

National Grid
Cable Tunnel Replacement
Project

Environmental Statement
Volume VI

Appendix 9.3: Written Scheme of
Investigation for
Geoarchaeological Deposit
Modelling and Borehole Survey

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Quality information

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1 Introduction

- 1.1.1 AECOM (the 'Consultant') has been commissioned by National Grid (the 'Client'), to prepare a Written Scheme of Investigation (WSI) for a programme of geoarchaeological deposit modelling, investigation and reporting to inform the Environmental Assessment in advance of the TKRE Cable Tunnel Replacement Project (hereafter the 'Proposed Development'). The programme of geoarchaeological works will be undertaken by Quaternary Scientific ((Quest); the 'Archaeological Contractor').
- 1.1.2 The Proposed Development relates to the replacement of the cabled section of the TKRE 400 kV circuits with a new bored tunnel under the River Thames being constructed to carry new cross linked polyethylene (XLPE) cables, together with new associated infrastructure either side of the Thames at new headhouse and Sealing End Compound (SEC) sites.
- 1.1.3 The northern headhouse and SEC will be located to the northeast of the former Tilbury Power Station in Essex, with the southern headhouse and SEC situated adjacent to the existing Eastcourt Marshes Electricity Substation, near Gravesend, Kent.
- 1.1.4 An archaeological desk-based assessment (AECOM, 2023) prepared to support the Environmental Screening Report identified the location of both headhouse sites within the floodplain of the River Thames as having potential for deeply stratified sequences of alluvial deposits, which may include Holocene peat deposits. At Tilbury there is potential for multiple peat horizons dating from the Mesolithic, Neolithic to Bronze Age and Iron Age, with the potential for the survival of palaeoenvironmental and waterlogged archaeological remains. The remains of an Iron Age or Romano-British saltern and possible settlement site and medieval flood defences have also been recorded in the vicinity of the Tilbury headhouse site. At Gravesend recent ground investigations have identified a peat horizon within the sequence of alluvial deposits and evidence of two undated salt working sites within the marshland surrounding the headhouse site.
- 1.1.5 The excavation of the proposed replacement tunnel through the chalk bedrock will not result in any impact on the archaeological resource as the chalk is 65 million years old and archaeologically sterile. However, the two new 15m diameter tunnel shafts (one at each headhouse location) will be excavated to a depth of approximately 45m and used to launch/receive the Tunnel Boring Machine (TBM). Excavation of the tunnel shafts has the potential to remove the alluvial deposit sequence within their footprint and any surviving archaeological or palaeoenvironmental remains present.
- 1.1.6 This WSI therefore sets out the aims and objectives, scope, methodology and report deliverables for a staged programme of desk-based geoarchaeological deposit modelling (Stage 1) followed by desk-based exercise using existing borehole data, geoarchaeological borehole survey, sampling and assessment (Stage 2).
- 1.1.7 The WSI has been prepared by the Consultant on behalf of the Client in accordance with guidance provided by the Chartered Institute for Archaeologists (CIfA), including Code of Conduct: Professional Ethics in Archaeology (CIfA, 2022), the Standard and Guidance for Field Evaluation (CIfA, 2020), Historic England guidance for Deposit Modelling and Archaeology (Historic England 2020) and Geoarchaeology Using Earth Sciences to Understand the Archaeological Record (Historic England 2015).

2 Background Information

2.1 Site Description

- 2.1.1 The Site is located to the east of Tilbury and Gravesend, which occupy both the north and south banks of the River Thames (Figure 1). The northern end, and launch point, for the Proposed Development is located to the northeast of the now demolished Tilbury Power Station on the north bank of the River Thames with the construction of the northern headhouse and SEC compound east of Tilbury, Essex (centred NGR 566295 175834). The cable tunnel will extend for approximately 2.4 km on a northwest to southeast alignment beneath the River Thames to the Eastcourt Marshes just east Gravesend, Kent centred (NGR 567429 174097) where southern headhouse and SEC compound will be constructed.
- 2.1.2 The proposed northern headhouse and associated construction site is located 1km southeast of Tilbury at approximately 3m AOD and is set within an industrial landscape to the north, west and south boundaries, and tidal marsh to the east that has seen intermittent mineral extraction and waste material depositing. The site lies approximately 170m north of the Thames' northern bank.
- 2.1.3 The proposed southern headhouse and associated construction site is located 800m east of Gravesend at approximately 3.5m AOD and is set within coastal marshland to the east that has been developed into the Milton Rifle Range, industrial buildings and Metropolitan Police Specialist Training Facility to the west and enclosed agricultural fields to the south, with the site bounded by the Thames and Medway Canal on its southern extent. The site lies approximately 30m south of the southern bank of the River Thames.

2.2 Geology

- 2.2.1 The underlying bedrock geology of both headhouse and SEC compound sites comprises the Lewes Nodular Chalk Formation, comprising of Seaford Chalk and Newhaven Chalk, formed approximately 72.1 to 93.9 million years ago during the Cretaceous Period. The superficial geology of both headhouse and SEC compound sites is recorded as Alluvium, comprising clay, silt, sand and peat, formed between 11.8 thousand years ago and present during the Quaternary Period (BGS 2023).
- 2.2.2 Soils within the Proposed Development area are recorded as being loamy and clayey soils of coastal flats with naturally high groundwater (Soilscapes 2023).
- 2.2.3 Recent ground investigations undertaken to inform the engineering design of the Proposed Development has recorded a sequence of made ground, alluvium, including peat horizons, river terrace deposits and Chalk bedrock.
- 2.2.4 Within the proposed Tilbury headhouse and SEC compound borehole BH01 recorded a sequence comprised of river terrace deposits at a depth of approximately 16.50m below ground level (bgl) overlain by 8.70m of alluvial silty and sandy clay deposits, a 2.10m thick peat deposit between 5.70 and 7.80m bgl which was sealed by a further 3.50m of alluvial clay deposit, with the alluvial sequence sealed by approximately 2m of made ground and topsoil. Borehole BH07 just west of the proposed headhouse recorded two distinct peat horizons at 6.80m bgl and 12.50m bgl, sealed between bands of alluvium (Socotec, 2023b).
- 2.2.5 Within the proposed Gravesend headhouse and SEC compound BH06, on the proposed headhouse location, recorded a sequence comprised of river terrace deposits at a depth of approximately 13.20m below ground level (bgl) overlain by 10.60m of alluvial silty and sandy clay deposits, sealed by approximately 2.60m of made ground and topsoil. Although peat was absent from BH06, BH04 to the northeast of the proposed headhouse recorded a 1.90m thick peat horizon between at 11.80m and 12.70m bgl, sealed between bands of alluvium (Socotec, 2023a).

2.3 Topography

- 2.3.1 The local environment is dominated by the River Thames which bisects the centre of the Proposed Development. The proposed Tilbury headhouse and SEC compound comprises a level area of hardstanding formerly used for parking, storage and as a compound for the demolition of the Tilbury Power Station. The associated laydown area to the northeast of the tunnel shaft is also a flat area of hardstanding with the access track and hardstanding parking area to the south of the shaft are essentially flat with a gentle slope southwards towards the River Thames.
- 2.3.2 The proposed Gravesend headhouse and SEC compound is located within an area of relatively flat grassland, part of the former marshland, immediately south of the existing tunnel headhouse with a drainage ditch enclosing its southern extent. To the north of the site lie earthen bank and flood defences within the River Thames beyond to the south Eastcourt marshes extend for approximately 800m towards the village of chalk where the landform rises to approximately 20m AOD.

2.4 Proposed Development

- 2.4.1 The Proposed Development comprises:
- The boring of a new approximately 2.2km long (headhouse to headhouse), 4.5m diameter tunnel crossing the River Thames at a depth of approximately -34mAoD to - 32mAoD, parallel to the existing tunnel;
 - Two new tunnel headhouses: one either side of the new tunnel, onshore, which would cover the shaft measuring approximately 15m internal diameter and down to -34mAoD to -32mAoD deep into the tunnel. During construction, the shafts is used to lower the TBM into/out of position. Once operational, the shaft is the access point to the tunnel for maintenance work once the tunnel is built and operational. The headhouses also contain ventilation equipment (fans) which regulate the temperature inside the tunnels, keeping the cables cool. These fans would be of a similar size and design to those in the existing headhouses. The Tilbury headhouse will occupy an area of up to 0.048ha (based on an indicative footprint of 23.5 m x 20.5 m) and have an approximate maximum building height of approximately 10 m above ground level. The Gravesend headhouse will occupy an area of approximately 0.023ha (based on an indicative footprint of 15 m x 16 m) and have an approximate maximum building height of 8 m above ground level;
 - Two new cable sealing end compounds: one either side of the tunnel, onshore, which house the connection between the overhead line and underground cable. The Tilbury SEC will occupy an area of approximately 0.73ha, although during construction, a larger area of approximately 8.14ha will be required during installation to accommodate construction equipment and storage areas. The Gravesend SEC will occupy an area of approximately 0.62ha, however a larger area of approximately 3.7 ha will be requiring during installation to accommodate construction equipment and storage areas; and
 - Overhead line modifications to the existing overhead lines: The new sealing end compounds would be connected to the existing TKRE 400 kV circuits overhead lines either side of the tunnel.
- 2.4.2 Eastcourt Marshes Electrical Substation on the Gravesend side of the Thames and the existing sealing compound on the Tilbury side of the Thames are to remain in place and form connections for these works.

3 Archaeological and Historical Background

- 3.1.1 The archaeological and historical background presented below is summarised from the Historic Environment Desk Based Assessment prepared to support the Environmental Scoping Report (AECOM 2023).

3.2 Tilbury Headhouse and SEC compound

Prehistoric (7000,000 BC to AD 43)

- 3.2.1 Evidence of in situ Palaeolithic remains are nationally rare, with isolated findspots of flint artefacts providing most of the limited evidence for early human activity. The Anglian glaciation icesheet would have covered Essex and up to the outskirts of present-day London, scouring the pre-Anglian land surface and contributing to the lack of Lower Palaeolithic remains within the study area. Evidence of Mesolithic settlement is, like the preceding Palaeolithic, largely limited to isolated findspots or scatters of flint artefacts. Mesolithic peat deposits have been recorded at depths of approximately 10m below ground level within and west of the study area at Tilbury Fort and near the World End Tavern. Evidence for Mesolithic activity was recovered in 1883 during the construction of the East India and West India Docks at Tilbury 2.4km west of the Site, in the form of a partial male human skeleton from a Holocene sand deposit sealed by peat (Schulting, 2013).
- 3.2.2 Evidence for settlement activity from the Neolithic period survives in part due to the waterlogged nature of the intertidal zone, with the Blackwater Estuary preserving extensive evidence of settlement activity in the northeast of the county (Natural England 2013). Sea levels decreased towards the end of the Iron Age period, combined with wetland drainage in the Roman period leading to expansion of salt-making industry along the marshes. Evidence for salt making was found within the study area with a potential saltern or 'Red Hill' undated briquetage pottery (MEX6632), 970m north of the Site boundary, highlighting the changing sea level throughout the periods with the current Thames bank situated 130m south of the Site boundary.

