area of geoarchaeological test pitting is also proposed at the HDD site (or other trenchless technique) to the north of the river. On this side of the river boreholes have been proposed, targeting both the superficial deposits associated with the alluvial sequence and possible Pleistocene deposits mapped in this area as glaciofluvial gravels. The latter deposits are mapped as underlying the area of geoarchaeological test pitting.

6.2.3 South of the Clwyd boreholes are suggested in order to target the deeper alluvial sequence of the river, including the area of the proposed HDD site (or other trenchless technique).

6.2.4 The drilling rig will be operated by experienced engineers under the supervision of a suitably experienced geoarchaeologist. Within the area of the intertidal zone the boreholes will be undertaken at low tide with an additional engineer available to support the drilling team and ensure safe working.

6.2.5 The cores will be split and described on-site by the geoarchaeologist as work proceeds. Where sequences are recorded that warrant further investigation, sequences will be resealed and returned to an appropriate laboratory for further detailed geoarchaeological investigations.

6.2.6 Selected cores for further assessment will be sealed and marked within project number, site number, borehole number and sample depth before being returned to a laboratory.

6.2.7 Before drilling commences, service plans will be consulted, and all locations scanned using a Cable Detection tool by a trained operative.

6.2.8 Boreholes described in the field or retrieved for later description will include the following information;

- Depth
- Texture
- Composition
- Colour
- Inclusions
- Structure (bedding, ped characteristics etc)
- Contacts between deposits

6.2.9 Interpretations will be made regarding the likely depositional environments and formation processes of the sampled deposits. The data will be tabulated by borehole and depth.

7 POST-EXCAVATION METHODS AND REPORTING

7.1 Stratigraphic evidence

7.1.1 All written and drawn records from the evaluation will be collated, checked for consistency and stratigraphic relationships. Key data will be transcribed into a database, which can be updated during any future analyses. The preliminary phasing of archaeological features and deposits will be undertaken using stratigraphic relationships and the spot dating from finds, particularly pottery.

7.1.2 A written description will be made of all archaeologically significant features and deposits that were exposed and excavated, ordered either by trench or by period as appropriate. Detail of all contexts will be provided in trench tables in the appendix of the report.

7.2 Finds evidence

7.2.1 All retained finds will, as a minimum, be washed, weighed, counted and identified. They will then be recorded to a level appropriate to the aims and objectives of the evaluation. Recording and reporting will conform to the Type 2 (Appraisal) level according to ClfA's *Toolkit for Specialist Reporting*, to include appropriate quantification, characterisation and assessment of significance and potential. The report will include a table of finds by feature/context or trench.

7.2.2 Metalwork from stratified contexts will be X-rayed and, along with other fragile and delicate materials, stored in a stable environment. The X-raying of objects and other conservation needs will be undertaken by suitably qualified conservation staff, or by another approved conservation centre.

7.2.3 Finds will be suitably bagged and boxed in accordance with the guidance given by the relevant museum and generally in accordance with the standards of the ClfA (2014b).

7.3 Environmental evidence

7.3.1 Bulk environmental soil samples will be processed by standard flotation methods. The residues will be fractionated into 5.6/4 mm and 1/0.5 mm and dried if necessary. The coarse residue fraction (>5.6/4 mm), and the fine fraction when appropriate, will be sorted and discarded, with any finds recovered given to the appropriate specialist. The flot will be retained on a 0.25 mm mesh and scanned to assess the range of environmental remains

present and their preservation. Unsorted fine residues will be retained until after any analyses and discarded following final reporting (in accordance with the Selection policy, below).

7.3.2 In the case of samples from cremation-related deposits the flots will be retained on a 0.25 mm mesh, with residues fractionated into 4 mm, 2 mm and 1 mm. In the case of samples from inhumation burial deposits, the sample will be wet-sieved through 9.5 mm and 1 mm mesh sizes. The coarse fractions (9.5 mm) will be sorted with any finds recovered given to the appropriate specialist together with the finer residues.

7.3.3 Any waterlogged samples will be processed by standard waterlogged flotation methods.

7.3.4 Recording and reporting will conform to the Type 2 (Appraisal) level according to ClfA's *Toolkit for Specialist Reporting*, to include appropriate quantification, characterisation and assessment of significance and potential.

7.4 Reporting

General

7.4.1 Following completion of the fieldwork and the evaluation of the stratigraphic, artefactual and ecofactual evidence, a draft report will be submitted for approval to the client and the Development Control Archaeologist, for comment. Once approved, a final version will be submitted.

7.4.2 The report will include the following elements:

- Non-technical summary;
- Project background;
- Archaeological and historical context;
- Aims and objectives;
- Methods;
- Results – stratigraphic, finds and environmental;
- Conclusions in relation to the project aims and objectives, and discussion in relation to the wider local, regional or other archaeological contexts and research frameworks etc;
- Archive preparation and deposition arrangements;
- Appendices, including trench summary tables;
- Illustrations; and
- References.

7.4.3 A copy of the final report will be deposited with the HER, along with surveyed spatial digital data (.dxf or shapefile format) relating to evaluation.

Publication

7.4.4 If no further mitigation works are undertaken, a short report on the results of the evaluation will be prepared for publication in a suitable journal, if considered appropriate and agreed with the client and the Development Control Archaeologist.

OASIS

- 7.4.5 An OASIS (online access to the index of archaeological investigation) record¹ will be created, with key fields completed, and a .pdf version of the final report submitted. Subject to any contractual requirements on confidentiality, copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service (ADS) ArchSearch catalogue.

8 ARCHIVE STORAGE AND CURATION

8.1 Museum

- 8.1.1 It is recommended that the finds archive resulting from the evaluation be deposited with the Denbighshire Museums Service. The museum will receive notification of the project prior to fieldwork commencing, and an accession number will be obtained if appropriate. The documentary archive will be deposited with the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW).

8.2 Transfer of title

- 8.2.1 On completion of the evaluation (or extended fieldwork programme), every effort will be made to persuade the legal owner of any finds recovered (ie, the landowner), with the exception of human remains and any objects covered by the *Treasure Act 1996*, to transfer their ownership to the museum in a written agreement.

8.3 Preparation of archive

Finds archive

- 8.3.1 Any finds (artefacts and ecofacts) will be prepared following the standard conditions for the acceptance of excavated archaeological material by the Denbighshire Museums Service, and in general following nationally recommended guidelines (SMA 1995; ClfA 2014c; Brown 2011). The archive will usually be deposited within one year of the completion of the project, with the agreement of the client.

Documentary archive

- 8.3.2 The physical archive (paper records and graphics) and born digital data (site records, finds and environmental data, photographs, survey data and reports) will be prepared following the standard conditions for the acceptance of excavated archaeological material by Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) and in general following nationally recommended guidelines (SMA 1995; ClfA 2014c; Brown 2011).

8.4 Selection strategy

- 8.4.1 It is widely accepted that not all the records and materials (artefacts and ecofacts) collected or created during the course of an archaeological project require preservation in perpetuity. These records and materials will be subject to selection in order to establish what will be retained for long-term curation, with the aim of ensuring that all elements selected to be retained are appropriate to establish the significance of the project and support future research, outreach, engagement, display and learning activities, ie the retained archive should fulfil the requirements of both future researchers and the receiving Museum.
- 8.4.2 The selection strategy, which details the project-specific selection process, is underpinned by national guidelines on selection and retention (Brown 2011, section 4) and generic selection policies (SMA 1993) and follows ClfA's *Toolkit for Selecting Archaeological*

¹ <http://oasis.ac.uk>

Archives. It should be agreed by all stakeholders (Retained Archaeologist, external specialists, local authority, museum) and fully documented in the project archive.

- 8.4.3 In this instance, given that the level of finds recovery is expected to be relatively low, decisions on selection will be deferred until after the fieldwork stage, and no detailed strategy is presented here. Any material not selected for retention may be used for teaching or reference collections by the museum, or by the Retained Archaeologist.

8.5 Security copy

- 8.5.1 In line with current best practice (eg, Brown 2011), on completion of the project a security copy of the written records will be prepared in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

9 FURTHER MITIGATION STRATEGY

9.1 Introduction

- 9.1.1 Preservation in situ and preservation by record through archaeological investigation are the two main options by which impacts to archaeological remains can be mitigated. Preservation *in situ* is the conservation of an archaeological asset in their original location and is the preferred method of conservation for assets of national or international significance in accordance with best practice. Preservation by record through archaeological investigation is the process by which archaeological remains are excavated, recorded and published to offset the construction effects and to disseminate the information to the public.

9.2 Mitigation Strategy (outline)

- 9.2.1 Once the further evaluation of the onshore ECC, onshore Substation and associated activities has been undertaken and the significance of any deposits is known, the mitigation strategy can be refined, based on the results of the investigations. The details and scope of these further works will be discussed with the Development Control Archaeologist and Detailed WSIs produced. Where there is still some flexibility within the design through the Rochdale Envelope, the results of the evaluation will be used to inform detailed design of elements not yet finalised, where applicable. Mitigation could comprise;
- *Excavation- undertaken in areas where significant archaeology has been identified through evaluation;*
 - *Preservation in situ- as described above where archaeological remains of national or international significance are identified and where it is practicable to do so;*
 - *Amendments to design- the Rochdale envelope will allow for some degree of flexibility within certain aspects of the design. Where these details are not finalised and where significant archaeological remains are identified, archaeological considerations could influence the design.*
 - *Watching Brief- a watching brief involves the monitoring of ground works during construction in areas where the archaeological potential is considered to be low.*
- 9.2.2 The design of the mitigation will be informed by the construction programme, so that appropriate techniques can be programmed (either before or during construction) without causing delay to the construction programme. Ideally as much of the mitigation as possible

would be carried out prior to the main construction phase to minimise delays during construction.

- 9.2.3 All phases of mitigation will be subject to separate detailed WSI informed by the earlier phases of work and in consultation with the Development Control Archaeologist.

9.3 Excavation Methodology

- 9.3.1 Archaeological excavation usually takes one of two forms, full excavation (usually single context excavation) or selective sample-based excavation (known as strip, map, sample excavation).

- 9.3.2 In accordance with the ClfA guidance (*Standards and Guidance for Archaeological Excavation*), the general aims of the archaeological excavation are to:

- *Further define the features identified in the evaluation;*
- *Examine the archaeological resource within the OL;*
- *Seek better understanding of and compile a lasting record of the resource, within a defined framework of research objectives; and*
- *Analyse and interpret the results and disseminate them.*

- 9.3.3 Full excavation is required where complex remains on several levels are expected to be found, whereas strip, map sample excavation can be used where remains are expected to be relatively shallow, at one level and likely to consist of negative features (pits/ditches) cut into the natural geology. Strip, map sample is likely to be the preferred method of excavation, however this would be informed by the earlier stages of investigation. The strip, map sample excavation should entail:

- *Removal of the topsoil or made ground under archaeological supervision to either the subsoil or the first archaeological horizon;*
- *Hand cleaning of archaeological deposits to identify the extent of discrete features. Features should be surveyed, photographed and recorded;*
- *Sampling techniques and sizes will be set out within the WSI but this could include sections of circular or linear features, quadrants of large circular features. Features would be hand excavated to record internal stratigraphy and for artefact recovery. Typical sample based excavations involve hand excavation of 50% of discrete features and 20-25% of linear features;*
- *Certain types of features (burials, hearths, stratified remains or significant features) may be hand excavated in their entirety by the archaeologist and recorded; and*
- *Palaeoenvironmental sampling of buried soil horizons and bulk sampling of certain deposits will also be undertaken to retrieve additional evidence.*

- 9.3.4 The depth and complexity of archaeological deposits across the Site will be assessed. Sections shall be positioned to record accurate cross-section profiles of any remains and to identify structural/phasing sequences (for example terminus and intersections).

- 9.3.5 The spot height of all principal features and levels will be calculated in meters relative to Ordnance Datum, correct to two decimal places. Plans, sections and elevations will be annotated with spot heights as appropriate.

9.3.6 A full photographic record will be maintained using digital images, to include detailed views of archaeological features and deposits, the general context of archaeological remains and to record the progress of the investigations, including images potentially suitable for use in publicity material.

9.3.7 Metal detectors may be used as appropriate to scan stripped surfaces and archaeological features prior to and during excavation as appropriate, and to scan spoil heaps where practicable.

9.4 Watching Brief

9.4.1 An Archaeological Watching Brief is a programme of observation, investigation and recording of archaeological remains discovered during the construction of the proposed development. It is used where archaeological remains have not been identified during the earlier stages of assessment (Desk-Based Assessment and Evaluation) but where there remains potential for archaeological remains to exist. The ground works would be monitored by an archaeologist and as such the method of working would not be directly controlled by the archaeologist (unless significant discoveries are found).

9.4.2 Both of the types described below involve monitoring attendance to observe the ground works and make a basic record and investigation and recording if archaeological remains are revealed within the works.

9.4.3 All work would be carried out in accordance with ClfA Standards and Guidance for an Archaeological Watching Brief (2014). A WSI would be prepared for a Watching Brief and agreed with the relevant stakeholders.

General Watching Brief

9.4.4 A General Watching Brief would monitor the ground works as they occur with no specific requirements on the method of operation. This can be used in areas where there is a low potential for archaeological remains.

Targeted Watching Brief

9.4.5 A targeted watching brief involves closer monitoring and supervision of the works by the archaeologist. This may include particular requirements on the method of the works or the types of plant that can be used. In areas where greater care is needed to minimise damage for example near areas where preservation in situ is required.

9.5 Inter-tidal Mitigation

9.5.1 Subject to the final design, an intertidal zone watching brief could be implemented to mitigate effects to archaeological assets within the inter-tidal zone during the construction phase. This could involve the exposure of preserved timber identified during the foreshore survey and environmental sampling as appropriate.

9.5.2 Watching brief in the inter-tidal area will be subject to a WSI. Archaeological features or structures will be examined and/or excavated during low tide. A sufficient sample of each layer/feature type will be investigated in order to elucidate the date, character, relationships and function of the feature/structure. Recording will include written, drawn and photographic elements as conditions allow.

9.5.3 The finding of any watching brief will be compiled as an archaeological watching brief report consistent with industry standards. This would be undertaken in accordance with the ClfA Standards and Guidance for archaeological watching brief.

