

Outer Dowsing Offshore Wind

Environmental Statement

Appendix 13.2 Marine and Intertidal
Archaeology Geoarchaeological
assessment Phase One (ECC)

Volume 3 Appendices

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Acronyms & Definitions

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AfL	Agreement for Lease
BH	Borehole
CPT	Cone Penetration Tests
ECC	Export Cable Corridor
GC	Gravity Cores
GT R4 Limited	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
MA	Maritime Archaeology Ltd
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
NSPRMF	North Sea Prehistory Research and Management Framework
ODOW	Outer Dowsing Offshore Wind (The Project)
PAD	Protocol for Archaeological Discoveries
PEIR	Preliminary Environmental Information Report
SBP	Sub-Bottom Profiler
VC	Vibrocore
WSI	Written Scheme of Investigation

Terminology

Term	Definition
Agreement for Lease (AfL) Array area	The area of the seabed awarded to GT R4 Ltd. through an Agreement for Lease (AfL) for the development of an offshore wind farm, as part of The Crown Estate's Offshore Wind Leasing Round 4.
Array area	The area offshore within the ES Boundary within which the generating stations (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling are positioned.
Cores	Refers to the soil samples collected by the Vibrocorer
Document	A document can be anything that is written, drawn, depicted, photographed or recorded on a material such as paper or in a digital program / media
The Applicant	Refers to GT R4 Limited GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, Tota Energies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.

Term	Definition
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Shall	Indicates that a provision is mandatory
Should	Indicates that a provision is not mandatory but is recommended as good practice
Enviros	Enviros Survey & Consultancy Ltd

Reference Documentation

Document Number	Title
6.1.3	Chapter 3: Project Description

1 Introduction

1. GTR4 Ltd (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop Outer Dowsing Offshore Wind (ODOW) ('the Project'). The Project Array Area will be located approximately 54km from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm), export cables to landfall, Offshore Reactive Compensation Platforms (ORCPs), onshore cables, connection to the electricity transmission network, ancillary and associated development and areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation of a biogenic reef (if these compensation measures are deemed to be required by the Secretary of State) (see Volume 1, Chapter 3: Project Description for full details).
2. This report presents a Phase One geoarchaeological assessment of Vibrocores (VC) collected in the offshore Export Cable Corridor (ECC) in 2022 as part of the pre-construction engineering geotechnical survey campaign.
3. This Phase One geoarchaeological report summarises the current understanding and geoarchaeological potential of the material collected to date and presents Phase Two recommendations for cores and samples collected in the windfarm area.
4. This geoarchaeological report has been produced by Maritime Archaeology Ltd (MA) on behalf of the Applicant.

1.1 Geoarchaeological Background

5. The marine archaeological resource can be characterised into the following five main categories of sites and features:
 - Submerged prehistoric landscapes related to fluctuations in past sea-level. Such landscapes may contain significant evidence of prehistoric human occupation and/or environmental change.
 - Archaeological remains of vessels deposited after a wrecking event at sea or abandoned in an intertidal context.
 - Remains of aircraft crash sites, either coherent assemblages or scattered material, typically the result of Second World War (WWII) military conflict, but also numerous passenger casualties. This category includes aircraft, airships and other dirigibles dating to the First World War (WWI); however, these rarely survive within the archaeological record.
 - Structural remains other than watercraft, such as defensive structures, lighthouses or sites lost to the sea as a result of coastal erosion, may be found within the intertidal zone (between MLWS and MHWS).
 - Historic Seascape Character: the historic cultural influences which shape present perception of seascape, its use, and its ability to accommodate change.

6. A comprehensive archaeological desk-based assessment has been produced to support the application (Volume 1, Chapter 13 Marine and Intertidal Archaeology), prior to the writing of this geoarchaeology Phase One report. The previously submitted Technical Report (Volume 5, Annex 7.1) included a preliminary deposit model, based on Sub-Bottom Profiler (SBP) data.
7. No geoarchaeological investigations or assessments have been conducted in the ECC in association with the Project, prior to the writing of this report. However, previous geoarchaeological assessments have been undertaken in this area of the North Sea, including the Phase One Geotechnical assessment undertaken for the Array Area (Marine and Intertidal Archaeology Geoarchaeological Assessment Phase One ECC, 2023). These previous studies, such as the North Sea Palaeolandscapes Project (NSPP), will be used to assess the geoarchaeological potential of the Project area.
8. This report is Phase One of five Phases (see section 3.3). The geoarchaeological assessment in this report focuses on submerged prehistoric landscapes and will assess the geoarchaeological potential of core logs produced during the geotechnical campaigns undertaken between 30 April 2022 and 07 May 2022.

1.2 Aims and Objectives

9. The main aim of the Phase One geoarchaeological report is to understand the geoarchaeological potential of the sub-seafloor deposits within the Project.
10. The objectives of this Phase One report are as follows;
 - Assess the available core logs for geoarchaeological potential to improve our understanding of the archaeological and palaeoenvironmental capacity in the Project;
 - Provide a preliminary understanding of the palaeoenvironmental context, using the outline deposit model and core logs,
 - Cross reference all collected cores against data collected for the Project as well as palaeolandscape features identified in The North Sea Palaeolandscape Project (University of Birmingham, 2011);
 - Present recommendations for Phase Two assessment as per the outlined methodology, Section 3.3.

2 Geotechnical Site Investigations

11. Enviros Survey and Consultancy Ltd (enviros) were appointed to conduct geotechnical investigations of the offshore ECC for the Project. Investigations took place from 30 April 2022 to 07 May 2022.
12. During this survey period a total of 226 geotechnical investigations were conducted using the survey vessel GEO OCEAN III. This included 113 VCs, Seventeen Gravity Cores (GC) and 96 Cone Penetration Tests (CPT), however only the VCs were used in this archaeological assessment. While a 6m Vibrocorer was used, a maximum penetration range of up to 5.5m and a maximum soil recovery of 5.5m were achieved for the VCs.
13. The sampling procedure followed onboard was as follows:
 - Once the vessel was in a stable position, the VC was lowered into the water.
 - Once the VC was positioned on the seabed, the cable length was noted by the crane operator. Following this, the motor was activated to start the vibration.
 - Vibration began as soon as possible after the VC was positioned on the seabed. Sufficient lifting cable and power umbilical was provided to ensure safe operation of the system in all water depths within the investigation area.
 - The umbilical cable was lowered with constant tension at the same rate as the penetration.
 - Abnormal changes in vibration or amperage may indicate hard obstructions such as stones, gravel, or pebbles. If this occurred, the vibromotor was switched off after a maximum of 10 seconds to avoid mechanical damage.
 - Penetration was monitored by an altimeter sensor on the VC frame, which detected the vertical movement of the vibrocore barrel, relative to the seabed.
 - Upon completion, the core barrel was retrieved vertically from the seabed and the VC was recovered to deck.
 - Further attempts were made if material recovery was less than 4.5m.
14. Following the collection of the VCs, the liner was split into one metre sections. The samples were then stored unopened but submitted to basic offshore testing. The sample tubes were all new, undamaged, sufficiently rigid and allowed airtight and watertight sealing. Samples were then labelled with a unique reference number immediately after collection. Samples were then stored vertically in transport crates out of direct sunlight and at the lowest temperature possible to be protected from frost and loss of moisture. The following sample shipment to the designated laboratory was performed as quickly as possible once the vessel was demobilised.

3 Methodology

15. The geoarchaeological assessment methodology is based around two main articles of guidance; Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (COWRIE, 2011) as well as, Environmental Archaeology: a guide to the theory and practice of methods, from sampling to post excavation and Deposit Modelling and Archaeology: Guidance for Mapping Buried Deposits (Historic England, 2020).
16. The phased approach utilised, as set out in Section 3.3.2, will allow a directed development of our collective understanding of the historic environment of the offshore zone and thereby offsetting potential impacts through public benefit, in line with the previously published Outline Marine WSI (Volume 5, Annex 7.2¹) document and guidance in Offshore Geotechnical Investigation and Historic Environment Analysis: Guidance for the Offshore Renewable Energy Sector (COWRIE, 2011).
17. This Phase One geoarchaeological assessment will take the North Sea Prehistory Research and Management Framework (NSPRMF) into account when making recommendations for this opportunity to align with the goals of the NSPRMF. In addition to the ability to fully utilise the results from the currently completed and further planned site investigation works.
18. All core locations have also been compared to The North Sea Palaeolandscapes Project (NSPP), (University of Birmingham, 2011) data, however due to the mapped palaeofeatures extending only partially into the upper eastern part of the ECC boundary and only overlapping with a small number of collected cores NSPP (University of Birmingham, 2011) data has had limited use during the assessment of the VCs included in this report.

