



FIVE
ESTUARIES
OFFSHORE WIND FARM

FIVE ESTUARIES
OFFSHORE WIND FARM
PRELIMINARY ENVIRONMENTAL
INFORMATION REPORT

VOLUME 5, ANNEX 7.1: HISTORIC
ENVIRONMENT DESK-BASED
ASSESSMENT

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In general, field survey data used to inform the Five Estuaries Offshore Wind Farm PEIR were gathered specifically for the Project. However, in instances where the North Falls Offshore Wind Farm Project held pertinent survey data and reports, these have been provided to the Five Estuaries Offshore Wind Farm Project for use in the PEIR.

This annex is an example of information that has been provided by the North Falls Offshore Wind Farm Project for use by the Five Estuaries Offshore Wind Farm Project. It should be noted that all relevant technical information is included in the Five Estuaries Offshore Wind Farm Project PEIR, regardless of initial source.



Five Estuaries Offshore Wind Farm Onshore Project Area Essex

Archaeological Desk-Based Assessment

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Summary

Wessex Archaeology was commissioned on behalf of RWE Renewables UK to prepare an Archaeological Desk-Based Assessment (DBA) for the Five Estuaries Offshore Wind Farm to inform the preparation of the Preliminary Environmental Impact Report (PEIR) and subsequent Environmental Statement (ES) Chapter for Onshore Archaeological and Cultural Heritage .

The aims of this study were to assess the known and potential heritage resource within the Onshore Red Line Boundary (RLB) and the surrounding area, and to assess the likely impacts of the development proposals on this resource.

The Onshore Project Area is located within the district of Tendering in the county of Essex. Onshore cable route is approximately 22 km and runs from the Landfall Zone located to the southeast of Great Holland northwest to the Substation Search Areas (SSA's) located between Ardleigh and the A120.

This assessment has established that there is an archaeological interest within the Onshore RLB defined as the potential for the presence of buried archaeological remains dating from the prehistoric to post-medieval periods with elevated potential for the late prehistoric, Romano-British and medieval periods. Concentrations of cropmarks are recorded within the Substation Search Areas (SSA's) including possible evidence of prehistoric funerary and settlement activity alongside potential remains of a network of Roman roads and Roman roadside settlement. Evidence of field systems are also noted around the historic settlements of Little Bromley, Thorpe Green, Thorpe-Le-Soken and Great Holland that are thought to be of medieval date. However, as none of the cropmarks have been subject to intrusive archaeological investigation their presence, form, function and date cannot be confirmed based on current evidence. The potential date range of the cropmarks is informed by their general appearance and the potential activities levels within the locale, based predominantly on the recovery of finds recorded as part of the Portable Antiquities Scheme. Geophysical Survey of the route is currently ongoing.

Due to lack of previous intrusive archaeological investigation within the Onshore RLB, the presence and significance of archaeological remains cannot be confirmed on the basis of the available information. As none of the cropmarks recorded within the Onshore RLB have yet to be ground truthed their purpose, form and significance remains unknown. Any adverse impact to buried after features as a result of the implementation of the project would be permanent and irreversible in nature. This potential adverse effect could be reduced through the implementation of an appropriate scheme of archaeological assessment and mitigation, in accordance with national and local planning policy. The need for, scale, scope and any further archaeological works should be agreed through consultation with the statutory authorities.



Five Estuaries Offshore Wind Farm Onshore Project Area Essex

Archaeological Desk-Based Assessment

1 INTRODUCTION

1.1 Project and report background

- 1.1.1 This assessment seeks to inform an application for Development Consent Order for the onshore cable route (hereafter Onshore ECC) and substation works for the Five Estuaries Offshore Wind Farm (hereafter VE). The cable route will cover a distance of approximately 22km and will run from the coast to the south east of Great Holland (between Holland on Sea and Frinton on Sea) to an Onshore Substation (OnSS) located between Ardleigh and the A120. This will be connected to a new National Grid Substation. **Figure 1** shows the location of the Onshore Red Line Boundary (RLB) and two substation search area options considered as part of the Preliminary Environmental Impact Report.
- 1.1.2 The Five Estuaries Offshore Wind Farm will comprise an array of offshore wind turbine generators (WTGs) and offshore electrical platforms which will be connected to the shore by offshore export cables installed within an offshore cable corridor. The project also requires onshore infrastructure in order to connect the offshore wind farm to the National Grid. The entirety of the project area (hereafter described as ‘the Red Line Boundary’ (RLB)) is split into three areas:
- Landfall Zone
 - Onshore Export Cable Corridor (Onshore ECC); and
 - Onshore Substation (OnSS) Search Areas.
- 1.1.3 The North Falls Offshore Wind Farm (OWF) is a similar project which will utilize the same or a very similar Onshore Project Area to VE. Royal HaskoningDHV have produced high-level historic environment desk-based (baseline) assessments (DBA) for the Site (2021, 2022) to support the application for the North Falls OWF, which utilises a similar route to the VE OWF. To avoid duplication of information and to ensure consistency of the baselines between the North Falls OWF and the VE OWF, the data and results of the assessment prepared by Royal HaskoningDHV have been used in the preparation of this assessment, to ensure a joined up approach to assessment.
- 1.1.4 Air Photo Services (APS) have prepared an assessment of airborne and satellite remote sensing data and map regression analysis for archaeology for both projects. Assessments were completed for the Landfall Zone and a separate report for the Onshore ECC and OnSS Search Areas (SSA West and SSA East). The results of the assessment have been used to inform this report, with the reports provided in **Appendix 4**. GIS shapefiles of the potential features identified were also provided as part of this work.



1.2 Scope of document

1.2.1 This assessment was requested by the Client in order to determine, as far as is possible from existing information, the nature, extent and significance of the historic environment resource within the Onshore RLB and its environs, and to provide an initial assessment of the potential impact of development on the heritage assets that embody that significance.

1.2.2 Archaeological Interest is defined in the *National Planning Policy Framework* (NPPF 2021): Annex 2, as:

'there will be archaeological interest in a heritage asset if it holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point'

1.2.3 NPPF Annex 2 defines a Heritage Asset as:

'a building monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage assets include designated heritage assets and assets identified by the local planning authority (including local listing).'

1.3 Aims and Objectives

1.3.1 The specific aims of this assessment are to:

- outline the known and potential heritage assets, based on a review of existing information to provide an archaeological and historical baseline within a defined study area; and
- assess the significance of known and potential heritage assets through weighted consideration of their valued components.

2 PLANNING BACKGROUND

2.1 Introduction

2.1.1 There is national legislation and guidance relating to the protection of, and proposed development on or near, important archaeological sites or historical buildings within planning regulations as defined under the provisions of the *Town and Country Planning Act 1990*. In addition, local authorities are responsible for the protection of the historic environment within the planning system.

2.1.2 The following section summarises the main components of the national and local planning and legislative framework governing the treatment of the historic environment within the planning process. Further detail is presented in Appendix 2.

2.2 National Planning Policy Framework

2.2.1 The *National Planning Policy Framework* (NPPF) was published in July 2021 and sets out the government's planning policies for England and how these are expected to be applied.

2.2.2 Section 16 of the NPPF, entitled *Conserving and enhancing the historic environment*, sets out the principal national guidance on the importance, management and safeguarding of heritage assets within the planning process.



2.2.3 The aim of NPPF Section 16 is to ensure that Local Planning Authorities, developers and owners of heritage assets adopt a consistent and holistic approach to their conservation and to reduce complexity in planning policy relating to proposals that affect them.

2.2.4 To summarise, government guidance provides a framework which:

- recognises that heritage assets are an irreplaceable resource;
- requires applicants to provide proportionate information on the significance of heritage assets affected by the proposals and an impact assessment of the proposed development on that significance;
- takes into account the desirability of sustaining and enhancing the significance of heritage assets and their setting;
- places weight on the conservation of designated heritage assets, in line with their significance; and
- requires developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and impact, and to make this evidence (and any archive generated) publicly accessible.

2.2.5 A selection of excerpts from NPPF Section 16: Conserving and enhancing the historic environment is presented in **Appendix 2**.

2.2.6 Further additional guidance intended to accompany the NPPF is provided in the Planning Practice Guidance (PPG) web-based resource¹.

2.3 National Policy Statements for Energy

2.3.1 These policies (specifically EN-1: Overarching NPS for Energy and EN3: National Policy Statement for Renewable Energy infrastructure) set out the Government's policy for delivery of nationally significant energy infrastructure. Section 5.8 of EN-1 sets out the Government's stance on protecting the historic environment and assessing the impact of any new energy infrastructure. It states that in considering the impact of a proposed development on any heritage assets, the Planning Inspectorate (PINS) should consider the nature and significance of the assets and the value they hold. Section 2.5.34 of EN-3 also states that when considering any impact on the historic environment, PINS should take into account the positive role that large-scale renewable projects play in the mitigation of climate change and delivery of energy security.

2.4 Designated heritage assets

2.4.1 A designated heritage assets is defined in NPPF Annex 2 as:

'A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.'

¹ <https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment>



2.4.2 Statutory protection is provided to certain classes of designated heritage asset under the following legislation:

- *Planning (Listed Buildings and Conservation Areas) Act 1990;*
- *Ancient Monuments and Archaeological Areas Act 1979; and*
- *Protection of Wrecks Act 1973*

2.4.3 The *Historic Buildings and Ancient Monuments Act 1953* makes provision for the compilation of a register of gardens and other land (parks and gardens, and battlefields).

