



NeuConnect Onshore Cable Installation Phase & HDD Works, Isle of Grain Medway, Kent

Palaeolithic Geoarchaeological Evaluation and
Geoarchaeological Monitoring of Ground Investigation Works



Ref: 268971.04
October 2024



© Wessex Archaeology Ltd 2024, all rights reserved.

Portway House
Old Sarum Park
Salisbury
Wiltshire
SP4 6EB

www.wessexarch.co.uk

Wessex Archaeology Ltd is a Registered Charity no. 287786 (England & Wales) and SC042630 (Scotland)

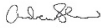
Disclaimer

The material contained in this report was designed as an integral part of a report to an individual client and was prepared solely for the benefit of that client. The material contained in this report does not necessarily stand on its own and is not intended to nor should it be relied upon by any third party. To the fullest extent permitted by law Wessex Archaeology will not be liable by reason of breach of contract negligence or otherwise for any loss or damage (whether direct indirect or consequential) occasioned to any person acting or omitting to act or refraining from acting in reliance upon the material contained in this report arising from or connected with any error or omission in the material contained in the report. Loss or damage as referred to above shall be deemed to include, but is not limited to, any loss of profits or anticipated profits damage to reputation or goodwill loss of business or anticipated business damages costs expenses incurred or payable to any third party (in all cases whether direct indirect or consequential) or any other direct indirect or consequential loss or damage.

Document Information

Document title	NeuConnect Onshore Cable Installation Phase & HDD Works, Isle of Grain, Medway, Kent
Document subtitle	Palaeolithic Geoarchaeological Evaluation and Geoarchaeological Monitoring of Ground Investigation Works
Document reference	268971.04
Client name	De Romein Nearshore Ltd (Lisburn)
Address	282 Moira Road, Lisburn, Northern Ireland, BT28 2TU
Site location	Isle of Grain, Grain, Medway, ME3 0BG
County	Kent
National grid reference	588327, 176917 (TQ 88327 76917)
Planning authority	Kent County Council
Planning reference	MC/19/3015, MC/21/2483, MC/21/3496
Museum name	Guildhall Museum, Medway
Museum accession code	N/A
OASIS ID	XXX
WA project name	NeuConnect Onshore Cable Installation Phase & HDD
WA project code	268971
Project management by	Dr Alexander Brown
Document compiled by	Agata Kowalska and Dr Andrew Shaw,
Contributions from	Dan Carter (ceramics) and Mark Stewart (worked flint)
Graphics by	Marijane Porter

Quality Assurance

Issue number & date		Status	Author	Approved by
1	30/10/2024	Draft	AK	



Contents

Summary	i
Acknowledgements.....	ii
1 INTRODUCTION	1
1.1 Project and planning background	1
1.2 Scope of works	2
1.3 Scope of document	4
2 BACKGROUND	5
2.1 Introduction.....	5
2.2 Location and topography	5
2.3 Chronology	5
2.4 Previous investigations.....	6
2.5 Palaeolithic geoarchaeological background	10
2.6 Summary of Palaeolithic geoarchaeological potential	12
3 AIMS AND OBJECTIVES	12
3.1 Introduction.....	12
3.2 Aims	12
3.3 Objectives.....	12
4 FIELDWORK METHODS	13
4.1 Introduction.....	13
4.2 Setting out of interventions	13
4.3 Service location and other constraints	13
4.4 Test Pits	13
4.5 Boreholes	14
4.6 Survey	15
5 POST-EXCAVATION METHODS	15
5.1 Stratigraphic evidence	15
5.2 Review of GI logs	15
5.3 Deposit modelling.....	16
5.4 Finds evidence	16
5.5 Palaeoenvironmental, sedimentological and scientific dating samples	16
6 RESULTS	16
6.1 Introduction.....	16
6.2 Deposits	17
6.3 Finds Assessment	19
6.4 Palaeoenvironmental, sedimentological and scientific dating samples	20
7 DISCUSSION	20
7.1 Introduction.....	20
7.2 Sedimentary sequences and depositional environments	20
7.3 Assessment of Palaeolithic geoarchaeological potential.....	20
8 CONCLUSIONS AND RECOMMENDATIONS	21
8.1 Conclusions.....	21
8.2 Recommendations	22
9 ARCHIVE STORAGE AND CURATION	22
9.1 Museum.....	22
9.2 Preparation of archive	22
9.3 Selection strategy	23
9.4 Security copy	24



9.5	OASIS	24
10	OUTREACH AND SOCIAL MEDIA	24
11	COPYRIGHT	24
11.1	Archive and report copyright	24
11.2	Third party data copyright.....	24
	REFERENCES	26
	APPENDICES.....	28
	Appendix 1 Test pit summaries	28
	Appendix 2 Borehole summaries.....	34
	Appendix 3 Geotechnical logs – Causeway Geotech (2024)	37
	Appendix 4 Data used in the deposit model	38
	Appendix 5 OASIS form.....	39

List of Figures

Figure 1	Site location and plan
Figure 2	Bedrock geology
Figure 3	Superficial geology
Figure 4	Transect 1
Figure 5	West facing section of Test Pit 1
Figure 6	South-west facing section of Test Pit 4
Figure 7	South-east facing section of Test Pit 6

List of Tables

Table 1	Assessment of previous impacts
Table 2	Staged approach to Palaeolithic geoarchaeological investigations
Table 3	British Quaternary chronostratigraphy
Table 4	Previous investigations
Table 5	Chronology of the Thames-Medway Pleistocene river terrace sequence
Table 6	Summary of finds by material type



Summary

Wessex Archaeology was commissioned by De Romein Nearshore, on behalf of NeuConnect Britain Ltd, to report on a Palaeolithic geoarchaeological evaluation and associated geoarchaeological monitoring of Ground Investigation (GI) works carried out along the route of the NeuConnect onshore DC cable route and the Horizontal Directional Drilling (HDD) works area. The cable route and HDD works are located at Grain on the Isle of Grain, Kent. The evaluation area is centred on National Grid Reference (NGR) 588327, 176917 (TQ 88327 76917).

The evaluation was carried out in accordance with a requirement for archaeological evaluation outlined in Condition 22 (i) of approved planning application MC/21/2483. The purpose of the evaluation was to establish requirements for further archaeological work needed to comply with Condition 22 (ii) of the approved planning application, which outlines a requirement to mitigate against impacts of the development on any significant archaeological remains, or to provide information for a management plan to prevent impacts.

In consultation with the County Archaeologist for Kent County Council (KCC), archaeological advisor to the Local Planning Authority (LPA), it was established that the principal archaeological risk of the development was impacting on Pleistocene geological deposits containing significant Palaeolithic geoarchaeological remains (artefacts and sediments with potential to preserve palaeoenvironmental evidence).

The program of evaluation and monitoring comprised the excavation and recording of six geoarchaeological test pits, with associated assessment for Palaeolithic geoarchaeological evidence; geoarchaeological monitoring, recording and assessment of three GI boreholes; geoarchaeological review of three GI borehole logs, and the production of a deposit model, which incorporated all relevant, available deposit records.

The evaluation and monitoring established that Quaternary geological deposits are absent from large areas of the HVDC cable route and onshore HDD works area, with Made Ground overlying London Clay Formation bedrock being present in most locations.

Locally Sands and Gravels between 0.20m and 1.0m thick unconformably overlay bedrock and were sealed by made ground. The lithology of the Sands and Gravels was consistent with being fluvial Pleistocene sediments, but no clear evidence demonstrating that these were *in situ* sediments (e.g. fluvial bedding structures) was identified, and they may be recently redeposited. If *in situ*, these Sands and Gravels are the basal remnants of a Thames-Medway river terrace, which has been truncated by previous aggregate extraction and which are likely to be broadly equivalent with deposits investigated to the south-west at the site of the NeuConnect Converter Station and Substation (Wessex Archaeology 2024). At the Converter Station and Substation site these terrace deposits were dated to MIS 9–7 (337–191 Kya) and demonstrated to locally contain late Lower/early Middle Palaeolithic archaeology. No archaeology was identified from the Sands and Gravels during the evaluation, and they had low potential for preserving palaeoenvironmental evidence. Based on the results of the evaluation, the Palaeolithic geoarchaeological potential of the sands and gravels was assessed to be low.

The results of geoarchaeological evaluation demonstrate that Pleistocene deposit containing a significant Palaeolithic geoarchaeological resource are unlikely to be impacted on by the NeuConnect HVDC onshore cable installation and HDD works. Consequently, it is recommended that no further archaeological work is required to mitigate against impacts.



Acknowledgements

Wessex Archaeology would like to thank De Romein for commissioning the Palaeolithic evaluation and geoarchaeological monitoring on behalf of NeuConnect Britain Ltd. In particular Wessex Archaeology would like to thank Ciaran McPeake and Jack Scott at DeRomein Nearshore. Wessex Archaeology is also grateful for the advice and support of Ben Found who monitored the project for Kent County Council.

The evaluation and monitoring work was directed by Agata Kowalska, with the assistance of Huwel Grant and Madeleine Smedley. This report was written by Agata Kowalska and Dr Andrew Shaw, with contributions from Dan Carter (ceramics) and Mark Stewart (worked flint). The report was edited by Dr Andrew Shaw. The project was managed by Dr Alexander Brown on behalf of Wessex Archaeology.



NeuConnect Onshore Cable Installation Phase & HDD Works, Isle of Grain, Medway, Kent

Palaeolithic Geoarchaeological Evaluation and Geoarchaeological Monitoring of Ground Investigation Works

1 INTRODUCTION

1.1 Project and planning background

- 1.1.1 Wessex Archaeology was commissioned by De Romein Nearshore ('the Client'), on behalf of NeuConnect Britain Ltd, to report on a Palaeolithic geoarchaeological evaluation through a program of test pitting and associated geoarchaeological monitoring of Ground Investigation (GI) works. These geoarchaeological works were carried out along the route of the NeuConnect onshore DC cable route and Horizontal Directional Drilling (HDD) works area. The cable route and HDD works are located at Grain on the Isle of Grain, Kent. The evaluation and monitoring area is centred on National Grid Reference (NGR) 588327, 176917 (TQ 88327 76917) (**Figure 1**).
- 1.1.2 NeuConnect Britain Ltd has been granted planning permission to construct a 1400-megawatt (MW) interconnector between the UK and Germany, with the onshore converter station for the UK works located on the Isle of Grain, Kent. The new link will create a connection for electricity to be transmitted in either direction between Great Britain and Germany. The project comprises approximately 700 kilometres (km) of subsea and underground High Voltage Direct Current (HVDC) cables, with onshore converter stations linking into the existing electricity grids at Grain in Great Britain and at Wilhelmshaven in Germany.
- 1.1.3 The program of geoarchaeological evaluation and monitoring relates to the NeuConnect onshore HVDC cable route and HDD works (**Figure 1**). These works will comprise the installation of onshore cables and reinstatement and installation of three HDD ducts from land to sea. Associated archaeological and geoarchaeological works relating to the NeuConnect Converter Station and Substation have been carried out and reported on as separate phases of works (see **Section 2.4** for details).
- 1.1.4 A planning application for onshore development works associated with NeuConnect project was submitted to Medway Council by NeuConnect Britain Limited on 15th November 2019 (planning application reference: MC/19/3015), which was supported by an Environmental Statement (ES). A non-material amendment was submitted on 20 August 2021 (planning application reference: MC/21/2483) to allow for phased discharge of conditions which was approved on 17 September 2021. A further non-material amendment was submitted on 13 December 2021 (planning application reference: MC/21/3496) to widen/straighten a length of the HVDC cable route. The application was approved by Medway Council, with conditions, under the Town and Country Planning Act 1990 on 12th February 2012.
- 1.1.5 The following condition[s] relate to archaeology:

Condition 22:

"No phase of development shall take place until the applicant, or their agents or successors in title, has secured the implementation within that phase of:



i. Archaeological field evaluation works, including specialist assessment of the site's Palaeolithic potential, in accordance with a specification and written timetable which has been submitted to and approved by the Local Planning Authority: and

ii. Following on from the evaluation, any safeguarding measures to ensure preservation in situ of important archaeological remains and/or further archaeological investigation and recording in accordance with a specification and timetable which has been submitted to and approved by the Local Planning Authority.

Reason: *"To ensure appropriate assessment of the archaeological implications of any development proposals and the subsequent mitigation of adverse impacts through preservation in situ or by record."*

Condition 24

"Following completion on-site of the archaeological mitigation works, referred to in condition 22 above, a Post-excavation Assessment Report shall be submitted to the local planning authority for approval. The Post-excavation Assessment Report shall include an Updated Project Design and accompanying timetable for any further analysis and for the publication of the findings of the archaeological investigations and deposition of the resulting archaeological archive. The analysis, archaeological publication and the deposition of the archive shall be funded by the developer and carried out in accordance with the programme and timetable set out in the updated project design".

Reason: *"To ensure the results of the archaeological investigations are made publicly accessible so as to advance understanding of the significance of any heritage assets to be lost (wholly or in part) in accordance with the objectives of the NPPF".*

1.1.6 The evaluation and geoarchaeological monitoring were carried in fulfilment of Condition 22 (i) in relation to the NeuConnect onshore HVDC cable route and HDD works and in order to establish the requirement for, and scope of, any further works to fulfil Condition 22 (ii).

1.1.7 The evaluation was undertaken between 16th to the 18th of September 2024, and the geoarchaeological monitoring of GI works from the 25th to 27th of September 2024.

1.2 Scope of works

1.2.1 The evaluation was carried out in advance of the HDD Works and the Onshore Cable Installation phase of the NeuConnect approved Phasing Plan (NeuConnect 2022).

1.2.2 In consultation with County Archaeologist for Kent County Council (KCC), archaeological advisor to the Local Planning Authority (LPA), it was identified that geological deposits with potential to contain 'geoarchaeological' evidence dating to the late Lower and/or early Middle Palaeolithic periods (c. 337–130 Kya) could be present in the area of the onshore HVDC cable route and HDD works. In accordance with Condition 22 (i) of approved planning application MC/21/2483 (see above), archaeological evaluation to assess this potential was therefore required.

1.2.3 Geoarchaeological potential refers to the archaeological resource contained within geological deposits. This resource can consist of both archaeological remains (artefacts, archaeological layers etc), as well as environmental remains reflective of past human activity, landscapes and environments. A specialist 'geoarchaeological' approach, which combines archaeological, geological, geophysical and palaeoenvironmental investigative techniques, is required when investigating this archaeological resource



- 1.2.4 The area of the onshore HVDC cable route and HDD works has been subject to extensive previous aggregate extraction and subsequent landfill. Desktop assessment (NeuConnect 2023) has divided the onshore HVDC cable route and HDD works area into eight areas, reflecting assessed extent of these previous development impacts. The areas are illustrated on **Figure 1** and summarised in **Table 1**. Based on this assessment, it was established that geological deposits with Palaeolithic geoarchaeological potential were only likely to be present and possibly impacted on by the onshore HVDC cable route and HDD works in Areas 3 and 5. Through consultation with the County Archaeologist for KCC, archaeological advisor to the LPA, a requirement for Palaeolithic geoarchaeological evaluation focussed on these areas was established.