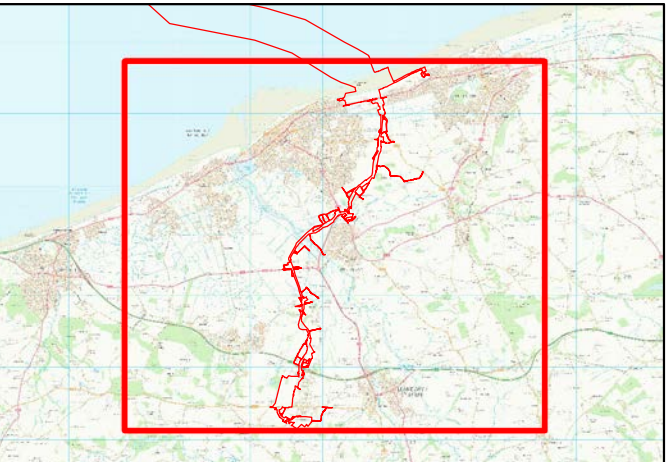
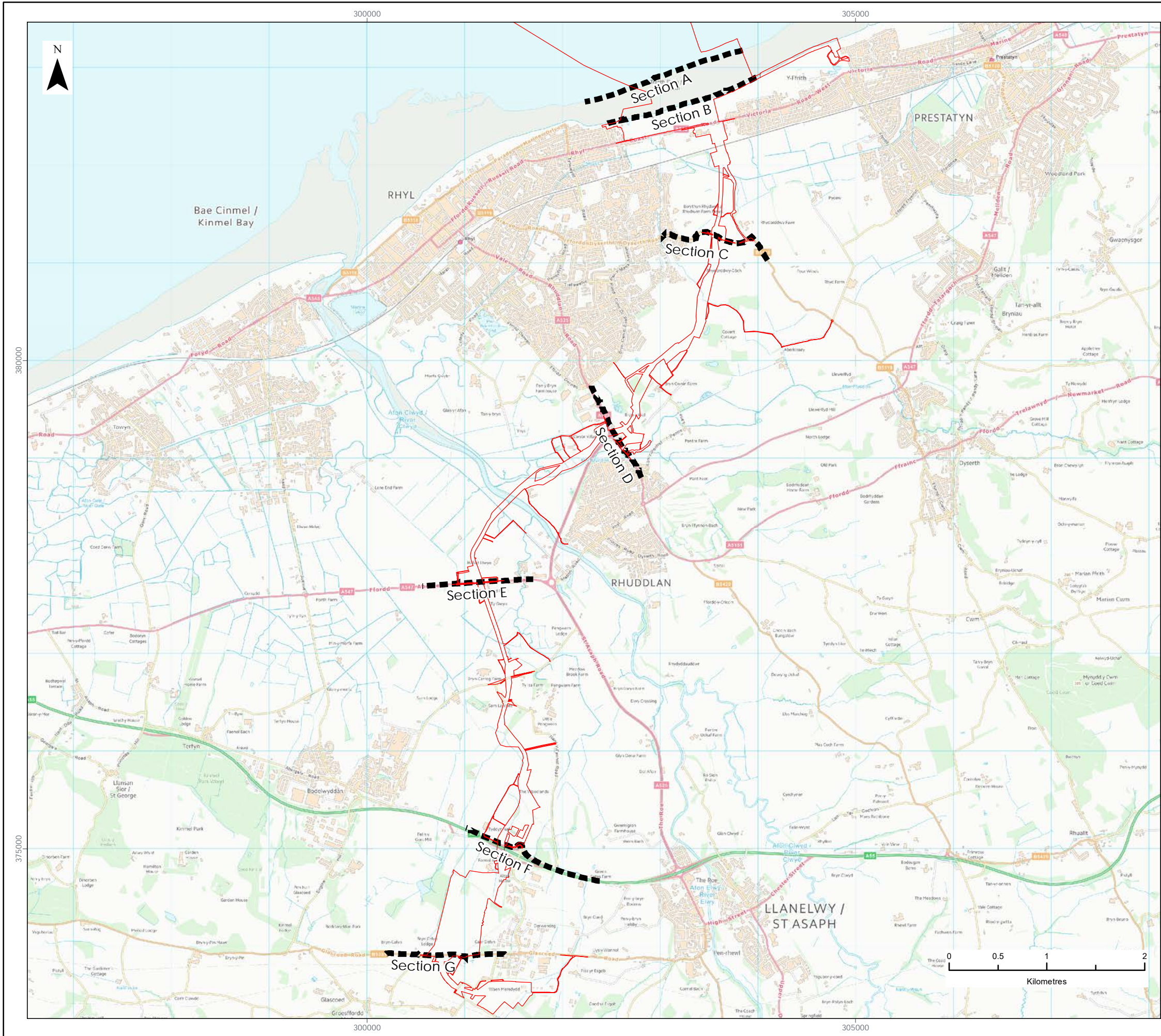
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APPENDIX 1 (6.5.8.5.1): ORDER LIMITS LOCATION



LEGEND

Order Limits

Onshore Cable Route Section Breaks

Data Source:

© Crown Copyright [and database rights] (2022) OS OpenData.

PROJECT TITLE:

AWEL Y MÔR OFFSHORE WINDFARM

FIGURE TITLE:

Location of Order Limits

VER	DATE	REMARKS	Drawn	Checked
1	17/02/2022	Draft	MK	TP

FIGURE NUMBER:

Figure 1

SCALE: 1:40,000 PLOT SIZE: A3 DATUM: OSGB 1936 PROJECTION: BNG

Fferm Wylt Alltraeth

AWEL Y MÔR

Offshore Wind Farm



APPENDIX 2 (6.5.8.5.2): DATA MANAGEMENT PLAN



Awel y Mor Onshore Data Management Plan

257390
November 2021

Awel y Mor Onshore Data Management Plan

1 WESSEX ARCHAEOLOGY STANDARDS AND PROCEDURES

Standard Wessex Archaeology procedures include pro-forma digital and paper recording, fieldwork/survey manuals, context/finds database guidance and archive procedure manual. company quality management protocols and implementation of a competence management system in line with ISO 10018, data management guidelines and data protection and security policy.

2 NATIONAL STANDARDS AND GUIDANCE

2.1 Formal standards for data management

ADS 2013 *Caring for Digital Data in Archaeology: a guide to good practice*. Archaeology Data Service & Digital Antiquity Guides to Good Practice

Brown, D H 2011 *Archaeological Archives: A guide to best practice in creation, compilation, transfer, and curation* (2nd edition). Reading, Institute of Field Archaeologists/Archaeological Archives Forum

ClfA 2014 *Standard and guidance for the collection, documentation, conservation, and research of archaeological materials* (revised edition June 2020). Reading, Chartered Institute for Archaeologists

English Heritage 2012 *MIDAS: the UK Historic Environment Data Standard Version 1.1. Best practice guidelines. Forum on Information Standards in Heritage (FISH)*

Forster, M 2019 *Work Digital / Think Archive. A Guide to managing Digital data generated from archaeological investigations*. Dig Ventures

Historic England 2015 *Digital Image Capture and File Storage*. Swindon, Historic England

3 SCOPE OF DIGITAL DATA CREATION AND FILE TYPES

3.1 Digital data creation and standardised Open Source/Archival format file types to be used will include

Survey data (raw and tidied) in Esri shapefiles (.shp), points, lines, and polygons, and site plans in an AutoCAD .dwg or .dxf format, where requested

Interpreted geophysical survey data in .tif, .tiff or shapefiles and .xyz data files

Light detection and ranging (LiDAR) and laser scan data, where produced for deposition, will consist of GeoTiff .tif and .E57 files respectively

Digital site photographs – record, working and condition monitoring, in addition to aerial photos plus UAV photos all captured in high resolution .jpeg with a minimum 16-megapixel sensor

Photogrammetry and UAV photogrammetry – captured in high resolution .jpeg with a minimum 16-megapixel sensor with the resulting model, if created, archived as open source .obj files and orthographic or isometric .tif or high quality .jpeg

Digital pro forma fieldwork records created on tablet in .pdf format and automatically exported into server-held project data spreadsheets

Digital security copy scans of site permatrace drawings will be produced in .tif format at a minimum 300 dpi and all site paper register in pdf format

Excel spreadsheet .csv or .xlsx data files containing site stratigraphic data, environmental data, finds specialist assessment and analysis data and general finds quantification and retention data

Specialist data – conservation (x-ray etc.), radiocarbon dating data and certificates in Microsoft Word .docx or .pdf format

Specialist and project reports and figures produced in Microsoft Word .docx or .pdf format stored in Union Square (US) a proprietary project management system (PMS) used by Wessex Archaeology. Upon completion of the work, these will be incorporated into the relevant report.

3.2 Wessex Archaeology procedures

All data types are industry standard and can be accessed by most data-specific software. If this is not the case, data can be converted to other common formats. As advised by ADS, all .pdf files selected for archive will be converted to archival standard PDF/A on deposition.

Standardised file naming conventions to include project number, type of work undertaken and title/unique identifiers eg, WAProjectNumber_CameraNumber_ImageNumber.. For example: 12345_D999_54321.jpg

Standardised project folder structure used to organise and compartmentalise various project elements from set up to archiving.

Project reporting document management system (DMS) with versioning and version control handled automatically.

3.3 Guidance

Chartered Institute for Archaeologists [CIfA] 2014, Standards and Guidance, Codes of Conduct and Regulations. CIfA, Reading

Historic England 2015 *Digital Image Capture and File Storage*. Swindon, Historic England

Historic England 2015 *Metric Survey Specifications for Cultural Heritage*. Swindon, Historic England

4 SCOPE OF DIGITAL DATA COLLECTION

The exact scope of digital data collection will be dependent upon the type of project, as well as the nature and extent of archaeological remains found. Digital data will be used, in conjunction with other data, in interpretation and reporting of the site.

4.1 Digital data collection methods

Archaeological site survey

Will be used as the primary method of recording the 3D spatial location of the investigated area(s) and any archaeological remains found within. It may also be used to geo-reference other data types, such as photogrammetry and drawn plans. This data will then be used in the production of report figures.

Site survey would be conducted with a real time kinematic (RTK) Global Navigation Satellite System (GNSS) or a Total Station Theodolite (TST), set to a 3D coordinate quality of at least 50 mm. Where an RTK connection is not possible, post-processed kinematic surveying or a Total Station Theodolite (TST) will be used instead. All data will be collected within Ordnance Survey National Grid with heights calculated as distance above Ordnance Datum (Newlyn), as defined by OSGM15 and OSTN15. Data shapefiles or .txt files (where created) will be sent via File Transfer Protocol to the office for processing and back up at the end of each day; this facilitates data security, quality management and faster access to the data for the field and post-excavation teams.

Photography

Will primarily be used as a visual record of any archaeological deposits. It may also be used for general site views and condition monitoring photographs suitable for display or reporting, recording the state of site(s) prior to Wessex Archaeology access, recording reinstatement and other general shots as necessary. Photography would be conducted with DSLRs and captured in high resolution .jpeg with a minimum 16-megapixel sensor. Photographs will be regularly backed up onto company servers to ensure data security.

Finds photography will be undertaken using a DSLR with at least a 16-megapixel sensor. Images will be captured in JPEG format .jpg files at the highest quality settings available on the camera. Particularly small artefacts and ecofacts may also be photographed by means of a camera attached to a microscope.

Photogrammetry

Where appropriate, archaeological remains or areas of investigation may be recorded with photogrammetry. This will be determined on a case-by-case basis. Where conducted this may be carried out with a handheld DSLR or with a UAV mounted camera, the exact specifications of which will be dependent upon airspace restrictions on the site. The ground sample distance of any data collected will be dependent upon the recording aims and expected reproduction scale, as per Historic England standards. Photogrammetric data may be used to produce line drawings of complex deposits, orthographic images (plan or section) of remains, illustrative images and, where deemed appropriate, textured colour 3D models.

Pro forma sheets

Archaeological record sheets, for example context or environmental sample records, will be produced using a digital recording system loaded onto tablet devices. This data will be synced with an online data storage system to allow for quick access to the data by the post-excavation team and the automated production of certain records. These record sheets will follow established standards and include all the information found on a paper counterpart.

Environmental data

Environmental sample locations are recorded in the field using a GNSS or TST in Ordnance Survey (OS) National Grid and Ordnance Datum (OD) Newlyn, as defined by OSGM15 and OSTN15, to a three-dimensional coordinate quality of ± 50 mm.

Data pertaining to the environmental sample processing procedure is recorded in an .xlsx file for future reference.

Pollen is analysed using tiliait's tilia software. this software utilises .tgx and .tlx format files. data can be output as .emf, .csv and .txt files for incorporation into reports.

Scientific dating

When undertaken results are calibrated and modelled using oxford radiation accelerator unit's oxcal software. modelled data is output in .csv or .txt format files, and images as .png files, ready for incorporation into reports.

Geoarchaeology data

Geoarchaeological fieldwork uses the Wessex Archaeology tablet recording system

Any archaeological borehole data is recorded using a defined borehole recording pro forma, whilst test pits and trenches utilise the standard pro forma for the archaeological recording of these interventions.

The locations of interventions are recorded using a GNSS or TST in Ordnance Survey (OS) National Grid and Ordnance Datum (OD) Newlyn, as defined by OSGM15 and OSTN15, to a three-dimensional coordinate quality of ± 50 mm.

4.2 General notes

It is not expected that other digital data collection methods will be employed for recording the site, however, should the need arise for other digital techniques to be used, these will be undertaken according to national standards and Wessex Archaeology's procedures.

Existing data that may be used to contribute to the project could include desk-based assessment, geophysical data, prior and relevant archaeological results and reporting, HER, NRHE and other archival data. Data volumes will be dependent on the size, number of sites and nature of investigation undertaken, and techniques used.

4.3 Wessex Archaeology procedures

Standardised survey, photographic, photogrammetric and archaeological recording procedures. Stratigraphic data entry/creation, post-excavation data recording and digital archiving following guidance and good practice outlined below.

Quality Management System (QMS) policy and procedures including quality assurance and control procedures. Quality assurance for the digital data will be provided by Wessex Archaeology's Quality Management System, including data quality monitoring and logging during survey, and quality control assessments during processing and interpretation. This will be conducted by the project supervisory and post-excavation teams, and the Geomatics department.

4.4 Guidance

ADS 2013 *Caring for Digital Data in Archaeology: a guide to good practice*. Archaeology Data Service & Digital Antiquity Guides to Good Practice

Chartered Institute for Archaeologists [CIfA] 2014 Standards and Guidance, Codes of Conduct and Regulations. Reading, CIfA

Historic England 2015 *Digital Image Capture and File Storage*. Swindon, Historic England

Historic England 2015 *Metric Survey Specifications for Cultural Heritage*. Swindon, Historic England

Historic England 2017 *Photogrammetric Applications for Cultural Heritage*. Swindon, Historic England

4.5 General notes

Data volumes are dependent on the size of site and specific equipment used.

All data types are industry standard and can be accessed by most data specific software. If this is not the case, data can be converted to other common formats.