3.1 Geoarchaeology briefing session

19. While the VC locations were not selected by an archaeologist, MA provided the geotechnical contractors with an archaeological briefing session, drawing on information contained in Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (COWRIE, 2011). The presentation aimed at increasing awareness of archaeological needs throughout the geotechnical campaign. The session was provided in person at the laboratories in Bristol, UK and to client representatives onboard coring vessels.
20. The overarching purpose of the briefing provided was to enable geotechnical staff working offshore to operate without the presence of an archaeologist on-board the vessel, or the onshore lab while obtaining basic records to appropriate archaeological standards.
21. The presentation covered the following key issues and elements:
 - Introduction;
 - How geotechnical survey is relevant to archaeological investigations;

¹ [OUTER DOWSING OFFSHORE WIND CONSULTATIONS - Outer Dowsing](#)

- Broad background to prehistoric archaeology in offshore contexts, including areas and sites as well as find spots from submerged contexts;
- Sediment types: which are typically of geoarchaeological potential;
- Overview of the archaeological assessment sequence;
 - Core logging;
 - Sampling;
 - Analysis and assessment;
 - Modelling;
 - Reporting;
- Key issues: storing of samples; access to samples; co-operation with other users of samples; collection of archaeology-only sample(s);
- Recording and documentation procedures, including logging, coding, and storage of samples in accordance with the documents and guidelines;
- Information on the procedure to be followed in the event of unexpected archaeological discoveries using a project specific Protocol for Archaeological Discoveries (PAD);
- Summary and Conclusion; and
- Question and Answer Session

22. In addition, a range of briefing material was incorporated, including hand-outs and guidance sheets which were distributed via email and made available to all attendees.

3.2 Geoarchaeological methodology

23. This geoarchaeological campaign was one part of the mitigation strategies in place to offset the impacts to archaeological resources from the ground investigations as well as generate geoarchaeological data in support of future geotechnical campaigns.

24. The assessment of geotechnical cores for deposits of archaeological potential is following a phased approach as described in The Crown Estate, 2010, COWRIE, 2011, and English Heritage, 2011. The proposed phased approach is composed of the following elements:

- **Phase One - Desk based assessment: archaeological review of geotechnical logs** (this and the corresponding Array report);
- Phase Two - Splitting and recording geotechnical cores;
- Phase Three - Sub-sampling and assessment;
- Phase Four - Analysis and dating; and
- Phase Five - Reporting (including publication).

25. This project format is designed to flow sequentially with each phase leading to the subsequent phase of work or representing the end of the assessment if the findings of any stage show that no further work is necessary. Each phase will build on the deposit model, adding more detail and context until the final report is written (Table 1).

3.3 Archaeological Assessment of Sub-Bottom Data

26. The Technical Report provided an initial assessment of the available sub-bottom data (Volume 5, Annex 7.1: Marine and Intertidal Archaeology Technical Report). The initial deposit model from the core logs will be further refined following further assessments of geotechnical data, as laid out in section 3.3.2. A deposit model is vital to provide context for the VCs, allowing the geotechnical core data to be cross referenced with the potential nature, extent, and distribution of palaeolandscapes.

27. The sub-bottom data assessment identified seven palaeochannel features present in the Array Area, which have been used to provide context for the deposits recovered with the VCs. The SBP data for the ECC was not available at the time of writing and therefore has not been assessed for this report.

3.4 Phase One - Desk-Based Assessment: Archaeological Review of Geotechnical logs

28. Initial core recording conducted either onboard the offshore site investigation vessels or in the onshore lab was completed by staff who had undertaken the briefing session as described in Section 3.2. All core logs derived from the collection of geotechnical vibrocores and produced by the geotechnicians were reviewed by a qualified marine archaeologist for the purpose of this Phase One report. Logs that had the potential to contain sediments or layers of possible geoarchaeological potential were identified and the results are presented in Section 3.5.

29. The assessment is based on the location of the cores within the offshore ECC and proximity to palaeochannels identified in the sub-bottom assessment where available as outlined in Section 3.4. In addition to this, assessment has been based on the physical appearance of the sediments recovered and descriptions recorded in the core logs. Following this, the list has been sorted into cores with none, low and high geoarchaeological potential.

- **None;** geoarchaeological potential cannot be determined, for example the core does not reach any Units of geoarchaeological potential.
- **Low;** the geoarchaeological potential is assessed as low, for example it reaches either a Unit that has geoarchaeological potential or is located within or close to a palaeo-feature.
- **High;** The geoarchaeological potential is assessed as high, for example the core reaches both a Unit that has geoarchaeological potential and is located in a palaeo-feature.

30. Only the cores defined as having high geoarchaeological potential have been recommended for Phase Two assessment. The results of the Phase One assessment are presented in Section 4 below and subsequent recommendations for the Phase Two assessment are included in Section 6.

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Legend

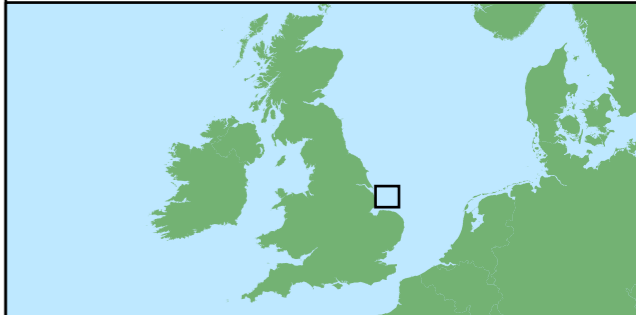
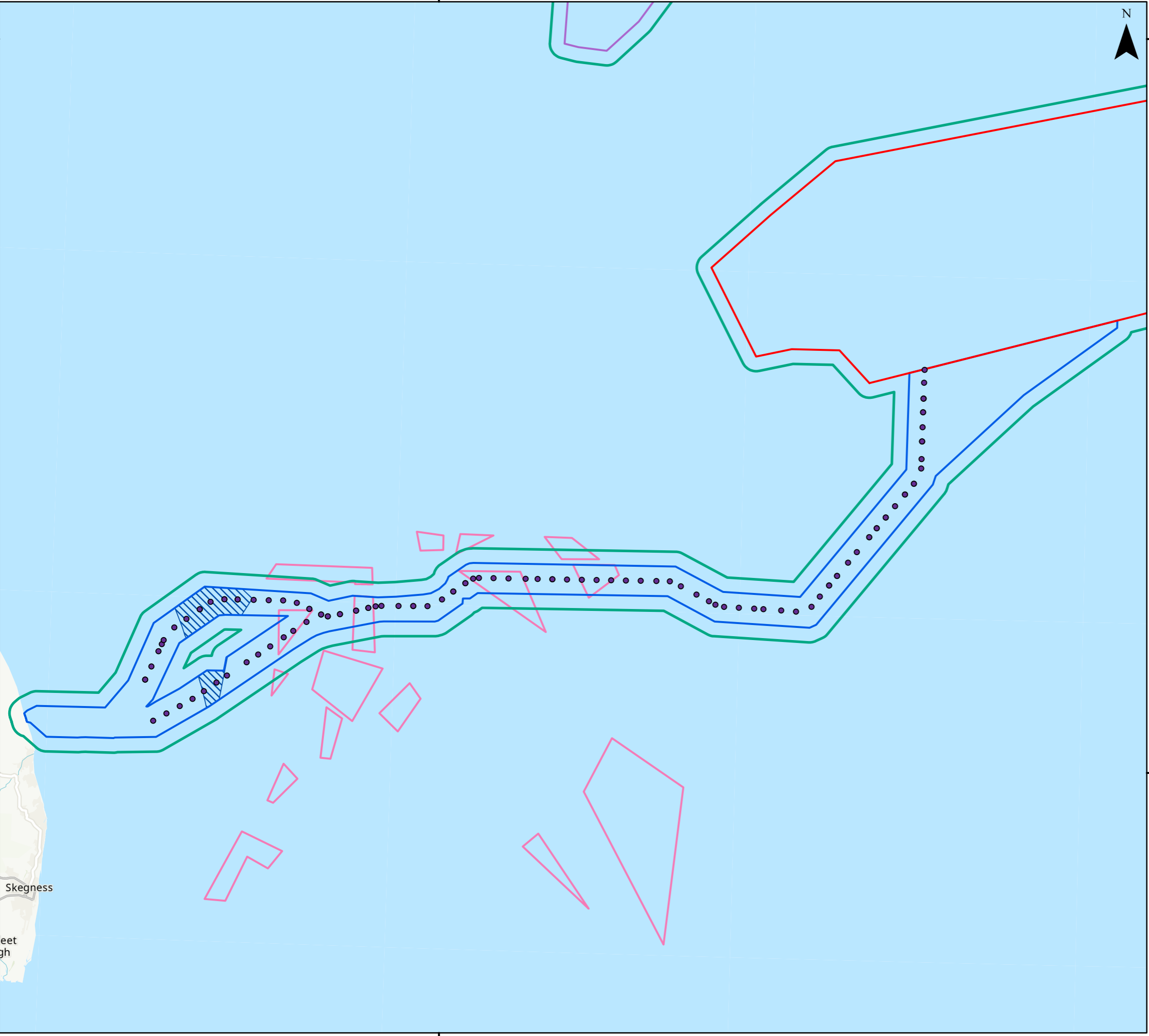
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- Offshore Export Cable Corridor
- 1km Buffer
- ORCP Area
- Artificial Nesting Structure Area
- Biogenic Reef Restoration Area
- Offshore ECC Vibrocores