Table 1 Assessment of previous impacts (NeuConnect 2023)

Area	Comments
1	Disturbed ground from previous quarry works
2	Existing haul road not being excavated likely excavated and compacted over its historic use
3	Likely virgin ground from edge of haul road. No historic data found on its use for quarry or landfill works. Area approximately 240m length by 20m width
4	Rosecourt Farm- Former sand pit and registered landfill site (P/03/25)
5	Likely virgin ground from edge of haul road. No historic data found on its use for quarry or landfill works. Area approximately 140m length by 20m width
6	Perrys farm Area 1-Former sand/gravel and registered landfill site (P/03/34)
7	Perrys farm area 2- Former sand/gravel and registered landfill site (P/03/34)
8	Outside scope of evaluation – covered by converter station evaluation (Wessex Archaeology 2022, 2024)

- 1.2.5 Proposed onshore HVDC cable route and HDD works in Areas 3 and 5 will comprise:

- Topsoil stripping works to remove average 300mm layer of topsoil;
- Open cable trench excavation to a depth 1.5m below ground level;
- Reinstatement works of the above.

- 1.2.6 The Palaeolithic evaluation comprised the following types and number of investigations:

- Four machine-dug geoarchaeological test pits in Area 3 of the onshore HVDC cable route, and
- Two machine-dug geoarchaeological test pits in Area 5 onshore HVDC cable route.

- 1.2.7 In addition, a program of GI works carried out along the onshore HVDC cable route was subject to geoarchaeological monitoring. These geoarchaeological works comprised:

- Geoarchaeological monitoring of 3 no. cable percussion boreholes located in Areas 3 and 5 of the onshore HVDC cable route (CG_BH01, CG_BH02 and CG_BH01), and
- Geoarchaeological review of GI logs of 3 no. cable percussion boreholes located in, and immediately south of, Area 6 of the onshore HVDC cable route (CG_BH04, CG_BH05 and CG_BH06).

- 1.2.8 The locations of these interventions are illustrated in **Figure 1**.



- 1.2.9 All works undertaken were in accordance with Written Schemes of Investigation (WSI) which detailed the aims, objectives, methodologies and standards to be employed to undertake the evaluation (Wessex Archaeology 2023a). The County Archaeologist for Kent County Council (KCC) approved the WSI, on behalf of the Local Planning Authority (LPA), prior to fieldwork commencing.

1.3 Scope of document

- 1.3.1 The purpose of this report is to provide a detailed description of the results of the Palaeolithic geoarchaeological evaluation and GI monitoring, to interpret the results within a local, regional or wider archaeological context and to assess whether the aims of the evaluation have been met.
- 1.3.2 The presented results will provide further information on the Palaeolithic geoarchaeological resource that may be impacted by the proposed development and facilitate an informed decision with regard to the requirement for, and methods of, any further geoarchaeological works; or the formation of a mitigation strategy (to offset the impact of the development on the archaeological resource); or a management strategy.
- 1.3.3 To help frame Palaeolithic geoarchaeological investigations, Wessex Archaeology has developed a four-stage approach, encompassing successive levels of investigation appropriate to the results obtained, accompanied by formal reporting of the results at the level achieved. The stages are summarised below (**Table 2**). This evaluation represents Stage 2 of this process.

Table 2 Staged approach to Palaeolithic geoarchaeological investigations

Stage 1: Geoarchaeological deposit model and Desk-based Assessment (GDBA)	A geoarchaeological deposits model and desk-based assessment (GDBA) examines a range of information (published and unpublished ("grey literature"), geological mapping, Ground Investigation data, historic maps etc.) to inform on the geoarchaeological potential of deposits within a Site The GDBA may include a Geoarchaeological Landscape Characterisation (GLC) which divides the Site into different zones (Geoarchaeological Characterization Zones – GCZs) based on variations in deposits and potential. The GDBA establishes the requirements for and scope of Stage 2 geoarchaeological field investigations. Should Stage 2 work be required, appropriate and proportionate recommendations for each GCZ are provided. The GDBA highlights any areas of a Site where Pleistocene deposits with possible Palaeolithic geoarchaeological potential may occur.
Stage 2: Palaeolithic geoarchaeological evaluation	Field evaluation to establish the Palaeolithic geoarchaeological potential of Pleistocene deposits within a defined Evaluation Area, which informs on the requirements and scope of Stage 3 palaeoenvironmental assessment and/or Stage 4 mitigation. The principal methods of evaluation are through targeted machine-dug test pits and boreholes. An evaluation report is produced, which includes updated deposit modelling and an updated GLC. If required, recommendations for Stage 3 sample assessment and/or Stage 4 mitigation are made.
Stage 3: Sample assessment	Palaeoenvironmental samples and/or sediment samples recovered during Stage 2 are assessed to inform on the geoarchaeological potential of deposits and guide the scope and need for Stage 4 mitigation. Dating of samples taken during Stage 2 may be required to inform on the geoarchaeological potential of deposits and to guide the scope and need for Stage 4 mitigation. If this is the case, dating will be carried out at this stage.



	Alternatively dating samples will be retained for Stage 4 mitigation, if required. Recommendations for dating requirements during Stage 3 are made in the Stage 2 report. A sample assessment report is produced outlining the palaeoenvironmental and dating potential of the deposits including targeted and proportionate recommendations for Stage 4 mitigation.
Stage 4: Palaeolithic geoarchaeological mitigation	Based on the results of the Stage 2 and 3 investigations Palaeolithic geoarchaeological mitigation may be required to offset development impacts. Mitigation may include targeted geoarchaeological sampling for palaeoenvironmental assessment and scientific dating, potentially alongside archaeological excavation. A final mitigation report is provided on completion of mitigation program.
Publication	The scope and location of a publication report will be agreed in consultation with the client and LPA advisor. The publication report may comprise a note in a local journal or a larger publication article or monograph, dependant on the significance of the archaeological work.

2 BACKGROUND

2.1 Introduction

- 2.1.1 This section provides background information relevant to the evaluation, including site location, topography and geology, and information relating to possible Palaeolithic geoarchaeological resource present.
- 2.1.2 Background on the NeuConnect onshore HVDC cable route and HDD works and the Palaeolithic geoarchaeological resource that may be present was provided in a prior WSI (Wessex Archaeology 2023a). Relevant information is summarised below, with additional sources of information referenced, as appropriate.

2.2 Location and topography

- 2.2.1 The evaluation areas are located on the Isle of Grain, at the eastern end of the Hoo Peninsula between the Thames Estuary to the north and the Medway Estuary to the south (**Figure 1**). The evaluation areas are north of the village of Grain and inland of the HVDC cable landfall and Horizontal Direction Drilling (HDD) works area.
- 2.2.2 The evaluation areas comprise two parcels of land (Areas 3 and 5) located between areas subject to prior aggregate extraction, and subsequent landfill (**Figure 1**).

2.3 Chronology

- 2.3.1 Palaeolithic geoarchaeological investigations are typically undertaken with reference to geological periods (e.g., Quaternary), epochs (e.g., Pleistocene) and sub-epochs (e.g., Devensian) that reflect major climate sea-level and/or environmental changes. Here we adopt British nomenclature correlated to the Marine Isotope Stage (MIS) record to distinguish between different climatic periods, with dates given in Kya BP (thousands of years before present).
- 2.3.2 Marine Isotope Stages are deduced from marine palaeoclimatic records and reflect alternating warm (interglacial and interstadial) and cold (glacial and stadial) periods throughout the Quaternary (**Table 3**).



2.3.3 Where age estimates are available these are expressed in millions of years (Mya), thousands of years (Kya) and within the Holocene epoch as either years Before Present (BP), Before Christ (BC) and Anno Domini (AD). These are linked to the global Marine Isotope Stage (MIS) chronological framework.

Table 3 British Quaternary chronostratigraphy

Geological Period	Chronostratigraphy		Age (Kya)	MIS
Holocene	Holocene interglacial		11.7 – present	1
Late Pleistocene	Devensian Glaciation	Loch Lomond Stadial	11.7 – 12.9	2 – 5d
		Windermere Interstadial	12.9 – 15	
		Dimlington Stadial	15 – 26	
		Upton Warren Interstadial	40 – 43	
		Early Devensian	60 – 110	
	Ipswichian interglacial		115 – 130	5e
Middle Pleistocene		Unnamed cold stage	130 – 374	6
		Aveley interglacial		7
		Unnamed cold stage		8
		Purfleet interglacial		9
		Unnamed cold stage		10
	Hoxnian interglacial		374 – 424	11
	Anglian glaciation		424 – 478	12
	Cromerian Complex		478 - 780	13 – 19

2.4 Previous investigations

2.4.1 Previous investigations relevant to the Palaeolithic geoarchaeological evaluation and monitoring of GI are listed in **Table 4** and summarised below.

Table 4 Previous investigations

Report type	Title	Report no	Reference
Geoarchaeological Desk-Based Assessment	NeuConnect Geoarchaeological Desk-Based Assessment	259031.01	Wessex Archaeology 2022a
Palaeolithic evaluation	NeuConnect Converter Station and Substation Isle of Grain, Medway, Kent. Palaeolithic test pitting evaluation.	259032.02	Wessex Archaeology 2022b



Report type	Title	Report no	Reference
Archaeological Evaluation	NeuConnect Isle of Grain, Kent. Archaeological Evaluation	259033.04	Wessex Archaeology 2022c
Archaeological mitigation	NeuConnect Onshore Converter Station Works, Isle of Grain, Medway, Kent. Additional Archaeological Mitigation Works – Stage 1 Interim Statement	259037.03	Wessex Archaeology 2023b
Archaeological mitigation	NeuConnect Onshore Converter Station Works, Isle of Grain, Medway, Kent. Additional Archaeological Mitigation Works – Stage 2 Interim Statement	259037.04	Wessex Archaeology 2023c
Review of Ground Investigation (GI) data	NeuConnect HDD Works. Archaeological Review of Ground Investigation Data	268971.02	Wessex Archaeology 2023d
Archaeological mitigation and post-excavation assessment	NeuConnect Converter Station. Isle of Grain, Kent. Post-excavation Assessment and Updated Project Design Volume 1: Main Report.	259035.01	Wessex Archaeology 2024

NeuConnect Geoarchaeological Desk-Based Assessment (Wessex Archaeology 2022a)

2.4.2 In 2022 Wessex Archaeology produced a Geoarchaeological Desk Based Assessment for the onshore area of the NeuConnect project. Although this included the area of HVDC cable route and HDD works, the study was based around a review of data arising from Ground Investigation (GI) works in the area of the proposed Converter Station and Substation for the NeuConnect project, located at the south-western end of the HVDC cable route.

2.4.3 Pleistocene river terrace deposits of the Thames-Medway were noted in the area of the proposed converter station and substation at elevations between c. 5 m and 8 m OD. These were identified as variously overlain by Head deposits (Pleistocene slope deposits, which could potentially also include Holocene colluvium), made ground or a modern topsoil/ploughsoil. The Pleistocene terrace deposits were identified as having high Palaeolithic geoarchaeological potential. It was noted that Head deposits on the Isle of Grain have been subject to little previous archaeological and geoarchaeological investigation, but that elsewhere such deposits have been shown to contain Palaeolithic artefacts reworked downslope, as well as stable horizons/landsurfaces associated with minimally disturbed archaeology.

NeuConnect Converter Station and Substation Isle of Grain, Medway, Kent Palaeolithic test pitting evaluation (Wessex Archaeology 2022b)

2.4.4 In 2022 Wessex Archaeology carried out a Palaeolithic geoarchaeological evaluation for the NeuConnect Converter Station and Substation. The evaluation comprised 24 machine-dug geoarchaeological test pits.



- 2.4.5 The evaluation recorded sequences of Pleistocene fluvial sands and gravels, overlain by finer-grained Pleistocene fluvial sands. These deposits were post-dated by slope deposits that may be of Pleistocene and/or Holocene date and, on the margins of the evaluation area, minerogenic Holocene alluvium.
- 2.4.6 Two refitting flint flakes were recovered from the top of the Pleistocene sands and gravels and the base of the overlying finer-grained Pleistocene sands. A fluviually reworked probable flake was also recovered from within the sands and gravels. A further two other possible flakes were recovered from the Pleistocene fluvial deposits. Based on the presence of two refitting flakes, the sands were highlighted as having high Palaeolithic geoarchaeological potential.
- 2.4.7 The overlying Head deposits were undated but were considered to potentially include both Pleistocene soliflucted sediments (deposited downslopes through seasonal freeze thaw under periglacial conditions) and Holocene colluvium. Such sediments were noted to have the potential to contain archaeology reworked down-slope and to bury stable horizons and land surfaces preserving in situ archaeology. However, no archaeology was recovered from these sediments during the evaluation, and no evidence for stable horizons or land surfaces was identified.
- 2.4.8 Sandy clays were recorded in selected sequences towards the north-east and east of the evaluation area, interpreted as Holocene estuarine alluvium, likely associated with the floodplain of the Yantlet Creek. No geoarchaeological significant deposits, for example organic sediments or peat, were recorded within the Holocene Alluvium, and they were considered to be of low geoarchaeological potential.

NeuConnect Isle of Grain, Kent. Archaeological Evaluation (Wessex Archaeology 2022c)

- 2.4.9 Alongside the Palaeolithic test pitting evaluation, Wessex Archaeology undertook archaeological trial trenching evaluation for the NeuConnect Converter Station and Substation.
- 2.4.10 Archaeological features were recorded in 43 of the 61 excavated trenches, with a distinct concentration within the central and southern part of the evaluation area. The features comprised linear ditches, along with several quarry pits, pits, post holes and two possible cremations. The results suggested settlement or mortuary activity, including industrial processes within the site, rather than agricultural activity. The datable artefactual evidence dated predominantly to the later prehistoric and Romano-British period, with almost two thirds of the pottery assemblage dating to the Late Iron Age/Romano-British.

Archaeological mitigation (Wessex Archaeology 2023b, 2023c, 2024)

- 2.4.11 Following the results of evaluation (Wessex Archaeology 2023c, 2022d), between November 2022 and June 2023 Wessex Archaeology carried out an archaeological mitigation for the NeuConnect Converter Station and Substation. The mitigation comprised two elements, the excavation of trenches to further investigate deposits identified with Palaeolithic geoarchaeological potential and the strip, map and sample excavation of two areas: Area 1 (centred on NGR 587630 176336) covered 1.75 ha and Area 2 (centred on NGR 587721 176256) was 200 m². The investigations identified geoarchaeologically significant Holocene deposits including organic sediments associated with landscape features in Area 1. These were investigated by a targeted Electrical Resistance Tomography (ERT) survey, geoarchaeological borehole survey and the excavation of geoarchaeological trenches/test pits, as well as scientific dating and deposit modelling.