Roman (AD 43 – 410)

- 3.2.3 Roman activity within the Essex is well represented, with a variety of sites and chance finds found within the study area and beyond. To the north, the Iron Age oppidum at Colchester developed into a veteran colony and a *Mansio* and small town was established at Chelmsford. To the west the provincial capital of *Londinium* was founded becoming the present-day City of London. The countryside outside of these administrative centres saw relatively little change, as new farmsteads and agricultural practises developed in the Late Iron Age, with a continuity through into the early Roman period. In the latter Roman period, there was a shift to arable farming with the number of rural settlements declining but the overall amount of farmland remaining the same (Museum of London 2006).
- 3.2.4 Evidence for Roman activity within the study area includes three recorded findspots of Roman pottery, a Romano-British pottery rim sherd (MEX6254) towards the southern boundary of the Site, Samian ware (MEX6255) at the eastern extent of the Site and a further collection of Roman pottery (MEX6630) found within the southern Site boundary along the Thames foreshore. Evidence of a Roman settlement (MEX6102), dating to the 1st to 2nd centuries AD, was recorded 370m east of the Site, now under the present high tide level. The settlement comprised a trackway, several hut circles with associated internal stake holes and another hut with an internal oven and evidence of floor-planking.

Early Medieval and Medieval (410 – 1540)

- 3.2.5 The town of Tilbury was not established until the 19th century, however, there is evidence for medieval activity within the study area.
- 3.2.6 Excavations at Gun Hill, approximately 1.8km north of the Site revealed Saxon occupation in the form of a single sunken floor building with contemporary pottery and salt making tools (Drury P J and Rodwell W, 1973).
- 3.2.7 The Domesday Survey of AD 1086 records Tilbury as 'Tilberia/Tilibiam', with mention of a Ranulf from William de Warenne, Osbern and Ralph from Swein of Essex, Hunwald from Theodoric Pointel, with 12 foals, 31 cattle, 260 sheep and a fishery. This survey would have been of East Tilbury and West Tilbury, which are located 2.3km northeast and 1.7km north of the Site respectively. To the north of Site, open field systems were commonplace and formed the majority of land use within the study area (Thurrock Council 2007). The West Tilbury marshes (MEX1042105) saw improvement in the medieval period for animal grazing and was the area in which the Tilbury Fort was constructed in the 16th century. A medieval sea wall (MEX6629) is located towards the eastern extent of the Site and 300m north of the Thames' foreshore. The sea wall does not appear at present ground level but does appear on the 1777 Andre and Chapman map of Essex.

Post-medieval (1540 – 1900)

- 3.2.8 Following the Reformation in the 16th century, the surrounding landscape saw extensive development. Drainage of the areas marshes and embankments saw land along the Thames reclaimed (Essex County Council, 2011). The increasing strategic importance of the Thames estuary and approach to London led to the development of fortifications along the Essex and Kent coastlines. Within the study area this was typified by the construction of Tilbury Fort (NHLE 1021092) approximately 900m west of the site boundary. The fort originated in 1540 as a two storey D-shaped blockhouse fort, one of a series that Henry VIII constructed to defend the Thames approach to London. It was one of a pair, with its sister fort constructed on the opposite side of the Thames in Gravesend. A third blockhouse fort was constructed further to the east at Coalhouse. Tilbury fort was later rebuilt in 1672 in its current pentagonal form and a double moat to a design, by Sir Bernard de Gomme. The 18th century Officer's barracks (NHLE 1375568) within the fort are listed grade II*.
- 3.2.9 Despite a strong military presence in the post-medieval landscape historic mapping shows that the Site formed part of the reclaimed marshes and was used primarily for agriculture (Essex County Council 2011).
- 3.2.10 Towards the end of the 19th century Tilbury experienced rapid development into a small town driven by the establishment of Tilbury Docks, 2.3km to the west of Site, and the construction of the Tilbury Riverside station, which allowed passengers to travel directly to the ferry crossing located on the Thames foreshore (Thurrock.gov.uk, Accessed 29/03/2023).
- 3.2.11 An archaeological watching brief was conducted by Oxford Archaeology between 2005-2006 (EEX55618), 450m west of the Site boundary. The works were conducted ahead of the Biosolids Dyer project and revealed made ground overlying peat and alluvial layers. Archaeological features were also found, likely associated with a post-medieval farm that occupied the works area prior to the construction of the water treatment works.

Modern (1900 – Present)

- 3.2.12 Following the expansion of Tilbury in the later 19th century the modern period saw developments to the defence and industrial aspects of the surrounding area.
- 3.2.13 Several Second World War non-designated heritage assets have been identified within the study area. The closest of these to the Site is a pillbox (MEX31812) is located 140m south of the Site. Its design is characteristic of the 'Essex Lozenge', unique to Essex (Osborne 2008). Within the wider

study area two spigot mortar emplacements were built within Tilbury fort approximately 900m west of the Site boundary, one was constructed at the northwest bastion (MEX31803) and the other at the southeast bastion (MEX31804). Other Second World War features include anti-tank cubes (MEX31805) and anti-glider ditches (MEX39674). A series of site surveys were also conducted by Essex County Council in 2012 (EEX56482), 910m northwest of the Site boundary, which recorded new sites and updated existing details for a variety of World War II features within the study area.

- 3.2.14 Following the end of the Second World War the industrial landscape of the area changed with the construction of Tilbury A coal fired power station in 1958 and Tilbury B oil fired power station in 1969 (MEX1032967). The power stations ran until 2013 when they were decommissioned, with demolition being completed in 2019.
- 3.2.15 Archaeological investigations within the study area have been associated with Tilbury Power Station. A geoarchaeological watching brief, historic borehole review and walkover survey were conducted by Wessex Archaeology in 2008 (EEX56725) at the Tilbury Coal Power Station, 160m west of the Site boundary which revealed no archaeological finds or features. An archaeological evaluation was also conducted by Wessex Archaeology in 2019 (EEX59539), immediately west of the Site boundary. The works formed part of the evaluation stage for the Tilbury II Power Station. A second archaeological evaluation was conducted by Wessex Archaeology in 2019 (EEX59539), 380m northwest of the Site boundary.

3.3 Gravesend Headhouse and SEC compound

Prehistoric (700,000 BC to AD 43)

- 3.3.1 The Site is situated within the North Kent Marshes to the east of the Dartford and Gravesham Conurbation. Prehistory is well represented in Kent with nationally important Palaeolithic sites such as the hominid skull recovered at Swanscombe and the Ebbsfleet elephant butchery site. There is also settlement evidence from the Neolithic, such as megalithic structures found on the North Downs and three earthen long barrows at the Wye valley (Kent County Council 2001). Excavations at the Lion Business Park (TQ 67 SE 286) 740m southwest of the Site boundary found examples of work flint and fragments of bunt unworked flint, as well as pottery sherds from the Neolithic/Bronze Age.
- 3.3.2 The North Downs and Greensands demonstrate a concentration of Bronze Age and Iron Age activity, however, settlement evidence has been found across the study area. Bronze Age circular cropmarks (TQ 67 SE 277) were recorded 670m southwest of the Site boundary. A Late Iron Age pit (TQ 67 SE 238) and Late Iron Age ditches (TQ 67 SE 239) were found 880m southwest of the Site boundary, believed to be part of a field system which continued into the Roman period, with a later ditch found in the vicinity indicating agricultural use across both periods.
- 3.3.3 Several archaeological investigations were recorded within the study area which identified prehistoric remains. An archaeological evaluation was conducted by Essex County Council Field Archaeology Unit in 2001 (EKE8607), 890m southwest of the Site boundary in advance of redevelopment of playing fields. This revealed evidence of Late Iron Age, Roman and post-medieval land use.
- 3.3.4 A review was also conducted by English Heritage between 2010-2011 (EKE15400), which covered the southern extent of the Site and the area beyond the Site boundary. The review described the Quaternary paleoenvironmental development and deposits of the Hoo peninsula region. The results of the review aided in the creation of GIS datasets on geological and archaeological sites within the Peninsula.
- 3.3.5 A series of test pits were excavated by Archaeology South-East in 2008 (EKE13337), 850m east of the Site. The test pits were located on the Isle of Grain and sought to confirm geophysical and geotechnical information as part of a Paleoenvironmental Evaluation. The evaluation found extensive spreads of fluvial sediments originating from river terraces across the study area.

Roman (AD 43 – 410)

- 3.3.6 Kent is home to major Roman sites such as Canterbury, Rochester and Dover, as well as the roadside settlement of Springhead (*Vagniacae*) and the religious centre of Horton Kirby to the south of the Site. Well established farmsteads were also created to the southwest of the study area namely Darenth, Keston and Lullingstone (Allen, Bird & Croxford, 2019).
- 3.3.7 A Roman building, the 'Chalk Villa' (TQ 67 SE 15), was excavated 940m south of the Site boundary; the villa is believed to have burnt down during the late 3rd century. The excavations also revealed several pits, three graves contain infant burials and mid-1st century pottery. Subsequent excavations within the vicinity revealed hypocaust, tiles and a complex Roman bath house.
- 3.3.8 A borehole survey was conducted by Oxford Archaeology in 2006 (EKE9782) at Denton Marshes, Gravesend, 760m southwest of the Site boundary. The works comprised of five boreholes which revealed alluvial and peat deposits possibly dating from the Roman period.

Early Medieval and Medieval (410 – 1540)

- 3.3.9 Anglo-Saxon influence on the region is represented mostly by funerary sites such as Darenth Park (NHLE 1003126), but very few settlement sites. There is evidence for the continuing use of both Roman roads and towns within the region, with the county being divided into 'lathes'. As the early medieval period progressed, parishes were formed and some settlements nucleated, however, open field systems, that were common at the time in other parts of the country, were not a feature of the agricultural landscape (Kent County Council 2001).
- 3.3.10 Gravesend is recorded in the Domesday survey of 1086AD as being within the hundred of Tollingtrough and owned by Bishop Odo of Bayeux. There was an expansion of settlement within the county, facilitated by the opening of Wealden pastures which Gravesend saw some of this expansion (Kent County Council 2001). Ridge and furrow (TQ 67 SE 1019) was recorded 200m west of the Site boundary at what is now the Metropolitan police training centre, this farming practise shows the extent of the organisation of settlements and surrounding farmland towards the end of the medieval period.
- 3.3.11 An archaeological excavation was conducted by Pre-Construct Archaeology in 1997 (EKE8797) at Damigos Road, Gravesend, 900m southwest of the Site boundary. The excavation was conducted prior to housing development works and found archaeological evidence from the medieval period and the post-medieval West Court Manor.

Post-medieval (1540 – 1900)

- 3.3.12 The parish of Gravesend experienced a large-scale expansion of industrial and agricultural practises which can be seen within the study area and the surrounding landscape. The industrial landscape is evidenced by industrial buildings, bridges, canals and the expansion of Gravesend docks. Denton Smock Mill (TQ 67 SE 1251), 940m west of the Site boundary, was constructed before 1840 it was used to grind corn and was demolished prior to 1897 on land that is now part of Gravesend docks.
- 3.3.13 Immediately south of the Site lies the Thames and Medway Canal (TQ 67 SE 20) which was established in 1778 to allow military craft to move between Deptford and Woolwich Dockyards to Chatham Dockyard avoiding use of the Thames estuary (Warren, C and Thomas, 2006). Three bridges were constructed across the Canal within the study area closest being a swing bridge (TQ 67 SE 49) 90m southeast of the Site boundary.
- 3.3.14 The proposed headhouse and SEC compound is located within the former western extent of the Milton Rifle Range (TQ 67 SE 1185) which extends 900m east of the Site boundary. Constructed in 1862 the range is located on the Eastcourt Marshes and comprises a series of low earthen mound firing points, target mounds and markers gallery with weather shelter.

