RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Environmental Statement

Volume 7

Appendix 22-6 Geoarchaeological Desk Based Assessment

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Glossary

Term	Definition
Horizontal Directional Drill (HDD)	HDD is a trenchless technique to bring the offshore cables ashore at the landfall and can be used for crossing other obstacles such as roads, railways and watercourses onshore.
Jointing Bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The point on the coastline at which the Offshore Export Cables are brought onshore, connecting to the onshore cables at the Transition Joint Bay (TJB) above mean high water.
Link Boxes	An underground metal box placed within a concrete pit where the metal sheaths between adjacent export cable sections are connected and earthed, installed with a ground level manhole to allow access to the link box for regular maintenance or fault-finding purposes.
Onshore Converter Stations	A compound containing electrical equipment required to transform HVDC and stabilise electricity generated by the Projects so that it can be connected to the electricity transmission network as HVAC. There will be one Onshore Converter Station for each Project.
Onshore Development Area	The Onshore Development Area for ES is the boundary within which all onshore infrastructure required for the Projects would be located including Landfall Zone, Onshore Export Cable Corridor, accesses, Temporary Construction Compounds and Onshore Converter Stations.
Onshore Export Cable Corridor	This is the area which includes cable trenches, haul roads, spoil storage areas, and limits of deviation for micro-siting. For assessment purposes, the cable corridor does not include the Onshore Converter Stations, Transition Joint Bays or temporary access routes; but includes Temporary Construction Compounds (purely for the cable route).

Term	Definition
Onshore Export Cables	Onshore Export Cables take the electric from the Transition Joint Bay to the Onshore Converter Stations.
Onshore Substation Zone	Parcel of land within the Onshore Development Area where the Onshore Converter Station infrastructure (including the haul roads, Temporary Construction Compounds and associated cable routeing) would be located.
Other trenchless techniques	Other techniques (aside from HDD) for installation of ducts or cables where trenching may not be suitable such as micro tunnelling or auger boring.
Priority Areas	Areas within the Onshore Development Area defined as priority for Archaeological Geophysical Survey as agreed with the ETG in the Written Scheme of Investigation for Archaeological Geophysical Survey. The criteria for Priority Areas are set out in the Written Scheme of Investigation.
The Applicants	The Applicants for the Projects are RWE Renewables UK Dogger Bank South (East) Limited and RWE Renewables UK Dogger Bank South (West) Limited. The Applicants are themselves jointly owned by the RWE Group of companies (51% stake) and Masdar (49% stake).
Transition Joint Bay (TJB)	The Transition Joint Bay (TJB) is an underground structure at the landfall that houses the joints between the Offshore Export Cables and the Onshore Export Cables.
Trenching	Open cut method for cable or duct installation

Acronyms

Term	Definition
AOD	Above Ordnance Datum
AoP	Areas of Potential
BC	Before Christ (used to indicate that a date is before the Christian era).
BGL	Below Ground Level
BGS	British Geological Survey
BP	Before Present
DEM	Digital Elevation Model
DMV	Deserted Medieval Village
GPS	Global Positioning System
HDD	Horizontal Directional Drilling
HER	Historic Environment Record
KA	Thousand years ago
LGM	Last Glacial Maximum
MYA	Million Years Ago
NGR	National Grid Reference
NHLE	National Heritage List for England
NMP	National Mapping Programme
OS	Ordnance Survey
PA	Priority Areas for Archaeological Geophysical Survey

Term	Definition
PEIR	Preliminary Environmental Information Report
RSL	Relative Sea Level
SSEAW	Soil Survey of England And Wales
TJB	Transition Joint Bay
WSI	Written Scheme of Investigation

22.6 Geoarchaeology Desk Based Assessment

22.6.1 Introduction

22.6.1.1 Project Background

1. AOC Archaeology Group was commissioned to undertake a Geoarchaeological Desk-Based Assessment of the Dogger Bank South (DBS) East and DBS West Offshore Wind Farms Onshore Development Area encompassing the potential landfall locations, onshore export cable corridor and Onshore Substation Zones.

2. The study area within this assessment was undertaken on an earlier iteration of the Onshore Development Area which has since undergone further refinement as part of detailed site selection and route refinement works. This document has not been updated following the refinement of the Onshore Development Area for the Environmental Statement (ES) as should be read as a point in time document as produced for the Preliminary Environmental Information Report (PEIR).

3. The study area presented in this report is wider than the PEIR boundary. Area 3: Leven to Woodmansey and Area 4: Beverley to Risby and Bentley of this assessment are no longer included in the Onshore Development Area but remain part of this assessment. The previous iteration of the Onshore Development Area is delineated as "Onshore Study Area" on the figures accompanying this report. Sources of information included in the assessment comprise but are not limited to:

- Geological and soil maps;
- Existing reports on previous environmental and archaeological works along the onshore export cable corridor; and
- Academic research papers related to the study area.

4. A review of the geoarchaeology of the north of England (Usai, 2005) highlights the presence of significant geoarchaeological deposits within Holderness and the Hull Valley. This review aims to highlight areas of potential geoarchaeological interest which have informed **Volume 7, Chapter 22 Onshore Archaeology and Cultural Heritage (application ref: 7.22)**.

22.6.1.2 Site Description

5. The Onshore Study Area consists of options for the landfall, onshore export cable corridor and Onshore Substation Zones within which the onshore substation could be located.

6. The Onshore Export Cable Corridor options within the Onshore Study Area are approximately 500m in width and head south-west from the landfall options towards Dunnington Lane before heading south to Sigglesthorne and then turning south-west towards Beverley. The onshore export cables will connect to the onshore convertor stations near to the existing Creyke Beck National Grid substation south of Beverley. The Onshore Study Area includes two onshore export cable route options between Meaux Lane and Creyke Beck (**Figure 22-6-1**).

7. The vast majority of current land-use around the Onshore Study Area is arable farmland and the landscape contains numerous small villages, with larger urban centres located to the north (Bridlington) and south-west (Beverley).

8. Following the drafting of this report the Onshore Study Area which was presented throughout the PEIR has been refined to the Onshore Development Area for the ES.

22.6.1.3 Development Impacts

9. The development impacts outlined below are informed by the project design outlined in **Volume 7, Chapter 5 Project Description (application ref: 7.5)**. **Volume 7, Chapter 22 Onshore Archaeology and Cultural Heritage (application ref: 7.22)**. Area 3: Leven to Woodmansey and Area 4: Beverley to Risby and Bentley no longer form part of the Onshore Development Area but have been retained in this report. In terms of this assessment the key development impacts considered are at:

- Landfall;
- Onshore Export Cables; and
- Onshore Converter Stations.

22.6.1.4 Aims and objectives

10. The aims of this study are:

- To further understand geological changes across the proposed onshore export cable route;
- To better understand the varying depths of deposits likely to be present; and

- To build towards a better understanding of the archaeological and geoarchaeological landscape

11. The aims of this report are:

- To review available existing/historic geotechnical and geoarchaeological sources of information in order to establish the geoarchaeological and palaeoenvironmental potential; and
- To prepare a fully illustrated report on the results of the geoarchaeological desk-based review that is compliant with all relevant policy, guidance and good practice and which is proportionate to the results, making recommendations for suitable (justified and proportionate) further work.

22.6.2 Methodology

22.6.2.1 Study Area

12. For ease of discussion and for the purposes of this Geoarchaeological Desk-Based Assessment, the Onshore Study Area has been divided into six areas (**Figure 22-6-2**), comprising:

- Area 1: Skipsea (landfalls) (**Figure 22-6-3**);
- Area 2: Skipsea to Leven (**Figure 22-6-4**);
- Area 3: Leven to Woodmansey (**Figure 22-6-5**);
- Area 4: Beverley to Risby and Bentley (**Figure 22-6-6**);
- Area 5: Routh to Beverley (**Figure 22-6-7**); and
- Area 6: Creyke Beck (onshore substations) (**Figure 22-6-8**).

13. An initial review of BGS (2022) borehole records within the Onshore Study Area (within which it is considered deposits would reflect those likely to be found within the landfall locations, onshore export cable route and Onshore Substation Zones) revealed insufficient records to characterise deposits and as such a Geoarchaeological Study Area was defined which comprised the Onshore Study Area plus a 500m buffer.

14. Many of the borehole records used in this study have only a very brief description of the lithologies. For example, a unit described as “Clay” could be alluvium, tidal flat deposits, head, till or glaciolacustrine. In interpreting this, judgement has been used, based on the likely stratigraphy at that location and depth.

15. The Paleoenvironmental Study Area extends 10km from the Onshore Study Area. Palaeoenvironment records and literature have been reviewed for relevant sites surrounding each section within 10km either side of the Onshore Study Area.

16. The following data sources were consulted during preparation of this desk-based assessment:

- British Geological Survey (BGS) Single Onshore Boreholes Index (SOBI); for records of boreholes, shafts and wells from all forms of drilling and site investigation work within the Onshore Study Area;
- Ordnance Survey (OS); for OS Terrain® 50 mapping for contour and spot height data for the Onshore Study Area;
- Environment Agency; for LiDAR Composite Digital Terrain Model (DTM) at 2m spatial resolution;
- Soil Survey of England and Wales; for soil mapping of the Geoarchaeological Study Area;
- ESRI (Environmental Systems Research Institute) Digital Globe, GeoEye, Earthstar Geographics; for satellite imagery showing the Onshore Study Area;
- Britain from Above; for online aerial photographs showing the Onshore Study Area;
- The Humber Wetlands Project; for records relating to investigations within the Geoarchaeological Study Area; and
- Publications and grey literature reports concerning previous archaeological and palaeoenvironmental investigations within the Paleoenvironmental Study Area as listed in section 22.6.3.3 and section 22.6.3.4.

17. This assessment refers to Geophysical Survey Priority Areas which are also presented in the accompanying figures. The 25 Priority Areas (PAs) were defined in agreement with the Expert Topic Group as part of the DBS Written Scheme of Investigation Archaeological for Geophysical Survey (RWE, 2022).

22.6.3 Desktop Review

22.6.3.1 Geology

22.6.3.1.1 Overview of Onshore Study Area

18. The Onshore Study Area is located within the Hull Valley and Holderness on low lying terrain generally at elevations of less than 20m Above Ordnance Datum (AOD). The natural drainage direction across the Onshore Study Area is south and west toward the Hull valley.

19. The Onshore Study Area is underlain by solid geological deposits of chalk belonging to the White Chalk Subgroup. The BGS (2022) geology maps show the bedrock within the Onshore Study Area to comprise the following formations (from oldest to youngest bedrock age):

- Burnham Chalk Formation (Area 6);
- Flamborough Chalk Formation (Areas 2-5); and
- Rowe Chalk Formation (Areas 1-2).

20. The BGS (2022) geology maps show that various superficial deposits underlie the Onshore Study Area. These deposits include (from oldest to youngest deposit age):

- Basement Till (diamicton);
- Skipsea Till (diamicton);
- Lacustrine Sand, Silt and Clay Deposits;
- Glaciofluvial Sand and Gravel Deposits;
- River Terrace Sand and Gravel Deposits; and
- Alluvial Clay Silt and Sand Deposits.

21. The oldest glacial deposit underlying the Onshore Study Area is the Basement Till, which is dated to the Wolstonian (Catt, 2007). This is overlain by the Skipsea till which is of Devensian age. Radiocarbon dates of 18,500 ± 400 14 calendar years (C yrs.) Before Present (BP) and 18,240 ± 250 BP obtained by Penny *et al.* (1969) on plant remains between the Basement and Skipsea Tills provide a maximum age for the onset of the Dimlington Stadial in the region (Rose, 1985). An additional date for the onset of the Stadial of 17,500 ± 1,600 BP was obtained by thermoluminescence techniques from beneath the Skipsea Till on the Wolds dip slope (Wintle and Catt, 1985).

22. The western limit of the Basement till lies along the OS 510000m line, although some outcrops extend towards the OS 505000m line around Leconfield and Cottingham. The overlying Skipsea till largely mirrors this distribution and demarcates the former limit of the Dimlington Stadial (22,000 to 13,000 year ago) North Sea glacier lobe (Bateman *et al.* 2015).

23. The diamicton glacial till is the main deposit from the last (Devensian) cold stage and underlies the majority of the Onshore Study Area. Till is deposited by glacial ice, either at the glacier base or derived from material within and on the ice. It comprises gravelly sandy silty clay with boulders and contains numerous lenses of sand and gravel. The till is also likely to contain interdigitating units of glaciolacustrine clay, plus sand and gravel formed during ice advance and retreat (Burke *et al.* 2015).

22.6.3.1.2 Area 1: Skipsea

24. Area 1 of the Geoarchaeology Study Area, including the landfall works at Skipsea, is underlain by a bedrock of Rowe Chalk Formation formed approximately 66 to 84 million years ago (mya) in the Cretaceous Period, under a shallow warm sea environment. Superficial geological deposits in Area 1 are variable. Diamicton till of Devensian date covers the largest portion of the area however patches of lacustrine sands silts and clays are mapped and may mark the location of former meres as mapped by Sheppard (1957). These lacustrine deposits likely accumulated in a depression in the pre-Holocene land surface and may be analogous to the Skipsea Withow Mere deposits initially studied by Gilbertson *et al.* (1984) and more recently studied by Dinnin and Lillie (1995). These lacustrine deposits have excellent potential for preservation of palaeoenvironmental remains having been sealed by colluvium.

25. Extending north out of Area 1 are alluvial clay silt sand and gravel deposits. These deposits are mapped in close association with Devensian glaciofluvial deposits (possibly eskers) which likely influenced the location of the alluvial channels. The alluvial deposits also occur in association with the modern channels of both the east and west branches of the Skipsea Drain. The Skipsea Drain is part of a longer watercourse called Stream Ditch or Dike which collected water from the higher grounds to its south and drained much of the land around Skipsea. The Stream Dike was embanked in the 18th century as part of the wider drainage of the Geoarchaeology Study Area.

22.6.3.1.3 Area 2: Skipsea to Leven

26. The chalk bedrock in Area 2 of the Geoarchaeology Study Area is Rowe Chalk Formation until it crosses the Beeford Road west of Upton where the underlying bedrock changes to Flamborough Chalk. The Flamborough Chalk formed 72 to 86 mya in the Cretaceous Period in a local environment previously dominated by warm chalk seas. Mapped superficial deposits within Area 2 are largely dominated by till relating to the Last Glacial Maximum (LGM) with areas of glaciofluvial sands and gravels and alluvial deposits mapped in the south-west where Onshore Study Area crosses the Catfoss Drain.

22.6.3.1.4 Area 3: Leven to Woodmansey

27. Area 3 of the Geoarchaeology Study Area is underlain by a solid geology of Flamborough Chalk. Superficial alluvial deposits are common across Area 3 and occur in association with former alluvial channels now in use as straightened drainage ditches such as the Meaux and Routh East Drain and the Holderness Drain. In the south of Area 3, near Woodmansey, alluvial deposits occur in association with the River Hull. Small patches of glaciofluvial sand and gravel deposits are also present across Area 3 and mark local topographic high points often reflected in place names such as the nearby 'Sand Hill'. The remainder of Area 3 is underlain by superficial diamicton till deposits.

22.6.3.1.5 Area 4: Beverley to Risby and Bentley

28. Area 4 of the Geoarchaeology Study Area is underlain by Flamborough Chalk until west of Bentley where deposits of Burnham Chalk are mapped before returning again to Flamborough Chalk. Alluvial deposits are present north of Bentley along the Blackmeredale Bottom. The majority of superficial deposits mapped by the BGS (2022) are diamicton till.

22.6.3.1.6 Area 5: Routh to Beverley

29. Area 5 of the Geoarchaeology Study Area is underlain by a solid geology of Flamborough Chalk. Alluvial deposits are present along the floodplain of the River Hull and the adjacent associated north to south aligned Beverley and Barmston Drain and the west to east aligned South Bullock Dike. These deposits directly related to the River Hull and drainage of the Hull valley. The remainder of Area 5 is underlain by superficial diamicton till deposits.

22.6.3.1.7 Area 6: Onshore Substation Zone

30. The eastern half of Area 6 of the Geoarchaeology Study Area is underlain by Flamborough Chalk whereas the western area is underlain by deposits of Burnham Chalk. The majority of superficial deposits mapped by the BGS (2022) are diamicton till. Deposits of sand and gravel of 'uncertain origin' are mapped in the east part of the Geoarchaeology Study Area. These are fine grained, unconsolidated, gravels and sands and may be associated with braided fluvial systems of the Hull valley or perhaps be of glaciofluvial origin.

22.6.3.2 Soils

31. A review of soil survey data held by the Soil Survey of England and Wales (SSEAW) and readily available online satellite imagery and aerial photography has been undertaken to inform a review of soils and land use. The soils in the Geoarchaeology Study Area are mainly influenced by the geology and superficial till deposits, where glacial clays are inter-bedded with sands and gravels.

32. Soils of the Holderness series dominate Areas 1-3 of the Geoarchaeology Study Area. The Holderness soils occupy relatively level ground whilst the Burlingham series is present on more sloping land, including hummocks on the till plain. Alluvial soils are also common and present along streams and drains where Fladbury series occurs as narrow strips winding between undulations of the till. Elsewhere glaciofluvial deposits associated with the till give rise to coarse loamy Arrow soils and Holderness soils with a coarse loamy topsoil. The soils within Area 1 are loamy and clayey with impeded drainage as a consequence of their association with the former mere deposits around Skipsea.

33. The flanks of the chalk Wolds at the south-western extremity of the Geoarchaeology Study Area within the western edge of Area 4, have well drained loamy soils. In contrast the flat, poorly drained areas of the Hull valley within Areas 3-6 associated with the mapped alluvial deposits are mainly characterised by gley soils, with some areas of freely drained brown earths. The varied depositional history means that the character of the overlying deposits changes across the Geoarchaeology Study Area. The LiDAR data shows changes in topography hinting at subtle depressions in landscape which appear to mark the route of various palaeochannels.

34. While soils in the Onshore Study Area are frequently mapped as semi-waterlogged, the continued drainage of land across Holderness and the Hull valley from the medieval period onwards has reduced the once extensive wetland carr areas (Sheppard, 1976). These drainage measures combined with rich soils of glacial till and alluvium have meant the modern landscape is dominated by intensive agriculture, primarily arable cultivation. Post-medieval narrow ridge and furrow was largely located in the lower lying areas adjacent to the River Hull, benefiting from the fertile alluvial deposits found on the floodplain. The resulting field patterns are of note with irregular field boundaries visible on areas that were subject to pre-parliamentary enclosure largely located on the higher ground. The field systems lying in the former carrs were some of the last areas of Holderness and the Hull valley to be enclosed and as such are notably more regular in plan (Chapman, 2000).

35. Grassland pasture is evident on the poorly drained areas or on poorer clay soils although these uses are very limited within the Geoarchaeology Study Area. Field boundaries on the lower-lying areas within the Hull valley are usually ditched for increased drainage, while on the higher ground hedged boundaries are more common. Woodland is very sparse across the Geoarchaeology Study Area and is present only in small copses or beside water courses. The modern settlement pattern was broadly established by the medieval period and reflects limited availability of dry areas prior to the effective drainage schemes of the 18th and 19th centuries.

36. Shrinkage of former peat land along with smaller scale 20th century drainage measures to facilitate agriculture have resulted in the drains having water levels several metres higher than the surrounding land (Van de Noort and Ette, 2000).

37. Topographically, evidence for settlement and land division within the study area can be seen ranging from elevations of up to 40m OD on the Wold edge at Risby down to approximately 2m in the Hull Valley itself, although most sites are above 3m OD. Known archaeological settlement sites are commonly located on slightly higher ground which presumably would have ensured that they remained relatively dry, a trend that continued for settlements into the medieval period and beyond.

22.6.3.3 Geoarchaeology and Palaeoenvironmental Background

38. During the latter stages of the last (Devensian) Ice Age, the Hull Valley and Holderness were covered by an ice lobe (North Sea Lobe) extending down the eastern margins of the North Sea Basin as far as North Norfolk, depositing extensive till and glaciofluvial sands and gravels across the region. During the colder Pleistocene periods, global sea levels were substantially lower than today and the Geoarchaeology Study Area occupied part of an important location on the western margins of 'Doggerland' now submerged beneath the southern North Sea but which formerly linked the Humber to northwest Europe (Gaffney *et al.* 2007).

39. Following the final retreat of the ice sheet (<13 ka BC), there was a rapid incision of the river valleys down to contemporary sea-level, creating steep sided valleys up to 9m deep (Van de Noort, 2000) now largely infilled with Holocene sediment. Large numbers of lakes formed in depressions left in the till (kettle holes and pingos). These water filled depressions are locally known as meres and many were sufficiently deep to ensure the survival of open water into the Holocene (Head *et al.* 1995). While Hornsea Mere remains as the only larger surviving open water body a significant number of former meres containing Late Glacial deposits of palaeoenvironmental importance survive across the landscape.

40. Following desk-based geoarchaeological reporting on geotechnical works (AOC, 2019) which identified peat units (e.g., 51996_BH05-6), a purposive geoarchaeological borehole investigation was undertaken at Ulrome by AOC Archaeology Group in 2020. The investigation followed identification of peat deposits identified in the vicinity of the Stream Dyke (Skipsea Drain) as part of geotechnical works for the Dogger Bank Creyke Beck Offshore Wind Farms (AOC, 2020).

41. The boreholes (AOCBH1 and AOCBH3) revealed a basal sequence of sand deposits interpreted as glacio-fluvial activity from the end of the Devensian glaciation, as noted at Routh Quarry (Geary, 2008). In AOCBH2 this was overlain by over 2m of fine-grained organic silt indicative of low energy deposition, from low moving or standing water, and indicates wetland or marshy conditions. Peat was found to be over 2m in thickness in AOCBH1 and a thin Holocene alluvial silty sandy was found to be sandwiched between the peat and underlying Pleistocene.

42. The presence of organic silt and peat deposits in the boreholes in combination with organic deposits observed during previous phases of work allowed for modelling of the Stream Dyke which was shown to be somewhat wider than the narrow channel of the modern Stream Dyke thus indicating the presence of a wider paleochannel or a kettle hole. The deeper central channel of the Stream Dyke has been infilled with peat and organic silt alluvium the thickness of which indicates that infilling of the channel/kettlehole was sustained and consistent beyond the early Holocene and thus may preserve palaeoenvironmental evidence for later landscape formation processes.

43. The Neolithic and Bronze Age site at West Furze (Fletcher and Van de Noort, 2007) is located in close proximity and although now a modern and straightened drainage channel, the Stream Dyke is evidently of some antiquity and is mentioned in association with Skipsea Castle in 1546 and in accounts of drainage in Skipsea Parish in 1765 (Allison, 2002). Previous studies of kettlehole deposits from Skipsea Withow (Gilbertson *et al*. 1984), Barmston (Brigham and Jobling, 2015) and Hornsea (Flenley, 1987), have shown them to have Late Quaternary / Holocene origins with long lasting presence in the landscape (Bateman *et al.* 2010).

44. Palaeoecological studies carried out at Skipsea Withow Mere, (Gilbertson *et al*. 1984), Barmston Mere (Dinnin and Lillie, 1995; Brigham and Jobling, 2015) and Brandesburton (Van de Noort and Ellis., 1995) in Holderness and at Routh Quarry (Geary, 2008) and Gransmoor Quarry (Walker *et al.* 1993) in the Hull valley have provided key information about late glacial environments. Studies from Roos Bog Holderness (Beckett, 1981) and Starr Carr in the Vale of Pickering (Day, 1996; Dark, 1998; Taylor *et al.* 2018; Taylor and Allison, 2018) provide important data for the understanding of past environments in the wider area and in particular provide dated continuous sequences which are largely absent from the Holderness and Hull valley palynological record (Van de Noort *et al.* 2000). These pollen records have allowed the development of the post-glacial environment in the area to be reconstructed as a series of 'Regional Pollen Assemblage Zones' (Beckett, 1981) that have been tentatively dated (Flenley, 1991; Lillie and Geary, 2000).

45. The earliest late glacial pollen records date from c. 13,000-12,400 BP and indicate an open landscape with few trees of birch, willow and juniper. Between 12,000 and 11,000 BP an expansion of birch woodland is evident although discrepancies between the records from Gransmoor (Walker *et al.* 1993) and Roos Bog (Beckett, 1981) indicate local climatic variations. Between 11,000 and 10,200 BP the pollen records form Roos Bog, Gransmoor and Star Carr all indicate deterioration in climate evidenced by a decrease in tree species and an increase in open ground conditions with herbs suggestive of unleached and calcium-rich soils (e.g. Helianthemum), and woody taxa limited to isolated patches of birch or hazel scrub (Lillie and Geary, 2000).

46. Birch and Scots Pine dominated the area as the tundra-like conditions of the Loch Lomond Interstadial gave way to the early Holocene, with probably smaller areas of juniper and willow between 10,200-9,500 BP. As the climate ameliorated further, hazel and elm began to dominate around 9,500-9,000 BP, with alder also increasing, and ash, lime and oak also appearing, beginning to shade out hazel and some of the other 'pioneer' species (Lillie and Geary, 2000)

47. Large-scale clearance of woodlands on the dry ground did not happen until the later Bronze Age and Iron Age by which time much of north-east Holderness and the Hull valley was dominated by eutrophic wetlands with transgression and encroachment of intertidal events. Alder dominated the marginal wetlands forming carr woodland, while pine and lime were more prevalent on free-draining soils. Following the elm decline (c. 3,800 cal BC), oak, hazel and lime dominated within woodlands until large-scale clearance from 1,000 cal BC (Van de Noort and Ellis., 1995). Although the earliest evidence for woodland clearance dates to c. 4,000 cal BC, these are typically small-scale and impermanent and are reflected in the archaeological record by evidence of temporary seasonal activity in the form of Mesolithic and Neolithic flint scatters. Investigations at Routh Quarry have shown that Mesolithic groups were exploiting the rich riparian environments of the region in a landscape that exhibited a mixed range of vegetation types (Lillie and Geary, 2000).

48. Palynological investigations at Brandesburton were undertaken following finds of a Maglemosian harpoon (Van de Noort and Ellis, 1995). The pollen diagram from this site is low resolution and focuses on organic material within the sequence. It is interpreted as representative of the Late Glacial, Post Glacial, Atlantic, Sub-boreal and modern periods. During the Late Glacial, birch is the dominant tree taxa accompanied by abundant herbaceous plants such as grasses and sedges. The Post Glacial begins with a dominance of birch, giving way to an expansion of pine and hazel in low frequencies. The Atlantic period is characterised by a sharp rise in alder. Higher up the sequence is a mixed oak forest taxa followed by pollen types associated with deforestation and animal husbandry with modern taxa represented in the final 20cm of the record (Clark and Godwin, 1957).

49. Records of late Holocene environmental change within the palynological record are constrained due to the effects of post-medieval drainage, arable exploitation and urban and industrial development. Sea-level rise continued until c. 500 BC, followed by drier conditions and a phase of marine regression during the late Iron Age and Romano-British period. Palynological data are sparse for the Iron Age and Romano-British periods. However, the relatively thick sequences of peat recorded within the aforementioned AOCBH1 near Ulrome have been found to preserve palaeoenvironmental proxies, such as pollen.

50. The dates obtained from AOCBH1 span the period from the Mesolithic (7029BP / 5986 – 5842 cal BC) at 2.74m, through the Neolithic (4151BP / 2874 – 2655 cal BC) at 1.66m, to the Bronze Age to Iron Age transition (2464BP / 758 – 421 cal BC) at 0.61m with an estimated sedimentation accumulation rate of 0.06 per 10mm (approximately 16 years per 10mm) between 0.61 – 1.66m and 0.04 per 10mm (approximately 27 years per 10mm) between 1.66 – 2.74m. Although it is probable that sedimentation rates will have varied over time, in response to variations in environmental conditions, these rates provide a good indication that there has been ongoing accumulation of sediment with no evidence of significant hiatuses within the record. Further analysis of these deposits thus may help in establishing a more secure mid-late Holocene sequence for the Geoarchaeology Study Area which in turn would contribute to our understanding of local environments, landscape formation processes and anthropogenic activity, prior to its drainage for modern agriculture (Millburn and Robertson, 2022).

51. The landscape of the Geoarchaeology Study Area went through a transformation over the course of the post-medieval period, largely as a result of extensive drainage schemes (Shephard, 1976) gradually reducing the impact and frequency of flooding in the lower lying carrs. Where

previously these carrs had been underwater for much of the year, by the mid-19th century they were largely dry (Shephard, 1976). The move to enclosure also effected a substantial change across north-east Holderness and within the Hull valley. It signified a shift away from the communal, open field methods of the medieval period and reflects an intensification of agriculture during this period. In the 20th century there was a further shift from mixed farming of arable and pastoral to primarily arable use with many former areas of meadow and permanent grassland drained and converted to arable (Middleton 1995).

22.6.3.4 Archaeological and Historical Background

52. Evidence of occupation from as early as the Mesolithic has been recovered from the area of Holderness including Brandesburton, Hornsea, Gransmoor and Skipsea in the form of barbed points of bone and antler and a Mesolithic blade core found during fieldwalking at Ulrome (Brigham et.al. 2008). In addition, finds of waterlogged wood artefacts and objects such as quernstones, along with the Middle Bronze Age / Iron Age 'lake dwelling' at Round Hill near Ulrome suggest that occupation of the area was fairly continuous throughout the prehistoric period (Brigham et.al., 2008, 63). Excavations at Weel have also illustrated the potential for sites of Mesolithic and early Neolithic date to survive well beneath alluvial deposits (Van de Noort *et al.* 2000). While no archaeological features pre-dating the Iron Age were encountered during recent archaeological investigation works associated with the Dogger Bank Wind Farm A and B programme 1, numerous palaeochannels were noted and the recovery of 746 residual struck and worked flints indicate an early prehistoric presence in the vicinity of AOCBH1, which corresponds to other evidence of early prehistoric activity in the area (Morris, 2021).

53. Roman occupation of the area is known from various finds including pottery assemblages recovered from areas of the Hull Valley (Van de Noort, 2004: 119), varied finds from the cliff and beach at Ulrome (Brigham et. al., 2008: 63) and two Romano-British farmsteads uncovered during construction of the bypass at Leven (ibid: 34). Recent survey undertaken from aerial photography of the Hull valley (Evans et. al., 2012) shows an extensive range of Roman and Iron Age archaeology, particularly features relating to land division and enclosures. Trackways were also identified, indicating that movement through the landscape was managed, and features were identified at as low as 3m AOD (ibid).

54. An extensive programme of archaeological excavation undertaken in advance of onshore works associated with the Dogger Bank Wind Farm A and B programme 1 recorded a network of Pre-Roman Iron Age or Roman boundary ditches as well as evidence of a small Pre-Roman Iron Age or Roman settlement (a ring gully and enclosure ditches) (Morris, 2021) north-east of the geoarchaeological investigations at AOCBH1 near Ulrome.

55. Environmental evidence shows that occupation of the area during the early medieval period declined, and the area was recolonised in the later medieval period with structures such as the motte and bailey castle at Skipsea and religious houses such as Meaux Abbey and Watton Priory being constructed (Van de Noort, 2004: 129). Moated sites, mainly constructed between 1250 and 1350 are also quite common in the Hull Valley and Holderness regions (ibid. The Domesday Survey of 1086 includes most of the villages in the Geoarchaeology Study Area (Catfoss, Routh, Sigglesthorne, Skidby and Skipsea). Beverley was not included within the area of Holderness, but had its own wapentake (Allison, 1984). Excavations at Sigglesthorne within Area 2 of the Geoarchaeology Study Area found traces of a 13th-14th century cobbled trackway possibly leading from the neighbouring village, Seaton, to Sigglesthorne Church, and several 13th-14th and 14th-15th century field boundaries (Carrott, Hall and Jaques, 2003).

56. Large-scale drainage of the area was undertaken during the post-medieval period and by the nineteenth century, with the construction of drains such as the Holderness Drain and the Beverley-Barmston Drain along with the floodwarping of fields, the area was successfully transformed from wetland into farmland (Van de Noort, 2004). Floodwarping involved enclosing the fields within embankments and allowing flooding of the field over several years in order to deposit silt and raise the level of the land to reduce the flood risk.

57. It is possible that occupation of the lower areas of the Humber Wetlands was intermittent prior to the post-medieval period due to the nature of the wetland environment and the rise and fall in sea level, and therefore settlements of medieval or earlier date would often be situated on the slightly higher and better drained ground underlain by glaciofluvial sands and gravels. Nevertheless, periods of low sea level allowed regular cultivation and exploitation of this resource-rich environment which can be seen from previous finds of tools and pottery. Palaeoenvironmental surveys undertaken as part of the Humber Wetlands Project indicated that some of the wetlands dried out during the Mesolithic period (Van de Noort et. al., 1995: 359) allowing for a wider range of land use, and woodland clearance during the Bronze Age indicates a shift towards agriculture (Van de Noort, 2004).

22.6.4 Research Aims and Objectives

58. Georchaeology is the application of earth science principles and techniques to the understanding of the archaeological record (Historic England, 2015a). It involves the examination of sub-surface deposit sequences, through coring or exposed sections, in order to identify site formation processes or landscape features of archaeological interest. Deposit models are often employed in geoarchaeology, these are conjectural maps and cross-sections used to investigate the archaeological significance, potential impact, or accessibility of buried deposits (Historic England, 2020). Geoarchaeological approaches often form part of a wider programme of archaeological investigation.

59. Archaeological investigations should enhance previous work and provide sufficient information upon which to base effective decisions concerning mitigation. Therefore, an investigation can highlight the need for further Written Schemes of Investigation and archaeological work to fulfil planning conditions.

60. The overall objective for the geoarchaeological desk-based deposit model comprised the review of recent and historic geoarchaeological, geotechnical, and BGS (2022) boreholes records. Geoarchaeological and geotechnical deposit data can be used to identify areas of archaeological potential by characterising the probable nature and depth of sub-surface deposits, so that the impact of the development can be understood, and informed decisions made regarding appropriate evaluation and mitigation. As part of this overarching objective and in order to fulfil the general aims, the specific objective of these works at the site are defined as:

- To review historic or recent deposit records, in order to characterise and model the deposit sequence and its distribution across the site, so that comment can be made on the archaeological/palaeoenvironmental potential of those sub-surface deposits.

61. The general research questions of the investigation at the site are defined as:

- RQ1: What is the distribution, depth, character, date, condition, and significance of the deposit sequence?
- RQ2: What is the palaeoenvironmental potential of the deposits encountered?
- RQ3: What is the extent of archaeological remains and their potential survival across the site?

- RQ4: What is the depth of modern overburden?

22.6.5 Methodology

22.6.5.1 Origin and Purpose of Deposit Modelling in Archaeology

62. The approach follows best professional practice as summarised in the appropriate Historic England guidelines for geoarchaeology and deposit modelling (Historic England, 2015a and Historic England, 2020).

63. The purpose of a geoarchaeological deposit model as outlined by Historic England (Historic England, 2020) is to:

- Identify areas of low or high archaeological potential;
- Avoid blanket evaluation coverage and inform appropriate mitigation strategies;
- Aid communication with construction professionals; and
- Facilitate palaeoenvironmental reconstruction.

64. The character and distribution of past human activity can be better understood through the consideration of the past landscape or environmental context. Such an approach is often required by archaeological advisors and the local planning authority on floodplains where the deposit sequence can vary from thin alluvium or peat, with shallowly exposed ancient land surfaces, to complex and thick sequences of interchanging alluvium and peat, covering deeply buried ancient land surfaces.

65. The topography and nature of the ancient land surface during the early Holocene, the current geological epoch and equivalent to the early Mesolithic (c. 11,500 BP or 10,000 BC), is dictated by and inferred from the surface of the Pleistocene superficial deposits (e.g., brickearth, till, or gravel from the previous epoch) and older solid geology (e.g., mudstone or chalk). Overlying the Pleistocene – or older – deposits, Holocene alluvium may preserve palaeoenvironmental evidence (e.g., pollen, diatoms, ostracods) of landscape development, from local channel migration and vegetation change to regional effects of climate and relative sea-level (RSL) change. In combination, likely preservation of palaeoenvironmental remains and deposit data (e.g., depth and character) provides a comparative framework to assess archaeological potential. Peat represents vegetated and waterlogged landscapes (e.g., marshland) which developed, within local or regional fluctuations of hydrology. The anaerobic and acidic conditions of the deposit are particularly conducive to organic preservation. Palaeoenvironmental remains from floodplain deposits, especially peat, provide information on the nature and timing of environmental change and the interplay with past human activity (Historic England, 2015a, 2015b).

66. Modelling software (Rockworks & ArcGIS) is often used to create two and three-dimensional deposit models of the buried topography and overlying strata on the site. The data used may be readily available BGS (2022) geological information, recent geotechnical data from the client, or data from past archaeological investigations. The depth and distribution of the various deposits is mapped in schematic cross-sections (transects) or plan, showing the elevation (Digital Elevation Model, (DEM)) or thickness (Isopach), of deposits or stratigraphic units. The model often culminates in schematics maps showing areas of archaeological potential.

22.6.5.2 Deposit Model

67. In order to create the deposit model, the geotechnical data was entered into a digital database (Rockworks 20). BGS (2022) logs added to the database were given a prefix relating to the two-letter grid square of its national grid reference e.g., TQ. A total of 379 sedimentary logs were included in the deposit model. Logs from the Humber Wetland project are also prefixed with the AOC project number and 'HW' to denote their origin. The distribution of this data set is presented on **Figure 22-6-2** to **Figure 22-6-8** and the data references for the sedimentary logs are presented in **Annex A**. The numbers of each type are:

- BGS (2022) historic deposit data: 167; and
- AOC deposit data: 212.

68. Each lithology type (gravel, sand, silt, clay etc.) was given a unique colour (primary component) and pattern (secondary component) enabling visual correlation of the sediment components of deposits across the site. By examining the relationship of the lithology types (both horizontally and vertical) in preliminary and iterative transects, correlations can inform the site-wide deposit groups. The grouping of these deposits is based on the lithological descriptions, which represent distinct depositional environments, coupled with a wider understanding of the local geological sequences. Thus, a sequence of stratigraphic units ('facies'), representing certain depositional environments, and/or landforms can be reconstructed both laterally and through time.

69. Inverse distance weighted (IDW, weighting =1 to 4, number of points =12) DEM and thickness (Isopach) plots were produced for key deposits (i.e. units defining major changes in the environment and modes of deposition) and surface horizons. These highlight major features of the topography through time. In this respect, the most common surface plot depicts the surface of the Pleistocene (or older) deposits (**Figure 22-6-20**, **Figure 22-6-26**, **Figure 22-6-31**, **Figure 22-6-37**, **Figure 22-6-42** and **Figure 22-6-48**) gives an approximation of the topography of the site as it existed at the beginning of the early Mesolithic period c 10,000 years ago. The development of the Holocene floodplain is likely to have been influenced by the topography inherited from the Pleistocene/Late glacial period. This surface would have dictated the course of later channels, with gravel high points forming areas of dry land within the wetlands, and lower lying areas forming the main threads of later channels. Many of the additional surface or thickness plots are more representative of deposit survival than time-specific landscapes.

70. The overlying deposit sequence across the site depicted by the stratigraphic units, as representative of specific depositional environments and/or landforms laterally and through time for the site and the immediate vicinity, is illustrated in profile or transect form (**Figure 22-6-9** to **Figure 22-6-17**). Such transects present a straight-line or modelled correlation between the data points, extrapolating the stratigraphic units identified within each borehole.

71. By examining the surface and thickness plots in combination with the vertical deposits shown in the transects, areas of archaeological potential can be mapped (**Figure 22-6-52** to **Figure 22-6-57**). These characterise the differing geoarchaeological and archaeological potential and significance of single stratigraphic units, deposit sequences containing multiple stratigraphic units, or specific landforms and depositional environments.

72. The reliability of the model is dependent upon the data upon which it is founded. The borehole logs used for the model within the site have been interpreted by a geoarchaeologist, but interpretations were limited to historic records and desk-based research. Interpretation of deposits from such sources rely upon the accuracy of the original observations.

22.6.6 Deposit Model

22.6.6.1 Key Stratigraphy

73. Although the results and interpretation detailed in this report have been produced as accurately as possible, it should be noted that the conclusions offered are a subjective assessment of collected data sets.

74. Ten stratigraphic units have been identified across the Geoarchaeology Study Area. These units are summarised in **Table 22-6-1** and listed in stratigraphic order from the oldest to the most recent. The vertical deposit succession is illustrated on the transects drawn across the site (**Figure 22-6-9** to **Figure 22-6-17**). The major stratigraphic units are also represented by surface and/or thickness plots (**Figure 22-6-18** to **Figure 22-6-51**).

Table 22-6-1 Summary of identified stratigraphic units (subdivision of the Holocene based Walker et al. 2012)

Stratigraphic Unit (facies)	Lithology/Description	Chronology	Environment of Deposition
Burnham Chalk Formation, West (grouped as "tertiary bedrock - chalk" to improve deposit modelling).	White, thinly bedded chalk with common flint bands.	Turonian to Santonian Age (83.9 to 83.6 million years ago).	Marine deposit
Flamborough Chalk Formation, Central (grouped as "tertiary bedrock - chalk" to improve deposit modelling).	Chalk. White, well bedded, flint-free chalk with common marl seams.	Santonian to Campanian Age (86.3 to 72.1 million years ago).	Marine deposit

Stratigraphic Unit (facies)	Lithology/Description	Chronology	Environment of Deposition
Rowe Chalk Formation, East (grouped as “tertiary bedrock - chalk” to improve deposit modelling).	White, flint-bearing chalk with sporadic marl bands.	Campanian to Maastrichtian Age (83.6 to 66.0 million years ago).	Marine deposit
Pleistocene - glacial till.	Poorly sorted, very mixed, containing clay, silt, sand, gravel, boulders.	Devensian, Late Pleistocene (116,000 to 11,650 years ago).	Glacial conditions – deposits associated with glaciers.
Pleistocene – glaciofluvial.	Primarily sand and gravel, occasionally with silty or clayey beds. Including occasional areas mapped as uncertain age and origin.	Devensian, Late Pleistocene (116,000 to 11,650 years ago).	Coarse sediments transported by glacial meltwater streams. High energy periglacial fluvial deposits.
Head (only minimal points recorded so grouped with “glaciofluvial deposits” in deposit model out puts).	Poorly sorted, poorly stratified. Comprises gravel, sand, silt, clay.	Devensian, Late Pleistocene (116,000 to 11,650 years ago).	Slow, downslope transport of waterlogged material resulting from meltwater. Periglacial conditions.
Holocene – Lacustrine.	Clay, silt, sand, with occasional organic beds. Include clasts deposited by streams running into the lake.	Early Holocene / Greenlandian (c 11,650–8,276 BP/ 9,700–6326 BC).	Deposits at the base and shores of lakes.

Stratigraphic Unit (facies)	Lithology/Description	Chronology	Environment of Deposition
Holocene - lower alluvium.	Primarily silt and clay, occasionally sandy. Occasional organic inclusions.	Early Holocene / Greenlandian (c 11,650–8,276 BP/ 9,700–6326 BC).	Fluvial floodplain deposits. Temperate floodplain and river channel environments.
Holocene - organic deposits.	Peat.	Mid Holocene / Northgrippian (c 8,276 – 4,200 BP/ 6,326 – 2,250 BC) to Late Holocene / Meghalayan (c 4200 BP/2250 BC onwards).	Temperate wetland development within a floodplain environment.
Holocene – alluvium.	Primarily fine grained sediments of silt and clay, with occasional sand and gravel, and organic inclusions.	Late Holocene / Meghalayan (c 4,200 BP/ 2,250 BC onwards).	Representative of floodplain and intertidal mudflats, with additions from possible reworking of shingle or sand bank material.
Colluvium (only minimal points recorded so grouped with "Holocene - alluvium" in deposit model out puts).	Identified as hard / stiff brown sandy clay overlying alluvial deposits. Poorly sorted.	Late Holocene / Meghalayan (c 4,200 BP/ 2,250 BC onwards).	Downslope transport of material under temperate conditions.
Topsoil and made ground -Modern.	Clay, silt, sand, and gravel with inclusions of generally modern / reworked anthropogenic materials such as ceramic building materials.	Post-medieval to modern (19^{th} Century AD onwards).	Reclamation / agriculture. Modern land surface.