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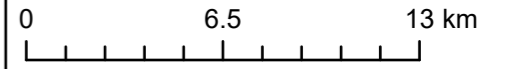
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Coordinate System: WGS 1984 UTM Zone 31N



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Environmental Statement

Locations of the 113 Vibrocores within the ECC assessed in this Phase One Report

Figure 13.1



Date: 09/02/2024
Produced By: LR
Revision: 0.1



Contains ESRI Basemapping;
World Topographic Map: Esri
UK, Esri, TomTom, Garmin,
Foursquare, METI/NASA, USGS

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4 Results

31. This Phase One geoarchaeological assessment has established that the offshore ECC is primarily composed of mobile sandy and gravelly surface deposits, formed into sandwaves and ripples, overlying fine sands and soft clay representing the Botney Cut Formation, which was not seen in the Array Area. Below the Botney cut Formation a complex Boulder Bank Formation is noted, represented of firm to stiff clays and in places gravels.
32. The Egmond Ground Formations have also been observed in the UHRS data (GEOxyz, 2023) across the whole offshore ECC and is believed to be represented by sand and gravels. The Egmond Ground Formation is underlain by the Swarte Bank Formation in localised channels along the ECC and is seen as sand and clay in the UHRS data.
33. Bedrock in the form of Cretaceous Chalk is seen along the offshore ECC and is in places seen just below the Holocene sands.
34. The deposit model and results outlined here cover both AfL Array Area and offshore ECC. The two reports should therefore be read with each other.

4.1 Deposit model

35. The use of a deposit model is crucial for the understanding of the local and regional context of the offshore ECC and AfL Array Area, supporting the archaeological interpretation. As outlined by COWRIE (2011:39) “An archaeological deposit model can illuminate the character and nature of buried sediments and deposits, their vertical extents, their relationship across the area being studied, and their individual levels of archaeological interest”. Guidance on Deposit Modelling and Archaeology (Historic England, 2020) has also been considered, although the guidance does not cover the marine zone.
36. The outline deposit model presented below has been developed based on the results of the geotechnical campaign (Table 1).

Table 1.1 Outline Deposit Model table

Unit	Stratigraphy	Description	Epoch	Geoarchaeological potential
Unit A	Holocene mobile sands	Mobile loose to medium gravelly SAND	Holocene	Sedimentary low geoarchaeological potential, however archaeological artefacts may be located within these sediments
Unit B	Botney Cut Formation	Laminated fine SAND with very soft to soft CLAY	Quaternary, Marine Isotope Stage 2	Potential to contain material of geoarchaeological interest
Unit C	Bolders Bank Formation	Fine to medium SAND and soft to stiff CLAY with sand, gravel chalk and pebbles. At base GRAVEL	Quaternary, Isotope Stage 3-2	Potential to contain material of geoarchaeological interest
Unit D	Egmond Ground Formation	Medium to fine SAND and gravels	Quaternary, Marine Isotope Stage 11	Limited potential to contain material of geoarchaeological interest
Unit E	Swarte Bank Formation	SAND and CLAY with occasional gravel	Quaternary, Marine Isotope Stage 12	Limited potential to contain material of geoarchaeological interest
Unit F	Bedrock	Cretaceous CHALK	Cretaceous	No geoarchaeological interest

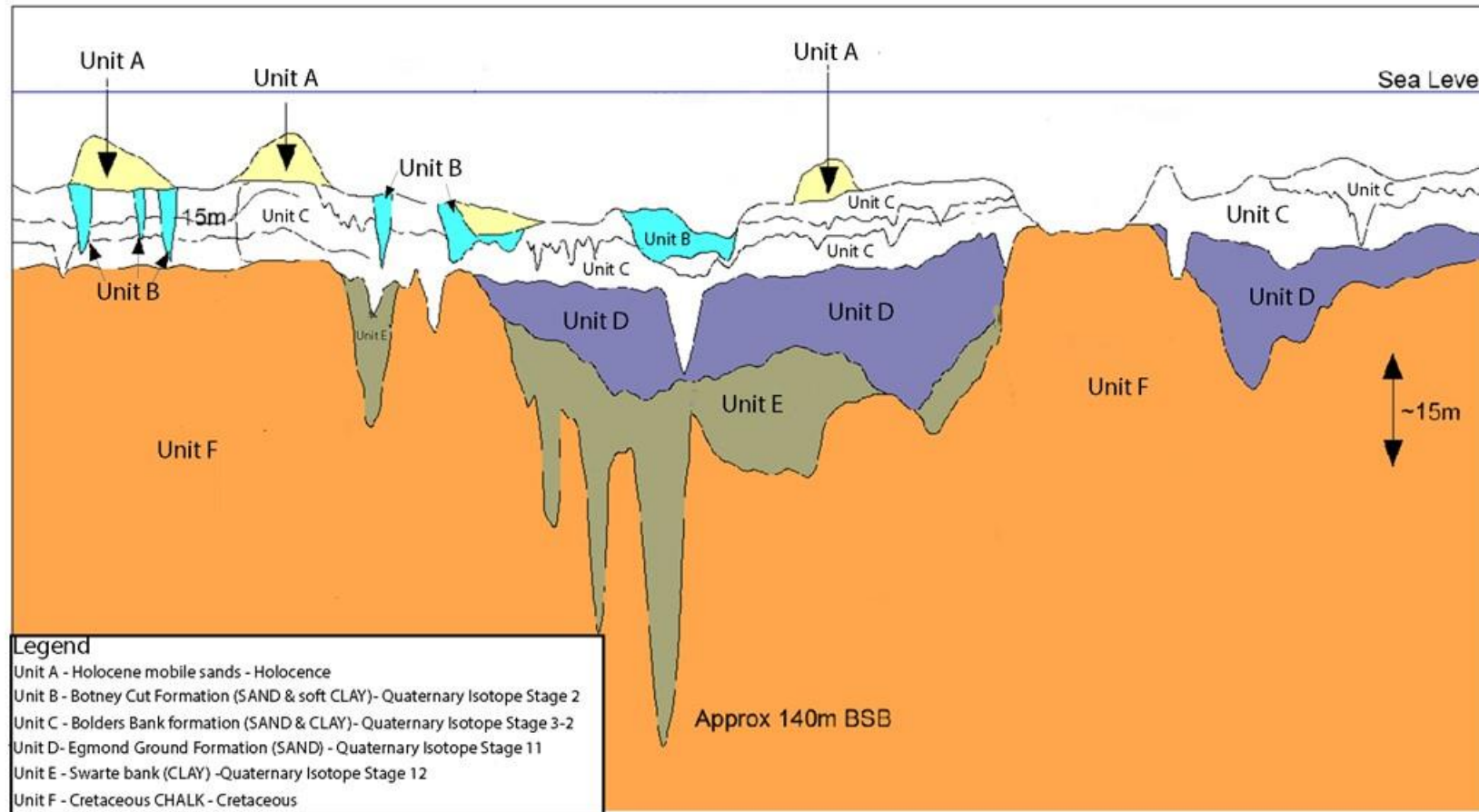


Plate 1 Illustrated outline deposit model. Adapted from Offshore & Nearshore Geophysical & Geotechnical Results & Charts (Vol. 5). GEOxyz, 2023.