2.4.4 Further information regarding heritage designations is provided in **Appendix 2**.

2.5 Hedgerows Regulations 1997 (as Amended 2002)

2.5.1 Hedgerows that fulfil certain criteria are afforded protection under the *Hedgerows Regulations 1997* (as Amended 2002). The administration of the regulations is the responsibility of the Local Planning Authority (LPA).

2.6 The Protection of Military Remains Act 1986

2.6.1 All military aircraft crash sites in the United Kingdom, its territorial waters, or British aircraft in international waters, are controlled sites under the *Protection of Military Remains Act 1986*. It is an offence under this act to tamper with, damage, move or unearth any items at such sites, unless the Ministry of Defence (MOD) has issued a licence authorising such activity.

2.7 Local Planning Policy and guidance

Tendring District Local Plan

2.7.1 The Site is located within the administrative boundaries of Tendring District Council, which adopted *Tendring District Local Plan* Section 1 in January 2021 and Section 2 in January 2022 following examination. Policies PPL 7, PPL8 and PPL9 are relevant to this assessment and are provided in **Appendix 2**.

2.7.2 Due to strategic cross-boundary policies and allocations, Tendring, Braintree and Colchester's Local Plan share an identical Section 1. Tendring specific policies and allocations can be found within Section 2 of the Local Plan.

2.7.3 Section 1 of the local plan (*Tendring District Local Plan 2013-2033 and Beyond: North Essex Authorities, 2021*) details the direction that the North Essex Authorities, including Tendring District Council wish to take their policies and allocations.

2.7.4 Section 2 of the Local Plan used for planning decisions is currently subject to an examination and is available in draft (*Tendring District Local Plan 2013-2033 and Beyond Publication Draft, 2017*).

2.7.5 Objective 7 Historic Environment states that: To conserve and enhance Tendring District's historic environment, including: heritage; respecting historic buildings and their settings; heritage assets; landscapes; links; and views. Policy SPL3 gives the requirements for Sustainable Design and states with particular relation to heritage that "the design and layout of the development maintains or enhances important existing site features of landscape, ecological, heritage or amenity value".



3 METHODOLOGY

3.1 Introduction

3.1.1 The methodology employed during this assessment was based upon relevant professional guidance, including the Chartered Institute for Archaeologists' *Standard and guidance for historic environment desk-based assessment* (CIfA 2020).

3.2 Study Area

3.2.1 A Study Area was established within a 500 m radius of the Onshore RLB. The use of a 500 m Study Area was agreed as part of the Scoping Opinion by the Planning Inspectorate (PINS) as an appropriate means upon which to base the assessment due to the linear nature of the scheme and the volume of available data within that radius.

3.3 Site Walkover

3.3.1 The Onshore RLB was visited between 10th and 21st October with varied weather conditions. A fieldwork record comprising digital photography is held in the project archive.

3.3.2 The aim of the site walkover was to assess the general aspect, character, condition and setting of the Site and to identify any prior impacts not evident from secondary sources. The site visit also sought to ascertain if the Site contained any previously unidentified features of archaeological, architectural or historic interest.

3.3.3 To date, approximately 80% of Onshore Project Area has been subject to walkover survey. Access to the areas that have not been subject to walkover survey due to access restrictions will be attempted between the preparation of the PEIR and ES Chapter.

3.3.4 Due to the continual erosion of the foreshore, which has potential to expose previously unidentified features of archaeological, architectural or historic interest, a second visit to the foreshore will be undertaken to take account of any changes that may have taken place between the visits between the PEIR and ES.

3.4 Sources

3.4.1 Sources that contain relevant historic environment information have been consulted in the production of this DBA. This includes:

- Online 'Listing data' from the NHLE, maintained by Historic England, for information and shapefiles of designated heritage assets (Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, Registered Battlefields and World Heritage Sites)
- National Record for the Historic Environment (NRHE)
- HER search for information on non-designated heritage assets and historic landscape characterisation data
- HER event records for previous archaeological investigation reports
- Data from the CITiZAN project, publicly assessed through the project's website
- Data from the Portable Antiquity Scheme (PAS) accessed through information held by the HER, with supplementary information accessed via the online database

- Tendring District Council website for information on Conservation Areas.
- The Essex Record Office for historic mapping including pre-Ordnance Survey maps, published and unpublished documentary sources (sourced by APS)
- Landmark data (sourced by APS)
- LiDAR data (sourced by APS)
- Geological mapping and borehole information held by the British Geological Survey
- Assessment of relevant archaeological grey literature reports held by the Archaeology Data Service (ADS) and the HER
- Tendring District Historic Environment Characterisation Report (Tendring District Council and Essex County Council 2008)
- Tendring Geodiversity Characterisation Report (Tendring District Council and Essex County Council 2009); and
- Essex Historic Grazing Marsh Project (Essex County Council 2014)
- Observations from Site Walkovers.

3.4.2 Sources consulted during the preparation of this assessment are listed in the references section of the report.

3.5 Significance

3.5.1 Significance (for heritage policy) is defined in NPPF Annex 2 as:

'The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting. For World Heritage Sites, the cultural value described within each site's Statement of Outstanding Universal Value forms part of its significance.'

3.5.2 The interests as listed in the NPPF are further defined in Historic England's (2019) *Statements of Heritage Significance: analysing significance in heritage assets*. These are:

- Archaeological Interest: there will be archaeological interest in a heritage asset if it holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point;
- Architectural and Artistic Interest: these are interests in the design and general aesthetics of a place. They can arise from conscious design or fortuitously from the way the heritage asset has evolved. More specifically, architectural interest is an interest in the art or science of the design, construction, craftsmanship and decoration of buildings and structures of all types. Artistic interest is an interest in other human creative skill, like sculpture; and
- Historic Interest: An interest in past lives and events (including prehistoric). Heritage assets can illustrate or be associated with them. Heritage assets with historic interest not only provide a material record of our nation's history but can also provide



meaning for communities derived from their collective experience of a place and can symbolise wider values such as faith and cultural identity.

- 3.5.3 This assessment was also informed by the advice published by Historic England in the document entitled *Managing Significance in Decision-Taking in the Historic Environment: historic environment good practice advice in planning note 2* (2015).

3.6 Assumptions and Limitations

- 3.6.1 Data used to compile this report consists of secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this Study. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.

- 3.6.2 The records held by the EHER are not a record of all surviving heritage assets, but a record of the discovery of a wide range of archaeological and historical components of the historic environment. The information held within it is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown.

3.7 Copyright

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

4 BASELINE RESOURCE

4.1 Introduction

- 4.1.1 The following section provides a summary of the recorded historic environment resource within the Study Area, compiled from the sources summarised above and detailed in the references section of this report. Sections 4.3-4.6 are based upon the baseline studies carried out by Royal Haskoning DHV and APS (2021 & 2022), but tailored to the VE project. The aim is to identify the known and potential components of the historic environment (heritage assets) that could be affected.

4.2 Site Description and Walkover Observations

Landfall Zone

- 4.2.1 The southern half of the Landfall Zone, located at the southern end of the Onshore RLB comprises Holland Haven Country Park, Holland Haven Marshes Site of Special Scientific Interest (SSSI), Frinton Golf Course and a waste water treatment works (**Plates 1-3**). The Holland Brook passes through the area on a northwest-southeast alignment. The Holland Brook was previously a larger water course known as Holland River with the surrounding extant marshland reclaimed during the post-medieval period. Prior to this, the marsh formed part of the Gunfleet Estuary.
- 4.2.2 Two pillboxes are present within the southern half of the Landfall Zone within the Onshore RLB, one located within the Holland Haven Country Park (**Plate 23**) and the other imbedded into the seawall (**Plate 24**). Both pillboxes are in good condition with the pillbox located

within the Holland Haven Country Park still retaining its flameproof shutters. Access into the internal chambers has, however, been sealed up.

- 4.2.3 The foreshore was visited at low tide (13th October, 8 am; **Plate 4**). Concrete rubble, brick and timbers were noted. The concrete and timbers identified are remnants of the groynes that were replaced in 2014 during the Clacton to Holland on Sea Coast Protection Scheme. No features of archaeological interest were recorded.
- 4.2.4 The northern half of the Landfall Zone comprises agricultural fields, interspersed farmsteads, a small area of ancient woodland managed by the Essex Wildlife Trust and the village of Great Holland. At the time of the walkover survey, the majority of the fields had recently been harvested or ploughed (**Plates 5-6**). Field boundaries were formed by a mix of hedge and trees species and deep drainage channels. Considerable gaps in the boundaries were noted in fields to the south and southeast of Great Holland. A single boundary recorded to the east of the Granary farmstead was identified for consideration as a potentially important hedgerow (see **section 4.7**).
- 4.2.5 No previously unrecorded features of archaeological, historical or architectural interest were identified within the Landfall Zone.