- 3.3.15 The earliest available cartographic data for this Site is within a 1694 levels survey of the area conducted by George Russell of Rochester. The levels survey shows that the Site is situated within areas of enclosed marshland fields, with the field boundaries marked at ditches and sewer drains, all of which link and lead to the estuary to the north.

Modern (1900 – Present)

- 3.3.16 The modern landscape of the Site saw little change until the construction of the Eastcourt Marshes Electricity Substation. Within the wider study area there is evidence for the development of urban housing, industry and transport infrastructure such as roads and railway. Second World War defences are well represented within the study area with numerous records within the Kent Historic Environment Record.
- 3.3.17 There was development to the dock and coastal area of Gravesend, with a causeway (TQ 67 SE 1032) visible on the 3rd edition Ordnance Survey map of 1908, approximately 580m west of the Site boundary, comprising of wood and steel and is extant. A mooring post (TQ 67 SE 1033) is also located 160m northwest of the Site boundary, comprising of three piles with posts in a triangular shape with cross timbers situated on the Thames foreshore.

Geotechnical Investigations

- 3.3.18 A geotechnical ground investigation was conducted by Babbie in 1997 (EKE7181) for the Denton Relief Road, 870m southwest of the Site boundary. The works consisted of six boreholes and six trial pits excavated to an organic peat layer, no archaeological finds were recovered.
- 3.3.19 A geotechnical ground investigation was conducted by Soils Ltd in 1998 (EKE9780) at Lower Higham Road, Gravesend, 840m southwest of the Site boundary. The works involved soil samples taken at subsequent levels of the ground investigation, no archaeological finds were recovered.
- 3.3.20 Immediately west of, and adjacent to, the proposed Gravesend headhouse and SEC compound site a geoarchaeological deposit model was prepared for the Metropolitan Police Specialist Training Centre site using boreholes drilled in advance of construction. The model recorded a sequence of floodplain gravels overlying the chalk bedrock and sealed by a sequence of alluvial silts and clay and interdigitated thin layers of peat. The model concluded that the Metropolitan Police Specialist Training Centre site had probably been inundated during the Mesolithic, with the layers of peat representing periods of limited sea-level rise. The alluvial sequence was considered to have a high potential for paleoenvironmental remains, a low-moderate potential for artefactual remains, relating to Upper Palaeolithic and early Mesolithic occupation, and a low-moderate potential for artefactual remains relating to human use of the marshes from the later Mesolithic to the post-medieval periods (MOLA, 2023).

4 Project Aims and Objectives

4.1 Stage 1 Deposit Modelling

4.1.1 The aims of the geoarchaeological deposit modelling will be to:

- Use historic borehole evidence and the results of previous investigations to map the buried deposit sequence of each headhouse and SEC compound site placing them within the wider landscape and geological context of the Lower Thames Valley, with reference to the Tilbury sequence identified by Devoy (Devoy 1979) and subsequent studies carried out with the study area (e.g. Tilbury 2, Batchelor et al., 2019; Thurrock FGP – Batchelor & Timms, 2022; Batchelor et al., in prep; the Lower Thames Crossing – National Highways, 2022 and the Metropolitan Police STC – MOLA, 2023);
- Inform the understanding of the palaeoenvironment and palaeotopography of the two sites and where possible identify areas or zones of archaeological and palaeoenvironmental potential; and
- Inform the scope and design of the Stage 2 geoarchaeological borehole investigation and palaeoenvironmental assessment required to address construction impacts identified from the Proposed Development's detailed design drawings.

4.2 Stage 2 Geoarchaeological Borehole Survey

4.2.1 The aims of the geoarchaeological borehole survey will be to:

- Record the location, depth, extent, character and state of preservation of the buried deposit sequence of each headhouse and SEC compound site. All depths will include heights in m OD;
- Refine understanding of the presence, nature and distribution of Holocene alluvial floodplain, estuarine and tidal deposits and palaeoenvironmental sequences across the two sites and assess their potential for archaeological and a palaeoenvironment remains to be preserved;
- Identify and recover sediment cores and samples for off-site assessment/analysis, capable of providing a range of proxy biological and environmental indicators that will inform the deposition history, climate, hydrology, vegetation and land-use (human activity) of the two sites;
- Identify and recover sediment cores and samples for off-site assessment/analysis, suitable for scientific dating techniques (e.g. Radiocarbon dating or Optically Stimulated Luminescence (OSL) dating) in order to provide a robust chronostratigraphic framework for each site;
- Interpret the vegetational and aquatic conditions within each headhouse and SEC compound site and their surrounding environs;
- Update and refine the Stage 1 deposit model with the results of the borehole investigation and the interpretation and significance of the deposit sequence;
- Inform the potential impact of the proposed development on deposits of geoarchaeological and archaeological potential; and
- Present the results of the geoarchaeological investigation in a suitable report for wider dissemination.

4.3 Regional Research Agendas

4.3.1 The Proposed Development extends across the Lower Thames with elements in both Essex and Kent, consequently three research frameworks are relevant to the programme of geoarchaeological investigation, the East of England Research Framework, The South-East Research Framework and the Greater Thames Estuary Research Framework.

- 4.3.2 The two headhouse sites have potential for the survival of palaeoenvironmental remains preserved in peat horizons and organic alluvial deposits and possibly associated archaeological remains dating to the Mesolithic, Neolithic/Bronze Age and Iron Age.
- 4.3.3 The East of England Research Framework identifies the following period based research objectives that may be relevant to the Tilbury Headhouse and SEC compound:

Palaeolithic and Mesolithic

- Pal-Meso 11: Are deposit modelling and predictive modelling useful tools?
- Pal-Meso 23: What do we know about the scale, distribution and character of occupation in the region?
- Pal-Meso 24: What do we know about the Mesolithic/Neolithic transition in the region?

Neolithic

- Neo 02: How can we learn more about climate and environmental conditions during the Neolithic?
- Neo 23: How can we better characterise the variability of the Neolithic landscape?

Early and Middle Bronze Age

- E-MBA 03: How can we refine the chronology of the Early and Middle Bronze Age?
- E-MBA 19: How can palaeoenvironmental assessment be used more effectively for Early to Middle Bronze Age remains?

- 4.3.4 The South-East Research Framework also identifies a number of period specific research objectives that may be relevant to the Gravesend Headhouse and SEC compound:

Upper Palaeolithic and Mesolithic

- B.1 Integration of existing palaeoenvironmental reports into a gazetteer for Late Pleistocene and early Holocene environments.
- B.11 Can the 8.2 ka event be confidently identified in palaeoenvironmental sequences in south-east England and what relationship does this have with the Early-to-Mid-Holocene vegetation transition?
- B.14 What is the relationship between palaeoenvironmental sites and known early Mesolithic activity?
- B.18 How do the region's palaeoenvironmental records relate to the landscape archaeological record?
- C8 To what extent does the timing of Holocene sea-level rise affect the visibility of sites?
- E.2 The identification of key points in the region's Mesolithic archaeological and palaeoenvironmental records and application of absolute dating, where possible (i.e. the Pinus rise; Corylus rise).

Middle Bronze Age to Iron Age

- Environment - There is enormous potential for research into past land use by exploiting the resources of the modern coastal zone of the Thames Estuary and the estuaries of the smaller rivers, such as the Medway, Stour, Rother, Adur and Arun, which may all contain surviving evidence for previous episodes of human activity.

4.3.5 In addition, the Greater Thames Estuary Research Framework (Heppell, E. 2010) highlights several research questions and specific objectives that the geoarchaeological deposit modelling and borehole investigation may contribute to:

- Framework Objective 1B - To develop a better understanding of the Upper Palaeolithic and Mesolithic around the estuary, which has been identified as a 'gap' in the record.
- Specific Objective: 1B.SO1 Integration of existing databases
 - Framework Objective 1C - To increase understanding of the physical evolution of the Thames estuary and associated climatic and environmental change and their relationship with human activity during the Holocene.
- Specific Objective: 1C.SO1 characterising key stratigraphic units and establishing the vertical sequence of buried land surfaces and other deposits throughout the estuary;
- Specific Objective: 1C.SO2 developing understanding of coastline and sea level change in the estuary through time; and
- Specific Objective: 1C.SO4 developing appreciation of human interaction with this environment, particularly with regard to the exploitation and management of woodland and marshes.
 - Framework Objective 8A - To exploit the potential of the Thames estuary as a study area for methodological innovation pertinent to the detection, recording, monitoring and management of estuarine sediments and sites.
- Specific Objective: 8A.SO6 refining techniques for recognizing buried land surfaces and understanding their palaeoenvironmental context; and
- Specific Objective: 8A.SO12 Developing regional / local geoarchaeological models.

5 Scope and Stages of Geoarchaeological Works

5.1 Stage 1 Deposit Modelling

- 5.1.1 The geoarchaeological deposit model will comprise a desk-based exercise using existing borehole and ground investigation data, and the results of previous archaeological and geoarchaeological investigations undertaken in the vicinity of the two headhouse and SEC compound sites to create a model of the buried deposit sequence, surface and thickness plots, depositional environments and zones of archaeological and paleoenvironmental potential within the Site.
- 5.1.2 The geoarchaeological deposit model will include:
- A series of outputs to model the vertical and lateral extent of deposits across the two headhouse and SEC compound sites;
 - Interpretation of the sediments placing them within their local and regional geoarchaeological context;
 - Presentation of the deposit sequences, palaeotopography and areas of different deposit character in a series of suitable surface models, transects or fence diagrams; and
 - Assessment of the likely archaeological and geoarchaeological potential of the deposits present.
- 5.1.3 Sources used to inform the geoarchaeological deposit model will include but are not limited to:
- Available historic BGS borehole records;
 - Available results of previous geoarchaeological investigations, e.g. Tilbury Power Station, the Tilbury 2 proposed port terminal, Thurrock FGP and Lower Thames Crossing and the Metropolitan Police Specialist Training Centre, Gravesend;
 - Ground investigation desk study prepared for the Proposed Development; and
 - Geotechnical data (borehole and test pit logs and interpretive reports) from the recent programme of ground investigation undertaken for the Proposed Development.

5.2 Stage 2 Geoarchaeological Borehole Survey

- 5.2.1 The scope of the Stage 2 geoarchaeological borehole investigation has been informed by the results of the Stage 1 deposit model and consultation with the Archaeological Officers from Essex Place Services and Kent County Council and Historic England's Regional Science Advisors.
- 5.2.2 The geoarchaeological borehole investigation will comprise the recovery of 4no. borehole cores (see Figure 2 and Table 1), comprising:
- The recovery of 2no. boreholes cores up to 20m in depth and 100mm in diameter from the Tilbury headhouse and SEC compound site - 1no. targeting the proposed tunnel launch shaft and 1no. targeting the location of the new northern terminal pylon; and
 - The recovery of 2no. boreholes cores up to 16m in depth and 100mm in diameter from the Gravesend headhouse and SEC compound site - 1no. targeting the proposed tunnel launch shaft and 1no. targeting the location of the new southern terminal pylon.

Table 1: Geoarchaeological boreholes

Borehole No.	Location	NGR	Depth	Purpose
BH001	Northern headhouse and SEC compound Tilbury	TBC	Up to 20m	To record the alluvial deposit sequence and recover core samples for palaeo-environmental assessment and scientific dating.
BH002	New Northern Terminal Pylon Tilbury	TBC	Up to 20m	To record the alluvial deposit sequence and recover core samples for palaeo-environmental assessment and scientific dating.
BH003	Southern headhouse and SEC compound Tilbury	TBC	Up to 16m	To record the alluvial deposit sequence and recover core samples for palaeo-environmental assessment and scientific dating.
BH004	New Southern Terminal Pylon Gravesend	TBC	Up to 16m	To record the alluvial deposit sequence and recover core samples for palaeo-environmental assessment and scientific dating.