22.6.6.2 Area 1: Skipsea

22.6.6.2.1 Area 1: Chalk bedrock

75. Chalk bedrock (**Figure 22-6-18**) was recorded with a surface elevation between approximately -10.5 and -17m OD, with a general trend of greater elevations toward the northeast and a fall toward the southwest of the area. Chalk was recorded at only a few points in this area; however, thus this is unlikely to be fully representative.

22.6.6.2.2 Area 1: Glacial Till

76. Glacial till is mapped by the BGS (2022) as covering much of the eastern extent of the site. It was encountered among 49 of the 57 datapoints included to produce the models for this area, with a thickness of up to 20m (**Figure 22-6-19**). Across the majority of this area the thickness was recorded between approximately 2-7m, though directly to the north of PA01 the deposits reached up to *c.* 20m. Due to proximity, this thickness is likely to be identified within this part of the site.

22.6.6.2.3 Area 1: Glaciofluvial Deposits

77. Glaciofluvial sands and gravels were recorded at eight locations beyond the north of the site, in an isolated group. With no BGS (2022) mapping or borehole data suggesting glaciofluvial deposits within the Landfall Zones (CB8 and CB9) site, it is unlikely that such deposits will be encountered within these parts of the development area. However, the BGS does map glaciofluvial deposits at the boundary of Area 1 and Area 2 flanking the modern Skipsea Drain, so they may be present here despite their absence in the boreholes.

78. A surface plot (**Figure 22-6-20**) has been generated to illustrate the surface of the glaciofluvial and till deposits. The plot illustrates the likely ground surface approximately 12, 000 years ago, at the beginning of the Holocene. The surface ranges between approximately 0-17m OD, with a northwest-southeast aligned area of lower elevation passing through the site. This low-lying area would likely have been a route for Late Pleistocene to Early Holocene surface run off and channel or wetland, as well as a primary route for inundation as a result of RSL rise. The location correlates well with the mapped Skipsea Low Mere and Withow Mere (Van de Noort and Ellis, 1995).

79. Transect A (**Figure 22-6-9**) has been produced crossing the low-lying area from southwest to northeast, to the north of the site boundary. It illustrates an accumulation of Holocene alluvial and organic deposits associated with the meres and in lieu of similar logs from the site could be representative of deposits onsite. Higher areas of sands and gravel would have remained dry land for longer periods of the past, as adjacent lower lying areas became waterlogged and rich wetland resources developed.

80. An area of raised Pleistocene surface is illustrated at the southern border of the site (WX_55762_Tr1) adjacent to PA05, which declines steeply toward the modern coastline (**Figure 22-6-10**) by approximately 10m. This area may have provided a continuously dry location from which the resources of the wetlands may be accessed.

22.6.6.2.4 Area 1: Lacustrine Deposits

81. Lacustrine deposits were recorded among five locations in Area 1. They comprise primarily clays and silts, with frequent mollusc shells recorded particularly among the deeper beds. Organic deposits were recorded interbedded with the minerogenic units, including peat and organic silts and clays. These deposits were identified in a cluster to the north of the site, as well as traversing through the site in a north-west – south-east alignment, correlating with the lower Pleistocene surface (**Figure 22-6-20**). These deposits are likely to have formed in the Late Pleistocene to Early Holocene during periglacial and interglacial conditions, respectively.

22.6.6.2.5 Area 1: Alluvium

82. Alluvium, broadly used here to denote freshwater floodplain deposits and estuarine mudflats, was identified at seven locations to the north and west of Area 1, beyond the limits of the site boundary. At a number of these locations the alluvium is interbedded with organic deposits of peat (see section 22.6.6.2.6).

83. The alluvium identified in the north is approximately 1.5km to the east of BGS (2022) mapped alluvial units, suggesting a high likelihood for further unidentified alluvium to exist in the area.

84. A thickness plot of the Holocene superficial deposits has been generated (**Figure 22-6-21**) to illustrate the distribution of the lacustrine and alluvium units as well as their organic components. It shows that the thickness of Holocene deposits reaches up to approximately 7.5m, with the thickest of these identified within CB9 (PA02) at the coast, and to the northwest of the site boundary. The increased thickness of the Holocene units correlates with depressions in the Pleistocene surfaces, which is further illustrated in Transects A and B (**Figure 22-6-9** and **Figure 22-6-10**).

22.6.6.2.6 Area 1: Organic Deposits

85. Organic deposits were recorded at six locations, interbedded with alluvium and lacustrine deposits. **Figure 22-6-22** has been generated to illustrate the thickness of Holocene organic deposits within Area 1. It shows that the organic deposits reach up to 7m in thickness, external to the northwest of the site. Within the site, the unit reaches up to approximately 1.5m in thickness, within CB9 (PA02) (Marsters2008_S_Auger). These units have been modelled to extend across much of this coastal area, into the Priority Areas PA01, PA02, PA04. Even though thick organic deposits (up to 7m) are currently only recorded outside of the site, it is likely that they extend onto the site through PA02-PA05.

86. Radiocarbon dates have been obtained from a previous geoarchaeological borehole investigation (AOC, 2020) to the north of the Area 1 boundary providing a chronology from the Late Mesolithic to Early Iron Age (5986-5842 cal BC (95%), 7029 ± 24, SUERC100889, 0.25-0.26m OD, BH1; 2874-2631 cal BC (95%), 4151 ± 21, SUERC100888, 1.33-1.34m OD, BH1; and 758-421 cal BC (95%), 2464 ± 24, SUERC100887, 2.38-2.39m OD, BH1, AOC 2020). The dates and their associated elevations are illustrated on Transects A and B (**Figure 22-6-9** and **Figure 22-6-10**). Organic deposits recorded within PA02 (Marsters2008_S_Auger) were identified between approximately 3.66-5m OD and at least 1m higher than the Iron Age date provided from the north (SUERC-100887). There is a possibility that the deposits so far recorded in PA02 post-date the dated organics to the north, however, the currently available records in PA02 are very sparse and the single one that does exist (Marsters2008_S_Auger) utilises elevations estimated from modern LIDAR data because none were provided with the original record. Therefore, thick deposits of Mesolithic to Iron age date could be present in the area.

22.6.6.2.7 Area 1: Topsoil and Made Ground

87. A thickness plot (**Figure 22-6-23**) has been produced to illustrate the thickness of made ground and topsoil deposits across Area 1. No made ground was recorded and topsoil sealed the area with a thickness of up to 2m at location WX_55762_Tr1, though this is noted to potentially comprise 1.5m of colluvium. On the whole, the unit is between c. 0.5 and 1.5m in thickness.

22.6.6.3 Area 2: Skipsea to Leven

22.6.6.3.1 Area 2: Chalk bedrock

88. Chalk bedrock was identified at elevations of approximately -22 to -7m OD within Area 2. Generally, it has a higher elevation at the north-eastern and south-western extents of the area, though a zone of marginally higher bedrock is also identified in the central region of the site (TA14NW83), which stands approximately 7m higher than the surrounding areas.

89. Transect C (**Figure 22-6-11**) illustrates that within the site the chalk bedrock is primarily recorded between approximately -10 and -20m OD and rises and falls throughout.

22.6.6.3.2 Area 2: Glacial Till

90. Glacial till is recorded throughout Area 2. Overlying the chalk of lower surface elevation, the thickness of the till unit reaches up to *c.* 40m. This likely reflects a northwest to southeast path of glacial activity.

91. The surface elevation of the till, representative of the likely ground surface at the end of the Pleistocene (*c.* 12,000 years ago) is illustrated on **Figure 22-6-26**. In contrast with the chalk bedrock, the Pleistocene surface is shown to be of greatest elevation through the central part of Area 2, a trend which is further illustrated in transect C (**Figure 22-6-11**). The greatest elevation of the Pleistocene surface is located in between PA09 and PA10 and reaches up to *c.* 20m OD. To the southwest in PA13 there is a rapid fall in elevation to approximately 2.5m OD, which is also illustrated in Transect C.

22.6.6.3.3 Area 3: Glaciofluvial Deposits

92. No glaciofluvial deposits were recorded in the borehole data for this area. However, as discussed for Area 1, glaciofluvial sands and gravels are mapped by the BGS (2022) at the boundary of Area 1 and Area 2, and flanking the modern Skipsea Drain, in the centre of the area flanking the Catfoss Drain. Therefore, despite their absence in the boreholes they may be present in isolated zones flanking ancient river valleys and meres.

22.6.6.3.4 Area 3: Holocene Deposits (Lacustrine, Organic, Alluvium)

93. No Holocene deposits were recorded in this area. BGS (2022) and the Humber Wetlands Project (Van de Noort and Ellis 1995) mapping plots isolated areas of alluvium throughout this section of the site relating to historical accounts of meres and kettle holes, though no records for these occurrences suitable for deposit modelling have been obtained.

94. Data from boreholes to the north-west of the site suggest there is potential for the presence of Holocene deposits at the far southwestern extent, within PA13 (**Figure 22-6-27**) but this will be discussed in reference to Area 3.

22.6.6.3.5 Area 3: Topsoil and Made Ground

95. Across Area 2 of the site, the topsoil and made ground is broadly recorded to be of up to 0.5m in thickness (**Figure 22-6-28**). However, to the south adjacent to PA13 (TA14SW24), there is a record of made ground up to 6m in thickness, which is likely associated with the adjacent Yarrows Aggregates.

22.6.6.4 Area 3: Leven to Woodmansey

22.6.6.4.1 Area 3: Chalk bedrock

96. The surface of the chalk bedrock was encountered between roughly -7 and -2.5m OD within Area 3 (**Figure 22-6-29**). Within this area, it is generally shown to be flatter than to the northeast, with the highest elevations in the centre and south at -4 and -2.5m OD. Transects D and E (**Figure 22-6-12** and **Figure 22-6-13**) illustrate this gradual sloping in the bedrock.

22.6.6.4.2 Area 3: Glacial Till

97. Glacial till was recorded across much of Area 3, overlying the chalk bedrock. The till reaches up to a thickness of approximately 11m (**Figure 22-6-30**, which shows combined thicknesses for the till and glaciofluvial), in PA14 toward the northeast of the site.

98. The unit is shown to be of only 3 to 6.5m thickness toward the southwestern boundary of the Onshore Study Area, which is further illustrated in Transect E (TA04SE8\A, **Figure 22-6-12** and 51996_BH29, **Figure 22-6-13**) where the till thins out and is overlain with Holocene alluvial deposits.

22.6.6.4.3 Area 3: Glaciofluvial Deposits

99. Glaciofluvial deposits were only recorded in the boreholes immediately outside the boundary at the southwest of Area 3 at the junction with Area 6 and will be discussed in the later section.

100. **Figure 22-6-31** shows a topographic plot generated for the surface of the Pleistocene deposits across the area. It illustrates that like the bedrock beneath, the surface is relatively flat throughout, ranging from -6.5 to 5m OD. The surface is highest in PA14 and PA13 in the centre and the northeast, these higher areas fringe lower areas which may have been potentially more waterlogged.

101. Once again despite the limited evidence in borehole logs the BGS (2022) mapping does project glaciofluvial sands and gravel over the east of PA13 and the north of PA14.

22.6.6.4.4 Area 3: Lacustrine Deposits

102. No lacustrine deposits were identified within Area 3.

22.6.6.4.5 Area 3: Alluvium

103. A thickness plot for the Holocene alluvial deposits has been generated (**Figure 22-6-32**), showing that there are isolated occurrences of alluvium external to the site. To the south of the boundary the alluvium is shown to reach up to approximately 4m (TA03NE152 and TA03NE14), adjacent to the River Hull. To the north of the site boundary, also adjacent to the River Hull, 10m of alluvial sequence has been recorded (TA04SE8/A, **Figure 22-6-12**, and 51996_BH29, **Figure 22-6-13**). These records suggest further alluvium likely exists adjacent to the river within the boundary of the Onshore Study Area.

104. The BGS (2022) maps alluvial deposits across broad swathes of this area, though among the majority of datapoints used to generate the models it has not been possible to prove the full character, extent or thickness of such deposits.

22.6.6.4.6 Area 3: Organic Deposits

105. Holocene organic deposits were identified associated with the alluvium adjacent to the River Hull in the southwest of the site and reach up to a thickness of approximately 2m within the site boundary (**Figure 22-6-33**).

106. Transect E (TA03NE222, **Figure 22-6-13**) illustrates accumulation of organic material beneath alluvium alongside the River Hull. Its presence on the higher till surface suggests isolated remains of wetland development across the floodplain, possibly forming in similar meres and kettles holes as those identified across other parts of the region (Van de Noort and Ellis 1995) and forming prior to increasing RSL which led to the backing up of inland watercourses further freshwater flooding and the accumulation of minerogenic alluvial deposits.

22.6.6.4.7 Area 3: Topsoil and Made Ground

107. Topsoil and made ground are shown across the site to be of less than 0.5m in thickness (**Figure 22-6-34**), with the exception of a small, isolated area to the southwest adjacent to Barmston Lane (TA03NE87 and TA03NE169), and another to the northeast adjacent to PA13 (TA14SW22) where this value extends up to approximately 1m in thickness. This suggests minimal modern truncation is likely to have taken place within Area 3.

22.6.6.5 Area 4: Beverley to Risby and Bentley

22.6.6.5.1 Area 4: Chalk bedrock

108. At the Eastern border of the Beverley to Risby route, chalk bedrock surface elevation (**Figure 22-6-35**) reaches approximately 89.5m OD, reflective of a sharp incline of topography to the east of the Hull Valley and Holderness. However, it must be noted how few data points exist in Area 4. At the southern end of the Beverley to Bentley route the chalk surface falls as low as 18m OD. This sharp fall is illustrated in Transect F (**Figure 22-6-14**), where topography falls swiftly from the northwest toward the southeast.

22.6.6.5.2 Area 4: Glacial Till

109. A thickness plot (**Figure 22-6-36**) has been generated to illustrate the distribution of till across Area 4. It is clear that glacial till is of greater thickness in the north, reaching up to 7m in thickness at the northern end of PA20 (SE93NE10 and SE93NE9, **Figure 22-6-14**).

110. A topographic plot has been generated to represent the surface of the Pleistocene glacial till across Area 4 (**Figure 22-6-37**). It illustrates a clear decline in elevation from west to east, falling from *c*. 100m OD at the eastern border of the Beverley to Risby route, to as low as 29m OD to the south of PA18 within the Beverley to Bentley route (TA03NW126, **Figure 22-6-14**). Further east, as illustrated on **Figure 22-6-37**, the surface of the Pleistocene deposits falls as low as 8.5m OD. The gradient of the slope is less significant among PA18, PA19, and the northern half of PA20.

22.6.6.5.3 Area 4: Glaciofluvial Deposits

111. No glaciofluvial deposits were recorded in the boreholes of projected across BGS (2022) mapping within Area 4.

112. Pleistocene Head is projected on BGS (2022) mapping in a narrow east-west aligned corridor crossing Area 4. It was not identified within the borehole records used to produce the models; however, it is possible that it may be encountered in this area.

22.6.6.5.4 Area 4: Lacustrine Deposits

113. No lacustrine deposits were identified within Area 4.

22.6.6.5.5 Area 4: Alluvium

114. No alluvium was identified within Area 4.

22.6.6.5.6 Area 4: Organic deposits

115. No organic deposits were identified within Area 4.

22.6.6.5.7 Area 4: Topsoil and Made Ground

116. Modern topsoil and made ground deposits are primarily of less than 1m across Area 4 (**Figure 22-6-38**), though much of PA20 is represented by values of up to 2m. The southern end of PA18 represents greater thickness, reaching up to *c.* 9.5m at the south-eastern boundary of the Beverley to Bentley route.

22.6.6.6 Area 5: Routh to Beverley

22.6.6.6.1 Area 5: Chalk bedrock

117. Chalk bedrock surface elevation across Area 5 (**Figure 22-6-39**) ranges between approximately 34.5 and -9m OD, the highest elevations being recorded in the southwest at PA17, at the junction of the Yorkshire Wolds and the Hull Valley. There is a steep gradient from here to the eastern end of PA17, where elevation reaches *c.* 4.5m OD. Across much of the rest of the area the surface is relatively stable. This is illustrated as well in Transect G (**Figure 22-6-15**), which shows marginal undulation in the bedrock across most of the area.

22.6.6.6.2 Area 5: Glacial Till

118. Glacial till was recorded across the majority of this area, particularly concentrated in the vicinity of PA17 and PA16. The thickness of Pleistocene deposits reaches up to approximately 24m across the modelled area (**Figure 22-6-40**), to the north of PA16 at which this thick deposit correlates with a depression in the underlying chalk bedrock (TA04SE6/C). To the west, adjacent to PA17, the till deposits were modelled at up to *c.*18m thickness, and rest on the lower slopes of the chalk bedrock beneath, although there are few data points in this area.

119. In a number of locations (e.g. TA04SE37 and TA04SE76, **Figure 22-6-15**), the basal part for the till unit is made up of chalk gravel increasingly mixed with the flint gravel and clay of the till as you move up the profile. This unit represents the periglacial erosion of the surface of the chalk by the glacial ice and abrasion entrained sediments of the till.

22.6.6.6.3 Area 5: Glaciofluvial Deposits

120. Glaciofluvial deposits were recorded across 14 datapoints in Area 5. These were thickest to the northwest of PA16 (TA04SW21/A and TA04SW21/B, **Figure 22-6-41**) at which they reached up to approximately 3.5m. To the north (51996_TP108) and the south (51996_BH25) of PA15 glaciofluvial deposits were identified reaching up to *c.* 2m in thickness. BGS (2022) mapping projects glaciofluvial deposits in the vicinity of PA15 also. The BGS mapping also indicates undated gravel and sand of unknown formation projecting into the site from the north c. 600m east of PA17, but no deposits of this type are reflected in the nearby boreholes.

121. A topographic plot has been generated to illustrate the combined surface of the Pleistocene glaciofluvial and till deposits (**Figure 22-6-42**). It shows a surface elevation range from approximately -9.5 to 50m OD, which like the chalk declines rapidly in the southwestern portion of Area 5 at PA17. Across the area there are remains of possible channels or kettle holes present in the surface, passing through north-west to south-east at PA16 at the route of the modern Hull River channel (TA04SE2, **Figure 22-6-15**), and south-west to north-east through PA15 (TA04SE8/A, **Figure 22-6-15**). These lower areas roughly correlate with the identified glaciofluvial deposits, and thus likely represent ancient river deposits adjacent to the modern route of the River Hull (PA16), or a relict channel which may have been a divergence in the previous route of the River Hull (PA15).

22.6.6.6.4 Area 5: Lacustrine Deposits

122. No lacustrine deposits were identified within Area 5.

22.6.6.6.5 Area 5: Alluvium

123. Holocene alluvium has been identified in ten records across Area 5, its thickness and distribution is illustrated on **Figure 22-6-43**. It reached a thickness of up to 15m at the western end or PA16 (TA04SE2) and to the northeast of PA15 (TA04SE8/A). At PA16 this is adjacent to the River Hull, whereas in the east the alluvium may represent a palaeochannel associated with now abandoned alternate or tributary route in the lower Pleistocene surface elevation.

124. Transect G (**Figure 22-6-15**) illustrates the distribution of alluvium infilling the low Pleistocene surfaces at these two locations. This clearly depicts thick alluvium (c. 15m) surviving in isolated areas, with nearest adjacent datapoints (c. 0.8-1.8km) recording only between 0-0.5m of alluvial deposits. Due to the very limited description given in these kinds of records (e.g., “black warp” for TA04SE2, BGS 2022) for the sediment in question, and in context of a number of borehole records where the term warp is used

to refer to deposits that could not be anthropogenic flood deposits, questions arise about the accuracy of these records. Alternatively, if present, the spatial extent of these thicker deposits need investigation given the broad interval between adjacent points.

22.6.6.6.6 Area 5: Organic Deposits

125. Organic deposits were identified only c. 1km north-east of the site, with a thickness of 0.6m (51996_TP106). With only a limited thickness and extent recorded beyond the site, near PA15, these are not currently modelled as extending into the boundary. Although there is a slight chance they may considering the thickness of alluvium in TA04SE8/A (**Figure 22-6-15**) only 250m north of the site.

22.6.6.6.7 Topsoil / Made Ground Deposits

126. Topsoil and Made ground reaches up to 2m in thickness to the southwest of PA15 (TA04SE76, **Figure 22-6-44**), likely associated with the Ticton Pumping Station and the Holderness Drain. Across the majority of Area 5 this unit is up to *c*. 0.5m, though the east of PA17 and west of PA15 are mapped with between approximately 0.5-1m sealing the underlying geologies.

22.6.6.7 Area 6: Substation

22.6.6.7.1 Area 6: Chalk bedrock

127. A topographic plot of the chalk surface elevation has been generated for Area 6 (**Figure 22-6-45**). It shows a steep decline in elevation from the west (up to *c*. 70m OD) as the slopes of the Yorkshire Wolds descend to the Hull Valley, where elevation falls as low as *c*-7m OD. This is illustrated in Transect H (**Figure 22-6-16**), where bedrock drops from west to east.

128. The lowest chalk surfaces are identified in the northeast and southeast of Area 6.

22.6.6.7.2 Area 6: Glacial Till

129. Glacial till is found predominantly at the base of the slopes of the chalk surface, as illustrated in the Pleistocene deposit thickness (**Figure 22-6-46**). At the south of Area 6 the till is recorded at up to *c*. 24m in thickness (TA03SW54).

130. Deposits are modelled much thinner, c. 2m, in the vicinity of PA25 and the Creyke Beck 1 Grid Connection (labelled substation on **Figure 22-6-17**). Transect I (**Figure 22-6-17**) shows potentially thin till deposits in HOW04-TP113 and HOW04-TP111 but also thicker deposits southwards that partially in fill an area of seemingly lower chalk (HOW04-BH001 and HOW04-BH007). As the chalk bedrock is rarely recorded in the HOW04 test pits the higher chalk and thinner till in the north of **Figure 22-6-17** may be a modelling artefact resulting from the extremely high elevations of chalk on the Yorkshire Wolds further north.

131. At PA23 and PA24 the till is recorded up to approximately 8m in thickness, becoming less prevalent toward the west at PA21 and PA22.

22.6.6.7.3 Area 6: Glaciofluvial Deposits

132. Glaciofluvial deposits were recorded at ten data points across the eastern portion of Area 6, with a thickness of up to approximately 14m (TA03NW395, **Figure 22-6-47**). These deposits are most prominent c. 900m beyond the east of PA25.

133. Transect H (51996_BH37, **Figure 22-6-16**) shows an accumulation of glaciofluvial sands at the base of the slope, to the east of the Substation development area. A deeper glaciofluvial sequence is recorded c. 280m to the south of the Creyke Beck 1 Grid Connection (labelled substation on **Figure 22-6-16**), reaching approximately 10m in thickness (TA03NW150), illustrated in Transect I (**Figure 22-6-17**). These likely represent glacial meltwater channels travelling from the higher elevations of the Yorkshire Wolds to the west down toward the main river channels and the coast. The BGS (2022) mapping outlines widespread and undated sands and gravel deposits flanking Creyke Beck and associated watercourses, but also extending across PA25.

134. A topographic plot of the surface of the Pleistocene deposits is shown on **Figure 22-6-48**. It follows the general shape of the Chalk beneath, though is more level throughout the eastern part of the area. This levelling is evident in Transects H and I (**Figure 22-6-16** and **Figure 22-6-17**), showing infilling of modelled lower areas of chalk.

135. The Pleistocene surface elevation falls from approximately 90m OD to the west of the site boundary, reaching as low as c -5m OD in the far northeast (TA03NE114).

136. Pleistocene Head is projected on BGS (2022) mapping in a narrow east-west aligned swathe of Area 6, extending slightly into Area 4. It was not identified within the borehole records used to produce the models; however, it is possible that it may be encountered in this area.

22.6.6.7.4 Area 6: Lacustrine Deposits

137. Lacustrine deposits were not identified within Area 6.

22.6.6.7.5 Area 6: Alluvium

138. Holocene alluvium was identified only in the very northeast and southeast limits of Area 6, the onshore substation. A thickness plot (**Figure 22-6-49**) has been generated to illustrate distribution and survival of these deposits. At the southeast (TA03SW159) the alluvium was recorded at a thickness of 6.75m, though nearby locations did not identify such deposits suggesting an isolated occurrence. In the northeast, the alluvium is recorded to be of 5m (TA03NE114) and 0.85m (52058_AOCBH12) in thickness. These are most likely associated with the minor watercourses and ponds adjacent to the datapoints. It is likely that more alluvial deposits may be identified to the northeast of PA25, due to the abundance of streams.

139. Across the western and central parts of Area 6 no alluvium was identified.

22.6.6.7.6 Area 6: Organic Deposits

140. Holocene organic deposits were identified only at one location in Area 6, in the very north-eastern limits (TA03NE114). The thickness of this unit reached up to *c.* 3m (**Figure 22-6-50**). The unit consists of peat from the ground surface to a depth of 3m bgl and is likely associated with the adjacent watercourse and pond. Other occurrences of organic material are likely to be identified in this region due to the presence of numerous watercourses.

22.6.6.7.7 Area 6: Topsoil and Made Ground

141. A thickness plot illustrating the thickness of topsoil and made ground deposits across. The majority of the onshore substation area, including the Creyke Beck 1 Grid Connection zone, record less than 0.5m thickness of topsoil or made ground. Notable exceptions exist in the northwest of the area, around PA21 to PA24, where the units reach up to approximately 9m in thickness. Deposits also reach c. 2.5m thick in the southeast of Area 6, near Cottingham Water Pumping Station. Both zones suggest there to be possibly significant truncation nearby.

22.6.7 Geoarchaeological potential

22.6.7.1 Realisation of the Research Aims

142. Drawing on the results presented in section 22.6.6, the following is concluded in relation to the evaluation aims, objectives and research questions detailed in section 22.6.4.

143. The aims of this study are:

- To further understand geological changes across the Onshore Study Area;
    - Bedrock is of three chalk units from west to east across the Onshore Study Area.
    - Superficial geology is primarily of glacial till (AoP-D). It has been recorded across every area of the site. In the west, across Area 4, the till is generally the only superficial deposit identified, likely reflecting the change in elevation moving into the Yorkshire Wolds.
    - Glaciofluvial deposits (AoP-B) are identified in Areas 3, 5, and 6, therefore primarily within the Hull Valley.
    - Pleistocene Head is mapped in a narrow east-west aligned swathe of Area 6 (AoP-C), extending slightly into Area 4. It was not identified within the borehole records used to produce the models; however, it is possible that it may be encountered in this area.
    - Holocene alluvial and lacustrine sequences are recorded in various locations throughout the lower elevations of Holderness and the Hull Valley (AoP-A). Particularly in the northeast of the site and Area 1, these include organic deposits.
- To better understand the varying depth of deposits likely to be present;
    - Topographic plots generated to represent the surfaces of the chalk bedrock and the Pleistocene deposits indicate the elevation at which such deposits should be anticipated across the Onshore Study Area.
    - Thickness plots for the topsoil and made ground provide an indication of the depth below ground level at which underlying geological units are likely to be encountered.
- To build towards a better understanding of the archaeological and geological landscape;
    - The models assist in an understanding of the archaeological landscape on the basis of geological features and changes.

22.6.7.2 Archaeological Potential and Significance

144. Based on distribution and character of the deposit sequence, as identified in the deposit model, and illustrated in the figures, areas of potential (AoP) for archaeological and palaeoenvironmental remains have been mapped for the site. These are shown on **Figure 22-6-52** to **Figure 22-6-57** and the differing character and potential of each area is outlined in **Table 22-6-2**.

Table 22-6-2 Areas of Potential (AoP) for archaeology and palaeoenvironmental interest

AoP	Character of Area	Archaeological Potential	Palaeoenvironmental Potential
A (Alluvium, Organic deposits, Lacustrine, and colluvium)	Applies to the site: Area 1 – throughout (PA01, PA02, PA03, PA04, PA05); Area 2 – throughout, primarily southeast (PA07, PA08, PA09, PA11, PA12, PA13); Area 3 – throughout (PA14); Area 4 – narrow area within east (PA18); Area 5 – central and eastern (PA15, PA16);	Evidence of short-term prehistoric activity may survive beneath these deposits, on the surface of the underlying glacial till. It is likely however, that significant reworking and erosion will have taken place throughout the period of the Holocene where fluvial action or wetland formation has taken place. It is unlikely for remains to survive in situ. Any remains surviving on these surfaces would pre-date full inundation. Rare prehistoric wooden structures (such as jetties) may survive within the fills of these low-lying areas. Trackways may survive across organic deposits, the latter being	Minerogenic deposits from within these low-lying regions provide moderate potential for the preservation of palaeoenvironmental proxies (e.g. pollen, ostracods, diatoms) which can be used to reconstruct changes in hydrology, climate, and local ecology. This includes human influence. Organic deposits within these sequences present moderate to high potential for preservation of proxies such as pollen and plant macrofossils, which can aid in reconstruction of changing environments in the past. Lacustrine deposits likely associate with meres can contain Late Glacial deposits of palaeoenvironmental importance, and alluvial sequences

AoP	Character of Area	Archaeological Potential	Palaeoenvironmental Potential
	Area 6 – primarily northeast and south, with narrow areas in northwest and southwest (PA24, PA25); and Low-lying surfaces of the Pleistocene till, glaciofluvial, and head deposits forming rivers, meres and kettle holes, providing access to resources associated with the terrestrial to wetland ecotone.	representative of hard to access but resource rich wetland areas. The isolated occurrences of c. 1.5m of mixed deposits in Area 1, indicative of downslope erosion (colluvium), will not in and off themselves provide potential for in situ remains. However, they may seal in situ flint scatters or evidence of other activity sites preserved within now buried land surfaces. General potential for AoP - Moderate to high significance x low probability = **moderate potential** Although it should be noted that in this AoP for Area 1 **potential is high** due to the incidence of previous early prehistoric finds in the vicinity.	more likely represent Holocene development. Colluvium deposits, being mixed naturally deposited sediment, do not provide good potential for paleoenvironmental. However, the isolated occurrences may seal ecofact-sensitive soil horizons in the surface of underlying deposits. General potential for AoP - Moderate to high significance x moderate to high probability = **moderate to high potential**

AoP	Character of Area	Archaeological Potential	Palaeoenvironmental Potential
B **(Glaciofluvial)**	Applies to the site: Area 3 – southwest, and outside to the northwest or PA14 Area 5 – central and east (PA15 and to the north of PA16) Area 6 – north-eastern (northeast of PA25), central (south of PA25), and south-eastern. Sand and gravel accumulating in depressions in the underlying glacial till, representing high energy late glacial	Prehistoric (Palaeolithic) archaeological remains (e.g., lithics) may survive within these deposits, although due to the nature of deposition and reworking of these deposits by water it is highly unlikely that any remains will survive in situ. It is also likely that they will have undergone significant erosion. The surface of these deposits represented the current land surface (Mesolithic onwards). Later archaeological remains may survive on or cut into its surface. Compared with surrounding glacial till deposits these areas would have been better drained, and potentially higher, providing suitable locations for more long-term land use. General potential for AoP -	High energy depositional environments and coarse clastic deposits yield low potential for preservation of palaeoenvironmental proxies and faunal remains due to high erosion and reworking, unless interglacial horizons are identified within the unit. General potential for AoP - Moderate significance x Low potential = **moderate to low potential**

AoP	Character of Area	Archaeological Potential	Palaeoenvironmental Potential
	meltwater channels. Including occasional areas mapped as uncertain age and origin, which may also be glaciofluvial in origin.	High significance x low to moderate probability = **moderate potential** Although it should be noted that in this AoP for Area 1 potential is high due to the incidence of previous early prehistoric finds in the vicinity.	
C (Head)	Applies to the site: Area 4 – narrow area in the south (south of PA20 and north of PA21); Area 6 – narrow area in the west (north of PA21 and south of PA24); and Poorly sorted, poorly stratified. Comprises	Prehistoric (Palaeolithic) archaeological remains may be preserved beneath head deposits where late glacial mass movement seals subaerial slope positions. Remains within the head itself are unlikely, though Holocene archaeological remains and cut features may survive at its surface. General potential for AoP - Moderate to high significance x low to moderate probability = **moderate**	Slumping of head deposits may preserve past ground horizons and seal any existing ecological features (remains of plants, insects, molluscs). Due to high mixing and low structure associated with head deposits, the potential of the deposits themselves is very low. General potential for AoP - Moderate significance x very low probability = **low potential**

AoP	Character of Area	Archaeological Potential	Palaeoenvironmental Potential
	gravel, sand, silt, clay formed as slow, downslope transport of waterlogged material resulting from meltwater in periglacial conditions.	**potential**	
D (Till)	Applies to the site: All Areas, all Priority Areas (PA01-PA25); and Poorly sorted, very mixed, containing clay, silt, sand, gravel, boulders. Deposited in Glacial conditions.	Archaeological finds or features of prehistoric origin onwards may survive lying on the surface of or cut into the till, where it represented the land surface at the end of the Pleistocene (c. 12,000 years BP onwards). These may include remains of fires, cut features, structures, lithics etc. Where these features remained close to modern surface throughout the Holocene period, and not sealed by later deposits, remains may range from the Mesolithic onwards and	Till presents little opportunity for preservation of palaeoenvironmental proxies and organic horizons. General potential for AoP - Moderate significance x very low Probability = **low potential**

AoP	Character of Area	Archaeological Potential	Palaeoenvironmental Potential
		could have been disturbed by modern activity. General potential for AoP - Moderate significance x moderate probability = **moderate potential** Although it should be noted that in this AoP for Area 1 potential is high due to the incidence of previous early prehistoric finds in the vicinity.	

22.6.7.2.1 Area 1: Skipsea

145. Area 1 includes CB8, CB9, and PA01-PA05. Two areas of potential are identified within this area; AoP-D and AoP-A. Till was identified throughout Area 1, the surface of which represents the likely land surface at the end of the Pleistocene (c. 12,000 years ago). AoP-D represents areas of higher elevation, which were likely occupied by dryland during the early Holocene. These areas would have provided stable positions within the landscape for temporary human activity as well as settlement, thus remains of archaeological activity may survive on this surface. Particularly across PA02-PA05, there may be short-term occupation remains of activities associated with the adjacent wetland environments.

146. The till was overlain with lacustrine or alluvial deposits in areas including the north of PA02, the centre and east of PA03, the northwest and centre of PA04, and west, south, and northeast of PA05. These sequences frequently include organic deposits. Many of these relate to previously mapped meres, which formed in depressions within the surface of the glacial till. They present potential for late Glacial to early Holocene remains of palaeoenvironmental importance, potentially preserving palaeoenvironmental proxies which can be utilised to reconstruct changing climate, hydrology, and ecology of the area.

147. As well as their palaeoenvironmental significance, these meres would have provided resources for human exploitation. Remains associated with access to the wetland environment (e.g., trackways), or obtaining and processing the resources (e.g., fish traps, lithic tools) may survive in these areas.

148. Continuous prehistoric occupation has been represented by remains identified within the vicinity of Area 1, often closely associated with the meres to the north. This includes Mesolithic remains such as barbed points crafted from bone and antler, waterlogged wooden artefacts associated with a Middle Bronze Age to Iron Age 'lake dwelling' (Fletcher and Van de Noort, 2007), and various finds identified at the cliff and beach of Ulrome to the north which were of Romano-British origin (Morris, 2021). This would suggest very high potential for remains of prehistoric age to exist within Area 1, particularly within close proximity of AoP-A.

22.6.7.2.2 Area 2: Skipsea to Leven

149. Area 2 includes PA06-PA13. Much of the area is occupied by AoP-D, though small, isolated regions fall into AoP-A. Toward the north, these areas are particularly small and sporadic, identified in PA07, PA09, and to the south of PA08. A broader area of alluvial or lacustrine deposits is seen between PA09 and PA10 extending eastwards from the site boundary. A channel traverses the site from west to east through the south of PA11 and north of PA12. A further area identified as AoP-A runs parallel to much of PA13 within Area 2.

150. Toward the north at PA06-07, the potential is likely to be similar to that of Area 1, due to proximity to the known and mapped meres as well as the prehistoric remains to the north at Ulrome and close to Transect A.

151. Around PA08-10, evidence is more likely to be associated with dryland activity and more likely prehistoric settlement. As outlined in section 1.3.4., as RSL increased throughout the Holocene the Holderness region was broadly wet and evidence suggests occupation declined from the Early Medieval. Small fragments of AoP-A exist in this area suggestive of possibly small ponds or lakes, which may provide well-preserved sequences for palaeoenvironmental reconstruction.

152. PA11 and PA12 fringe a channel, which would have provided access to riparian resources and thus evidence of human activity may therefore be present in the vicinity of the channel.

153. At the southwestern extent of Area 2, at PA13, there may be potential for further wetland remains, as mapped to the north adjacent to the site boundary.

22.6.7.2.3 Area 3: Leven to Woodmansey

154. Area 3 includes the southwestern end of PA13 and PA14.

155. The area is roughly equally proportioned between AoP-A and AoP-D, representing broad swathes of wetland and palaeochannels on the surface of the till. This suggests that land in this area was likely to be utilised only temporarily or seasonally, for its resources. Broad wetland areas such as these present potential for widely preserved organic deposits among the alluvial and lacustrine sequences, which may provide temporally long sequences which have potential for good preservation for palaeoenvironmental proxies.

156. In the far southwest and to the northwest of the site boundary and PA14, some areas of glaciofluvial deposits are mapped, as part of AoP-B. Glaciofluvial deposits, as highlighted in section 1.3.4., provided what was often a slightly raised and better drained land surface upon which may have been suitable for more long-term occupation, even as RSL increased, and the land became more heavily inundated. These areas are some of the few that are locally within the Hull Valley and Holderness area, which have presented evidence of occupation continuing into and beyond the early medieval period. However, as many of the glaciofluvial routes were replaced by modern alluvial channels, not all AoP-B regions would have provided such conditions.

22.6.7.2.4 Area 4: Beverley to Risby and Bentley

157. Area 4 is located on the edge of the Yorkshire Wolds, seeing a rapid incline in ground elevation towards the west. It includes PA18-20, and the western ends of PA21-22.

158. Almost exclusively within AoP-D, this area represents dryland at the end of the Pleistocene and into the Holocene.

159. A narrow channel of alluvial deposits (AoP-A) passes southwest to northeast through PA18 and follows the path of a modern drainage ditch. Such modern ditches were commonly constructed during the post medieval to 19th century period in an effort to transform the land from wetland to farmland, thus this unit is likely to be of post medieval origin.

160. To the south of PA20 and north of PA21, AoP-C is identified beyond the site boundary. Representative of Pleistocene Head deposits, this reflects an area of downslope transport of waterlogged material under gravity. Beneath it may be preserved remains of Late Pleistocene origin.

161. Archaeological remains identified within this area may date to any period, prehistoric onwards, having provided a dryland area with access to the wetlands of the Hull Valley to the east.

162. Palaeoenvironmental potential is generally low.

22.6.7.2.5 Area 5: Routh to Beverley

163. PA15-17 are located within the Area 5 route division.

164. Much of the area is within AoP-D, representing higher elevation, dryland positions. The northwest of PA15, east of PA16, and entirety of PA17 are shown to be within this category.

165. AoP-B extends into the site to the northwest of PA16 and into the north-eastern side of PA15, representing areas of Pleistocene sands and gravels, which originate from glaciofluvial processes or braided fluvial channels of the Hull Valley. They generally align with later alluvial/lacustrine deposits, as well as modern river channels.

166. The alluvial and lacustrine deposits of AoP-A area mapped across and extending beyond the west of PA16, and the east and northwest of PA15. Across the area these units appear most likely associated with existing channels such as the River Hull adjacent to PA16, and the Holderness Drain and associated ditches at PA15. The Holderness drain is associated with the post-medieval landscape transformation which included floodwarping of fields and extensive draining, thus suggesting the wetlands to have been present in the locale from the early Holocene to c. 17th century, and rich palaeoenvironmental records may be preserved among these mapped zones. These may also have been attractive features to humans, particularly during the prehistoric period, for exploitation of riparian resources.

22.6.7.2.6 Area 6: Substation

167. Area 6 occupies the vicinity of the proposed substation development area, and includes the eastern ends of PA21-22, as well as PA23-25.

168. AoP-A has been identified traversing Area 6 in a west to east alignment across the north of the area, passing through the north of PA24 and PA25. This unit follows the form of an existing minor watercourse. To the northeast of PA25 AoP-A becomes most prominent, and spreads across a region of minor watercourses, ponds, and lakes, which are likely the remains of past wetland and draining strategies. This region may present high palaeoenvironmental potential with continuous records throughout much of the Holocene. Similar areas are identified across the southwest and southeast.

169. AoP-B is mapped across much of the northeast of Area 6, as well as to the south of PA25 and at the south-eastern extent. Representing sands and gravels, these likely result from glaciofluvial deposits or a braided channel within the Hull Valley fluvial system. These deposits may have provided well drained land adjacent to the wetlands which would have been more suitable for long term human activity than AoP-D.

170. Generally, Area 6 falls within AoP-D, representing historically dry land zones, particularly across the west side and into the centre. PA21-23 are found the be fully within this AoP, though PA21 is directly south of and parallel to AoP-C. This zone represents a region of Pleistocene head identified by the BGS (2022), which results from low velocity mass movement of waterlogged material generally instigated by significant meltwater. It has potential to have sealed a land surface.

22.6.7.3 Conclusions and Recommendations

171. The following section reviews the significance of the results of the geoarchaeological borehole evaluation in relation to the development and makes recommendations for an appropriate evaluation and mitigation strategy.

172. The appropriate mitigation strategy for the site will be decided by and agreed with East Riding of Yorkshire Council and their archaeological advisors.

22.6.7.3.1 Area of Potential A – Alluvium, Organic Deposits and Lacustrine

173. AoP-A extends across the Skipsea project area (Area 1), encroaching into the landfall zone of CB9/PA02 as well as the onshore export cables zone (including PA03-5, **Figure 22-6-52**). Development impacts from the currently proposed TJB compounds and underground structures are not full known but will likely disturb or truncate the near surface remains in this zone. If trenchless crossing (likely HDD) techniques are used for the onshore to offshore cable connections, impact is likely to be restricted to the onshore entry point.

174. Only very localised parts of the Skipsea to Leven (Area 2, **Figure 22-6-53**) onshore export cables route includes AoP-A. There are c. 6-7 zones and on the whole, they are c. 50-200m in diameter. Notable exceptions include the large sub-circular zone between PA09 and PA10, although as currently defined this only extends c. 60m within the site. As well as the alluvial valley connecting Hornsea Mere to Hull valley (PA11 and PA12) which bisects the Onshore Study Area in a c. 90m west to east corridor.

175. As the Projects cross the Hull valley in the Leven to Woodmansey part of the Onshore Study Area (Area 3, **Figure 22-6-54**), the majority falls within AoP-A with large areas of alluvium flanking the River Hull and associated watercourses.