4.2 Geoarchaeological Assessment of Vibrocore Logs

37. The results from the Phase One assessment of the 113 VCs in the offshore ECC area are outlined below in Table 2 which shows a summary of the information present in the core logs and a grading, based on each core's geoarchaeological potential and viability for geoarchaeological analysis at Phase Two as set out in Section 3.5.

Table 1.2 Vibrocores assessed in the offshore ECC during Phase One

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B03-VC-000	Medium SAND with gravel overlying firm, dark and reddish brown CLAY with rare pieces of chalk and lenses of organic matter.	5.00	2.25	330899.7	5908294.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B03-VC-001	Medium SAND with gravel overlying stiff CLAY with pieces of chalk and rare lenses of organic matter.	3.30	2.38	329991.0	5906362.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B03-VC-001a	Soft CLAY with fine sand and gravel overlying stiff CLAY with abundant pieces of chalk and rare lenses of organic matter.	3.20	2.96	329993.8	5906362.2	Unit C.	Penetrates Unit C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B03-VC-002	Medium SAND with very fine gravel overlying stiff CLAY of low plasticity overlying stiff silty CLAY.	3.20	2.92	303417.8	5907257.7	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B03-VC-003a	Medium SAND with fine gravels overlying medium clayey SAND. Overlying stiff CLAY with abundant pockets of sand.	5.50	5.11	331126.9	5908779.8	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B03-VC-004	Fine SAND, dark olive brown overlying firm CLAY with slightly fine sand and gravel. Overlying Coarse SAND and medium GRAVEL with occasional pieces of chalk.	4.25	3.87	331252.5	5909054.0	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B04-VC-001	Medium yellowish brown SAND overlying firm CLAY with rare pieces of organic matter and rare fine gravel.	3.30	2.84	331977.9	5909916.5	Unit A, B and C.	Penetrates Units A and B, possible channel infill material, recommended for Phase Two.	High
B04-VC-002	Medium pale brown SAND with very fine to medium gravel overlying dark greyish brown fine SAND. Overlying fine clayey SAND with abundant lenses of clay.	6.12	5.95	332803.9	5910499.2	Unit A.	Penetrates Unit A only, not recommended for Phase Two.	None

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B04-VC-003	Medium dark greyish SAND overlying firm PEAT with rare pieces of clay.	5.10	3.15	333714.0	5911150.3	Unit A, B and C.	Penetrates Units A, B and C possible channel infill material including a layer of peat which has geoarchaeological potential. Recommended for Phase Two.	High
B04-VC-003a	Firm CLAY with occasional pockets of medium sand overlying black PEAT with occasional pieces of wood.	5.01	2.55	333708.6	5911156.5	Unit A, B and C.	Penetrates Units A, B and C possible channel infill material including a layer of peat which has geoarchaeological potential. Recommended for Phase Two.	High
B04-VC-004	Medium brown SAND with rare pieces of clay overlying firm brown CLAY which overlies stiff very dark greyish brown stiff CLAY.	4.11	3.75	334446.5	5911661.8	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B05-VC-001	Medium light olive brown SAND overlying firm brown CLAY with rare pieces of organic matter.	3.95	3.50	335389.8	5911838.3	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B05-VC-001a	Medium brown SAND with rare cobble and shell fragments overlying firm brown CLAY with rare pieces of organic matter.	4.40	2.75	335389.5	5911834.0	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B05-VC-002	Medium pale brown SAND overlying stiff brown CLAY and firm brown CLAY with rare pieces of organic matter.	4.32	2.70	336288.7	5911818.3	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B05-VC-002a	Medium light olive brown SAND overlying stiff dark brown CLAY.	4.31	2.25	336292.7	5911824.3	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B05-VC-003a	Fine, light yellowish brown SAND overlying medium light olive brown SAND. Overlying Stiff brown and dark brown CLAY with rare pieces of organic matter.	3.82	2.60	337381.7	5911793.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B05-VC-004a	Medium greyish brown SAND overlying stiff dark greyish brown CLAY.	3.01	2.10	338407.9	5911769.8	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	Overlying fine light yellowish brown SAND and stiff dark greyish brown CLAY with rare pieces of organic matter.						potential. Not recommended for Phase Two.	
B05-VC-005	Medium, silty brown SAND overlying medium clayey dark grey SAND. Overlying stiff and very stiff dark greyish CLAY with occasional pieces of organic matter.	2.35	2.00	339390.3	5911755.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B06-VC-001	Medium dark yellowish brown SAND overlying firm, very dark greyish brown CLAY. Overlying very stiff, very dark greyish brown CLAY with rare pieces of organic matter.	3.18	2.35	340322.3	5911591.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B06-VC-002	Medium, dark greyish brown SAND overlying firm to stiff, dark brown CLAY and fine, very dark greyish brown SAND. Overlying very stiff, dark brown CLAY.	4.00	3.51	341173.6	5911174.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B06-VC-002a	Medium, dark greyish brown SAND overlying Firm brown CLAY and fine SAND with abundant lenses of clay and rare pieces of organic matter.	4.21	3.60	341174.8	5911181.8	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B06-VC-003	Medium, dark grey SAND overlying medium yellowish SAND with a lens of firm CLAY and fine clayey dark greyish brown SAND.	1.50	1.40	341975.3	5910796.3	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B06-VC-003a	Medium and very dark grey SAND overlying firm CLAY and fine yellowish brown SAND with lenses of clay.	1.60	1.60	341975.7	5910798.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07a-VC-000	Medium, very dark greyish brown SAND overlying firm and very stiff brown CLAY with chalk inclusions.	1.80	1.65	342429.6	5910672.2	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07a-VC-000a	Medium, dark olive brown SAND overlying brown stiff	2.70	2.40	342434.3	5910672.2	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	CLAY with fine sand and chalk inclusions.						potential. Not recommended for Phase Two.	
B07a-VC-001	Medium, dark greyish brown SAND overlying stiff, dark greyish brown CLAY and very stiff dark greyish brown CLAY with abundant pieces of chalk.	3.05	2.11	343260.5	5910821.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07a-VC-001a	Medium, very dark grey SAND overlying firm, dark greyish brown CLAY. Overlying dark greyish brown vary stiff CLAY with abundant pieces of chalk.	3.21	2.17	343258.5	5910820.0	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07a-VC-002	Fine, very dark greyish brown SAND overlying firm dark greyish brown CLAY with few inclusions.	2.22	2.07	344362.1	5911059.5	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07a-VC-002a	Medium, very dark greyish brown SAND overlying firm very dark greyish brown CLAY with pockets of medium clayey sand.	2.22	1.80	344357.3	5911058.9	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	Overlying Firm reddish brown CLAY.							
B07a-VC-003	Medium, brown SAND with rare clay inclusions overlying medium sandy CLAY. Overlying very stiff, dark greyish brown CLAY with abundant pieces of chalk.	3.20	2.70	345187.8	5911245.5	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07a-VC-003a	Medium, light yellowish brown SAND overlying firm, dark greyish brown CLAY with rare pieces of chalk. Overlying very stiff, dark greyish brown CLAY with occasional medium gravel and abundant chalk pieces.	2.50	1.66	345192.8	5911246.3	Units A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07a-VC-004	Medium, brown SAND with occasional clay overlying structureless white CHALK of medium density.	6.00	5.90	345689.0	5911354.5	Unit A and F.	Penetrates Units A and F. Not recommended for Phase Two.	None
B07b-VC-001	Very soft, dark olive CLAY overlying fine, light olive brown and greyish brown	6.00	5.88	346085.3	5911384.5	Unit A and F.	Penetrates Units A and F. Not recommended for Phase Two.	None