5 SCOPE OF DIGITAL DATA PROCESSING

5.1 Wessex Archaeology procedures

Wessex Archaeology uses standardised survey, photographic, photogrammetric, and archaeological recording procedures, stratigraphic data entry/creation, post-excavation data recording, digital archiving. QMS policy and procedures as summarised below;

Archaeological site survey – Raw GNSS/TST data as shapefiles

These will be processed through a survey data processing programme in order to create CAD files. The data may be edited using AutoCAD 2018 to correct errors in the survey data collection, such as missed points, incorrect coding. Edited working drawings will be saved as .dwg CAD drawings and backed up on Wessex Archaeology's secure servers.

Once fieldwork survey data has been processed and quality checked, it will be exported as Shapefiles into Wessex Archaeology's Ladybird software. Ladybird combines the written records collected via the Butterfly site recording software with the survey data, linking each record to the surveyed features. All data which is collated in Ladybird is synchronised to Wessex Archaeology's Arc GIS online (for future reuse and metadata production) and then exported into AutoCAD for editing and figure production.

Combined survey data shapefiles, with accompanying metadata, and .dwg CAD file(s) will be produced for archiving.

Photography

Captured as .raw and/or .jpeg files, site photographs are unlikely to undergo processing, except, where necessary format conversion from raw for post-excavation and reporting use and archiving.

Photogrammetry

Captured as .jpeg files, photogrammetric data may undergo some processing prior to photogrammetric processing. This may include colour correction and masking. Each photogrammetric dataset will be processed using photogrammetric software to produce, a textured 3D mesh, from which other outputs will be derived. This will be in a proprietary format. The nature of the outputs will be dependent upon the requirements for each instance of photogrammetric recording.

All outputs will be in open formats and will include an .obj per dataset (if deemed significant enough), .jpeg or .tif images (orthographic or isometric) and CAD drawings in .dwg or .dxf format. Archaeological features recorded using photogrammetry but not modelled as a deliverable will be archived as ortho-rectified plans in a .tif or high quality .jpeg format

Site records

Written records created during the archaeological fieldwork, such as context records, trench sheets and day books will be created on site in tablet pro forma sheets. All pro forma sheets will be converted into PDF format and information extracted to create spreadsheets, tables, and databases.

Fieldwork drawings will be created using pencil and permatrace. These will then be scanned at a minimum DPI of 300 and saved as .tif files. These files will constitute the digital security copy. Digital security copies will be kept on Wessex Archaeology's servers until they are deposited as part of the project archive. Some scanned drawings may be incorporated into project reports, where deemed appropriate.

Geoarchaeology

Data from the recording sheets is exported into a .docx file, for incorporation into the fieldwork episode's report, and an .xlsx file for the purposes of modelling and interpretation.

ArcGIS, Rockware Rockworks and Golden Software Strater are all used for the purposes of geoarchaeological modelling, utilising the data collected in the field. Data is exported as .emf format image files and Shapefiles ready to be incorporated into report figures.

5.2 Guidance

ADS 2013 *Caring for Digital Data in Archaeology: a guide to good practice*. Archaeology Data Service & Digital Antiquity Guides to Good Practice

Chartered Institute for Archaeologists [CIfA] 2014 Standards and Guidance, Codes of Conduct and Regulations. Reading, CIfA

Forster, M 2019 *Work Digital / Think Archive. A Guide to managing Digital data generated from archaeological investigations*. Dig Ventures

Historic England 2015 *Digital Image Capture and File Storage*. Swindon, Historic England

Historic England 2015 *Metric Survey Specifications for Cultural Heritage*. Swindon, Historic England

Historic England 2017 *Photogrammetric Applications for Cultural Heritage*. Swindon, Historic England

6 QUALITY MANAGEMENT

6.1 Wessex Archaeology procedures

Standardised naming conventions and folder structures alongside (US) document version control will be used for consistent and clear data recording and management. Consistency and quality of data collection will be controlled and documented via on site supervision/QA, post-excavation/reporting QA and digital archiving/QA. This may include processes such as calibration, repeat samples or measurements, standardised data capture or recording, data entry validation, peer review of data or representation with controlled vocabularies.

Wessex Archaeology is an ISO 9001 accredited organisation (certificate number FS 606559) independently audited by the British Standard Institution (BSI), confirming the operation of a Quality Management System which complies with the requirements of ISO 9001:2008 – covering professional archaeological and heritage advice and services.

Wessex Archaeology is registered as an archaeological organisation with the Chartered Institute for Archaeologists (CIfA) and fully endorses its Code of Conduct and Regulations for Professional Conduct.

7 MANAGING ACCESS AND DATA SECURITY

7.1 Wessex Archaeology procedures

Risks to data security will be managed in accordance with Wessex Archaeology's data security policy and procedures. Access will be controlled by secure user accounts and the implementation of document and folder level security.

All Wessex Archaeology office networks are secured behind managed firewalls which are upgraded, updated, and reviewed on a regular basis. All internal core systems are Microsoft licensed products (Windows 10, Windows Server 2016, Windows Server 2019) and we implement Active Directory to manage all user accounts, security, services and access to systems data and resources.

External access to Wessex Archaeology's systems and network is controlled via secured Virtual Private Network connections (encrypted and security controlled). Access is granted to Wessex Archaeology staff only.

Collaboration will be enabled via data access and sharing protocols that do not jeopardise data security. When creating the primary archive or collecting data in the field, data will be backed up daily onto Wessex Archaeology's main secured systems.

Wessex Archaeology's IT department has a backup strategy and policies that involve daily, weekly, monthly, and annual backups of data. Data will be stored on secured servers and within offsite storage locations.

7.2 Data protection

Wessex Archaeology has a privacy policy and procedures for dealing with personal information which meets the requirements of the *Data Protection Act 2018*. These detail what information Wessex Archaeology collects, the purpose for collecting this data, how it will be processed, stored, transferred, and disposed of. These documents are available on request.

Wessex Archaeology takes appropriate technical and organisational steps to ensure the security of relevant personal data. We have implemented security measures to protect the personal data that we have under our control from:

- Unauthorised access;
- Improper use or disclosure; and
- Unauthorised modification.

The Company ensures that all staff are aware of their responsibilities under GDPR and the *Data Protection Act 2018*, and provides them with the necessary advice, guidance, and awareness training in handling personal data.

Wessex Archaeology is committed to complying with the *General Data Protection Regulation* (GDPR) and the *Data Protection Act 2018* in fulfilling its duty to the rights of

individuals and in the collection, processing, and transfer of personal information to ensure that personal data is:

- Processed lawfully, fairly and in a transparent manner;
- Collected for specific, explicit, and legitimate purposes only;
- Adequate, relevant, and limited to what is necessary in relation to the purposes for which it is collected;
- Accurate and, where necessary, kept up to date. We will take every reasonable step to erase or rectify inaccurate personal data;
- Not kept in a form which allows identification of the subject for longer than is necessary for the specified purpose(s);
- Processed in an appropriately secure manner including protection against unauthorised use, accidental loss, destruction, or damage; and
- Where required, personal data will be redacted prior to the exchange of project documents or data with external organisations and individuals.

All relevant data collected as part of the project will be curated in line with these principles.

8 DATA RETENTION, SHARING AND PRESERVATION

8.1 Storage and preservation

All data will be retained forming the digital element of the overall working project archive. Digital data will be securely stored by Wessex Archaeology, with consideration of client confidentiality, GDPR restrictions and technological developments. Data will be stored in a logical, manageable way using Wessex Archaeology's methodology and storage systems. This will allow easy access throughout the duration of the project and for archive collation and consolidation once the project has ended.

For long-term storage preservation and accessibility, files will be converted to an open-source format, e.g., .csv and .dxf, where necessary or required. Data for all sites investigated as part of the project should be retained for as long as it is deemed to have potential for archaeological reuse. At a minimum, project reports that do not contain confidential information should be made available. It is recommended that data supporting these reports be made publicly accessible.

8.2 Selection and retention

The digital archive may include where created, site records, reports (including Written Scheme of Investigation (WSI) , post-excavation reports etc.), photographs, photogrammetric data, GNSS survey data, completed survey drawings, geoarchaeological data, environmental data, and post-excavation databases.

The digital archive may also include TST data, geophysics data and additional specialist data, depending on the final requirements of the project fieldwork and the resultant archaeological finds.

Not all born digital data will be archived. In order to create a high quality, sustainable, concise, and easily intelligible archive, all archaeological data/material will undergo a process of selection.

All data will be subject to this selection and retention process, as defined by the project-specific Selection Strategy, and as agreed with all project stakeholders during the course of the project.

Relevance of data considered for the archaeological archive will also be dependent upon and defined by the nature and significance of archaeological deposits, methods of recording, outputs created and potential for reuse. Some data may be redacted in order to comply with GDPR legislation.

This process will be reviewed with project stakeholder agreement and documented at project review and archival stages and updated as necessary. Such documentation will be included in the deposited archaeological archive. All digital data selected for deposition will be deposited as agreed with stakeholders with a Trusted Digital Repository and subject to good practice and repository guidelines.

Data will be kept in line with obligations to retain certain data, the potential reuse value, what is economically sustainable, and any additional effort required to prepare the data for data sharing and preservation. Data will be reused to validate research findings, conduct new studies, and for teaching. File formats will be stable cross-industry standard formats and deposited following good practice guidance.

Deselected digital files, those not being archived will be held on backed-up Wessex Archaeology servers for an appropriate and sustainable period of not less than a year following project completion, submission, and archive deposition.

8.3 Specific data type selection

Survey

Survey data in shapefiles and site plans in a CAD .dwg or .dxf format will be deposited in final file versions representing the data collection and data processing stages of work respectively and phased post-excavation interpreted data where created. Final file versions of survey data from various phases of work may also be consolidated into an overarching master survey drawing for archival concordance and sustainability following good practice guidance. Interpreted survey data in .tif, .tiff or shapefiles will be subject to the same selection procedure.

Photogrammetry

Photogrammetry and UAV photogrammetry models, if created, will be archived following good practice guidance as open source .obj files (where created) and orthographic or isometric georeferenced .tif or high quality .jpeg with component .jpg images will be archived along with the .obj along with a .pdf of the PhotoScan report (where created). Where not modelled an orthographic or isometric georeferenced .tif or high quality .jpeg, will be deposited along with a .pdf of the PhotoScan report (where created) and a .dwg CAD drawing. The deselected component images will be held on Wessex Archaeology's backed up servers.

Digital photographs

Digital site photographs in addition to aerial photos plus UAV photos (where created) will be deposited as taken in high quality jpeg. These will comprise a selection of all the digital

images taken across the project, inclusion based upon quality control, weeding of superfluous working shots and extraneous non-archaeological shots as well as excluding pre- and post-excavation site condition shots for the sustainability and potential for archaeological reuse of the archive. De-selected images will be retained on Wessex Archaeology's backed up servers.

Site records

Digital pro forma fieldwork records created on tablet in proforma .pdf format and automatically exported into server held project data spreadsheets. All final file versions of these records and the data exported from them will be digitally archived in .pdf and .xlsx formats respectively. The extracted data will form part of the project data submission spreadsheets specified below. Digital Security copy scans of site permatrace drawings will be produced in .tif format at a minimum 300 dpi and all site paper registers in pdf format.

Security copies of all paper/drawn records will be produced as per ClfA guidelines. These will be prepared on completion of a fieldwork episode as PDF format files. This will also ensure their security and accessibility for the project team. These will be stored on the Wessex Archaeology servers and undergo the same backup processes as other project data. Upon deposition, these will be converted into PDF/A.

Project data

Project data selection will be overseen at every stage throughout the course of the project during post-excavation data creation and processing by those responsible from fieldwork reporting and post-excavation to data storage and archiving. This will be subject to company quality control measures and guidance.

Selected project archive data will comprise Excel spreadsheet .csv or .xlsx data files containing site stratigraphic data, environmental data, finds specialist assessment and analysis data and general finds quantification and retention data. For archiving combined final file version .xlsx archival spreadsheets will be produced with component sheets representing the data type and/or project stage of data processing e.g.: Stratigraphic, Finds or Environmental data or different post-excavation specialist assessment or analysis records where created.

All other specialist data, for example conservation records, x-rays and registers, radiocarbon dating data and certificates and environmental analysis tables, where not included in project reporting, will be archived in Microsoft Word .docx or .pdf format.

Reporting

All final client reports and specialist archive reports produced will be archived as final file versions in .pdf or Microsoft Word .docx format. Early versions, drafts will not be selected for archive but will be held on Wessex Archaeology servers. Project reporting is subject to a document management system (DMS) with versioning and version control handled automatically. Digital images used as project client final report images will also be archived separately as high resolution .jpeg files and cross-referenced.

Data types

All data types used for archiving are industry standard and can be accessed by most data specific software. If this is not the case, data can be converted to other common formats. As advised by ADS all .pdf files selected for archive will be converted to archival standard PDF/A on deposition.

8.4 Guidance

ADS 2019 *Guidance on the Selection of Material for Deposit and Archive* Online guidance <https://archaeologydataservice.ac.uk/advice/selectionGuidance.xhtml> (accessed 31/08/21)

Brown, D H 2011 *Archaeological Archives: a guide to best practice in creation, compilation, transfer, and curation* (revised edition). Archaeological Archives Forum

Forster, M 2019 *Work Digital / Think Archive. A Guide to managing Digital data generated from archaeological investigations*. Dig Ventures

Whyte, A and Wilson, A 2010 *How to Appraise & Select Research Data for Curation* (revised 15/08/16, v.1.1), Digital Curation Centre, <https://www.dcc.ac.uk/guidance/how-guides/appraise-select-data> (accessed 31/08/21)

9 DATA SHARING

Data will be shared via a range of accessible media and portals as broadly as possible and via a Core Seal trusted repository. Data will be shared in accordance with project stakeholder requirements and any restrictions, if imposed and shared with consideration of client confidentiality and GDPR restrictions.

An OASIS form will be completed for each phase of archaeological work associated with the project. For some projects with negative archaeological results, this, alongside selected images deposited with OASIS, would form the archaeological archive as agreed with project stakeholders.

A final version of the project reporting will be supplied to the Historic Environment Record directly and/or via OASIS, and any data which they request can also be provided directly if they are manageable and sustainable. Data will be made available as soon after collection as possible, provided it is in accordance with stakeholder agreed requirements and any restrictions. Data archived with the ADS will have a persistent Digital Object Identifier (DOI) after deposition.

In agreement with project stakeholders, the digital archaeological archive and required metadata will be deposited with a Core Trust Seal trusted repository at a level commensurate with its potential for archaeological reuse, value for future research and public benefit. This will follow national and repository guidelines and ClfA standards, as outlined in this DMP.

Wessex Archaeology will attempt to minimise data restrictions as far as practicable. Exclusive use of the data may be required for limited periods where client approval is required, or longer term where sensitivities exist in discussion with project stakeholders. A data sharing agreement (or equivalent) will be adhered to via a deposition licence.