Onshore ECC

- 4.2.6 The Onshore ECC continues from Great Holland towards Little Bromley passing the settlements of Thorpe-Le-Soken, Thorpe Green and Tendering Green (**Plates 7-15**). Most of the Onshore ECC comprises of agricultural fields that are in use for arable purposes, which maintain the areas historic rural character.
- 4.2.7 The three main settlements adjacent to the Onshore ECC are set on the B1035, the historic road that led from the coast to Colchester. Further minor roads and a railway line cross through the Onshore ECC that subdivide the fieldscape into smaller field systems, which are managed by an interspersed network of farmsteads.
- 4.2.8 At the time of the survey, most of the fields had been harvested or ploughed, though several of the fields around the Tendering Green area were planted with winter crop (example in **Plate 11**).
- 4.2.9 A single area of ancient woodland is present to the northeast of Thorpe-Le-Soken (**Plate 10**) with smaller copses located on the edges of the field, south of the railway line, and northwest of Tendering Green at Bradfield's Cottages.
- 4.2.10 A small section of the Onshore ECC passes through two fields used as horse paddocks, north of Thorpe Green. The western boundary of the fields may meet the criteria to be considered potentially important hedgerows (discussed in greater detail in **section 4.7**).
- 4.2.11 Located in the southern field close to the eastern boundary is the possible site of a previously unrecorded well (**Plate 22**). According to the landowner, the well may be of medieval origin due to the recovery of 15th century coins from area around it by a private metal detectorist. However, there is no record of the well on the HER, nor are the recovery of coins documented on the PAS. The well is also not recorded on any historical mapping. Due to the presence of horses within the field at the time of the survey access to the well was not permitted by the landowner.
- 4.2.12 Field boundaries are similar to those identified in the Landfall Zone comprising a variety of hedge and tree species in varying condition with deep and extensive drainage ditches. All

fields contained at least one large break to allow modern farm machinery to pass freely, while most of the hedges that would have historically bound the B1035 have been removed or significantly reduced in height.

- 4.2.13 With the exception of the possible medieval well, no further features of previously unrecorded archaeological, historical or architectural interest were identified within the Onshore ECC.

OnSS Search Areas (SSA East and SSA West)

- 4.2.14 The OnSS Search Areas are a continuation of the rural fieldscape present in the Onshore ECC with isolated farmsteads and small areas of woodland. For the purposes of PEIR, two OnSS Search Areas have been retained, SSA East and SSA West located between the A120 and Ardleigh (**Plates 16-21**).
- 4.2.15 The fieldscape within the SSA's is more open compared to the rest of the onshore RLB with larger more irregular shaped fields, owed to the modern changes in the field system. This part of the onshore RLB has suffered considerable boundary loss particularly in the areas east of the National Grid Substation and around Little Bromley. Former boundaries are, however, still legible as most fields retain drainage channels.
- 4.2.16 Although there has been considerable boundary loss within the SSA's, two of the extant hedgerows have been identified as being potentially important hedgerows (see **section 4.7**).
- 4.2.17 Two former 19th century farmsteads that are not recorded on the HER were identified within the SSA's. The first, historically known as Mulberry Farm, is located within SSA East, south east of Little Bromley with access via a trackway that leads from Mulley's Farm (**Plate 16**). The farmhouse seen on historical mapping (**Appendix 4**) has been demolished with what remains comprising a L-shaped storage shed and area of hardstanding. The second farmstead is found within the southern part of SSA West, south of Ardleigh Road (**Plate 19**) known as Cattsgreen Farm. Two storage barns built from steel framing and corrugated iron sheeting are all that remain of the farmstead. Considering their form, function and structural integrity the buildings are considered to be of negligible heritage value. However, the potential for below ground remains of former structures is unknown.
- 4.2.18 No previously unrecorded features of archaeological, historical or architectural interest were identified within the SSA's during the walkover survey.

4.3 Topography and geology

Topography

- 4.3.1 The north-western extent of the Onshore RLB, around Little Bromley, forms the highest parts of the Study Area ranging from 35 m above Ordnance Datum (aOD) to 30 m aOD and gradually declines to 20 m aOD around Great Holland in the south-eastern extent of the Onshore RLB. At the Landfall Zone, elevation descends to 5 m aOD towards the Holland Brook before descending to below sea level at the foreshore.

Geology

- 4.3.2 After the Anglian glaciation (424,000 years BP), the River Thames was diverted to its modern channel which left a series of terraces (Kesgrave Sand and Gravels) exposed. These were then covered indiscriminately by the deposition of brickearth during the Devensian glacial stage (15-20,000 years BP). These superficial deposits of Brickearth are recorded within the north-western extent of the site with pockets towards the southeast.



Localised areas of Kesgrave Catchment Subgroup Sands and Gravels are recorded near Tendring, Thorpe-le-Soken and Great Holland. The valley slopes of the Holland Brook and Hamford Water are covered by Alluvium.

- 4.3.3 Essex County Council and Tendring District Council have undertaken a study of the geodiversity of the district, which culminated in a GIS data set and accompanying report characterising geodiversity. It has been designed as a tool to support planning decisions and development control in the area. The project was developed primarily to serve as a tool for Tendring District to use in the creation of its Local Development Framework and to facilitate the development of positive approaches to the integration of geodiversity objectives into spatial planning for the District. The results of the Tendring Geodiversity Characterisation Report (Essex County Council and Tendring District Council 2009) form a critical resource for better understanding the geoarchaeological resource and its importance.
- 4.3.4 The report provides a detailed analysis of the previous courses of the River Thames and Medway and detailed discussion of underlying geology and overlying soils. An explanation of geologically derived cropmarks is also provided, stating that it is generally confined to generally flat areas of brickearth, and represents the results of Glacial melts.
- 4.3.5 The report identified Geodiversity Character Areas (GCA) and further breaks these down into Geodiversity Character Zones (GCZ), which provide an invaluable understanding of the underlying character of the geology within the study area. A more detailed review and consideration of the GCAs and GCZs located within the Study Area are presented in the Geoarchaeological DBA (WA 2022a).
- 4.3.6 There are two main GCAs which fall within the Onshore RLB and Study Area:
- GCA 1 Tendring Plateau extends across the northern section of the study area with pockets recorded to the south. This is further subdivided into GCZs 1.2, 1.4, 1.5, 1.6, 1.7 and 1.8.
 - GCA 13 London Clay extends across much of the central and southern portions of the study area. This is further subdivided into GCZs 13.1 and 13.2.
 - The remaining areas within the study area consist of localised GCAs including GCA 4, 6, 7, 12, 16 and 18.

4.4 Designated heritage assets

Onshore Red Line Boundary

- 4.4.1 There are no designated heritage assets located within the Onshore RLB.

Study Area

- 4.4.2 The following designated heritage assets are located within the 500 m Study Area:
- 36 Listed Buildings comprising of two Grade II* Listed Building and 34 Grade II Listed Buildings: and
 - Two Conservation Areas.
- 4.4.3 There are no World Heritage Sites, Registered Battlefields, Registered Parks and Gardens or Scheduled Monuments located within the 500 m Study Area.

- 4.4.4 Scheduled monument status has been sought for the potential henge (EHER no. 2460) located 90m south of the Onshore RLB, close to Little Bromley Road. It is likely that the monument may become scheduled during the course of the DCO application and in recognition of this and its high significance, the monument has been treated as of equal significance to a scheduled monument.
- 4.4.5 Designated heritage assets and their settings are considered in greater detail within a separate Onshore GPA3 assessment report (WA 2022b).
- 4.4.6 Designated heritage assets are illustrated in **Figures 3A-K**.

4.5 Previous archaeological investigations

- 4.5.1 A single intrusive archaeological investigation has taken place within the Study Area.
- 4.5.2 In 2010, an archaeological evaluation was carried out at Carrington's Farm, Great Bromley, covering an area from the Onshore RLB to the 500 m Study Area boundary, by Colchester Archaeological Trust (2457) ahead of mineral extraction on a 6.5ha field north of Carringtons Farm, which contained the cropmarks of a rectilinear field system and a small sub-rectangular enclosure. 50 trenches found 67 archaeological features. The majority of these (31) were of natural origin. Twenty-one features were field ditches (mostly undated) which shared a southwest-northeast alignment with the present-day field boundaries and are probably part of the same field system (also undated but presumed to be post-medieval). The small cropmark enclosure may be of prehistoric date. Together with three prehistoric pits, these demonstrated thinly spread prehistoric activity. There were also a few undated ditches on an east-west alignment.
- 4.5.3 The EHER records further non-intrusive surveys comprising:
- Field observation to the west of Bradfield Heath, 30 m north of the Onshore RLB, which recovered a Neolithic hand axe (EEX24067)
 - Desk-based assessment of farmstead 490 m to the southwest of the Onshore RLB as part of a wider assessment of farms owned by Essex County Council (EEX53779)
 - Recovery of 27 fragments of burnt flint within the Onshore RLB at Little Bromley (EEX8730); and
 - Desk-based assessment and aerial photography survey at Rose Hill Quarry, Thorpe-Le-Soke, 130 m west of the Onshore RLB.

4.6 Archaeological and historical background

Introduction

- 4.6.1 All HER data has been compiled into a gazetteer and the sub-sections below identify the known remains most relevant to the Study Area with additional information provided where available from archaeological reports, HER event record data, data held on the ADS and results from The Tendring District Historic Environment Characterisation Project (Tendring District Council and Essex County Council 2008) and the National Mapping Programme Essex: Management Report (Essex County Council and EH 2003).
- 4.6.2 All heritage assets identified within the Study Area are listed in **Appendix 3**. The NHLE and HER entries are assigned a unique number by the EHER and NHLE, used for ease of reference within the text and on the figures.

4.6.3 Non-designated heritage assets are illustrated in **Figure 4A-K**.

Palaeolithic (970,000 – 9500 BC)

4.6.4 Tendring District is known to contain Palaeolithic deposits of international importance. Deposits of this level of importance are generally concentrated along the coast around Clacton and Jaywick, outside the Study Area. These Palaeolithic deposits from the wider Clacton area have produced a range of flint tools and the oldest wooden tool ever recovered from Britain. The deposits are of international importance and as such the name ‘Clactonian Industry’ is given to the evidence for production and typology of tools recovered from this region dating to 300,000 – 200,000 years BP. The Palaeolithic deposits also provide a rich source of information on the past environment, habitats, flora and fauna.