176. Very limited parts of Area 4 (**Figure 22-6-55**), Beverly to Risby and Bentley, are designated as AoP-A. Only relatively thin (c. 50-60m wide) corridors of alluvium bisect the Onshore Study Area near PA18, associated with historic watercourses and modern drainages ditches.

177. Similar to Area 3, within the Routh to Beverly part of the Onshore Study Area (Area 5, **Figure 22-6-56**), the Onshore Study Area again crosses the Hull valley although the alluvial deposits are restricted to a c. 2km corridor flanking the River Hull between PA16 and PA17, with other more localised areas potentially encroaching into the Site near PA15.

178. Comparable to Area 4, the area containing the Onshore Substation Zones (Area 6, **Figure 22-6-57**), has very minimal coverage for AoP-A. Only relatively thin (c. 50-60m wide) corridors of alluvium bisect the centre near PA24 and PA25 and to the south of PA23. These are associated with historic watercourses and modern drainages ditches. The alluvial corridors do potentially widen or extend into the area to a greater degree, to c. 500-700m, in the northeast and south.

179. The impacts in Area 2, 3, 4, 5 and parts of Area 6 are predominantly from the 100m working width of the onshore export cable corridor, including the subsurface jointing bay structures and surface link boxes approximately every 0.75 to 1.5km (see **Volume 7, Chapter 5 Project Description (application ref: 7.5)**). The onshore export cable corridor will be dug by trenches (maximum of seven) and backfilled, apart from select sections where trenchless crossing (likely HDD) techniques will be employed. Where trenching is utilised the depth of the cable trenches will likely impact part if not all of the deposits of interest in this AoP.

180. More extensive impacts are expected within the two Onshore Substation Zones but no AoP-A deposits are expected in the vicinity.

181. To more fully understand the nature of the potential archaeological and paleoenvironmental remains as outlined in section 22.6.7.2, a staged approach for investigation and potential mitigation in AoP-A is recommended:

- GI work is proposed for Summer 2023, any interventions within AoP-A should be monitored by a geoarchaeologist;
- All non-monitored GI interventions not within AOP-A should undergo a desk-based review to confirm no areas of interest were missed;
- Monitored and non-monitored GI records should be used to update the deposit model;

- Select areas where deep deposits of geoarchaeological/palaeoenvironmental interest are identified in the deposit model should be targeted for purposive geoarchaeological boreholes (e.g., mere, lacustrine, riverine sequences or associated organic deposits);
- Select areas on the ecotone edge of wetland/dryland environments should undergo targeted trench evaluation to look for artefactual/structural evidence of the utilisation of such rich resource zones by past people (e.g., trackways, jetties, fish traps etc) in near surface waterlogged deposits; and
- Samples from the boreholes and trenches should be retained for paleoenvironmental assessment and possible future analysis/publication should that be recommended by post-evacuation assessment or updated project designs.

22.6.7.3.2 Area of Potential B - Glaciofluvial

182. Localised instances of AoP-B extend into the Leven to Woodmansey part of the Geoarchaeology Study Area (Area 3, **Figure 22-6-54**), north of PA14, as well as the Routh to Beverly part of the Geoarchaeology Study Area (Area 5). On the whole, these areas are outside of the Onshore Study Area with only minimal potential to extend within it.

183. Within Area 6 (**Figure 22-6-57**), the Onshore Substation Zones, AoP-B encroaches into the site to a larger degree (c. 2km diameter). This highlights the potential for glaciofluvial or terrace gravel deposits within the east and south of Area 6, and just to the southeast of the Onshore Substation Search Area.

184. The impacts in Area 3 and parts of Area 6 are predominantly from the 100m working width of the onshore export cable corridor, including the subsurface jointing bay structures and surface link boxes approximately every 0.75 to 1.5km. The onshore export cable corridor will be dug by trenches and backfilled, apart from select sections where trenchless crossing (likely HDD) techniques will be employed. Where trenching is utilised the depth of the cable trenches will likely impact part if not all of the deposits of interest in this AoP.

185. More extensive impacts are expected in the area of the Onshore Substation Search Area, where the two onshore substations are planned. Although no AoP-B deposits extend into this part of the Onshore Study Area they are directly to the south-east.

186. To more fully understand the nature of the potential archaeological and paleoenvironmental remains as outlined in section 22.6.7.2, a staged approach for investigation and potential mitigation in AoP-B is recommended:

- GI work is proposed for Summer 2023, a selection of interventions within AoP-B in Area 6, where mapped by the BGS as of uncertain age and origin should be monitored by a geoarchaeologist;
- All non-monitored GI interventions within AOP-B or near its boundary should undergo a desk-based review to confirm no stratified palaeoenvironmentally sensitive interglacial deposits are present;
- Monitored and non-monitored GI records should be used to update the deposit model;
- Select areas where deep deposits of potential sand and gravel mapped as of uncertain origin by the BGS or those identified as having interglacial deposits should be targeted for purposive geoarchaeological trial pits or boreholes in order to record the deposits in more detail, sieve for palaeolithic flint artefacts or faunal remains (e.g. trial pits), and to collect samples for palaeoenvironmental sampling and OSL dating (e.g. boreholes) etc.; and
- As dryland and near surface archaeology is predominantly expected, the main route of investigation should be led by geophysical survey and standard archaeological trial trenching.

22.6.7.3.3 Area of Potential C - Head

187. Extremely limited AoP-C are designated crossing Area 4 and 6 (**Figure 22-6-57**), the Onshore Substation Zones. AoP-C encroaches into the site in the west of Area 6. AoP-C forms a west to east linear corridor (c. 2km long and 100m wide) between PA21 and PA24.

188. To more fully understand the nature of the potential archaeological and paleoenvironmental remains as outlined in section 22.6.7.2, a staged approach for investigation and potential mitigation in AoP-C is recommended:

- All GI interventions within AOP-C or near its boundary should undergo a desk-based review to confirm the presence and potential age of any Head deposits;
- GI records should be used to update the deposit model;

- As dryland and near surface archaeology is predominantly expected, the main route of investigation should be led by geophysical survey and standard archaeological trial trenching; and
- Any trial trenching in the vicinity of Head deposits will need to confirm the depth and date of the unit in order to reach the desired Pleistocene to Holocene transition in the deposit sequence.

22.6.7.3.4 Area of Potential D - Till

189. The majority of the Onshore Study Area falls under AoP-D (**Figure 22-6-54** to **Figure 22-6-57**). The majority of the deposit is poorly sorted clay, silt, sand, gravel, and boulders, having been deposited in glacial conditions and having low palaeoenvironmental potential. However, the surface of the till has moderate to high potential to preserve archaeological features of prehistoric origin onwards.

190. To more fully understand the nature of the potential archaeological and paleoenvironmental remains as outlined in section 22.6.7.2, a staged approach for investigation and potential mitigation in AoP-D is recommended:

- All GI interventions within AOP-D should undergo a desk-based review to confirm the presence of near-surface Till deposits;
- GI records should be used to update the deposit model; and
- As dryland and near surface archaeology is predominantly expected, the main route of investigation should be led by geophysical survey and standard archaeological trial trenching.

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Annex A – Deposit Model Data References

Deposit log	Easting	Northing	Elevation	Source
51996_BH01	517163	458062.4	8.05	AOC
51996_BH02	517074.2	458103.2	10.271	AOC
51996_BH03	517109.3	457980.5	9.398	AOC
51996_BH04	516977.4	458008.8	10.772	AOC
51996_BH05	515347.1	456352	3.107	AOC
51996_BH06	515327.3	456331	3.022	AOC
51996_BH07	514217.1	455354.6	9.88	AOC
51996_BH08	514184.6	455337.1	9.576	AOC
51996_BH09	513705.3	454398	12.797	AOC
51996_BH10	513709.3	454350.8	13.289	AOC
51996_BH11	513298.1	452591.7	16.725	AOC
51996_BH12	513248.2	452597.9	16.34	AOC
51996_BH13	512267.6	451346.2	9.978	AOC
51996_BH14	512245.6	451303.4	9.685	AOC
51996_BH15	512068.3	450929	9.627	AOC
51996_BH16	511997.2	450854.4	10.451	AOC
51996_BH17	511938.1	450728.6	11.328	AOC
51996_BH18	511814.3	450626.8	10.041	AOC
51996_BH19	508645.2	447207.1	0.522	AOC
51996_BH20	508645	447177.7	0.142	AOC
51996_BH21	508568.6	445000.9	-0.254	AOC

Deposit log	Easting	Northing	Elevation	Source
51996_BH22	508554.1	444925.1	-0.059	AOC
51996_BH24	507888.9	442129.1	4.082	AOC
51996_BH25	507423.8	441053.7	0.71	AOC
51996_BH26	507359.3	441043.9	0.998	AOC
51996_BH27	507099.3	440981.2	0.141	AOC
51996_BH28	507085.2	440947.3	0.607	AOC
51996_BH29	506649.1	438158.8	1.062	AOC
51996_BH30	506532	438160.2	0.844	AOC
51996_BH31	506453.3	438103.9	1.094	AOC
51996_BH32	506337.7	438102.8	1.074	AOC
51996_BH33	506260.2	438010.2	1.679	AOC
51996_BH34	506155.1	437984.2	1.725	AOC
51996_BH35	505803.4	437673.9	3.075	AOC
51996_BH36	505758.5	437599.1	2.243	AOC
51996_BH37	504762.7	436193.7	6.805	AOC
51996_BH39	503949	435956	12.613	AOC
51996_BHCS01	504100.5	436252	12.056	AOC
51996_BHCS02	504009.4	436250.3	12.86	AOC
51996_BHCS03	503916.3	436249.6	14.077	AOC
51996_BHCS04	503916.3	436153.8	14.222	AOC
51996_BHCS05	504019	436157.3	12.704	AOC
51996_BHCS06	504105.2	436154.1	12.231	AOC

Deposit log	Easting	Northing	Elevation	Source
51996_BHCS07	503913.5	436058.2	13.94	AOC
51996_BHCS08	504015.4	436083.4	13.118	AOC
51996_BHCS09	504109.2	436067	12.833	AOC
51996_BHCS10	503993.8	436017.7	13.148	AOC
51996_BHCS11	504073.3	435985.2	12.959	AOC
51996_BHCS12	504154.1	435943.7	12.613	AOC
51996_TP01	517137.1	458150.6	9.156	AOC
51996_TP02	517189.2	457972.5	5.313	AOC
51996_TP03	517093.5	458042	9.483	AOC
51996_TP04	517028.1	458070.2	10.21	AOC
51996_TP05	517047.3	457975.3	10.133	AOC
51996_TP06	516952.1	458020.6	11.491	AOC
51996_TP07	516966.1	457981.9	10.783	AOC
51996_TP103	508618.4	444344.5	0.227	AOC
51996_TP104	508605.3	444047.4	0.197	AOC
51996_TP105	508613.8	443996.9	0.434	AOC
51996_TP106	508758.4	443761.6	0.899	AOC
51996_TP107	508767.9	443728.9	1.737	AOC
51996_TP108	508645.8	443602.6	3.826	AOC
51996_TP109	508637.1	443587.9	3.611	AOC
51996_TP11	516355.7	457247.3	12.161	AOC
51996_TP12	516171.2	457127.4	12.169	AOC

Deposit log	Easting	Northing	Elevation	Source
51996_TP13	516144.5	457110	11.771	AOC
51996_TP14	515866.8	456903.7	10.091	AOC
51996_TP21	515132.8	456155.6	9.054	AOC
51996_TP22	514955.1	455990.8	11.821	AOC
51996_TP23	514939.9	455949.2	12.601	AOC
51996_TP24	514791.8	455711.8	16.663	AOC
51996_TP27	514476.3	455524.7	12.444	AOC
51996_TP28	514235.3	455371	10.247	AOC
51996_TP29	514165	455323.4	9.473	AOC
51996_TP30	514058.4	455039.6	11.213	AOC
51996_TP31	514032.5	455006.9	12.11	AOC
51996_TP32	513913.1	454878.1	14.465	AOC
51996_TP33	513895.1	454855.1	15.102	AOC
51996_TP34	513709.9	454687.2	14.45	AOC
51996_TP34(A)	513709.9	454687.2	14.45	AOC
51996_TP35	513695.8	454419.6	12.932	AOC
51996_TP36	513711.3	454327.7	13.429	AOC
51996_TP37	513729.3	454028.3	13.197	AOC
51996_TP38	513747.8	453724	12.749	AOC
51996_TP39	513750.4	453678.4	12.496	AOC
51996_TP40	513774.6	453291.3	12.013	AOC
51996_TP41	513765	453235.4	12.071	AOC

Deposit log	Easting	Northing	Elevation	Source
51996_TP42	513718.2	453193.5	12.606	AOC
51996_TP43	513699.1	452907.1	15.595	AOC
51996_TP44	513698.5	452869.1	16.305	AOC
51996_TP45	513705.5	452600.5	16.018	AOC
51996_TP46	513335.4	452596.8	17.367	AOC
51996_TP55	512282.2	451369.4	10.408	AOC
51996_TP56	512237.4	451282.9	9.649	AOC
51996_TP57	512079.1	450950	9.283	AOC
51996_TP84	508688.7	447810.2	2.33	AOC
51996_TP87	508642.6	447229.1	0.073	AOC
51996_TP88	508664.6	447171.9	0.288	AOC
51996_TP89	508672.7	446660.8	1.614	AOC
51996_TP90	508688.9	446637.3	1.288	AOC
51996_TP91	508753.4	446513.4	2.593	AOC
51996_TP92	508746.5	446479	3.68	AOC
51996_TP93	508738.7	446181.4	-0.359	AOC
51996_TP94	508725.2	445874.4	-0.077	AOC
51996_TP95	508722.9	445824.9	-0.297	AOC
51996_TP96	508660.2	445512.1	-0.257	AOC
51996_TP97	508644.5	445464.9	-0.349	AOC
51996_TP98	508570.3	445027.2	-0.151	AOC
51996_TPCS01	504181.7	436265.7	11.214	AOC

Deposit log	Easting	Northing	Elevation	Source
51996_TPCS02	504068.4	436263.7	12.76	AOC
51996_TPCS03	503967.6	436262.6	13.314	AOC
51996_TPCS04	503916.9	436208.1	14.057	AOC
51996_TPCS05	504038.9	436178.9	12.705	AOC
51996_TPCS06	504103.1	436210.5	11.814	AOC
51996_TPCS07	503969.5	436153.2	13.597	AOC
51996_TPCS08	503920.2	436103.9	13.555	AOC
51996_TPCS09	503966.1	436071.1	13.174	AOC
51996_TPCS10	504117.2	436123.8	12.587	AOC
51996_TPCS11	503958.3	436022.6	13.738	AOC
51996_TPCS12	504036.6	435985.3	12.46	AOC
51996_TPCS13	504073	436031.5	13.246	AOC
51996_TPCS14	504118	435997.4	12.972	AOC
52058_AOCBH1	515317	456325	3	AOC
52058_AOCBH10	508660	447488	2.5	AOC
52058_AOCBH11	508647	447293	1.3	AOC
52058_AOCBH12	505432	437424	3.8	AOC
52058_AOCBH13	505285	437362	4.2	AOC
52058_AOCBH2	515214	456239	6.4	AOC
52058_AOCBH3	515447	456483	6.3	AOC
52058_AOCBH4	508730	446025	-0.1	AOC
52058_AOCBH5	508695	445664	-0.2	AOC

Deposit log	Easting	Northing	Elevation	Source
52058_AOCBH6	507049	440549	-1	AOC
52058_AOCBH7	511175	449367	7.9	AOC
52058_AOCBH8	510931	449230	5.9	AOC
52058_AOCBH9	508686	447634	2.7	AOC
Dennison2011_Tr1_W	516543	454985.8	8.94	AOC
HOW04-BH001	503621.4	435234.8	13.698	AOC
HOW04-BH002	503923.8	435225.8	10.461	AOC
HOW04-BH003	503856	435197.8	11.419	AOC
HOW04-BH004	503612	435176.2	13.69	AOC
HOW04-BH005	503879.2	435141.9	11.844	AOC
HOW04-BH006	504019.9	435118.9	11.668	AOC
HOW04-BH007	503595	435088.9	14.353	AOC
HOW04-BH008	503726	435133.6	11.529	AOC
HOW04-BH009	503941	435098	11.859	AOC
HOW04-BH010	503838	435071.8	12.811	AOC
HOW04-BH011	503994.8	435036.3	10.998	AOC
HOW04-BH012	503713.7	435038	13.67	AOC
HOW04-BH013	503857.3	435011.9	12.395	AOC
HOW04-BH014	504041.1	435043	10.801	AOC
HOW04-BH015	504003.9	434967.7	11.474	AOC
HOW04-CPT001	503666.5	435222.3	13.607	AOC
HOW04-CPT003	503808.1	435197.2	12.284	AOC

Deposit log	Easting	Northing	Elevation	Source
HOW04-CPT006	503722.3	435167.1	12.353	AOC
HOW04-CPT013	503637.4	435071.1	14.022	AOC
HOW04-CPT021	503568.1	435125.5	14.704	AOC
HOW04-TP001	503557.4	435216.5	13.766	AOC
HOW04-TP003	503688.2	435190.2	13.116	AOC
HOW04-TP004	503757.8	435193.7	12.465	AOC
HOW04-TP005	503838.6	435181.4	11.881	AOC
HOW04-TP006	503919.2	435203.8	10.548	AOC
HOW04-TP007	503945.5	435160.9	11.388	AOC
HOW04-TP008	504055.5	435110	11.396	AOC
HOW04-TP009	503972	435129.6	11.975	AOC
HOW04-TP010	503852.1	435136.2	12.488	AOC
HOW04-TP011	503748.6	435155.9	12.394	AOC
HOW04-TP012	503703.2	435142.3	12.127	AOC
HOW04-TP013	503544.6	435120.6	15.337	AOC
HOW04-TP014	503597.1	435110.7	14.391	AOC
HOW04-TP015	503669.6	435103.7	13.471	AOC
HOW04-TP016	503748.1	435061.8	14.259	AOC
HOW04-TP018	503905.4	435043	12.003	AOC
HOW04-TP019	503986.7	435026.3	11.145	AOC
HOW04-TP020	504077.1	435033.9	10.803	AOC
HOW04-TP021	503690.6	435030.3	13.675	AOC

Deposit log	Easting	Northing	Elevation	Source
HOW04-TP022	503769.1	435017.7	13.504	AOC
HOW04-TP023	503849.8	434997.3	12.525	AOC
HOW04-TP024	503998.2	434962.3	11.436	AOC
HOW04-TP025	504108.9	434971.8	10.48	AOC
HOW04-TP028	504024.9	435066.4	11.044	AOC
HOW04-TP029	504051	435051.3	11.034	AOC
HOW04-TP101	503442.5	435131.1	16.263	AOC
HOW04-TP102	503379.2	435118.7	16.906	AOC
HOW04-TP103	503303.4	435172.1	17.563	AOC
HOW04-TP104	503285.1	435262.8	17.225	AOC
HOW04-TP105	503325.7	435359.6	16.573	AOC
HOW04-TP106	503337.7	435468.8	17.128	AOC
HOW04-TP107	503349.8	435585.2	18.337	AOC
HOW04-TP108	503404	435690.8	16.048	AOC
HOW04-TP109	503498.2	435786.7	14.867	AOC
HOW04-TP110	503522.1	435897.1	14.865	AOC
HOW04-TP111	503540	435980.1	13.056	AOC
HOW04-TP112	503570.2	436090.7	14.715	AOC
HOW04-TP113	503561.8	436163.3	16.519	AOC
HOW04-TP114	503520.8	436225.4	17.093	AOC
HOW04-TP115	503445.7	436281.9	17.813	AOC
HOW04-TP116	503330	436319.5	18.571	AOC

Deposit log	Easting	Northing	Elevation	Source
HOW04-TP117	503291.9	436386.3	15.906	AOC
HOW04-TP201	503042.8	434972.4	19.838	AOC
HOW04-TP202	503138	434997.2	18.267	AOC
HOW04-TP203	503235.8	435070.7	18.456	AOC
HOW04-TP204	503249.2	434983.2	17.589	AOC
HOW04-TP205	503319.9	435083.9	17.292	AOC
HOW04-TP206	503345.8	434997.5	17.246	AOC
HOW04-TP207	503398.4	435068.9	17.024	AOC
HOW04-TP208	503459.4	435027.3	16.403	AOC
HOW04-TP210	503093.5	434783.7	22.193	AOC
HOW04-TP212	503200.1	434790	19.979	AOC
HOW04-TP213	503278.8	434882.9	17.52	AOC
HOW04-TP214	503296.9	434824.1	18.402	AOC
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SE93NE10	499300	439300	57	BGS
SE93NE8	497600	436300	97	BGS
SE93NE9	499560	439260	52	BGS
SE93NW13	494300	439200	109	BGS
SE93SE7	497430	433780	97.54	BGS
SE93SE8/A	498830	433845	69.19	BGS
SE93SE82	499700	433900	89	BGS
SE94SE26/B	498539	440164	51.82	BGS

Deposit log	Easting	Northing	Elevation	Source
SE94SE33	497133	440683	52.04	BGS
TA03NE114	505000	438300	2.5	BGS
TA03NE119	507260	436650	2.5	BGS
TA03NE14	507885	436929	5	BGS
TA03NE150	507690	436850	3.05	BGS
TA03NE152	507900	436930	5	BGS
TA03NE157	506660	437050	2.13	BGS
TA03NE166	505500	437980	4.57	BGS
TA03NE169	506280	437420	4	BGS
TA03NE17	506678	437039	2.13	BGS
TA03NE175	509400	439800	5	BGS
TA03NE184	507100	436700	4	BGS
TA03NE194	506700	437500	4	BGS
TA03NE198	509100	437500	6	BGS
TA03NE203	507550	437580	3	BGS
TA03NE214	507570	437620	3	BGS
TA03NE220	507590	437540	4	BGS
TA03NE221	507600	437470	3	BGS
TA03NE222	507610	437600	4	BGS
TA03NE223	507620	437490	4	BGS
TA03NE227	507900	436900	5	BGS
TA03NE24	505496	437966	4.57	BGS

Deposit log	Easting	Northing	Elevation	Source
TA03NE38	505446	436798	3.048	BGS
TA03NE41	507114	436921	2.13	BGS
TA03NE49	506302	437574	4.57	BGS
TA03NE51	507688	436857	3.05	BGS
TA03NE6	509401	439846	6	BGS
TA03NE87	506276	437430	3	BGS
TA03NW12	502636	437414	25.6	BGS
TA03NW126	502500	437630	34	BGS
TA03NW129	502310	437870	42.67	BGS
TA03NW130	502030	438000	50	BGS
TA03NW149	501340	439650	46	BGS
TA03NW150	503630	435660	16	BGS
TA03NW162	504840	436680	8.23	BGS
TA03NW177	503640	435600	16	BGS
TA03NW178	502100	438120	45	BGS
TA03NW20/B	501330	439650	46	BGS
TA03NW3	503619	435653	15	BGS
TA03NW383	502602	437456	25.34	BGS
TA03NW384	502560	437439	28.5	BGS
TA03NW385	502536	437437	29.8	BGS
TA03NW386	502559	437471	29.8	BGS
TA03NW387	502547	437390	28.8	BGS

Deposit log	Easting	Northing	Elevation	Source
TA03NW395	504930	437070	7	BGS
TA03NW410	501600	437800	55.64	BGS
TA03NW420	502100	435800	28	BGS
TA03NW427	501416	439691	45	BGS
TA03NW428	501390	439651	49.75	BGS
TA03NW429	501409	439678	45	BGS
TA03NW6/B	501590	437710	53.34	BGS
TA03NW67	504825	436678	8.23	BGS
TA03NW7	502030	437990	50	BGS
TA03NW81	504934	437262	6.1	BGS
TA03NW94	502800	437800	27.5	BGS
TA03SW107	503020	433500	33.53	BGS
TA03SW108	502800	433820	42.26	BGS
TA03SW109	502870	433830	39.11	BGS
TA03SW110	502950	433870	32.199	BGS
TA03SW111	503000	433880	34.04	BGS
TA03SW112	502960	433870	33.85	BGS
TA03SW113	503010	433880	33.53	BGS
TA03SW114	503030	433880	32.95	BGS
TA03SW115	503060	433890	31.99	BGS
TA03SW116	503120	433900	29.02	BGS
TA03SW134	501720	433990	33.7	BGS

Deposit log	Easting	Northing	Elevation	Source
TA03SW135	501760	434000	33.6	BGS
TA03SW136	501770	433980	34.1	BGS
TA03SW159	503900	433900	13	BGS
TA03SW168	502600	433240	38	BGS
TA03SW172	502600	433270	39	BGS
TA03SW175	502600	433150	35	BGS
TA03SW177	502600	433400	46	BGS
TA03SW179	502600	433200	37	BGS
TA03SW19	504422	434870	9.14	BGS
TA03SW36/E	504718	434240	11	BGS
TA03SW36/W	504690	434330	9	BGS
TA03SW36/Y	504420	434590	10	BGS
TA03SW47	504145	433898	12.19	BGS
TA03SW48	503940	433850	13.72	BGS
TA03SW54	503016	433506	33.53	BGS
TA03SW56	502564	433792	45.77	BGS
TA03SW70	504249	433628	9.14	BGS
TA03SW98	503940	433850	13.72	BGS
TA03SW99	504250	433630	11	BGS
TA04SE15	509611	440541	5	BGS
TA04SE2	505332	442639	2.13	BGS
TA04SE21	506808	442321	5	BGS

Deposit log	Easting	Northing	Elevation	Source
TA04SE23	509686	440449	5	BGS
TA04SE3	506548	442842	7.62	BGS
TA04SE33	508910	442820	5	BGS
TA04SE37	506540	442850	7.62	BGS
TA04SE48	509100	442400	5	BGS
TA04SE49	509670	440660	5	BGS
TA04SE51	509600	440600	6	BGS
TA04SE6/C	505920	443510	10.97	BGS
TA04SE7	509160	442265	4.88	BGS
TA04SE76	507400	442400	4	BGS
TA04SE8/A	508910	442820	4.88	BGS
TA04SW100	504030	441270	6	BGS
TA04SW111	503040	441180	8	BGS
TA04SW112	503310	441160	6.5	BGS
TA04SW113	503420	441270	6	BGS
TA04SW114	503230	441060	7	BGS
TA04SW115	503370	441270	7	BGS
TA04SW116	503300	441230	8	BGS
TA04SW117	503170	441120	8	BGS
TA04SW118	503240	441150	8	BGS
TA04SW119	503340	441090	10	BGS
TA04SW120	503110	441160	9	BGS

Deposit log	Easting	Northing	Elevation	Source
TA04SW134	501000	441920	23	BGS
TA04SW142	503580	441080	6.096	BGS
TA04SW15	501987	441604	23.73	BGS
TA04SW152	501000	442100	21	BGS
TA04SW16/A	502740	441350	11	BGS
TA04SW16/B	502810	441370	10	BGS
TA04SW17/A	502652	441540	7.86	BGS
TA04SW17/B	502654	441540	8.01	BGS
TA04SW17/C	502677	441521	8.11	BGS
TA04SW17/D	502618	441531	7.96	BGS
TA04SW17/E	502704	441509	8.53	BGS
TA04SW17/F	502591	441596	7.99	BGS
TA04SW21/A	504838	443438	6.1	BGS
TA04SW21/B	504864	443386	6.1	BGS
TA04SW22	501018	441824	24.38	BGS
TA04SW23	502066	440812	24.38	BGS
TA04SW29/A	503934	441454	5.83	BGS
TA04SW29/B	503922	441496	5.83	BGS
TA04SW29/C	503915	441513	5.83	BGS
TA04SW29/D	503926	441474	5.83	BGS
TA04SW30	503581	441079	6.096	BGS
TA04SW72	501010	441930	22	BGS

Deposit log	Easting	Northing	Elevation	Source
TA04SW73	502900	440900	11	BGS
TA04SW90	503980	441110	7	BGS
TA04SW93	503760	441070	8	BGS
TA04SW94	503770	441170	8	BGS
TA04SW95	503780	441300	8	BGS
TA04SW96	503740	441360	8	BGS
TA04SW97	503890	441330	7	BGS
TA04SW98	503860	441170	7	BGS
TA04SW99	503950	441220	7	BGS
TA14NE5	515330	445350	21	BGS
TA14NW10	514500	448300	16.15	BGS
TA14NW35	514400	449240	20	BGS
TA14NW72	514000	445900	14	BGS
TA14NW83	514430	449240	20	BGS
TA14NW84	514460	446500	14	BGS
TA14NW85	514530	446070	14	BGS
TA14NW9/A	514330	446990	14.33	BGS
TA14NW9/B	514250	446980	14.33	BGS
TA14SW13	511270	443530	6.71	BGS
TA14SW20	511290	443520	6.71	BGS
TA14SW22	510700	443100	3	BGS
TA14SW24	512740	444610	7	BGS

Deposit log	Easting	Northing	Elevation	Source
TA14SW5	511344	443524	6.71	BGS
TA158558.14	515800	455800	11	BGS
TA158563.03	515800	456300	9	BGS
TA15NE14	517350	456030	9	BGS
TA15SW15	514556	451074	19	BGS
WX_55762_Tr1	517249.4	453891.4	16.6	AOC

Figures

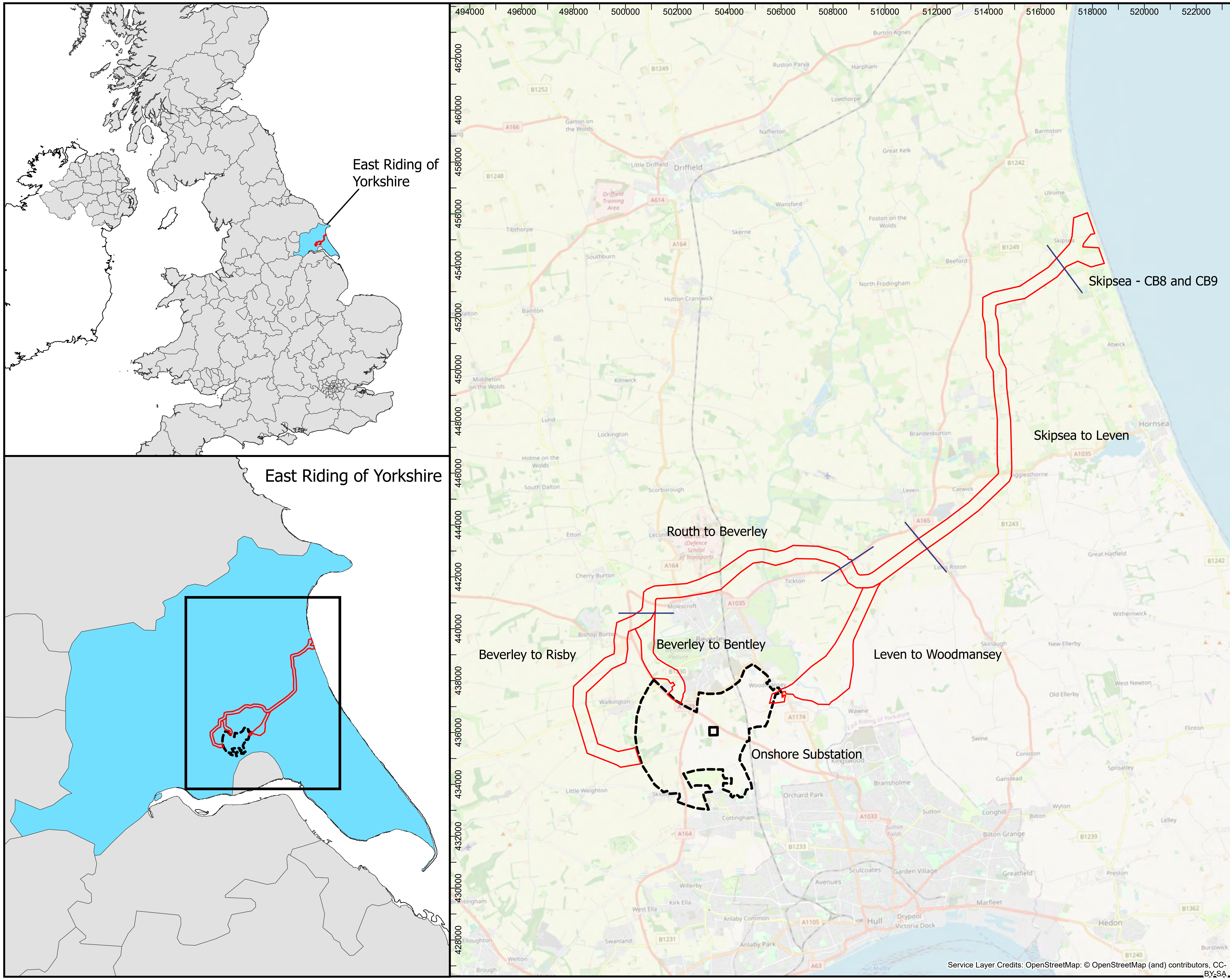

Figure 22-6-1

Site Location Map

Legend

- Onshore Substation Search Area
- Creyke Beck 1 Grid Connection
- GEOA Route Divisions
- Onshore Study Area

FOR

RWE Renewables UK Dogger Bank South (West) Limited
and
RWE Renewables UK Dogger Bank South (East) Limited

Drawn/checked:	JT
DWG no / Date:	25/04/23
AOC Project No.:	53110

AOC Archaeology Group

N

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Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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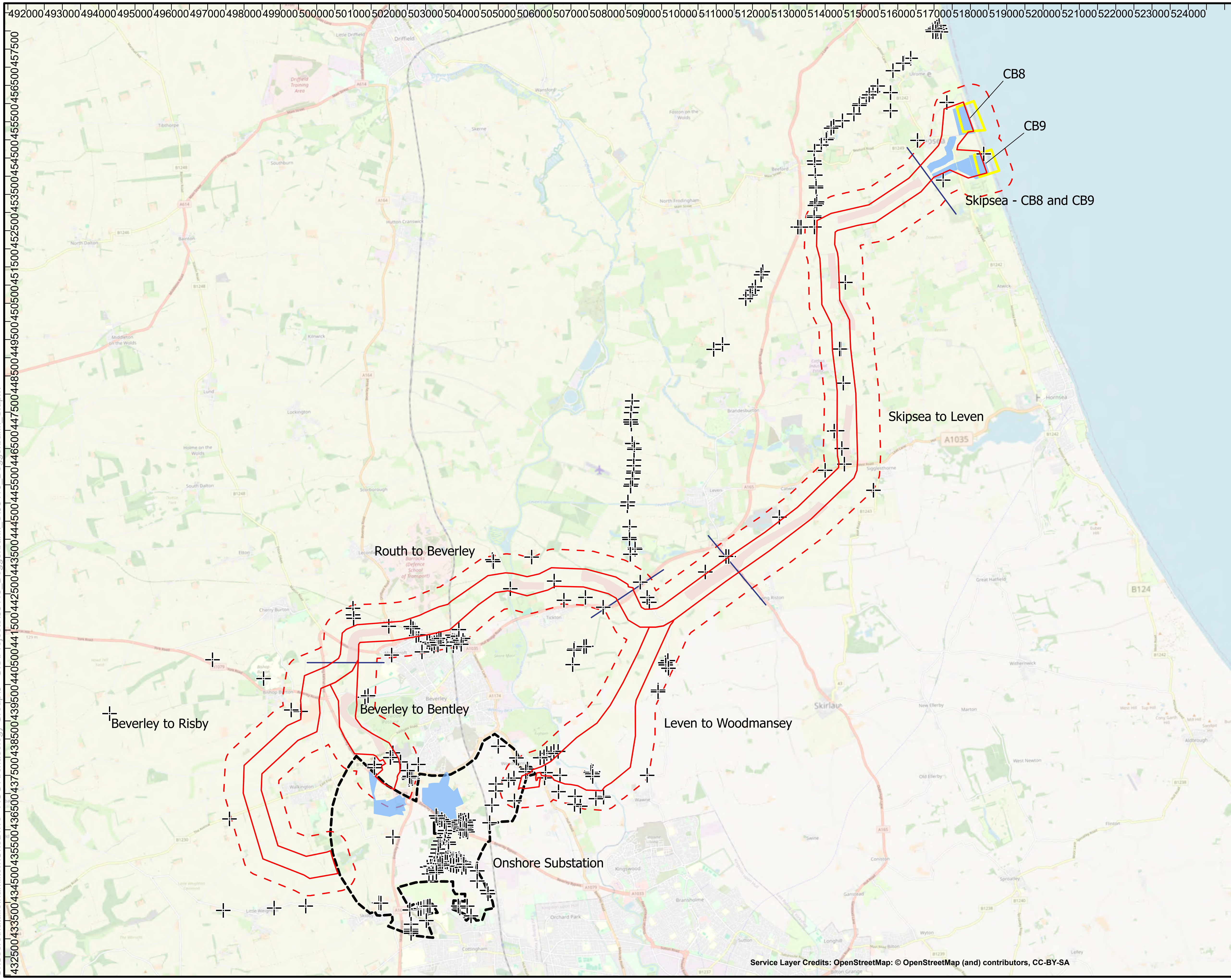

Figure 22-6-2

Development areas, and priority areas, with route division markers

- Transect A
- Transect B
- Transect C
- Transect D
- Transect E
- Transect F
- Transect G
- Transect H
- Transect I
- Data Points
- GEOA Route Divisions
- Potential Landfall Areas

Priority Geophysics Areas

- No
- Yes
- Onshore Study Area
- Geoarchaeological Study Area
- Onshore Substation Search Area
- Creyke Beck 1 Grid Connection

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Datum: OSGB 1936

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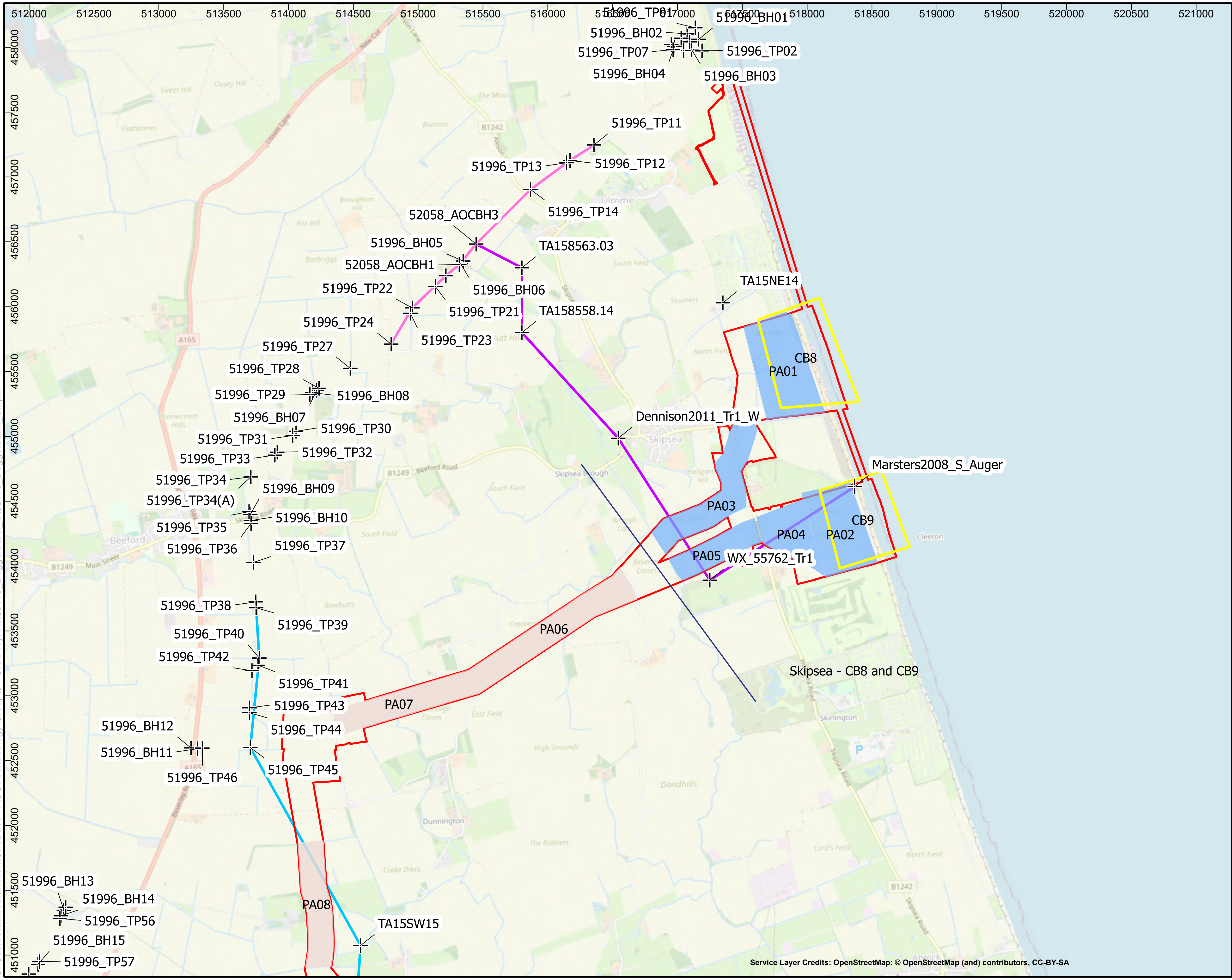

Figure 22-6-3

Data points and transect locations - Area 1

Legend

- Potential Landfall Areas
- Onshore Substation Search Area
- NEW Scheme boundary
- No
- Yes
- GEOA Route Divisions
- Data Points
- Creyke Beck 1 Grid Connection
- Transect A
- Transect B
- Transect C
- Transect D
- Transect E
- Transect F
- Transect G
- Transect H
- Transect I

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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

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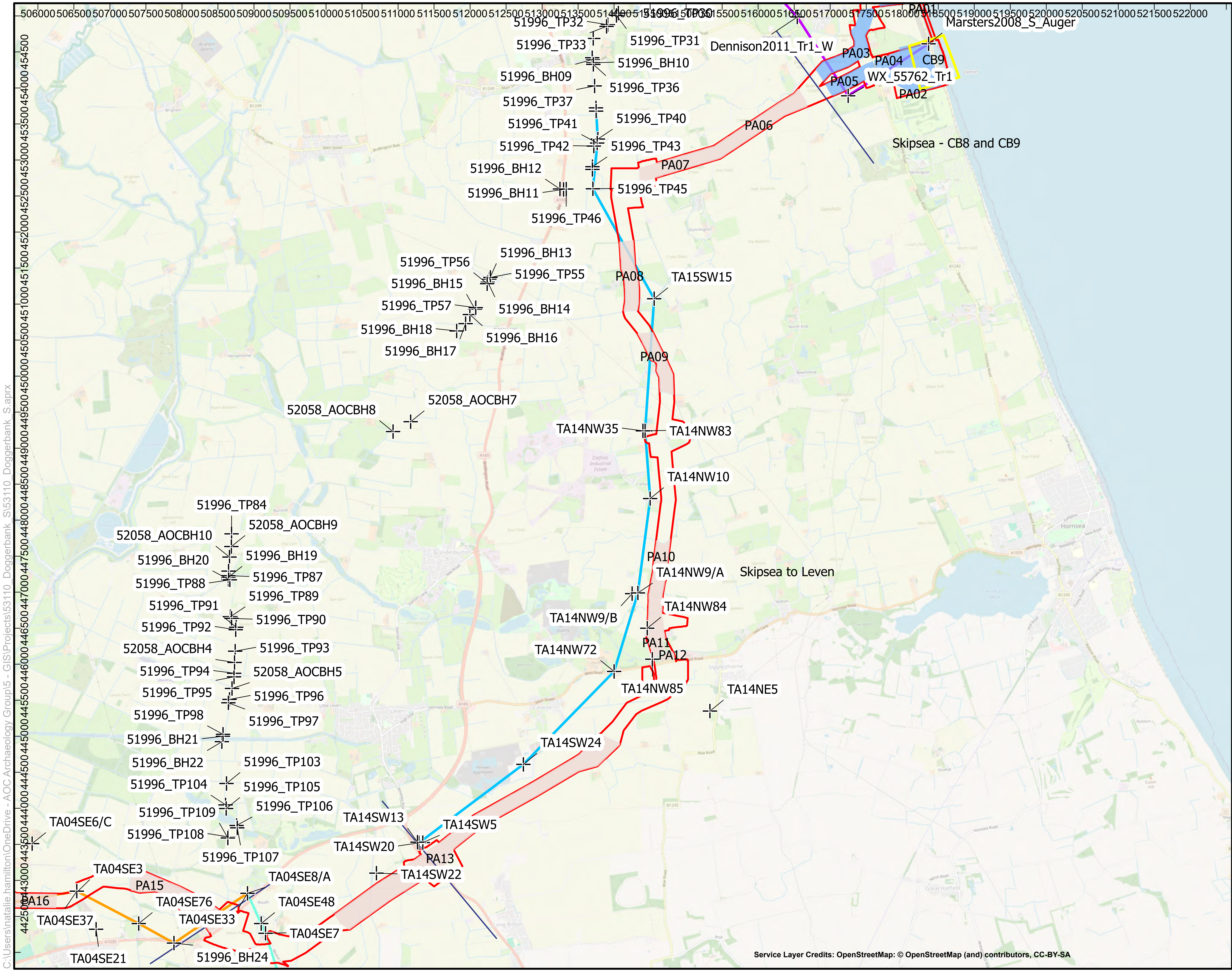