Data for deposition will be shared digitally via downloads accessible by the general public via the specific repository's data sharing guidelines and deposition licence with acknowledged long-term value. The methods used to share data will be dependent on several factors such as the type, size, complexity, and sensitivity of data. Open source and standard formats will form the basis of files comprising the archaeological archive to best enable future data sharing and ease of reuse.

If deposition is not possible at the time of project completion, the archive will be retained by Wessex Archaeology, until a suitable repository is agreed between project stakeholders.



APPENDIX 3 (6.5.8.5.3): FIELDWORK SELECTION STRATEGY

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Awel y Mor
 [version 1, 19/11/2021]

Selection Strategy

Project Information

Project Management

Project Manager	Bruce Eaton	
Archaeological Archive Manager	Lorraine Mephram	
Organisation	Wessex Archaeology (WA)	
Stakeholders		Date Contacted
Collecting Institution(s)	TBC Archaeology Data Service	
Project Lead / Project Assurance	Lead: Bruce Eaton Assurance: Bruce Eaton	N/A
Landowner / Developer	TBC in consultation with GoBe	
Other (external)	External finds & environmental specialists (see WSI) Development Control Archaeologist at CPAT	
Other (internal)	WA Finds Manager (Rachael Seager Smith) WA Environmental Officer (Inés López Dóriga) WA Geomatics & BIM Manager (Chris Breeden) WA internal finds & environmental specialists (see WSI)	N/A; briefed as part of standard project process

Resources

Resources required

WA Finds and Environmental specialists; external finds and environmental specialists; WA archives team

Context

This overarching selection strategy document is based on the ClfA Archives Selection Toolkit (2019) and relates to archaeological project work being undertaken by Wessex Archaeology as defined in the WSIs.

Relevant standards, policies and guidelines consulted include:

General

- *Selection, Retention and Dispersal of Archaeological Collections* (Society of Museum Archaeologists, 1993)
- *Archaeological archives: a guide to best practice in creation, compilation, transfer and curation* (AAF, revised edition 2011, section 4)

Relevant research agendas

- A Research Framework for the Archaeology of Wales (IFA 2008)

Finds

- *Standard Guidance for the collection, documentation, conservation & research of archaeological materials* (CIFA, 2014)
- *A Standard for Pottery Studies in Archaeology* (Prehistoric Ceramics Research Group, Study Group for Roman Pottery, Medieval Pottery Research Group 2016)

Environmental

- *Environmental Archaeology: A Guide to the Theory, Practice of Methods, from Sampling and Recovery to Post-excavation* (English Heritage 2011)
- *Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record* (Historic England 2015)
- *Guidelines for the Curation of Waterlogged Macroscopic Plant and Invertebrate Remains* (English Heritage 2008)
- *Waterlogged Wood: Guidelines on the Recording, Sampling, Conservation and Curation of Waterlogged Wood* (English Heritage 2010)
- *Waterlogged Organic Artefacts: Guidelines on their Recovery, Analysis and Conservation* (Historic England 2018)

Research objectives of the project

Following consideration of the archaeological potential of the site and the regional research framework (IFA 2008), the research objectives of the excavation are to:

- examine the results of the geophysical survey (Wessex Archaeology 2021b);
- determine the dating for the ring-ditches identified through the geophysical survey;
- determine the extent/preservation of medieval/post-medieval ridge and furrow and assess if this has impacted on any earlier remains;
- determine the best location for the temporary construction compound in relation to the archaeological evidence within the Site; and
- assess whether there is further archaeological evidence that have not been identified within the previous gradiometer survey (Wessex Archaeology 2021b).

REVIEW POINTS

Consultation with all Stakeholders regarding project-specific selection decisions will be undertaken at a maximum of three project review points:

1. Data gathering: on site, if any unforeseen discovery necessitates an amendment to the proposed collection strategy, or if adjustments are made to any sampling strategy
2. End of data gathering (assessment stage)
3. Archive compilation

1 – Digital Data

Stakeholders

WA Project Manager; WA Archives Manager; WA Geomatics & BIM Manager; Development Control Archaeologist at CPAT; ADS

Selection

Location of Data Management Plan (DMP)

This document is designed to link to the project Data Management Plan (DMP), which can be supplied on request.

To promote long-term future reuse deposition file formats will be of archival standard, open source and accessible in nature following national guidance from ADS 2013, ClfA 2014c and the requirements of the digital repository.

Any sensitive data to be handled according to Wessex Archaeology data policy to ensure it is stored and transferred securely. The identity of individuals will be protected in line with GDPR. If required, data will be anonymised and redacted. Selection and retention of sensitive data for archival purposes will occur in consultation with the client and relevant stakeholders. Confidential data will not be selected for archiving and will be handled as per contractual obligation.

Document type	Selection Strategy	Stakeholders	Review Points
Site records	Most records will be completed digitally on site (with the exception of registers). All will be selected for deposition.	As above	3
Reports	To include WSIs, Interim reports, post-excavation assessment reports, publication reports. Final versions only will be selected for deposition.	As above	2, 3
Specialist reports	Specialist reports will generally be incorporated in other documents with only minimal editing (reformatting, etc), and will be selected only if the original differs significantly from the incorporated version.	As above	2, 3
Photographic media (site recording)	Substandard and duplicate images will be eliminated; pre-excavation images may not be selected where duplicated by post-excavation shots; working shots will be very rigorously selected to include only good quality images with potential for reuse and those integral to	As above	2, 3

	understanding features, their inter-relationships and location on site; site condition and reinstatement photos will not be selected.		
Photographic media (objects)	Images of individual or groups of objects, to include those of significance selected for publication and reporting. Substandard and duplicate images will be eliminated; all others will be selected.	As above	3
Photographic media (photogrammetry)	All terrestrial photogrammetry recording will generate orthographic photos. For those features or finds which are particularly archaeological significant, 3D models will be generated and deposited but raw photos will only be selected where models have been selected and OBJs are to be deposited, where re-processing may have some archaeological value (eg very significant features, or where the model is less accurate than the surveyed georeference targets or of lower quality and the quality of the original photos is good enough to represent a reasonable chance of better future outcomes). Aerial photogrammetry topographic surveys will generate 3D models and orthographic photos, and the final outputs in the form of the report. These will all be selected, but not the raw photos from aerial surveys.	As above	2, 3
Photographic media (community engagement and other activities)	General shots, promotional videos, etc. None will be selected, unless images are generated that are not duplicated in the main site record, but which have specific archaeological value.	As above	3
Survey data	Site survey data will be used to generate CAD/GIS files for use in post-excavation activities. Shapefiles of both the original tidied survey data, and the final phased drawings will be selected.	As above	2, 3
Databases and spreadsheets	Context, finds and environmental data in linked databases. Final versions will be selected. Any	As above	2, 3

	specialist data submitted separately will also be selected.		
LIDAR data	All will be selected	As above	2, 3
Laser Scan data	All will be selected	As above	2, 3
Geophysical data	RAW data and Interpretation Geotiffs	As above	2, 3
Administrative records	Includes invoices, receipts, timesheets, financial information, email correspondence. None will be selected, with the exception of any correspondence relating directly to the archaeology.	As above	3

De-Selected Digital Data

De-selected data will be stored on WA secured servers on offsite storage locations. The WA IT department has a backup strategy and policies that involves daily, weekly and monthly and annual backups of data as stated in the DMP. This strategy is non-migratory, and original files will be held at WA under their unique project identifier, as long as they remain useful and usable in their final version format. This data may also be used for teaching or reference collections by the museum, or by WA unless otherwise required by contractual or copyright obligations.

Amendments

Date	Amendment	Rationale	Stakeholders

2 – Documents

Stakeholders

WA Project Manager; WA Archives Manager; RCHAMW; Development Control Archaeologist at CPAT

Selection

A security copy of all paper/drawn records is a requirement of ClfA guidelines. This will be prepared on completion of the project, in the form of a digital PDF/A file. If the security copy is not required for deposition by Stakeholders, it will be retained on backed-up servers belonging to Wessex Archaeology.

Note that some information may be redacted to comply with GDPR legislation (personal data).

Document type	Selection Strategy	Stakeholders	Review Points
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Site records	Selected records only will be completed in hard copy on site (registers, some graphics). All will be selected for deposition.	As above	3
Reports	Hard copies of all reports (SSWSIs, Interim reports, post-excavation assessment reports, publication reports). All will be selected for deposition, with the exception of earlier versions of reports which have been clearly superseded.	As above	2, 3
Specialist reports & data	Specialist reports will generally be incorporated in other documents with no significant editing. Supporting data is more likely to be included in the digital archive, but if supplied in hard copy and not incorporated elsewhere, this will be selected.	As above	2, 3
Photographic media	X-radiographic plates: all will be selected.	As above	3
Secondary sources	Hard copies of secondary sources will not be selected.	As above	3
Working notes	Rough working notes, annotated plans, preliminary versions of matrices etc, will not be selected.	As above	3
Administrative records	Invoices, receipts, timesheets, financial information, hard copy correspondence. None will be selected, with the exception of any hard copy correspondence relating directly to the archaeology.	As above	3

De-Selected Documents

De-selected sensitive analogue data will be destroyed (shredded) subject to final checking by the WA Archives team with the remainder recycled. Possible exceptions include records retained for business purposes, including promotional material, teaching and internal WA library copies of reports.

Amendments

Date	Amendment	Rationale	Stakeholders

3 – Materials

Material type

Artefacts (bulk and registered finds)

Section 3.

3.1

Stakeholders

WA Archives Manager; WA Finds Manager; WA internal specialists; external specialists; Denbighshire Museums Service; Development Control Archaeologist at CPAT; landowner

Selection

Note that human remains are not included in this selection strategy; their recovery and subsequent treatment and curation will be governed by a Ministry of Justice licence(s).

The on-site finds recovery strategy is given below; it is of necessity fairly generic. It is anticipated that this will be reviewed and updated at the project assessment stage, once all collected finds have been processed and quantified. Amendments may be made prior to that on site in the event of unforeseen discoveries necessitating adjustments to recovery or sampling strategies (eg production sites, large concentrations of building debris, 'burnt mounds').

Throughout the following section, 'stratified' is taken to include topsoil deposits, while 'unstratified' indicates anything completely separated from context eg spoilheap finds, or surface finds other than those directly associated with underlying features.

Find Type	Selection Strategy	Stakeholders	Review Points
Animal bone	All will normally be collected from stratified contexts. Selection could be recommended at next review point, dependent on stratigraphic integrity, condition and size of assemblage.	As above	2, 4
Building materials (other, eg, mortar, plaster, <i>opus signinum</i>)	If found <i>in situ</i> , these should be recorded on site and, if appropriate, a small sample of <i>opus signinum</i> or wall plaster (not mortar) retained for further examination. Loose fragments of mortar or <i>opus signinum</i> should not be collected, but their presence on site should be noted. All loose wall plaster will be collected from stratified contexts. Selection likely to be recommended at next review point.	As above	2, 4
Burnt (unworked) flint	All will normally be collected from stratified contexts. Selection likely to be recommended at next review point.	As above	1 (if large quantities encountered), 2, 3

Ceramic building material	All CBM from stratified contexts will be collected and reviewed at the processing stage. If <i>in situ</i> structures are encountered, these should be fully recorded on site, but samples of components may be collected for a closer examination of form, fabric and dimensions. Selection likely to be recommended at next review point.	As above	1 (if large quantities encountered), 2, 3
Ceramic objects	Includes spindlewhorls, loomweights, slingshot, portable kiln furniture, etc. All will be collected, including any unstratified examples.	As above	2, 3
Clay tobacco pipes	All will normally be collected from stratified contexts. Selection likely to be recommended at next review point.	As above	2, 3
Coins	All will be collected, including unstratified finds.	As above	2, 3
Fired clay	Includes structural material ('daub') as well as briquetage, and undiagnostic fragments. All will be collected from stratified contexts. Selection likely to be recommended at next review point.	As above	2, 3
Glass, vessel and window	All will normally be collected from stratified contexts. Unstratified post-medieval/modern material will not be collected, unless of intrinsic interest. If large-scale post-medieval/modern bottle dumps are encountered, items will be recorded <i>in situ</i> as far as possible, and a small sample collected. Selection likely to be recommended at next review point.	As above	1 (if large quantities encountered), 2, 3
Glass, objects	All will be collected, including unstratified finds	As above	2, 3
Jet, shale, amber	All will be collected, with the possible exception of unstratified unworked shale or shale-working waste. Selection could be recommended at next review point, dependent on condition.	As above	2, 3

Leather and textile	All will be collected, including unstratified finds. Selection could be recommended at next review point, dependent on date and condition.	As above	2, 3
Marine shell	All will normally be collected from stratified contexts. If large-scale dumps are encountered, an appropriate sampling strategy may be employed with the aim of characterising the shell assemblage (species, condition, potential sources, management of oyster beds, etc). All shell-working waste will be collected. Selection likely to be recommended at next review point.	As above	1 (if large quantities encountered), 2, 3
Metalwork	All will be collected from stratified contexts, with the exception of obviously modern (19 th -/20 th -century) objects found in topsoil/overburden or unstratified. Selection likely to be recommended at next review point.	As above	2, 3
Metalworking residues	All will be normally collected from stratified contexts. Selection likely to be recommended at next review point.	As above	2, 3
Pottery, prehistoric	All will be collected, including unstratified finds.	As above	2, 3
Pottery, all other periods	All will be collected from stratified contexts. From unstratified contexts, only pieces of intrinsic interest will be collected, unless this is the only datable material recovered. Selection could be recommended at next review point.	As above	2, 3
Stone, building	<i>In situ</i> architectural fragments and other building material may be recorded on site rather than collected, and samples taken for geological identification. Other building stone will be collected from stratified contexts. From unstratified contexts, only pieces of intrinsic interest (eg, architectural fragments). Selection likely to be recommended at next review point.	As above	2, 3

Stone, portable objects	All will be collected from stratified contexts. From unstratified contexts, only identifiable objects.	As above	2, 3
Stone, unworked	Unworked stone will only be collected if considered to be archaeologically significant, ie included in features intentionally, or thought to have fulfilled a specific function.	As above	2, 3
Worked bone and antler	Includes finished objects as well as boneworking waste. All will be collected, including unstratified finds.	As above	2, 3
Worked flint	All will be collected.	As above	2, 4
Worked wood	This includes all structural timbers as well as any portable objects (e.g. vessels, implements, etc). Structural timbers found <i>in situ</i> should be recorded stratigraphically but may be sampled for species identification and/or dating without full recovery. All other will be collected, with the exception of unstratified and undiagnostic pieces. Selection could be recommended at next review point.	As above	1 (if <i>in situ</i> finds encountered), 2, 4

Uncollected Material

Finds which fall outside the categories proposed for on-site collection will not normally be recorded beyond a general comment on site recording sheets on the presence and nature of large concentrations (eg building materials, modern debris), but if specific sampling strategies are employed to deal with, for example, production waste, then a more accurate guide to the actual size of the parent assemblage (and thus the sample percentage) will be given.