4.6.5 Essex County Council and Historic England undertook a project to develop a methodology and create a predictive model of the Palaeolithic resource at a county-wide scale, which resulted in a detailed report: *Managing the Essex Pleistocene* (2015). It builds on previous work, including the Medway Valley Palaeolithic Project (2009), the Tendring Geodiversity Characterisation Project (2009) and earlier Aggregates Levy Sustainability Fund (ALSF) funded projects carried out within Essex. As part of the *Managing the Essex Pleistocene* project, areas that can be characterised by their potential for the presence and survival of Palaeolithic archaeological remains and/or associated Pleistocene palaeoenvironmental remains were identified and named Palaeolithic Potential Areas (or PPAs). The Study Area is largely characterised by low potential areas, but one moderate potential PPA intersects the study area in two locations in the vicinity of Thorpe-le-Soken, namely Thorpe Cross and near the intersection of the railway lines to Frinton-on-Sea and Holland-on-Sea (east of Thorpe-le-Soken). The area is characterised as Cooks Green/Wivenhoe gravel (as per Tendring Geodiversity Project GCA 7) of Kesgrave (Colchester) formation with recorded Palaeolithic findspots within its extent and within close proximity to the mapped extent of this area.

4.6.6 Within the Study Area the Palaeolithic evidence can generally be characterised by flint tools (53850, 1917, 1919), some of which are broadly dated to the Paleolithic to Bronze Age.

4.6.7 Some of the HER records include sites where archaeological features and finds recovered have been dated between the Palaeolithic and later periods. A field north of Carringtons Farm (2457) containing cropmarks dating from at least the prehistoric period underwent trial trenching in 2011 (30 trenches). The cropmarks comprised a small sub-rectangular enclosure (possibly prehistoric). Three pits were excavated and produced prehistoric pottery and flints. One pot sherd was Late Iron Age in date and two other sherds were more tentatively assigned the same date. A further 21 features were identified and comprised field ditches (mostly undated) which share a southwest-northeast alignment in line with the present-day field boundaries. These were also undated but presumed to be post-medieval.

4.6.8 Other cropmark features within the wider area have been broadly dated to the prehistoric to Roman periods, though sometimes these are described as being masked in part by underlying geological conditions. Similarly, a series of cropmarks west of Horsleycross Street (3127) are masked in part by underlying geological conditions and have been broadly dated to the Palaeolithic to post-medieval periods. Of these cropmarks, the sub-rectangular enclosure was presumed to be prehistoric in origin and the remainder of features included pits, trackways and field boundaries dating from the prehistoric to the post-medieval periods.

4.6.9 The Palaeolithic period is discussed in further detail within the *Geoarchaeological Desk-Based Assessment* (WA 2022).

Mesolithic (85,000 – 4000 BC)

- 4.6.10 In the wider area, evidence from the Mesolithic period can largely be characterised by significant assemblages of microlith stone tools, particularly around the coast at Walton-on-the-Naze, which attest to the presence of transient groups relying on wild game and fishing for subsistence. Within the Study Area records of Mesolithic finds include one tranchet axe (1918) and an Adze (53618). In the wider area other tranchet axes, maceheads and a perforated stone objects have also been found.
- 4.6.11 The sea levels began to rise during this period due to glacial melt and by the Mesolithic period there was probably a tidal estuary (48658) within the Landfall Zone, which occupied the area of low, flat, marshy land in the vicinity of the current Holland Brook (former Holland River). The estuary was known as the Gunfleet estuary from the Medieval period onwards. The estuary extended broadly along the line of the Holland Brook and surrounding marshlands and narrowed as it stretched northwest inland. It probably extended well beyond the present location of Fan bridge on the road between Great Holland Common and Cook's Green (Little Clacton) and may have been tidal as far as Weeley and navigable to smaller boats up to Thorpe-le-Soken further north.

Neolithic (4000 – 2400 BC)

- 4.6.12 Neolithic activity is well attested across the wider Tendring District and is evidenced by cropmarks of a monumental causewayed enclosure at St Osyth and a ring ditch at Brightlingsea, which together have yielded one of the largest collections of early Neolithic ceramics in the East of England. Evidence suggests that during this period the population begins to move to a more settled agricultural existence.
- 4.6.13 Within the Study Area Neolithic evidence comprises a findspot of three axe heads characteristic of this period found to the south of Lawford (7413) and south of Great Holland (2812 and 2814). The discovery of the finds indicates, at least, a presence in the area during this period.
- 4.6.14 Over 1.5 km north of the Study Area, near Lawford, a scheduled Neolithic settlement site (NHLE List Entry 1002157) initially identified as a cropmark has since been variously excavated. Earthworks and a domestic structure have been identified, along with finds such as Neolithic pottery, flint tools, bone pins and animal bones.
- 4.6.15 A Neolithic beaker burial was also recorded and scheduled (NHLE List Entry 1002146) near Ardleigh, approximately 1.4 km west of the Study Area. The burial was found in a rectangular pit, with no other grave goods. A series of later features were also identified and are also located outside the Study Area. The features include Late Iron Age or early Roman field ditches (17435); Anglo-Saxon evidence (17436); and post-medieval features (17437).

Bronze Age (2400 – 700 BC)

- 4.6.16 Evidence for Bronze Age evidence in the wider Tendring area can be characterised by Beaker pottery, barrows and cremation cemeteries. A locally distinctive form of pottery and funerary tradition has been recovered from cremation cemeteries at Ardleigh, Brightlingsea, Lodge Farm and Little Bromley (all outside the study area), with cremations being placed between barrows in large straight sided elaborately decorated Bucket Urns (evident as ring ditches). Bronze Age burials have also been found eroding from modern cliff faces north of Walton, which would have still been a distance from the coastline during the Bronze Age.
- 4.6.17 A concentration of potential Bronze Age features has been identified around Carrington's Farm at the southern part of the Study Area adjacent to the Onshore RLB with the discovery

of two possible ring ditches both measuring 11m in diameter (17485 and 2640). The latter ring ditch (2640) is situated within a complex series of undated cropmarks (likely field boundaries, pit and trackway).

- 4.6.18 Finds recovered from within the Onshore RLB include two Bronze Age axe heads (51077 and 51089) and a Bronze Age hoard (51070) while a second Middle Bronze Age hoard (51086) and further axe heads (51130, 51076 and 51074) have been recovered from within the Study Area.

Iron Age (800 BC – AD43)

- 4.6.19 Evidence for Iron Age activity in the wider area is characterised by dispersed domestic and agricultural settlements, field systems, cremation burials and red hills (salt production). Evidence from sites such as St Osyth (over 5km to the west of the Study Area) suggest arable and pastoral farming were practiced, with the lower lying salt marshes being used for grazing. Wool production likely also formed part of the local economy, which was probably heavily influenced by the Trinovantes tribe, whose capital was located in the nearby nationally significant Iron Age settlement of Camulodunum (near modern Colchester over 16km to the north-west). A comprehensive account of Essex red hills is given in *The Red Hills of Essex: Salt-making in antiquity* published by Colchester Archaeological Group. One red hill is recorded within the Study Area at Beaumont Quay (3016) along with sherds of Iron age and Roman pottery found on the mound.
- 4.6.20 The majority of the Iron Age evidence are finds recorded by the Portable Antiquities Scheme (56322, 56331, 51854, 51855, 51858, 51859, 51860, 51861, 51862, 56325, 56330 and 56387). There is a particular concentration to the south of Little Bentley, which is a common theme across the periods. This could be due to it being an area used for metal detecting, where finds have been properly recorded through the Portable Antiquities Scheme and subsequently the HER. However, there is a very notable concentration from the Iron Age through to the Post-medieval, suggesting this could be an area of particular sensitivity, consistent with multiperiod settlement and/or activity.

Romano-British (AD43 - 410)

- 4.6.21 Evidence from the Romano-British period in the wider area suggests a dispersed settlement pattern during this period, with an associated agricultural landscape with localised industries. The Roman town at Colchester (7km west of the northern extent of the Study Area) would also have heavily influenced land use, settlement pattern and economy in the area. A number of villa sites have been identified at St Osyth, Little Oakley and Dovercourt, all located over 6km from the Study Area.
- 4.6.22 Various Roman roads are recorded within the Study Area, with a particular concentration at the northern extent of the Study Area, which is reflective of the influence of the Roman town at Colchester. Sections of the Roman road connecting Colchester to Manningtree cross this area (2573 and 2770) and have been identified partly by aerial photography and extant roads with probable Roman (or earlier) origins, such as Bromley Road. Two other Roman roads are recorded in this area north of Little Bromley (3168 and 3128). There are two records of undated cropmarks (17110) within the vicinity of these roads, both of which also include possible sections of Roman road (2631).
- 4.6.23 Geophysical survey of the northwestern corner of the Onshore RLB identified the presence of the Roman road 2573 together with outlying linear features (WA 2023).
- 4.6.24 Evidence of likely roadside settlement is recorded around Grange Road where roads 2573 and 3168 intersect. Records 17110, 17486 and 2468 represents a very high concentration

of cropmark features indicative of settlement including a double-ditched rectangular enclosure with entrances, a curvilinear enclosure, the roads themselves and various linear features.

- 4.6.25 A further section of road is thought to run through the Onshore RLB on an east to west alignment along the Thorpe Road by Bakers Hall Cottage (3073). However, the existence of the road has not been confirmed.
- 4.6.26 The remaining records of Romano-British date are finds recorded by the Portable Antiquities Scheme (3122, 2316, 56327, 57288, 57299, 56298, 56326, 56333, 56339 and 56367). There is a concentration of records near to Little Bromley close to the Roman roads, but as with the Iron Age records this may be a poor reflection of the potential for the wider area due to the extensive amount of metal detecting that has occurred in around the village.