- 2.4.12 Palaeolithic geoarchaeological mitigation targeted Pleistocene fluvial sands identified by the evaluation as having high Palaeolithic geoarchaeological potential. Palaeolithic geoarchaeological mitigation works included open area excavation (Area 200) targeted on the location where two refitting flint flakes were recovered during evaluation (see above). This was supported by stepped geoarchaeological trenches (T300–T306).
- 2.4.13 The mitigation did not identify further Palaeolithic archaeology. Samples for palaeoenvironmental assessment and dating work were obtained. Optically Stimulated Luminescence dates for the fluvial sands ranged within MIS 9–7 (337–191 Kya), suggesting that the two refitting flakes from these deposits identified during the evaluation date to early Middle Palaeolithic. Associated palaeoenvironmental assessment works did to identify significant remains and suggested that potential for palaeoenvironmental preservation in these deposits is low.
- 2.4.14 The excavated strip map and sample areas contained a relatively dense concentration of archaeological features dating from the early prehistoric through to the post-medieval and modern periods. Although evidence of earlier activity was limited, a residual flint assemblage included a Levallois flake of Middle Palaeolithic date and other items characteristic of general Neolithic–Bronze Age lithic production. In addition, worked flints were found alongside a notable quantity of Early Neolithic pottery in a small bowl-shaped pit. There were also a few small Late Neolithic/Early Bronze Age Beaker sherds, and a considerable amount of residual Middle/Late Bronze Age and Late Bronze Age/Early Iron Age pottery; these hint at there once being multiple features or deposits of this date that had been heavily disturbed by later settlement.
- 2.4.15 The archaeological evidence suggested a broadly contiguous phase of occupation originating in the late prehistoric period (probably the latter half of the Iron Age), but with most activity relating to the Late Iron Age–early Romano-British transition (1st century BC to 1st century AD). This included the remains of at least 13 penannular ring ditches/gullies – often repeatedly redefined, and probably representing drainage surrounding roundhouses, or working and storage areas – as well as numerous ancillary ditches and several small pits. These were interspersed with a multi-phase system of curvilinear and rectilinear enclosure and boundary ditches, focused in two distinct areas, and a group of substantial pits, ponds or waterholes, several of which contained waterlogged deposits that produced a significant range of palaeoenvironmental evidence (including rarely encountered specimens). Some also included substantial finds assemblages, and where diagnostic material was identified there was an emphasis on local pottery supply, primarily from the immediate area of North Kent.
- 2.4.16 Subsequent, less intensive land-use likely represents a continuation of settlement, albeit on a reduced scale, throughout the early–mid-Romano-British period (probably into the first decades of the 2nd century AD). There was no evidence for any continuity of land-use into the later Romano-British or the immediate post-Roman period; finds were sparse, though occasional medieval and post-medieval artefacts were retrieved. Later activity mainly comprised post-medieval and modern field boundary ditches, alongside extensive truncation from modern agricultural drainage.
- 2.4.17 Geoarchaeologically significant Holocene deposits identified in Area 1 of the exactions were initially investigated through ERT survey and geoarchaeological boreholes to establish their extent and nature of the landscape features they were within. These surveys indicated that the organic deposits comprised localised organic silty clays associated with the more widely distributed minerogenic silty clays and sandy clays, which may have been sealed by later, deliberated redeposited sediments.

- 2.4.18 Informed by the ERT and borehole surveys, a single trench (T401), and two test pits (T402 and T403) were dug in order to establish the deposition context, record and further sample the organic deposits. This work established that the organic sediments accumulated as the basal fill of a large archaeological feature, which was situated within a wet, low-lying area of the site. The organic clays were subsequently capped by gravelly sandy clays, which may have been deliberately redeposited to stabilise wet, low-lying areas.
- 2.4.19 Plant macro remains were dated through radiocarbon dating to the end of the Iron Age and transition to Roman rule, establishing that they are contemporary with main phase of archaeological activity identified in Area 1. Palaeoenvironmental assessment of samples taken during the fieldwork has established that they significant potential for analysis to provide information on landscape, environments and human activity. These samples are subject to an on ongoing program of palaeoenvironmental analysis.

NeuConnect HDD Works. Archaeological Review of Ground Investigation Data (Wessex Archaeology 2023d)

- 2.4.20 In 2023 Wessex Archaeology was commissioned by Natural Power, on behalf of NeuConnect Britain Ltd, to undertake a review of data from an earlier phase of Ground Investigation (GI) carried out in the NeuConnect HDD works area.
- 2.4.21 A total of two borehole (BH-01 and BH-02), located at the High Mean Water Springs at the south-west end of the HDD Works area, and six Cone Penetration Tests (CPTu-01, 01A, 02, 02A, 03 and 03A), all located within the intertidal zone at the north-east, were reviewed (**Figure 1**).
- 2.4.22 The review identified sequences of sands, sandy silts and silty sands overlain by significant depths of Made Ground. The sands, sandy silts and silty sands are likely to mostly be bedrock sediments (London Clay Formation and Harwich Group), but possible Pleistocene and/or Holocene slope deposits and recent Beach and Tidal Flat deposits were identified, both of which have limited geoarchaeological potential.

2.5 Palaeolithic geoarchaeological background

- 2.5.1 The Palaeolithic geoarchaeological background to the evaluation and monitoring has been reviewed in a WSI (Wessex Archaeology 2023a). The results of this review are provided below, with additional sources of information referenced as appropriate.
- 2.5.2 London Clay Formation bedrock is mapped by the British Geological Survey (BGS) across the onshore HVDC cable route and the HDD works area (**Figure 2**). This bedrock was formed in shallow marine environments during the Palaeogene period (47.8–56.0 Mya).
- 2.5.3 Across Areas 2–6 and the south of the onshore HVDC cable route, BGS mapping records Pleistocene sand and gravel of the ‘2nd Terrace’ overlying London Clay Formation bedrock (**Figure 3**). In in north and within the onshore HDD works area Pleistocene Head and Holocene Beach and Tidal Flat deposits are mapped (**Figure 3**).
- 2.5.4 The Pleistocene terrace deposits have been highlighted as having Palaeolithic geoarchaeological potential. Desktop assessment (NeuConnect 2023) has established that these terrace deposits will have been severely impacted on by previous aggregate in most areas of the onshore HVDC cable route, but that these could be preserved in two locations, Areas 3 and 5 (see **Table 1** and **Figure 1**).
- 2.5.5 The ‘2nd Terrace’ deposits mapped by the BGS belong to deposits located at the confluence between the Rivers Thames and Medway. Bridgland (2003) and the BGS identify at

least eight distinct terrace aggradations of the Thames-Medway on the Isle of Grain and Hoo Peninsula that date to the Middle to Late Pleistocene. Bridgland (2003) refers to the '2nd Terrace' deposits underlying the onshore HVDC cable route as the Grain Gravel. The Grain Gravel is considered to represent a downstream continuation of the Corbets Tey Gravel of the River Thames and the Stoke Gravel of the River Medway, which suggests a date within MIS 10-9-8 (c. 350–260 kya).

- 2.5.6 Wenban-Smith et al. (2007) reviewed the Pleistocene terrace stratigraphy of the Hoo Peninsula, including these deposits on the Isle of Grain, as part of the Medway Valley Palaeolithic Project (MMVPP). This review highlighted that at Clubb's Pit, Isle of Grain, Optically Stimulated Luminescence (OSL) dates indicate a later date for the deposition of the Grain Gravel, within MIS 6, suggesting that they post-date these terrace deposits (196±14 kya and 147.52±14 kya; Wenban-Smith et al. 2007).
- 2.5.7 Based on the results of the previous investigations, three cross correlating stratigraphic sequences for the Thames-Medway river terraces have been proposed, which include the deposits along the onshore HVDC cable route ('2nd Terrace' / Grain Gravel). These are summarised in **Table 5**.

Table 5 Chronology of the Thames-Medway Pleistocene river terrace sequence (adapted from Bridgland 2003 and Wenban-Smith et al 2007)

Lower Thames	Maidstone Medway (BGS)	Maidstone Medway (MVPP)	Hoo Peninsula (MVPP)	Hoo Peninsula (Bridgland 2003)	Marine Isotope Stage (MIS)
Shepperton/East Tilbury Marshes		A	Z		2-4
			Y		
East Tilbury Marshes	Terrace 1	B	X		?5a-d
		C	W		
Mucking	Terrace 2	D	V	Binney	6-8
Corbets Tey			U	Stoke (Grain Gravel)	MIS7?

- 2.5.8 Deposits mapped by the BGS as '2nd Terrace' to the south-west of those recorded in the HVDC cable route have recently been dated as part of geoarchaeological works carried out for the NeuConnect Converter Station and Substation (Wessex Archaeology 2022c; see **Section 2.4**). Fluvial sands in the top of these terrace deposits have been dated to MIS 9–7 (337–191 Kya). This suggests that the '2nd Terrace' / Grain Gravel identified along the onshore HVDC cable route date to the late Lower/early Middle Palaeolithic period.
- 2.5.9 Archaeological works carried out in advance of the NeuConnect Converter Station and Substation (Wessex Archaeology 2024) recovered flint artefacts, including two relatively fresh, though slightly patinated re-fitting flakes from the '2nd Terrace' / Grain Gravel deposits. A diagnostic Middle Palaeolithic Levallois flake was also excavated as a residual find within an archaeological feature.



2.6 Summary of Palaeolithic geoarchaeological potential

- 2.6.1 Desk-based assessment has suggested that Pleistocene river terrace deposits with Palaeolithic geoarchaeological potential could be present along onshore HVDC cable route. Consideration of previous impacts (NeuConnect 2023) has established that such deposits are only likely to be preserved in two locations (Areas 3 and 5).
- 2.6.2 Data indicates that the Pleistocene terrace deposits belong to the '2nd Terrace' / Grain Gravel of Thames-Medway and that they likely correlate with sediments that at the NeuConnect Converter Station and Substation site have been dated to MIS 9–7 (337–191 Kya) (Wessex Archaeology 2024). These deposits have been demonstrated to locally contain late Lower/early Middle Palaeolithic archaeology.

3 AIMS AND OBJECTIVES

3.1 Introduction

- 3.1.1 The aims and objectives of the evaluation are in accordance with those outlined within the WSI (Wessex Archaeology 2023a).

3.2 Aims

- 3.2.1 The overarching aims (or purpose) of the evaluation, in compliance with the ClfA' Standard and guidance for archaeological field evaluation (ClfA 2020a) and Kent County Council's *Manual of Specification Part B: Specification for Preliminary Evaluating of Quaternary Deposits and Palaeolithic Potential*, are:
- provide information about the Palaeolithic geoarchaeological potential of geological deposits in evaluation Areas 3 and 5;
 - consider the possible significance of any Palaeolithic geoarchaeological evidence present, or potentially present, in the context of national and regional research priorities and agendas (e.g. English Heritage 2008, SERF 2019); and
 - inform either the scope and nature of any further geoarchaeological work that may be required to fulfil Condition 22 (ii) of planning application MC/21/3496.

3.3 Objectives

- 3.3.1 In order to achieve the above aims, the objectives of the evaluation were to:
- establish the broad presence/absence, nature and distribution of Pleistocene deposits within the evaluation Areas 3 and 5;
 - establish the potential of Pleistocene deposits to preserve Palaeolithic archaeology;
 - establish the potential of Pleistocene deposits to preserve paleoenvironmental evidence;
 - establish the potential of the Pleistocene deposits for scientific dating;
 - provide a deposit model for the onshore HVDC cable route and the HDD works area;
 - place the results of the evaluation within a wider geoarchaeological context, including consideration of the possible significance of the geoarchaeological resource in relation to national and regional research priorities and agendas; and
 - make recommendations for further work, where appropriate.



4 FIELDWORK METHODS

4.1 Introduction

- 4.1.1 All works will be undertaken in accordance with the detailed methods set out within the WSI.
- 4.1.2 The evaluation comprised the excavation, investigation and recording of six machine dug test pits and monitoring of three (BH101, BH102 and BH103) cable percussion boreholes in Area 3 and 5 of the NeuConnect onshore HVDC cable route.

4.2 Setting out of interventions

- 4.2.1 All interventions were set out by the principal using GNSS in the positions shown in **Figure 1**. Locations were tied into the Ordnance Survey (OS) National Grid and Ordnance Datum (OD) (Newlyn), as defined by OSGM15 and OSTN15.

4.3 Service location and other constraints

- 4.3.1 Identification of services and other constraints was the responsibility of the principal contractor.

4.4 Test Pits

Excavation methods

- 4.4.1 The test pits were excavated using a 13 tonne 360° mechanical excavator with a toothless bucket. Machine excavation was carried out by the principal contractor under the supervision of a geoarchaeological specialist experienced in interpreting Pleistocene sediments and identifying Palaeolithic lithic artefacts, who recorded and number the sequence of sedimentary units as excavation progressed following standard descriptive practices. The textural characteristics (grain-size, consolidation, colour, material and sedimentary structures) of sedimentary units were recorded, and the shape and nature of their lithostratigraphic contacts (dip, conformity and overall geometry).
- 4.4.2 Machine excavation proceeded in level spits of approximately 50-100 mm, respecting the interface between sedimentary units, until either the solid geology was exposed, or further excavation became impractical.
- 4.4.3 Test pits could not be entered due to the principal contractor's health and safety requirements. Recording took place without entering the test pit.
- 4.4.4 Sediment samples of at least 100 litres were taken at regular intervals in stratigraphic succession through the Pleistocene stratigraphy in each test pit and sieved on-site through a 10 mm mesh to investigate whether artefacts and/or macro vertebrate faunal remains were present. When sediments encountered were not suitable for dry-sieving (i.e. too clayey), excavation proceeded in shallower spits of c. 50 mm, looking carefully for the presence of any archaeological or geoarchaeological evidence, and the spit samples carefully investigated by hand (using archaeological trowels) for any geoarchaeological evidence.
- 4.4.5 The potential for deposits to preserve paleoenvironmental evidence and requirements for sampling of sediments were assessed for each Pleistocene sediment unit by the monitoring geoarchaeological specialist. No deposits suitable for palaeoenvironmental and/or sedimentological sampling were encountered.



4.4.6 The suitability of deposits for luminescence dating was considered. No deposits suitable for luminescence dating were identified.

4.4.7 Where modern features were seen to truncate the geoarchaeological sequence, these were removed in a manner that did not damage the surrounding deposits.

Recording

4.4.8 The test pits were recorded in the form of a measured sketch sections of at least one face and accompanying geoarchaeological descriptions and interpretations.

4.4.9 Descriptions included information such as:

- *Depth*
- *Texture*
- *Composition*
- *Colour*
- *Inclusions*
- *Structure*
- *Shape and nature of contacts between deposits*

4.4.10 Interpretations included, where possible, probable depositional environments and formation processes.

4.4.11 All samples were individually numbered. The location, size, stratigraphic context, purpose and whether retained or processed on-site were recorded.

4.4.12 A full photographic record was made using digital cameras equipped with an image sensor of not less than 10 megapixels. This recorded both the detail and the general context of the principal lithostratigraphic features of the sediments, and the evaluation areas as a whole. Digital images are subject to managed quality control and curation processes which will embed appropriate metadata within the image and ensure long term accessibility of the image set. Photographs were taken of all areas, including access routes, to provide a record of conditions prior to and on completion of the evaluation.

Reinstatement

4.4.13 Test pits were immediately backfilled on completion using excavated materials in the order in which they were excavated. No further reinstatement was carried out.

4.5 Boreholes

Drilling methods

4.5.1 An experienced member of the Wessex Archaeology geoarchaeology team monitored the excavation of geotechnical boreholes during the GI works. A total of 3 no. boreholes (CG_BH01–CG_BH03) located in the locations shown in **Figure 1** were monitored.

4.5.2 The geotechnical boreholes were undertaken using cable percussion drilling rig operated by experienced geotechnical drillers from ISJ Drilling Services Ltd. Hand-dug starter pits were excavated to a depth of 1.2m bgl prior to drilling. The three monitored boreholes were drilled to a depth of 10.45 m bgl. The GI contractor provided a suitable and safe position for the monitoring geoarchaeologist.



- 4.5.3 The supervising geoarchaeologist recorded, described and interpreted the sequences of deposits encountered and assessed their likely geoarchaeological potential.

Recording

- 4.5.4 The monitored GI interventions were recorded using Wessex Archaeology's pro-forma digital recording system. For each lithostratigraphic unit descriptions and interpretations of the deposits were provided. Descriptions of deposits included information such as:

- *Depth*
- *Texture*
- *Composition*
- *Colour*
- *Inclusions*
- *Structure*
- *Shape and nature of contacts between deposits*

- 4.5.5 Interpretations included, where possible, probable depositional environments and formation processes.

- 4.5.6 A full photographic record was made using digital cameras equipped with an image sensor of not less than 10 megapixels.

- 4.5.7 Digital images are subject to managed quality control and curation processes which embed appropriate metadata within the image and ensure long term accessibility of the image set.