Any uncollected material will be left *in situ* or (if collected and then de-selected), re-incorporated into the site.

De-Selected Material

Consideration will be given to the suitability for use for handling or teaching collections by the museum or Wessex Archaeology, or whether they are of particular interest to the local community. De-selected material will either be returned to the landowner or disposed of. All will be adequately recorded to the appropriate level before de-selection.

Amendments

Date	Amendment	Rationale	Stakeholders

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3 – Materials

Material type	Palaeoenvironmental material	Section 3.	3.2
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Stakeholders

WA Archives Manager; WA Environmental Officer; WA internal specialists; external specialists; Denbighshire Museums Service; Development Control Archaeologist at CPAT

Selection

All contexts suitable for environmental sampling will be considered for sampling. All environmental sampling will be undertaken following Wessex Archaeology's in-house guidance, which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015a) and as stated in relevant WSI.

Env Material Type	Selection Strategy	Stakeholders	Review Points
Unprocessed samples	In the event of any samples being eliminated from processing due to lack of archaeological significance, these will not be retained.	As above	2, 3
Unsorted residues	Residues from samples not proposed for further analysis will be de-selected, with the possible exception of any taken for the recovery of human remains.	As above	2, 3
Assessed flots with no extracted materials	Assessed flots with no extracted materials are considered to be devoid of any significant environmental evidence and will be de-selected.	As above	2, 3
Assessed or analysed flots with extracted materials	All analysed samples will be selected; assessed flots with extracted materials with no further research potential (to be established on a sample by sample case) may be de-selected.	As above	2, 3
Charred & waterlogged plant remains	All extracted plant remains will be selected	As above	3
Mollusca	All extracted mollusca will be selected	As above	3
All other analysed material (eg insects,	All material will be selected	As above	3

pollen)			
Uncollected Material			
Any uncollected material will be left <i>in situ</i> or re-incorporated into the site.			
De-Selected Material			
De-selected material from samples will be disposed of after processing and post-excavation recording. All processed material will be adequately recorded to the appropriate level before de-selection.			
Amendments			
Date	Amendment	Rationale	Stakeholders



APPENDIX 4 (6.5.8.5.4): WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL EVALUATION (NOVEMBER 2021)



Awel y Mor Onshore Cable Route Denbighshire

Written Scheme of Investigation for Archaeological Evaluation

Document Ref.: 257390.01
November 2021



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Awel y Mor Onshore

Written Scheme of Investigation for Archaeological Evaluation

1 INTRODUCTION

1.1 Project and planning background

- 1.1.1 Wessex Archaeology has been commissioned by GoBe Consultants Ltd. ('the Client') to produce a written scheme of investigation (WSI) for a proposed archaeological evaluation of 31 ha. The evaluation area is centred on NGR 300967, 374269 (**Fig. 1**), where the substation and construction compound will be constructed for the Awel y Mor Onshore cable route.
- 1.1.2 The substation and its associated construction compound will have the potential to damage or truncate any buried archaeological features within their footprint.
- 1.1.3 The evaluation will comprise the excavation, investigation and recording of 40 trial trenches (each measuring 2 m by 50 m).
- 1.1.4 This evaluation is part of staged approach in determining the archaeological potential of the site, and follows other non-intrusive archaeological work, including a gradiometer survey of the Site, which identified a number of strong anomalies that may represent prehistoric archaeological features adjacent to the Bodelwyddan Park (Wessex Archaeology 2021b).

1.2 Scope of document

- 1.2.1 This WSI sets out the aims of the evaluation, and the methods and standards that will be employed. In format and content, it conforms to current best practice, as well as to the guidance in *Management of Research Projects in the Historic Environment* (MoRPHE, Historic England 2015a) and the Chartered Institute for Archaeologists' (CIfA) *Standard and guidance for archaeological field evaluation* (CIfA 2014a).
- 1.2.2 This document will be submitted to Mark Walters, archaeological advisor to the Local Planning Authority (LPA), for approval, prior to the start of the evaluation.

1.3 Location, topography and geology

- 1.3.1 The proposed evaluation area is located adjacent to Bodelwyddan Park, comprising of agricultural fields.
- 1.3.2 Existing ground levels are between 48 and 58 m aOD.
- 1.3.3 The underlying geology is mapped as predominantly Warwickshire Group – Mudstone, Siltstone And Sandstone, with a small parcel at the south-western area of the Site being Clwyd Limestone Group. Superficial deposits of Devensian Till run throughout the whole evaluation area.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

- 2.1.1 The archaeological and historical background was assessed in a prior desk-based assessment (Wessex Archaeology 2021a), which considered the recorded historic environment resource within a 1 km study area of the full cable route including the proposed substation and construction compound area. A summary of the results is presented below, with relevant entry numbers from the CPAT Historic Environment Record (HER) and the National Heritage List for England (NHLE) included. Additional sources of information are referenced, as appropriate.

2.2 Previous investigations

Gradiometer Survey (Wessex Archaeology 2021b)

- 2.2.1 Wessex Archaeology conducted a gradiometer survey across the proposed route for the onshore cable route for Awel y Mor Onshore. The works indicated that the proposed evaluation area contained three distinct areas of probable settlement activity. The first phase of settlement is in the form of a number of ring-ditch features, likely dating between the Neolithic and Iron Age periods. Recti-linear features have also been identified through the survey, which likely date to the Romano-British, or even to as late as the early medieval period. There have also been curvi-linear and linear ditch-like features identified, although the dating of these remains uncertain from the survey.

2.3 Archaeological and historical context

- 2.3.1 The absence of extensive prehistoric activity within this landscape could relate to the lack of previous targeted intrusive archaeological investigations, and therefore raises the possibility that there remains a background potential for further, as yet undiscovered archaeological remains within the immediate vicinity to the Scheme. The superficial geological deposit of Till is a cold climate deposit that is deposited directly by ice sheets. It consists of poorly sorted sediments resulting from the erosion and entrainment of material by the moving ice of a glacier. Till has low potential to preserve archaeological and geoarchaeological datasets with any material it does contain to be heavily and extensively reworked.
- 2.3.2 A possible standing stone is speculated on the HER records, approximately 150 m to the east of the Site, although little information is available (**102658**).
- 2.3.3 Romano-British activity is also limited within the north-eastern region of Wales, with research suggesting that there is a lack of evidence of Romano-British settlement patterns and urban centres (Archaeoleg 2003). Roman-British finds were discovered through metal detecting approximately 260 m to the west of the Site (**104608**).
- 2.3.4 The Domesday Survey (1086) indicates that the landscape was settled by the medieval period, with a number of small settlements running along the route, situated within the historic county of Cheshire (Cefn Du, Cwybr Bach, Cwybr, Rhuddlan and LLan Elwy). There is no evidence of Saxon activity within the landscape; however, these sparse settlements may have originated in earlier Saxon settlements.
- 2.3.5 It is thought that St Asaph may have been the site of a monastery and episcopal see as early as 560 AD by St Kentigern. St Asaph is thought to have succeeded Kentigern as bishop. The earlier settlement was referred to as Llanuile (Llanelwy) in the Domesday book but around the middle of the 12th century the name was changed to St Asaph. In 1239 construction for a cathedral began but this was burned by the troops of Edward I in 1282.

- 2.3.6 It is likely that the landscape continued to be predominantly agricultural in nature during the early medieval and medieval periods, with extensive evidence of ridge and furrow in regularly formed fields being identified in the Site. Ridge and furrow would have been a crucial part of the medieval feudal system where peasant workers were given strips of land by knights and lords of the manors, in exchange for a percentage of their produce for sustenance. The HER records that almost all of the area within the Site was previously ridge and furrow identified from aerial photographs and LiDAR although this was only visible within a single field to the south east of Faenol-Bropor Farmstead. It is possible that the ridge and furrow could exist as below ground features in other areas.
- 2.3.7 Faenol-Bropor is a farmstead adjacent to the evaluation area for the Site. The agricultural fields which surround and are associated with the farmstead retain their historic character through the presence of hedgerow boundaries, grazing fields and the surviving area of ridge and furrow. This area of ridge and furrow could be identified on the Site visit and can also be seen clearly on the LiDAR image.
- 2.3.8 The post-medieval period saw the development of small hamlets in villages. The Agricultural Revolution and associated developments in technological innovation saw the enclosure of open fields and the construction of more farmstead buildings nationwide. Tithe Mapping indicates that the landscape had been fully enclosed by 1845 (National Library of Wales 2021).
- 2.3.9 The route runs along the boundary of the Bodelwyddan Castle Park, with documentary evidence suggesting that the estate originated at least in the 15th century and the current layout of the estate dating to the mid-19th century refurbishment including the estate wall and formal garden.
- 2.3.10 The grounds also contain the scheduled monument relating to WWI practice trenches which extend beyond the scheduled area over several hectares (**FL186**). These were initially excavated for practice to excavate the trenches and then subsequently used for infantry combat training. Frontline trenches are identifiable from their crenelated shape with zig zag communication lines linking back to the reserve lines. It appears that several distinct groups were created perhaps as opposing lines. Circular craters across much of the area indicate that the practice was intended to be as realistic as possible, replicating the battlefield landscape. Overlooking the training area is what is thought to be a remote command post on slightly higher ground (CPAT 2014).

3 AIMS AND OBJECTIVES

3.1 General aims

- 3.1.1 The general aims (or purpose) of the evaluation, in compliance with the *CIfA Standard and guidance for archaeological field evaluation* (CIfA 2014a), are to:
- provide information about the archaeological potential of the site; and
 - inform either the scope and nature of any further archaeological work that may be required; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.

3.2 General objectives

- 3.2.1 In order to achieve the above aims, the general objectives of the evaluation are to:

- determine the presence or absence of archaeological features, deposits, structures, artefacts or ecofacts within the specified area;
- establish, within the constraints of the evaluation, the extent, character, date, condition and quality of any surviving archaeological remains;
- place any identified archaeological remains within a wider historical and archaeological context in order to assess their significance; and
- make available information about the archaeological resource within the site by reporting on the results of the evaluation.

3.3 Site-specific objectives

3.3.1 Following consideration of the archaeological potential of the site and the regional research framework (IFA Wales 2008), the site-specific objectives of the evaluation are to:

- examine the results of the geophysical survey (Wessex Archaeology 2021b);
- determine the dating for the ring-ditches identified through the geophysical survey;
- determine the extent/preservation of medieval/post-medieval ridge and furrow and assess if this has impacted on any earlier remains;
- determine the best location for the temporary construction compound in relation to the archaeological evidence within the Site; and
- assess whether there is further archaeological evidence that have not been identified within the previous gradiometer survey (Wessex Archaeology 2021b).

4 FIELDWORK METHODS

4.1 Introduction

4.1.1 Health and safety will override archaeological considerations in all works since, as stated in ClfA guidance, *Health and Safety regulations and requirements cannot be ignored no matter how imperative the need to record archaeological information; hence Health and Safety will take priority over archaeological matters* (ClfA 2014a, 11)

4.1.2 All works will be undertaken in accordance with the detailed methods set out within this WSI. Any significant variations to these methods will be agreed in writing with Mark Walters at CPAT, archaeological advisors to the local planning authority, and the client prior to being implemented.

4.1.3 The evaluation will comprise the excavation, investigation and recording of 40 trial trenches (each measuring 2 m by 50 m).

4.2 Setting out of the trenches

4.2.1 All trenches will be set out using a Global Navigation Satellite System (GNSS) in the approximate positions shown in **Figures 1-2**. The reasoning behind the trenches in these locations are shown in the table below.

Table 1 Reasoning for trench plan methodology

Trench numbers	Reasoning for location
1-3	Targeting strong anomalies, including curvi-linear and linear features, and pit alignments
4	Targeting a former field boundary, as well as other weak anomalies on the geophysical survey
5	Targeting weak anomalies that may be archaeological in nature

6	Targeting weak anomalies that may be archaeological in nature
7	Targeting ridge and furrow
8-13	Targeting strong archaeological anomalies, including ring-ditches, curvi-linear and linear features, identified on geophysical survey
14-15	Targeting strong archaeological anomalies, including ring-ditches and curvi-linear features, identified on geophysical survey
16	Targeting weak anomalies that may be archaeological in nature
17	Targeting weak anomalies that may be ferrous in nature
18	Targeting weak anomalies that may be archaeological in nature
19	Targeting weak anomalies that may be archaeological in nature
20	Targeting strong archaeological anomaly that indicates a ring-ditch
21	No archaeological features were identified within this area on geophysical survey, so targeted to check accuracy of survey/see if construction compound could be located here
22	No archaeological features were identified within this area on geophysical survey, so targeted to check accuracy of survey/see if construction compound could be located here
23	Targeting weak anomalies that may be archaeological in nature
24	Targeting weak anomalies that may be archaeological in nature
25	No archaeological features were identified within this area on geophysical survey, so targeted to check accuracy of survey/see if construction compound could be located here
26	Targeting potential ridge and furrow
27	Targeting potential ridge and furrow
28	Targeting a former field boundary, as well as other weak anomalies that may be archaeological in nature
29	No archaeological features were identified within this area on geophysical survey, so targeted to check accuracy of survey/see if construction compound could be located here
30-35	Targeting features relating to potential double-ditched enclosure
36-40	Targeting features relating to anomalies identified through gradiometer survey

4.2.2 Minor adjustments to the layout may be required to take account of constraints such as vegetation or located services, and to allow for machine manoeuvring. The trench locations will be tied in to the Ordnance Survey (OS) National Grid and Ordnance Datum (OD) (Newlyn), as defined by OSTN15.

4.3 Service location and other constraints

4.3.1 The client will provide information regarding the presence of any below/above-ground services, and any ecological, environmental or other constraints.

4.3.2 Before excavation begins, the evaluation area will be walked over and visually inspected to identify, where possible, the location of any below/above-ground services. All trial trench locations will be scanned before and during excavation with a Cable Avoidance Tool (CAT) to verify the absence of any live underground services.

4.4 Excavation methods

4.4.1 The trenches will be excavated using a 360° tracked excavator equipped with a toothless bucket. Machine excavation will be under the constant supervision and instruction of the monitoring archaeologist. Machine excavation will proceed in level spits of approximately 50–200 mm until either the archaeological horizon or the natural geology is exposed. Where necessary, the base of the trench/surface of archaeological deposits will be cleaned by hand.