Core ID	Soil description	Penetration/Recovery (m)	Easting	Northing	Units penetrated	Interpretation	Priority	
	SAND. Overlying white, structureless CHALK.							
B07b-VC-002	Medium, silty light olive brown SAND overlying structureless white and uncompact CHALK.	6.00	5.87	347247.8	5911378.7	Unit A and F.	Penetrates Units A and F. Not recommended for Phase Two.	None
B07b-VC-003	Medium, light olive brown silty SAND overlying dark brown stiff CLAY with gravel inclusions.	4.63	3.15	348250.6	5911371.1	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07b-VC-003a	Medium, dark brown SAND overlying firm, very dark greyish brown sandy CLAY.	4.10	2.50	348252.2	5911375.9	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B07b-VC-004a	Fine, brown SAND with occasional shell fragments, overlying firm, dark greyish brown CLAY. Overlying thickly laminated firm CLAY with thickly laminated silt and thickly laminated CLAY with thickly laminated	5.14	4.45	349221.7	5911367.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	SAND. Overlying firm brown CLAY.							
B08-VC-001	Medium greyish brown GRAVEL overlying firm, brown CLAY with some fine gravel.	5.12	2.45	350209.9	5911823.3	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B08-VC-002	Medium, brown SAND overlying coarse SAND with fine gravel. Overlying medium dark greyish brown GRAVEL, overlying stiff, brown CLAY.	3.08	2.80	350979.8	5912360.3	Units A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B08-VC-002a	Medium, pale brown and brown GRAVEL overlying very stiff, dark brown CLAY with silty and gravelly pockets.	3.46	3.05	350976.1	5912366.8	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B08-VC-003	Medium, greyish brown Gravel overlying stiff, dark brown CLAY with fine sand inclusions and rare lenses of sand.	3.53	3.00	351800.9	5912933.1	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B08-VC-003a	Medium, greyish brown GRAVEL overlying stiff, dark brown CLAY with rare pieces of organic matter.	2.62	2.30	351801.9	5912927.0	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B08-VC-004	Medium, brown sandy GRAVEL overlying stiff, greyish brown CLAY. Overlying a thin layer of fine, yellowish brown silty SAND, overlying stiff, dark brown CLAY.	3.21	2.65	352332.4	5913241.1	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B09-VC-001	Medium, light olive brown SAND, overlying firm to very stiff, dark grey to brown CLAY.	3.09	2.60	352724.4	5913286.2	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B09-VC-002a	Fine, olive brown, SAND overlying stiff, brown sandy CLAY with rare pieces of organic matter and rare charcoal.	3.01	2.40	353720.8	5913274.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B09-VC-003	Medium, brown, gravelly SAND overlying stiff,	2.50	2.08	354739.8	5913252.3	Unit A and C.	Penetrates Units A and C, located in area of low	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	reddish brown CLAY with rare pieces of chalk and organic matter.						geoarchaeological potential. Not recommended for Phase Two.	
B09-VC-004	Medium, dark greyish brown SAND overlying medium GRAVEL. Overlying stiff, very dark greyish brown CLAY.	3.41	2.47	355904.4	5913228.7	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B09-VC-005	Medium, light brownish grey SAND.	3.50	3.10	356723.3	5913218.3	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B09-VC-006	Medium, pale brown gravelly SAND.	2.60	2.40	357723.1	5913195.5	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B09-VC-006a	Medium, pale brown gravelly SAND.	2.60	2.25	357728.2	5913199.8	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B09-VC-007	Medium, pale brown gravelly SAND, overlying stiff, reddish brown with medium gravel inclusions.	4.90	4.80	358723.9	5913178.9	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	Overlying stiff, dark brown CLAY.						recommended for Phase Two.	
B09-VC-008	Medium, yellowish brown SAND, overlying stiff dark brown CLAY with coarse gravel. Overlying stiff brown CLAY.	5.22	5.00	359731.6	5913162.7	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B09-VC-009	Medium, brown SAND overlying medium dark grey SAND. Overlying stiff, brown gravelly CLAY with rare pieces of organic matter.	5.00	4.71	360738.0	5913147.1	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B09-VC-010	Medium brown gravelly SAND overlying stiff, dark brown CLAY. Overlying firm, reddish brown CLAY, overlying stiff, dark greyish brown CLAY with rare pieces of organic matter.	5.00	4.67	361728.9	5913129.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B09-VC-011	Fine, brown and dark greyish brown SAND overlying thickly laminated soft, dark grey CLAY. Overlying very thinly	6.00	5.95	362734.3	5913110.9	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	bedded, fine and very dark grey SAND. Overlying thickly laminated fine, very dark grey SAND.							
B09-VC-012	Medium, brown and greyish brown gravelly SAND, overlying medium, very dark grey SAND.	5.21	4.75	363743.3	5913095.1	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B09-VC-013b	Fine, dark greyish brown SAND, overlying sandy dark grey CLAY. Overlying thinly bedded fine SAND with thickly laminated clay inclusions.	6.00	5.80	364809.1	5913078.7	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B09-VC-014	Medium, very dark greyish brown SAND overlying fine, very dark grey silty SAND with rare pieces of organic matter. Overlying thickly laminated, dark grey silty and sandy CLAY.	6.00	5.80	365727.7	5913057.1	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B10-VC-001	Medium greyish brown gravelly SAND, overlying thickly laminated, very soft CLAY of medium plasticity with rare detritus.	6.00	5.95	366477.2	5912718.7	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B10-VC-002	Medium, greyish brown gravelly SAND overlying fine and very thinly bedded, dark grey SAND. Overlying medium, light olive brown silty SAND.	6.00	5.35	367541.4	5912154.6	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B10-VC-003	Medium, yellowish brown SAND overlying yellowish brown gravelly SAND. Overlying fine to medium, very dark grey SAND overlying stiff, black pseudo-fibrous PEAT, overlying medium, dark yellowish brown SAND.	4.90	4.75	368390.3	5911699.6	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B10-VC-004	Medium, brown gravelly SAND, overlying medium, very dark grey silty SAND. Overlying firm dark greyish brown CLAY and medium, dark greyish brown gravelly SAND.	4.46	5.10	368830.4	5911465.6	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B11-VC-001	Medium, brown and dark grey gravelly SAND overlying medium, dark grey and pale brown SAND.	5.60	5.20	369420.6	5911317.1	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B11-VC-002	Medium, brown gravelly SAND overlying stiff greyish brown, CLAY with occasional chalk inclusions.	5.00	4.70	370426.8	5911257.5	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B11-VC-003	Fine, dark yellowish brown very gravelly SAND overlying stiff to firm, dark brown sandy CLAY. Overlying medium, dark yellowish silty SAND, overlying stiff to very stiff, very dark greyish brown CLAY.	4.85	3.75	371469.6	5911196.0	Unit A and C.	Penetrates Units A and C. Indication of organic material. Recommended for Phase Two.	High
B11-VC-004	Medium, brown SAND, overlying medium to very stiff dark greyish brown CLAY with occasional chalk.	3.77	2.55	372099.2	5911160.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B11-VC-005	Fine, light yellowish brown and greyish brown SAND.	2.97	2.05	373311.1	5911072.1	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B11-VC-006a	Fine, pale brown and greyish brown SAND.	2.52	1.95	374319.4	5910993.0	Unit A.	Only penetrates Unit A in area of mega ripples. Not	None