5.2.3 In addition, a contingency of 2no. boreholes will be made at each of the Tilbury and Gravesend Headhouse and SEC sites in the event that:

- one or more of Boreholes BH001 – BH004 fail and are unable to recover a complete core for the full sequence of alluvial deposits; and
- additional samples for OSL dating need to be recovered.

5.2.4 Each borehole core will, depending on the depth of the alluvial sequence, be recovered using a windowless sampling rig (for example a Terrier Drilling Rig, Dando Rig or Shell and Auger Rig) that will be provided by and under the control of the Archaeological Contractor. Each core shall be recovered in plastic tubes or an appropriate substitute. Where OSL samples are to be collected opaque plastic tubes or liners should be used.

5.2.5 Initial recording and description of the cores will take place on-site, the cores will then be securely wrapped (to avoid sediment loss/contamination and moisture loss), labelled and retained for further off-site investigation at laboratory/ processing facilities.

5.2.6 Following an initial appraisal of the recovered cores and samples, and consultation with Historic England's Regional Science Advisor, Archaeological Officers from Essex Place Services and Kent County Council and the Client, appropriate samples will be selected for geoarchaeological/palaeoenvironmental assessment in an off-site laboratory.

5.2.7 It is anticipated that, if suitable deposits exist, the palaeoenvironmental sampling will include, but may not be limited to the specialist palaeoenvironmental assessment of plant macrofossils, water-logged wood, pollen, diatom/foraminifera, insects and molluscs, to identify the potential for past environmental reconstruction. Where appropriate, natural deposit sequences will also be sampled should important palaeoenvironmental evidence and/or important sequence dating be possible.

5.2.8 The results of the sampling and dating of deposit sequences (both archaeological and natural) will be incorporated by a suitably qualified geoarchaeologist into the Stage 1 deposit model for each of the proposed headhouse and SEC sites.

6 Methodology

6.1 Stage 1 Geoarchaeological Deposit Modelling

Deposit modelling

- 6.1.1 A geoarchaeological deposit model will be prepared by collating the results from any available geotechnical data from the ground investigation programme being undertaken for the Proposed Scheme and previous geoarchaeological data from the area. The deposit modelling will be undertaken in accordance with Historic England guidance Deposit Modelling and Archaeology Guidance for Mapping Buried Deposits (Historic England, 2020).
- 6.1.2 The geoarchaeological deposit model will be collated from, but not limited to sources set out at section 5.1.3 extending to the site boundaries and, where appropriate, will use data available beyond the site to avoid 'edge effects' and provide a wider context for the results.
- 6.1.3 The different lithologies recorded will be entered into industry standard software (such as Rockworks[™] v17.0 or similar) and assigned to a stratigraphic unit. Each lithology (gravel, sand, silt, clay etc.) will be assigned a unique colour (primary component) and pattern (secondary component) enabling visual correlation of the sediment components of deposits across the Site.
- 6.1.4 A stratigraphic framework for the Proposed Development will be produced and could be linked to the geotechnical interpretation produced by the Geotechnical Contractor, as agreed with the Consultant and Client, to provide a consistent model for the Site.
- 6.1.5 The data will then be exported into Arc GIS (or similar) and used to create a range of outputs in 2- and 3-dimensions, including thickness (Isopach) plots, digital elevation models (DEMs) for key stratigraphic deposits and surface horizons (e.g. the top of the river terrace deposits, the thickness of peat, alluvium and made ground etc.). Representative transects or fence diagrams mapping the subsurface topography of specific depositional environments and/or buried landforms beneath the Site will also be produced. The readability of the data will need to be in a format that is accessible for both archaeological and non-archaeological parties for wider circulation.
- 6.1.6 The results of the deposit modelling will identify and map areas of archaeological and palaeoenvironmental potential, to inform the scope and extent of the Stage 2 programme of geoarchaeological borehole investigation.

Report Deliverable

- 6.1.7 Following completion of the geoarchaeological deposit model, the report will include the following elements:
- A signed QA sheet detailing as a minimum - title, author, version, date, checked by, approved by.
 - Non-technical summary;
 - Acknowledgements.
 - Project background, including location, OASIS reference, grid reference, geology and soils, place of deposition of the archive (including digital archive), museum accession number, full dates of work and any relevant details of the project's history.
 - A site location drawing.
 - The aims and objectives of the geoarchaeological deposit modelling;
 - Archaeological and geoarchaeological context;
 - Previous archaeological and geoarchaeological investigation within the Site;

- The methodology employed.
- Results – deposit modelling outputs, stratigraphy, palaeoenvironmental analysis and dating;
- Interpretation detailing the sediment sequence, formation processes and likely significance of the results in their local, regional and national context, cross-referenced to the Regional Research Framework and research agenda;
- Statement of archaeological/geoarchaeological and palaeoenvironmental potential of the Site;
- Conclusions in relation to the projects aims and specific research objectives, and discussion in relation to the wider local, regional or other archaeological and geoarchaeological contexts and research frameworks etc;
- Recommendations for further geoarchaeological investigation and sampling;
- Archive deposition
- Bibliography;
- A copy of the OASIS data collection form.
- Illustrations including isopach maps and surface models, transects/cross-sections and fence diagrams, as appropriate; and
- Appendices (including, stratigraphic matrix and specialist assessment is reports, where appropriate).

6.1.8 Digital copies of the complete draft report (complete with illustrations and plates) in both Microsoft Word and PDF format will be submitted to the Consultant for comment. When the draft report is of a sufficient standard, the Consultant will submit a copy of the draft report to the Historic England's Regional Science Advisor, Archaeological Officers from Essex Place Services and Kent County Council, the comments of whom will be taken into account by the Archaeological Contractor when finalising the report.

6.1.9 The final report will be submitted to the Consultant within two weeks of the receipt of comments on the draft report. The Archaeological Consultant will provide a final copy to the Client and Historic England's Regional Science Advisor, Archaeological Officers from Essex Place Services and Kent County Council.

6.1.10 A project archive including digital text files in Microsoft Word format, and illustrations in AutoCAD format or ArcView shapefile format, digital data from the deposit model in AGS data format will be submitted together with a fully collated version of the Fieldwork Report in PDF format.

6.2 Stage 2 Geoarchaeological Borehole Survey

6.2.1 No geoarchaeological borehole work should commence without a PAS128 Type B utilities survey having been completed and the locations of any services marked on site, together with any environmental or ecological constraints and corresponding buffer zones (see Section 10 of this WSI) prior to the start of works.

6.2.2 Any additional access requirements, demarcation or safety measures required by the Client to ensure that each borehole location is safe will be communicated to the Archaeological Contractor prior to commencement of works for inclusion in the Archaeological Contractor's Risk Assessment and Method Statement (RAMS).

Setting out

6.2.3 Boreholes will be set out at the locations defined in Table 1 and Figure 2 to address construction impacts arising from the Proposed Development. The final positions will be selected to avoid the current site constraints (e.g. known overhead and buried services and utilities, extant structures and vegetation) and specified in the Archaeological Contractor's Method Statement.

- 6.2.4 All geoarchaeological boreholes shall be positioned to an accuracy of $\pm 100\text{mm}$ of the borehole locations specified in the Archaeological Contractor's Method Statement using survey-grade GPS or equivalent metric-survey equipment.

Boreholes

- 6.2.5 Each borehole core will be recovered using a windowless sampling rig (for example a Terrier Drilling Rig, Dando Rig or for deeper deposits a Shell and Auger Rig) that will be provided by and under the control of the Archaeological Contractor. The diameter of the borehole shall be approximately 100mm, unless otherwise agreed, each core shall be recovered in plastic tubes (or an appropriate substitute).
- 6.2.6 As noted above the borehole locations are the proposed and may have to be modified in the light of service runs and/or other constraints found when on the site. Each borehole location will be scanned by the Archaeological Contractor using a Cable Avoidance Tool (CAT scanner) and Genny prior to drilling to ensure that no live services are present. The Archaeological Contractor shall also hand excavate a starter pit using insulated tools, measuring no less than 600mm (l) x 600mm (w) and 1.20m deep, prior to drilling in order to confirm that no buried services, land drains or other subsurface obstructions are present.
- 6.2.7 Each borehole will be drilled by an experienced drilling crew, under the constant supervision of a suitably experienced and qualified geoarchaeologist. The geoarchaeologist will be present at all times during the preparatory ground disturbance and during drilling of the cores. This is to ensure that a proper record is made of the depth of deposits and to ensure that samples are collected and labelled appropriately.
- 6.2.8 Cores will be preliminarily opened and described on-site and then securely wrapped (to avoid sediment loss/contamination and moisture loss), labelled and retained for further off-site investigation at laboratory/ processing facilities. Preliminary interpretation of the deposit sequence sampled in the cores will be made on site. An onsite overview of the lithology and stratigraphic character will identify formation processes and palaeoenvironmental/ archaeological potential in light of any further sampling needs (e.g. for radiocarbon or OSL dating). As a general rule cores have a shelf life limited to 3-4 years. Once in laboratories, the cores may require extrusion or further cleaning/examination. Descriptions will follow standard geological criteria on pro-forma logs sheets.
- 6.2.9 Soil core sample holes will be re-instated with bentonite (or equivalent inert material) to protect the groundwater, minimise contamination pathways and/or address any other residual hazards. Should a significant obstruction be encountered before reaching the target depth an additional hole shall be drilled, at a distance of at least 1.0m from the survey point, at the discretion of the Archaeological Contractor. Should the additional core encounter an obstruction of a similar nature the circumstances shall be recorded, and the excavation ceased. Such additional cores will be assigned the same unique number as the original core along with a suffix (e.g. A, B, etc for each additional drilling attempt).

Recording

- 6.2.10 The sedimentary record recovered in each borehole core shall be recorded through use of graphic logs and written description by the Archaeological Contractor's suitably qualified geoarchaeologist. As a minimum, all logs must include the following descriptive information in a table format:
- Sample Unique Identification Number;
 - Location (XY coordinates);
 - Level of the top of the sample (e.g. m OD);
 - Depth for top and bottom of each lithological unit;
 - Depths for poor / no sediment retrieval;

- Description of each lithological unit, follow conventional standards (see Historic England 2015) and including sediment structure;
 - colour;
 - texture; and
 - sorting and boundary characteristics.
 - Sampling locations (including purpose of sampling and unique sub-sample code).
- 6.2.11 A colour photographic record in digital format will be made of the site survey works whilst they are in progress to graphically demonstrate each activity. Archeologically significant soil core samples shall be photographically recorded (in colour) whilst onsite. These may include significant contacts revealed in the sample window or deposits containing significant palaeoenvironmental or cultural assemblages. All records shall be cross-referenced to the unique core sample number.