Anglo-Saxon (AD410 – 1066)

- 4.6.27 Evidence from the Anglo-Saxon period is generally sparse in the wider area, suggesting either continued occupation or reoccupation of previously abandoned villas and farmsteads. One example being St Osyth, the name of which derives from the dedication of a minster church to Osyth, daughter of a Saxon King. Evidence for Middle Saxon domestic settlement and activity have been recovered from the Clacton area while Later Viking evidence is rare in Essex as a whole. However, Kirkby-le-Soken and Thorpe-le-Soken are Danish in origin suggesting at least a general presence in the area.
- 4.6.28 The majority of Anglo-Saxon HER records within the Study Area are findspots and include items such as horse tack (51331 and 51332), coins (51330 and 51163), a sword (51324) and a brooch (52899). The finds are fairly widely distributed across the Study Area with a loose concentration between Great Bromley and Little Bromley.
- 4.6.29 A number of the cropmarks that are currently undated could be of Anglo-Saxon origin particularly those around the settlement of Thorpe-le-Soken which has its origins during the period. However, none of the cropmarks have been ground truthed through intrusive archaeological survey.

Medieval (AD1066 – 1500)

- 4.6.30 Settlement patterns and activities in the wider area remained dispersed during the medieval period with villages (centered around churches and greens), hamlets, hall complexes and farmsteads providing settlement foci in an otherwise rural and agricultural landscape. These dispersed settlements were linked across the intervening agricultural land and commons by an extensive network of lanes connecting into the wider road network that led to larger central market towns.
- 4.6.31 Moated sites are a common small-scale settlement type in Essex, but less so in Tendring. The nearest medieval moated hall is recorded at Gutteridge Hall in Weeley, over 3 km to the west of the Study Area. A possible moat was recorded within the RLB amongst other undated cropmarks east of Hannam Hall (17241), but they have yet to be subject to intrusive survey.
- 4.6.32 Medieval activity is well attested at St Osyth and Great Bentley, where the remains of a windmill were identified and represents another relatively characteristic structure of Medieval Essex. No medieval mills are recorded within the Study Area, though two Post-medieval mills are recorded.



- 4.6.33 Various cropmarks (48329, 46798, 46801 and 46799) are recorded within the Onshore RLB and Study Area that could be of medieval origin, with a considerable concentration around Thorpe-le-Soken and Great Holland (3627 and 2983). The alignment and form would suggest that they comprise field boundaries but further investigation is required.
- 4.6.34 Central markets for agricultural trade during this period would have been at Colchester, St Osyth and Manningtree. Coastal trade would have also formed an important aspect of the local economy during the Medieval period. Harwich (over 11km to the northeast of the RLB) represents the main hub, with smaller sites at St Osyth, Manningtree and Beaumont Quay.
- 4.6.35 The Study Area is largely located inland, so there are minimal records relating to coastal trade though the few sites recorded would have fed into the wider economy during this period. There are presumed landing places recorded along the line of the former Holland River close to the RLB (48667, 48668 48659 and 48661). They likely represent lanes that linked the Gunfleet estuary (48658) to the farms and villages on the higher land, allowing crops and other local produce to be loaded easily onto boats and carried along the river for trade in the wider area and into London. Remote landing places could also be used to avoid customs control and the isolated marshes at Holland earned a reputation for smuggling which carried on until the 17th century after the estuary had been reclaimed. Likewise, some of the quays along Hamford Water earned a similar reputation.
- 4.6.36 The remaining records are of findspots of items such as coins, horse tack, personal adornment, ampullae (flasks) and tokens. There are notable concentrations between Great Bromley and Little Bromley.

Post-medieval (AD1500 – 1900)

- 4.6.37 Coastal trade continued to grow in importance during the post-medieval period. The port at Manningtree 2 km north of the Onshore RLB thrived throughout the period largely due to its role in the shipping and transport of the area's agricultural produce and its growing role in the malting industry. Previously, the brewing of ale and beer had been predominantly on a small, domestic scale. The post-medieval and modern periods saw the gradual growth of the brewing industry on an industrial scale which generated a thriving malting industry in this part of the county. Brightlingsea continued in existence as a trading port and smaller wharves existed at Beaumont-cum-Moze (Beaumont Quay), St Osyth, Manningtree and elsewhere along the coast.
- 4.6.38 Two post-medieval windmills are recorded within the Study Area representing characteristic features of the Essex landscape during this period, continuing on from the medieval period. Great Holland Hill mill (2853) is a former smock mill, the base of which is still extant. The other record marks the possible location of a mill which is no longer standing (3036).
- 4.6.39 Record 3142 relates to a former Church. The HER record is sparse, but map regression shows the site was formerly a church and has now been converted internally into a house and re-named Green Acre.
- 4.6.40 As with the medieval period many of HER entries for the post-medieval period are for findspots recorded under the Portable Antiquities Scheme and comprise items such as bodkins, buckles, buttons, coins, various items of personal adornment and pottery.

Modern (AD1900 – present day)

- 4.6.41 During the modern period malting continued to grow in importance in the wider area. Mistley, approximately 3 km north of the Study Area, developed a thriving malting industry in the 19th century supplying malt to large scale brewing companies with much going to the

London market. By the end of the century and aided by effective rail and sea transport, Mistley had become a major centre of the industry. Eight brick-built maltings incorporating a number of technological innovations pioneered by Robert Free were erected which dominated the town. The surviving maltings at Mistley, along with associated features such as the railway station, dock facilities, office block, workers housing and school form a group of national importance and have been the subject of extensive study. Mistley is also designated as part of the Manningtree and Mistley Conservation Area. Another important and earlier malting (1874-1882) built by Robert Free can be found at Thorpe-le-Soken, at the southern reach of the Study Area and a smaller rural malting and survives as part of a farm complex at Little Bentley. Agriculture in the wider area during this period would have supported and supplied this industry, yet there are no specific HER records relating to maltings within the Study Area.

- 4.6.42 During the modern period the aggregates industry grew exponentially in this area and has resulted in significant areas of mineral extraction across the Tendring peninsula since the Second World War (WWII). The nearest occurrences of extraction near the Study Area is at Ardeleigh. Archaeological investigations prior to work beginning on these sites has revealed much about the influence and activities of humans on the Tendring landscape.
- 4.6.43 Coastal defences continued to be variously built and decommissioned within the Study Area during the modern period with the advents of the First and Second World Wars (WWI and WWII). Several WWII pillboxes are located with the southern part of the Landfall Zone in varying condition (1044, 10045, 10046, 10047 and 10048). Two of the pillboxes fall within the Onshore RLB (**Plates 23-24**). Several former WWII defences also existed within the Study Area which have since been removed (47909, 21357 and 16984).
- 4.6.44 An advanced night landing ground (19342) is recorded 360 m to the north of the Onshore RLB. The 43-acre site served the 39 Squadron Royal Flying Corps who were operating anti-Zeppelin patrols from April 1916 as part of WWI air defences. By August 1916 the site had been returned to agricultural use. No buildings were erected on this site. In view of the short duration of this landing ground's use, it is very unlikely that any evidence of the airfield survives on or below ground. The site remains in agricultural use and the original field boundaries defining the landing ground survive. Generally, these sites were intentionally hidden during the night to avoid being bombed by German aircraft. They would only be lit and ready for British aircraft to land when sufficient signal had been reached between operatives on the ground and in the aircraft.
- 4.6.45 A pair of cast iron signposts, one located within the Onshore RLB (40797) and one in the Study Area (40801), are recorded on the HER. They both sit along the B1035 road on the entry to Beaumont; one at the junction with Swan Lane and the other opposite Chapel Lane. They date to the 1920s or 1930s and were manufactured by Maldon Iron Works. They consist of a flat semicircular parish plate finial reading "Parish of Beaumont - E.C.C", along with distances to the nearest towns etc.
- 4.6.46 During this period, following WWI the British Government escalated social support efforts, this is evident in the Study Area by records relating to scattered homes and social housing built by the Land Settlement Association, comprising The Firs (15399), The Limes (15400) and 69-90 Hungerdown Lane (40585) in Lawford. The buildings are now used as nursing homes or privately owned.

Undated

- 4.6.47 The EHER records an extensive series of cropmarks both with the Onshore RLB and Study Area that remain undated. The cropmarks, which also feature as part of the National

Mapping Programme (NMP) dataset, generally consist of linear features, ditches, field boundaries, enclosures, and ring ditches.

- 4.6.48 Examples include a large cropmark area to the south and west of Little Bromley Hall (2460) that lies directly along the northern end of the Onshore RLB. The cropmarks consist of mainly linear features being part of field systems or trackways, in addition to many ring ditches and several enclosures, and a henge.
- 4.6.49 The remaining records that have been assigned no date of finds recorded by the Portable Antiquaries Scheme and are typically concentrated between Great Bromley and Little Bromley. As previously stated, this could be due to these areas being used for metal detecting (although no specific events are recorded on the HER), and the finds have been appropriately recorded through the PAS, and subsequently the HER.