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
							recommended for Phase Two.	
B12-VC-001a	Medium, light yellowish brown SAND, overlying fine, greyish brown SAND. Overlying thinly laminated soft CLAY with occasional lenses of organic matter.	6.00	5.75	375375.6	5911321.7	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B12-VC-002	Medium, light yellowish brown SAND, overlying thickly laminated, dark greyish brown CLAY. Overlying firm, dark greyish brown SILT, overlying very thinly bedded dark greyish brown CLAY.	6.00	5.72	375942.4	5912018.6	Unit A and B.	Penetrates Units A and B, representative of channel infill. Recommended for Phase Two.	High
B12-VC-003	Medium, brown SAND overlying firm to very stiff, dark brown CLAY with rare pieces of chalk and organic matter.	3.06	2.45	376574.7	5912780.2	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B12-VC-003a	Medium, pale brown gravelly SAND, overlying firm to stiff, dark greyish	3.00	2.55	376573.1	5912771.3	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	brown CLAY with occasional chalk.						recommended for Phase Two.	
B12-VC-004	Fine, yellowish brown SAND, overlying medium yellowish brown gravelly SAND. Overlying firm to very stiff, dark greyish brown CLAY with rare pieces of organic matter.	3.31	2.99	377113.5	5913428.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B12-VC-004a	Medium, black and very dark grey SAND, overlying soft, very dark grey CLAY. Overlying firm to stiff, greyish brown CLAY with occasional chalk pieces.	3.28	2.65	377117.7	5913422.6	Unit A, B and C.	Penetrates Units A, B and C. Indication of organic material. Recommended for Phase Two.	High
B12-VC-005a	Medium, olive brown gravelly SAND, overlying stiff, very dark greyish brown CLAY, with occasional chalk pieces.	4.80	3.50	377864.2	5914328.5	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B12-VC-006	Medium SAND overlying medium, black slightly organic GRAVEL. Overlying soft to stiff very dark greyish brown CLAY, with	5.00	4.25	378462.2	5915047.0	Unit A, B and C.	Penetrates Units A, B and C. Indication of organic material. Recommended for Phase Two.	High

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	bands of medium, dark yellowish brown SAND.							
B12-VC-007	Fine, pale brown and dark grey SAND.	3.00	2.80	379309.5	5916058.8	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B12-VC-007a	Fine, pale brown and dark grey SAND.	3.00	2.70	379304.0	5916064.4	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B12-VC-008	Fine, pale brown and dark grey SAND.	2.71	2.63	379817.9	5916674.7	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B12-VC-008a	Fine, pale brown and dark grey SAND.	3.50	2.95	379816.3	5916672.0	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B12-VC-009	Fine, pale brown and dark grey SAND.	2.75	2.65	380431.9	5917404.1	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B12-VC-009a	Fine, pale brown and dark grey SAND with lenses of organic matter.	3.11	2.90	380429.5	5917406.3	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B12-VC-010a	Medium, greyish brown gravelly SAND, overlying firm, brown to dark greyish brown sandy CLAY. Overlying Firm, very dark greyish brown CLAY, overlying firm, very dark greyish brown CLAY, with abundant chalk pieces.	6.00	4.40	381065.2	5918175.5	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B12-VC-011	Stiff, very dark greyish CLAY, overlying fine, dark greyish brown SAND. Overlying firm, very dark greyish brown Clay.	4.40	2.17	381742.8	5918974.8	Unit C.	Penetrates Unit C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B12-VC-011a	Stiff, dark grey, sandy CLAY, with occasional chalk pieces and lenses of fine sand.	4.50	3.00	381739.1	5918969.8	Unit C	Penetrates Unit C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B12-VC-012	Medium, pale brown SAND, overlying firm, dark greyish brown CLAY, with occasional pieces of chalk and rare lenses of sand.	4.26	3.35	382349.1	5919703.8	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B12-VC-012a	Medium, dark greyish brown SAND, overlying firm, dark brown CLAY with occasional chalk pieces.	4.25	2.35	382347.8	5919705.9	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B13-VC-001	Fine, dark yellowish brown SAND, overlying firm, dark yellowish brown CLAY. Overlying very stiff, very dark grey CLAY with occasional chalk pieces.	4.40	2.80	382846.1	5920744.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B13-VC-002a	Stiff, brown CLAY, overlying fine, brown SAND. Overlying very stiff, very dark grey CLAY with occasional chalk pieces.	4.22	3.00	382870.0	5921386.1	Unit C.	Penetrates Unit C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B13-VC-003	Medium, pale brown SAND, overlying fine, dark grey and black SAND. Overlying coarse, very dark grey and black SAND.	5.90	3.84	382906.9	5922587.1	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B13-VC-003a	Medium, light olive brown gravelly SAND, overlying fine, light yellowish brown SAND. Overlying very dark	4.96	3.95	382911.6	5922582.1	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	greyish brown and dark olive brown SAND.							
B13-VC-003b	Medium, pale brown and dark grey SAND, overlying coarse, light olive and greyish brown SAND.	6.00	5.83	382903.3	5922590.0	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B13-VC-004	Medium, pale brown and dark grey SAND.	3.05	2.85	382939.6	5923554.2	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B13-VC-005	Medium, dark grey and pale brown SAND.	3.04	2.90	382975.2	5924574.4	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B13-VC-005a	Medium, light yellowish brown SAND.	2.86	2.05	382973.6	5924573.6	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B13-VC-006	Fine, light yellowish brown gravelly SAND, overlying firm to stiff, very dark greyish brown and very dark brown CLAY with occasional lenses of organic matter.	5.19	3.20	383007.0	5925506.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B13-VC-006a	Medium to coarse, brown and dark greyish brown	5.07	3.05	383011.4	5925506.9	Unit A and C.	Penetrates Units A and C, located in area of low	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	SAND, overlying firm to stiff, dark greyish brown CLAY.						geoarchaeological potential. Not recommended for Phase Two.	
B13-VC-006b	Coarse to medium, light yellowish and greyish brown SAND, overlying very stiff, dark greyish brown CLAY with occasional chalk pieces.	5.00	3.40	383001.5	5925505.0	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B13-VC-007	Medium, brown gravelly SAND, overlying stiff to very stiff dark grey CLAY with occasional chalk.	5.50	2.53	383043.2	5926586.9	Unit A, B and C.	Penetrates Units A, B and C. Located in area of previously identified wetland deposits. Possibly recovered Unit B, infill deposit. Recommended for Phase Two.	High
B13-VC-008	Medium, light yellowish brown SAND and GRAVEL, overlying soft, grey CLAY. Overlying firm black to dark grey CLAY, overlying very stiff, dark greyish brown CLAY.	5.10	4.15	383079.7	5927464.0	Unit A, B and C.	Penetrates Units A, B and C. Located in area of previously identified wetland deposits. Possibly recovered Unit B, infill deposit. Recommended for Phase Two.	High
B14-VC-001	Medium, black silty SAND, overlying firm to stiff, dark greyish brown CLAY.	2.90	2.47	340982.1	5910291.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological	Low

Core ID	Soil description	Penetration/Recovery (m)	Easting	Northing	Units penetrated	Interpretation	Priority	
						potential. Not recommended for Phase Two.		
B14-VC-002	Medium to fine, dark brown SAND, overlying firm to stiff, very dark greyish brown CLAY, with abundant pieces of chalk.	4.20	3.34	340077.8	5909682.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B14-VC-003	Medium, dark brown SAND, overlying stiff, very dark greyish brown CLAY with abundant chalk and rare layers of chalk.	2.20	1.84	339431.1	5909243.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B14-VC-004a	Medium, brown gravelly SAND. Overlying medium, dark greyish brown silty SAND.	5.60	5.34	338509.0	5908623.8	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B14-VC-005a	Medium, pale brown occasionally gravelly SAND.	5.20	4.67	337690.1	5908072.1	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B15-VC-001	Medium, light yellowish brown gravelly SAND, overlying thinly bedded to firm dark brown CLAY.	6.00	4.75	334847.6	5906162.5	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
							recommended for Phase Two.	
B15-VC-002	Medium, light yellowish brown gravelly SAND, overlying soft, dark greyish brown CLAY. Overlying thinly bedded grey and dark greyish brown SAND, which overlies medium, light olive and greyish brown silty SAND.	6.00	6.00	333992.6	5905573.5	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B15-VC-003	Medium, very dark greyish brown and brown SAND, overlying firm, very dark greyish brown SAND. Overlying firm, black CLAY with abundant pieces of peat. Overlying stiff, very dark grey and very dark greyish brown sandy CLAY with abundant chalk pieces.	5.60	5.10	333219.3	5905050.5	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B15-VC-004	Medium, brown clayey SAND, overlying very stiff dark greyish brown sandy CLAY. Overlying medium,	4.48	4.10	332346.7	5904561.4	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not	Low