4.6 Survey

- 4.6.1 The real time kinematic (RTK) survey of all as dug intervention of all tests pits was carried out using a Leica GNSS connected to Leica's SmartNet service. The as-dug location data for all boreholes was provided by the GI contractor. All survey data was recorded in OS National Grid coordinates and heights above OD (Newlyn), as defined by OSGM15 and OSTN15, with a three-dimensional accuracy of at least 50 mm.

5 POST-EXCAVATION METHODS

5.1 Stratigraphic evidence

- 5.1.1 All written and drawn records from the evaluation have been collated, checked for consistency. Where possible, probable depositional environments, formation processes and chronostratigraphic context have been considered.

- 5.1.2 A written description was made of all geoarchaeological deposits, ordered by intervention and lithostratigraphy. Details of all lithostratigraphic contexts are provided in tables in **Appendices 1 and 2**.

5.2 Review of GI logs

- 5.2.1 The results of the evaluation were supplemented by a review of the logs from CG_BH04, CG_BH05 and CG_BH06. The data were provided by the client and the GI contractors logs are presented in **Appendix 3**.



- 5.2.2 The log review was undertaken by a suitably qualified geoarchaeologist, with an assessment of the quality of the sediment descriptions and a geoarchaeological interpretation of the deposits cross-referencing the GI locations with nearby monitored interventions, existing BGS mapping and their topographic context.

5.3 Deposit modelling

- 5.3.1 The data has been utilised to provide a deposit model. The deposit modelling has been carried out in accordance with *Deposit modeling and archaeology: guidance for mapping buried deposits* (Historic England 2020) and Kent County Council's *Manual of Specifications Part B Specification KCC generic specification requirements for desk-based assessment of geoarchaeological potential (including baseline deposit modelling)*.
- 5.3.2 Data used in deposits modelled comprised all records from the evaluation, geoarchaeological modelling and log reviewed, augmented with data obtained geotechnical borehole and six CPT carried at the north-western end of the HVDC cable route and Horizontal Direction Drilling (HDD), which was subject to previous geoarchaeological review (Wessex Archaeology 2023c). In total 20 deposit records were used in the deposit modelling and presented in **Appendix 4**.
- 5.3.3 All available data points were entered into industry standard geological utilities software (Rockworks™ 23). Each stratigraphic unit was given a colour and pattern allowing cross correlation and grouping of the different sedimentary units. The grouping of these deposits is based on lithological descriptions, which define distinct depositional environments referred to as 'stratigraphic units' (e.g., Bedrock, Fluvial Gravel and Made Ground)
- 5.3.4 A two-dimensional stratigraphic profile ('transect') including all interventions was generated using RockWorks 23™. This transect show the main stratigraphic units and their lateral and vertical variability across the Site (**Figure 4**).

5.4 Finds evidence

- 5.4.1 All retained finds were washed, weighed, counted and identified. They were recorded to a level appropriate to the aims and objectives of the evaluation.
- 5.4.2 Finds have been suitably bagged and boxed in accordance with the guidance given by the relevant museum and generally in accordance with the standards of the ClfA (2020b).

5.5 Palaeoenvironmental, sedimentological and scientific dating samples

- 5.5.1 No palaeoenvironmental, sedimentological and scientific dating samples were taken during monitoring.

6 RESULTS

6.1 Introduction

- 6.1.1 This section outlines the results of the geoarchaeological evaluation and monitoring. It includes summaries of the deposits identified, integrated within deposit model for the onshore HVDC cable route and HDD works area, and an assessment of any archaeological finds recovered.



6.2 Deposits

6.2.1 The lithostratigraphy of deposits identified during the evaluation and monitoring is listed and summarized below. The specific lithologies and lithostratigraphic succession encountered in each intervention are outlined in **Appendices 1 and 2**.

6.2.2 The generalised lithostratigraphic sequence encountered within the Site comprised:

- Topsoil (Recent)
- Made Ground (Recent)
- Beach and Tidal Flat Deposits (Holocene)
- Sand and Gravels (?Pleistocene)
- Bedrock (Palaeogene)

6.2.3 Deposit modelling has been carried out, which allows the vertical and horizontal distribution of these lithostratigraphic units to be considered. The deposit records used in the modelling are listed in **Appendix 4** and their locations illustrated in **Figure 1**.

6.2.4 The output of the deposit modelling comprised of a single transects oriented south-west to north-east and is shown in **Figure 4**.

6.2.5 The deposits, their lithostratigraphic relationship and their distribution are described below.

Bedrock

6.2.6 Bedrock was recorded in the following interventions located along the onshore HVDC cable route: CG_BH01 to CG_BH02 and WA_TP1 to WA_TP6 (**Figure 4**). The unit consisted of stiff, homogenous and stoneless, dark grey to grey clay graded into brown (oxidised) firm to stiff clay. The brown clays which occur at the top of these deposits were weathered (**Figures 5–7**). Bedrock surfaces were recorded between 9.50 m OD (3.00 m bgl) in CG_BH04 and 7.64 m OD (1.25 m bgl) in CG_BH02.

6.2.7 Bedrock London Clay has also been identified in GI records from the onshore HDD works area (GEM_BH01 and GEM_BH02) from c. 0.0 m OD (7.5 m bgl) (**Figure 4**), where they were overlain by yellowish red, soft to firm silty clay with rare fine – sized and angular flint gravel (Silty Clays). The presence of angular flint clasts within these deposits suggest that they may be London Clay bedrock that has been reworked downslopes during the Pleistocene and/or Holocene.

6.2.8 In the coastal zone of the HDD works area Cone Penetration Tests (CPTs) GEM_CPTu-2, GEM_CPTu-2A, GEM_CPTu-3 and GEM_CPTu-1 (**Figure 1**) identified 9.50m of sediments with properties indicative of being silts and clays, overlain by sediments likely to be sands and gravelly sands. Their properties and their stratigraphic relationships to sediments in other deposit records (**Figure 4**) suggest that these are likely to principally be London Clay Formation bedrock (silty clays), overlying Harwich formation bedrock (sands and gravelly sands).

Sand and Gravels

6.2.9 Sands and Gravels were locally recorded overlying Bedrock and beneath Made Ground in interventions in Areas 3 and 5 of the onshore HVDC cable route (CG_BH01–CG_BH03,

CG_BH06 and WA_TP1, WA_TP4 and WA_TP06). The Sands and Gravels in different interventions were lithologically variable, but generally comprised loose to moderately cohesive, often yellowish brown to reddish brown matrix supported gravel (**Figures 5–7**). Gravel units were poorly sorted, and included sub-angular to rounded to, fine to coarse-sized flint clasts with relatively high percentage of well-rounded pebbles, likely reworked from Palaeogene marine deposits. The groundmass varied from sand to clayey sands.

- 6.2.10 The unit was encountered at between c. 9.5 m OD (2.0 m bgl) in CG_BH06 to 6.2 m OD (1.28 m bgl) in CG_BH02 with basal elevation ranging from 5.80 m OD (4.60 m bgl) in CG_BH06 to 7.83 m OD (0.62 m bgl) in WA_TP4. The thickness varied from c. 0.2 m in WA_TP1 to 1.0 m in CG_BH01 (**Figure 4**).
- 6.2.11 Test pits containing these deposits could not be entered during the evaluation in order to clean sections and there is no clear evidence to confirm how these sands and gravels were deposited (e.g. fluvial bedding structures). Their lithology indicates that these are at least derived from Pleistocene fluvial deposits, and they could represent the locally preserved basal remnants of Pleistocene fluvial sands and gravels, which have been truncated by previous aggregate extraction. However, being so lithologically variable and at the base of Made Ground, raises the possibility that these are recently redeposited sediments.
- 6.2.12 Geoarchaeological review of a log from a borehole located immediately to the south of Area 6 of the HVDC cable route (CG_BH06) identified c. 2.70 m of Sand and Gravels beneath 4.70 m of Made Ground. Within these Sands and Gravels stratigraphy was recorded, with gravelly clays at the base, overlain by coarse gravel embedded in sandy matrix and sandy clayey gravels. The stratification is suggestive of bedded fluvial deposits but, whilst the gravel component is described as dominated by sub-angular to sub-rounded, fine to coarse-sized flint clasts, limestone clasts were also recorded. Limestone would not occur in-situ fluvial sediments in this area and, if correctly identified, would demonstrate that these are recently redeposited sediments.

Beach and Tidal Flat Deposits

- 6.2.13 Two GI boreholes in the HDD works area (GEM_BH01 and GEM_BH02) recorded 1.50m of gravelly silty clay and sandy gravels containing rounded flint clasts, located beneath 3.50m of Made Ground. These are likely to recent Beach and Tidal Flat Deposits.

Made Ground

- 6.2.14 Made Ground was present in interventions located across of the onshore HVDC cable route and HDD works area. It was lithologically variable, but generally consisted of compact to firm, yellowish to greyish brown slightly clayey silty sands with common to frequent poorly sorted, rounded to angular, fine to coarse-sized flint pebbles mixed with occasional fragments of tarmac, shingle, and red bricks.
- 6.2.15 The thickness of the deposit varied from c. 4.30 m in Area 6 of the HVDC cable route (CG_BH04) to 0.50 m in WA_TP3 located in Area 2. In Area 1 of the HDVC cable route and in the HDD works area (e.g. GEM_BH-01 and GEM_BH-02) the Made Ground was c. 3.00 m thick (**Figure 4**).
- 6.2.16 Monitoring of borehole CG_BH01 identified 0.32m of loose, dark brown to brown, slightly silty sandy gravel beneath 0.67 m of Made Ground and overlying Sands and Gravels. This did not contain any obvious recent material, but the matrix was indicative of this being Made Ground.



Topsoil

- 6.2.17 Topsoil was recorded in CG_BH04 to CG_BH06. It ranged from c. 0.15 m to 0.25 m in thickness and comprised loose gravelly silty sand and reddish yellow slightly gravelly silty sand with common rooting.

6.3 Finds Assessment

- 6.3.1 A small quantity of finds, weighing 91 g, was recovered from three deposits encountered within two geoarchaeological test pits (WA_TP1 and WA_TP2). The assemblage ranges in date from prehistoric to modern and varies in condition from slightly worn to heavily abraded. The finds comprise worked flint and ceramics and have been cleaned, marked and quantified by material type (**Table 6**). All artefacts were from Made Ground.

Table 6 Summary of finds by material type (number and weight in grammes)

Test Pit	Context No.	Interpretation	Ceramic Building Material		Pottery		Worked Flint	
			No.	Wgt.	No.	Wgt.	No.	Wgt.
WA_TP1	102	Made ground					1	45
WA_TP2	202	Made ground	2	44	1	2		
Total by Material			2	44	1	2	1	45

Ceramic Building Material

- 6.3.2 The ceramic building material comprises two fragments of flat roof tile from the made ground in WA_TP2. Both occur in an oxidised sandy fabric but are largely undiagnostic dating from the medieval period onwards.

Pottery

- 6.3.3 One very small fragment of flowerpot was collected from the Made Ground in WA_TP2. The piece is heavily abraded, and most likely modern in date.

Worked Flint

- 6.3.4 A single piece of worked flint in relatively fresh condition was recovered from Made Ground in WA_TP1. This is a thick, secondary flake which has been detached with a hard (stone) hammer from an unprepared, cortical platform, all features most typical of material produced in the flake-based technology of the Bronze Age. Any attribution of a date must remain tentative when assessing a single object, but material of this period was also recovered during the archaeological evaluation carried out in advance of the planned converter station immediately to the southwest of WA_TP1 (Wessex Archaeology 2022d). The raw material is of reasonably good quality and has been sourced from the fluvial gravels or head deposits forming the superficial geology on the site.

Recommendations for Analysis

- 6.3.5 While the ceramic building material is medieval or later, its occurrence in secondary context alongside a piece of modern flowerpot makes a more recent date more probable. With this in mind, most of the artefacts can be said to be post-medieval or later and are therefore of highly limited significance, warranting no additional analysis. The single flint object should be considered in the light of the Bronze Age activity recorded on the adjacent excavation (referred to above) but is of little significance in and of itself and warrants no further work.



6.4 Palaeoenvironmental, sedimentological and scientific dating samples

- 6.4.1 No deposits suitable for or warranting palaeoenvironmental assessment, sedimentological analysis or scientific dating were identified during the evaluation or GI monitoring.

7 DISCUSSION

7.1 Introduction

- 7.1.0 The following discussion considers the depositional and stratigraphic context of the geological deposits identified during the evaluation and monitoring, their age and their geoarchaeological potential. The latter includes assessment of their potential for both archaeology and palaeoenvironmental and dating evidence reflective of landscapes and environments.

7.2 Sedimentary sequences and depositional environments

- 7.2.1 Bedrock clays of the London Clay Formation have been identified across the onshore HVDC cable route and HDD works area. In geoarchaeological and GI interventions an erosive and sub-horizontal contact separated this bedrock from overlying Made Ground or from 0.2 m to 1.0 m of Sands and Gravels, which were themselves truncated and overlain by Made Ground.
- 7.2.2 The Sands and Gravels were locally present in interventions in Areas 1, 3 and 5 of the onshore HVDC cable route. The lithology of the deposits was characteristic of Pleistocene fluvial sediments. They may be the basal, remnants of Pleistocene river terrace deposits, truncated during previous aggregate extraction. However, no clear evidence was observed which firmly established that these were in situ sediments (e.g. fluvial bedding structures), and it is possible that these have been recently redeposited.
- 7.2.3 The base of the Sands and Gravels (c. 5.8 and 7.5 m OD) occur at similar elevations to Pleistocene fluvial deposits of Pleistocene terrace deposits of the Thames-Medway investigated to the south-west at NeuConnect Converter Station and Substation site (c. 3.5 and 7.5 m OD) (Wessex Archaeology 2024). If the Sands and Gravels in areas of the onshore HVDC cable route are in-situ Pleistocene fluvial terrace deposits, they are likely to be part of the same Thames-Medway terrace. Fluvial sands within the top of these sediments at the NeuConnect Converter Station and Substation site have been dated to MIS 9–7 (337–191 Kya), and have been demonstrated to locally contain late Lower/early Middle Palaeolithic archaeology (Wessex Archaeology 2024).

7.3 Assessment of Palaeolithic geoarchaeological potential

- 7.3.1 The evaluation and monitoring demonstrated that Pleistocene deposits are largely absent across the onshore HVDC cable route and HDD works area, and that the Pleistocene river terrace deposits mapped in these areas by the BGS (**Figure 3**) have been largely, if not entirely, removed by previous gravel extraction.
- 7.3.2 Sands and Gravels were locally identified which may be recently redeposited or be the truncated basal remnants of Pleistocene river terrace deposits of the Thames Medway. If *in situ* Pleistocene sediments, they are likely to be equivalent to deposits located to the south-west at the NeuConnectUK Converter Station and Substation site. At the Converter Station and Substation, geoarchaeological works have demonstrated that these sediments have potential to contain late Lower/Early Middle Palaeolithic archaeology (Wessex Archaeology 2024).