Figure 22-6-4

Data points and transect locations - Area 2

Legend

- Potential Landfall Areas
- Onshore Substation Search Area
- NEW Scheme boundary
- No
- Yes
- GEOA Route Divisions
- Data Points
- Creyke Beck 1 Grid Connection
- Transect A
- Transect B
- Transect C
- Transect D
- Transect E
- Transect F
- Transect G
- Transect H
- Transect I

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DWG no / Date:	25/04/23
AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

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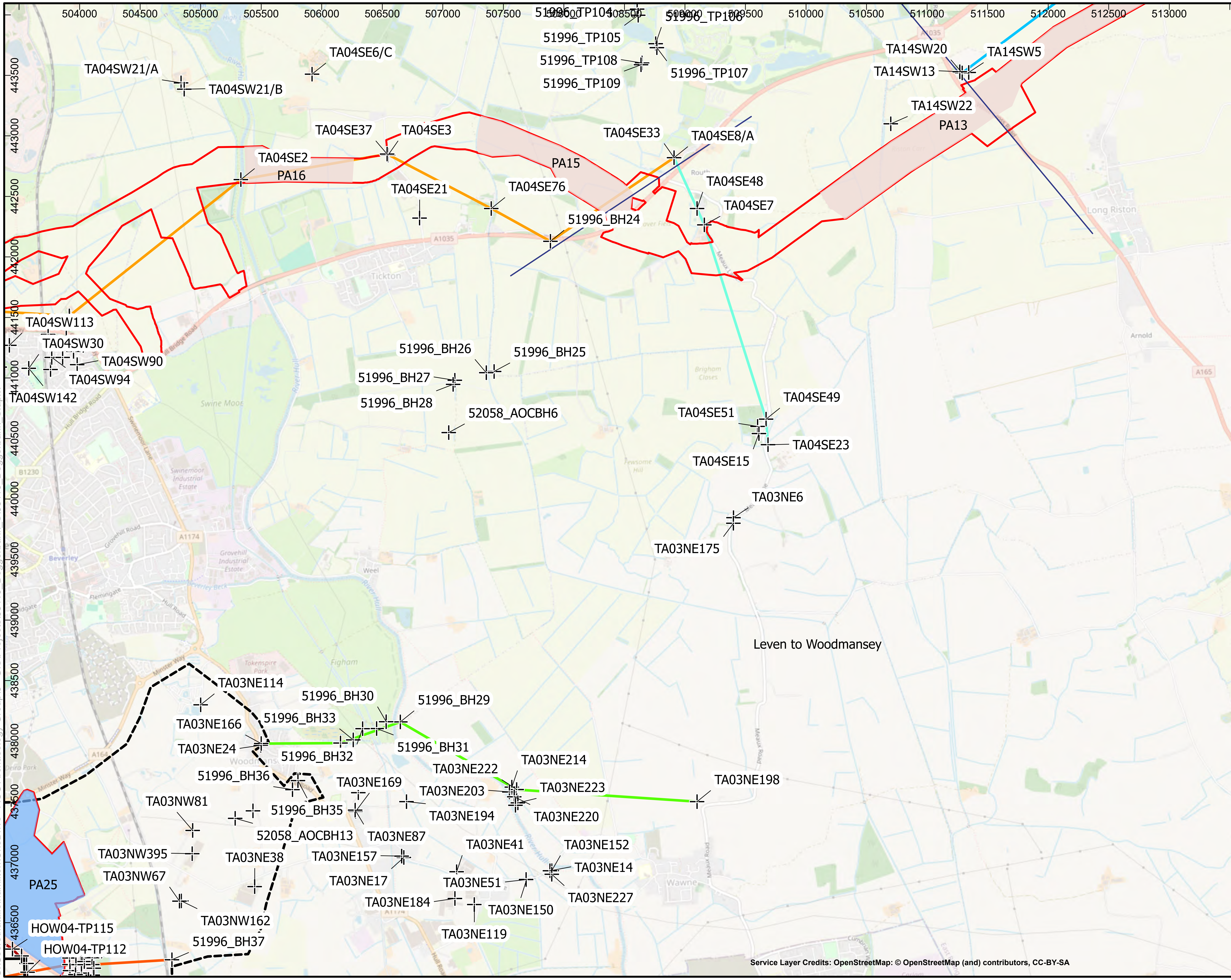

Figure **22-6-5**

Data points and transect locations - Area 3

Legend

- Potential Landfall Areas
- Onshore Substation Search Area
- NEW Scheme boundary
- No
- Yes
- GEOA Route Divisions
- Data Points
- Creyke Beck 1 Grid Connection
- Transect A
- Transect B
- Transect C
- Transect D
- Transect E
- Transect F
- Transect G
- Transect H
- Transect I

FOR

RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited

Drawn/checked:	JT
DWG no / Date:	25/04/23
AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

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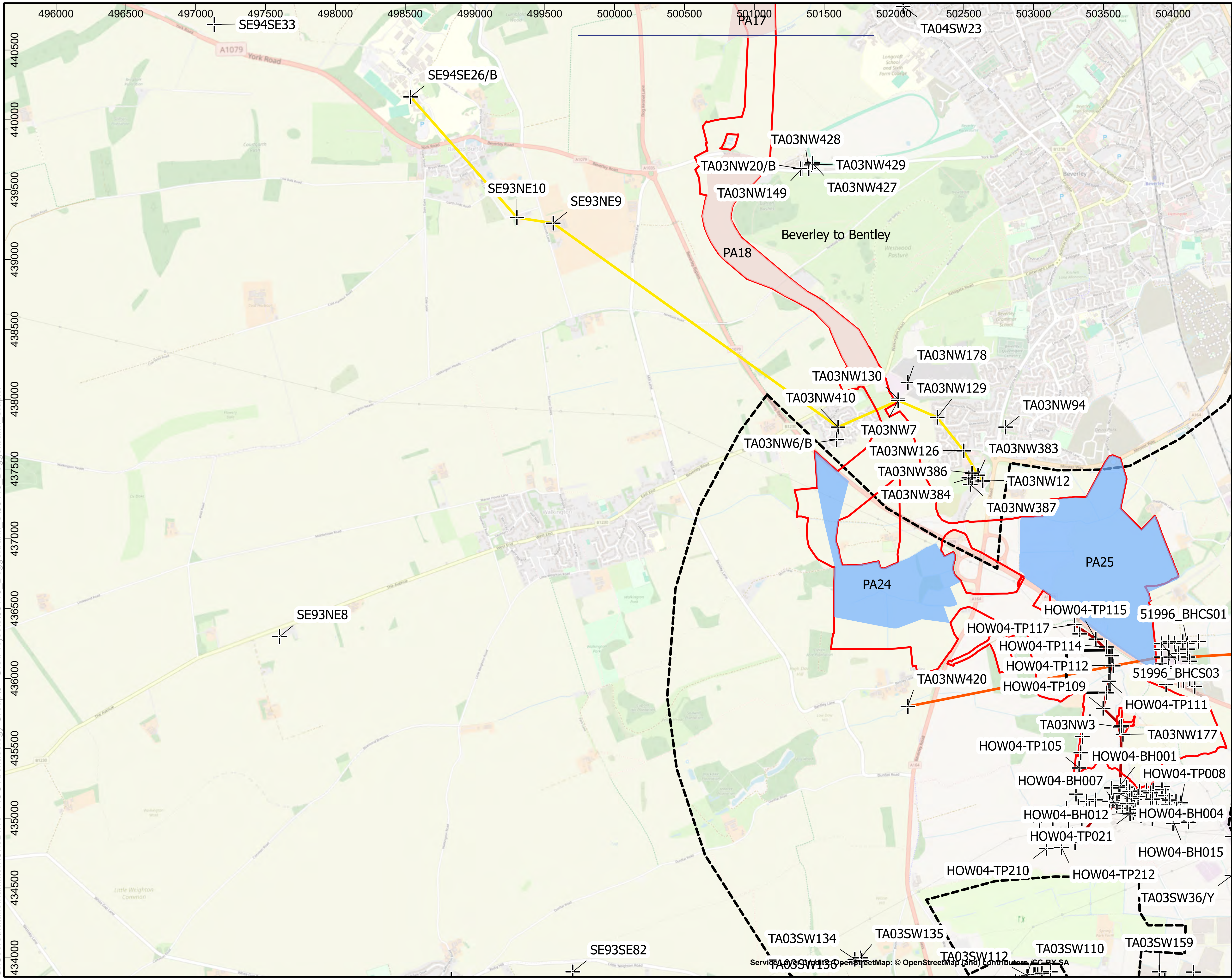

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Figure	22-6-6

Data points and transect locations - Area 4

Legend

- Potential Landfall Areas
- Onshore Substation Search Area
- NEW Scheme boundary
- No
- Yes
- GEOA Route Divisions
- Data Points
- Creyke Beck 1 Grid Connection
- Transect A
- Transect B
- Transect C
- Transect D
- Transect E
- Transect F
- Transect G
- Transect H
- Transect I

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and
RWE Renewables UK Dogger Bank South (East) Limited

Drawn/checked:	JT
DWG no / Date:	25/04/23
AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

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Projection: Transverse Mercator
Datum: OSGB 1936

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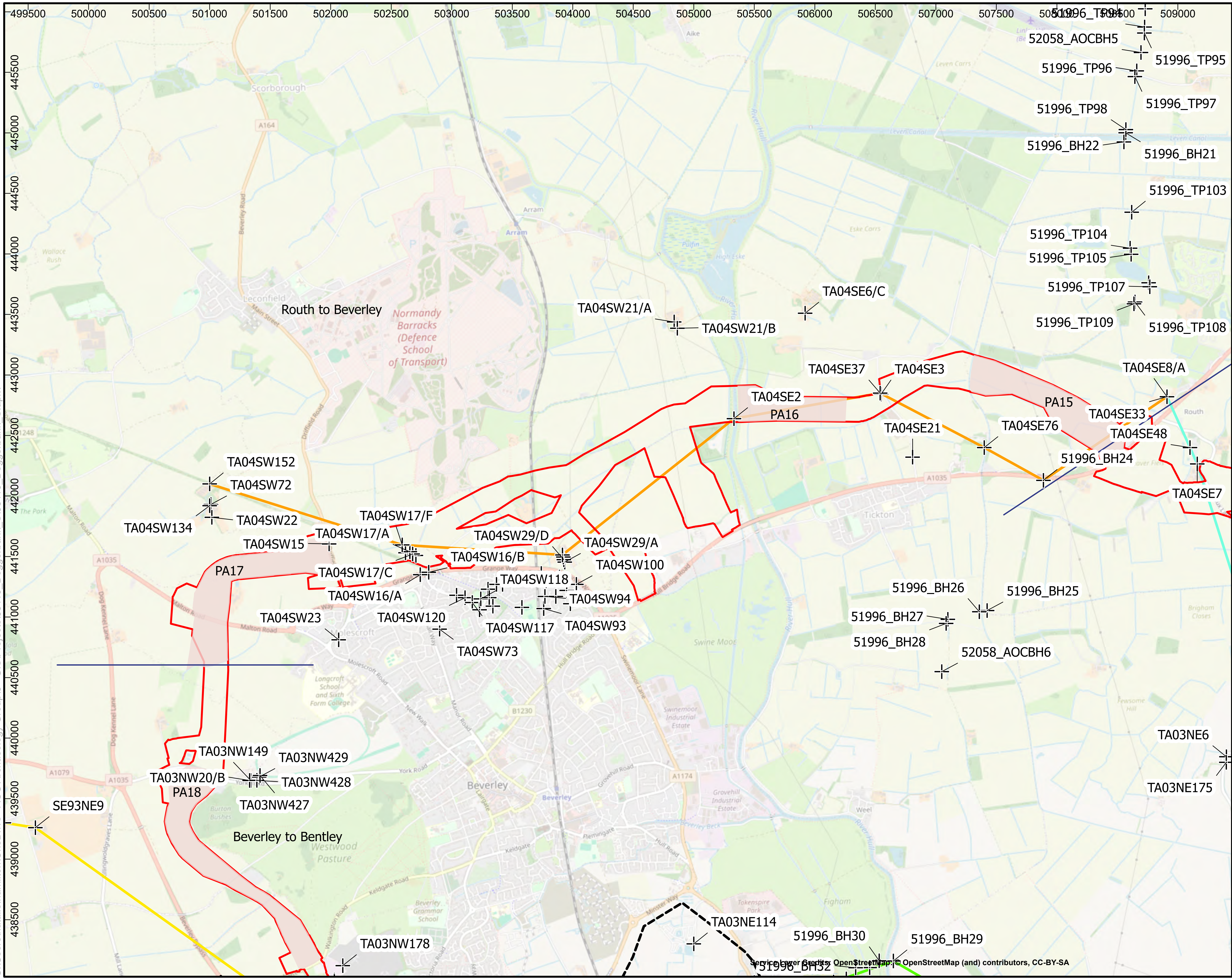

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Figure 22-6-7

Data points and transect locations - Area 5

Legend

- Potential Landfall Areas
- Onshore Substation Search Area
- NEW Scheme boundary
- No
- Yes
- GEOA Route Divisions
- Data Points
- Creyke Beck 1 Grid Connection
- Transect A
- Transect B
- Transect C
- Transect D
- Transect E
- Transect F
- Transect G
- Transect H
- Transect I

FOR

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

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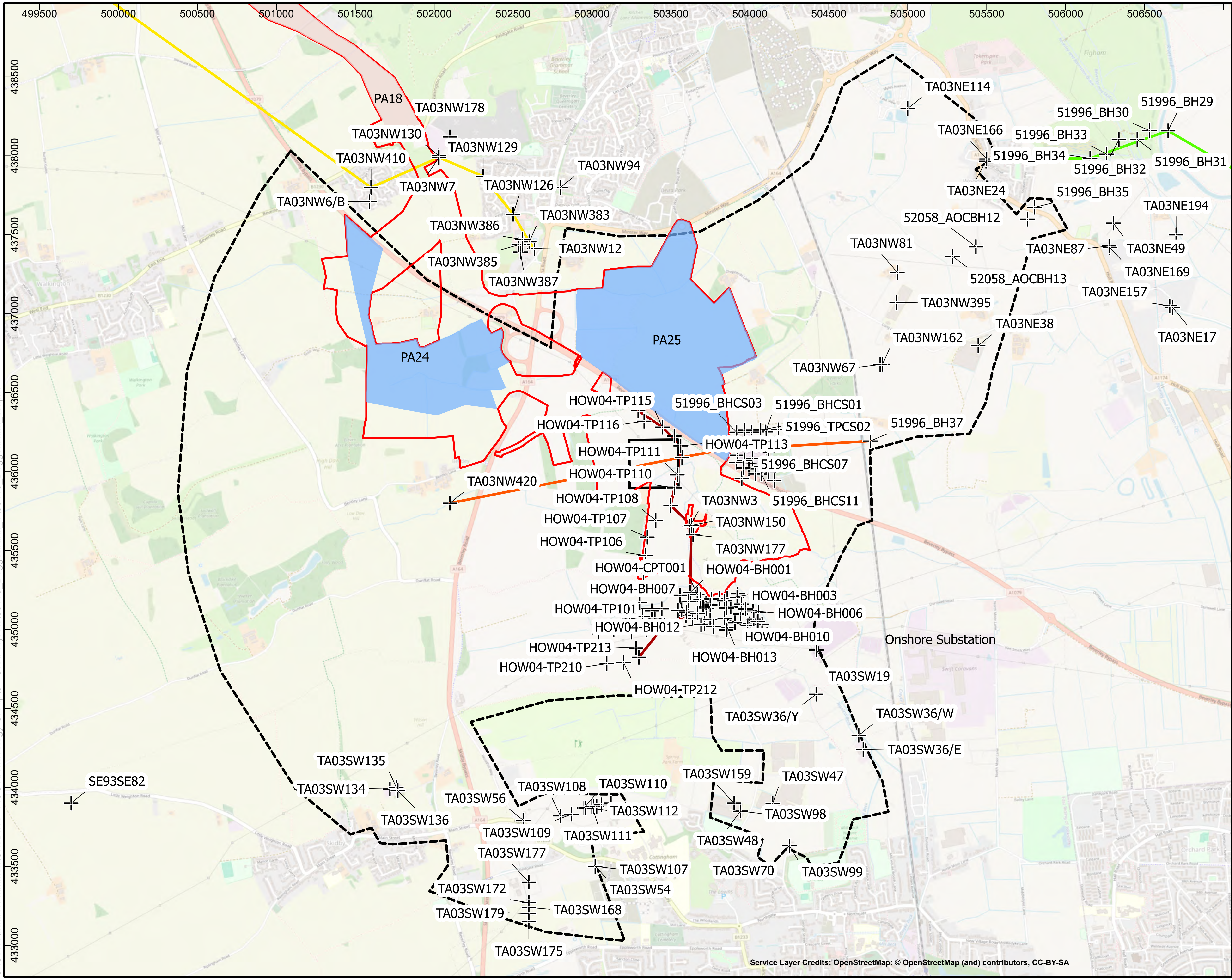

Figure	22-6-8

Data points and transect locations - Area 6

Legend

- Potential Landfall Areas
- Onshore Substation Search Area
- NEW Scheme boundary
  - No
  - Yes
- GEOA Route Divisions
- Data Points
- Creyke Beck 1 Grid Connection
- Transect A
- Transect B
- Transect C
- Transect D
- Transect E
- Transect F
- Transect G
- Transect H
- Transect I

FOR

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N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

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0 1,000m

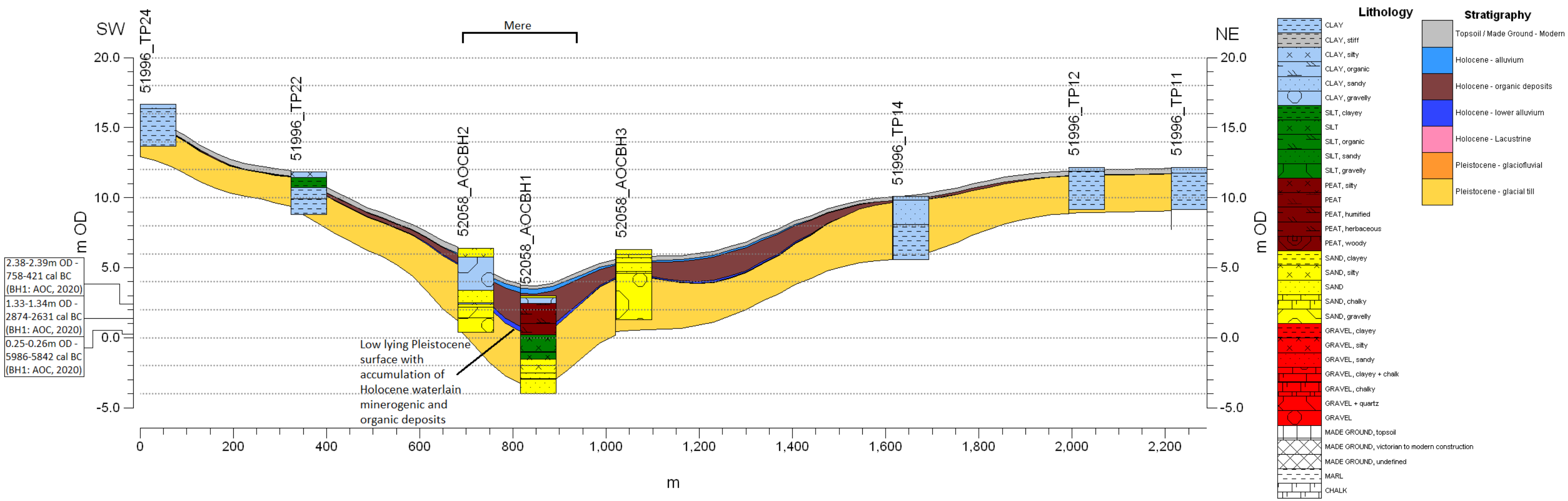

Figure 22-6-9 Transect A, soutwest to northeast across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

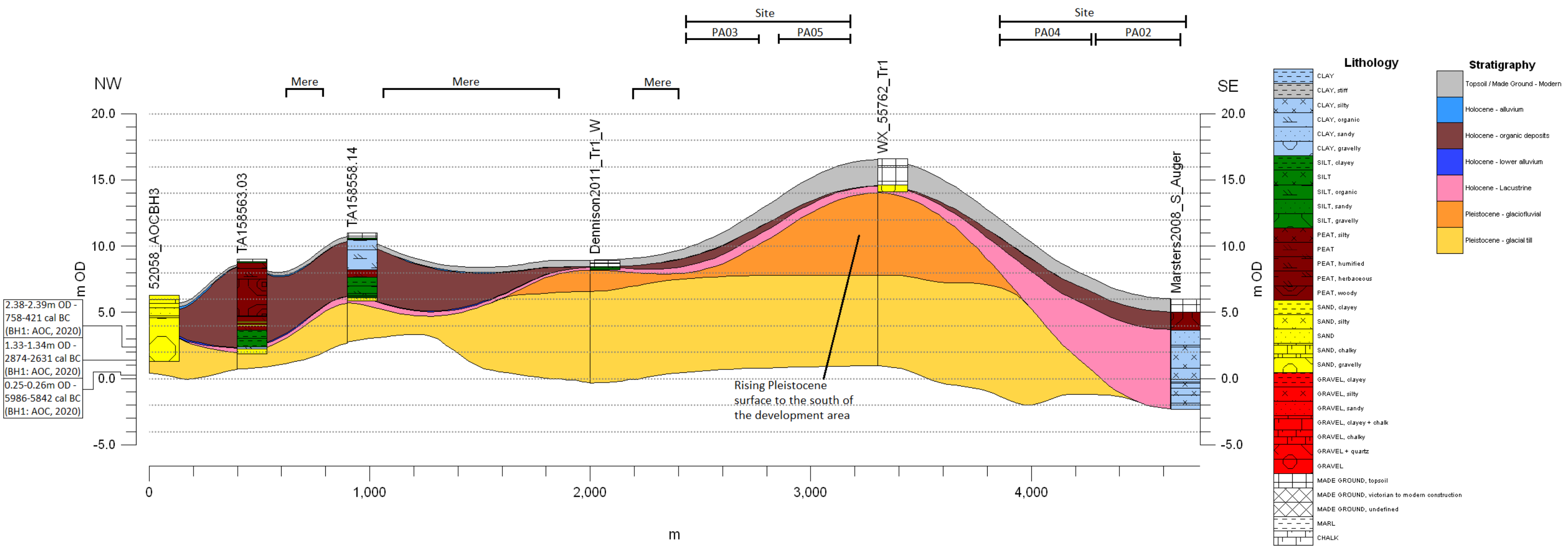

Figure 22-6-10 Transect B, northwest to southeast across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

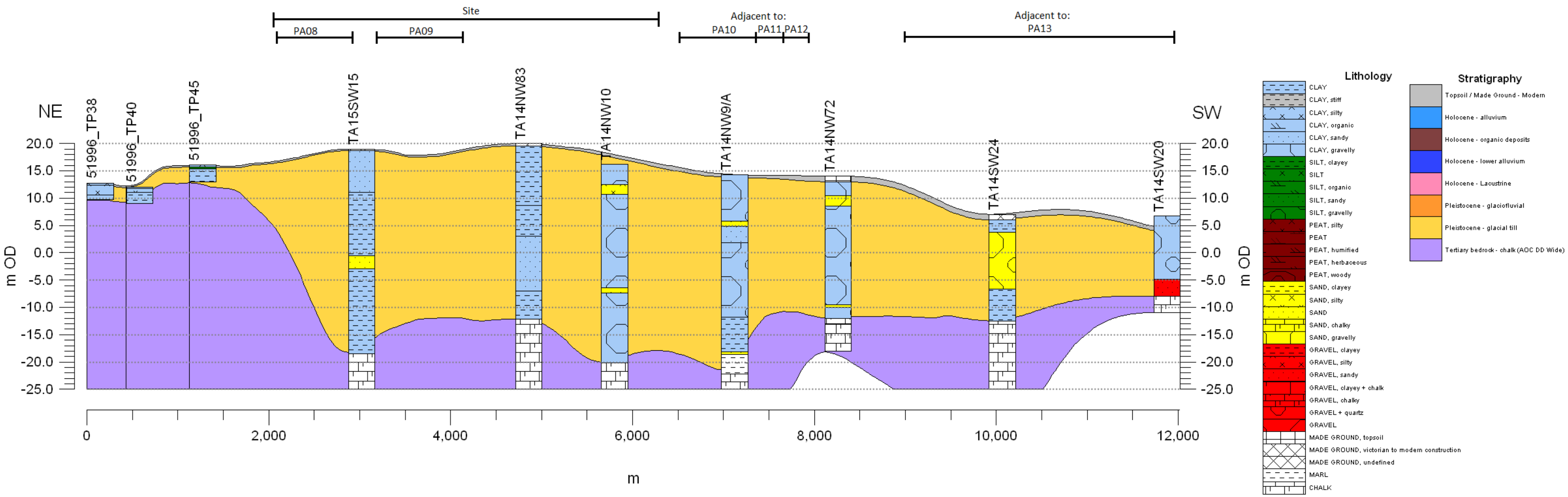

Figure 22-6-11 Transect C, northeast to southwest across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

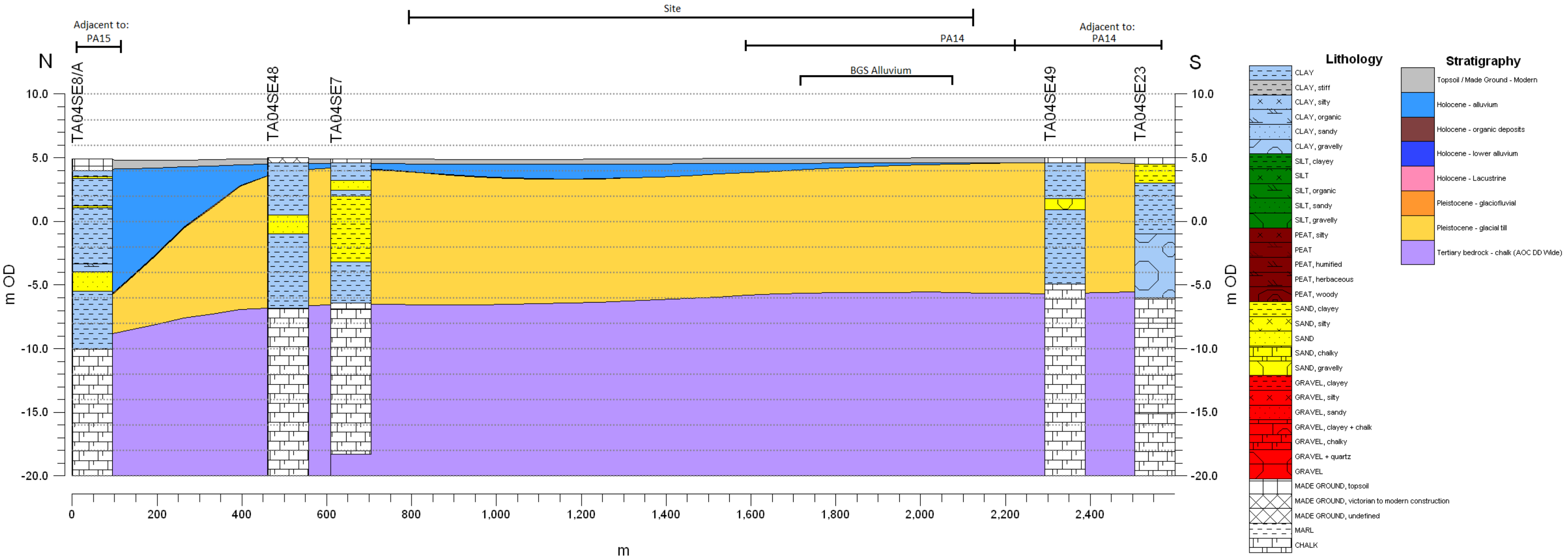

Figure 22-6-12 Transect D, north to south across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

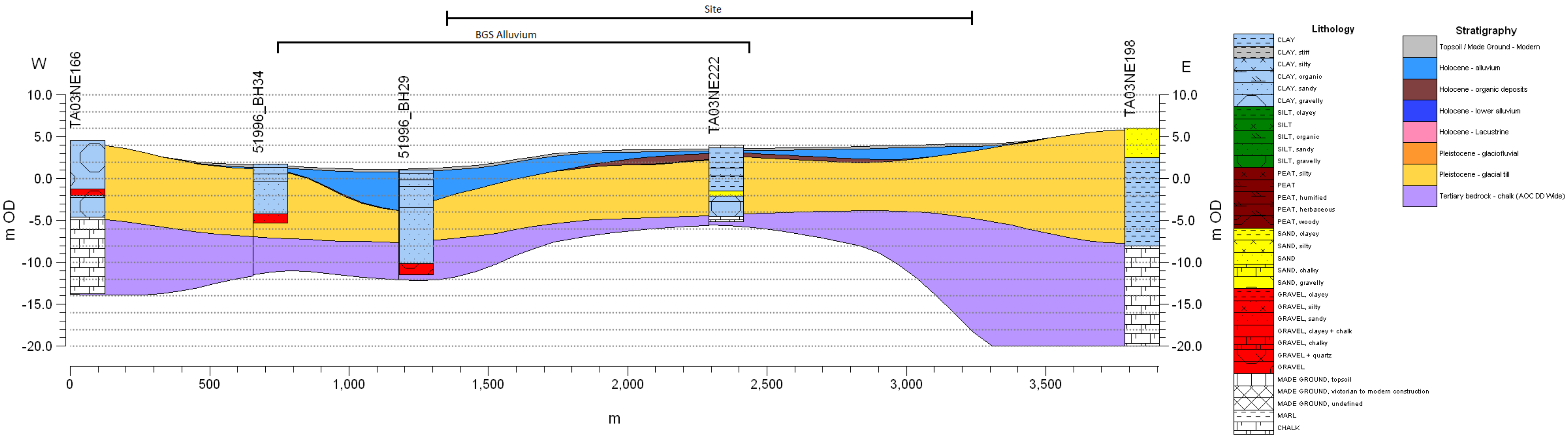

Figure 22-6-13 Transect E, west to east across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

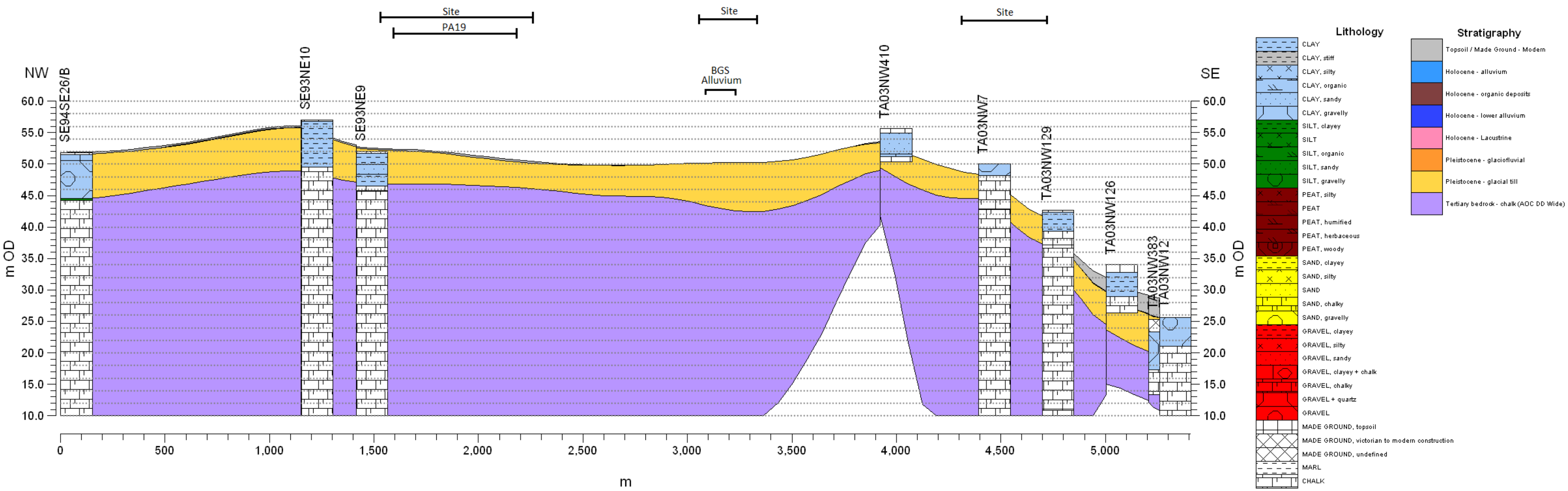

Figure 22-6-14 Transect F, northwest to southeast across the site showing the levels and thickness of deposits over the underlying

geology in section (extrapolated from deposit records)

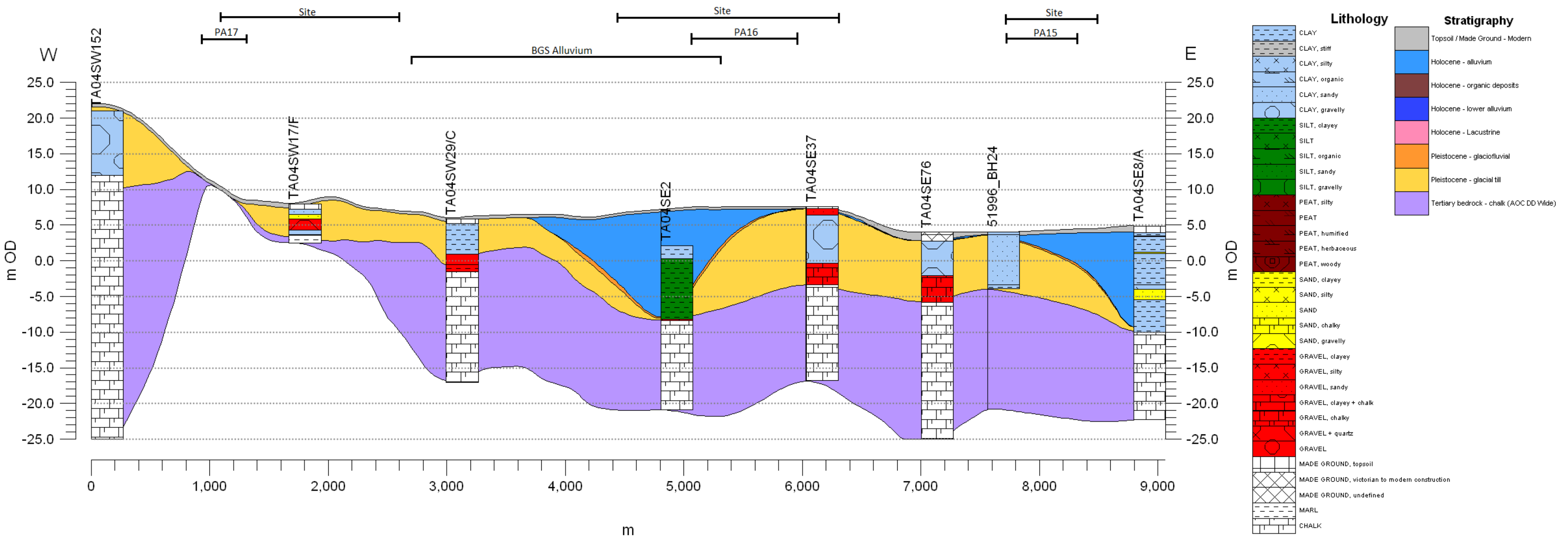

Figure 22-6-15 Transect G, west to east across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

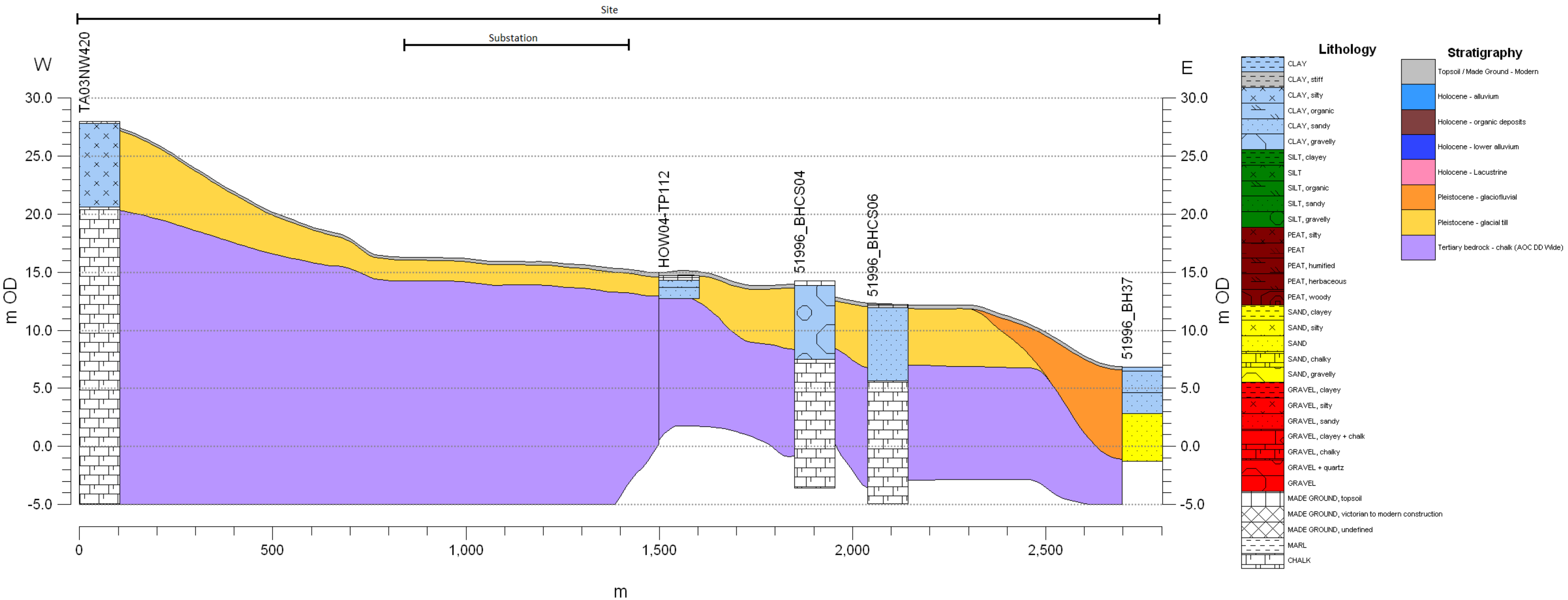

Figure 22-6-16 Transect H, west to east across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

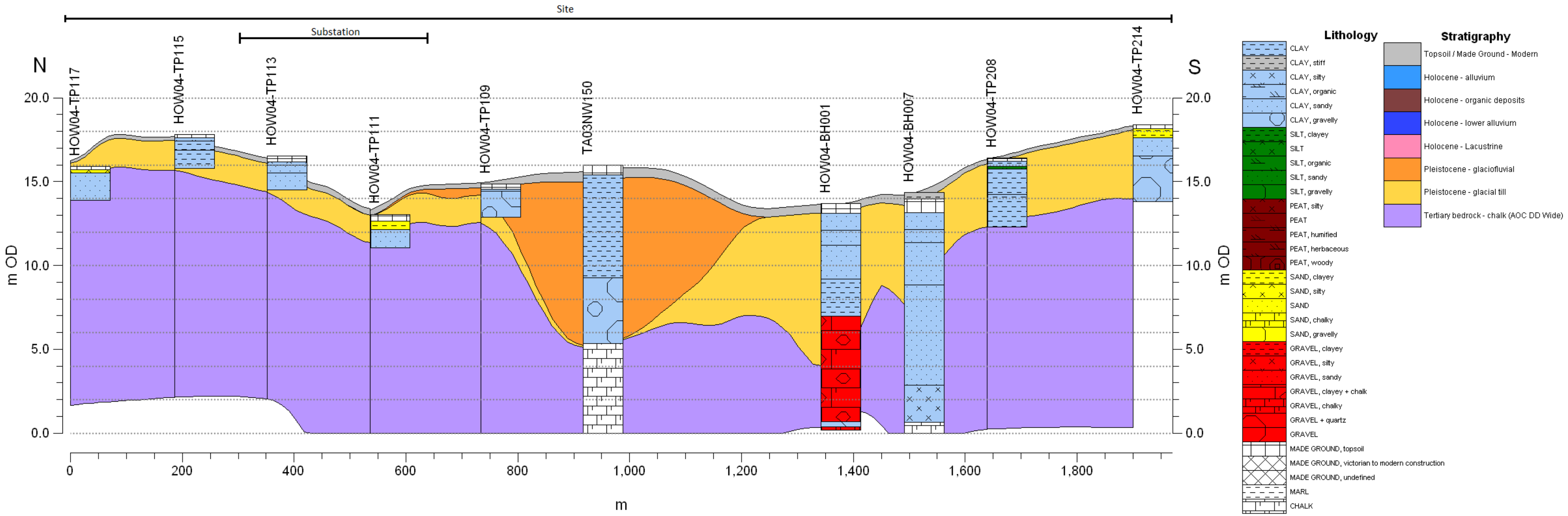

Figure 22-6-17 Transect I, north to south across the site showing the levels and thickness of deposits over the underlying geology in section (extrapolated from deposit records)