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	very dark greyish brown SAND, overlying stiff, dark greyish brown CLAY with abundant chalk pieces.						recommended for Phase Two.	
B15-VC-005	Soft, dark greyish brown sandy CLAY overlying firm to stiff, dark greyish brown CLAY with abundant chalk pieces.	2.60	2.55	331440.6	5904058.0	Unit C.	Penetrates Unit C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B15-VC-006a	Medium, dark greyish brown silty CLAY, overlying stiff, dark greyish brown sandy CLAY.	2.97	2.55	330538.0	5903559.7	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not recommended for Phase Two.	Low
B17-VC-001a	Medium, pale brown gravelly SAND, overlying medium, greyish brown SAND. Overlying coarse to medium, greyish brown to pale brown SAND.	6.00	5.55	336902.9	5907543.9	Unit A.	Only penetrates Unit A in area of mega ripples. Not recommended for Phase Two.	None
B17-VC-002	Medium, dark brown SAND overlying fine, very dark greyish brown GRAVEL. Overlying stiff to very stiff, dark greyish	3.49	2.65	335564.3	5906639.6	Unit A and C.	Penetrates Units A and C, located in area of low geoarchaeological potential. Not	Low

Core ID	Soil description	Penetration/Recovery (m)	Easting	Northing	Units penetrated	Interpretation	Priority
	brown CLAY, with abundant chalk pieces.					recommended for Phase Two.	

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Legend

- Array Area
- Offshore Export Cable Corridor
- 1km Buffer
- ORCP Area
- Artificial Nesting Structure Area
- Biogenic Reef Restoration Area

Priority

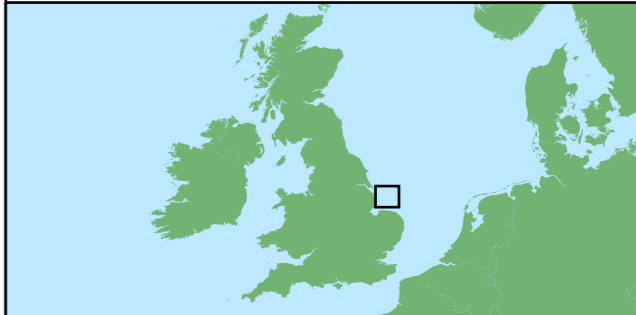
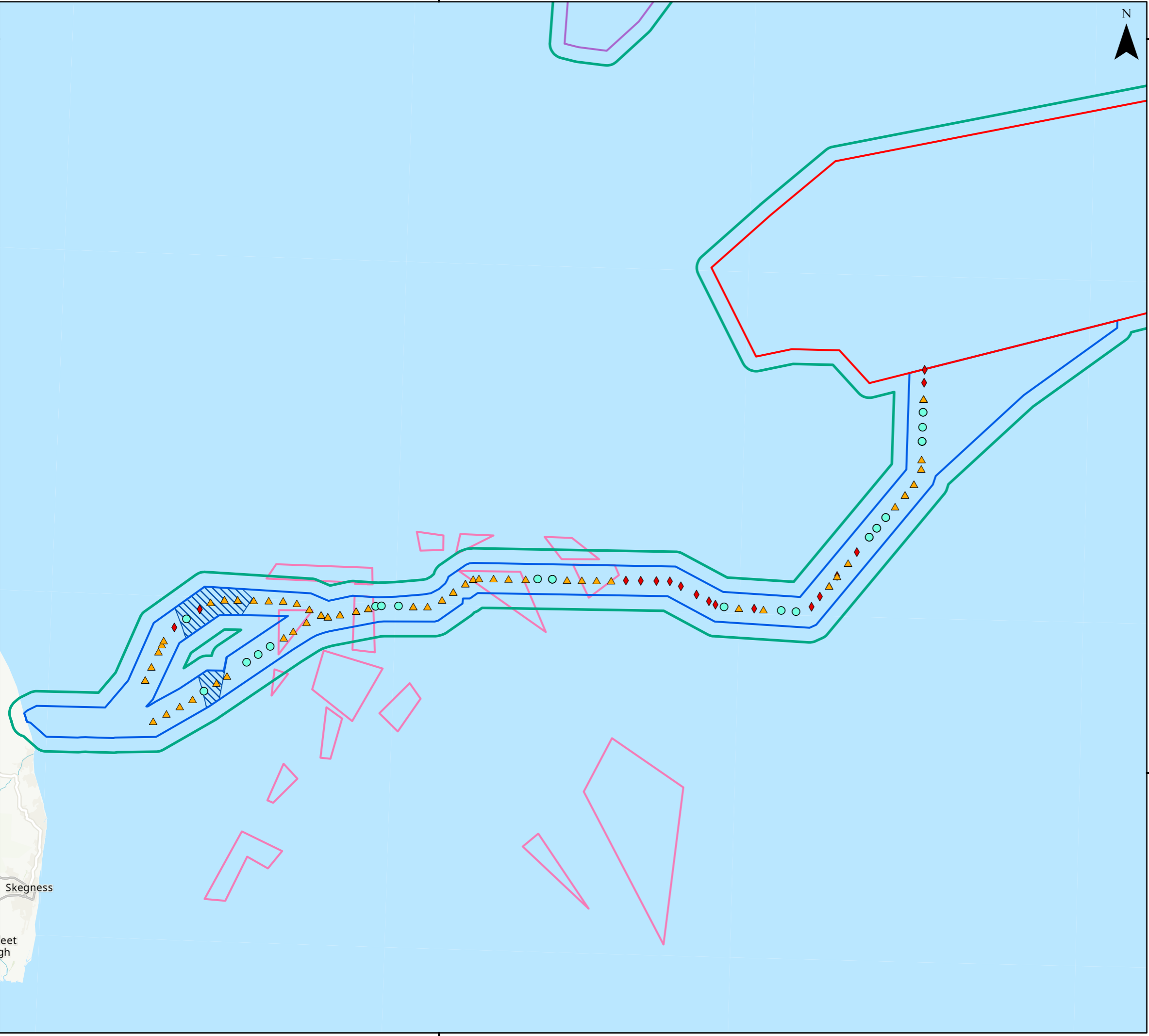
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- ▲ Low
- None

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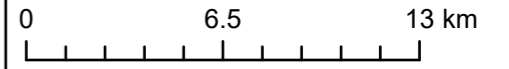
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Coordinate System: WGS 1984 UTM Zone 31N



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Environmental Statement

Vibrocores of high, low and of no geoarchaeological potential within the ECC

Figure 13.2



Date: 09/02/2024
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Revision: 0.1



Contains ESRI Basemapping;
World Topographic Map: Esri
UK, Esri, TomTom, Garmin,
Foursquare, METI/NASA, USGS

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5 Discussion

38. In total, 113 geotechnical VCs were collected in the offshore ECC area, using a vibrocorer to a maximum target depth of 6m. These cores were subsequently assessed according to the methodology set out in Section 3. After being assessed for geoarchaeological potential individually, 26 cores were determined to have no geoarchaeological potential and were labelled as none. Sixty nine were defined as having low geoarchaeological potential and 18 were defined as having a high geoarchaeological potential (and are, therefore, considered to be valuable for understanding the palaeoenvironmental context of the Project).
39. Sub-bottom data for the offshore ECC has not been included in this assessment, further the NSPP data does not extend into the majority of the offshore ECC, therefore the colour and composition of sediments, as well as descriptions recognised in the core logs, were used as the primary indicators of geoarchaeological potential.
40. Following the assessment completed in line with the methodology set out in Section 3.5, 18 cores have been designated as having high geoarchaeological potential, as detailed in Table 3.
41. Of the high potential cores recommended for Phase Two assessment, three cores indicate organic material (B11-VC-003, B12-VC-004a and B12-VC-006). Organic deposits, especially Peat can have similar appearance to shallow gas on sub-bottom data which has been noted across the ECC (GeoXYZ, 2023). The presence of organic material can therefore have a wider extent than what is seen within the core material.
42. In 17 of the cores Unit B, the Botney Cut Formation was noted, the deposit is assumed to be present within infilled glacial valleys that have eroded into the Bolders Bank Formation. Channels filled with Botney Cut Formation have been noted on the sub-bottom data as present across the ECC in several places (GEOxyz, 2023). In two of the cores (B13-VC-007 and B13-VC-008) Unit B could be associated with a wetland environment as also noted in the NSPP data.