- 7.3.3 The Sands and Gravels located in Areas 3 and 5 of the onshore HVDC cable route and HDD works were assessed for Palaeolithic archaeology. No archaeology was recovered. The Sands and Gravels were also assessed to have low potential to contain palaeoenvironmental evidence.
- 7.3.4 Given the localised and heavily truncated nature of the Sands and Gravels, uncertainty as to whether these are *in situ* or redeposited material and lack of any archaeology identified within these sediments during evaluation, the potential for these deposits to contain significant Palaeolithic archaeology is considered to be low.
- 7.3.5 The results of the evaluation and GI monitoring indicate that potential is low for works associated with the NeuConnect onshore HVDC cable route and HDD works to impact on Pleistocene deposits containing a significant Palaeolithic geoarchaeological resource.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

- 8.1.0 Geoarchaeological evaluation through a program of test pitting and monitoring of Ground Investigation (GI) boreholes has been carried across the NeuConnect onshore HVDC cable route and HDD works area. The evaluation was carried out in accordance with a requirement for archaeological evaluation outlined in Condition 22 (i) of approved planning application MC/21/2483. The purpose of the evaluation was to establish requirements for further archaeological works needed to comply with Condition 22 (ii) of the approved planning application, which outlines a requirement to mitigate against impacts of the development on any significant archaeological remains, or to provide a management plan to prevent impacts.
- 8.1.1 In consultation with the County Archaeologist for Kent County Council (KCC), archaeological advisor to the Local Planning Authority (LPA), it was established that the principal archaeological risk of the development was impacting on Pleistocene geological deposits containing significant geoarchaeological remains dating to the Palaeolithic period. Desk-top assessment (NeuConnect 2023) established that Pleistocene geological deposits were only likely to occur in two areas of the onshore NeuConnect HVDC cable route and HDD works (Areas 3 and 5) having likely been impacted on at other locations by aggregate extraction and landfill.
- 8.1.1 The evaluation and monitoring established that Pleistocene geological deposits are absent from large areas of the onshore HVDC cable route and HDD works area, with Made Ground overlying London Clay Formation Bedrock in most locations. The geoarchaeological works established that that locally Sands and Gravels are present that overlay Bedrock and were beneath Made ground. Between c. 0.2 and 1.0 thick sequences of these Sands and Gravels were recorded. The lithology of the Sands and Gravels are consistent with being fluvial Pleistocene river terrace deposits, but no clear evidence was observed that firmly established that these were *in situ* (e.g. fluvial bedding structures), and they may be recently redeposited.
- 8.1.2 If the sands and gravel are *in situ* Pleistocene deposits, they represent the basal remains of Pleistocene fluvial sequences, the upper units having been truncated and likely removed by previous aggregate extraction. If *in situ*, the basal heights of the sands and gravels indicate that they are likely to be broadly equivalent with terrace deposits of the Thames-Medway investigated to the south-west of the HVDC cable route and onshore HDD works area at the NeuConnect Converter Station and Substation site (Wessex Archaeology 2024). The upper units of the deposits at the NeuConnect Converter Station and Substation site



have been dated to MIS 9–7 (337–191 Kya) and locally contained late Lower/early Middle Palaeolithic archaeology (Wessex Archaeology 2024).

- 8.1.3 During the evaluation the Sands and Gravels were accessed for the presence of Palaeolithic archaeology. No archaeology was identified. The potential of the sands and gravels to preserve significant palaeoenvironmental remains reflective of Palaeolithic landscapes and environments was assessed to be low.
- 8.1.4 Based on the localised and heavily truncated nature of these sands and gravels, uncertainty as to whether these are *in situ* or redeposited material and lack of any archaeology identified within these sediments during evaluation, their Palaeolithic geoarchaeological potential has been assessed to be low.

8.2 Recommendations

- 8.2.1 In fulfilment of Condition 22 (i) of approved planning application MC/21/2483, the geoarchaeological evaluation and monitoring of GI has successfully characterised the geological deposits present across the NeuConnect onshore HVDC cable route and HDD works area and assessed their geoarchaeological potential.
- 8.2.2 The results established that deposits containing a significant geoarchaeological resource are unlikely to be present and it is recommended that no further archaeological work is required to mitigate against or prevent development impacts, in order to fulfil Condition 22 (ii) of the planning application.

9 ARCHIVE STORAGE AND CURATION

9.1 Museum

- 9.1.1 The archive resulting from the evaluation is currently held in the offices of Wessex Archaeology in Salisbury. The site falls within the collecting area of Guildhall Museum, Medway. The museum is not currently accepting archaeological archives. Every effort will be made to identify a suitable repository for the archive resulting from the fieldwork, and if this is not possible, Wessex Archaeology will initiate discussions with the local planning authority in an attempt to resolve the issue. If no suitable repository is identified, Wessex Archaeology will continue to store the archive but may institute a charge to the client for ongoing storage beyond a set period.

9.2 Preparation of archive

Physical archive

- 9.2.1 The archive, which includes paper records, graphics, and artefacts will be prepared following the standard conditions for the acceptance of excavated archaeological material and in general following nationally recommended guidelines (Brown 2011; ClfA 2020; SMA 1995).
- 9.2.2 All archive elements are marked with the **site code 268971**, and a full index will be prepared. The physical archive currently comprises the following:
- 01 cardboard boxes or airtight plastic boxes of artefacts and ecofacts, ordered by material type
 - 01 files/document cases of paper records

Digital archive

- 9.2.3 The digital archive generated by the project will be deposited with a Trusted Digital Repository, in this instance the Archaeology Data Service (ADS), to ensure its long-term curation. Digital data will be prepared following ADS guidelines (ADS 2013 and online guidance) and accompanied by metadata.

9.3 Selection strategy

- 9.3.1 It is widely accepted that not all the records and materials (artefacts and palaeoenvironmental data) collected or created during the course of an archaeological project require preservation in perpetuity. These records and materials will be subject to selection in order to establish what will be retained for long-term curation, with the aim of ensuring that all elements selected to be retained are appropriate to establish the significance of the project and support future research, outreach, engagement, display and learning activities, i.e. the retained archive should fulfil the requirements of both future researchers and the receiving Museum.
- 9.3.2 The selection strategy, which details the project-specific selection process, is underpinned by national guidelines on selection and retention (Brown 2011, section 4, ClfA 2022) and generic selection policies (SMA 1993; Wessex Archaeology's internal selection policy) and follows ClfA's *Toolkit for Selecting Archaeological Archives*. It should be agreed by all stakeholders (Wessex Archaeology's internal specialists, external specialists, local authority, museum) and fully documented in the project archive.
- 9.3.3 Project-specific proposals for selection are presented below. These proposals are based on recommendations by Wessex Archaeology's internal specialists and will be updated in line with any further comment by other stakeholders (museum, local authority). The selection strategy will be fully documented in the project archive.
- 9.3.4 Any material not selected for retention may be used for teaching or reference collections by Wessex Archaeology.

Finds

- 9.3.5 A small number of archaeological finds were made during the evaluation. The following curation and retention strategy will be adopted:
- Ceramic Building Material (2 fragments): Residual ceramic building material, found alongside modern pottery; to be discarded.
 - Pottery (1 sherd): Modern flowerpot; to be discarded.
 - Worked Flint (1 piece): Single piece of probable Bronze Age date; to be retained as part of a broader assemblage including that from the adjacent NeuConnect Converter Station and Substation site (Wessex Archaeology 2024).

Documentary records

- 9.3.6 Paper records comprise site registers (other pro-forma site records are digital), drawings and reports (Written Scheme of Investigation, client report). All will be retained and deposited with the project archive.

Digital data

- 9.3.7 The digital data comprise site records (tablet-recorded on site) in spreadsheet format; finds records in spreadsheet format; survey data; photographs; reports. All will be deposited, although site photographs will be subject to selection to eliminate inferior quality and



duplicated images, and any others not considered directly relevant to the archaeology of the site.

- 9.3.8 Wessex Archaeology follows national guidelines on selection and retention (SMA 1993; Brown 2011, section 4). In accordance with these, and any specific guidance prepared by the museum, a process of selection and retention will be followed so that only those artefacts that are considered to have potential for future study will be retained. The selection policy will be agreed with the museum and is fully documented in the project archive.

9.4 Security copy

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

9.5 OASIS

- 9.5.1 An OASIS (online access to the index of archaeological investigations) record (<http://oasis.ac.uk>) has been initiated, with key fields completed (**Appendix 5**). A .pdf version of the final report will be submitted following approval by the County Archaeologist for Kent County Council (KCC) on behalf of the LPA. Subject to any contractual requirements on confidentiality, copies of the OASIS record will be integrated into the relevant local and national records and published through the Archaeology Data Service (ADS) ArchSearch catalogue.

10 OUTREACH AND SOCIAL MEDIA

- 10.1.1 In line with its charitable aims, Wessex Archaeology will, where possible and in consultation with the client, seek opportunities to disseminate the results of the evaluation and engage with the local community through social media, press releases, open days and volunteer involvement, while considering issues such as health and safety, confidentiality and vandalism.

11 COPYRIGHT

11.1 Archive and report copyright

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

11.2 Third party data copyright

- 11.2.0 This document, the evaluation report and the project archive may contain material that is non-Wessex Archaeology copyright (e.g., Ordnance Survey, British Geological Survey,



Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licences, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of the *Copyright, Designs and Patents Act 1988* with regard to multiple copying and electronic dissemination of such material.



REFERENCES

- ADS 2013. *Caring for Digital Data in Archaeology: a guide to good practice*. Archaeology Data Service & Digital Antiquity Guides to Good Practice.
- British Geological Survey GeoIndex (onshore) <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/> (accessed 25/10/2024).
- Bridgland D 2003 The evolution of the River Medway, SE England, in the context of Quaternary palaeoclimate and the Palaeolithic occupation of NW Europe. *Proceedings of the Geologists' Association*, 114, 23-48.
- Brown, D. H. 2011. *Archaeological Archives: a guide to best practice in creation, compilation, transfer and curation* (revised edition). Archaeological Archives Forum.
- Chartered Institute for Archaeologists [ClfA] 2020a. *Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials*. Reading: ClfA.
- ClfA 2020b. *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives*. Reading, ClfA.
- ClfA 2023 *Standard and Guidance for Archaeological Field Evaluation*. Reading, ClfA.
- English Heritage 2008 *Research and Conservation Framework for the British Palaeolithic*. Portsmouth, English Heritage.
- Kent County Council nd. *Specification for Preliminary Evaluation of Quaternary Deposits and Palaeolithic Potential*.
- Kent County Councils nd. *Manual of Specifications Part B Specification KCC generic specification requirements for desk-based assessment of geoarchaeological potential (including baseline deposit modelling)*.
- NeuConnect 2022 *Phasing Plan*. Report ref. NEU-AFV-ZZZ-UK-RP-0001
- NeuConnect 2023 *UK Site Disturbed Ground Layout*.
- SMA 1993. *Selection, Retention and Dispersal of Archaeological Collections*. Society of Museum Archaeologists.
- SMA 1995. *Towards an Accessible Archaeological Archive*. Society of Museum Archaeologists.
- Wenban-Smith FF, Bates MR and Marshall G 2007 Medway Valley Palaeolithic Project Final Report: The Palaeolithic Resource in the Medway Gravels (Kent). English Heritage, Swindon.
- Wessex Archaeology 2022a *NeuConnect Geoarchaeological Desk-Based Assessment*. Report Ref. 259031.01.
- Wessex Archaeology 2022b *NeuConnect Converter Station and Substation, Isle of Grain, Medway, Kent*. Report Ref. 259032.02.
- Wessex Archaeology 2022c *NeuConnect Isle of Grain, Kent. Archaeological Evaluation*. Report Ref.: 259033.4.



Wessex Archaeology 2023a *NeuConnect Onshore Cable Route and HDD Works. Written Scheme of Investigation for Palaeolithic Archaeological and Geoarchaeological Evaluation.* Report Ref. 268971.01

Wessex Archaeology 2023b *NeuConnect Onshore Converter Station Works, Isle of Grain, Medway, Kent. Additional Archaeological Mitigation Works – Stage 1 Interim Statement.* Report Ref. 259037.03.

Wessex Archaeology 2023c *NeuConnect Onshore Converter Station Works, Isle of Grain, Medway, Kent. Additional Archaeological Mitigation Works – Stage 2 Interim Statement.* Report Ref. 259037.04.

Wessex Archaeology 2023d *NeuConnect HDD Works. Archaeological Review of Ground Investigation Data.* Report Ref. 268971.02.

Wessex Archaeology 2024 *NeuConnect Converter Station. Isle of Grain, Kent. Post-excavation Assessment and Updated Project Design Volume 1: Main Report.* Report Ref. 259035.01



APPENDICES

Appendix 1 Test pit summaries

The stratigraphic succession encountered in each test pit are outlined below. Both heights and coordinates were taken at the centre of each trench. Depth bgl = below ground level

Site Code: 268971		Site Name: NeuConnect		Test Pit ID: WA_TP1	
Coordinates (NGR) X: 588285		Coordinates (NGR) Y: 176692		Level (top): 8.64 m OD	
Length: 2.30 m		Width: 1.80 m		Depth: 3.60 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
101	Compact to firm, mid yellowish brown slightly clayey SILT SAND with common (<20%) poorly sorted, rounded to angular, fine to coarse - sized flint pebbles (<50mm) and few small bricks fragments. Diffuse lower contact.	Made Ground/ Topsoil	0.00-0.24	8.64-8.40	
102	Compact to firm, mid yellowish brown slightly CLAYEY SILT SAND with common (<35%) poorly sorted, rounded to subangular, fine to coarse -sized flint pebbles (<50mm). Sharp lower contact.	Made Ground	0.24-0.90	8.4-7.74	
103	Loose, but moderately cohesive, yellowish brown GRAVELLY SAND. Gravel (<30%) was poorly sorted, often rounded to subangular, fine to coarse -sized (<60mm) flint pebbles. Embedded in slightly silty clay sand matrix. Few fragments of shells recorded. Sharp lower contact.	Sands and Gravels	0.90-1.10	7.74-7.54	<2>
104	Firm, reddish brown silty CLAY. Structureless, stoneless and homogeneous. Gradual lower contact.	Weathered London Clay Bedrock	1.10-1.40	7.54-7.24	
105	Firm to dense with depth, dark grey silty CLAY. Structureless, stoneless and homogeneous.	London Clay Bedrock	1.40-3.60+	7.24-5.04+	



Site Code: 268971		Site Name: NeuConnect		Test Pit ID: WA_TP2	
Coordinates (NGR) X: 588278		Coordinates (NGR) Y: 176753		Level (top): 8.91 m OD	
Length: 2.40 m		Width: 1.80 m		Depth: 3.70 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
201	Compact to firm, mid yellowish to greyish brown slightly CLAYEY SILT SAND with common (<20%) poorly sorted, rounded to angular, fine to coarse -sized flint pebbles (<50mm), fragments of tarmac, shingle, and red bricks. Sharp lower contact.	Made Ground	0.00-0.60	8.91-8.29	
202	Firm, moderately cohesive, dark reddish brown SILTY SAND with (<25%) poorly sorted, rounded to subangular fine to medium, occasionally coarse -sized flint pebbles. Poorly sorted and randomly originated. Sand is fine to very fine. Few (<3%) fragments of ceramic, charcoal and possibly fragment of pottery. Sharp lower contact.	Made Ground (Backfill)	0.60-1.15	8.29-7.76	
203	Firm, very dark grey SILTY fine SAND with very few (<2%) rounded medium sized flint pebbles (<20mm) and fragment of marine shell. Sharp lower contact.	Made Ground	1.15-1.30	7.76-7.61	<4>
204	Firm, reddish brown silty CLAY. Stoneless and structureless. Sharp lower contact.	Weathered London Clay Bedrock	1.30-1.62	7.61-7.29	
205	Firm to dense with depth, dark grey silty CLAY. Structureless, stoneless and homogeneous.	London Clay Bedrock	1.62-3.70+	7.29-5.21+	