4.7 Historic Landscape Characterisation

- 4.7.1 The Historic Landscape Character (HLC) data held by the HER has been obtained and included in **Figure 5** which displays the broad HLC groups as described in the report: Essex Historic Landscape Characterisation Project (HLC) (Essex County Council and Historic England, 2011).
- 4.7.2 The report provides a summary/profile of Tendring District in both the overview report and Volume 3. It states that the core of the area comprises a plateau of London Clay, with bands of Kesgrave sands and gravels, marking the former line of the River Thames. The fieldscape is characterised by a mix of later enclosure and pre-18th century irregular fields. The area also comprises long thin roadside greens and triangular greens at road junctions. Historically the settlement character is very dispersed and rural.
- 4.7.3 Within Tendring at the northern and eastern flank of Colchester were extensive heaths. These were enclosed in the early 19th century. Ardleigh Reservoir (approximately 3.2 km west of the RLB) now forms a major landscape feature within the area. To the south, in the Alresford area (over 5 km to the south of the Onshore RLB), the landscape is gently undulating. The zone is characterised by extensive areas of meadow pasture along the valleys of the three brooks which drain it and large areas of orchards. The fieldscape comprises a mix of pre-18th century irregular fields and later enclosure of common fields. There are extensive areas of mineral extraction to the south. The landscape is similar to the southeast, around St Osyth, although the fields are noticeably smaller. The valley of the Holland Brook forms a distinct landscape element, characterised by enclosed meadows along the brook and drained tidal marshes. Historically the settlement for the area is markedly dispersed.
- 4.7.4 The coastline is marked by both improved and unimproved coastal marsh. Hamford Water in particular represents a particularly complex landscape of reclaimed marsh, salt-marsh, inter-tidal muds, creeks and islands.
- 4.7.5 There is one Protected Lane within the Study Area, Church Lane, Little Bentley. The Protected Lanes were initially set out in Essex County Council Policy, but for Tendring District an assessment and update of the data was published in 2015. The lanes have been scored according to historic integrity, diversity, group association, archaeological association, archaeological potential, biodiversity and aesthetic value. The lane (tenlande11) scores relatively low on most criteria apart from integrity, which suggests limited or discrete erosion/damage to the historic fabric of the lane and/or significant hedgerow loss. The status of Protected Lanes is reflective of lanes with early origins. The greater part of the road network in the Essex countryside derives from at least as far back

as the medieval period. Much of it undoubtedly existed in Saxon times and it is likely that many roads and lanes were formed long before that. These lanes are part of what was once an immense mileage of minor roads and track-ways connecting villages, hamlets and scattered farms and cottages (Essex County Council, 2015).

Historic hedgerows

- 4.7.6 As part of the walkover survey extant hedgerows were assessed against the criteria for *important hedgerows* as defined in the Hedgerows Regulations 1997 (amended 2002). Observations were made during the survey and this was followed up with desk-based analysis of historic mapping. Of the entire Onshore RLB area, five sections of hedgerow were identified to potentially meet the criteria under Schedule 1 Part II Criteria: Archaeology and History set under the Hedgerows Regulation Act. The hedgerows are provided in the table below and presented in **Figure 6**.

Table 1 Identified hedgerows that may meet criteria for consideration as ‘important’

ID	CRITERIA MET	REASON
IH1	is part of a field system or looks to be related to any building or other feature associated with the field system that existed before 1845	Visible on the 1839 Great Bromley Tithe map as part of a former field system
IH2	is part of a field system or looks to be related to any building or other feature associated with the field system that existed before 1845	Visible on the 1839 Great Bromley Tithe map as part of a former field system
IH3	is part of a field system or looks to be related to any building or other feature associated with the field system that existed before 1845	Visible on the 1841 Thorpe-le-Soken Tithe map as part of a former field system
IH4	is part of a field system or looks to be related to any building or other feature associated with the field system that existed before 1845	Visible on the 1839 Great Holland Tithe Map as part of a former field system and has a relationship with the pre-1839 farmstead to the west.
IH5	is part of a field system or looks to be related to any building or other feature associated with the field system that existed before 1845	Visible on the 1841 Thorpe-le-Soken Tithe map as part of a former field system (apportionment 555)

4.8 CiTIZAN Data

- 4.8.1 Publicly held records created as part of the CiTIZAN project were reviewed as part of this assessment². All of the records recorded by the project form part of the existing HER dataset. No new entries within the Study Area were identified.

4.9 Tendring District Historic Environment Characterisation

- 4.9.1 This section forms a summary of the results of The Tendring District Historic Environment Characterisation Project (HEC) (Tendring District Council and Essex County Council 2008), the data from which was provided separately by Place Services (Essex County Council) on 31st January 2022. This data was produced as an aid in the interpretation of the current landscape history and evolution and forms an aid to identifying areas of the landscape which may be sensitive to change. It should be noted that due to the nature of the data, in some cases the character polygons extend beyond the parameters of the Onshore RLB and Study

² Online map for the CiTIZAN project was viewed at <https://citzan.org.uk/>

Area. As such, more localised character types summarised below may lie beyond the area assessed in this review. Where possible, this is noted in the following discussion.

4.9.2 Each character area (HECA) is subdivided by character zones (HECZ). The zones have been scored on a range of criteria for which separate scores are retained within the GIS metadata by Tendering District Council. The following system is based on scoring developed for the English Heritage Monuments Protection Programme (MPP); modified to consider broad zones rather than particular monuments. This method of scoring is intended as a simple means of engaging with issues of sensitivity, value and importance. It is not designed to be definitive and is likely to be subject to change as new information becomes available and understanding develops. Seven criteria have been used:

- Diversity of historic environment assets
- Survival
- Documentation
- Group Value Association
- Potential
- Sensitivity to change
- Amenity Value

4.9.3 Each of the criteria have been scored for each of the zones with a rating of 1, 2, or 3 with 1 as the lowest and 3 as the highest. Given the size of the study area and the fact it only partially intersects most of the character zones, only an overarching summary has been reproduced here of the character areas, with any relevant reference being made to additional pertinent data within the zone summaries.

4.9.4 There are five main HECAs which fall within the Study Area (see **Figure 7**):

- Great Oakley (HECA 3) extends across the centre of the study area, only the zone of Wix (HECZ 3.2) intersects the RLB.
- South East Tendring Plateau and the Sokens (HECA 6) extends across the south of the Study Area, only The Sokens (HECZ 6.3) and The Great Holland (HECZ 6.4) zones intersect with the RLB.
- St Osyth and Great Bentley (HECA 11) extends south from the southern part of the Study Area at Little Bromley. Only the area between Little Bentley and Little Bromley (HECZ 11.1) intersects with the RLB to the south of Little Bromley.
- Arleigh (HECA 12) extends into the north western reaches of the Study Area. Half of the Great Bromley zone (HECZ 12.3) intersects the RLB over the southern section of the SSA West. Zones Arleigh (HECZ 12.2) and Foxash Estate (HECZ 12.4) intersect with the western edge of the study area, west of SSA West.
- Little Bentley Area (HECA 13) extends into the Study Area between Little Bromley and Lawford. Only the zone of Bradfield Heath (HECZ 13.2) intersects the RLB, covering the northern section of SSA West.

Great Oakley HECA3

- 4.9.5 The RLB only intersects with zone 3.2 Wix of the wider Great Oakley character area, which extends from Beaumont Quay to Horsley Cross.
- 4.9.6 The Wix zone comprises a gently undulating agricultural landscape. Drainage is into the Holland Brook to the south, Ramsey Creek to the east and a minor stream to the north. The fieldscape is largely ancient in origin, but significant areas have been affected by post-medieval enclosure and post war boundary loss. Field boundaries comprise low interstice hedgerows, with occasional mature hedgerow oaks, due to the decline of Elm during the late 20th century. There are surviving remnants of ancient woodland, particularly in the southern half of the zone. These include Stonehall, Gravel and Killgrove Woods. Settlement in the zone was historically polyfocal and dispersed, comprising settlement around linear and triangular greens like Goose Green, Bockings Green, Stones Green and Tendring Green, church/hall complexes such as Beaumont and isolated halls, farms and cottages. Many of the greens have been subsequently infilled by housing, or removed by road widening or enclosure.
- 4.9.7 Wix is the largest village in the zone and is located over 2km north of the Study Area, having developed from a crossing of two roads at 'Wick's Cross' close to the monastic settlement of Wix Abbey. A network of narrow lanes connects the historic settlements and tends to follow the higher ground and ridges. The modern A120 cuts across the zone on an embankment and passes through the Study Area at Horsley Cross.
- 4.9.8 Prehistoric ring ditches and ring ditch cemeteries are particularly characteristic of the wider zone and are most likely to represent the buried archaeological remains of individual Bronze Age round barrows and barrow cemeteries. Other cropmarks include prehistoric and later ditched enclosures, field boundaries, and double-ditched trackways, a number of medieval moated sites and a World War II anti-aircraft site adjacent to Hamford Water, illustrating the archaeological potential of the wider zone.