4.4.2 A sample of the archaeological features and deposits identified will be hand-excavated, sufficient to address the aims of the evaluation. Spoil derived from machine stripping and hand-excavation will be visually scanned for the purposes of finds retrieval, and where appropriate will also be metal-detected by trained archaeologists. Artefacts and other finds will be collected and bagged by context.



- 4.4.3 If an exceptional number and/or complexity of archaeological deposits are identified, sample excavation will aim to be minimally intrusive, but sufficient to resolve the principal aims of the evaluation, to a level agreed with Mark Walters at CPAT and the client.
- 4.4.4 If human remains are uncovered, the specific methods outlined below (section 4.9.2) will be followed.
- 4.4.5 Where complex archaeological stratification is encountered, deposits will be left *in situ* and alternative measures taken to assess their depth, as agreed with Mark Walters at CPAT. Where modern features are seen to truncate the archaeological stratification, these may be removed, where practicable, in a manner that does not damage the surrounding deposits to enable the depth of stratification to be assessed.

4.5 Recording

- 4.5.1 All exposed archaeological deposits and features will be recorded using Wessex Archaeology's pro forma recording system.
- 4.5.2 A complete record of excavated archaeological features and deposits will be made. This will include plans and sections, drawn to appropriate scales (generally 1:20 or 1:50 for plans, 1:10 for sections) and tied to the OS National Grid.
- 4.5.3 A full photographic record will be made using digital cameras equipped with an image sensor of not less than 16 megapixels. This will record both the detail and the general context of the principal features and the site. Digital images will be subject to managed quality control and curation processes, which will embed appropriate metadata within the image and ensure long term accessibility of the image set. Photographs will also be taken of all areas, including access routes, to provide a record of conditions prior to and on completion of the evaluation.

4.6 Survey

- 4.6.1 The real time kinematic (RTK) survey of all trenches and features will be carried out using a Leica GNSS connected to Leica's SmartNet service. All survey data will be recorded in OS National Grid coordinates and heights above OD (Newlyn), as defined by OSTN15 and OSGM15, with a three-dimensional accuracy of at least 50 mm.

4.7 Monitoring

- 4.7.1 The client will inform Mark Walters at CPAT of the start of the evaluation and its progress. Reasonable access will be arranged for Mark Walters to make site visits to inspect and monitor the progress of the evaluation. Any variations to the WSI, if required to better address the project aims, will be agreed in advance with the client and Mark Walters.

4.8 Reinstatement

- 4.8.1 Trenches completed to the satisfaction of the client and Mark Walters will be backfilled using excavated materials in the order in which they were excavated, and left level on completion. No other reinstatement or surface treatment will be undertaken.

4.9 Finds

General

- 4.9.1 All archaeological finds will be retained, although those of clearly very recent origin with negligible potential to provide information relevant to the project aims and objectives may be recorded on site and not retained. Where appropriate, soil samples may be taken and

sieved to aid in finds recovery. Any finds requiring conservation or specific storage conditions will be dealt with immediately in line with *First Aid for Finds* (Watkinson and Neal 1998).

Human remains

- 4.9.2 In the event of discovery of any human remains (articulated or disarticulated, cremated or unburnt), all excavation of the deposit(s) will cease pending Wessex Archaeology obtaining a Ministry of Justice licence (this includes cases where remains are to be left *in situ*).
- 4.9.3 Initially the remains will be left *in situ*, covered and protected, pending discussions between the client, Wessex Archaeology's osteoarchaeologist and Mark Walters regarding the need for excavation/removal or sampling. Where this is deemed appropriate, the human remains will be fully recorded, excavated and removed from site in compliance with the Ministry of Justice licence.
- 4.9.4 Excavation and post-excavation processing of human remains will be in accordance with Wessex Archaeology protocols and in-line with current guidance documents (eg, McKinley 2013) and the standards set out in ClfA Technical Paper 13 *Excavation and post-excavation treatment of cremated and inhumed remains*. Appropriate specialist guidance/site visits will be undertaken if required.
- 4.9.5 The final deposition of human remains subsequent to the appropriate level of osteological analysis and other specialist sampling/examinations will follow the requirements set out in the Ministry of Justice licence.

Treasure

- 4.9.6 Wessex Archaeology will immediately notify the client and Mark Walters on discovery of any material covered, or potentially covered, by the *Treasure Act 1996*. All information required by the *Treasure Act* (ie, finder, location, material, date, associated items etc.) will be reported to the Coroner within 14 days.

4.10 Environmental sampling

- 4.10.1 All sampling will be undertaken following Wessex Archaeology's in-house guidance, which adheres to the principles outlined in Historic England's guidance (English Heritage 2011 and Historic England 2015b).
- 4.10.2 Bulk environmental soil samples, for the recovery of plant macrofossils, wood charcoal, small animal bones and other small artefacts, will be taken as appropriate from well-sealed and dateable contexts. In general, features directly associated with particular activities (eg, pits, latrines, cesspits, hearths, ovens, kilns, and corn driers) should be prioritised for sampling over features, such as ditches or postholes, which are likely to contain reworked and residual material.
- 4.10.3 If waterlogged or mineralised deposits are encountered, an environmental sampling strategy will be devised and agreed with Mark Walters as appropriate. Specialist guidance will be provided by a member of Wessex Archaeology's geoarchaeological and environmental team, with site visits undertaken if required.
- 4.10.4 Any samples will be of an appropriate size – typically 40 litres for the recovery of environmental evidence from dry contexts, and 10 litres from waterlogged deposits.

- 4.10.5 Following specialist advice, other sampling methods such as monolith, Kubiena or contiguous small bulk (column) samples may be employed to enable investigation of deposits with regard to microfossils (eg, pollen, diatoms) and macrofossils (eg, molluscs, insects), soil micromorphological or soil chemical analyses.

5 POST-EXCAVATION METHODS AND REPORTING

5.1 Stratigraphic evidence

- 5.1.1 All written and drawn records from the evaluation will be collated, checked for consistency and stratigraphic relationships. Key data will be transcribed into a database, which can be updated during any future analyses. The preliminary phasing of archaeological features and deposits will be undertaken using stratigraphic relationships and the spot dating from finds, particularly pottery.
- 5.1.2 A written description will be made of all archaeologically significant features and deposits that were exposed and excavated, ordered either by trench or by period as appropriate. Detail of all contexts will be provided in trench tables in the appendix of the report.

5.2 Finds evidence

- 5.2.1 All retained finds will, as a minimum, be washed, weighed, counted and identified. They will then be recorded to a level appropriate to the aims and objectives of the evaluation. Recording and reporting will conform to the Type 2 (Appraisal) level according to ClfA's *Toolkit for Specialist Reporting*, to include appropriate quantification, characterisation and assessment of significance and potential. The report will include a table of finds by feature/context or trench.
- 5.2.2 Metalwork from stratified contexts will be X-rayed and, along with other fragile and delicate materials, stored in a stable environment. The X-raying of objects and other conservation needs will be undertaken by Wessex Archaeology in-house conservation staff, or by another approved conservation centre.
- 5.2.3 Finds will be suitably bagged and boxed in accordance with the guidance given by the relevant museum and generally in accordance with the standards of the ClfA (2014b).

5.3 Environmental evidence

- 5.3.1 Bulk environmental soil samples will be processed by standard flotation methods. The residues will be fractionated into 5.6/4 mm and 1/0.5 mm and dried if necessary. The coarse residue fraction (>5.6/4 mm), and the fine fraction when appropriate, will be sorted and discarded, with any finds recovered given to the appropriate specialist. The flot will be retained on a 0.25 mm mesh and scanned to assess the range of environmental remains present and their preservation. Unsorted fine residues will be retained until after any analyses and discarded following final reporting (in accordance with the Selection policy, below).
- 5.3.2 In the case of samples from cremation-related deposits the flots will be retained on a 0.25 mm mesh, with residues fractionated into 4 mm, 2 mm and 1 mm. In the case of samples from inhumation burial deposits, the sample will be wet-sieved through 9.5 mm and 1 mm mesh sizes. The coarse fractions (9.5 mm) will be sorted with any finds recovered given to the appropriate specialist together with the finer residues.
- 5.3.3 Any waterlogged samples will be processed by standard waterlogged flotation methods.

- 5.3.4 Recording and reporting will conform to the Type 2 (Appraisal) level according to ClfA's *Toolkit for Specialist Reporting*, to include appropriate quantification, characterisation and assessment of significance and potential.

5.4 Reporting

General

- 5.4.1 Following completion of the fieldwork and the evaluation of the stratigraphic, artefactual and ecofactual evidence, a draft report will be submitted for approval to the client and Mark Walters, for comment. Once approved, a final version will be submitted.

- 5.4.2 The report will include the following elements:

- Non-technical summary;
- Project background;
- Archaeological and historical context;
- Aims and objectives;
- Methods;
- Results – stratigraphic, finds and environmental;
- Conclusions in relation to the project aims and objectives, and discussion in relation to the wider local, regional or other archaeological contexts and research frameworks etc;
- Archive preparation and deposition arrangements;
- Appendices, including trench summary tables;
- Illustrations; and
- References.

- 5.4.3 A copy of the final report will be deposited with the HER, along with surveyed spatial digital data (.dxf or shapefile format) relating to evaluation.

Publication

- 5.4.4 If no further mitigation works are undertaken, a short report on the results of the evaluation will be prepared for publication in a suitable journal, if considered appropriate and agreed with the client and Mark Walters.

OASIS

- 5.4.5 An OASIS (online access to the index of archaeological investigation) record (<http://oasis.ac.uk>) will be created, with key fields completed, and a .pdf version of the final report submitted. Subject to any contractual requirements on confidentiality, copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service (ADS) ArchSearch catalogue.

6 ARCHIVE STORAGE AND CURATION

6.1 Museum

- 6.1.1 It is recommended that the finds archive resulting from the evaluation be deposited with the Denbighshire Museums Service. The museum will receive notification of the project prior to fieldwork commencing, and an accession number will be obtained if appropriate. The

documentary archive will be deposited with the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW).

6.2 Transfer of title

- 6.2.1 On completion of the evaluation (or extended fieldwork programme), every effort will be made to persuade the legal owner of any finds recovered (ie, the landowner), with the exception of human remains and any objects covered by the *Treasure Act 1996*, to transfer their ownership to the museum in a written agreement.

6.3 Preparation of archive

Finds archive

- 6.3.1 Any finds (artefacts and ecofacts) will be prepared following the standard conditions for the acceptance of excavated archaeological material by Denbighshire Museums Service and in general following nationally recommended guidelines (SMA 1995; ClfA 2014c; Brown 2011). The archive will usually be deposited within one year of the completion of the project, with the agreement of the client.

Documentary archive

- 6.3.2 The physical archive (paper records and graphics) and born digital data (site records, finds and environmental data, photographs, survey data and reports) will be prepared following the standard conditions for the acceptance of excavated archaeological material by Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) and in general following nationally recommended guidelines (SMA 1995; ClfA 2014c; Brown 2011).

6.4 Selection strategy

- 6.4.1 It is widely accepted that not all the records and materials (artefacts and ecofacts) collected or created during the course of an archaeological project require preservation in perpetuity. These records and materials will be subject to selection in order to establish what will be retained for long-term curation, with the aim of ensuring that all elements selected to be retained are appropriate to establish the significance of the project and support future research, outreach, engagement, display and learning activities, ie the retained archive should fulfil the requirements of both future researchers and the receiving Museum.
- 6.4.2 The selection strategy, which details the project-specific selection process, is underpinned by national guidelines on selection and retention (Brown 2011, section 4) and generic selection policies (SMA 1993; Wessex Archaeology's internal selection policy) and follows ClfA's *Toolkit for Selecting Archaeological Archives*. It should be agreed by all stakeholders (Wessex Archaeology's internal specialists, external specialists, local authority, museum) and fully documented in the project archive.
- 6.4.3 In this instance, given that the level of finds recovery is expected to be relatively low, decisions on selection will be deferred until after the fieldwork stage, and no detailed strategy is presented here. Any material not selected for retention may be used for teaching or reference collections by the museum, or by Wessex Archaeology.

6.5 Security copy

- 6.5.1 In line with current best practice (eg, Brown 2011), on completion of the project a security copy of the written records will be prepared in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

7 COPYRIGHT

7.1 Archive and report copyright

- 7.1.1 The full copyright of the written/illustrative/digital archive relating to the project will be retained by Wessex Archaeology under the *Copyright, Designs and Patents Act 1988* with all rights reserved. The client will be licenced to use each report for the purposes that it was produced in relation to the project as described in the specification. The museum, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use conforms to the *Copyright and Related Rights Regulations 2003*.
- 7.1.2 Information relating to the project will be deposited with the Historic Environment Record (HER) where it can be freely copied without reference to Wessex Archaeology for the purposes of archaeological research, or development control within the planning process.

7.2 Third party data copyright

- 7.2.1 This document, the evaluation report and the project archive may contain material that is non-Wessex Archaeology copyright (eg, Ordnance Survey, British Geological Survey, Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licences, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of the *Copyright, Designs and Patents Act 1988* with regard to multiple copying and electronic dissemination of such material.

8 WESSEX ARCHAEOLOGY PROCEDURES

8.1 External quality standards

- 8.1.1 Wessex Archaeology is registered as an archaeological organisation with the Chartered Institute for Archaeologists (CIfA) and fully endorses its *Code of conduct* (CIfA 2014d) and *Regulations for professional conduct* (CIfA 2014e). All staff directly employed or subcontracted by Wessex Archaeology will be of a standard approved by Wessex Archaeology, and archaeological staff will be employed in line with the CIfA codes of practice and will normally be members of the CIfA.

8.2 Personnel

- 8.2.1 The fieldwork will be directed and supervised by an experienced archaeologist from Wessex Archaeology's core staff. The overall responsibility for the conduct and management of the project will be held by one of Wessex Archaeology's project managers, who will visit the fieldwork as appropriate to monitor progress and to ensure that the scope of works is adhered to. Where required, monitoring visits may also be undertaken by Wessex Archaeology's Health and Safety manager. The appointed project manager will be involved in all phases of the investigation through to its completion.
- 8.2.2 The analysis of any finds and environmental data will be undertaken by Wessex Archaeology core staff or external specialists, using Wessex Archaeology's standard methods, under the supervision of the departmental managers and the overall direction of the project manager. A complete list of specialists is provided in Appendix 1.
- 8.2.3 The following key staff are proposed:
- Project Manager TBC

- Fieldwork Director TBC

8.2.4 Wessex Archaeology reserves the right, where necessary due to unforeseen circumstances, to replace nominated personnel with alternative members of staff of comparable expertise and experience.