Site Code: 268971		Site Name: NeuConnect		Test Pit ID: WA_TP3	
Coordinates (NGR) X: 588313		Coordinates (NGR) Y: 176954		Level (top): 8.42 m OD	
Length: 2.10 m		Width: 1.80 m		Depth: 3.50 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
301	Compact to firm, mid yellowish brown slightly SANDY CLAYEY SILT with common (<20%) poorly sorted, rounded to angular, fine to coarse - sized flint pebbles (<50mm) mixed with fragments of concrete and red brick. Diffuse lower contact.	Made Ground/ Topsoil	0.00-0.20	8.42-8.22	
302	Compact to firm, mid yellowish brown slightly CLAYEY SILT SAND with common (<20%) poorly sorted, rounded to angular, fine to coarse - sized flint pebbles (<50mm). Sharp lower contact.	Made Ground	0.20-0.55	8.22-7.87	
303	Firm, mid reddish brown (strong brown) SILT CLAY with occasional (<3%) medium -sized flint pebbles (<20mm) in the upper part of the deposit. Stoneless and structureless with depth. Diffuse lower contact.	Weathered/ Redeposited London Clay Bedrock	0.55-1.20	7.87-7.22	
304	Firm, dark grey SILTY CLAY with few (<5%) fine pores filled with secondary calcium and fine roots noted. Stoneless and structureless. Gradual lower contact.	Weathered London Clay Bedrock	1.20-1.44	7.22-6.98	
305	Firm to dense with depth, dark grey CLAY. Structureless, stoneless and homogeneous.	London Clay Bedrock	1.44-3.50+	6.98-4.92+	



Site Code: 268971		Site Name: NeuConnect		Test Pit ID: WA_TP4	
Coordinates (NGR) X: 588337		Coordinates (NGR) Y: 177015		Level (top): 8.45 m OD	
Length: 2.20 m		Width: 1.80 m		Depth: 3.70 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
401	Compact, yellowish brown SILTY CLAY SAND mixed with fragments of concrete and red brick. Sharp lower contact.	Made Ground/ Topsoil	0.00-0.15	8.45-8.30	
402	Compact to firm, mid yellowish brown slightly SANDY CLAYEY SILT with common (<25%) poorly sorted, rounded to angular, fine to coarse - sized flint pebbles (<60mm). Sharp lower contact.	Made Ground	0.15-0.62	8.30-7.83	
403	Loose, but moderately cohesive, yellowish brown MATRIX SUPPORTED GRAVEL. Gravel (<60%) was poorly sorted, often rounded to subangular, fine to coarse -sized (<60mm) flint pebbles. Embedded in slightly silty sandy clay matrix. Lenses of well sorted yellow coarse sand recorded. Sharp lower contact.	Sands and Gravels	0.62-0.90	7.83-7.55	<1>
404	Firm, reddish brown SILTY CLAY. Stoneless and structureless. Gradual lower contact.	Weathered London Clay Bedrock	0.90-1.50	7.55-6.95	
405	Fine to dense, grey to dark grey SILTY CLAY. Stoneless and structureless. Secondary calcium mottling noted throughout.	London Clay Bedrock	1.50-3.70+	6.95-4.75+	



Site Code: 268971		Site Name: NeuConnect		Test Pit ID: WA_TP5	
Coordinates (NGR) X: 588364		Coordinates (NGR) Y: 177077		Level (top): 7.91 m OD	
Length: 2.10 m		Width: 1.80 m		Depth: 2.60 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
501	Compact to firm, mid yellowish brown slightly SANDY CLAYEY SILT with common (<20%) poorly sorted, rounded to angular, fine to coarse - sized flint pebbles (<50mm) mixed with fragments of concrete and red brick and ceramic pipe fragments. Sharp lower contact.	Made Ground	0.00-0.58	7.91-7.33	
502	Loose, moderately cohesive, grey to reddish brown GRAVELLY SANDY SILT/CLAY. Gravel (<35%) poorly sorted, rounded to angular, fine to coarse -sized flint pebbles. Embedded in a mixed sandy silty clay matrix. Thinner towards east. Sharp lower contact.	Made Ground	0.58-0.78	7.33-7.13	
503	Firm, brown SILTY CLAY. Stoneless and structureless. Gradual lower contact.	Weathered London Clay Bedrock	0.78-1.06	7.13-6.85	
504	Firm to dense with depth, dark grey CLAY. Structureless, stoneless and homogeneous.	London Clay Bedrock	1.06-2.60+	6.85-5.31+	



Site Code: 268971		Site Name: NeuConnect		Test Pit ID: WA_TP6	
Coordinates (NGR) X: 588388		Coordinates (NGR) Y: 177134		Level (top): 7.74 m OD	
Length: 1.90 m		Width: 1.80 m		Depth: 3.40 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
601	Loose, pale brown to reddish brown SANDY GRAVEL. Gravel (<40%) was poorly sorted, rounded to angular, fine to coarse -sized flint pebbles mixed with rare (<3%) small fragments of brick, metal and charcoal. Fragments of three roots recorded. Sharp lower contact.	Made Ground (Redeposited Gravel)	0.00-0.42	7.74-7.28	
602	Firm, dark grey slightly sandy SILTY CLAY with common (<25%) poorly sorted, rounded to angular, fine to coarse -sized flint pebbles mixed with fragments of wood and three roots and very few small fragments of concrete, charcoal and red brick with yellowish mortar. Sharp lower contact.	Made Ground	0.42-1.34	7.28-6.57	
603	Firm, dark brown SILTY CLAY. Stoneless and structureless. Gradual lower contact.	Weathered London CLAY Bedrock	1.34-1.84	6.57-6.07	
604	Firm to dense with depth, dark grey CLAY. Structureless, stoneless and homogeneous.	London CLAY Bedrock	1.84-3.40+	6.07-4.51+	



Appendix 2 Borehole summaries

The stratigraphic succession encountered in each borehole are outlined below. Both heights and coordinates were taken at the centre of each trench. Depth bgl = below ground level

Site Code: 268971		Site Name: NeuConnect		Borehole ID: WA_BH01	
Coordinates (NGR) X: 588442.52		Coordinates (NGR) Y: 177238.04		Level (top): 7.79 m OD	
				Depth: 10.00 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
101	Firm, light grey SAND with frequent (<40%) of shingle, broken modern debris. Sharp lower contact.	Made Ground (levelling)	0.00-0.23	7.79-7.56	
102	Loose, black SILTY SAND. Sharp lower contact (Plastic layer).	Made Ground	0.23-0.35	7.56-7.44	
103	Loose, dark brown to brown, slightly silty SANDY GRAVEL. Gravel is frequent (<35%) poorly sorted rounded to subangular fine to coarse-sized flint pebbles. Sand is fine to medium. Slightly clayey with depth. Gradual lower contact.	Possible Made Ground	0.35-0.67	7.44-7.12	
104	Moderately cohesive, reddish brown slightly CLAYEY SANDY GRAVEL. Gravel is frequent (<60%), poorly sorted, rounded to subrounded, rare subangular and angular, fine to coarse-sized flint pebbles and well-rounded Tertiary pebbles. Matrix is clayey fine to medium sand. Lower contact not recorded.	Sands and Gravel	0.67-1.60	7.12-6.19	
105	Firm, reddish brown CLAY. Homogeneous and stoneless. Lower contact not recorded.	Weathered London Clay Bedrock	1.60-1.80	6.19-5.99	
106	Firm to dense with depth, dark grey CLAY. Structureless, stoneless and homogeneous.	London Clay Bedrock	1.80+	5.99+	



Site Code: 268971		Site Name: NeuConnect		Borehole ID: WA_BH02	
Coordinates (NGR) X: 588389.95		Coordinates (NGR) Y: 177129.05		Level (top): 7.58 m OD	
				Depth: 10 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
201	Friable, dark greyish brown, SANDY SILT with occasional (<10%) of poorly sorted rounded to subangular fine to medium size flint pebbles and well-rounded Tertiary pebbles. Common rooting for trees/shrubs. Sharp lower contact.	Made Ground	0.00-0.25	7.58-7.33	
202	Firm, moderately cohesive yellowish brown slightly clayey SANDY SILT with common (<20%) poorly sorted rounded to subangular, fine to large flint and rounded Tertiary pebbles. Few fragments of concrete. Sharp lower contact.	Made Ground	0.25-0.82	7.33-6.76	
203	Firm, moderately cohesive reddish brown, SANDY SILT with occasional, moderately sorted rounded to subangular, fine to medium flint pebbles and rounded Tertiary pebbles. Sand is very fine. Lower contact not recorded.	Sands and Gravels	0.82-1.28	6.76-6.20	
204	Loose, brownish yellow slightly clayey fine SAND. Sharp lower contact.	Sands and Gravels	1.28-1.35	6.20-6.23	
205	Firm, brown SILTY CLAY. Homogeneous and stoneless. Lower contact not recorded.	Weathered London Clay Bedrock	1.35-2.00	6.23-5.58	
206	Dense to stiff, grey CLAY. Homogeneous and stoneless.	London Clay Bedrock	2.00+	5.58+	



Site Code: 268971		Site Name: NeuConnect		Borehole ID: WA_BH03	
Coordinates (NGR) X: 588286.62		Coordinates (NGR) Y: 176697.13		Level (top): 8.89 m OD	
				Depth: 10 m	
Context Number	Description	Interpretation	Depth m bgl	Depth m OD	Samples
301	Firm, mid greyish brown, slightly CLAYEY SILT SAND (very fine to fine) with occasional (<15%) poorly sorted rounded to angular fine to coarse -sized flint pebbles and fragments of roots, small fragment of brick. Clear lower contact.	Made Ground/ Topsoil	0.00-0.20	8.89-8.69	
302	Firm, mid brown slightly SILTY SAND (very fine to fine) with common (<25%) poorly sorted rounded to subangular, fine to coarse -sized flint pebbles and medium sized well rounded Tertiary pebbles. Moderately cohesive.	Made Ground	0.20-0.60	8.69-8.29	
303	Loose, moderately cohesive slightly SILTY GRAVELLY SAND with common (<15%) moderately sorted, rounded to subangular fine to medium coarse flint pebbles and well-rounded Tertiary pebbles. Sand is fine and medium with depth. Lenses of oxidised brown clay recorded throughout. Sharp lower contact.	Sands and Gravels	0.60-1.25	8.29-7.64	
304	Firm, reddish brown CLAY. Homogeneous and stoneless. Lower contact not recorded.	Weathered London Clay Bedrock	1.25-1.70	7.64-7.19	
305	Dense to stiff with depth, grey to dark grey CLAY. Homogeneous and stoneless.	London Clay Bedrock	1.70+	7.19+	



Appendix 3 Geotechnical logs – Causeway Geotech (2024)

 CAUSEWAY GEOTECH				Project No. 24-1009		Project Name: Neuconnect UK - Isle of Grain, Rochester			Borehole ID BH04												
Method Cable Percussion		Plant Used Dando 1500		Top (m) 0.00		Base (m) 8.00		Coordinates 588309.88 E 176601.68 N		Final Depth: 10.45 m		Start Date: 30/09/2024		Driller: SM		Sheet 1 of 2 Scale: 1:40					
										Elevation: mOD		End Date: 30/09/2024		Logger: RM		FINAL					
Depth (m)		Sample / Tests		Field Records		Casing Depth (m)		Water Depth (m)		Level mOD		Depth (m)		Legend		Description		Water		Backfill	
0.30 - 0.60		B1										0.10				Grass overlying light brown slightly gravelly sandy clayey TOPSOIL with many fine roots and rootlets. Gravel is subangular to subrounded fine to coarse of flint and limestone. Sand is fine to coarse.					
1.00		D2																			
1.20 - 1.65		SPT (S)		N=14 (4,3/3,2,3,6) Hammer SN = AR2727				Dry													
1.70 - 2.00		B3										1.70				Light grey gravelly silty fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone.					
2.00		D4																			
2.00 - 2.32		SPT (S)		50 (10,11/50 for 170mm) Hammer SN = AR2727				Dry													
3.00		D5										3.00				Brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint.					
3.00 - 3.45		SPT (S)		N=3 (1,0/0,1,1,1) Hammer SN = AR2727 Water strike at 3.00m				2.90													
3.50 - 4.00		B6																			
4.00		D7										4.00				Soft becoming firm greyish blue CLAY.					
4.00 - 4.45		SPT (S)		N=6 (1,1/1,1,2,2) Hammer SN = AR2727				4.00													
4.50 - 5.00		B8																			
5.00		D9																			
5.00 - 5.45		UT10		Ublow=100 22% Recovery				Dry													
5.50		D11																			
5.50 - 6.00		B12																			
6.00		D13																			
6.00 - 6.45		SPT (S)		N=12 (2,2/2,2,4,4) Hammer SN = AR2727				4.00		Dry											
6.50 - 7.00		B14																			
7.00		D15																			
7.00 - 7.45		U16		Ublow=30 100% Recovery				Dry													
Water Strikes				Chiselling Details				Remarks													
Struck at (m)		Casing to (m)		Time (min)		Rose to (m)		From (m)		To (m)		Time (hh:mm)		Inspection pit excavated to 1.20m.							
3.00		3.00		20		2.50								Co-ordinates are approximate and generated from logging software.							
Casing Details				Water Added																	
To (m)		Diameter		From (m)		To (m)															
Termination Reason												Last Updated									
Terminated at scheduled depth.												22/10/2024									



				Project No. 24-1009		Project Name: Neuconnect UK - Isle of Grain, Rochester			Borehole ID BH05			
Method		Plant Used	Top (m)	Base (m)	Coordinates	Client: De Romein		Client's Rep: N/A		Sheet 1 of 2 Scale: 1:40		
Cable Percussio		Dando 1500	0.00	10.45	588258.19 E 176421.29 N	Final Depth: 10.45 m		Start Date: 01/10/2024	Driller: SM	FINAL		
						Elevation: mOD		End Date: 01/10/2024	Logger: RM			
Depth (m)	Sample / Tests	Field Records		Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description		Water	Backfill
0.20 - 0.50	B1	N=5 (3,2/1,1,1,2) Hammer SN = AR2727					0.15		Grass overlying soft light brown sandy gravelly TOPSOIL with abundant roots and rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint. MADE GROUND: Soft to firm brown slightly sandy slightly gravelly SILT with brick and concrete fragments. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint.			
1.00	D2											
1.20 - 1.65	SPT (S)											
1.70 - 2.00	B3	N=5 (1,1/1,1,1,2) Hammer SN = AR2727					1.70		MADE GROUND: Soft to firm dark brown mottled black slightly sandy slightly gravelly CLAY with brick and concrete fragments. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint.			
2.00	D4											
2.00 - 2.45	SPT (S)											
3.00	D5	N=4 (1,1/1,1,1,1) Hammer SN = AR2727					3.00		Soft dark grey slightly sandy slightly gravelly CLAY with occasional lenses of orange sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of flint.			
3.00 - 3.45	SPT (S)											
3.50 - 4.00	B6											
4.00	D7	Ublow=9 100% Recovery					4.30		Firm becoming stiff greyish blue CLAY.			
4.00 - 4.45	UT8											
4.50	D9											
4.50 - 5.00	B10	N=14 (1,2/2,3,4,5) Hammer SN = AR2727										
5.00	D11											
5.00 - 5.45	SPT (S)											
5.50 - 6.00	B12	Ublow=25 100% Recovery										
6.00	D13											
6.00 - 6.45	U14											
6.50	D15	N=16 (2,13/4,3,4,5) Hammer SN = AR2727										
6.50 - 7.00	B16											
7.00	D17											
7.00 - 7.45	SPT (S)											
Water Strikes				Chiselling Details			Remarks					
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit excavated to 1.20m.					
							Co-ordinates are approximate and generated from logging software.					
Casing Details		Water Added										
To (m)	Diameter	From (m)	To (m)									
Termination Reason					Last Updated							
Terminated at scheduled depth.					22/10/2024							