Palaeoenvironmental Sampling

- 6.2.12 The Archaeological Contractor's Method Statement will outline an appropriate environmental sampling strategy and approach to scientific dating that conforms to this WSI.
- 6.2.13 The Proposed Development is located within two Historic England Regions, the Regional Science Advisor (RSA) for both the South East Anne de Vareilles, Tel. 07557 828187 (London Office) and East of England Zoe Outram, Tel. 01223 582707 (Cambridge Office), will be notified of the commencement of the works and will be consulted regarding the sampling strategy proposed by the Archaeological Contractor.
- 6.2.14 Provision shall be made for the removal of samples, or subsamples, from all securely stratified deposits which shall be sampled for retrieval and assessment of biological remains. If suitable deposits exist samples will be submitted for specialist palaeoenvironmental assessment, including but not limited to plant macrofossils, water-logged wood, pollen, diatom/ foraminifera, insects and molluscs, to identify the potential for past environmental reconstruction. Where appropriate natural deposit sequences will also be sampled should important palaeoenvironmental evidence and/or important sequence dating be possible.
- 6.2.15 Sediment samples will be taken in order to:
- Provide material for environmental assessment of biological remains capable of providing proxy records of climate, vegetation, sea-level change and land-use (human activity); and
 - Provide material for scientific dating using techniques appropriate to the likely age and type of sediment encountered.
- 6.2.16 Processing and assessment of samples shall be undertaken in line with the agreed strategy for the recovery and sampling of environmental remains and current guidance, Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation (English Heritage 2011) and Geoarchaeology - Using Earth Sciences to Understand the Archaeological Record (Historic England 2015). Subject to variations agreed in writing based on this, samples shall be processed and assessed under the supervision of the Archaeological Contractor's palaeoenvironmental specialist(s).
- 6.2.17 Using professional judgment, additional samples suitable for scientific dating shall also be recovered during the geoarchaeological survey to provide a range of dates across the site. The use of and strategy for radiocarbon dating techniques should be informed by the current guidance provided in 'Radiocarbon Dating and Chronological Modelling' (Historic England 2022). Dating techniques shall only be applied where required to meet the aims and objectives of the investigations and on written instruction from the Consultant. These may include:
- Radiocarbon dating;
 - Radiocarbon dating (Accelerator Mass Spectrometry);

- OSL dating; and
- Dendrochronological dating.

- 6.2.18 Appropriate techniques for assessment of the range, diversity, abundance and state of preservation of environmental remains should be employed. Such assessment must be sufficiently robust to determine the potential of the full range of environmental evidence for contributing to the existing or updated archaeological research objectives.
- 6.2.19 All processing, recording, cleaning, storage and conservation of samples shall be in accordance with the Chartered Institute for Archaeologist's Standard and guidance for the collection, documentation, conservation and research of archaeological materials (2014d).
- 6.2.20 The results of the sampling and dating of deposit sequences (both archaeological and natural) will be incorporated by a suitably qualified geoarchaeologist into the updated Stage 1 deposit model for the two headhouse and SEC compound sites.

Artefact Recovery

- 6.2.21 In the event that artefacts are recovered from the borehole core these will be collected, stored, and processed in accordance with standard archaeological methodologies and national guidelines (refer to Appendix 1). In the case of potential Palaeolithic remains recovered from the terrace gravels the current guidance 'Curating the Palaeolithic' (Historic England 2023) should be followed.
- 6.2.22 All archaeological finds, except modern artefacts where these do not contribute to project objectives, will be collected and retained. The Archaeological Contractor will clarify in their Method Statement the Collection Policy of the recipient repository/ museum and will ensure that it is in-line with relevant local authority guidelines. Each 'significant find' will be recorded three dimensionally. Similarly, if artefact scatters are encountered these should also be recorded three dimensionally. Bulk finds will be collected and recorded by context.
- 6.2.23 All recovered artefacts will be stabilised, conserved and stored in accordance with current national conservation guidelines and standards (refer to Appendix 1). If necessary, a conservator will visit the Site to undertake 'first aid' conservation treatment.
- 6.2.24 Artefacts will be stored in appropriate materials and conditions and monitored to minimise further deterioration.

Finds Processing

- 6.2.25 Initial processing of finds (and if appropriate other samples) will be undertaken concurrently with the fieldwork. The processing of finds will be finished shortly after completion of the investigation. The finds will be retained (according to the Collection Policy), washed, marked, bagged and logged on a Microsoft (MS) Access or GIS database (or equivalent), together with their locations according to the National Grid References (including eastings, northings) and Ordnance Datum (height) accurate to two decimal places.
- 6.2.26 The finds assemblage will be treated, labelled and stored in accordance with the appropriate Historic England guidance documents, local authority guidelines (if appropriate) and the Institute of Conservation guidelines (refer to Appendix A). The Archaeological Contractor will ensure that the processing of the assemblage is in accordance with the requirements of the recipient repository.
- 6.2.27 If appropriate, the Archaeological Contractor will ensure that each category of find, or each material type will be examined by a suitably qualified archaeologist / specialist and the results incorporated into the fieldwork assessment report.

Human Remains

- 6.2.28 In the unlikely event that human remains are discovered during the course of the geoarchaeological borehole investigation or subsequent processing of samples the Archaeological Contractor will, within 24hrs of discovery, contact His Majesty's Coroner and will notify the Consultant, who will notify the Client and the appropriate Archaeological Officer.
- 6.2.29 Where human remains are encountered on site the location and details of the find should be recorded and the borehole relocated leaving the remains in situ. If disturbance of the remains is unavoidable then they should only be lifted in accordance with a Ministry of Justice licence and under the appropriate Environmental Health regulations and the Burial Act (1857).

Treasure

- 6.2.30 Any artefacts which are recovered that fall within the scope of the Treasurer Act 1996 and Treasure (Designation) Amendment Order 2023 will be reported to the Archaeological Consultant immediately. The Archaeological Consultant will contact His Majesty's Coroner and the relevant Portable Antiquities Scheme Finds Liaison Officer and will ensure that the Treasure regulations are enforced and that all the relevant parties are kept informed. A list of finds that have been collected that fall under the Treasure Act and related legislation will be included in the fieldwork report.
- 6.2.31 Artefacts that are classified as 'treasure' will be removed to a safe place, but where removal cannot be effected on the same working day as the discovery, suitable security measures must be taken to protect the finds from damage or unauthorised removal.

Completion of Fieldwork

- 6.2.32 The Archaeological Contractor shall prepare and submit a Completion Statement (Appendix C) to the Consultant within one day of the end of the geoarchaeology borehole survey on site. The Consultant will ensure that the completion statements are factually correct and will provide copies to the Client and Archaeological Officers from Essex Place Services and Kent County Council.
- 6.2.33 The Archaeological Contractor shall ensure that all materials that they bring onto the site are removed, and that the sites are left in a tidy condition.
- 6.2.34 An OASIS entry shall be completed within two weeks of the end of the fieldwork, irrespective of whether a formal report is required (available online at: <http://ads.ahds.ac.uk/project/oasis/>). If appropriate the entry should include caveats about conclusions drawn in advance of analysis. The OASIS entry may be updated and re-submitted no later than two months after the completion of the report. When completing the form, the Archaeological Contractor must make reference to the Regional Research Framework.

Report Deliverable

- 6.2.35 A digital copy of the geoarchaeological borehole assessment report will be submitted, in draft, to the Consultant for comment within eight weeks of the completion of the geoarchaeological borehole survey. When the draft report is of a sufficient standard, the Consultant will submit a copy of the draft report to the Client, Historic England's Regional Science Advisors for the South East and East of England, Archaeological Officers from Essex Place Services and Kent County Council. If comments are received from these stakeholders they will be taken into account by the Archaeological Contractor when finalising the report.
- 6.2.36 The final report will be submitted to the Consultant within two weeks of the receipt of comments on the draft report. The Archaeological Consultant will provide a final copy to the Client and Historic England's Regional Science Advisor, Archaeological Officers from Essex Place Services and Kent County Council.

6.2.37 The preparation of the site archive will be undertaken in accordance with this WSI and will follow relevant archaeological standards and national policy and guidance (refer to Appendix A).

6.2.38 The content and scope of the geoarchaeological borehole assessment report shall be dependent upon the findings, but it shall be undertaken in accordance with this specification and current good practice and guidance (refer to Appendix A). Typically, the assessment report shall contain the following:

- Title page or cover sheet giving key project details.
- A signed QA sheet detailing as a minimum - title, author, version, date, checked by, approved by.
- A non-technical summary.
- Acknowledgements.
- Site details, including location, OASIS reference, grid reference, geology and soils, place of deposition of the archive (including digital archive), museum accession number, full dates of work and any relevant details of the project's history.
- A site location drawing.
- Geology and topography of each site;
- The archaeological and historical background.
- Results of previous stages of investigation e.g. the Stage 1 Geoarchaeological Deposit Modelling.
- The aims and objectives of the geoarchaeological borehole investigation.
- The methodology employed for site works and off-site assessment.
- The results of the geoarchaeological borehole investigation including a full lithological description, assessment of condition, quality and significance of the deposits and palaeoenvironmental remains.
- The results of any scientific dating undertaken including illustrated calibration curves if appropriate.
- If human remains are encountered the report will include a statement that addresses the future retention of the material, including, if appropriate, options for reburial.
- Refinement of Stage 1 geoarchaeological deposit models with additional data collected during fieldwork to provide enhanced stratigraphic descriptions of the Holocene record at each site.
- An assessment of and conclusions on the significance of the results in their local, regional and national context, cross-referenced to the Regional Research Framework and research agenda.
- Assessment of results and interpretation against Aims and Objectives and, where appropriate, a review of evaluation strategies and research designs.
- Statement of geoarchaeological and palaeoenvironmental potential of each site and recommendations regarding the number and type of further analyses.
- Discussion and recommendations for any further work at each site, including plans for palaeoenvironmental assessment and development of secure chronostratigraphic frameworks.
- The current and proposed arrangements for long-term conservation and archive storage (including details of the accredited repository details).
- Bibliography;
- Appendices (including as appropriate):

- General and detailed plans showing the location of the geoarchaeological borehole investigation accurately positioned on an Ordnance Survey base map (at an appropriate and recognised scale, with scale bar and grid co-ordinates).
 - Illustrations including isopach maps and surface models, transects/cross-sections and fence diagrams, as appropriate; and
 - Colour photographic plates illustrating work in progress, borehole cores and key deposits.
 - Full specialist palaeoenvironmental, scientific dating and artefact assessment reports.
 - A list of all finds that fall within the scope of the Treasure Act and associated legislation.
 - A copy of the OASIS data collection form.
- 6.2.39 Digital image files shall be submitted in JPEG or TIFF format, digital text files shall be submitted in Microsoft Word format, digital illustrations shall be submitted in AutoCAD format or ArcView shapefile format. A fully collated version of the report shall be included in PDF format.