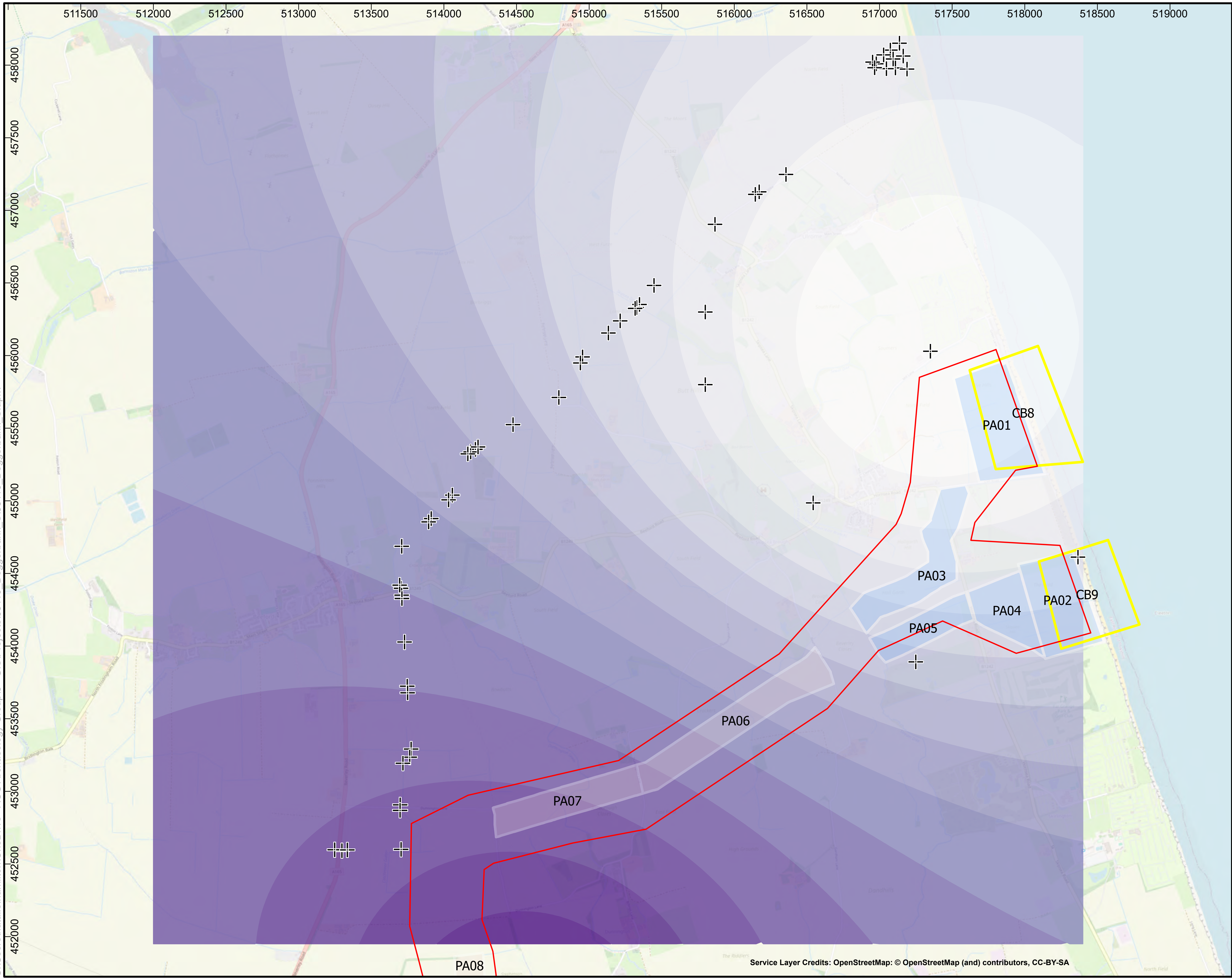

Figure 22-6-18

Topographic plot of the below ground chalk bedrock (extrapolated from deposit records) - Area 1

Data Points
Onshore Study Area
Potential Landfall Areas

Priority Geophysics Areas

No
Yes

Chalk Surface - Area 1

m OD

-10.999999 - -10.500000
-11.499999 - -11.000000
-11.999999 - -11.500000
-12.499999 - -12.000000
-12.999999 - -12.500000
-13.499999 - -13.000000
-13.999999 - -13.500000
-14.499999 - -14.000000
-14.999999 - -14.500000
-15.499999 - -15.000000
-15.999999 - -15.500000
-16.499999 - -16.000000
-16.999999 - -16.500000
-17.000000

FOR

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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000 m

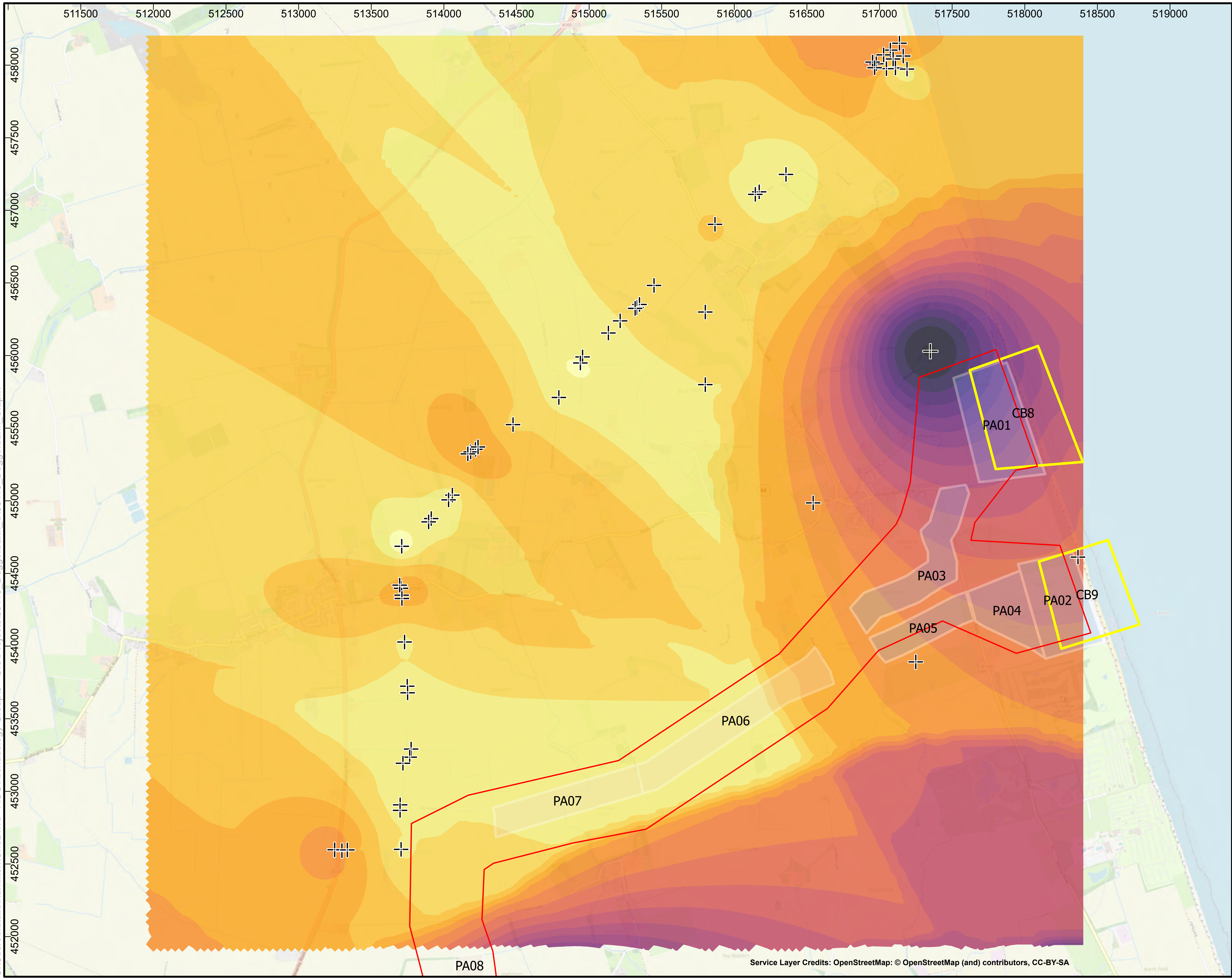

Figure 22-6-19

Thickness plot of the below ground Pleistocene deposits (extrapolated from deposit records), representing survival - Area 1

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AOC Archaeology Group

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

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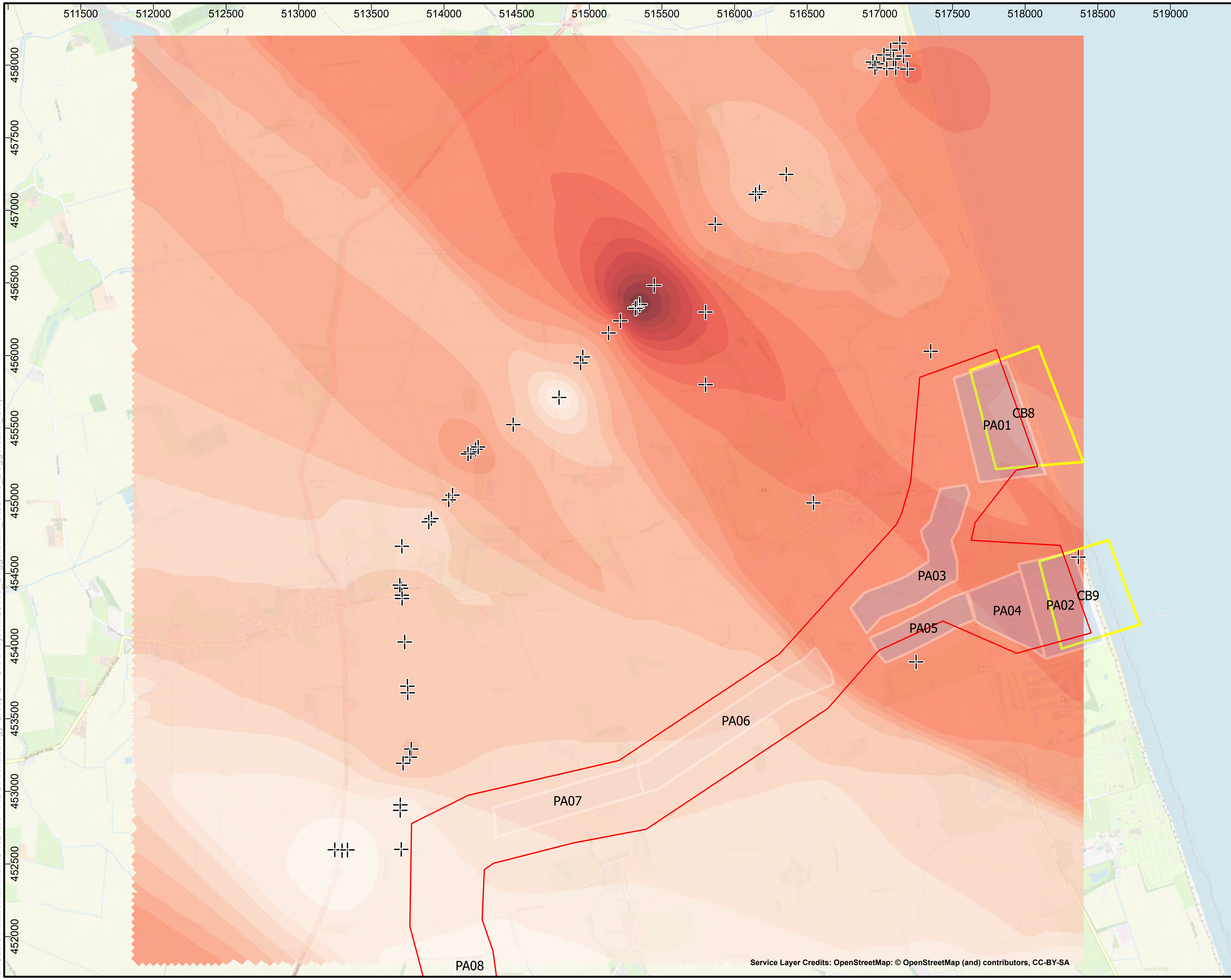

Figure 22-6-20

Topographic plot of the below ground Pleistocene deposits (extrapolated from deposit records), representing the possible land surface at c. 12,000 BP - Area 1

Data Points

Onshore Study Area

Potential Landfall Areas

Priority Geophysics Areas

No

Yes

Pleistocene Surface - Area 1

m OD

16.000001 - 17.000000

15.000001 - 16.000000

14.000001 - 15.000000

13.000001 - 14.000000

12.000001 - 13.000000

11.000001 - 12.000000

10.000001 - 11.000000

9.000001 - 10.000000

8.000001 - 9.000000

7.000001 - 8.000000

6.000001 - 7.000000

5.000001 - 6.000000

4.000001 - 5.000000

3.000001 - 4.000000

2.000001 - 3.000000

1.000001 - 2.000000

0.000001 - 1.000000

-0.500000 - 0.000000

Data Points

FOR

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AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

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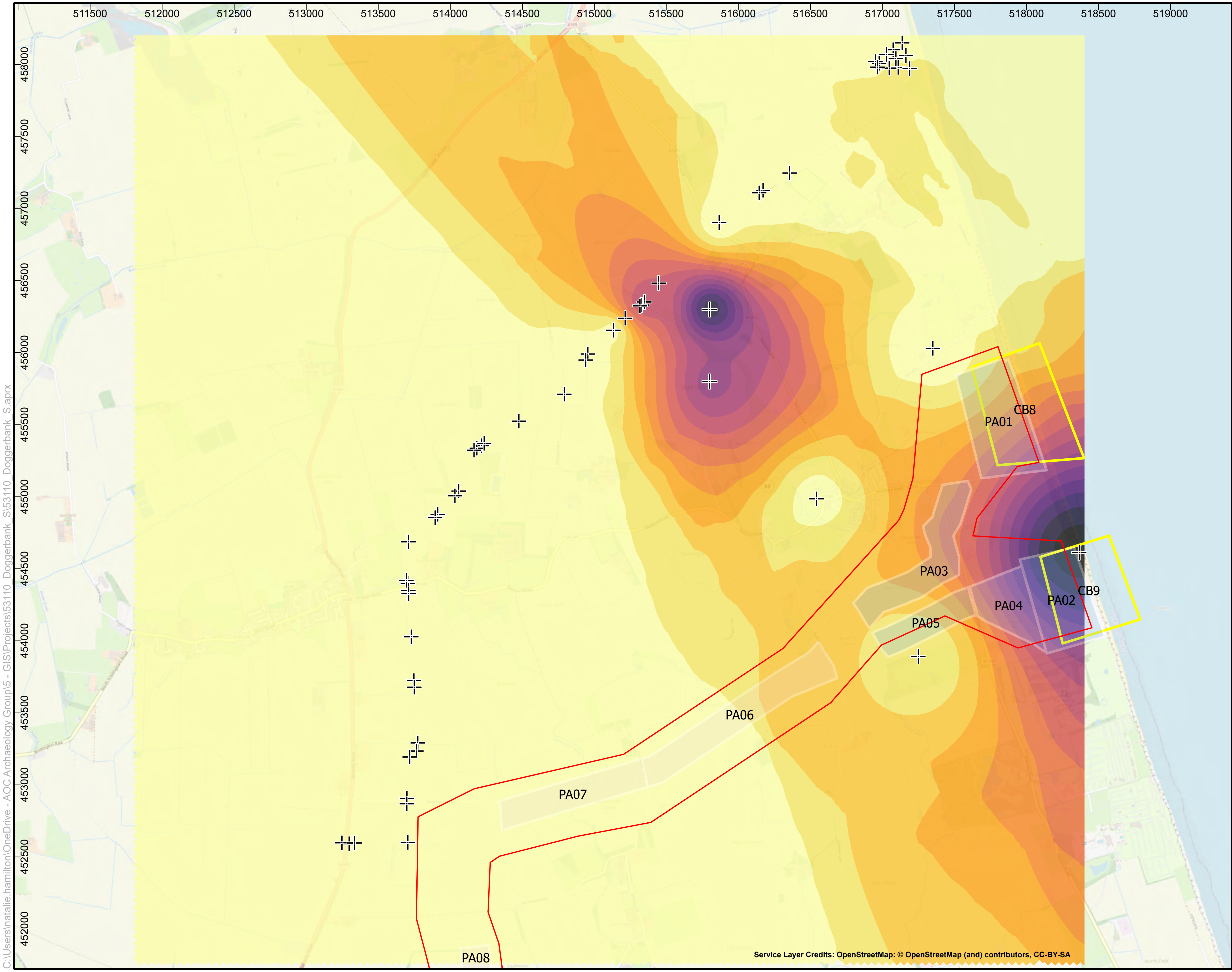

Figure 22-6-21

Thickness plot of the below ground Holocene deposits (extrapolated from deposit records), representing deposit survival
- Area 1

Data Points
Onshore Study Area

Priority Geophysics Areas
No
Yes
Potential Landfall Areas

Holocene Thickness - Area 1
m
0.000000 - 0.500000
0.500001 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000
2.000001 - 2.500000
2.500001 - 3.000000
3.000001 - 3.500000
3.500001 - 4.000000
4.000001 - 4.500000
4.500001 - 5.000000
5.000001 - 5.500000
5.500001 - 6.000000
6.000001 - 6.500000
6.500001 - 7.000000
7.000001 - 7.500000

FOR
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AOC Archaeology Group

N

SYSTEM
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE
1:25,000 @ A3

0 1,000m

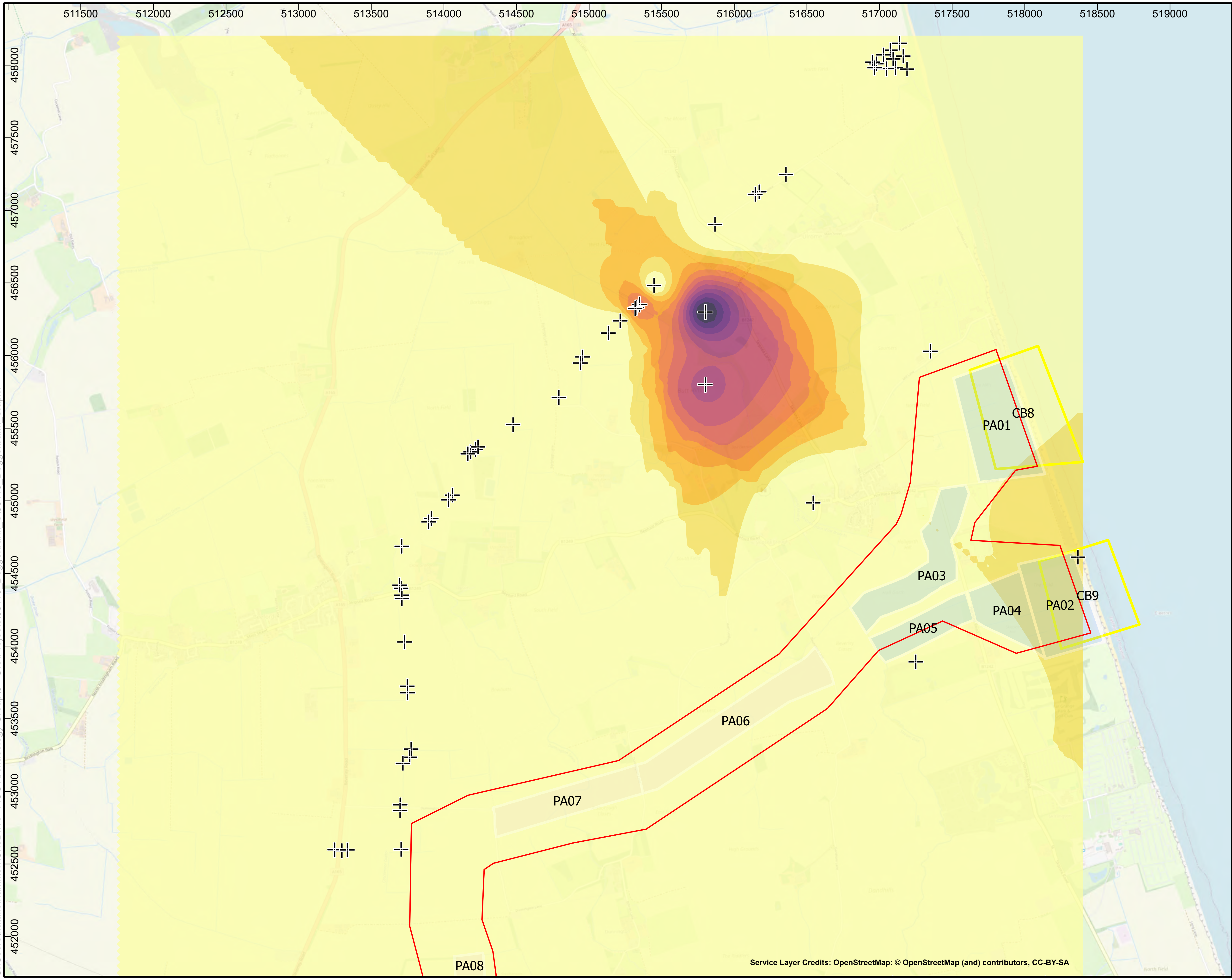

Figure 22-6-22

Thickness plot of the below ground Holocene organic deposits (extrapolated from deposit records), representing deposit survival - Area 1

Onshore Study Area

Priority Geophysics Areas

No

Yes

Potential Landfall Areas

Organic Thickness - Area 1

m

0.500000 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000
2.000001 - 2.500000
2.500001 - 3.000000
3.000001 - 3.500000
3.500001 - 4.000000
4.000001 - 4.500000
4.500001 - 5.000000
5.000001 - 5.500000
5.500001 - 6.000000
6.000001 - 6.500000
6.500001 - 7.000000

Data Points

FOR

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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000 m

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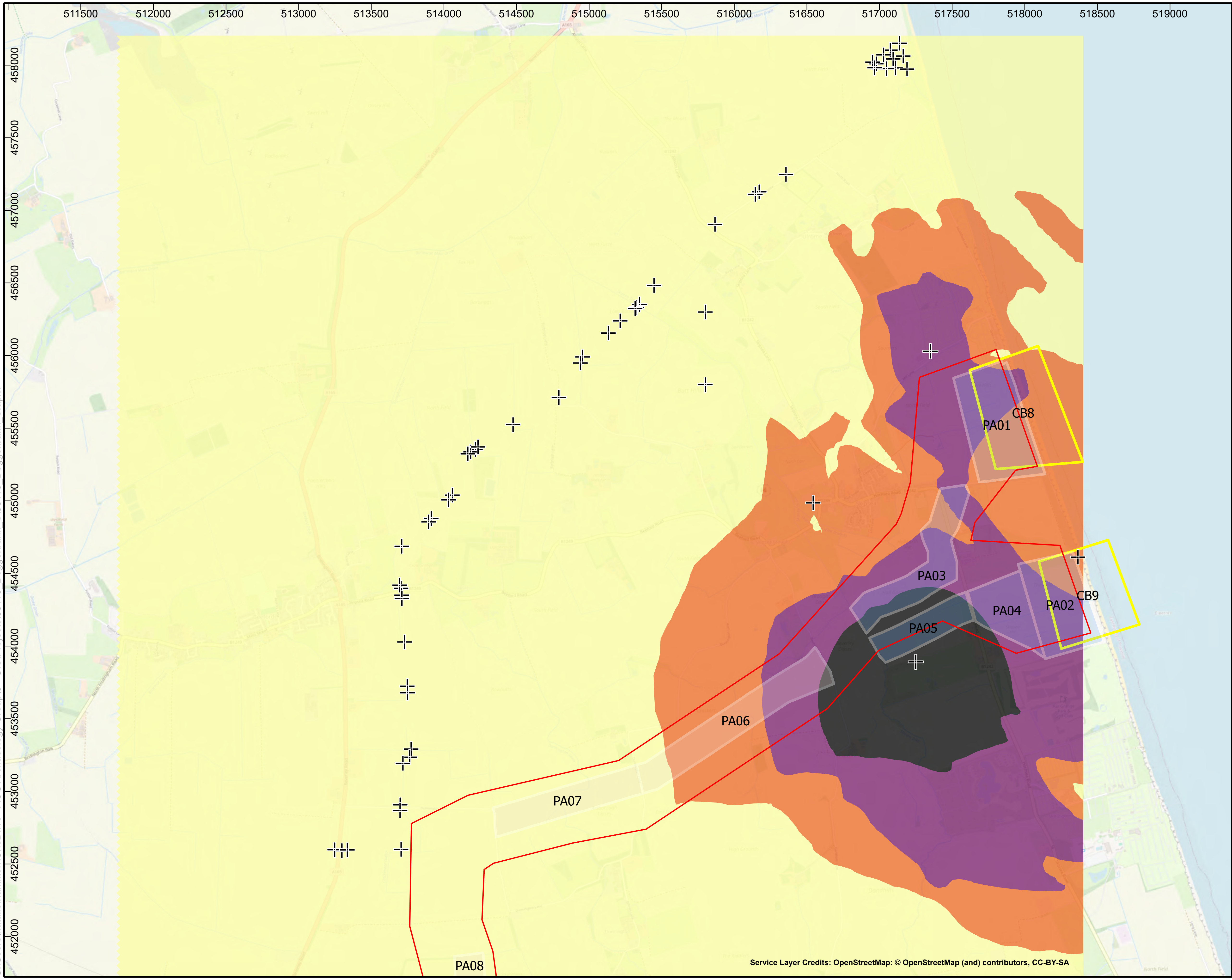

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Figure 22-6-23

Thickness plot of the modern made ground and topsoil deposits (extrapolated from deposit records), representing possible truncation - Area 1

Data Points
Onshore Study Area

Priority Geophysics Areas
No
Yes
Potential Landfall Areas

Topsoil / Made Ground Thickness - Area 1
m
0.000000 - 0.500000
0.500001 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000

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SYSTEM
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE
1:25,000 @ A3

0 1,000 m

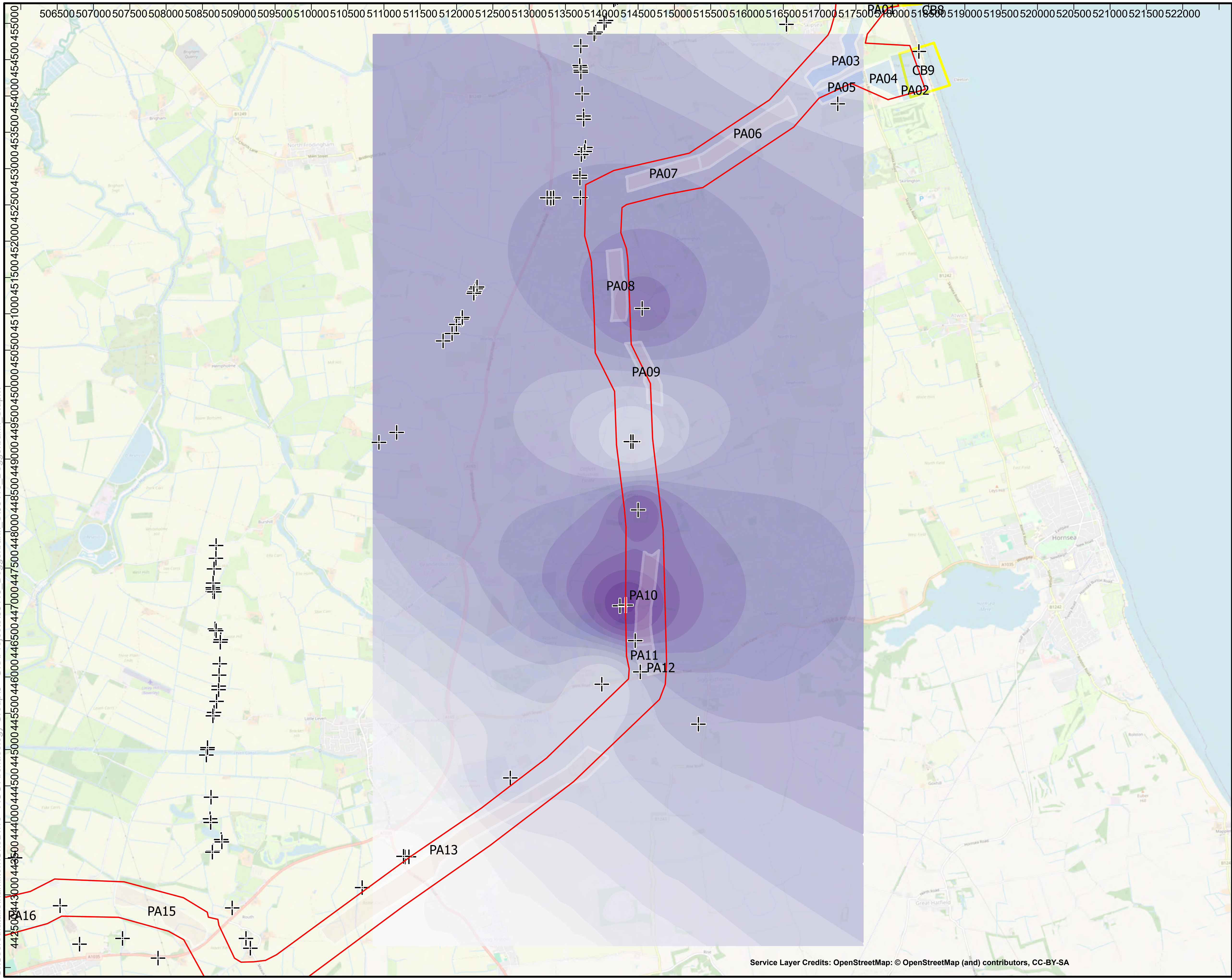

Figure 22-6-24

Topographic plot of the below ground chalk bedrock (extrapolated from deposit records) - Area 2

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Potential Landfall Areas

Chalk Surface - Area 2

m OD

-7.999999 - -7.000000
-8.999999 - -8.000000
-9.999999 - -9.000000
-10.999999 - -10.000000
-11.999999 - -11.000000
-12.999999 - -12.000000
-13.999999 - -13.000000
-14.999999 - -14.000000
-15.999999 - -15.000000
-16.999999 - -16.000000
-17.999999 - -17.000000
-18.999999 - -18.000000
-19.999999 - -19.000000
-20.999999 - -20.000000
-21.999999 - -21.000000
-22.000000

FOR

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:50,000 @ A3

0 2,000m

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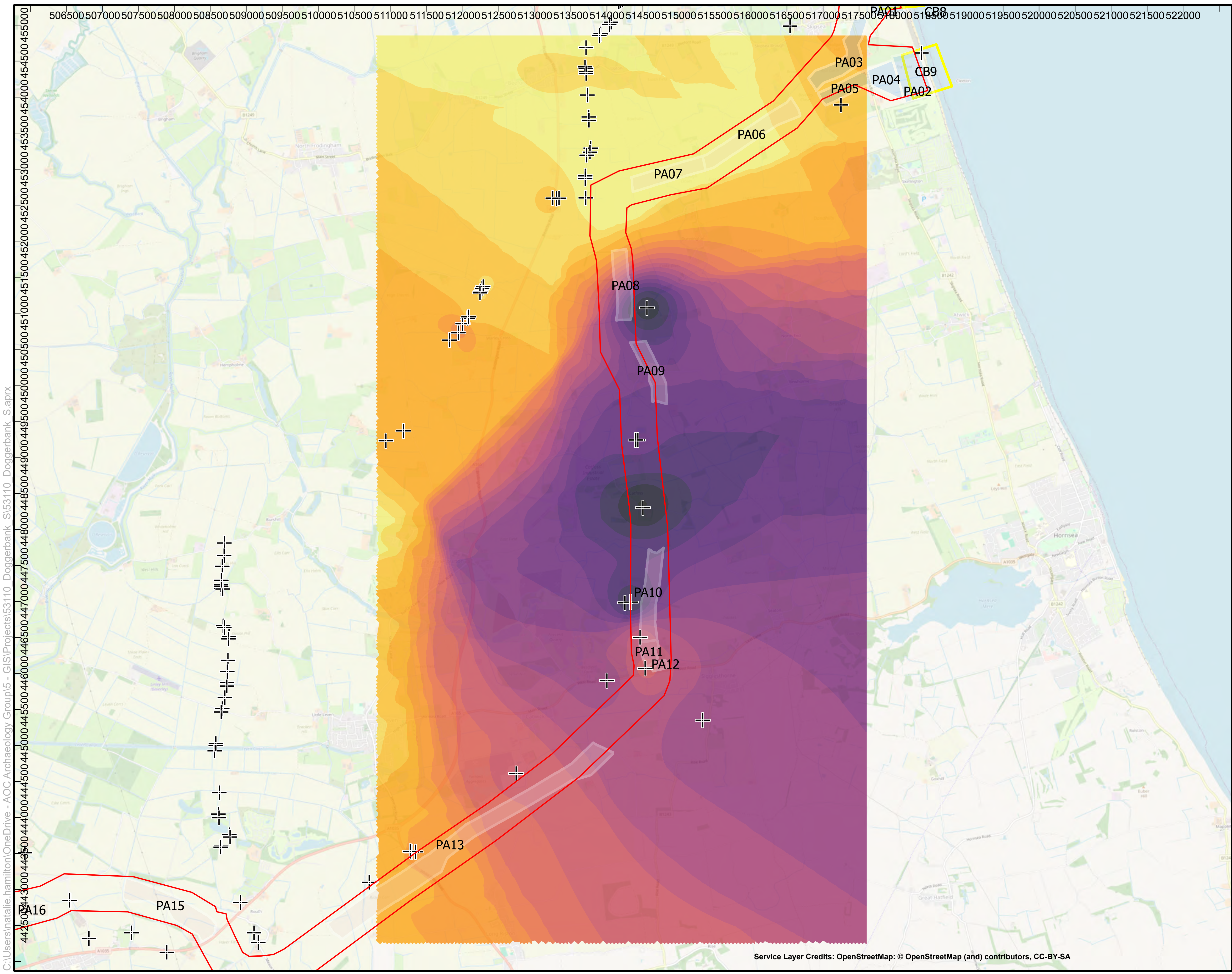

Figure 22-6-25

Thickness plot of the below ground Pleistocene deposits (extrapolated from deposit records) - Area 2

Data Points

Onshore Study Area

Priority Geophysics Areas

No

Yes

Potential Landfall Areas

Pleistocene Thickness - Area 2

m

1.500000 - 2.000000
2.000001 - 4.000000
4.000001 - 6.000000
6.000001 - 8.000000
8.000001 - 10.000000
10.000001 - 12.000000
12.000001 - 14.000000
14.000001 - 16.000000
16.000001 - 18.000000
18.000001 - 20.000000
20.000001 - 22.000000
22.000001 - 24.000000
24.000001 - 26.000000
26.000001 - 28.000000
28.000001 - 30.000000
30.000001 - 32.000000
32.000001 - 34.000000
34.000001 - 36.000000
36.000001 - 38.000000
38.000001 - 40.000000

FOR

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:50,000 @ A3

0 2,000m

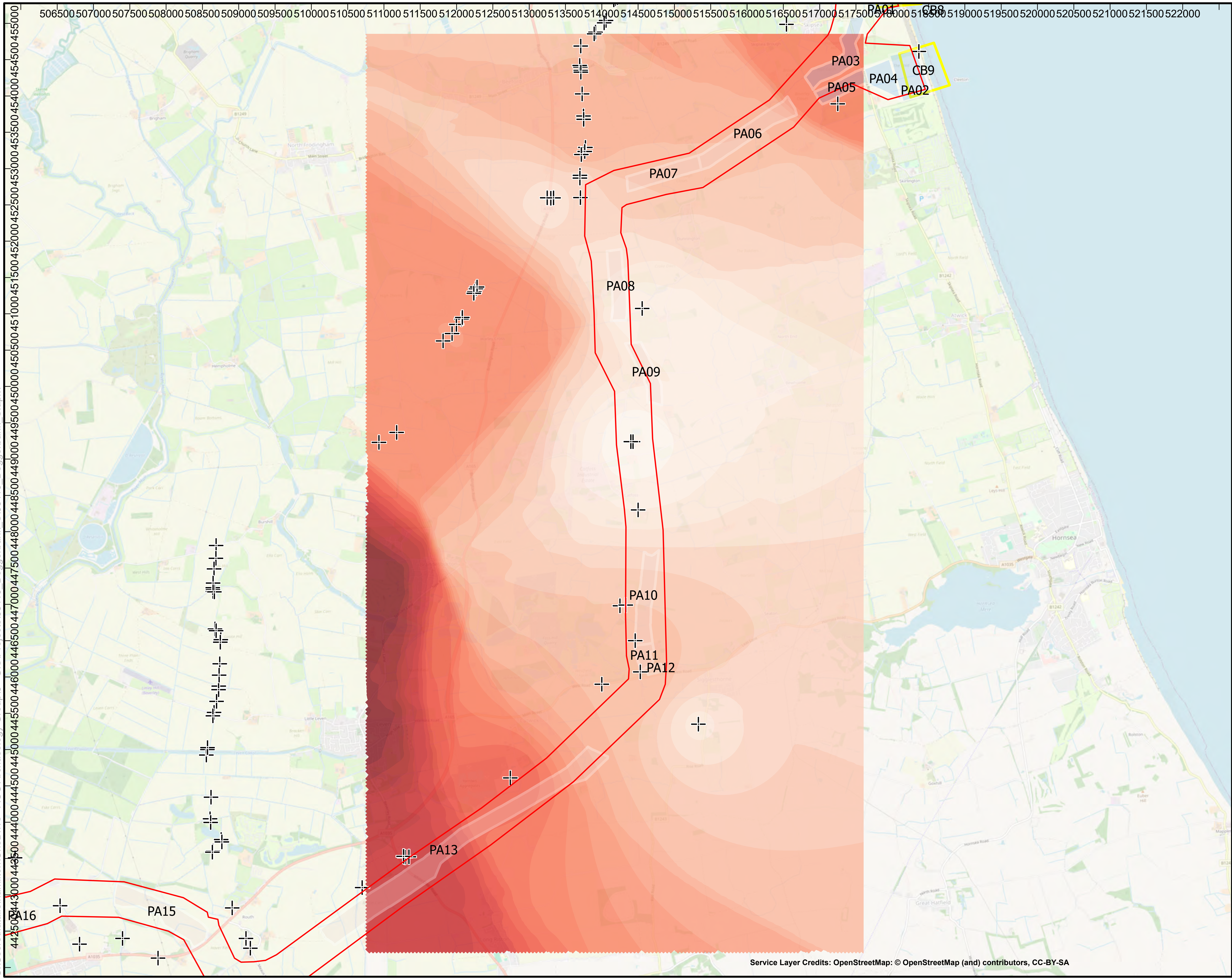

Figure 22-6-26

Topographic plot of the below ground Pleistocene deposits (extrapolated from deposit records), representing the possible land surface at c. 12,000 BP - Area 2

Data Points
Onshore Study Area

Priority Geophysics Areas
No
Yes
Potential Landfall Areas

Pleistocene Surface - Area 2
m OD

19.000001 - 20.000000
18.000001 - 19.000000
17.000001 - 18.000000
16.000001 - 17.000000
15.000001 - 16.000000
14.000001 - 15.000000
13.000001 - 14.000000
12.000001 - 13.000000
11.000001 - 12.000000
10.000001 - 11.000000
9.000001 - 10.000000
8.000001 - 9.000000
7.000001 - 8.000000
6.000001 - 7.000000
5.000001 - 6.000000
4.000001 - 5.000000
3.000001 - 4.000000
2.000001 - 3.000000
1.000001 - 2.000000
0.000001 - 1.000000
-0.999999 - 0.000000
-1.999999 - -1.000000
-2.000000

FOR

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N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:50,000 @ A3

0 2,000 m

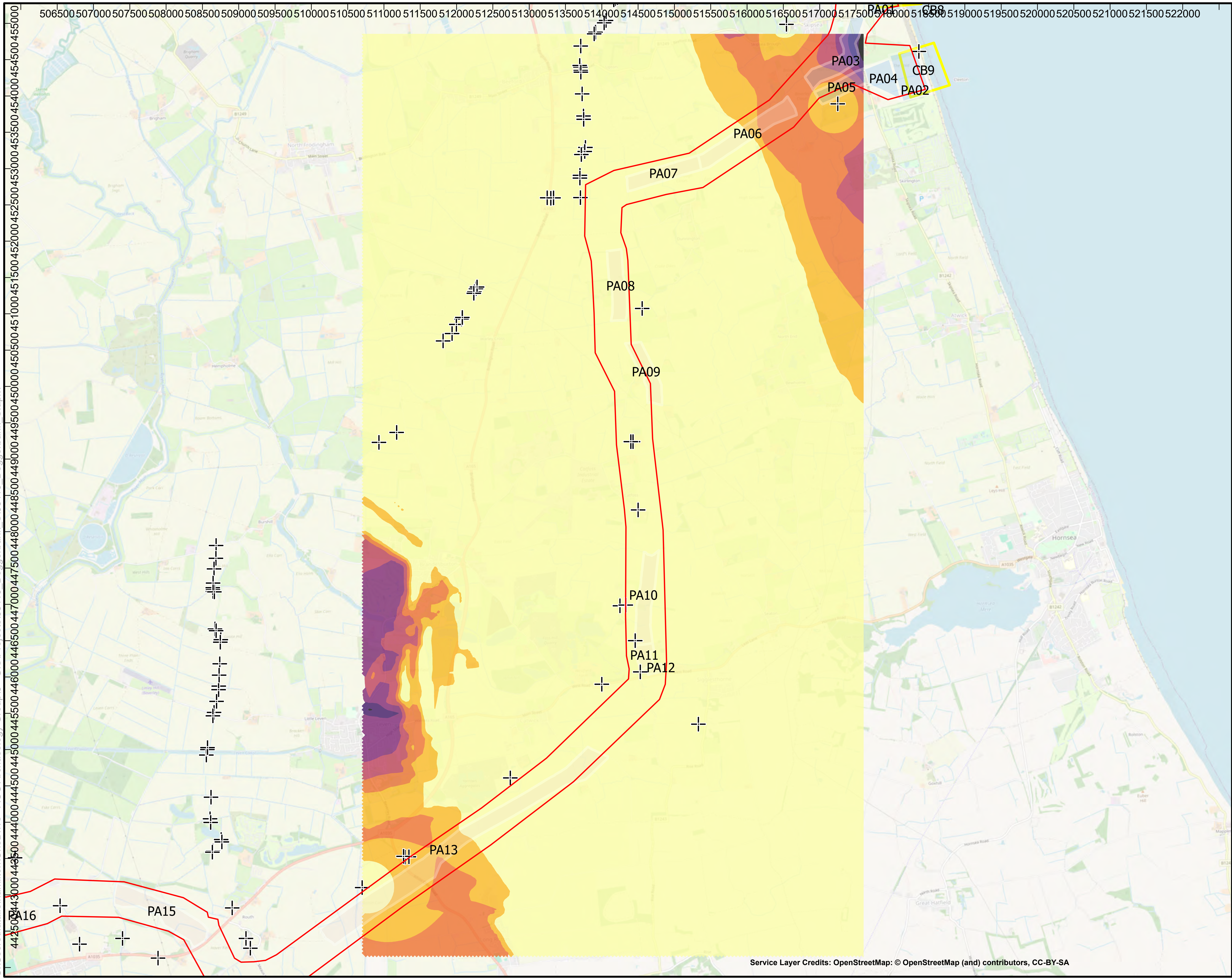

Figure 22-6-27

Thickness plot of the below ground Holocene organic deposits (extrapolated from deposit records), representing deposit survival
- Area 2

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Potential Landfall Areas

Holocene Thickness - Area 2

m

0.000000 - 0.500000
0.500001 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000
2.000001 - 2.500000
2.500001 - 3.000000
3.000001 - 3.500000

FOR

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AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:50,000 @ A3