Table 2 Wix 3.2

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Range of multi-period cropmarks, historic settlement pattern, religious foundation, ancient woodland, historic field boundaries.	3
Survival	Cropmarks indicate surviving below ground deposits. The settlement pattern and field system are quite well preserved.	2
Documentation	HER data, cartographic evidence, NMP.	2
Group Value Association	Settlement pattern and field system.	2
Potential	Good potential for below ground archaeological deposits.	2
Sensitivity to change	Sensitive to change due to historic settlement pattern and below ground deposits.	2
Amenity Value	Potential for interpretation of historic settlements/landscape patterns and cropmarks particularly in relation to neighbouring zones.	2

South East Tendring Plateau and the Sokens HECA 6

- 4.9.9 This character area is present covers over a third of the RLB at its southern extent, with sub zones of Weeley area 6.2, The Sokens 6.3 and The Great Holland area 6.4 intersecting the RLB.
- 4.9.10 The Weeley 6.2 sub zone comprises a predominantly agricultural landscape with interspersed areas of settlement. The fieldscape is a mixture of rectilinear fields of ancient origin and post-enclosure regular field systems. Both have suffered moderate boundary loss as a result of modern rationalization of the agricultural land. Areas of meadow pasture of medieval origin together with pockets of surviving ancient woodland can be found to border the Holland Brook. Settlement in the area was historically polyfocal and dispersed, comprising isolated manors and farms. The historically dispersed nature of the settlement pattern has been challenged during the late 20th-century following the piecemeal expansion of historic settlements.
- 4.9.11 The Soken 6.3 sub zone contains the parishes of Thorpe-le-Soken and Kirby-le-Soken, both of which have their origins during the Anglo-Saxon period. The fieldscape is similar to that found in Weeley 6.2 sub zone having also suffered moderate boundary loss, but has a much more open aspect. The principal settlement in the area is the village of Thorpe-le-Soken which has expanded considerably since the interwar period with expansion also occurring at Kirby-le-Soken but at a slower pace.
- 4.9.12 Great Holland area comprises the village of great Holland and its immediate environs. It occupies a promontory of high grounds that falls gently southeast towards the undeveloped coastline north of Holland-on-Sea. The general character of the agricultural landscape seen in sub zone 6.3 continues with the fieldscape comprising of rectilinear fields of ancient origin and some later enclosure, most notably the 19th century enclosure of Kirby Heath. The settlement pattern of the zone was historically highly dispersed, however gradual infilling of Great Holland has occurred throughout the 20th century.
- 4.9.13 All three zones have a similar archaeological character with extent cropmarks located within RLB and Study Area that are thought to date between the prehistoric and post-medieval periods. Former World War II defences are also located in all three sub zones with several pillboxes still in existence within the Great Holland area along the foreshore.

Table 3 Weeley Area 6.2

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Range of cropmarks, historic settlement pattern	3
Survival	Cropmarks and other evidence indicate surviving below ground deposits, historic settlement pattern and major landscape features	3
Documentation	HER data, cartographic evidence, NMP, excavation evidence	2
Group Value Association	Cropmarks, settlement pattern	3
Potential	Good potential for below ground archaeological deposits	2
Sensitivity to change	Sensitive to change due to the historic settlement pattern and below ground deposits	3



Amenity Value	Potential for promotion of the historic settlement pattern and cropmarks in relation to other zones to elucidate the history of Tendring District	2
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Table 4 The Soken 6.3

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Range of cropmarks, historic villages, and dispersed settlement.	3
Survival	Good survival of below ground deposits, plotland layout survives, historic settlement pattern.	3
Documentation	HER data, cartographic evidence, NMP.	2
Group Value Association	Dispersed settlement associated to the coastal parts of the zone, cropmarks.	3
Potential	Good potential for below ground archaeological deposits.	2
Sensitivity to change	Sensitive to change due to historic settlement pattern and below ground deposits.	2
Amenity Value	Potential for promotion of the cropmarks and settlement pattern and its relationship with the inter-tidal area, particularly in relation to neighbouring zones.	2

Table 5 The Great Holland 6.4

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Range of multi-period cropmarks, settlement pattern, WWII defences.	3
Survival	Cropmarks indicate good survival of multiperiod below ground deposits, settlement pattern survives well.	3
Documentation	HER data, cartographic evidence, NMP.	2
Group Value Association	Cropmarks, settlement pattern, WWII defences.	3
Potential	Good potential for below ground archaeological deposits.	2
Sensitivity to change	Sensitive to change due to historic settlement pattern and below ground deposits.	2
Amenity Value	Cropmarks and settlement pattern could be used in relation to neighbouring zones to elucidate the history of Tendring District.	2

St Osyth and Great Bentley HECA 11

4.9.14 The RLB only intersects with zone 11.1 the *Area to the North of Little Bentley*, which is characterised by a fieldscape of ancient origin comprising irregular enclosure, with some later enclosure of the former heathlands and greens. There has been moderate post-1950 boundary loss throughout the zone. Settlement was historically dispersed, comprising cottages and farms spread out along the greens and former heaths. Settlement foci includes Hare Green (approximately 1.7km south of the RLB), where the green has been infilled by

housing, and Little Bentley which developed at the crossroads to the north of the historic church/hall complex located in zone 11.2.

- 4.9.15 A number of cropmark complexes attest to the archaeological potential of the zone. These include ring-ditches of probable Bronze Age date, settlement enclosures and trackways of later prehistoric or Roman date and probable medieval field boundaries. Medieval remains are likely to survive in relation to settlement clustered around greens and former heaths, and associated with the dispersed halls, farms and cottages.

Ardleigh HECA 12

- 4.9.16 A small section of the Great Bromley 12.3 sub zone extends into the RLB within the southern section of SSA West. This area comprises a high, flat area characterised by large sections of former heathland; these included Ardleigh Heath and Burnt Heath (outside the western edge of the RLB) forming part of a rough semi-circle round the eastern flank of Colchester. These were enclosed by agreement in the early 19th century. Elsewhere the fieldscape is largely of ancient origin and irregular but there has been moderate loss of field boundaries since the 1950s. There were orchards in the northeast of the area established in the early 20th century and an extensive area of glass houses / nurseries exists today.
- 4.9.17 Ardleigh Park (approximately 1km west of the Study Area) is medieval in origin. Historic settlement foci include the nucleated village of Ardleigh, but more typically heaths formed the focal points for settlements as at Ardleigh/Burnt Heath. There are also church hall complexes and a scatter of halls, farms and cottages. The Foxash estate was developed for horticultural purposes in the 20th century, originating as a Land Settlement Association smallholding scheme. Modern housing is largely restricted to ribbon development along the roads.
- 4.9.18 The archaeology of this wider area is dominated by cropmarks including the Scheduled cropmark complex south of Ardleigh (NHLE List Entry 1002146), located 1.4 km west of the Study Area. This nationally important Bronze Age cemetery has also significant remains of Iron Age and Roman material known from excavations carried out between 1950 and 1980. The remains include an extensive complex of Iron Age and Roman trackways and ditched enclosures, an enclosed Middle Iron Age roundhouse, 'Belgic' burials, a ritual pit and various Roman features including pottery kilns. Other significant cropmark complexes are found at Great Bromley and further sites occur throughout the area. Both Ardleigh Reservoir and major mineral extraction works south of Ardleigh have resulted in extensive loss and truncation of the archaeological resource, but in most of the area survival has been shown to be good with high potential for archaeological remains throughout the sub zone. The historic settlement pattern was generally dispersed and associated archaeological deposits are likely to be widespread.

Table 6 Area to the north of Little Bentley 11.1

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Multi-period cropmark complexes, range of medieval and post medieval buildings, historic landscape features.	3
Survival	Good survival due to limited development in the zone.	3
Documentation	HER data, cartographic evidence, NMP.	2
Group Value Association	Cropmark complexes, historic landscape features and settlement pattern.	3



Potential	Good potential for below ground archaeological deposits.	3
Sensitivity to change	Below ground deposits and dispersed settlement pattern sensitive to change.	3
Amenity Value	Potential for promotion of development of little Bentley and in conjunction with other zones the historic development of Tendring District.	2

Little Bentley Area HECA 13

- 4.9.19 The northern part of the SSA West intersects with the Bradley Heath 13.2 sub zone.
- 4.9.20 The sub zone is characterised by heathland which is likely medieval in origin, such as Bradley Heath. The heathland was largely enclosed by the mid-19th century as part of wider agriculture developments, the current fieldscape comprises a mixture of later enclosure by agreement and irregular fields of ancient origin. Post 1950s boundary loss has been moderate. The historic settlement in the zone was dispersed and polyfocal, with settlement focused on former heathland. The historic pattern survives well in the modern landscape.
- 4.9.21 There is a high density of cropmarks throughout the zone, suggesting the area has long been the subject of human occupation and activity. In addition to the more common cropmark typologies in Tendring, two parallel cropmarks representing roadside ditches clearly illustrate the line of a Roman road from Colchester to a purported Roman settlement at Mistley (as described in the HER data). This zone is largely under arable and clearly has significant below ground potential for multi-period archaeological deposits.

Table 7 Great Bromley 12.3

SCORING CRITERIA	DESCRIPTION	SCORE
Diversity of historic environment assets	Multi-period cropmarks, prehistoric enclosures, and burials.	3
Survival	Cropmarks indicate extensive below ground survival, field pattern suffered considerable boundary loss.	3
Documentation	HER data, cartographic evidence and NMP.	2
Group Value Association	Cropmark complexes.	3
Potential	High potential for below ground deposits.	3
Sensitivity to change	Below ground deposits highly sensitive to change.	3
Amenity Value	Cropmarks and settlement pattern could be in conjunction with neighbouring zones be promoted to explore the history of Tendring.	2

4.10 APS Assessment of Aerial Imagery

- 4.10.1 Below is a summary of the assessment undertaken by APS which identifies the extent of cropmark features identified from aerial imagery (APS 2022a, 2022b; **Appendix 4**).
- 4.10.2 The object of this assessment was to provide information on the location and nature of buried and upstanding archaeological features which are visible on historic aerial photographs, modern aerial and satellite imagery and visualised ALS, which is also known

as LiDAR, to assess the topographic and micro topographic features within the RLB, alongside historic map regression analysis.