7 Archive Preparation and Deposition

- 7.1.1 Archaeological material recovered from fieldwork is irreplaceable and data recorded during archaeological investigations can and should be copied. An additional copy should be held securely in a separate location in line with current best practice (English Heritage 2011, ClfA 2020b). The Archaeological Contractor will store the archive (including the digital archive) in a suitable secure location until it is deposited in the agreed museum (e.g. Thurrock Museum, Essex and Dartford Museum, Kent).
- 7.1.2 The Site record and assemblages (list of fieldwork interventions, notebooks / diaries, context records, feature records, structure records, site geometry (drawings), photographs and films, finds records and associated data files) will constitute the primary site archive. This is the key archive of the fieldwork project and the raw data upon which all subsequent assessment and analysis and future interpretation will be based. The site archive will therefore not be altered or compromised.
- 7.1.3 The site archive should be quantified, ordered, indexed and made internally consistent, and in line with current good practice (refer to Appendix A) and local authority guidelines. All finds and coarse-sieved, and flotation samples will have been processed and stored under appropriate conditions. The site archive will also contain a site matrix, a summary of key findings and descriptions of artefactual and environmental assemblages. Arrangements should be made for the proper cataloguing and storage of the archive during the project lifecycle (it may be appropriate to liaise with an archive specialist). The content of an outline structure for a fieldwork archive is presented in MoRPHE, Appendix 1, Product P1 and Product P3 (MoRPHE, 2008, PPN3).
- 7.1.4 The Archaeological Contractor will, prior to the start of fieldwork, liaise with relevant museum archives (Thurrock Museum, Essex and Dartford Museum, Kent) to obtain agreement in principle to accept the physical, documentary and photographic archive for long-term storage and to obtain a Site Code.
- 7.1.5 The digital archive shall be deposited with a trusted digital repository such as the Archaeology Data Service, following communication with the recipient museums (Thurrock Museum, Essex and Dartford Museum, Kent). Should the Archaeological Contractor wish to use a different digital repository, details of the alternative arrangements should be provided to the Archaeological Officers from Essex Place Services and Kent County Council.
- 7.1.6 The Archaeological Contractor will be responsible for identifying any specific requirements, archiving costs or policies of the recipient repository in respect of the archive, and for adhering to those requirements.
- 7.1.7 Each archaeological investigation will have its own unique accession number, which will be obtained from Thurrock Museum, Essex and Dartford Museum, Kent by the Archaeological Contractor in advance of the fieldwork, to ensure that the project is recorded in accordance with the requirements of the local authority. The unique accession number will be recorded in the Archaeological Contractor's Method Statement.
- 7.1.8 The archive of finds and records generated during the fieldwork will be removed from the Site at the end of each day and kept secure at all stages of the project until it is deposited with the recipient museums. The site archive will be produced to current national standards (as detailed within Appendix A).
- 7.1.9 The deposition of the archive forms the final stage of this project. The Archaeological Contractor shall provide the Consultant with copies of communication with the Thurrock Dartford Museums and written confirmation of the deposition of the archive.

8 Monitoring and Progress Reports

- 8.1.1 The Archaeological Contractor will notify the start date agreed with the Client to the Consultant at least two weeks in advance of when the fieldwork is due to start. The Consultant shall notify Historic England's Regional Science Advisor, Archaeological Officers from Essex Place Services and Kent County Council of the start date prior to the commencement of the works.
- 8.1.2 Given the short duration of the geoarchaeological borehole survey and nature of the works it is unlikely that the works will be monitored by Archaeological Officers from Essex Place Services and Kent County Council. However, in the event that significant finds or deposits are identified access to the site will be arranged by the Consultant, with the agreement of the Client. In such cases access will be afforded to Archaeological Officers from Essex Place Services and Kent County Council, as appropriate, to enable them to evaluate the work being undertaken on site against the methodology detailed in this WSI. If significant or unusual deposits are revealed, the Historic England Science Advisor will be contacted by the Consultant to discuss recovery methods and sampling techniques and, if necessary, to arrange a site visit.
- 8.1.3 During the site works the Archaeological Contractor will provide the Consultant and the Client with a weekly progress report (via email each Monday morning) and will verbally update the Principal Contractor and the Client on work progress upon request. The progress reports will record the following where applicable:
- General progress and current programme;
 - Programme lookahead (including an updated timetable and schedule; and early warnings);
 - Contractor issues / performance;
 - Resources;
 - Access / site constraints;
 - Health, Safety & Environment; and
 - AOB.
- 8.1.4 Progress with concurrent off-site post-excavation work such as processing of finds and environmental samples and dating will also be included in the weekly progress reports.
- 8.1.5 The Archaeological Contractor will only accept instruction from the Consultant, or the Client as appropriate.

9 Resource and Timetable

- 9.1.1 The timetable and programme for the Stage 1 and 2 geoarchaeological investigations will be agreed in advance with the Consultant and Client.
- 9.1.2 The Stage 1 geoarchaeological deposit modelling will be undertaken in August 2023 with a draft report submitted to the Consultant in September 2023.
- 9.1.3 The timing of the Stage 2 geoarchaeological borehole survey is yet to be agreed.
- 9.1.4 An experienced and qualified geoarchaeologist shall supervise the Stage 1 and 2 geoarchaeological work. The Archaeological Contractor will ensure that sufficient staff are available to fully resource each stage of the works. All site staff will be suitably qualified and experienced professionals and hold valid Construction Skills Certification Scheme (CSCS) cards, to be provided to the Client upon request.
- 9.1.5 All staff will be fully briefed and aware of the work required under this specification and will understand the objectives of the investigation and methodologies to be employed.
- 9.1.6 The Stage 2 geoarchaeological borehole survey will be undertaken in accordance with the Client's programme. The works could be subject to clearance from other environmental disciplines, such as ecological constraints, prior to works beginning on site.
- 9.1.7 The Consultant will notify the Archaeological Officers from Essex Place Services and Kent County Council of the commencement of the Stage 1 and 2 geoarchaeological works at the earliest opportunity.

10 Site Information

10.1 Access Arrangements

- 10.1.1 Access to each proposed headhouse and SEC compound site will be arranged with the Client by the Consultant and communicated to the Archaeological Contractor.
- 10.1.2 It is currently understood that:
- The proposed Tilbury headhouse and SEC compound will be accessed via the Tilbury2 port access road from the junction at Fort Road; and
 - The proposed Gravesend headhouse and SEC compound will be accessed via the single lane road on the north side of the Thames and Medway Canal from its junction with Mark Lane.
- 10.1.3 The Archaeological Contractor shall be given reasonable notice of the access date for each site to allow the Archaeological Contractor to mobilise. Routes into and out of the Site will be identified by the Client and will be adhered to at all times.
- 10.1.4 The Archaeological Contractor will notify the Consultant immediately if the archaeological specified works cannot be undertaken and will provide a clear explanation for the situation.
- 10.1.5 The Archaeological Contractor will record photographically (digital photographs) the ground conditions at each of the proposed headhouse and SEC compound sites prior to works commencing, and at the end of borehole investigation.

10.2 Known hazards and site constraints

- 10.2.1 This WSI has been prepared using site constraint information provide in the Geotechnical and Geoenvironmental Desk Study (Baker Hicks, 2022) and Access and Construction Management Survey Report (Baker Hicks, 2023), which will be made available to the Archaeological Contractor. This includes the results of a PAS128 Type B utilities survey undertaken in January 2023.
- 10.2.2 Individual geoarchaeological borehole locations will be confirmed following completion of the Stage 1 Geoarchaeological deposit model and will be informed by the known hazards and site constraints set out below and an updated statutory utilities search (e.g. PAS 128 Type D survey) provided by the Client. The borehole locations and updated site constraints will be issued to the Archaeological Contractor in an updated version of this WSI prepared by the Consultant prior to the start of the Stage 2 geoarchaeological borehole investigations.

Utilities

Tilbury headhouse and SEC compound

- 10.2.3 A utilities desk study undertaken to inform the March 2023 Access and Construction Management Survey Report identified the following utilities:
- Two sets of overhead high voltage cables cross either side of the headhouse site, the first aligned north-south cross the eastern side of the headhouse site, the second (possibly not energised) extend north-south across the southern part of site from the existing headhouse, before turning northwest just south of the proposed headhouse.
 - Underground utilities including have been identified including:
 - National Grid electricity and fibre optic cables are present along the length of the access route however, no National Grid cables extend into the road leading to the proposed headhouse location.

- BT cables and apparatus, telecoms cables with the access road leading west of and bisecting the proposed headhouse and SEC compound site.
- Virgin Media cables run along the access road west of and are mapped extending into the western side of the proposed headhouse and SEC compound site.

10.2.4 A PAS128 Type B GPR survey issued to Baker Hicks on 24.02.2023 confirmed the presence of the BT Openreach apparatus, electrical cables, and fibre optic cables along the access route as it crosses through the proposed headhouse and SEC compound site. The survey also detected CATV cables, traffic control and water pipes and several 'Unknown Utilities' within the access road leading to the proposed headhouse and SEC compound site (Baker Hicks, 2023).

Gravesend headhouse and SEC compound

10.2.5 The utilities desk study undertaken to inform the March 2023 Access and Construction Management Survey Report identified the following utilities:

- Overhead National Grid high voltage lines extend southeast from the existing head house and SEC compound extending away from the proposed headhouse location.
- Overhead BT Openreach apparatus runs parallel to the east of the approach road for the proposed headhouse and SEC compound. The line crosses over the approach and runs parallel to the road on the north side of the Thames and Medway Canal.
- Two sets of overhead high voltage cables cross either side of the headhouse site, the first aligned north-south cross the eastern side of the headhouse site, the second (possibly not energised) extend north-south across the southern part of site from the existing headhouse, before turning northwest just south of the proposed headhouse.
- Underground utilities including
 - 2no. UKPN 132KV distribution cables running parallel to and along the length of the access road feeding the Rifle Range facilities south of the proposed headhouse and SEC compound.
 - SGN medium pressure gas main runs along the northern footpath of the Thames and Medway Canal and along the western side of the access track leading the existing headhouse and SEC compound.
 - BT cables and apparatus, along the access track along the western side of the proposed headhouse and SEC compound, before connecting to the existing SEC compound.
 - Vodafone telecoms cables are mapped along the access road and along the eastern side of the access track leading to the existing headhouse and SEC compound.

10.2.6 The PAS128 Type B GPR survey issued to Baker Hicks on 24.02.2023 confirmed the presence of the BT Openreach Apparatus, SGN gas mains, and electrical cables. In addition, CATV cables were detected running along the eastern side of the access track leading to, and feeding, the existing headhouse (Baker Hicks, 2023).

Unexploded Ordnance

10.2.7 An initial assessment of unexploded ordnance (UXO) risk was undertaken by Zetica Ltd and 6 Alpha Ltd to inform the Geotechnical and Geoenvironmental Desk Study. The indicative UXO risk was assessed as being:

- Moderate for the proposed Tilbury headhouse and SEC compound due to the proximity of Tilbury Fort, a recorded targeted for aerial bombing during the Second World War; and
- High for the proposed Gravesend headhouse and SEC compound with multiple incendiary bomb strikes recorded in the surrounding area (Baker Hicks, 2022).

10.2.8 The Geotechnical and Geoenvironmental Desk Study recommended that a more detailed UXO study be undertaken.

- 10.2.9 The requirement for, or results of any further UXO desk study will be confirmed and provided to the Consultant and Archaeological Contractor by the Client prior to the mobilisation for the Stage 2 geoarchaeological borehole survey. This will enable the UXO risk at each individual borehole location to be assessed, this WSI to be updated by the Consultant and appropriate control measures to be planned and implemented by the Archaeological Contractor prior to the start of works.

Ground Contamination

Tilbury headhouse and SEC compound

- 10.2.10 The Geotechnical and Geoenvironmental Desk Study (Baker Hicks, 2022) identified extensive, and variable made ground deposits up to 5.50m in depth and including ash from the boilers of the Tilbury Power Station that were disposed of across the area. Recent ground investigations within the site have confirmed that the depth of made ground deposits in the area of the proposed headhouse and SEC compound are between 1.50m and 2.20m below ground level.
- 10.2.11 Evidence for ground contamination was also recorded in the form of:
- Hydrocarbons within the soil in the vicinity of the proposed Tilbury headhouse/tunnel shaft; and
 - Asbestos Containing Material (ACM) have been recorded in the soil within the proposed compound and laydown area west of the headhouse on the site of the former Tilbury Power Station.