0 2,000 m

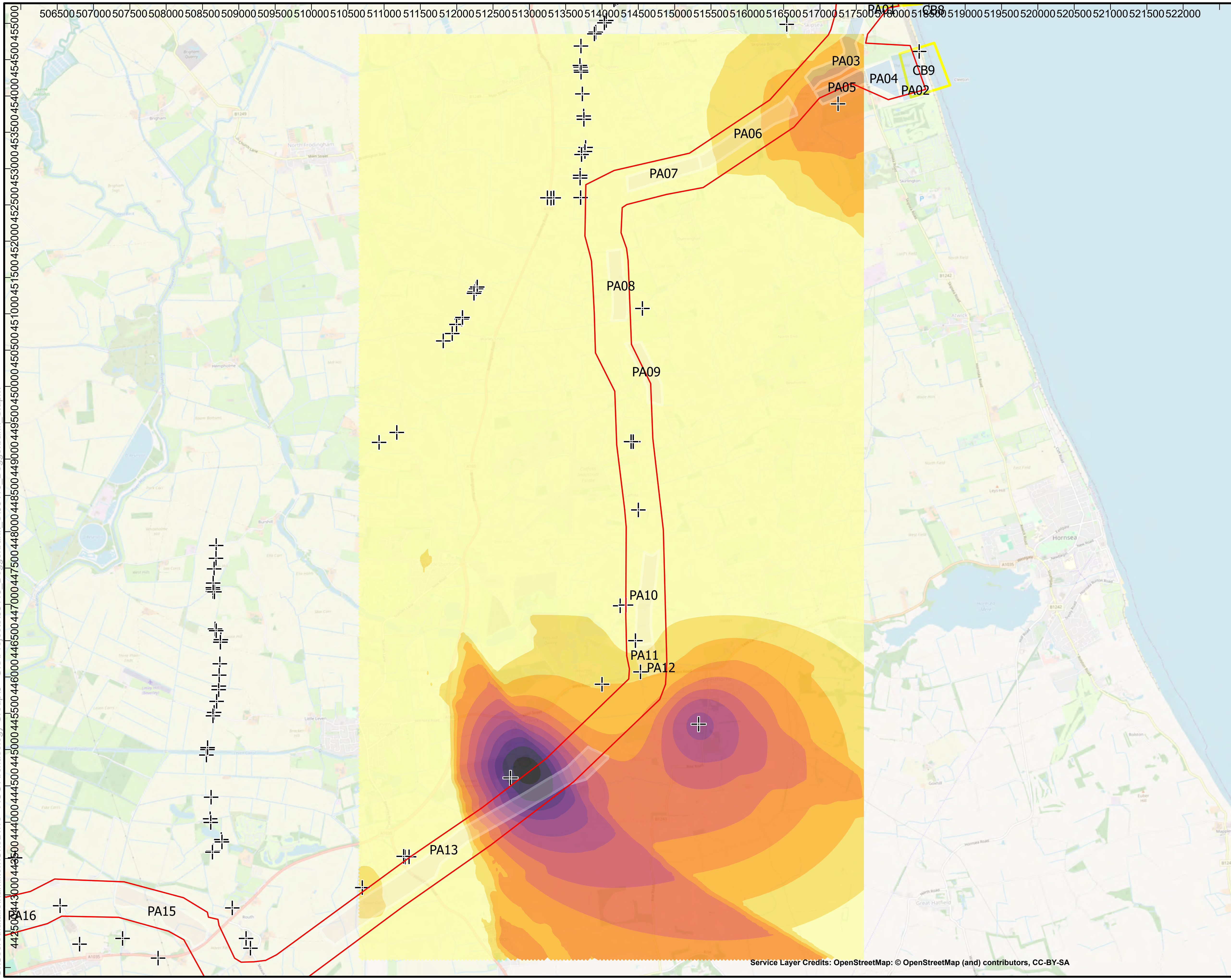

Figure	22-6-28

Thickness plot of the modern made ground and topsoil deposits (extrapolated from deposit records), representing possible truncation - Area 2

Data Points
Onshore Study Area

Priority Geophysics Areas

- No
- Yes
- Potential Landfall Areas

Topsoil / Made Ground Thickness - Area 2

m

- 0.000000 - 0.500000
- 0.500001 - 1.000000
- 1.000001 - 1.500000
- 1.500001 - 2.000000
- 2.000001 - 2.500000
- 2.500001 - 3.000000
- 3.000001 - 3.500000
- 3.500001 - 4.000000
- 4.000001 - 4.500000
- 4.500001 - 5.000000
- 5.000001 - 5.500000
- 5.500001 - 6.000000

FOR

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AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:50,000 @ A3

0 2,000 m

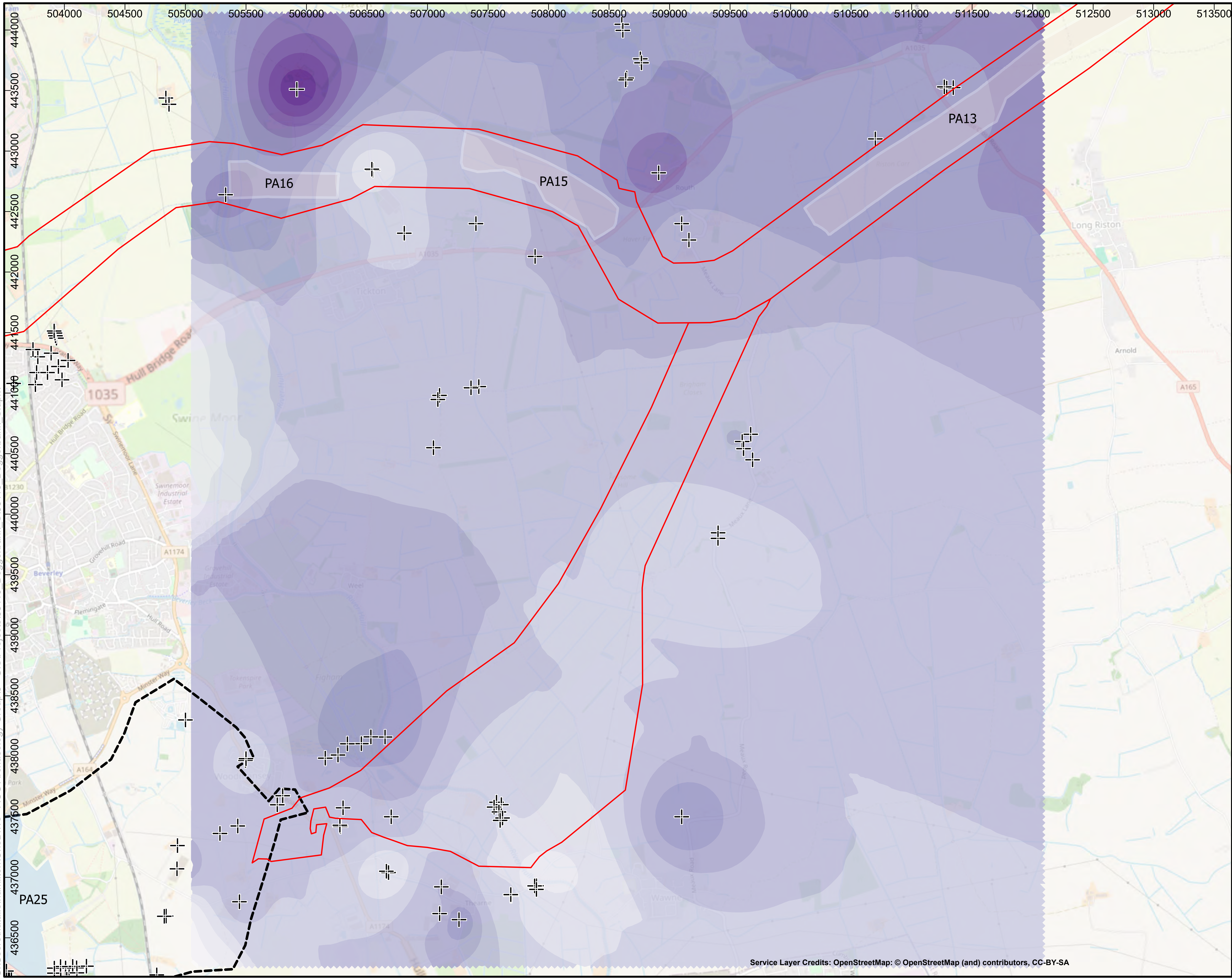

Figure 22-6-29

Topographic plot of the below ground chalk bedrock (extrapolated from deposit records) - Area 3

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Chalk Surface - Area 3

m OD

-0.999999 - 0.000000
-1.999999 - -1.000000
-2.999999 - -2.000000
-3.999999 - -3.000000
-4.999999 - -4.000000
-5.999999 - -5.000000
-6.999999 - -6.000000
-7.999999 - -7.000000
-8.999999 - -8.000000
-9.999999 - -9.000000
-10.999999 - -10.000000
-11.999999 - -11.000000
-12.500000 - -12.000000

FOR

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AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

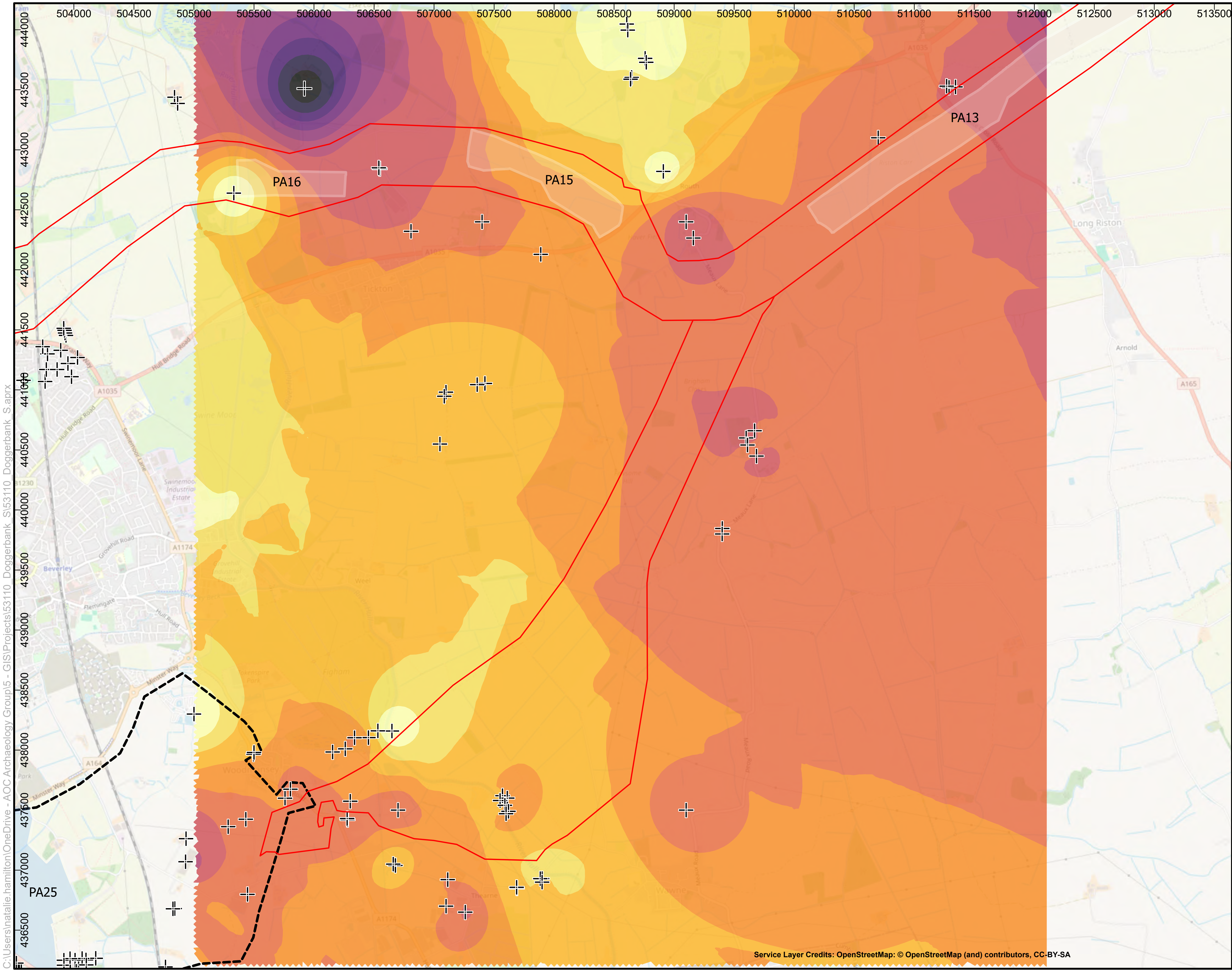

Figure **22-6-30**

Thickness plot of the below ground Pleistocene deposits (extrapolated from deposit records) - Area 3

Data Points

Onshore Study Area

Priority Geophysics Areas

No

Yes

Onshore Substation Search Area

Creyke Beck 1 Grid Connection

Pleistocene Thickness - Area 3

m

0.000000 - 2.000000

2.000001 - 4.000000

4.000001 - 6.000000

6.000001 - 8.000000

8.000001 - 10.000000

10.000001 - 12.000000

12.000001 - 14.000000

14.000001 - 16.000000

16.000001 - 18.000000

18.000001 - 20.000000

20.000001 - 22.000000

22.000001 - 24.000000

FOR

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AOC Project No.:	53110

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

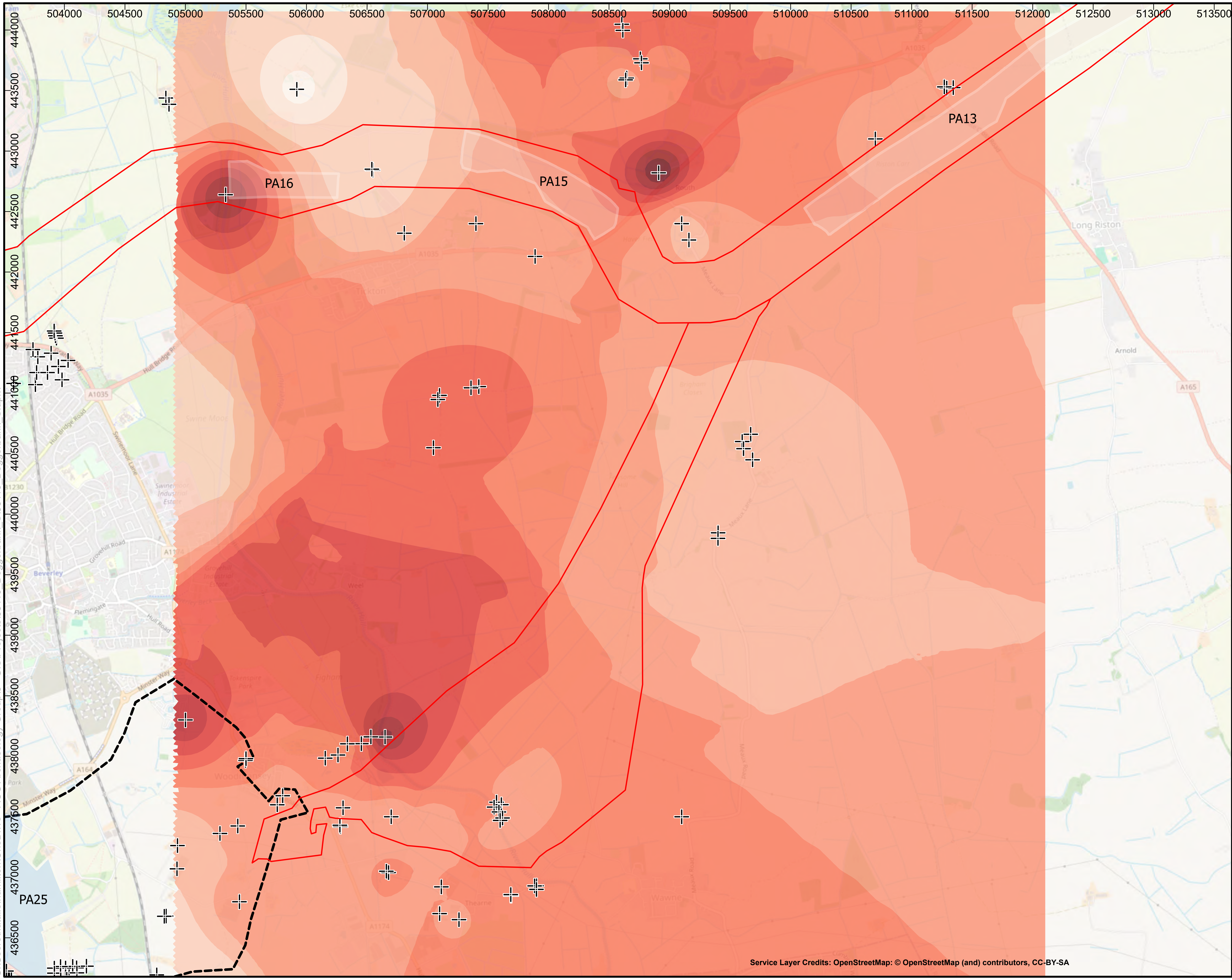

Figure	22-6-31

Topographic plot of the below ground Pleistocene deposits (extrapolated from deposit records), representing the possible land surface at c. 12,000 BP - Area 3

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Pleistocene Surface - Area 3

m OD

10.000001 - 12.000000
8.000001 - 10.000000
6.000001 - 8.000000
4.000001 - 6.000000
2.000001 - 4.000000
0.000001 - 2.000000
-1.999999 - 0.000000
-3.999999 - -2.000000
-5.999999 - -4.000000
-7.999999 - -6.000000
-9.500000 - -8.000000

FOR

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and
RWE Renewables UK Dogger Bank South (East) Limited

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AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

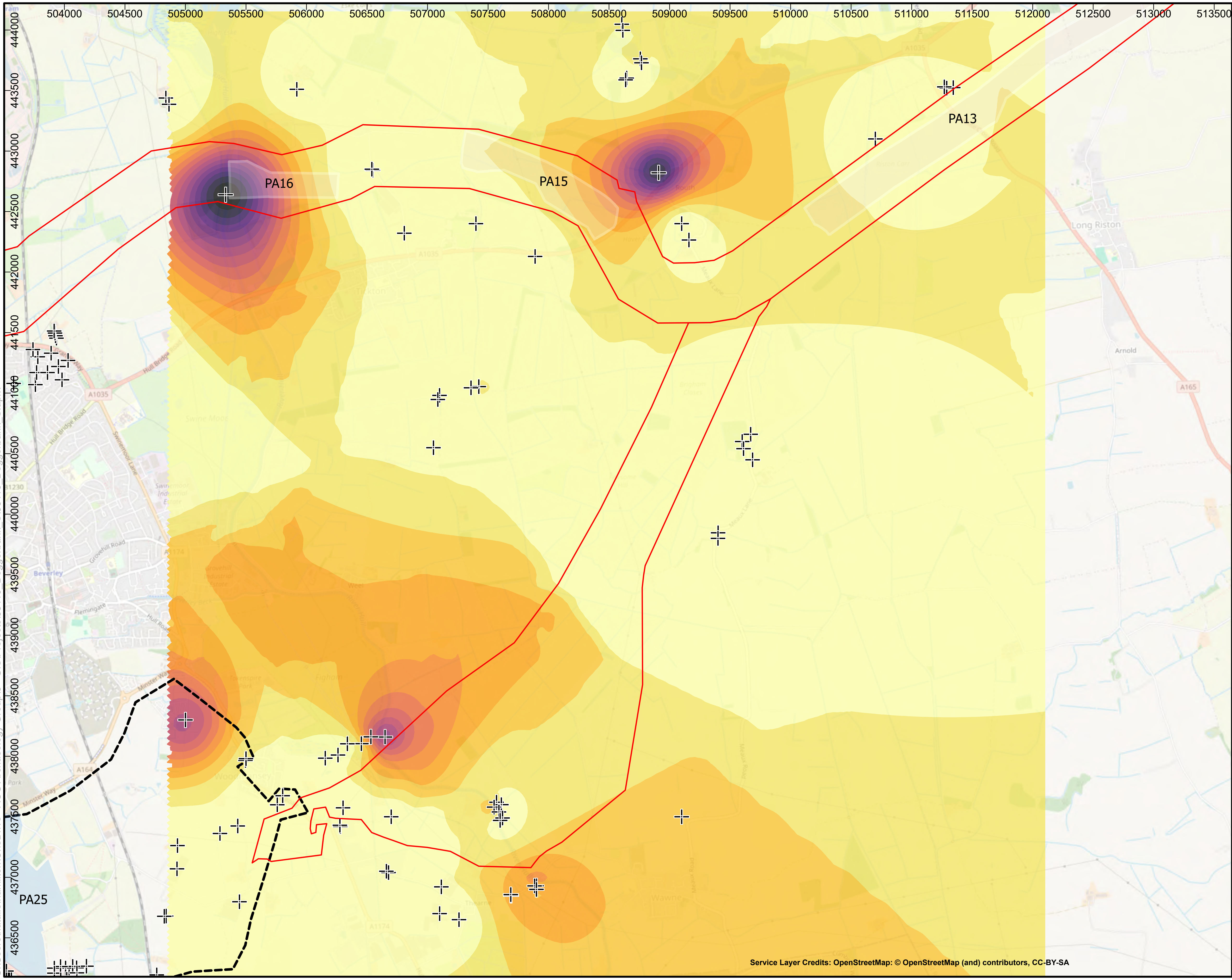

Figure 22-6-32

Thickness plot of the below ground Holocene alluvium deposits (extrapolated from deposit records), representing deposit survival - Area 3

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Holocene Thickness - Area 3

m

0.000000 - 1.000000
1.000001 - 2.000000
2.000001 - 3.000000
3.000001 - 4.000000
4.000001 - 5.000000
5.000001 - 6.000000
6.000001 - 7.000000
7.000001 - 8.000000
8.000001 - 9.000000
9.000001 - 10.000000
10.000001 - 11.000000
11.000001 - 12.000000
12.000001 - 13.000000
13.000001 - 14.000000
14.000001 - 15.000000

FOR

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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

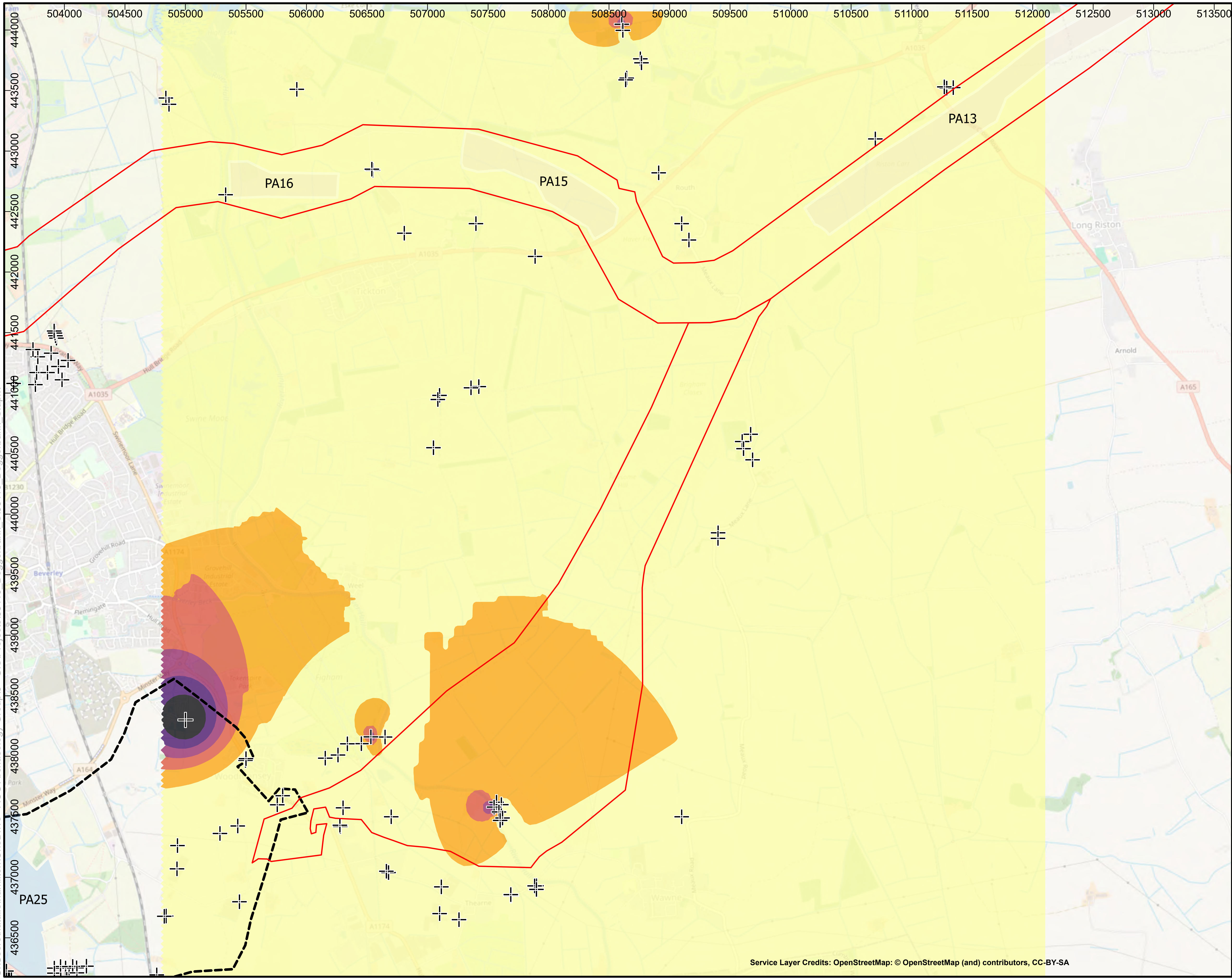

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Figure	22-6-33

Thickness plot of the below ground Holocene organic deposits (extrapolated from deposit records), representing deposit survival - Area 3

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Organic Thickness - Area 3

m

0.000000 - 0.500000
0.500001 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000
2.000001 - 2.500000
2.500001 - 3.000000

FOR

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

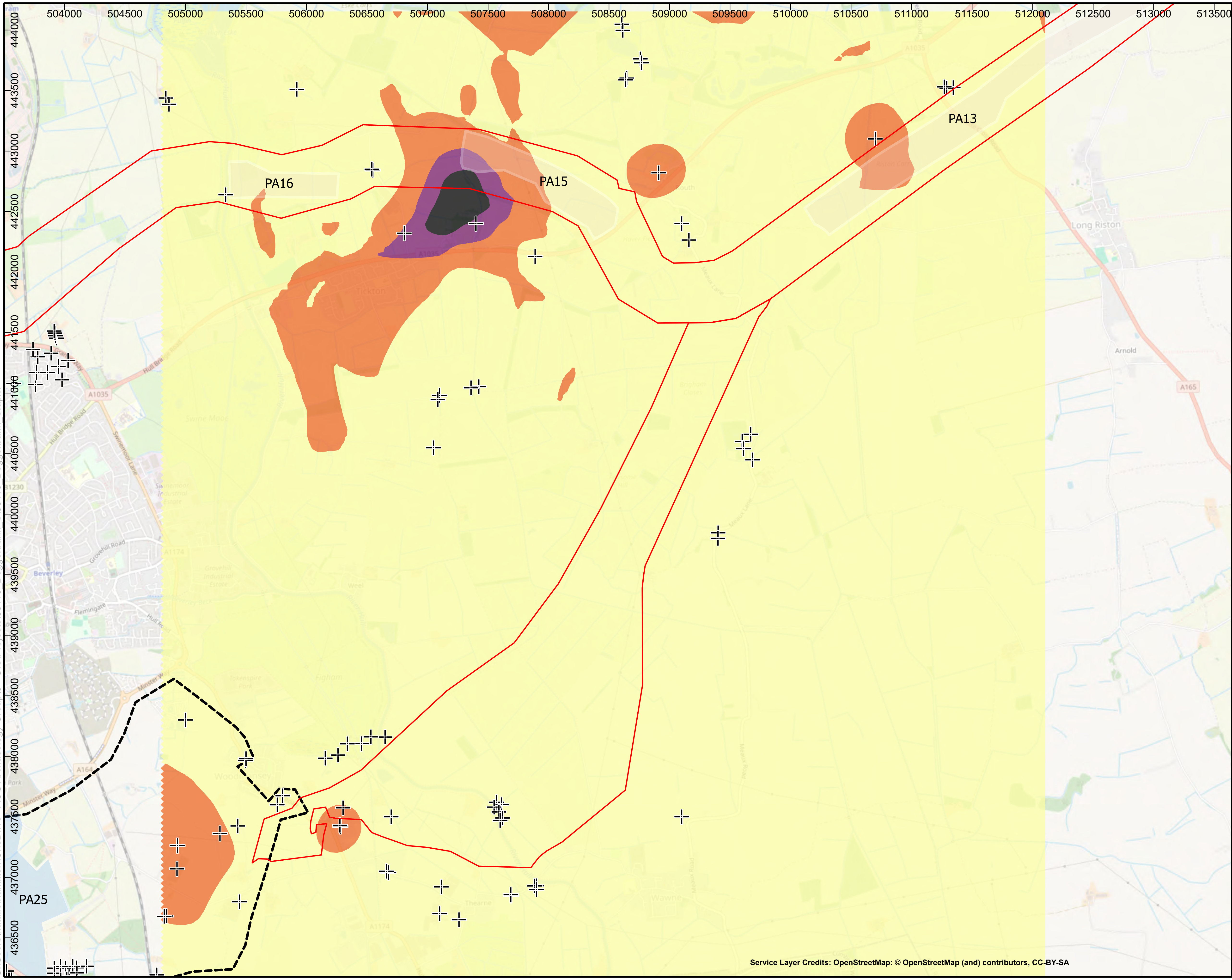

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Figure 22-6-34

Thickness plot of the modern made ground and topsoil deposits (extrapolated from deposit records), representing possible truncation - Area 3

Data Points

Onshore Study Area

Priority Geophysics Areas

No

Yes

Onshore Substation Search Area

Creyke Beck 1 Grid Connection

Topsoil / Made Ground Thickness - Area 3

m

0.000000 - 0.500000

0.500001 - 1.000000

1.000001 - 1.500000

1.500001 - 2.000000

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AOC Archaeology Group

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

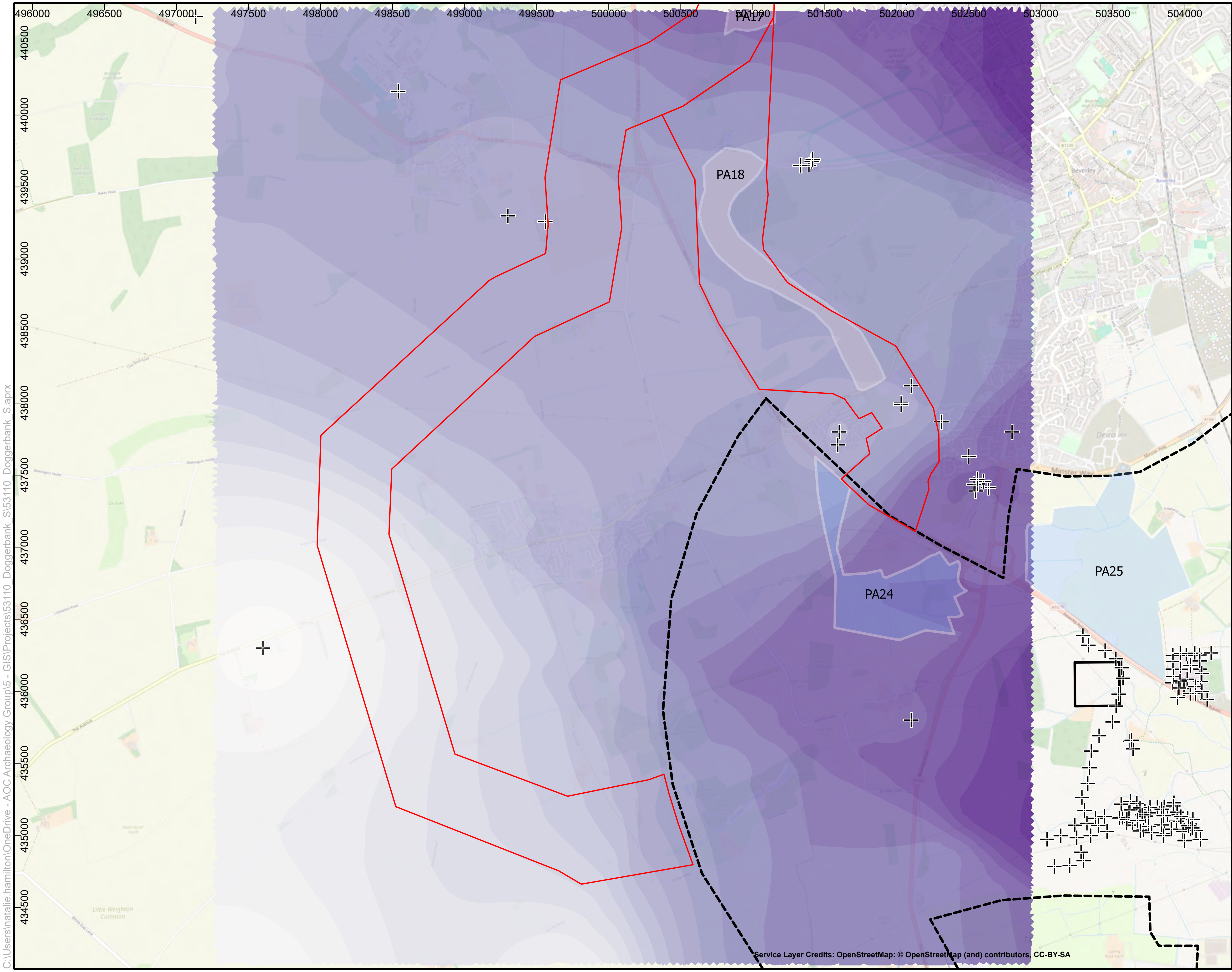

Figure 22-6-35

Topographic plot of the below ground chalk bedrock (extrapolated from deposit records) - Area 4

Data Points

Onshore Study Area

Priority Geophysics Areas

No

Yes

Onshore Substation Search Area

Creyke Beck 1 Grid Connection

Chalk Surface - Area 4

m OD

95.000001 - 100.000000
90.000001 - 95.000000
85.000001 - 90.000000
80.000001 - 85.000000
75.000001 - 80.000000
70.000001 - 75.000000
65.000001 - 70.000000
60.000001 - 65.000000
55.000001 - 60.000000
50.000001 - 55.000000
45.000001 - 50.000000
40.000001 - 45.000000
35.000001 - 40.000000
30.000001 - 35.000000
25.000001 - 30.000000
20.000001 - 25.000000
15.000001 - 20.000000
10.000001 - 15.000000
5.000001 - 10.000000
0.500000 - 5.000000

FOR

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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000 m

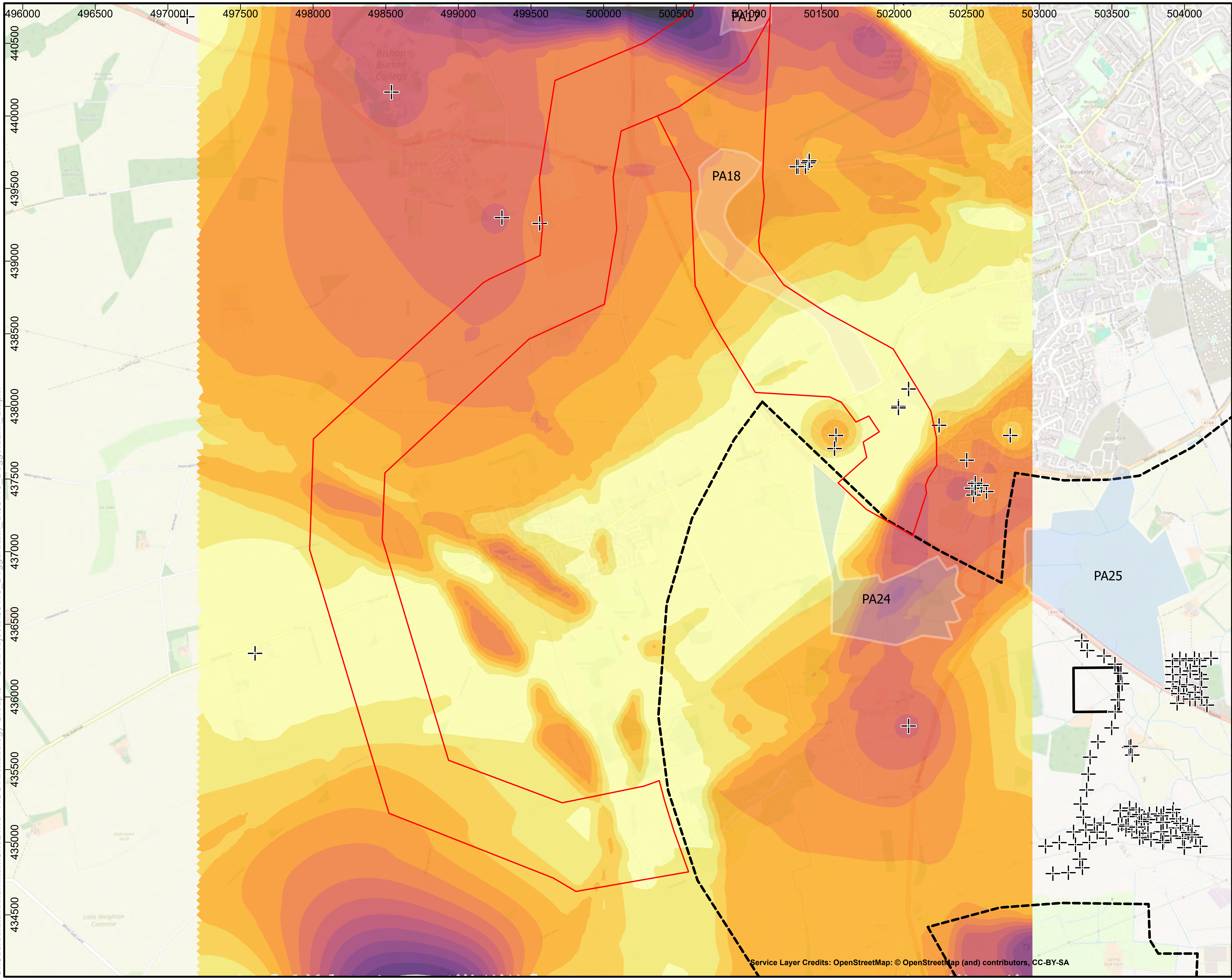

Figure 22-6-36

Thickness plot of the below ground Pleistocene deposits (extrapolated from deposit records) - Area 4

Data Points
Onshore Study Area

Priority Geophysics Areas
No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Pleistocene Thickness - Area 4

m

0.000000 - 1.000000
1.000001 - 2.000000
2.000001 - 3.000000
3.000001 - 4.000000
4.000001 - 5.000000
5.000001 - 6.000000
6.000001 - 7.000000
7.000001 - 8.000000
8.000001 - 9.000000
9.000001 - 10.000000
10.000001 - 11.000000
11.000001 - 12.000000
12.000001 - 13.000000
13.000001 - 14.000000
14.000001 - 15.000000
15.000001 - 16.000000

FOR

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

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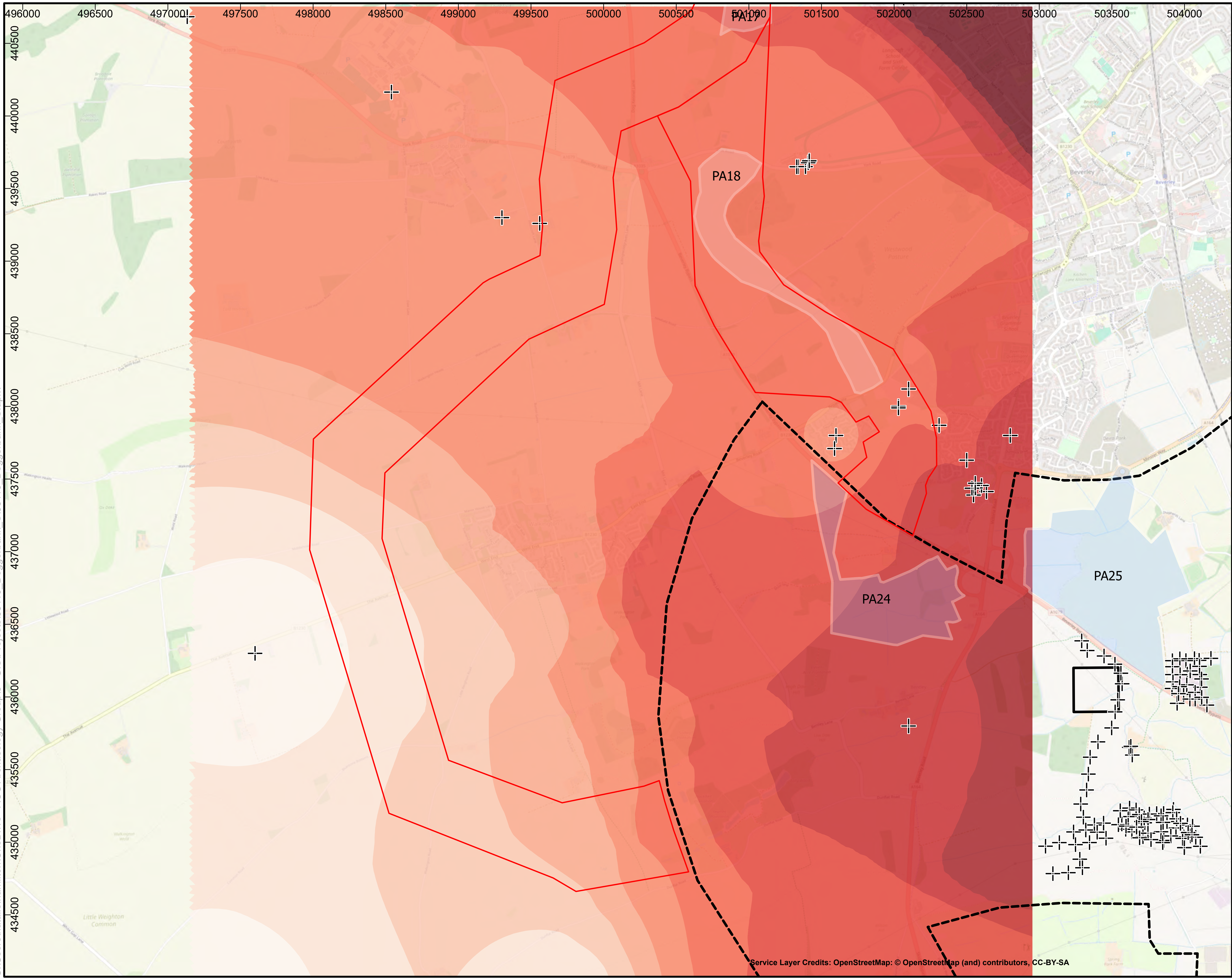

Figure 22-6-37

Topographic plot of the below ground Pleistocene deposits (extrapolated from deposit records), representing the possible land surface at c. 12,000 BP - Area 4

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Pleistocene Surface - Area 4

m OD

90.000001 - 100.000000
80.000001 - 90.000000
70.000001 - 80.000000
60.000001 - 70.000000
50.000001 - 60.000000
40.000001 - 50.000000
30.000001 - 40.000000
20.000001 - 30.000000
10.000001 - 20.000000
8.500000 - 10.000000

FOR

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N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000 m