 CAUSEWAY GEOTECH				Project No. 24-1009		Project Name: Neuconnect UK - Isle of Grain, Rochester				Borehole ID BH06		
Method		Plant Used		Top (m)	Base (m)	Coordinates		Client: De Romein		Client's Rep: N/A		
Cable Percussion		Dando 1500		0.00	10.45	588075.79 E 176350.21 N		Final Depth: 10.45 m		Start Date: 01/10/2024		
								Driller: SM		Sheet 1 of 2 Scale: 1:40		
								Elevation: mOD		End Date: 02/10/2024		
								Logger: RM		FINAL		
Depth (m)	Sample / Tests	Field Records		Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description		Water	Backfill
0.30 - 0.60	B1						0.10		Grass overlying soft light brown sandy gravelly TOPSOIL with abundant roots and rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint.			
1.00	D2						1.00		MADE GROUND: Soft to firm greyish brown sandy gravelly CLAY with lenses of coarse grey silty sand and brick and concrete fragments. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint.			
1.00 - 1.20	B3						1.40		MADE GROUND: Loose light grey gravelly silty fine to coarse SAND with occasional brick fragments. Gravel is angular to subangular fine to coarse of sandstone.			
1.20 - 1.65	SPT (S)	N=5 (2,2/1,2,1,1) Hammer SN = AR2727			Dry		2.00		MADE GROUND: Soft to firm greyish brown sandy gravelly CLAY with lenses of coarse grey and orange sand and brick and concrete fragments. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint.			
2.00	D4						2.00		MADE GROUND: Medium dense greyish orange sandy clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
2.00 - 2.45	B5				Dry		3.00		MADE GROUND: Medium dense orange sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
2.00 - 2.45	SPT (S)	N=23 (6,5/4,5,6,8) Hammer SN = AR2727					3.00		MADE GROUND: Medium dense orange sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
3.00	D6						3.00		MADE GROUND: Medium dense orange sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
3.00 - 3.45	B7						3.00		MADE GROUND: Medium dense orange sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
3.00 - 3.45	SPT (S)	N=15 (5,4/3,3,4,5) Hammer SN = AR2727 Water strike at 3.00m			2.90		3.00		MADE GROUND: Medium dense orange sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
4.00	D8						4.00		MADE GROUND: Medium dense orange sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
4.00 - 4.45	B9						4.00		MADE GROUND: Medium dense orange sandy slightly clayey subangular to subrounded fine to coarse GRAVEL of flint and limestone. Sand is fine to coarse.			
4.00 - 4.45	SPT (S)	N=24 (4,5/5,6,5,8) Hammer SN = AR2727			3.70		4.60		MADE GROUND: Soft light greyish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint.			
4.60 - 5.00	B10						4.70		MADE GROUND: Soft light greyish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint.			
5.00	D11						5.00		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
5.00 - 5.45	UT12	Ublow=17 100% Recovery			5.20		5.00		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
5.50	D13						5.50		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
5.50 - 6.00	B14						6.00		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
6.00	D15						6.00		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
6.00 - 6.45	SPT (S)	N=15 (2,3/3,3,4,5) Hammer SN = AR2727			5.20	Dry	6.50		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
6.50 - 7.00	B16						7.00		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
7.00	D17						7.00		MADE GROUND: Firm becoming stiff greyish blue CLAY.			
7.00 - 7.45	U18	Ublow=25 100% Recovery			5.20	Dry						
Water Strikes				Chiselling Details			Remarks					
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit hand dug to 1.20m.					
3.00	3.00	20	2.80				Co-ordinates are approximate and generated from logging software.					
Casing Details				Water Added								
To (m)	Diameter	From (m)	To (m)									

				Project No. 24-1009		Project Name: Neuconnect UK - Isle of Grain, Rochester			Borehole ID BH06				
Method Cable Percussion		Plant Used Dando 1500	Top (m) 0.00	Base (m) 10.45	Coordinates 588075.79 E 176350.21 N		Final Depth: 10.45 m	Start Date: 01/10/2024	Driller: SM	Sheet 2 of 2 Scale: 1:40			
							Elevation: mOD	End Date: 02/10/2024	Logger: RM	FINAL			
Depth (m)	Sample / Tests	Field Records		Casing Depth (m)	Water Depth (m)	Level mOD	Depth (m)	Legend	Description		Water	Backfill	
7.50 7.50 - 8.00	D19 B20	N=21 (2,3/4,5,5,7) Hammer SN = AR2727		5.20	Dry		7.50		Stiff greyish blue CLAY.				7.5
8.00 8.00 - 8.45	D21 SPT (S)											8.0	
8.50 - 9.00	B22											8.5	
9.00 9.00 - 9.45	D23 U24	Ublow=31 100% Recovery		5.20	Dry				End of Borehole at 10.45m				9.0
9.50 9.50 - 10.00	D25 B26											9.5	
10.00 10.00 - 10.45	D27 SPT (S)	N=23 (3,3/4,6,5,8) Hammer SN = AR2727			Dry		10.45					10.0	
													10.5
													11.0
													11.5
													12.0
													12.5
													13.0
													13.5
													14.0
													14.5
Water Strikes				Chiselling Details			Remarks						
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)	Inspection pit hand dug to 1.20m. Co-ordinates are approximate and generated from logging software.						
3.00	3.00	20	2.80										
Casing Details		Water Added											
To (m)	Diameter	From (m)	To (m)										
Termination Reason							Last Updated						
Terminated at scheduled depth.							22/10/2024						



Appendix 4 Data used in the deposit model

Name	Easting	Northing	Elevation (m OD)	Total depth (m)
GEM_BH-01	588517.10	177303.40	8.25	11.45
GEM_BH-02	588534.00	177327.40	8.29	12.00
GEM_CPTu-1	588856.20	177789.50	-0.02	10.67
GEM_CPTu-1A	588856.70	177789.50	0.00	10.63
GEM_CPTu-2	588764.60	177748.80	0.05	10.74
GEM_CPTu-2A	588779.30	177744.80	0.10	10.81
GEM_CPTu-3	588845.60	177796.30	0.00	10.32
GEM_CPTu-3A	588847.10	177796.90	-0.01	10.36
WA_TP1	588285.00	176692.00	8.64	3.60
WA_TP2	588278.00	176753.00	8.91	3.70
WA_TP3	588313.00	176954.00	8.42	3.50
WA_TP4	588337.00	177015.00	8.45	3.70
WA_TP5	588364.00	177077.00	7.91	2.60
WA_TP6	588388.00	177134.00	7.74	3.40
CG_BH01	588442.00	177238.00	7.78	10.45
CG_BH02	588389.00	177129.00	7.58	10.45
CG_BH03	588286.00	176697.00	8.90	10.45
CG_BH04	588309.00	176601.00	12.33	10.45
CG_BH05	588258.00	176421.00	11.34	10.45
CG_BH06	588075.00	176350.00	10.48	10.45



Appendix 5 OASIS form

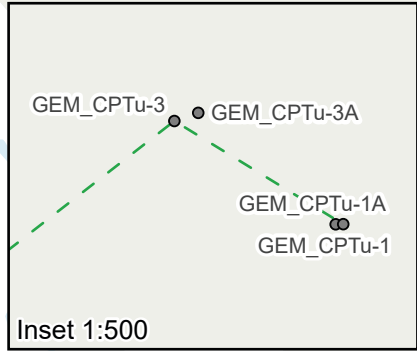
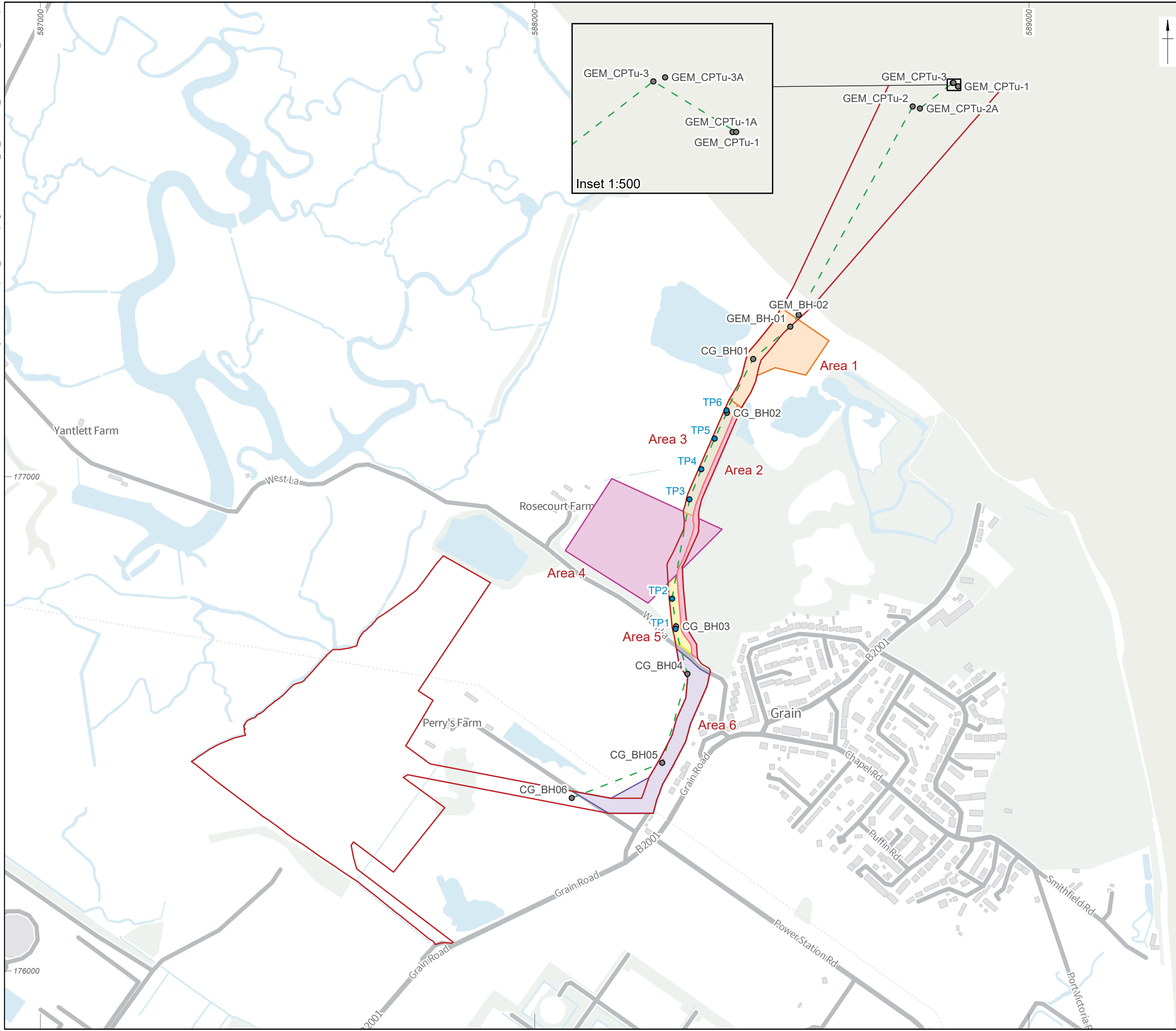
OASIS Summary for wessexar1-529176

OASIS ID (UID)	wessexar1-529176
Project Name	NeuConnect Onshore Cable Installation Phase & HDD Works, Isle of Grain, Medway, Kent Palaeolithic Geoarchaeological Evaluation and Geoarchaeological Monitoring of Ground Investigation Works
Sitename	NeuConnect Onshore Cable & HDD Works
Sitecode	268971
Project Identifier(s)	268971
Activity type	Evaluation
Planning Id	MC/19/3015, MC/21/2483, MC/21/3496
Reason For Investigation	Planning: Post determination
Organisation Responsible for work	Wessex Archaeology
Project Dates	16-Sep-2024 - 27-Sep-2024
Location	NeuConnect Onshore Cable & HDD Works NGR : TQ 88327 76917 LL : 51.459893709570174, 0.709523719696366 12 Fig : 588327,176917
Administrative Areas	Country : England County/Local Authority : Medway Local Authority District : Medway Parish : Isle of Grain

Project Methodology	Wessex Archaeology was commissioned by De Romein Nearshore, on behalf of NeuConnect Britain Ltd, to report on a Palaeolithic geoarchaeological evaluation and associated geoarchaeological monitoring of Ground Investigation (GI) works carried out along the route of the NeuConnect onshore DC cable route and the Horizontal Directional Drilling (HDD) works area. The cable route and HDD works are located at Grain on the Isle of Grain, Kent. The evaluation area is centred on National Grid Reference (NGR) 588327, 176917 (TQ 88327 76917). The evaluation was carried out in accordance with a requirement for archaeological evaluation outlined in Condition 22 (i) of approved planning application MC/21/2483. The purpose of the evaluation was to establish requirements for further archaeological work needed to comply with Condition 22 (ii) of the approved planning application, which outlines a requirement to mitigate against impacts of the development on any significant archaeological remains, or to provide information for a management plan to prevent impacts. In consultation with the County Archaeologist for Kent County Council (KCC), archaeological advisor to the Local Planning Authority (LPA), it was established that the principal archaeological risk of the development was impacting on Pleistocene geological deposits containing significant Palaeolithic geoarchaeological remains (artefacts and sediments with potential to preserve palaeoenvironmental evidence). The program of evaluation and monitoring comprised the excavation and recording of six geoarchaeological test pits, with associated assessment for Palaeolithic geoarchaeological evidence; geoarchaeological monitoring, recording and assessment of three GI boreholes; geoarchaeological review of three GI borehole logs, and the production of a deposit model, which incorporated all relevant, available deposit records.
---------------------	---

Project Results	The program of evaluation and monitoring comprised the excavation and recording of six geoarchaeological test pits, with associated assessment for Palaeolithic geoarchaeological evidence; geoarchaeological monitoring, recording and assessment of three GI boreholes; geoarchaeological review of three GI borehole logs, and the production of a deposit model, which incorporated all relevant, available deposit records. The evaluation and monitoring established that Quaternary geological deposits are absent from large areas of the HVDC cable route and onshore HDD works area, with Made Ground overlying London Clay Formation bedrock being present in most locations. Locally Sands and Gravels between 0.20m and 1.0m thick unconformably overlay bedrock and were sealed by made ground. The lithology of the Sands and Gravels was consistent with being fluvial Pleistocene sediments, but no clear evidence demonstrating that these were in situ sediments (e.g. fluvial bedding structures) was identified, and they may be recently redeposited. If in situ, these Sands and Gravels are the basal remnants of a Thames-Medway river terrace, which has been truncated by previous aggregate extraction and which are likely to be broadly equivalent with deposits investigated to the south-west at the site of the NeuConnect Converter Station and Substation (Wessex Archaeology 2024). At the Converter Station and Substation site these terrace deposits were dated to MIS 9–7 (337–191 Kya) and demonstrated to locally contain late Lower/early Middle Palaeolithic archaeology. No archaeology was identified from the Sands and Gravels during the evaluation, and they had low potential for preserving palaeoenvironmental evidence. Based on the results of the evaluation, the Palaeolithic geoarchaeological potential of the sands and gravels was assessed to be low. The results of geoarchaeological evaluation demonstrate that Pleistocene deposit containing a significant Palaeolithic geoarchaeological resource are unlikely to be impacted on by the NeuConnect HVDC onshore cable installation and HDD works. Consequently, it is recommended that no further archaeological work is required to mitigate against impacts.
Keywords	
Funder	Private or public corporation De Romein Nearshore
HER	Kent HER - unRev - STANDARD
Person Responsible for work	Alex Brown
HER Identifiers	
Archives	Physical Archive, Documentary Archive, Digital Archive - to be deposited with Guildhall Museum, Medway;