8.3 Internal quality standards

8.3.1 Wessex Archaeology is an ISO 9001 accredited organisation (certificate number FS 606559), confirming the operation of a Quality Management System which complies with the requirements of ISO 9001:2015 – covering professional archaeological and heritage advice and services. The award of the ISO 9001 certificate, independently audited by the British Standards Institution (BSI), demonstrates Wessex Archaeology's commitment to providing quality heritage services to our clients. ISO (the International Organisation for Standardisation) is the most recognised standards body in the world, helping to drive excellence and continuous improvement within businesses.

8.3.2 Wessex Archaeology assigns responsibility to individual managers for the successful completion of all aspects of a project including reporting. This includes monitoring progress and quality; controlling the budget from inception to completion; and all aspects of health and safety for the project. At all stages, the project manager will carefully assess and monitor performance of staff and adherence to objectives, timetables and budgets, while the manager's own performance is monitored by the team leader or regional director. The technical managers in the Graphics, Research, GeoServices and IT sections provide additional assistance and advice.

8.3.3 All staff are responsible for following Wessex Archaeology's quality standards but the overall adherence to and setting of these standards is the responsibility of the senior management team who, in consultation with the team leaders/regional directors, also ensure projects are adequately programmed and resourced within Wessex Archaeology's portfolio of project commitments.

8.4 Health and safety

8.4.1 All works will be undertaken in accordance with the *Health and Safety at Work Act 1974*; the *Management of Health and Safety at Work Regulations 1999*; and all other applicable health and safety legislation.

8.4.2 Wessex Archaeology has a fully compliant health and safety management system that has year on year satisfied the criteria for SSIP certification (Safety Schemes in Procurement). SSIP itself is aligned with PAS91.

8.4.3 Wessex Archaeology will, for all projects, produce one or more task and site-specific risk assessments and method statements (RAMS), which will ensure our staff can work safely on the site. A copy of the RAMS and our Health and Safety Policy can be provided to the client. All staff on our sites will be made fully familiar with the RAMS before work commences.

8.4.4 We aim to work collaboratively on health and safety with clients and, where separately appointed, with principal contractors. We expect clients to provide in good time all the necessary risk information about a site that may affect the archaeological work, such as locations of utilities or any known ground contamination. We will comply with the project specific Personal Protective Equipment (PPE) requirements, and any other specific additional requirements of the Principal Contractor.



- 8.4.5 All fieldwork staff are certified through the Construction Skills Certification Scheme (CSCS) and have undergone UKATA Asbestos Awareness Training. Staff who carry out specific tasks are suitably trained and competent to do so through training accredited by the Construction Industry Training Board (CITB), Institution of Occupational Safety & Health (IOSH) and the National Plant Operators Recognitions Scheme (NPORS).

8.5 Insurance

- 8.5.1 Wessex Archaeology holds Employers Liability (£10,000,000), Public Liability (£5,000,000) and Professional Indemnity (£5,000,000) policies.

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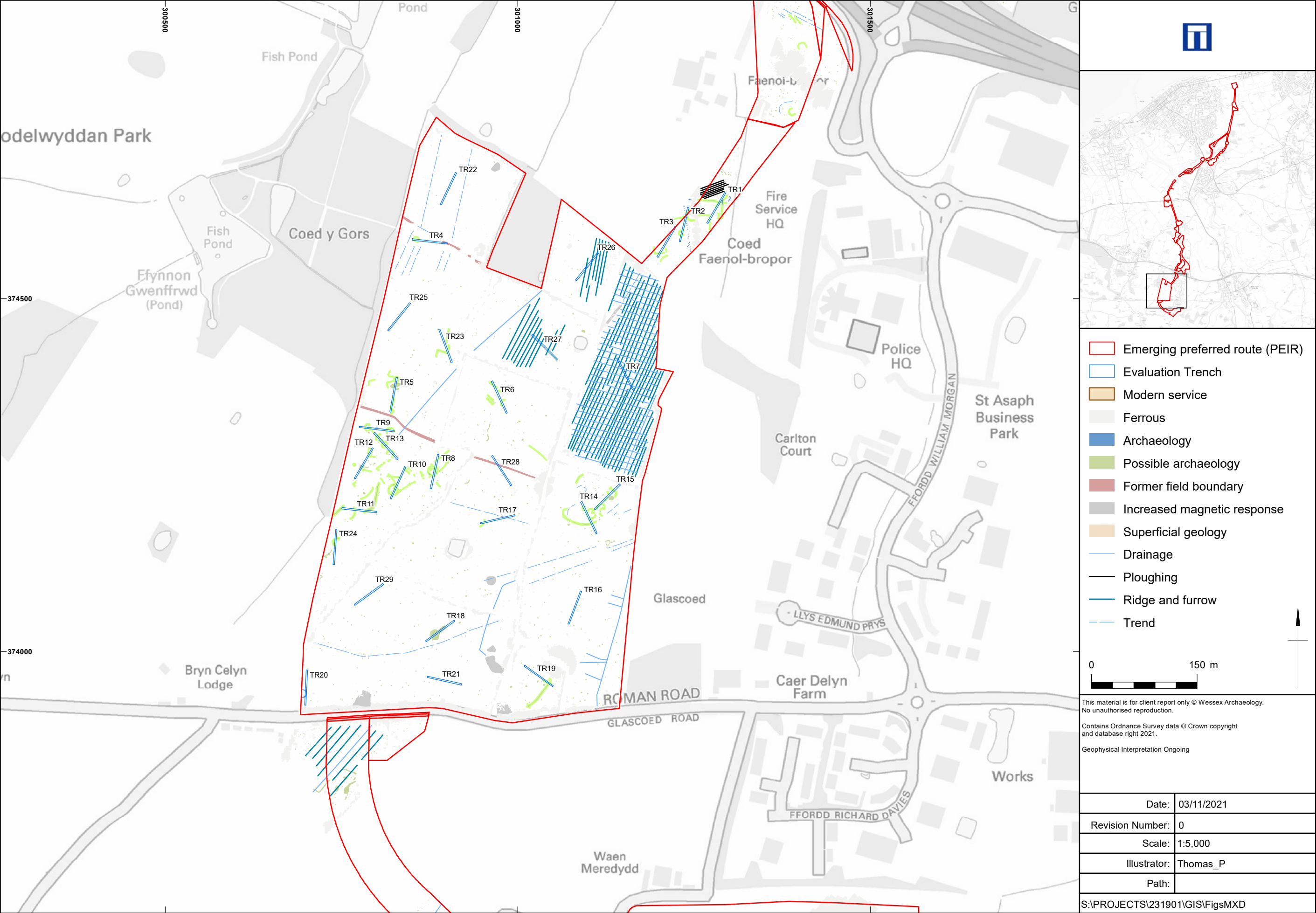


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Unpublished rep. 245490.03

APPENDICES

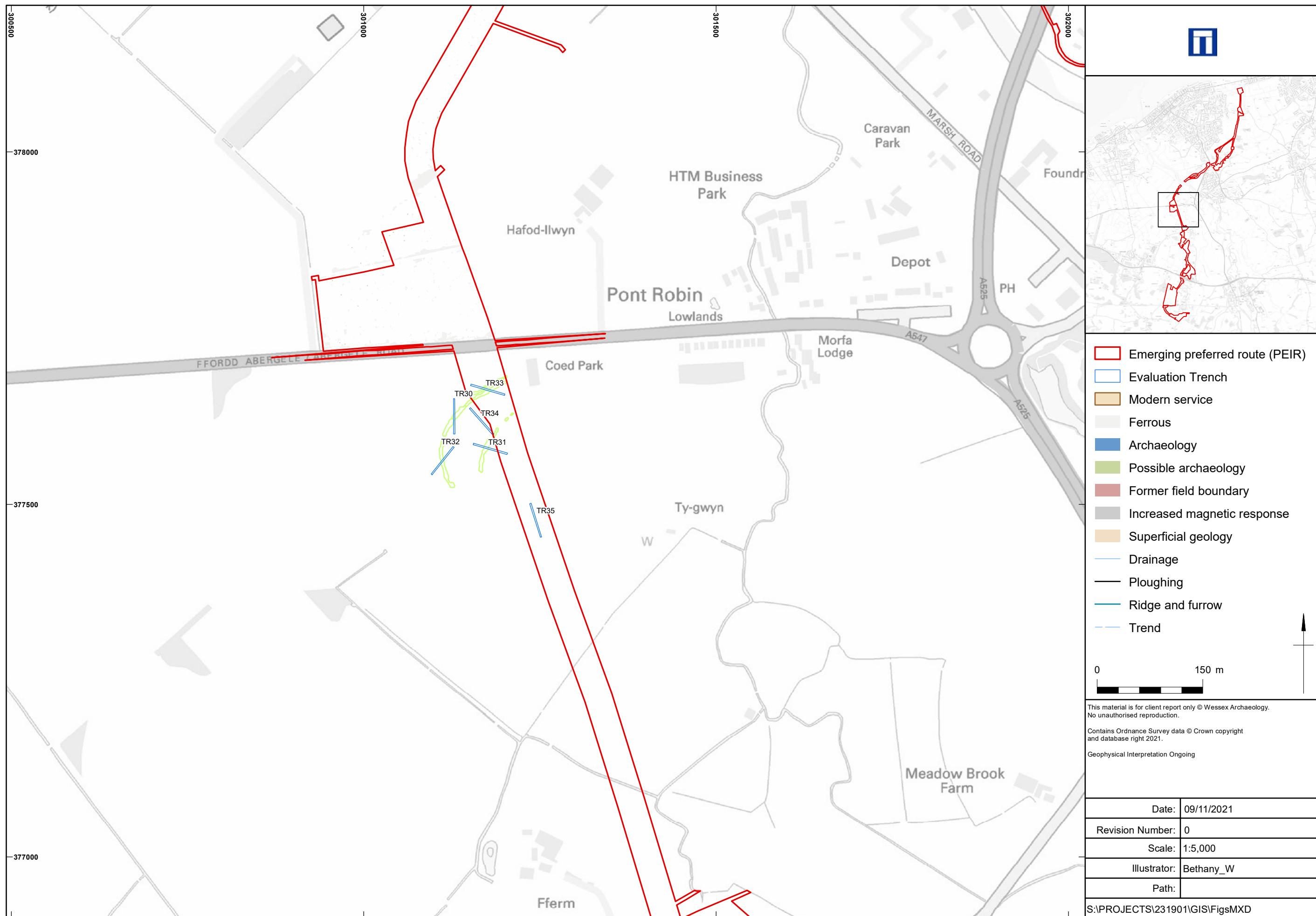
Appendix 1 Finds and environmental specialists

Name	Qualifications	Specialism
Sander Aerts	BA, MSc	Archaeoentomological remains, animal bone, marine shell and archaeobotanical remains (carbonised)
Phil Andrews	BSc; FSA; MCIfA	Slag and metal working debris
Ceridwen Boston	BSocSc; MA; MSc; DPhil	Osteoarchaeology; funerary archaeology
Elina Brook	BA; MA; PCIfA	Later prehistoric and Romano-British pottery, and small finds
Alex Brown	BA; MSc; PhD	Geoarchaeology, palynology
Kirsten Egging Dinwiddy	BA; MA; MCIfA	Human remains (inhumations)
Erica Gittins	BA; MA; PhD	Prehistoric flint
Phil Harding	PhD	Prehistoric flint, particularly Palaeolithic flint
Lorrain Higbee	BSc; MSc; MCIfA	Animal bone
Grace Jones	BA; MA; PhD; MCIfA	Prehistoric and Roman pottery, ceramic building material, fired clay, and small finds
Matt Leivers	BA; PhD; ACIfA	Prehistoric pottery and flint
Inés López-Dóriga	BA; MA; PhD	Archaeobotanical remains
Erica Macey-Bracken	BA; ACIfA	Post-medieval finds, ceramic building material and worked wood
Katie Marsden	BSc	Pottery from prehistoric to post-medieval/modern. Metalwork of all periods, including coins. Small and bulk finds including fired clay, ceramic building material, worked bone
Jacqueline McKinley	BTech; FSA	Human remains (inhumations and cremations)
Lorraine Mephram	BA; MCIfA	Pottery and other ceramic finds of all dates, concentrating on later prehistoric and post-Roman; ceramic building material; clay tobacco pipe; glass of Saxon or later date; small finds
Nicki Mulhall		Geoarchaeology and archaeobotanical remains
David Norcott	BA; MSc; MCIfA	Geoarchaeology
Richard Payne	BSc; MSc; MPhil	Geoarchaeology
Holly Rodgers	BA; MSc	Geoarchaeology
Emma Robertson	BA; MSc	Human remains (inhumations)
Megan Scantlebury	BA, MSc	Archaeobotanical remains
Rachael Seager Smith	BA; MCIfA	Pottery with particular emphasis on Roman ceramics; and metalwork, fired clay, ceramic building material, stone, worked bone, shale, glass, and wall plaster
Andrew Shaw	BA; MA; PhD	Palaeolithic lithic artefacts and Pleistocene geoarchaeology
Amy Thorp	BA; MA	Pottery with emphasis on Roman ceramics, small finds
Ed Treasure	BSc; MRes; PhD	Archaeobotanical remains, including plant remains and charcoal/wood