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- Legend**
- Array Area
 - Offshore Export Cable Corridor
 - 1km Buffer
 - ORCP Area
 - Artificial Nesting Structure Area
 - Biogenic Reef Restoration Area
 - High Priority Offshore ECC Vibrocores

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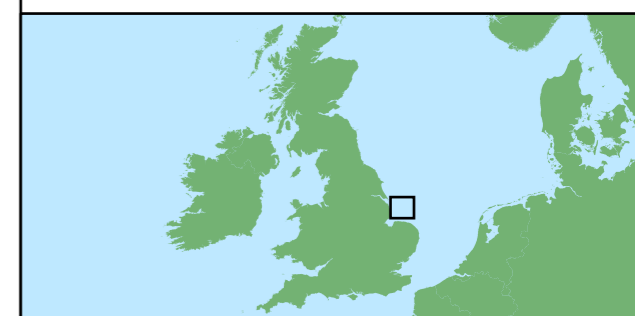
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Environmental Statement

Vibrocores of high geoarchaeological potential

Figure 13.3



Date: 09/02/2024
Produced By: LR
Revision: 0.1



Contains ESRI Basemapping;
World Topographic Map: Esri
UK, Esri, TomTom, Garmin,
Foursquare, METI/NASA, USGS

6 Recommendations for Phase Two assessments

43. In summary, it is recommended that 18 cores all of which are classified as having high geoarchaeological potential be logged for archaeological assessment during Phase Two, these cores are recorded in Table 3. This will involve accessing the core material to identify the deposits that have potential to yield material suitable for subsampling.
44. The subsampling of these cores during a Phase Two assessment will allow for the collection of valuable palaeoenvironmental data. This should maximise the opportunity to align with the research objectives of the NSPRMF which will be specified in forthcoming reporting.
45. Phase two assessments are to be undertaken in line with the phased approach outlined in COWRIE (2011) guidance, post consent, should consent be given as agreed in the WSI.

Table 1.3 Vibrocores defined as having high potential

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
B04-VC-001	Medium yellowish brown SAND overlying firm CLAY with rare pieces of organic matter and rare fine gravel.	3.30	2.84	331977.9	5909916.5	Unit A, B and C.	Possible channel infill material.	High
B04-VC-003	Medium dark greyish SAND overlying firm PEAT with rare pieces of clay.	5.10	3.15	333714.0	5911150.3	Unit A, B and C.	Possible channel infill material including a layer of peat.	High
B04-VC-003a	Firm CLAY with occasional pockets of medium sand overlying black PEAT with occasional pieces of wood.	5.01	2.55	333708.6	5911156.5	Unit A, B and C.	Possible channel infill material including a layer of peat.	High
B09-VC-011	Fine, brown and dark greyish brown SAND overlying thickly laminated soft, dark grey CLAY. Overlying very thinly bedded, fine and very dark grey SAND. Overlying thickly laminated fine, very dark grey SAND.	6.00	5.95	362734.3	5913110.9	Unit A and B.	Possible channel infill material.	High
B09-VC-012	Medium, brown and greyish brown gravelly SAND, overlying medium, very dark grey SAND.	5.21	4.75	363743.3	5913095.1	Unit A and B.	Possible channel infill material.	High
B09-VC-013b	Fine, dark greyish brown SAND, overlying sandy dark grey CLAY. Overlying thinly bedded fine SAND	6.00	5.80	364809.1	5913078.7	Unit A and B.	Possible channel infill material.	High

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	with thickly laminated clay inclusions.							
B09-VC-014	Medium, very dark greyish brown SAND overlying fine, very dark grey silty SAND with rare pieces of organic matter. Overlying thickly laminated, dark grey silty and sandy CLAY.	6.00	5.80	365727.7	5913057.1	Unit A and B.	Possible channel infill material.	High
B10-VC-001	Medium greyish brown gravelly SAND, overlying thickly laminated, very soft CLAY of medium plasticity with rare detritus.	6.00	5.95	366477.2	5912718.7	Unit A and B.	Possible channel infill material.	High
B10-VC-002	Medium, greyish brown gravelly SAND overlying fine and very thinly bedded, dark grey SAND. Overlying medium, light olive brown silty SAND.	6.00	5.35	367541.4	5912154.6	Unit A and B.	Possible channel infill material.	High
B10-VC-003	Medium, yellowish brown SAND overlying yellowish brown gravelly SAND. Overlying fine to medium, very dark grey SAND overlying stiff, black pseudo-fibrous PEAT, overlying medium, dark yellowish brown SAND.	4.90	4.75	368390.3	5911699.6	Unit A and B.	Possible channel infill material.	High
B10-VC-004	Medium, brown gravelly SAND, overlying medium, very dark grey silty SAND. Overlying firm dark	4.46	5.10	368830.4	5911465.6	Unit A and B.	Possible channel infill material.	High

Core ID	Soil description	Penetration/Recovery (m)	Easting	Northing	Units penetrated	Interpretation	Priority
	greyish brown CLAY and medium, dark greyish brown gravelly SAND.						
B11-VC-003	Fine, dark yellowish brown very gravelly SAND overlying stiff to firm, dark brown sandy CLAY. Overlying medium, dark yellowish silty SAND, overlying stiff to very stiff, very dark greyish brown CLAY.	4.85	3.75	371469.6	5911196.0	Unit A and C. Possible channel infill material. Indication of organic material.	High
B12-VC-001a	Medium, light yellowish brown SAND, overlying fine, greyish brown SAND. Overlying thinly laminated soft CLAY with occasional lenses of organic matter.	6.00	5.75	375375.6	5911321.7	Unit A and B. Possible channel infill material.	High
B12-VC-002	Medium, light yellowish brown SAND, overlying thickly laminated, dark greyish brown CLAY. Overlying firm, dark greyish brown SILT, overlying very thinly bedded dark greyish brown CLAY.	6.00	5.72	375942.4	5912018.6	Unit A and B. Possible channel infill material.	High
B12-VC-004a	Medium, black and very dark grey SAND, overlying soft, very dark grey CLAY. Overlying firm to stiff, greyish brown CLAY with occasional chalk pieces.	3.28	2.65	377117.7	5913422.6	Unit A, B and C. Possible channel infill material. Indication of organic material.	High
B12-VC-006	Medium SAND overlying medium, black slightly organic GRAVEL. Overlying soft to stiff very dark	5.00	4.25	378462.2	5915047.0	Unit A, B and C. Possible channel infill material.	High

Core ID	Soil description	Penetration/Recovery (m)		Easting	Northing	Units penetrated	Interpretation	Priority
	greyish brown CLAY, with bands of medium, dark yellowish brown SAND.						Indication of organic material..	
B13-VC-007	Medium, brown gravelly SAND, overlying stiff to very stiff dark grey CLAY with occasional chalk.	5.50	2.53	383043.2	5926586.9	Unit A, B and C.	Located in area of previously identified wetland deposits.	High
B13-VC-008	Medium, light yellowish brown SAND and GRAVEL, overlying soft, grey CLAY. Overlying firm black to dark grey CLAY, overlying very stiff, dark greyish brown CLAY.	5.10	4.15	383079.7	5927464.0	Unit A, B and C.	Located in area of previously identified wetland deposits.	High

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