X:\Projects\268971\Graphics_Office\Rep figs\PE + DM\2024_10_24\268971_ArcPro\268971_ArcPro.aprx



- Site boundary
- Transect 1
- Evaluation test pits
- Ground Investigation boreholes
- Area 1
- Area 2
- Area 3
- Area 4
- Area 5
- Area 6

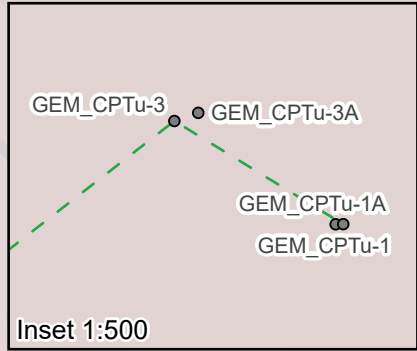
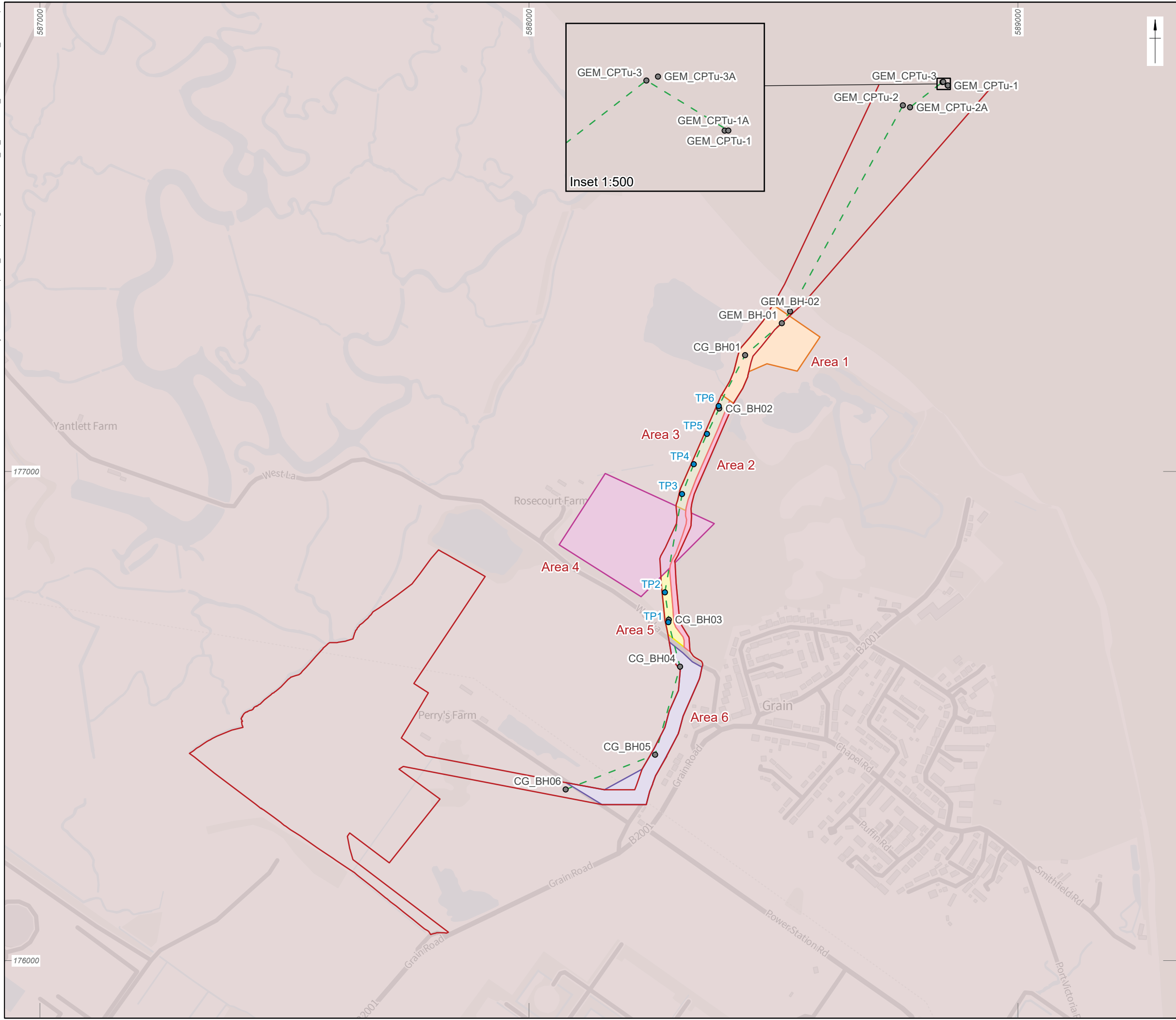
0 200 m

Coordinate system: OSGB 1936 British National Grid
Contains British Geological Survey materials © NERC 2024
Contains Ordnance Survey data © Crown copyright and database right 2024.
This material is for client report only © Wessex Archaeology.
No unauthorised reproduction.

Date: 25/10/2024	Created by: MKP	
Scale: 1:7,500 at A3	Revision: 0	

Figure 1: Site location and plan

X:\Projects\268971\Graphics_Office\Rep figs\PE + DM\2024_10_24\268971_ArcPro\268971_ArcPro.aprx



- Site boundary
- Transect 1
- Evaluation test pits
- Ground Investigation boreholes
- Area 1
- Area 2
- Area 3
- Area 4
- Area 5
- Area 6
- BGS Bedrock geology
- London Clay formation - Clay and Silt

0 200 m

Coordinate system: OSGB 1936 British National Grid
Contains British Geological Survey materials © NERC 2024
Contains Ordnance Survey data © Crown copyright and database right 2024.
This material is for client report only © Wessex Archaeology.
No unauthorised reproduction.

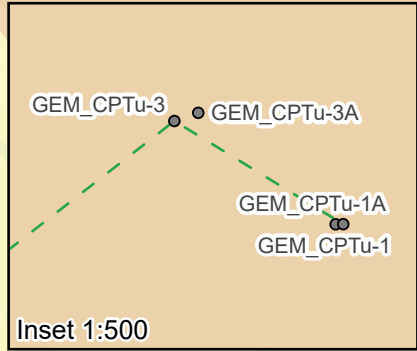
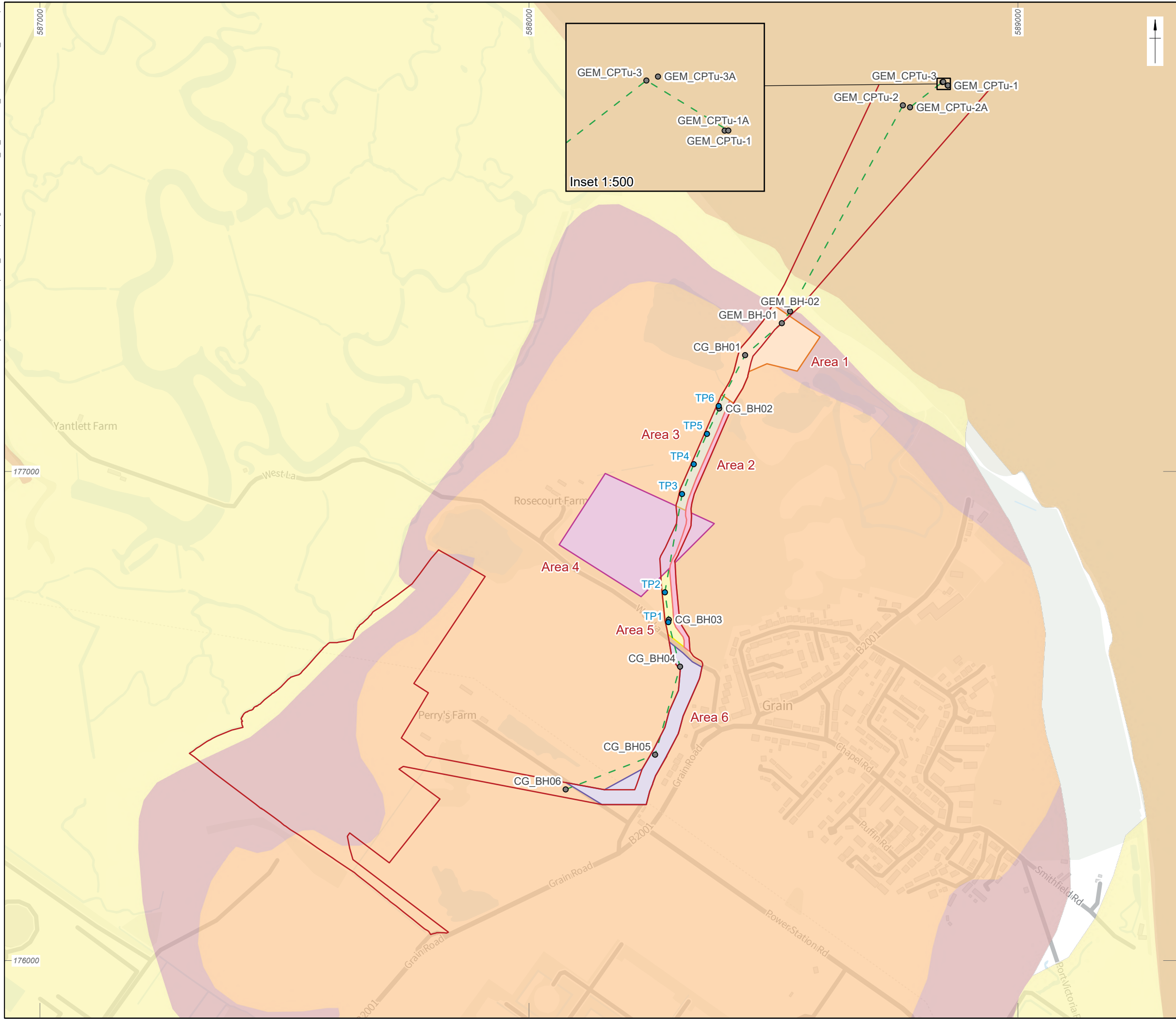
Date: 25/10/2024 Created by: MKP

Scale: 1:7,500 at A3 Revision: 0



Figure 2: Bedrock geology

X:\Projects\268971\Graphics_Office\Rep figs\PE + DM\2024_10_24\268971_ArcPro\268971_ArcPro.aprx



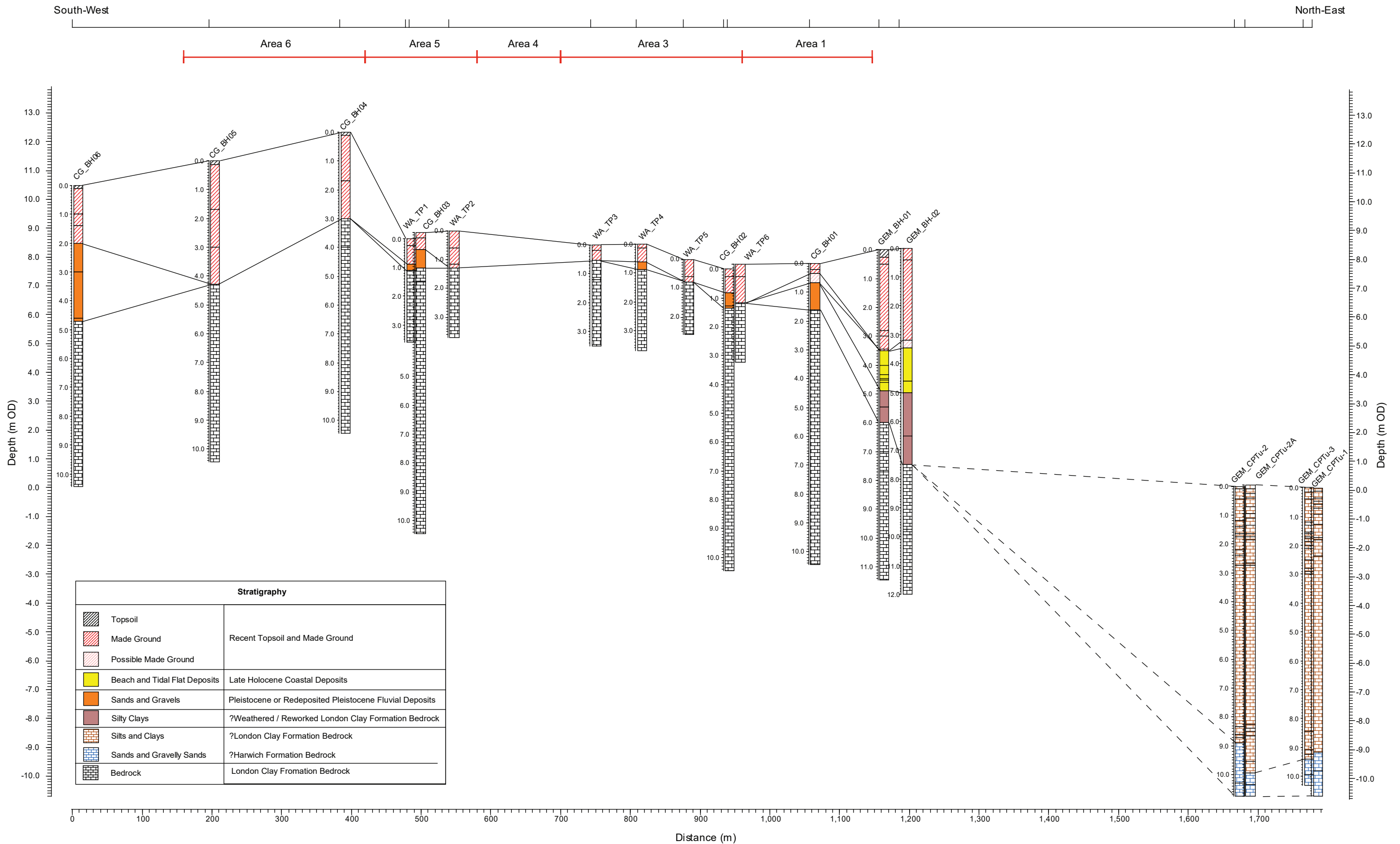
- Site boundary
- Transect 1
- Evaluation test pits
- Ground Investigation boreholes
- Area 1
- Area 2
- Area 3
- Area 4
- Area 5
- Area 6
- BGS Superficial deposits
 - River Terrace Deposits, 2 - Sand and Gravel
 - Head - Clay, Silt, Sand and Gravel
 - Alluvium - Clay, Silt, Sand and Peat
 - Beach and Tidal Flat Deposits (Undifferentiated) - Clay, Silt and Sand



Coordinate system: OSGB 1936 British National Grid
Contains British Geological Survey materials © NERC 2024
Contains Ordnance Survey data © Crown copyright and database right 2024.
This material is for client report only © Wessex Archaeology.
No unauthorised reproduction.

Date: 25/10/2024	Created by: MKP	
Scale: 1:7,500 at A3	Revision: 0	

Figure 3: Superficial geology



This material is for client report only © Wessex Archaeology. No unauthorised reproduction.

Date: 25/10/2024

Created by: MKP

Revision: 0

Scale: NTS at A3

Figure 4: Transect 1





Figure 5: West facing section of Test Pit 1



Figure 6: South-west facing section of Test Pit 4



Figure 7: South-east facing section of Test Pit 6



Wessex Archaeology Ltd registered office Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB
Tel: 01722 326867 Fax: 01722 337562 info@wessexarch.co.uk www.wessexarch.co.uk