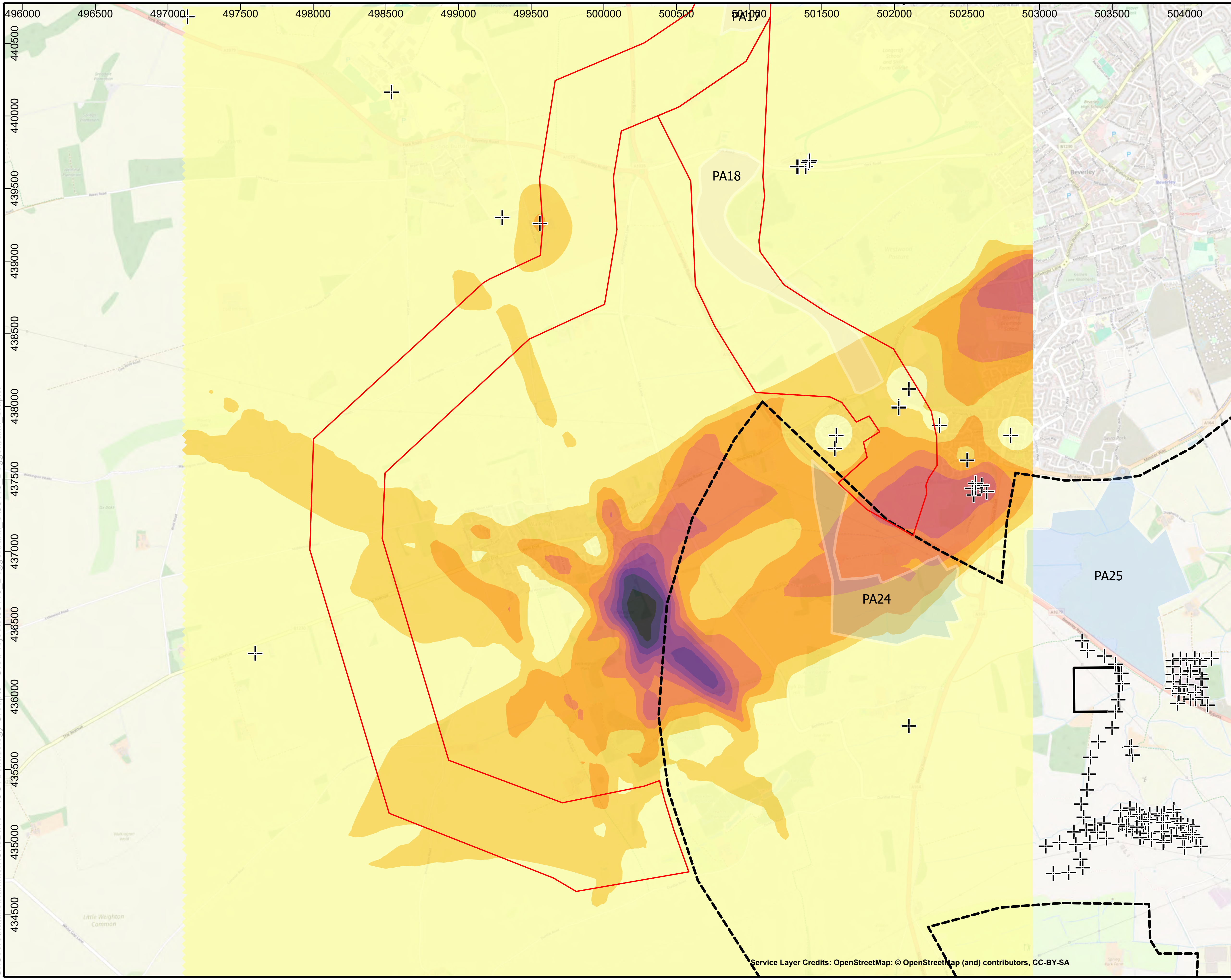

Figure 22-6-38

Thickness plot of the modern made ground and topsoil deposits (extrapolated from deposit records), representing possible truncation - Area 4

Data Points
Onshore Study Area

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Topsoil / Made Ground Thickness - Area 4

m

0.000000 - 2.000000
2.000001 - 4.000000
4.000001 - 6.000000
6.000001 - 8.000000
8.000001 - 10.000000
10.000001 - 12.000000
12.000001 - 14.000000
14.000001 - 16.000000
16.000001 - 18.000000
18.000001 - 20.000000

FOR

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N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000 m

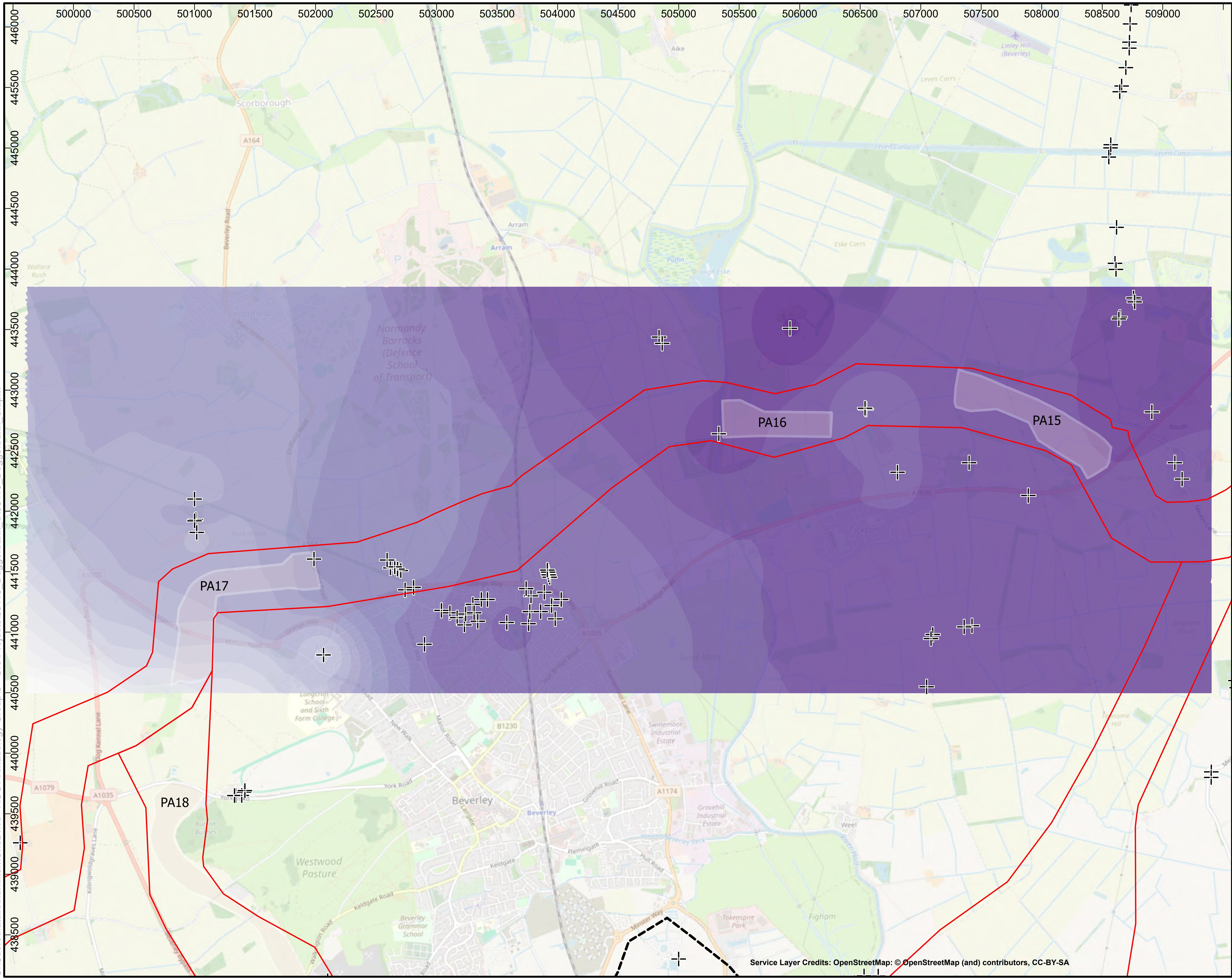

Figure 22-6-39

Topographic plot of the below ground chalk bedrock (extrapolated from deposit records) - Area 5

Data Points

Onshore Study Area

Priority Geophysics Areas

No

Onshore Substation Search Area

Chalk Surface - Area 5

m OD

35.000001 - 37.500000
32.500001 - 35.000000
30.000001 - 32.500000
27.500001 - 30.000000
25.000001 - 27.500000
22.500001 - 25.000000
20.000001 - 22.500000
17.500001 - 20.000000
15.000001 - 17.500000
12.500001 - 15.000000
10.000001 - 12.500000
7.500001 - 10.000000
5.000001 - 7.500000
2.500001 - 5.000000
0.000001 - 2.500000
-2.499999 - 0.000000
-4.999999 - -2.500000
-7.499999 - -5.000000
-9.999999 - -7.500000
-12.499999 - -10.000000
-12.500000

FOR

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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

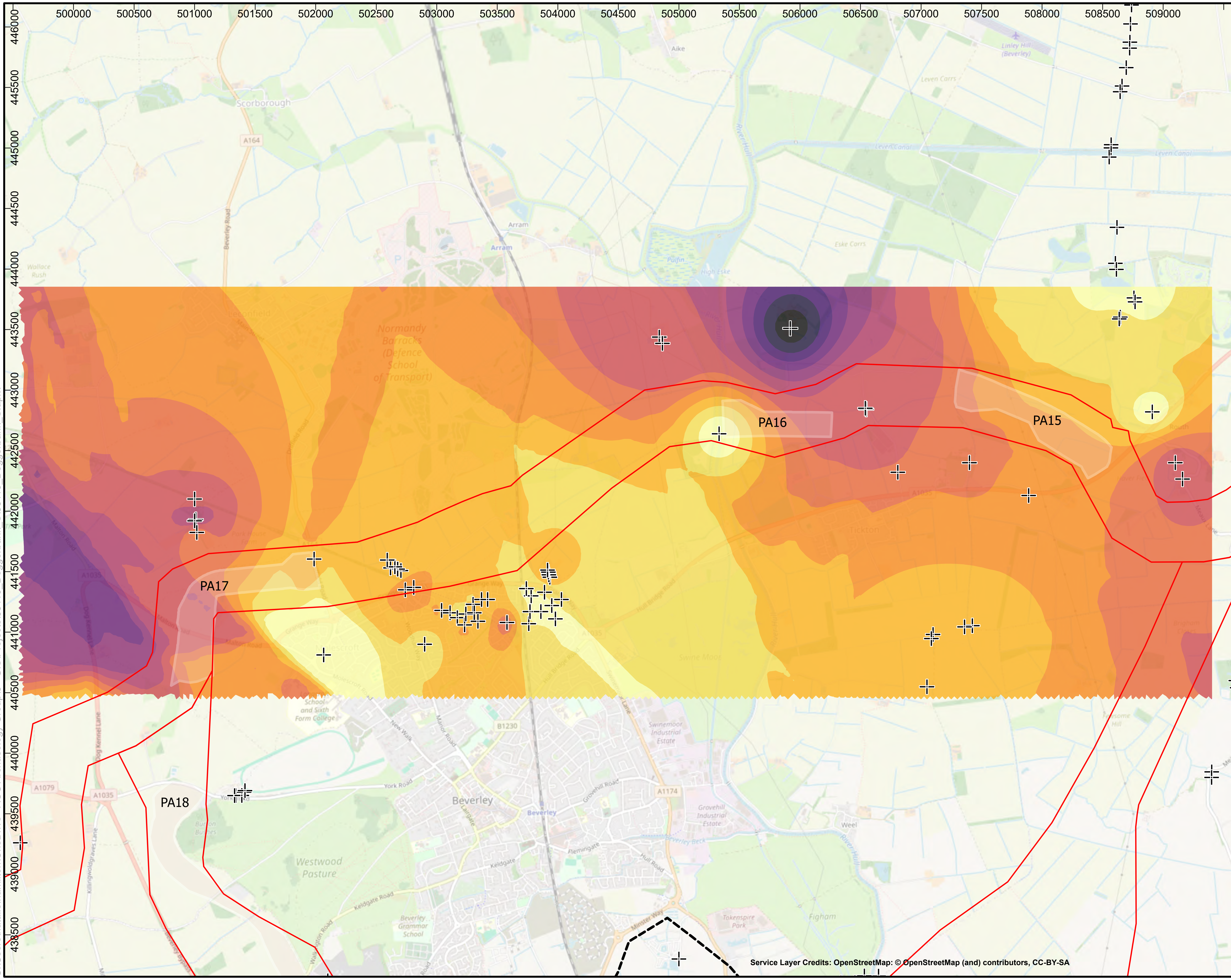

Figure 22-6-40

Thickness plot of the below ground Pleistocene deposits (extrapolated from deposit records)
- Area 5

Data Points

Onshore Study Area

Priority Geophysics Areas

No

Onshore Substation Search Area

Pleistocene Thickness - Area 5

m

0.000000 - 2.000000
2.000001 - 4.000000
4.000001 - 6.000000
6.000001 - 8.000000
8.000001 - 10.000000
10.000001 - 12.000000
12.000001 - 14.000000
14.000001 - 16.000000
16.000001 - 18.000000
18.000001 - 20.000000
20.000001 - 22.000000
22.000001 - 24.000000

FOR

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and
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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

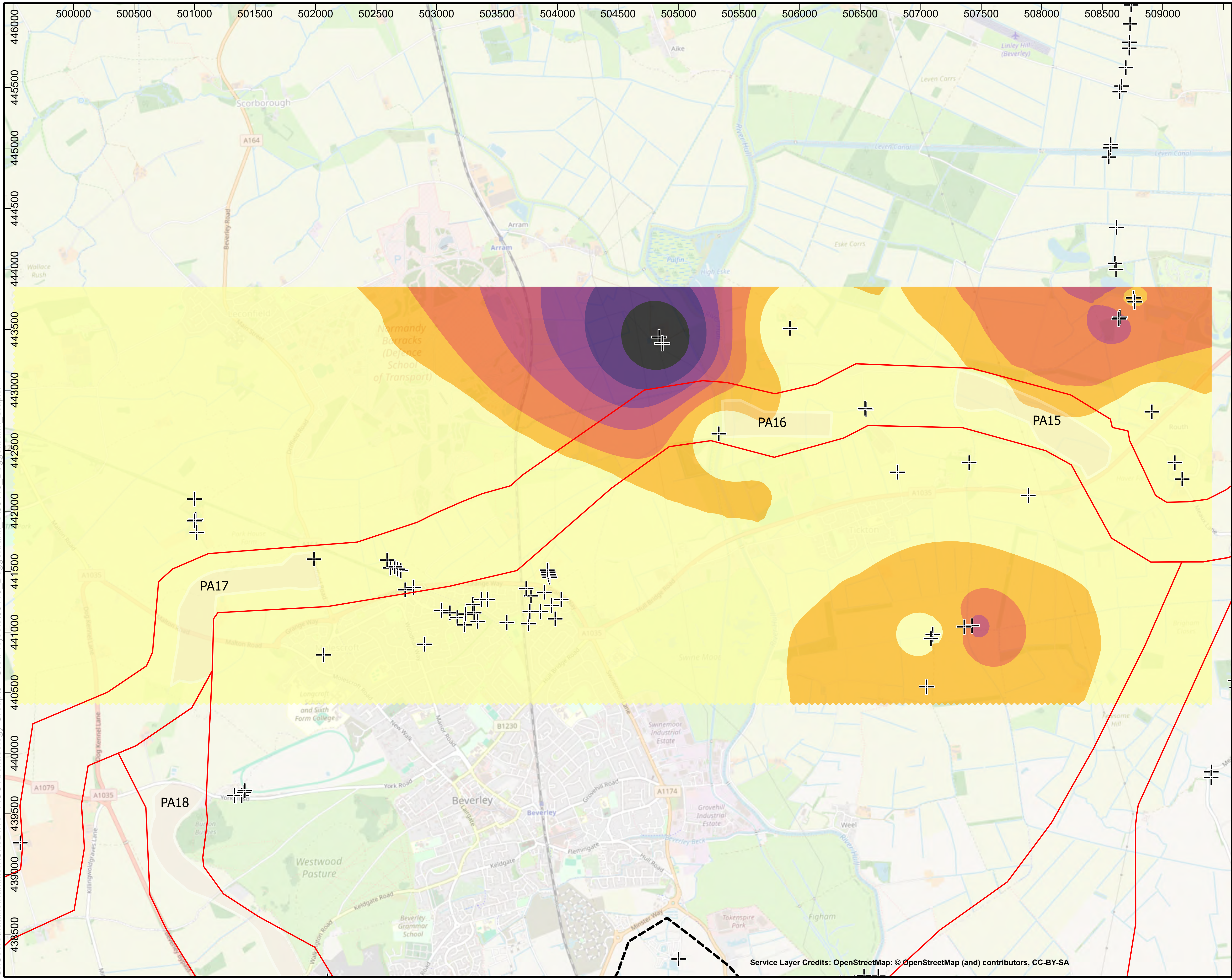

Figure 22-6-41

Thickness plot of the below ground Glaciofluvial deposits (extrapolated from deposit records) - Area 5

Data Points
Onshore Study Area

Priority Geophysics Areas
No
Onshore Substation Search Area

Glaciofluvial Thickness - Area 5
m

0.000000 - 0.500000
0.500001 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000
2.000001 - 2.500000
2.500001 - 3.000000
3.000001 - 3.500000

FOR

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

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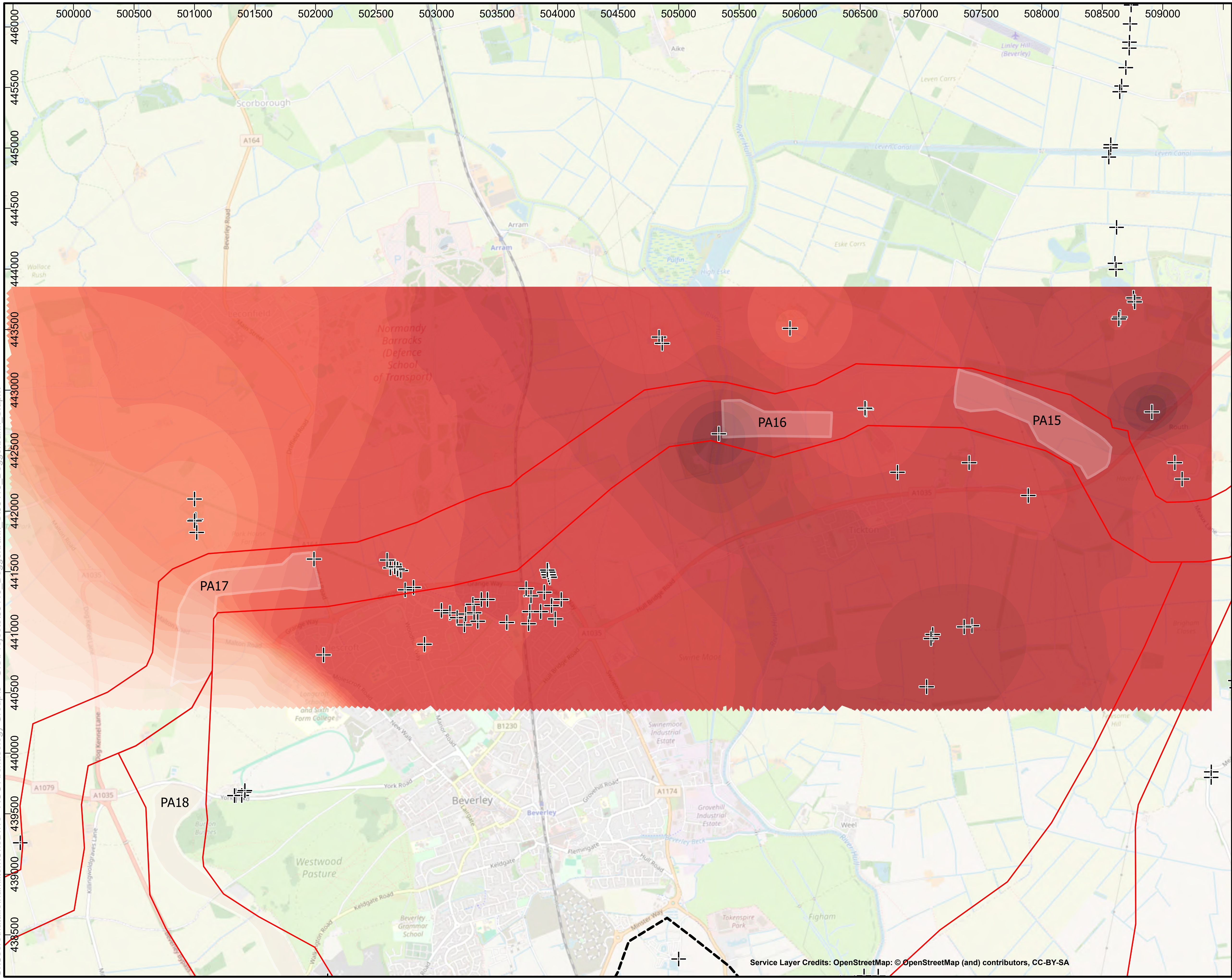

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Figure	22-6-42

Topographic plot of the below ground Pleistocene deposits (extrapolated from deposit records), representing the possible land surface at c. 12,000 BP - Area 5

Data Points
Onshore Study Area

Priority Geophysics Areas
No
Onshore Substation Search Area

Pleistocene Surface - Area 5
m OD

- 47.500001 - 50.000000
- 45.000001 - 47.500000
- 42.500001 - 45.000000
- 40.000001 - 42.500000
- 37.500001 - 40.000000
- 35.000001 - 37.500000
- 32.500001 - 35.000000
- 30.000001 - 32.500000
- 27.500001 - 30.000000
- 25.000001 - 27.500000
- 22.500001 - 25.000000
- 20.000001 - 22.500000
- 17.500001 - 20.000000
- 15.000001 - 17.500000
- 12.500001 - 15.000000
- 10.000001 - 12.500000
- 7.500001 - 10.000000
- 5.000001 - 7.500000
- 2.500001 - 5.000000
- 0.000001 - 2.500000
- -2.499999 - 0.000000
- -4.999999 - -2.500000
- -7.499999 - -5.000000
- -9.500000 - -7.500000

FOR

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AOC Project No.:	53110

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N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

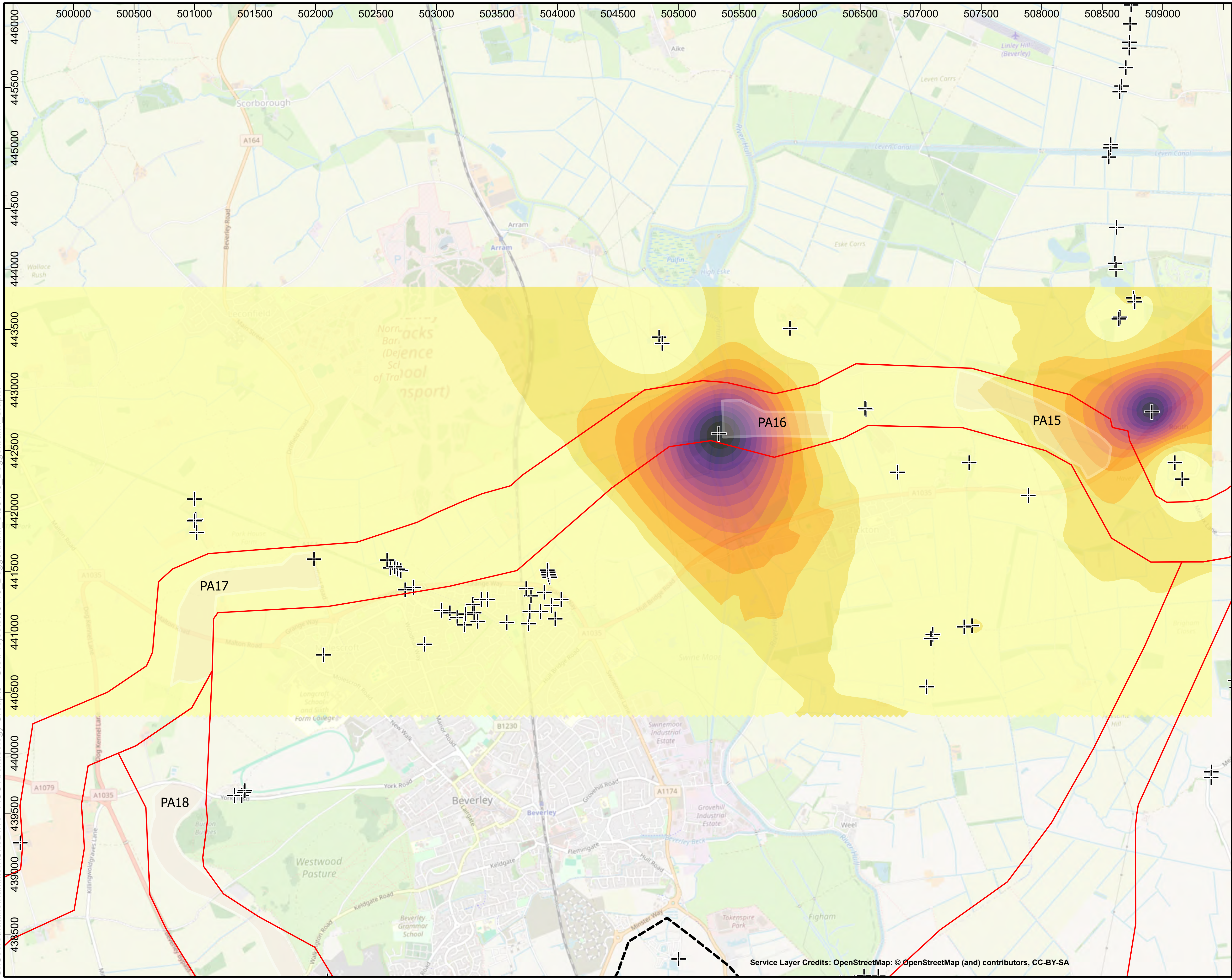

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Figure 22-6-43

Thickness plot of the below ground Holocene alluvium deposits (extrapolated from deposit records), representing deposit survival - Area 5

Data Points

Onshore Study Area

Priority Geophysics Areas

No

Onshore Substation Search Area

Holocene Thickness - Area 5

m

0.000000 - 1.000000
1.000001 - 2.000000
2.000001 - 3.000000
3.000001 - 4.000000
4.000001 - 5.000000
5.000001 - 6.000000
6.000001 - 7.000000
7.000001 - 8.000000
8.000001 - 9.000000
9.000001 - 10.000000
10.000001 - 11.000000
11.000001 - 12.000000
12.000001 - 13.000000
13.000001 - 14.000000
14.000001 - 15.000000

FOR

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and
RWE Renewables UK Dogger Bank South (East) Limited

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AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

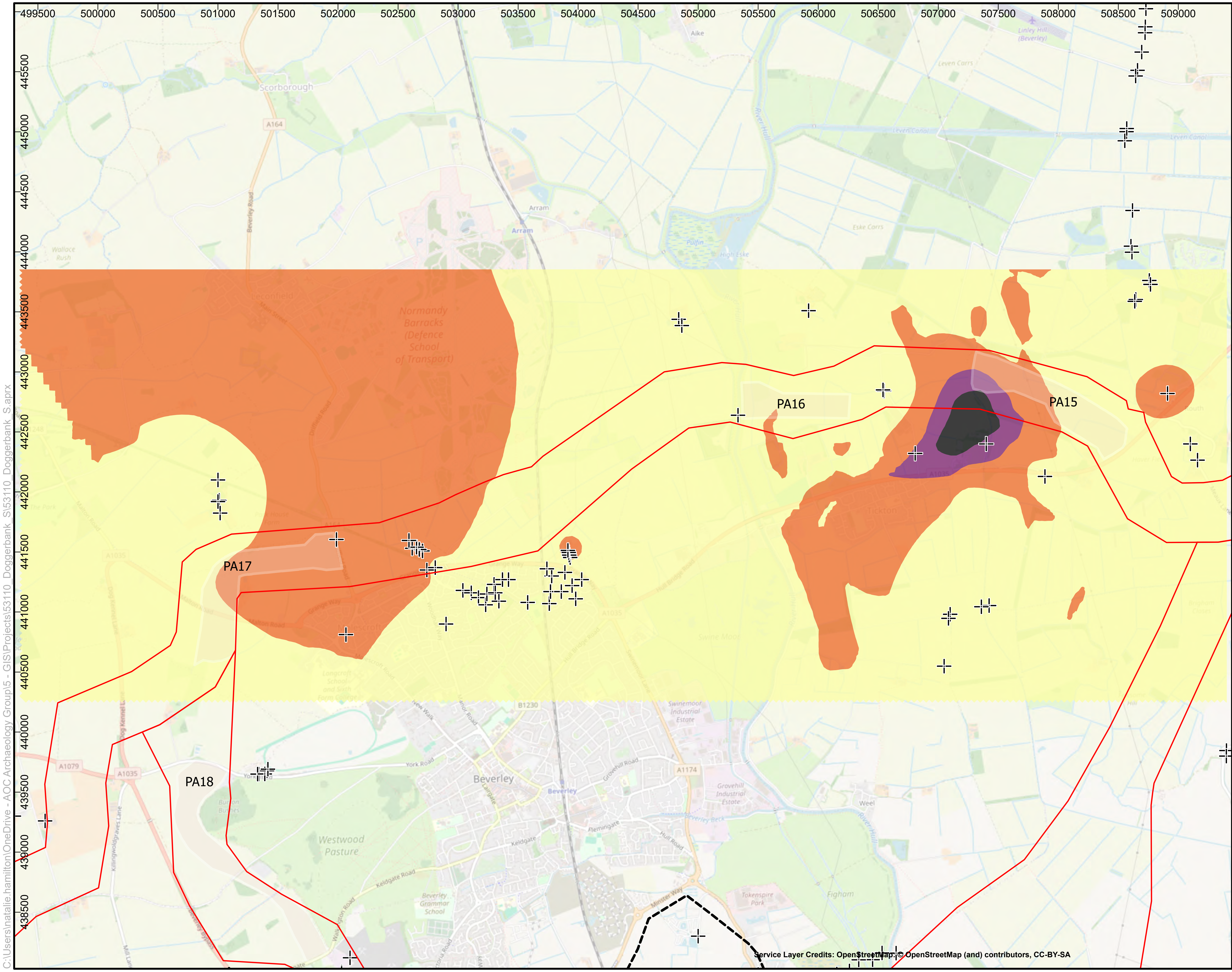

Figure 22-6-44

Thickness plot of the modern made ground and topsoil deposits (extrapolated from deposit records), representing possible truncation - Area 5

Data Points
Onshore Study Area
Priority Geophysics Areas
No
Onshore Substation Search Area
Topsoil / Made Ground Thickness - Area 5
m
0.000000 - 0.500000
0.500001 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000

FOR

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

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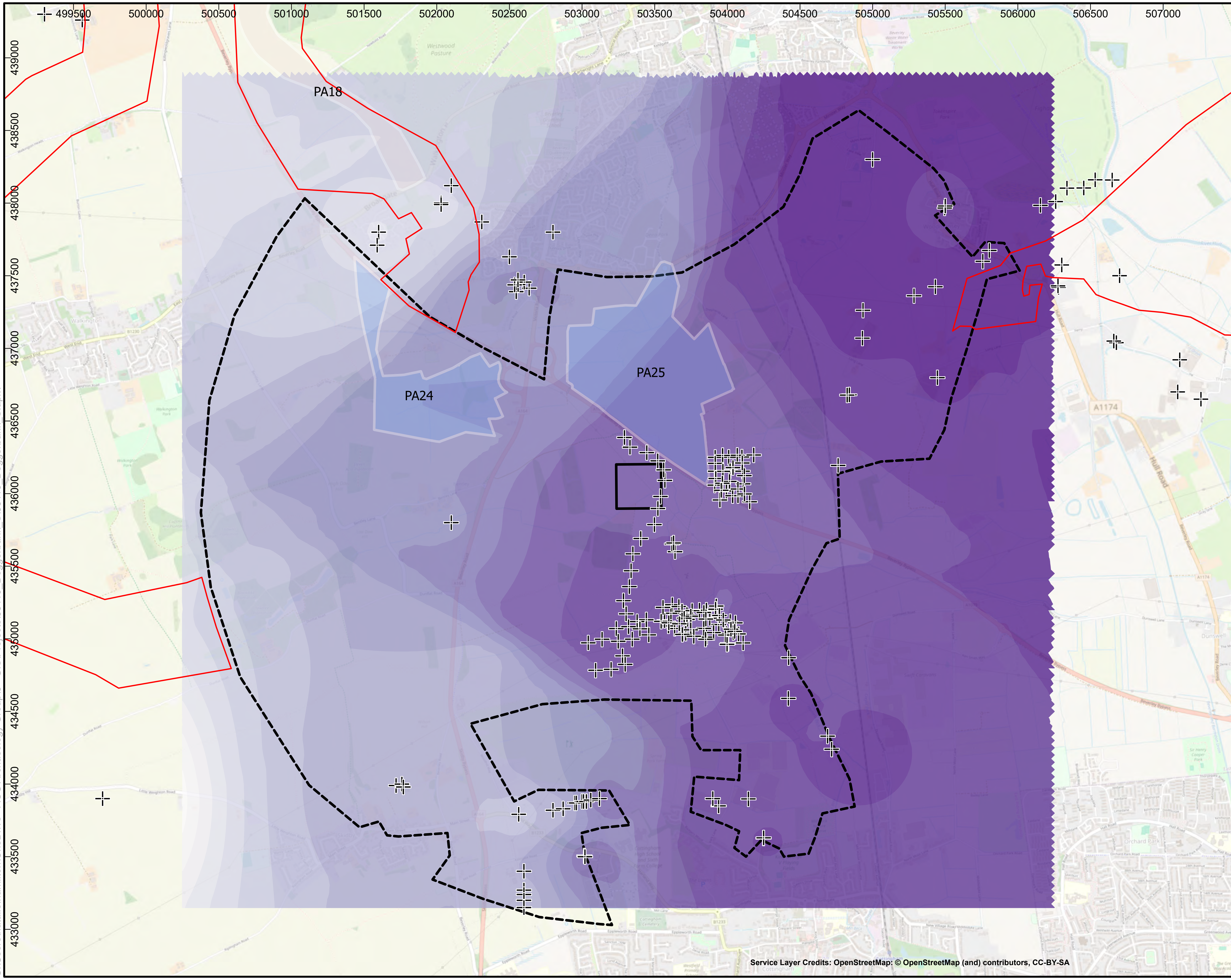

Figure 22-6-45

Topographic plot of the below ground chalk bedrock (extrapolated from deposit records)
- Area 6

Data Points
Onshore Study Area

Priority Geophysics Areas
No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Chalk Surface - Area 6

m OD
65.000001 - 70.000000
60.000001 - 65.000000
55.000001 - 60.000000
50.000001 - 55.000000
45.000001 - 50.000000
40.000001 - 45.000000
35.000001 - 40.000000
30.000001 - 35.000000
25.000001 - 30.000000
20.000001 - 25.000000
15.000001 - 20.000000
10.000001 - 15.000000
5.000001 - 10.000000
0.000001 - 5.000000
-4.999999 - 0.000000
-7.000000 - -5.000000

FOR

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and
RWE Renewables UK Dogger Bank South (East) Limited

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AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

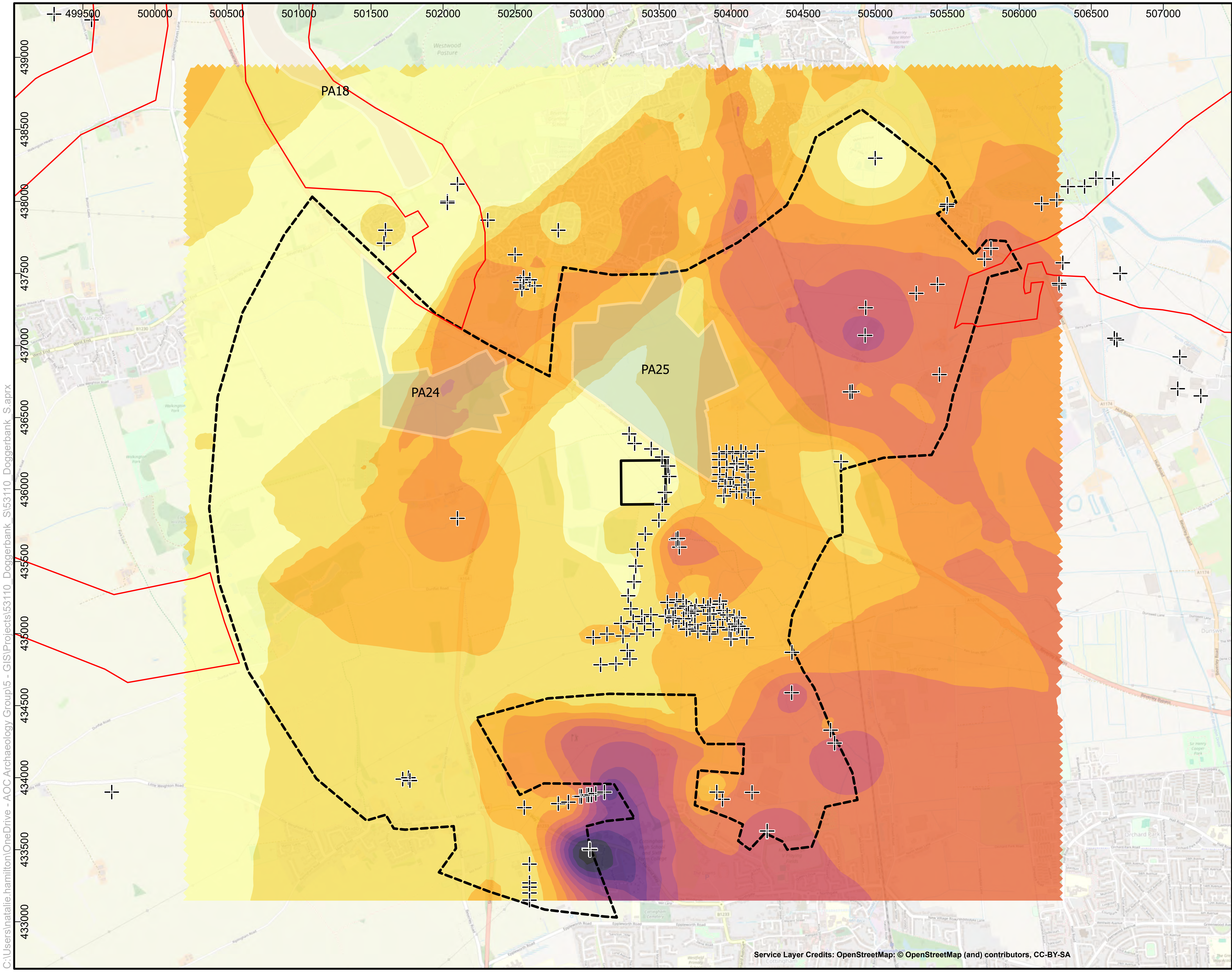

Figure 22-6-46

Thickness plot of the below ground Pleistocene deposits (extrapolated from deposit records) - Area 6

Onshore Study Area

Data Points

Priority Geophysics Areas

No

Yes

Onshore Substation Search Area

Creyke Beck 1 Grid Connection

Pleistocene Thickness - Area 6

m

0.000000 - 2.000000

2.000001 - 4.000000

4.000001 - 6.000000

6.000001 - 8.000000

8.000001 - 10.000000

10.000001 - 12.000000

12.000001 - 14.000000

14.000001 - 16.000000

16.000001 - 18.000000

18.000001 - 20.000000

20.000001 - 22.000000

22.000001 - 24.000000

FOR

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AOC Archaeology Group

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

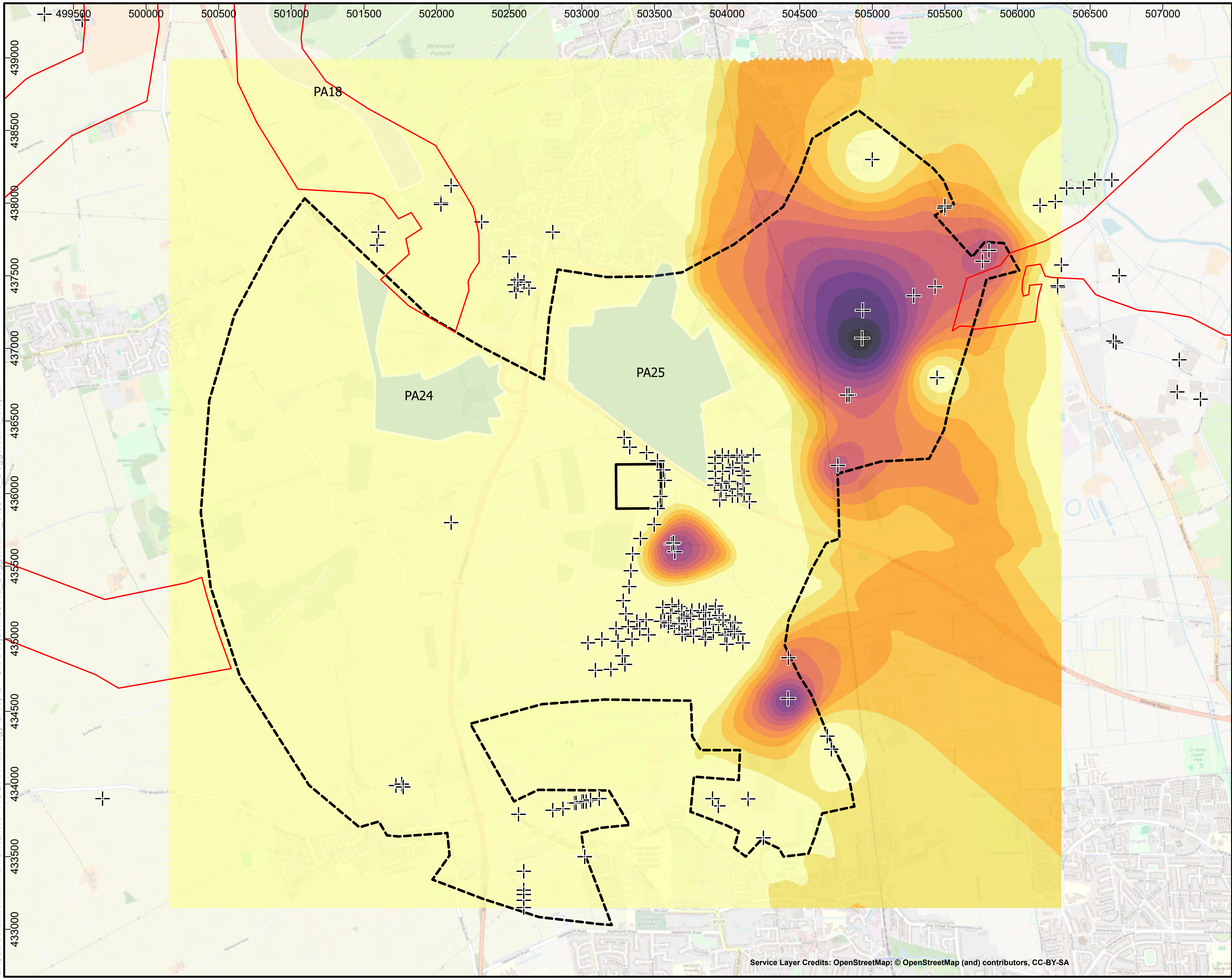

Figure 22-6-47

Thickness plot of the below ground Glaciofluvial deposits (extrapolated from deposit records) - Area 6

Onshore Study Area
Data Points

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Glaciofluvial Thickness - Area 6

m

- 0.000000 - 1.000000
- 1.000001 - 2.000000
- 2.000001 - 3.000000
- 3.000001 - 4.000000
- 4.000001 - 5.000000
- 5.000001 - 6.000000
- 6.000001 - 7.000000
- 7.000001 - 8.000000
- 8.000001 - 9.000000
- 9.000001 - 10.000000
- 10.000001 - 11.000000
- 11.000001 - 12.000000
- 12.000001 - 13.000000
- 13.000001 - 14.000000