Gravesend headhouse and SEC compound

- 10.2.12 The Geotechnical and Geoenvironmental Desk Study recorded that no made ground was recorded within the Gravesend headhouse and SEC compound on BGS mapping or historic boreholes. However recent ground investigation within the site has recorded made ground deposits to a depth of between 1.60 and 2.80m below ground level.
- 10.2.13 No evidence for ground contamination was reported within the Gravesend headhouse and SEC compound site (ibid.).

Ecological Constraints

- 10.2.14 The proposed Tilbury Headhouse and SEC compound is located north of a Local Nature Reserve that extends along the tidal salt marsh on the Thames foreshore, and the proposed Gravesend Headhouse and SEC compound is located immediately west of an RSPB Reserve on Eastcourt Marshes.
- 10.2.15 At the time of writing no specific ecological constraints have been reported within either headhouse and SEC compound site.
- 10.2.16 Information regarding ecological constraints and the results of any ecology surveys will be provided to the Consultant and Archaeological Contractor by the Client prior to the mobilisation for the Stage 2 geoarchaeological borehole survey and this WSI will be updated by the Consultant to identify any ecological constraints and control measures required.

Structures

- 10.2.17 The Access and Construction Management Survey Report and site walkover survey identified a single extant structure adjacent to the access gate for the proposed Tilbury headhouse and SEC compound site comprising a masonry structure believed to be a former pumping station presumed disused (Baker Hicks, 2023).

11 Safety Health and Environment

- 11.1.1 The Archaeological Contractor will provide the Consultant with details of their public and professional indemnity insurance cover. The Consultant will provide copies to the Client as appropriate.
- 11.1.2 The Archaeological Contractor will have their own Health and Safety policies compiled using national guidelines, which conform to all relevant Health and Safety legislation and best practice. A copy of the Archaeological Contractor's Health and Safety policy will be submitted to the Consultant and Client prior to the start of the archaeological investigations.
- 11.1.3 The Archaeological Contractor shall prepare a Risk Assessment(s) and Method Statement (RAMS) and submit these to the Consultant for review and to the Client for approval prior to starting on site. If amendments are required to the RAMS during the works, the Consultant, Client and any other interested party must be provided with the revised document at the earliest opportunity.
- 11.1.4 All staff involved in the fieldwork should be Construction Skills Certification Scheme (CSCS) qualified to a minimum standard as an 'Archaeologist Technician' and hold a valid CSCS card. Staff CVs should include CSCS qualifications and expiry dates.
- 11.1.5 All site personnel will familiarise themselves with the following:
- The Client's Health and Safety requirements and site procedures;
 - Site emergency and evacuation procedures;
 - The site's health and safety coordinator;
 - The first aider; and
 - The location of the nearest hospital and doctor's surgery.
- 11.1.6 The Archaeological Contractor's supervisor will maintain a record of site attendance and complete a daily briefing at the start of work for each day that there is a team in the field.
- 11.1.7 No site work shall commence without a PAS128 Type B utilities survey having been completed, at the time of writing, it is anticipated that this will be commissioned by the Archaeological Contractor and the results included in their RAMS.
- 11.1.8 The Archaeological Contractor shall be responsible for identifying any buried or overhead services and taking the necessary precautions to avoid damage to such services, prior to and during the fieldwork. The Archaeological Contractor will ensure that any operative scanning for buried services is both competent and appropriately trained.
- 11.1.9 Prior to drilling works the locations of any utilities should be marked on site, along with any environmental or ecological constraints and corresponding buffer zones, and that any additional demarcation or safety measures required to ensure that each area is safe prior to commencement of mitigation work are in place.
- 11.1.10 The Archaeological Contractor shall at all times maintain a safe working distance from the overhead and buried services/ utilities. In addition, the Archaeological Contractor shall be responsible for any requirements with regard to work in the vicinity of River Thames and local watercourses.
- 11.1.11 The Archaeological Contractor's Risk Assessment(s) and project Health and Safety Plan shall make reference to relevant guidance and good practice (for example: Health and Safety Executive SEGS6 - Avoidance of Danger from Overhead Lines; HS(G)47 - Avoiding Danger from Underground Services; Energy Networks Association The Safe Use of Mechanical Plant in the Vicinity of Electricity Overhead Lines; and PAS 128 – Specification for underground utility detection, verification and location).

- 11.1.12 All site personnel will wear personal protective equipment (PPE) as defined by the Archaeological Contractor's risk assessment undertaken in accordance with the Principal Contractor's mandatory requirements. Any visitors to the investigations will require a site induction in accordance with the Archaeological Contractor's Health and Safety requirements and will have read the appropriate Archaeological Contractor's Risk Assessment and Method Statement. The Archaeological Contractor will ensure that any visitors to the investigations are equipped with suitable PPE prior to entry to the site. All equipment that is used in the course of the fieldwork must be 'fit for purpose' and be maintained in a sound working condition that complies with all relevant Health and Safety regulations and recommendations.
- 11.1.13 The Archaeological Contractor will ensure the provision and maintenance of adequate, suitable and sufficient welfare and sanitary facilities at appropriate locations for the duration of the works. The locations for the temporary site welfare facilities will be agreed with the Client prior to the start of the works, and arrangements for temporary parking shall also be agreed.

12 Confidentiality and Publicity

- 12.1.1 The geoarchaeological borehole investigation may attract the interest of the public and the press. All communication regarding this project will be directed through the Client. The Archaeological Contractor will refer all inquiries to the Client without making any unauthorised statements or comments.
- 1.1.1 The Archaeological Contractor will not disseminate or upload onto Web sites information or images associated with the project for publicity or information purposes without the prior written consent of the Client.

13 Copyright

- 13.1.1 The Archaeological Contractor shall retain their copyright in all reports, documentation and images produced as part of this project. The Archaeological Contractor shall obtain all relevant copyrights from sub-specialists and relevant copyright holders (such as Ordnance Survey) required to produce the reports detailed in this WSI and any subsequent publication. The Archaeological Contractor shall not withhold the rights of the Client or Consultant to use, disseminate or publish the reports prepared by the Archaeological Contractor so long as the Archaeological Contractor is suitably attributed.
- 13.1.2 The Archaeological Contractor will be responsible for obtaining permission to retain archaeological finds from the landowners in line with current best practice (English Heritage 2011; ClfA 2020b).
- 13.1.3 The Archaeological Contractor shall be responsible for the transfer of ownership and copyright with Thurrock Museum and Dartford Museum prior to the deposition of the archives.

14 Adherence to Project Design

- 14.1.1 The Archaeological Contractor will undertake the works according to this Specification and any subsequent written variations. No variation from or changes to the WSI will occur except by prior agreement with the Consultant.

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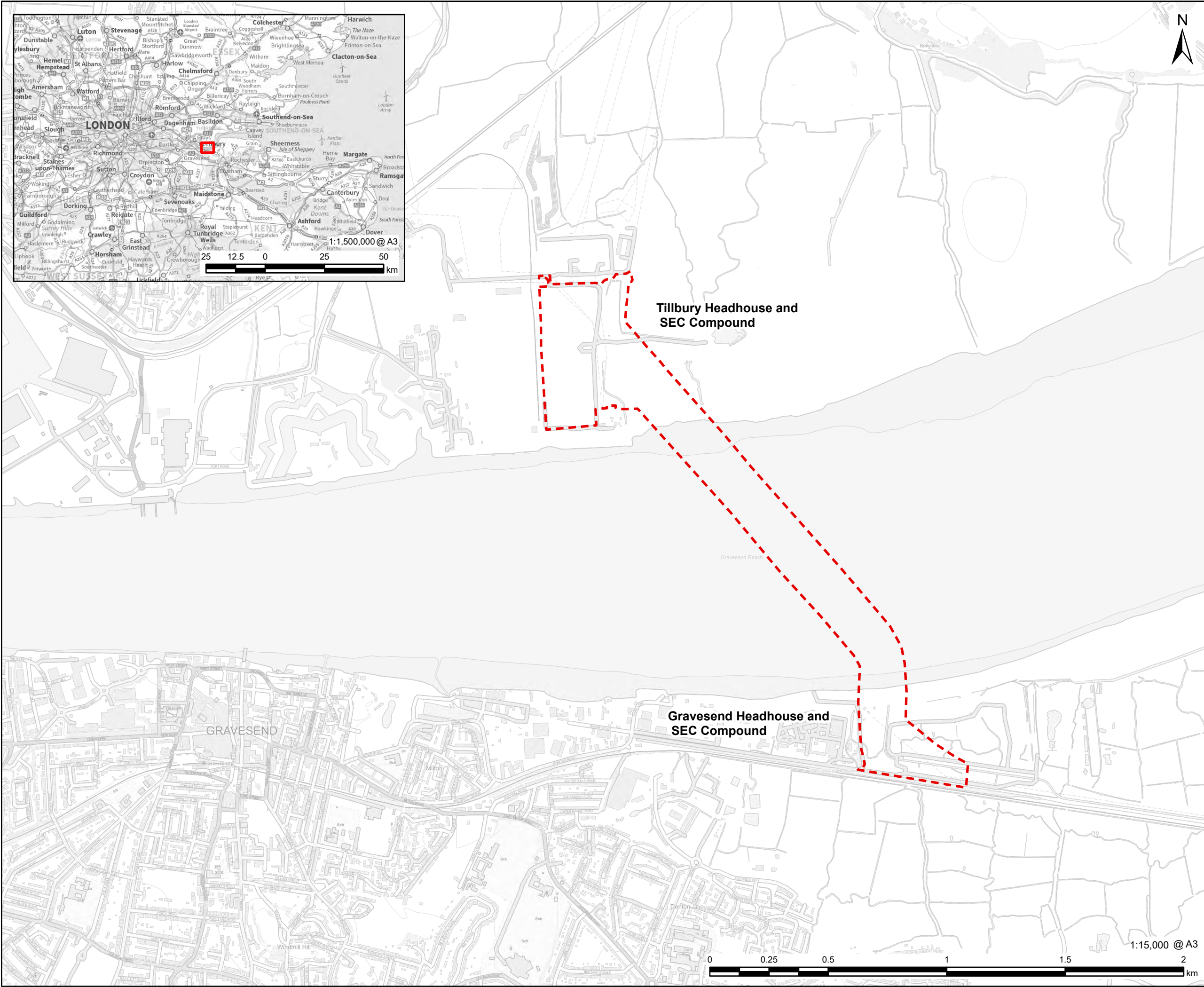
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Appendix B – Figures