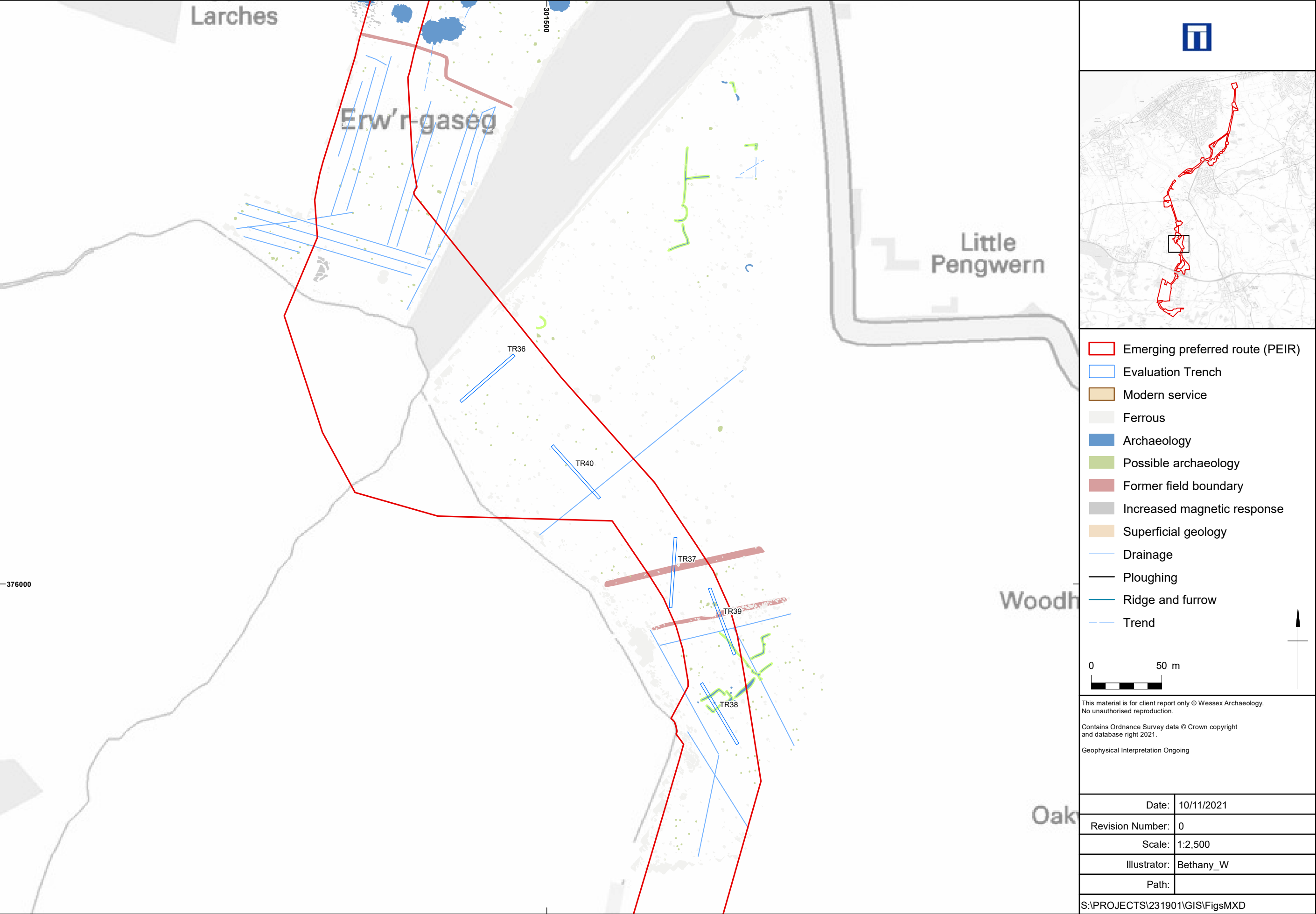
Site Location, Proposed Evaluation Trenching and Anomalies Identified on Gradiometer Survey

Figure 1



Site Location, Proposed Evaluation Trenching and Anomalies Identified on Gradiometer Survey

Figure 2



Site Location, Proposed Evaluation Trenching and Anomalies Identified on Gradiometer Survey

Figure 3



APPENDIX 5 (6.5.8.5.5): RECORD OF PRE-DEPLOYMENT TRENCH EVALUATION SITE VISITS



Awel y Môr Onshore Denbighshire

Record of Pre-deployment Trench Evaluation Site Visits

WA Document Ref.: 231901.06
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Document Information

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Document subtitle Record of Pre-deployment Trench Evaluation Site Visits
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Application Document
Reference 6.5.8.5.5

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Awel y Môr Onshore Denbighshire

Record of Pre-deployment Trench Evaluation Site Visits

1 INTRODUCTION

1.1 Project background

- 1.1.1 Wessex Archaeology has been commissioned by GoBe Consultants Ltd on behalf of Awel y Môr Offshore Wind farm Ltd ('the client'), to prepare a record of the pre-deployment trench evaluation site visits, to set out a schedule of site visits and consultation undertaken with Clwyd and Powys Archaeological Trust (hereafter CPAT) in the attempts to undertake trial trench evaluation for the construction of the proposed Onshore elements of the Awel y Môr Offshore Windfarm during December 2021 and February 2022.

1.2 Scope of document

- 1.2.1 This document sets out the consultation preceding and following the site visits and attempted evaluation. Photographs are provided which illustrate the ground conditions on site and the dates and locations within which the record was made. After each site visit contact was made with CPAT to provide an update on the conditions and whether or not the works could go ahead at that time.

2 PRE-DEPLOYMENT SITE VISITS

2.1 Introduction

- 2.1.1 The proposed archaeological trial trench evaluation was due to take place December 2021 following the agreement of a Written Scheme of Investigation in November 2021. Three trenches were opened at Abergele Road (Trenches 31, 33 and 34) between 14th-16th December, but these quickly filled with water. Despite the water being pumped out of the trenches, the conditions were still too wet to identify any archaeological remains within the trenches. As a result, these works were stood down and the trenches backfilled. Due to the wet winter weather conditions and following an abortive attempt to undertake the trial trench evaluation, it was decided that a site visit should take place weekly, to assess the site conditions and viability of undertaking the evaluation at this time.
- 2.1.2 Appendix 6.5.8.5.4 of the onshore Outline WSI (document reference 6.5.8.5, Appendix 4) contains the WSI for the proposed pre-determination trial trenching campaign, as agreed with CPAT on 19th November 2021.

2.2 Consultation

- 2.2.1 During the development of the Awel y Môr project application consultation has been undertaken on the archaeological aspects of the Environmental Impact Assessment (EIA). Complete records of the consultation undertaken are presented in the relevant chapter of the Environmental Statement.
- 2.2.2 During Q4 2021 and Q1 2022 consultation was undertaken via correspondence with representatives of CPAT. The consultation focussed on a proposed pre-application trial trenching campaign, including the scope and contingency measures should the campaign

not mobilise successfully. Initial agreement was reached via email on the 16th December, with a final photographic record of inadequate ground conditions issued on the 3rd February 2022; each mobilisation was preceded by a site visit in the week prior to mobilisation. To be able to complete the trial trench evaluation and subsequent analysis and reporting for the submission of the application, the latest date for mobilisation was 7th February 2022.

2.3 Dates of Site Visits and Summary of Conditions

2.3.1 The site visits were undertaken on the dates presented in **Table 1**. The areas visited and a summary of the conditions observed is also outlined below.

Table 1 Site Visits and Conditions

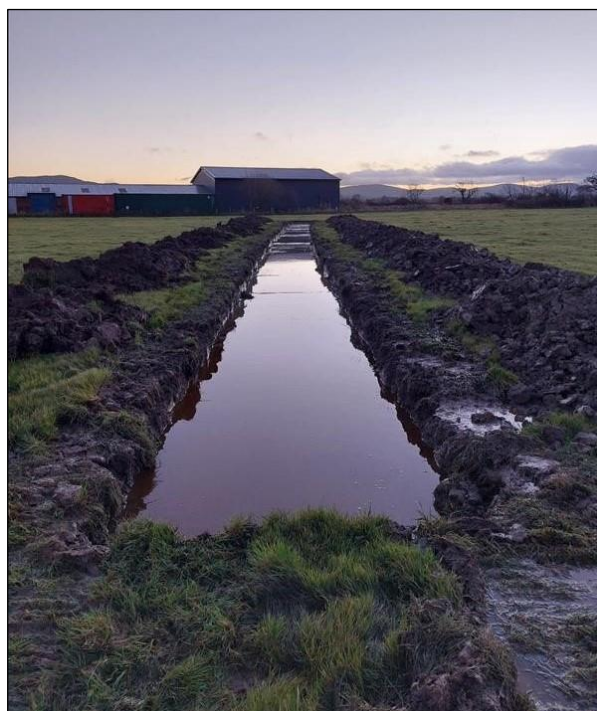
Date	Area Visited	Summary of Conditions
14 th -16 th December 2021	Attempted Evaluation- Abergele Road	<ul style="list-style-type: none"> Trenches 31, 33 and 34 were opened at Abergele Road and photographs shared with CPAT. Due to the water ingress and heavily waterlogged conditions, once recorded, it was agreed that these trenches could be backfilled without an external monitoring visit from CPAT (Plates 1-2).
5 th January	Pengwern Wood Abergele Road Faenol-Bropor Farm	<ul style="list-style-type: none"> All Areas- Standing water in the fields and likely that there would be difficulty with access due to boggy conditions (Plates 3-5)
12 th January	Abergele Road Pengwern Wood Faenol-Bropor Farm	<ul style="list-style-type: none"> Abergele Road- Still heavily waterlogged (Plate 6) Pengwern Wood- Ground still soft underfoot but much improved from last week (Plate 7) Faenol-Bropor Farm- Site access would still be an issue and could do with further drying out. Fields still wet and boggy underfoot but improved from last week (Plates 8,9,10).
19 th January 2022	Pengwern Wood Faenol-Bropor Farm	<ul style="list-style-type: none"> Pengwern Wood- Trenches may be possible in this area but only 3 proposed here. Faenol-Bropor Farm- Very wet and boggy (Plates 11,12)
26 th January 2022	Pengwern Wood Abergele Road Faenol-Bropor	<ul style="list-style-type: none"> Abergele Road- Still boggy with standing water (Plate 13) Pengwern Wood-This was the driest of the three sites that day Faenol-Bropor- Slight improvement on previous visit. Western part of this area was firmer but the eastern part was very boggy (Plate 14)
2 nd February 2022	Abergele Road Pengwern Wood Faenol-Bropor Farm	<ul style="list-style-type: none"> Abergele Road- Standing water on the ground surface- no improvement on ground conditions since the aborted attempt to evaluate (15.12.2021) which had to be abandoned due to water ingress (Plate 15, 16) Pengwern Wood- A few firm patches of ground although conditions were generally boggy. Advised by the Agricultural Liaison Officer that we were likely to have significant water ingress Faenol-Bropor Farm- Hand dug shovel test pits were excavated to get a better idea of ground conditions. One at the location of proposed trench 14 immediately filled with water. At the location of trenches 12 and 24 water seepage was acceptable but the access to this part of the Site was challenging due to waterlogged access routes and boggy ground (Plate 17, 18)



3 SITE VISIT PHOTOGRAPHS



*Plate 1: Attempted Evaluation 14th-16th December 2021
Trench 31*



*Plate 2: Attempted Evaluation 14th-16th December 2021
Trench 33*



Plate 3: Photo showing ground conditions at south of Abergele Road (05.01.2022)



Plate 4: Photo showing ground conditions at Pengwern Wood (05.01.2022)



Plate 5: Photo showing ground conditions at Faenol-Bropor Farm (05.01.2022)



Plate 6: Photo showing ground conditions at south of Abergele Road (12.01.2022)



Plate 7: Photo showing ground conditions at Pengwern Wood (12.01.2022)



Plate 8: Photo showing ground conditions at Faenol-Bropor Farm (12.01.2022)



Plate 9: Photo showing ground conditions at Faenol-Bropor Farm (12.01.2022)



Plate 10: Photo showing ground conditions at Faenol-Bropor Farm (12.01.2022)



Plate 11: Photo showing site conditions at Faenol-Bropor Farm (19.01.2022)



Plate 12: Photo showing site conditions at Faenol-Bropor Farm (19.01.2022)



Plate 13: Photo showing site conditions at Abergele Road (26.01.2022)



Plate 14: Photo showing site conditions at Faenol-Bropor Farm (26.01.2022)

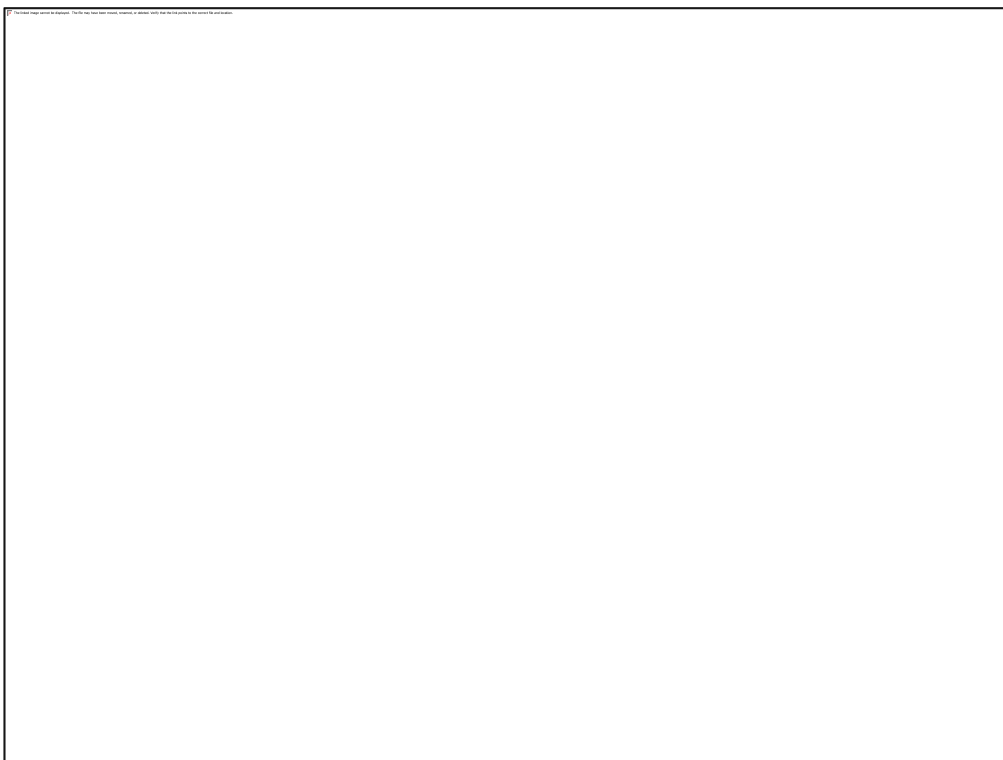


Plate 15: Photo showing site conditions at Abergele Road (02.02.2022)



Plate 16: Photo showing site conditions at Abergele Road (02.02.2022)



Plate 17: Photo showing site conditions at Faenol-Bropor Farm (02.02.2022)



Plate 18: Photo showing site conditions at Faenol-Bropor Farm (02.02.2022)



4 OUTCOMES

- 4.1.1 Communications between representatives of the Client and representatives of CPAT confirmed that in the event of access or ground conditions being inadequate the campaign could be deferred to the post-consent phase. Pre-requisites of the deferral were agreed as including a comprehensive record of attempted mobilisation and evidence base, presented here, and a robust WSI to contain the necessary commitments for undertaking the trial trenching campaign and the requisite further mitigation measures post consent and in advance of works commencing (presented within Annex 6.5.8.5 of the ES).
- 4.1.2 The final Site visit conducted on the 2nd February 2022, in advance of the anticipated mobilisation on the 7th February, concluded that conditions remained unsuitable for trench evaluation and future trenching in advance of application would be impeded by concerns raised by the landowner (damage to surfaces risking *Listeria monocytogenes* during the lambing season) and statutory advisers (risk of interaction with emerging Great Crested Newt that become mobile in warming weather post-January); this was reported to CPAT on 3rd February. Following this, it was agreed that the evaluation could be undertaken post-consent.



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