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

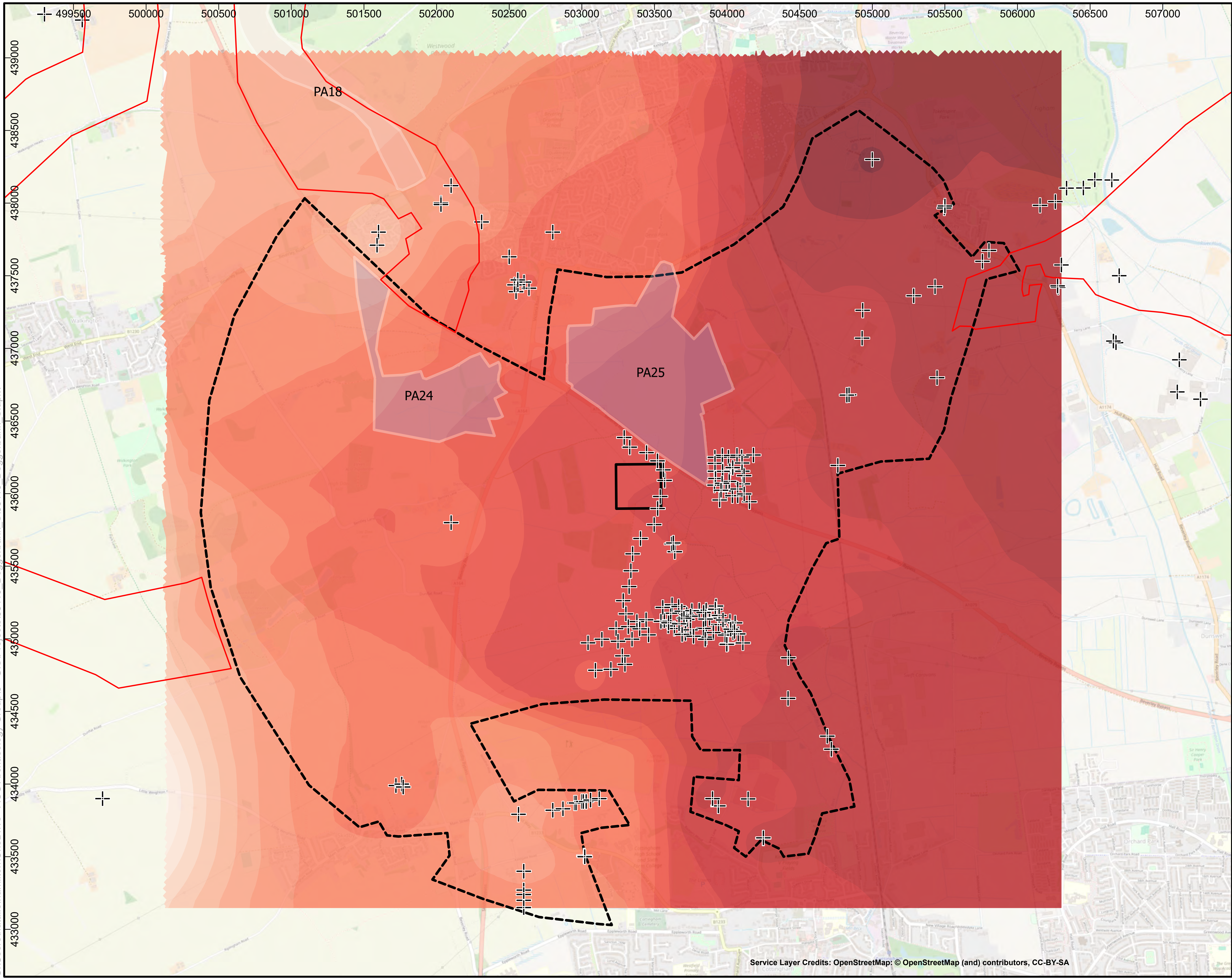

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Figure	22-6-48

Topographic plot of the below ground Pleistocene deposits (extrapolated from deposit records), representing the possible land surface at c. 12,000 BP - Area 6

Onshore Study Area
Data Points

Priority Geophysics Areas

No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Pleistocene Surface - Area 6

m OD

75.000001 - 80.000000
70.000001 - 75.000000
65.000001 - 70.000000
60.000001 - 65.000000
55.000001 - 60.000000
50.000001 - 55.000000
45.000001 - 50.000000
40.000001 - 45.000000
35.000001 - 40.000000
30.000001 - 35.000000
25.000001 - 30.000000
20.000001 - 25.000000
15.000001 - 20.000000
10.000001 - 15.000000
5.000001 - 10.000000
0.000001 - 5.000000
-4.999999 - 0.000000
-5.000000

FOR

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AOC Project No.:	53110

AOC Archaeology Group

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

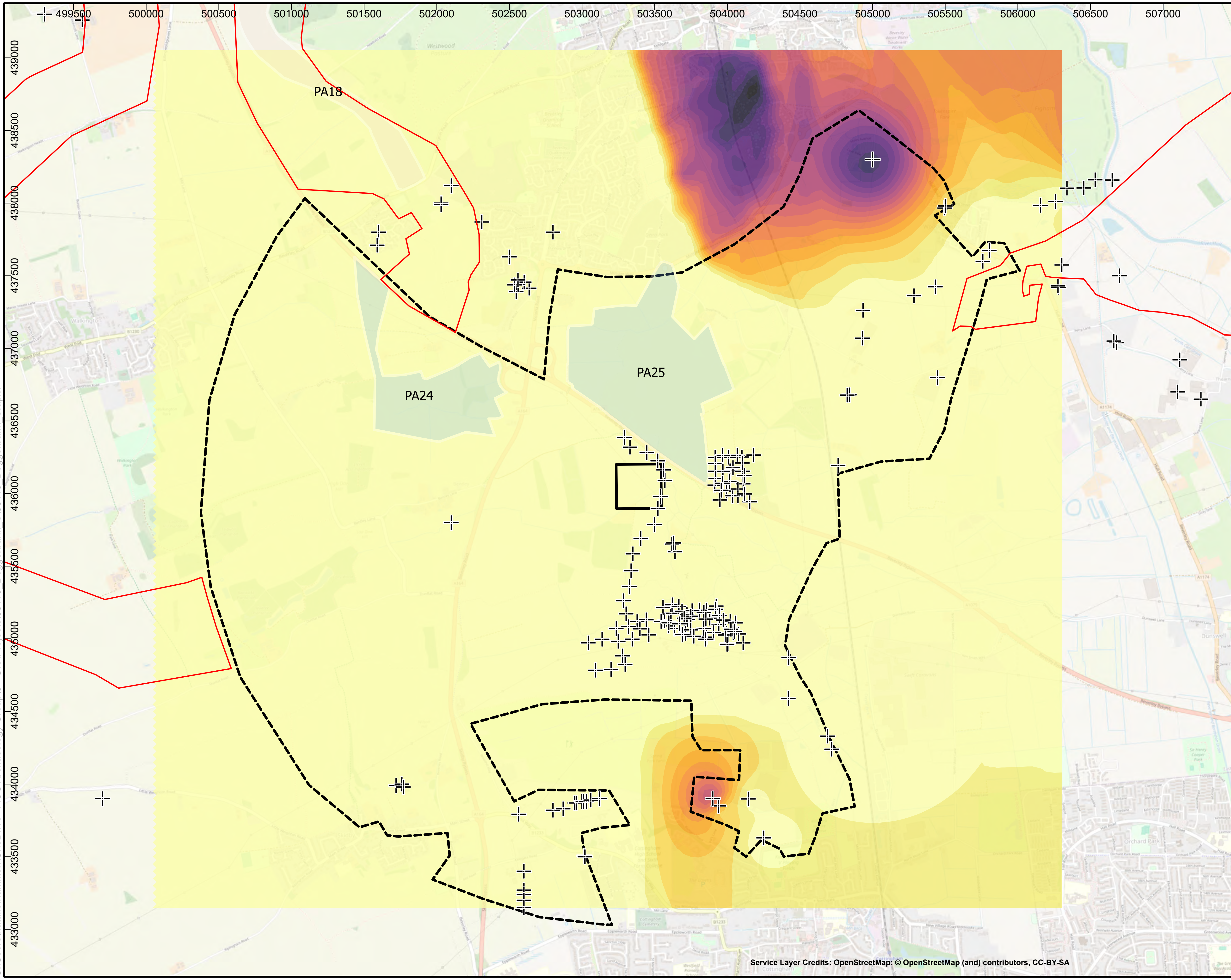

Figure **22-6-49**

Thickness plot of the below ground Holocene alluvium deposits (extrapolated from deposit records), representing deposit survival - Area 6

Onshore Study Area

Data Points

Priority Geophysics Areas

No

Yes

Onshore Substation Search Area

Creyke Beck 1 Grid Connection

Holocene Thickness - Area 6

m

0.000000 - 0.500000
0.500001 - 1.000000
1.000001 - 1.500000
1.500001 - 2.000000
2.000001 - 2.500000
2.500001 - 3.000000
3.000001 - 3.500000
3.500001 - 4.000000
4.000001 - 4.500000
4.500001 - 5.000000
5.000001 - 5.500000
5.500001 - 6.000000
6.000001 - 6.500000
6.500001 - 7.000000
7.000001 - 7.500000
7.500001 - 8.000000
8.000001 - 8.500000
8.500001 - 9.000000
9.000001 - 9.500000

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

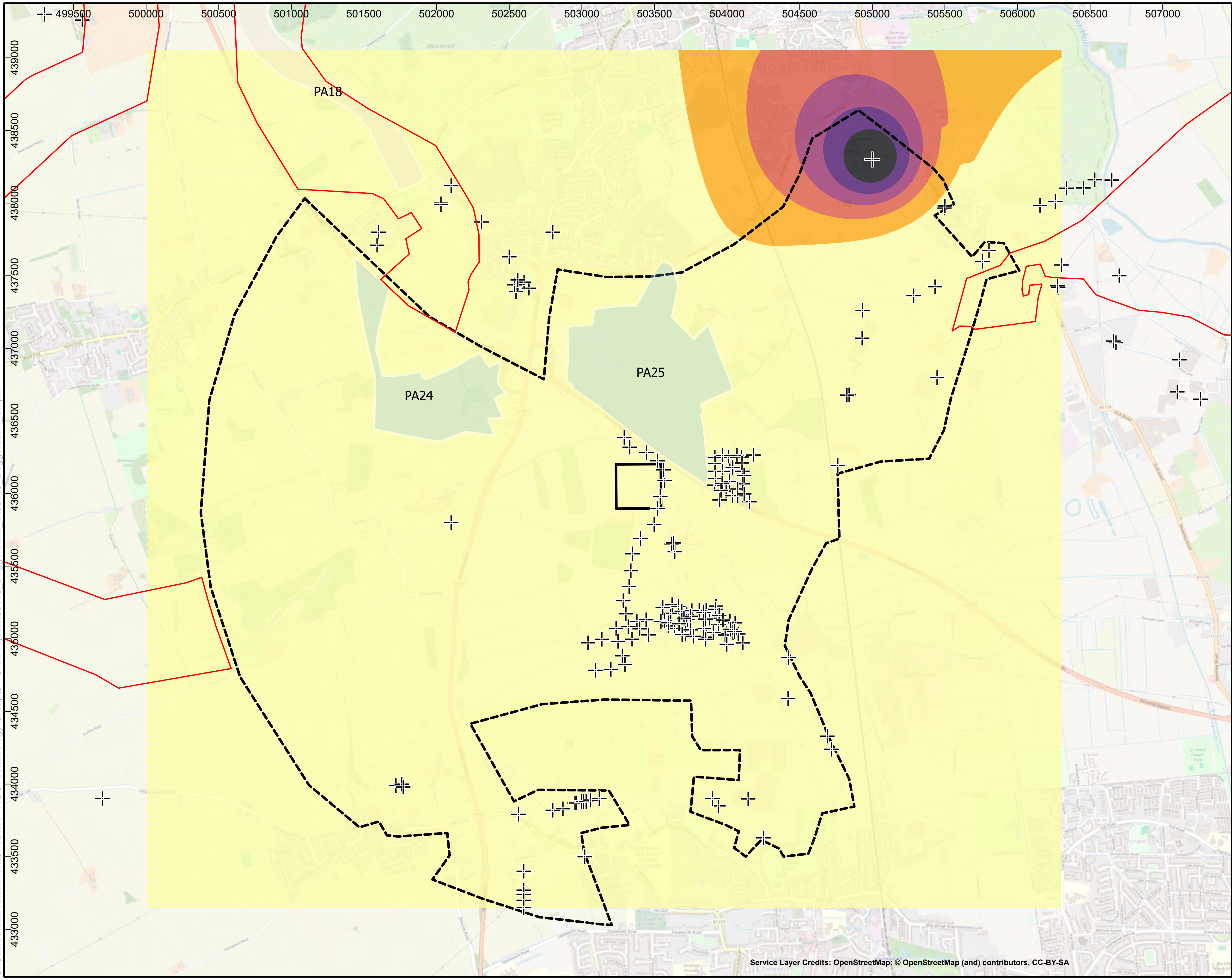
SCALE

1:25,000 @ A3

0 1,000m

Figure 22-6-50

Thickness plot of the below ground Holocene organic deposits (extrapolated from deposit records), representing deposit survival - Area 6



Onshore Study Area

Data Points

Priority Geophysics Areas

No

Yes

Onshore Substation Search Area

Creyke Beck 1 Grid Connection

Organic Thickness - Area 6

m

0.000000 - 0.500000

0.500001 - 1.000000

1.000001 - 1.500000

1.500001 - 2.000000

2.000001 - 2.500000

2.500001 - 3.000000

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AOC Archaeology Group

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000 m

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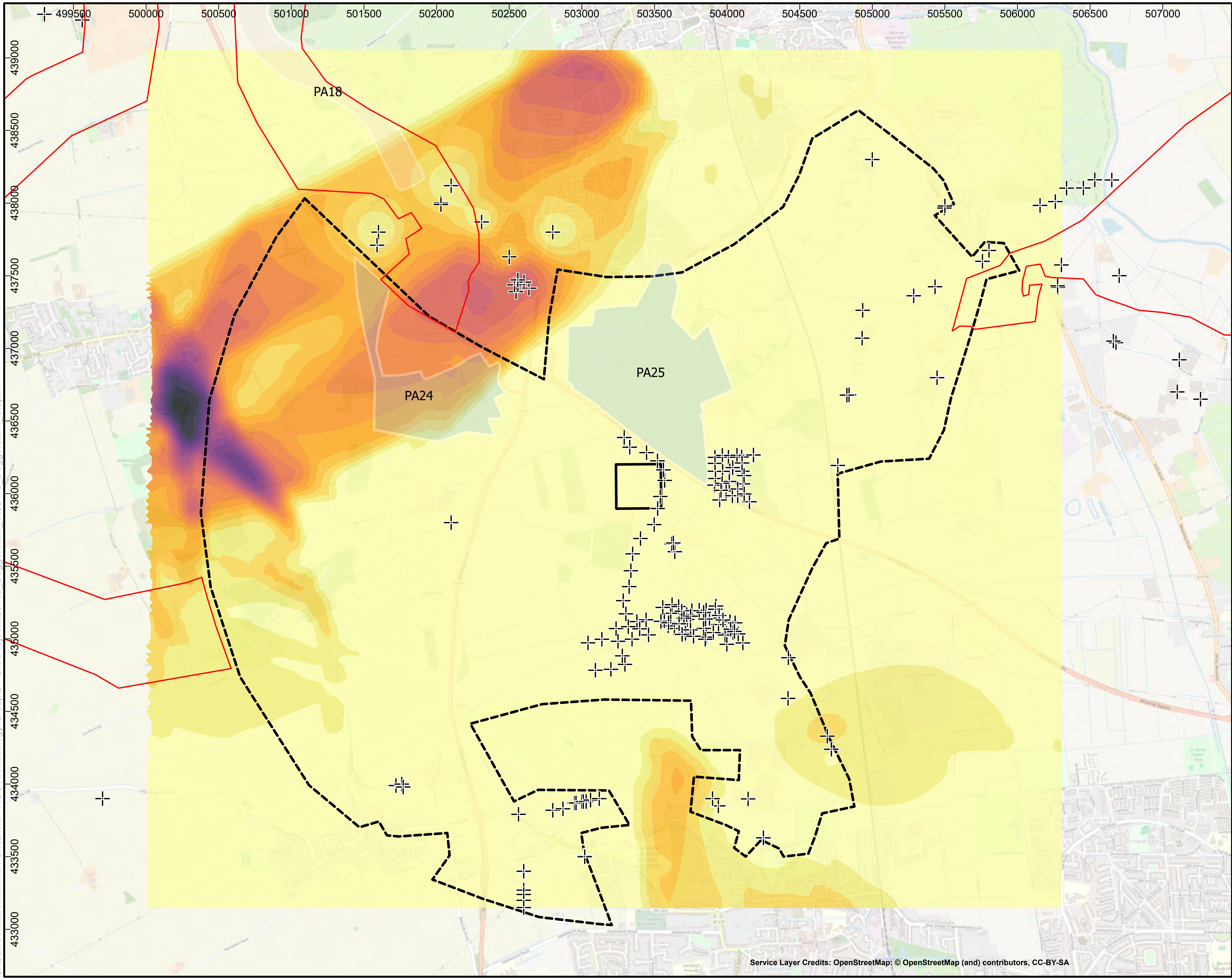

Figure	22-6-51

Thickness plot of the modern made ground and topsoil deposits (extrapolated from deposit records), representing possible truncation - Area 6

Onshore Study Area
Data Points

Priority Geophysics Areas
No
Yes
Onshore Substation Search Area
Creyke Beck 1 Grid Connection

Topsoil / Made Ground Thickness - Area 6
m
0.000000 - 1.000000
1.000001 - 2.000000
2.000001 - 3.000000
3.000001 - 4.000000
4.000001 - 5.000000
5.000001 - 6.000000
6.000001 - 7.000000
7.000001 - 8.000000
8.000001 - 9.000000
9.000001 - 10.000000
10.000001 - 11.000000
11.000001 - 12.000000
12.000001 - 13.000000
13.000001 - 14.000000
14.000001 - 15.000000
15.000001 - 16.000000
16.000001 - 17.000000
17.000001 - 18.000000
18.000001 - 19.000000
19.000001 - 20.000000

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N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

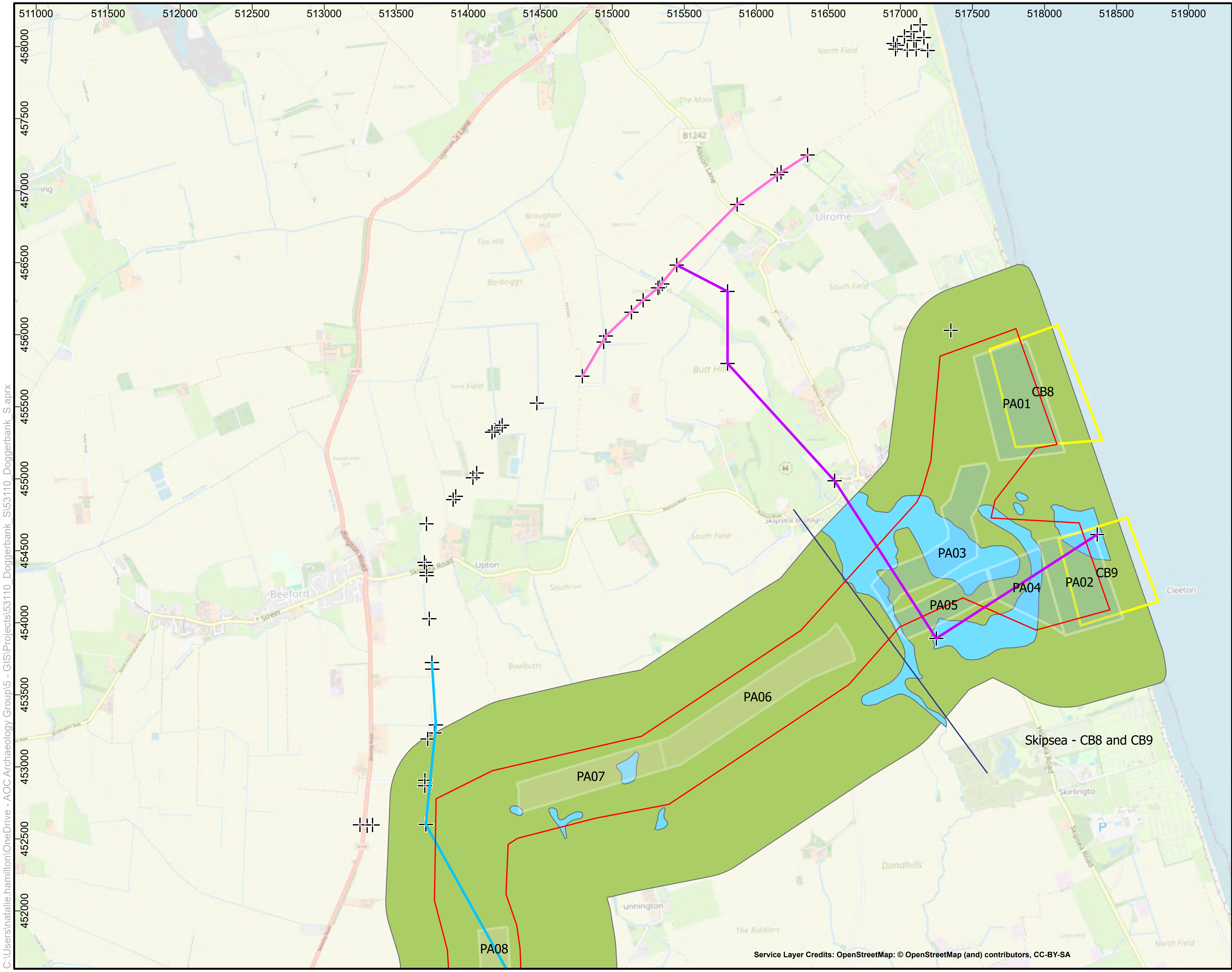

Figure 22-6-52

Plan showing Areas of Potential (AoP) for archaeology and palaeoenvironmental remains (extrapolated from deposit records) - Area 1

Legend

- Onshore Study Area
- Data Points
- Transect A
- Transect B
- Transect C
- GEOA Route Divisions
- Potential Landfall Areas
- AoP-A
- AoP-D

Priority Geophysics Areas

- No
- Yes

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

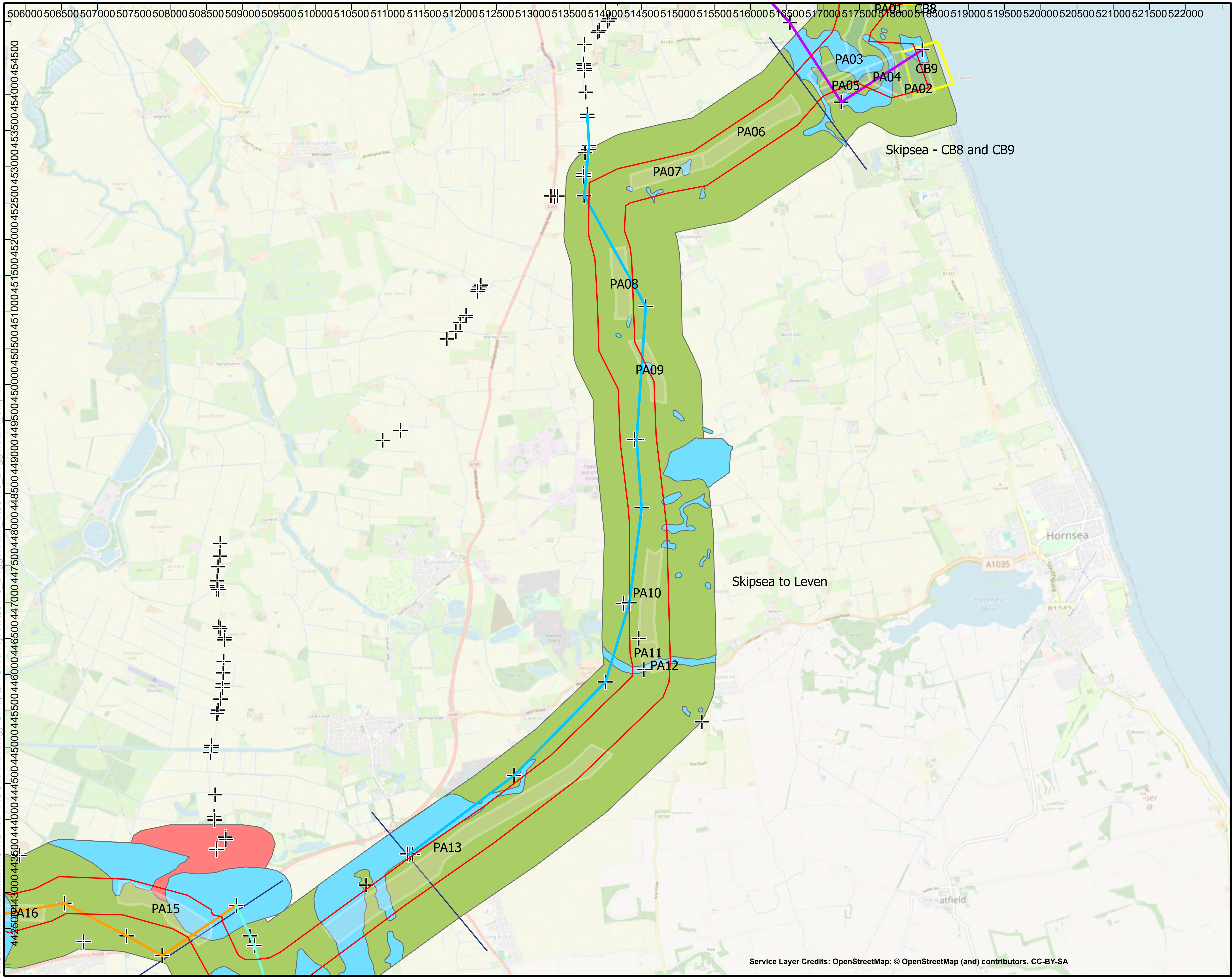

Figure 22-6-53

Plan showing Areas of Potential (AoP) for archaeology and palaeoenvironmental remains (extrapolated from deposit records) - Area 2

Legend

- Onshore Study Area
- Transect B
- Transect C
- Transect D
- Transect G
- Data Points
- GEOA Route Divisions
- Potential Landfall Areas
- AoP-A
- AoP-B
- AoP-D

Priority Geophysics Areas

- No
- Yes

FOR

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AOC Project No.:	53110

N

SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:50,000 @ A3

0 1,000m

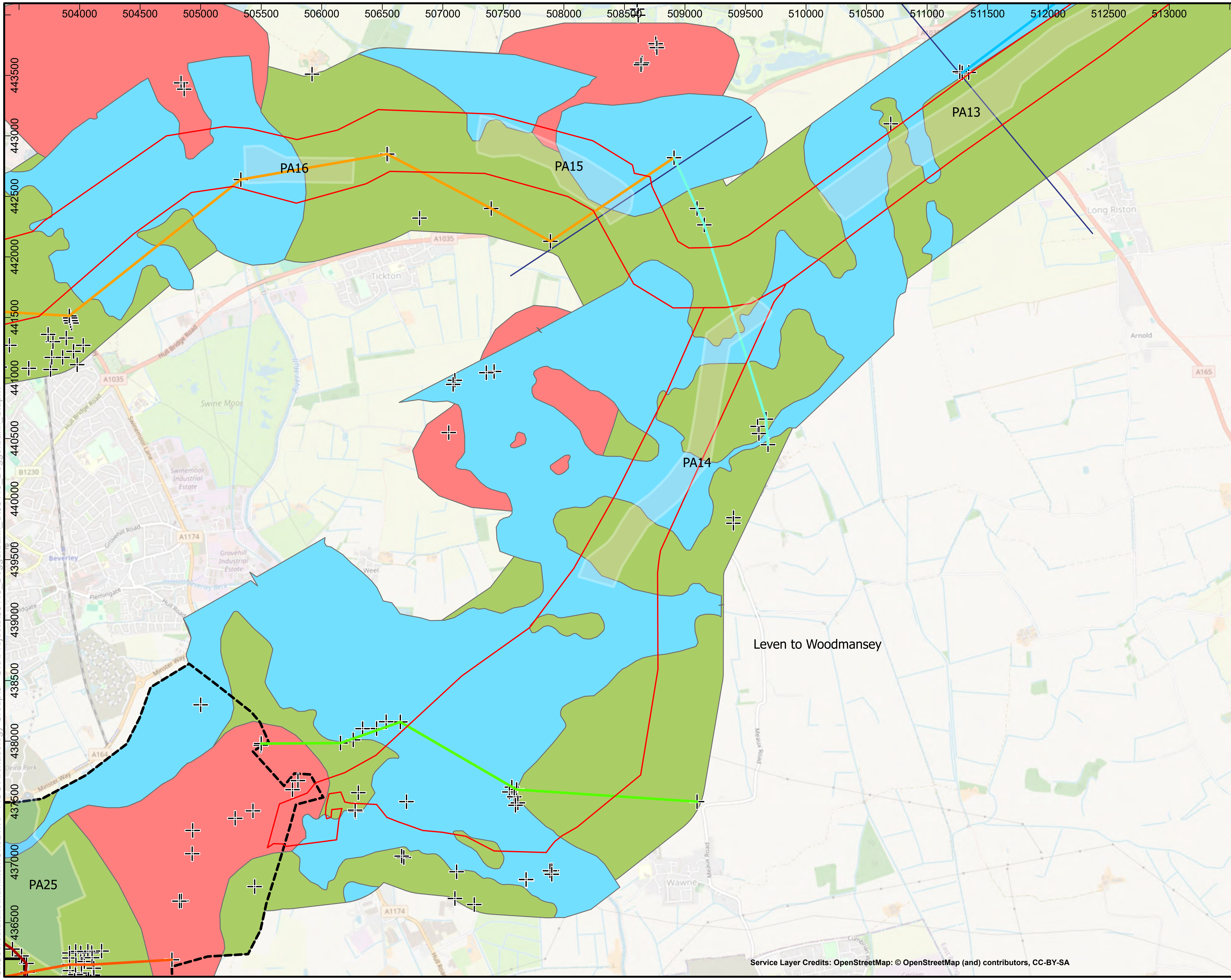

Figure 22-6-54

Plan showing Areas of Potential (AoP) for archaeology and palaeoenvironmental remains (extrapolated from deposit records) - Area 3

Legend

- Onshore Study Area
- Transect C
- Transect D
- Transect E
- Transect G
- Transect H
- Transect I
- Data Points
- GEOA Route Divisions
- Onshore Substation Search Area
- Creyke Beck 1 Grid Connection
- AoP-A
- AoP-B
- AoP-D

Priority Geophysics Areas

- No
- Yes

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:30,000 @ A3

0 1,000m

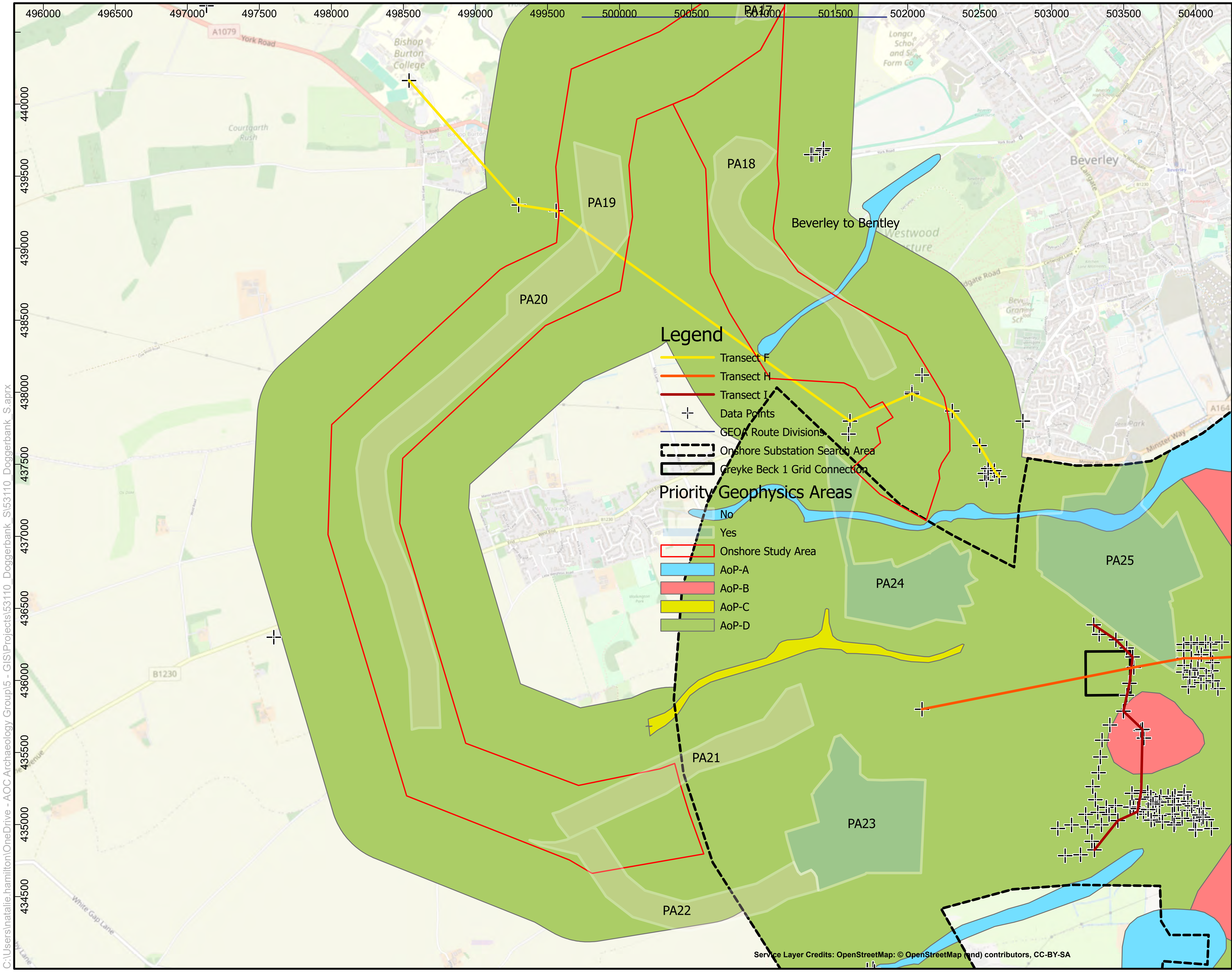

Figure 22-6-55

Plan showing Areas of Potential (AoP) for archaeology and palaeoenvironmental remains (extrapolated from deposit records) - Area 4

Legend

- Onshore Study Area
- Transect F
- Transect H
- Transect I
- Data Points
- GEOA Route Divisions
- Onshore Substation Search Area
- Creyke Beck 1 Grid Connection
- AoP-A
- AoP-B
- AoP-C
- AoP-D

Priority Geophysics Areas

- No
- Yes

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

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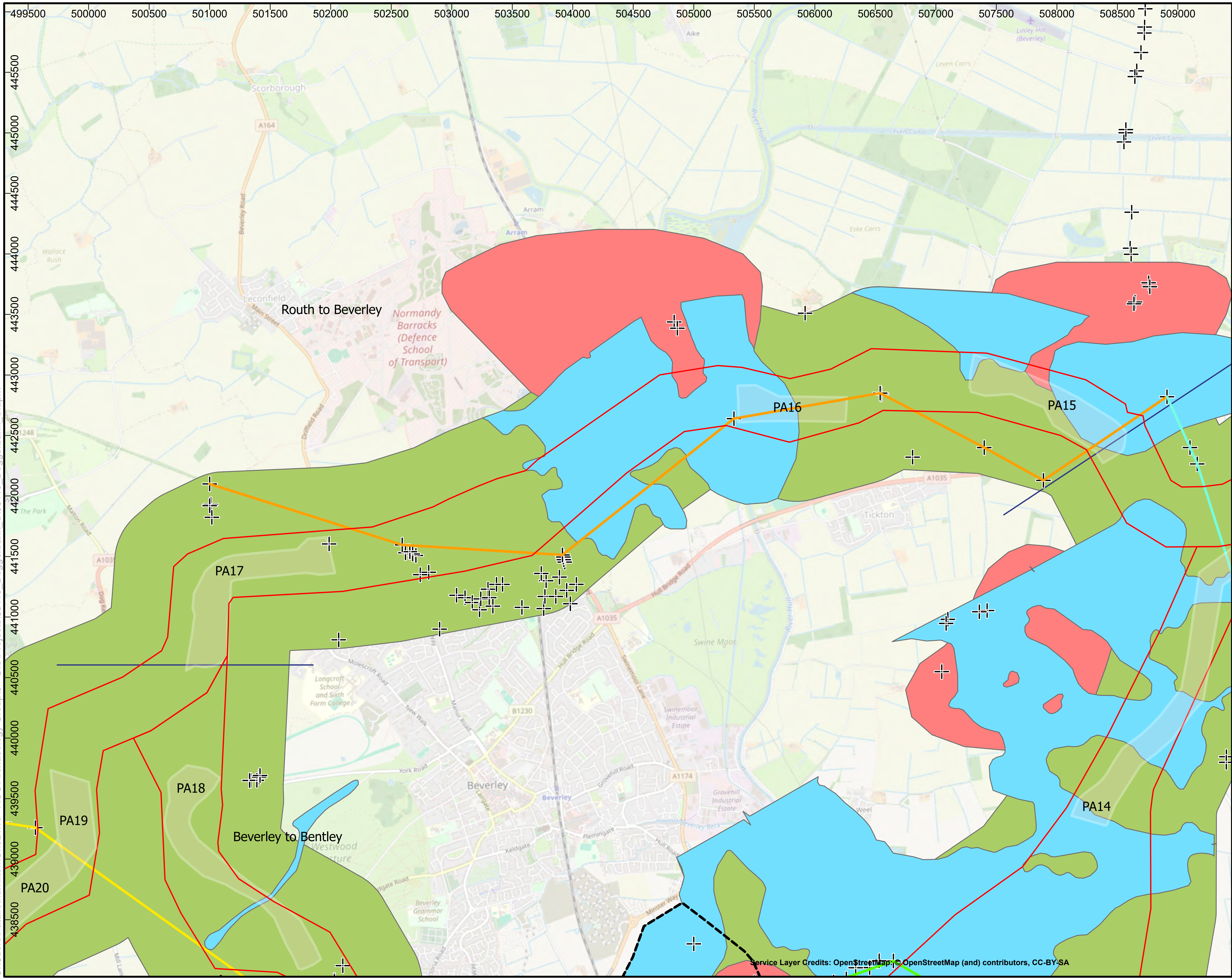

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Figure 22-6-56

Plan showing Areas of Potential (AoP) for archaeology and palaeoenvironmental remains (extrapolated from deposit records) - Area 5

Legend

- Onshore Study Area
- Transect D
- Transect E
- Transect F
- Transect G
- Data Points
- GEOA Route Divisions
- Onshore Substation Search Area
- AoP-A
- AoP-B
- AoP-D

Priority Geophysics Areas

- No

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SYSTEM

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

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0 1,000m

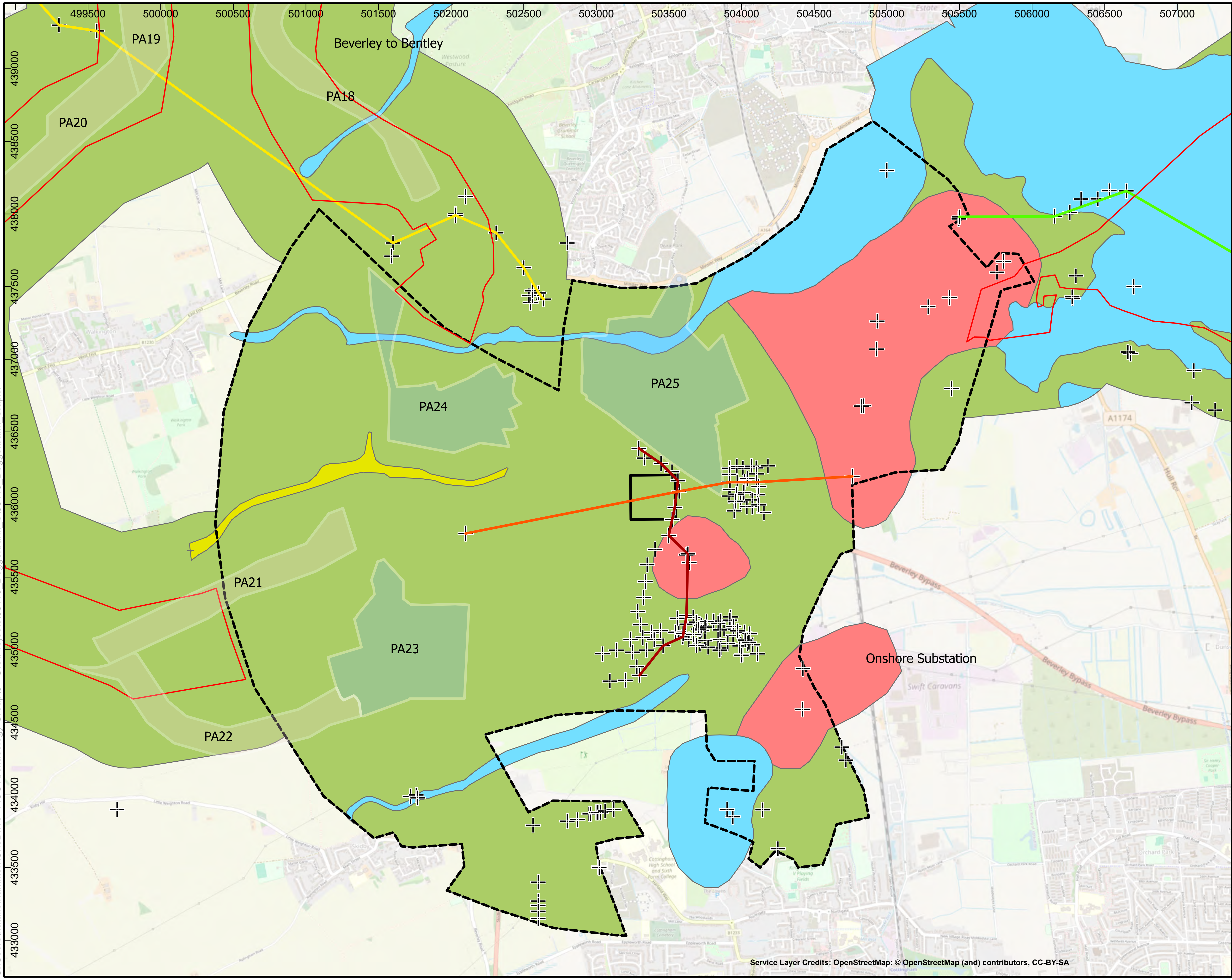

Figure 22-6-57

Plan showing Areas of Potential (AoP) for archaeology and palaeoenvironmental remains (extrapolated from deposit records) - Area 6

Legend

- Onshore Study Area
- Transect E
- Transect F
- Transect H
- Transect I
- Data Points
- Onshore Substation Search Area
- Creyke Beck 1 Grid Connection
- AoP-A
- AoP-B
- AoP-C
- AoP-D

Priority Geophysics Areas

- No
- Yes

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SYSTEM

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Projection: Transverse Mercator
Datum: OSGB 1936

SCALE

1:25,000 @ A3

0 1,000m

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Windmill Hill Business Park
Whitehill Way
Swindon
Wiltshire, SN5 6PB