Figure 1 Site Location

Figure 2 Geoarchaeological Borehole Locations



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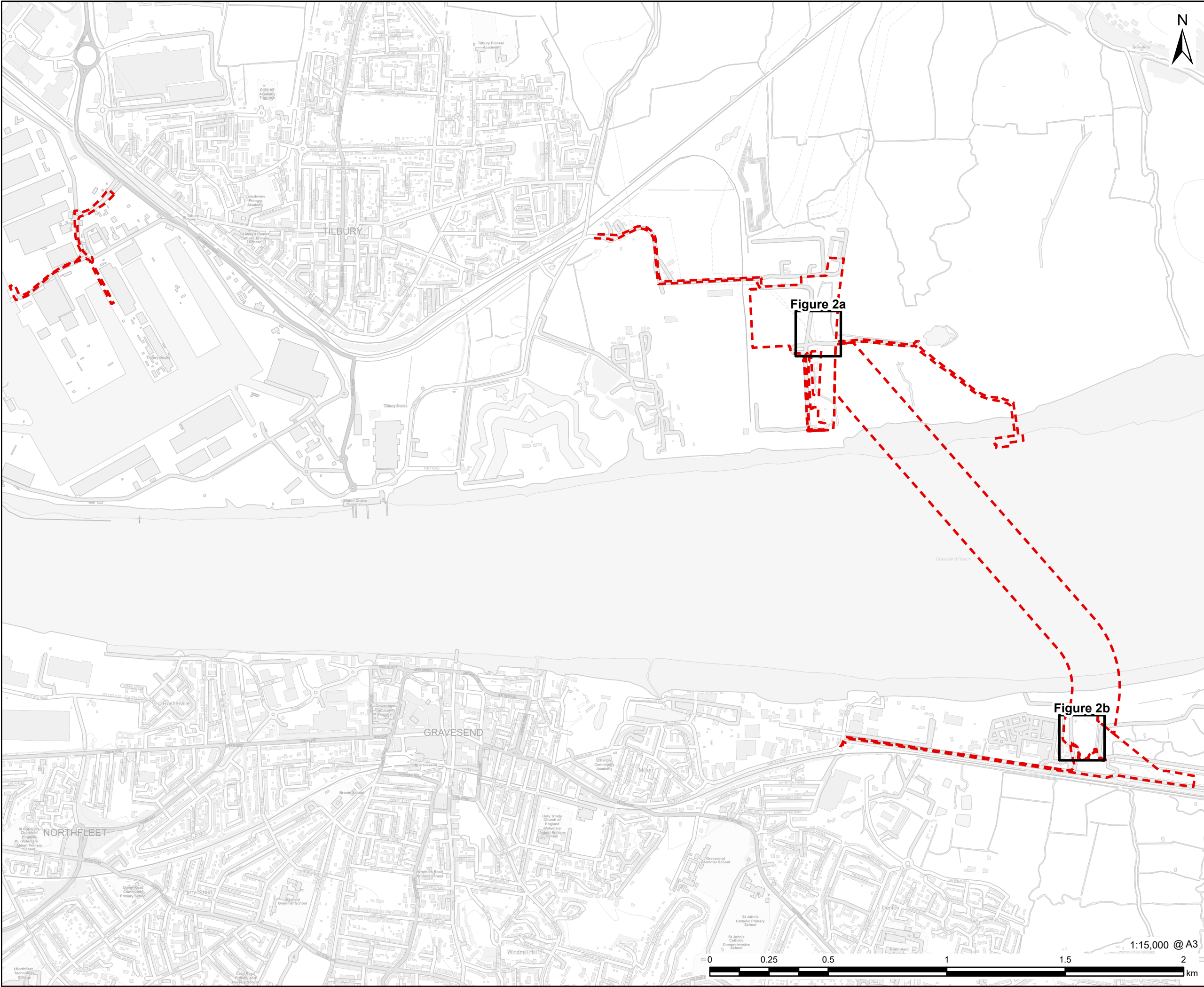
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FIGURE TITLE

Site Location Plan

FIGURE NUMBER

Figure 1



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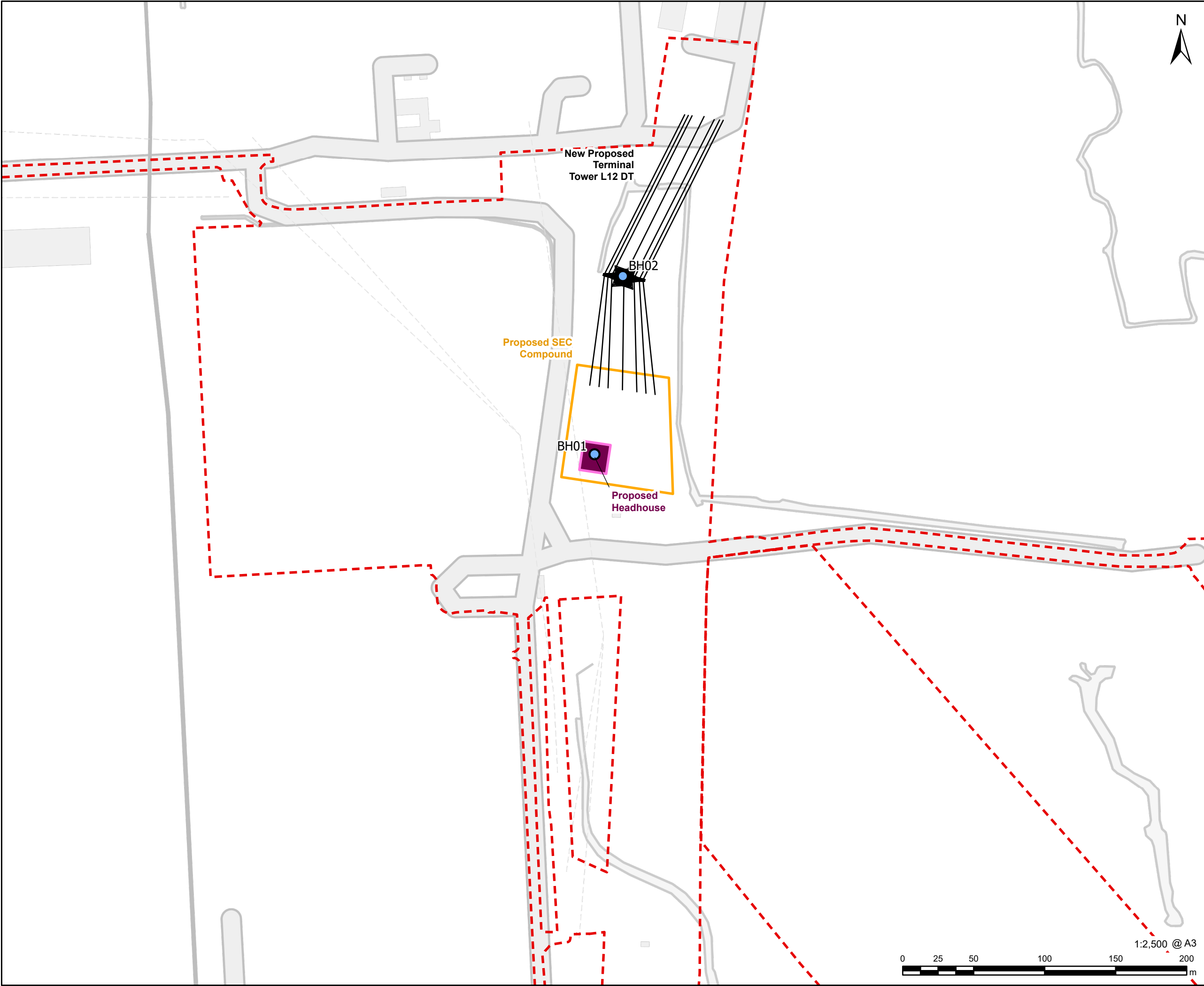
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FIGURE TITLE

Geoarchaeological Borehole Locations - Overview

FIGURE NUMBER

Figure 2



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 - Proposed Borehole Locations
 - Proposed Terminal Towers
 - Proposed SEC Compound
 - Proposed Headhouse

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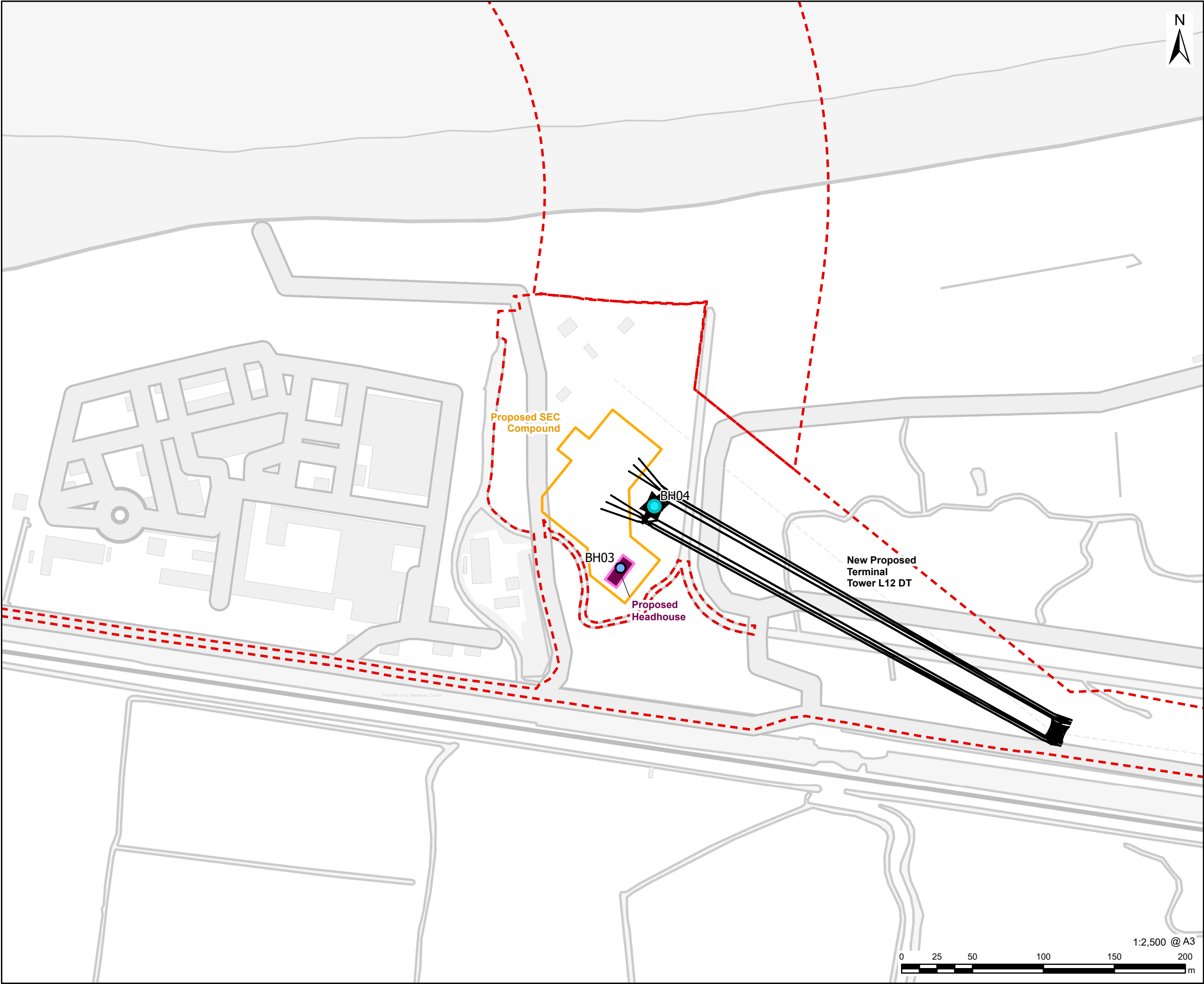
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FIGURE TITLE
Geoarchaeological Borehole Locations - Page 1

FIGURE NUMBER
Figure 2a

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FIGURE TITLE
Geoarchaeological Borehole Locations - Page 2

FIGURE NUMBER
Figure 2b

Appendix C – Fieldwork Completion Statement

Site Name:

Site Code:	
Historic Environment Investigation Type:	
Archaeological Contractor:	
Fieldwork Director:	
Site Area:	
Dates of fieldwork:	

Summary of Results

--

	Name	Signature	Date
Author (Archaeological Contractor):			
Checked (Consultant):			
Approved (LPA Archaeologist):			