- 4.10.3 Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates.
- 4.10.4 Features dating to the prehistoric, Roman, Medieval, Post-medieval periods have been identified and mapped. Some of these features have been previously identified by the EHER and Essex NMP survey.
- 4.10.5 In some cases, this assessment has augmented and added to these data from modern airborne and satellite imagery sources.
- 4.10.6 It is likely that the below-ground archaeological deposits which cause the marks in crops and grass in this area are more extensive, both horizontally and vertically, than shown via the aerial imagery. Absence of cropmark evidence does not necessarily indicate an absence of archaeological deposits in apparently blank areas.
- 4.10.7 The separation of dating into specific periods of prehistory and history can only be confirmed by ground-based or documentary analyses, but some dating evidence for sites within the RLB has been proposed by the EHER and NMP and by observation of morphological characteristics of cropmarked sites.
- 4.10.8 From an aerial perspective, this landscape may be analysed in a 'living' manner as one which developed over time and contains many multi-period elements. These will be more deeply stratified and extensive below the ground than is apparent in the results of the survey. The remains visible as cropmarks are all likely to have been impacted by agricultural cultivation, to some degree, and retain minimal or no micro-topographic features visible on the ground surface.
- 4.10.9 The assessment leads into and has benefited from a concurrent study of historic maps, which detail the development of the landscape over the past two centuries.
- 4.10.10 The assessment has initially identified 35 areas of archaeological interest (APS Sites) within the Onshore RLB and Study Area which are detailed in below and presented on **Figures 8A-K**. The table also aligns the APS Sites with the Essex HER data where relevant.
- 4.10.11 A detailed analysis of these sites forms part of the assessment reports provided in **Appendix 4** and includes historic map regression (APS 2022a, 2022b). The below table provides information on each APS site identified from the APS work undertaken for both the Landfall Zone and the route corridor. These are shown on **Figures 8A-K**.

Table 8 Heritage Assets identified through aerial imagery within the Onshore RLB

APS Site	Asset type	condition	Period	EHER MonUID
APS_01	Field Boundary	Micro topography	Undated - modern	MEX1031364
APS_02	Field Boundary	Micro topography	Undated	MEX1031364
APS_03	Field Boundary	Cropmarked buried feature	Undated	MEX12997
APS_04	Field Boundary	Micro topography	Undated	MEX11450 MEX1031415 MEX11519



APS_05	Field Boundary	Micro topography	Medieval/Post-medieval	MEX1040163 MEX1039613
APS_06	Field Boundary	Micro topography	Medieval	MEX1039613
APS_07	Field Boundary	Micro topography	Medieval	MEX1039612
APS_08	Field Boundary	Micro topography	Undated	MEX1031438
APS_09	Funerary site (round barrow); Field Boundary	Micro topography	Medieval	MEX1031435 MEX10843
APS_10	Field Boundary	Micro topography	Undated	MEX11405 MEX11650 MEX1031514
APS_11	Field Boundary	Micro topography	Undated	MEX11615
APS_12	Field Boundary	Micro topography	Undated	MEX11474 MEX1031508
APS_13	Barrow Cemetery	Cropmarked buried feature	Undated, likely Bronze Age	MEX8620
APS_14	Field Boundary	Micro topography	Undated	MEX11561
APS_15	Barrow Cemetery	Cropmarked buried features	Undated, likely Bronze Age	MEX11390
APS_16	Barrow Cemetery	Cropmarked buried features	Undated, likely Bronze Age	MEX8620
APS_17	Henge	Parchmark in grass	Prehistoric	MEX8620
APS_18	Ditch	Micro topography	Undated	MEX11382
APS_19	Field Boundary	Micro topography	Undated	MEX8620
APS_20	Field Boundary	Micro topography	Undated	MEX11391 MEX1040370 MEX1031512
APS_21	Field Boundary	Cropmarked buried feature	Undated	MEX11382
APS_22	Ditch	Cropmarked buried feature	Undated	MEX1031611
APS_23	Roman road	Cropmarked buried features	Roman	MEX43488
APS_24	Ditch	Cropmarked buried feature	Undated	MEX21957
APS_25	Field Boundary	Cropmarked buried feature	Undated	N/A
APS_26	Trackway	Cropmarked buried feature	Roman	MEX1031552
APS_27	Trackway	Cropmarked buried feature	Roman	MEX9188
APS_28	Field Boundary	Micro topography	Undated	N/A
APS_29	Field Boundary	Micro topography	Undated	MEX8755
APS_30	Enclosure	Cropmarked buried feature	Roman	N/A
APS_31	Enclosure	Cropmarked buried feature	Undated	MEX8489
APS_32	Ditch	Cropmarked buried feature	Undated	MEX10930
APS_33	Enclosure	Cropmarked buried feature	Undated	MEX1031543



APS_34	Ditch	Cropmarked buried feature	Undated	N/A
APS_35	Ditch	Cropmarked buried feature	Undated	MEX9864 MEX1031544
APS_01_LZ	Pits, possibly minefield	Levelled, grassmark	WWII	MEX49906
APS_02_LZ	Field system	Levelled, cropmark	Post Medieval	MEX10602 MEX1031371
APS_03_LZ	Anti-Aircraft defence site	Former structure, now levelled, crop and grassmark	WWII	MEX1031358
APS_04_LZ	Field system	Levelled, cropmark	Post Medieval	N/A
APS_05_LZ	Field System, settlement features (enclosures) and ring ditches	Levelled, cropmark	Prehistoric – Post Medieval	MEX10628 MEX1031371
APS_06_LZ	Round barrow	Levelled, cropmark	Prehistoric	MEX10628
APS_07_LZ	Pit	Levelled, cropmark	Unknown, possible prehistoric (Bronze Age)	MEX10628
APS_08_LZ	Square Enclosure	Levelled, cropmark	Medieval	MEX1031368
APS_09_LZ	Field System, trackway, boundaries	Levelled, cropmark	Prehistoric/unknown overlain by Post Medieval fields	MEX10655 MEX10609
APS_10_Z	Field System, track	Levelled, cropmark	Post Medieval/Modern	MEX1031361
APS_11_LZ	Field System	Levelled, cropmark	Post Medieval	MEX10636 MEX1031368
APS_12_LZ	Round barrow	Levelled, cropmark	Prehistoric	MEX10636
APS_13_LZ	Ring ditch, likely round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10636
APS_14_LZ	Field system, square enclosure	Levelled, cropmark	Post Medieval	MEX13203
APS_15_LZ	Field system	Residual earthwork via LiDAR data	Post Medieval	N/A
APS_16_LZ	Ditches, possible buried settlement	Levelled, cropmark	Medieval/Modern	MEX10618
APS_17_LZ	Round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10618
APS_18_LZ	Field system	Residual earthwork via LiDAR data	Medieval/Modern	N/A
APS_19_LZ	Ring ditch	Levelled, cropmark	Possible prehistoric (Bronze Age)	N/A



5 DISCUSSION

5.1 Summary of archaeological potential

- 5.1.1 The archaeological evidence within the Study Area reflects a human presence from the prehistoric to the present day.
- 5.1.2 Finds from the prehistoric period suggest that the Study Area provided an environment suitable for exploitation during the Palaeolithic and Mesolithic periods. The wider archaeological record suggests a prevalence of activities associated with subsistence, reflective of a nomadic existence of a hunter-gatherer lifestyle. Should further remains from this early period exist they will most likely comprise artefactual lithic finds.
- 5.1.3 Whilst the archaeological record is limited to lithic finds for the Neolithic period within the Study Area, evidence in the immediate vicinity at Lawford comprises evidence for a more settled existence from this period onwards. Should further remains from this period exist they would most likely comprise artefactual lithic finds, with a possibility of settlement evidence.
- 5.1.4 The archaeological record attests to Bronze Age funerary activity in the wider area. Cropmark evidence of ring ditches and finds within the Study Area are particularly focused around the southwest and northeast of the Little Bromley area, suggesting elevated potential for previously unrecorded assets dating to the Bronze Age relating to funerary practice in particular. Otherwise, there are finds at Great Holland, which also indicate some potential for this period across the southern reaches of the Onshore RLB (Onshore ECC area).
- 5.1.5 Evidence for Iron Age activity in the wider area is attested by dispersed domestic and agricultural settlements, field systems, cremation burials and red hills (salt production). The evidence within the Study Area comprises a high density of findspots to the south of Little Bromley where there is likely to be elevated potential. There are also smaller pockets of Great Holland, which follows the trend from the Bronze Age. Evidence in the remainder of the Study Area is relatively limited, which does not preclude potential for previously unrecorded assets dating to the Iron Age but is likely more reflective of the lack of archaeological investigation.
- 5.1.6 There is substantial evidence for Romano-British activity in the Study Area northwest of Little Bromley where a small settlement is likely present at the intersection of various Roman roads radiating from Colchester and out to coastal settlements/harbours. There is another notable concentration of evidence south of Little Bromley. Romano-British activity is well attested across the wider Tendring Peninsula. Any previously unrecorded assets would likely be representative of the road network and land-use in association with settlement and subsistence.
- 5.1.7 The archaeological record is relatively sparse for the Anglo-Saxon period in the Study Area, and similarly widely and sparsely dispersed within the wider area, however as with the earlier periods, a slight concentration of evidence to the south of Little Bromley has been noted. The reason for the dispersed and sparse nature of evidence for this period is generally based on the assumption that settlements were reoccupied (following the Roman period) or continued to be occupied from earlier periods prior. Any previously unrecorded assets would likely be representative of land-use in association with settlement and subsistence.



- 5.1.8 Within the Study Area, previously unrecorded assets from the medieval period are likely to relate to settlement, subsistence and coastal trade networks. Assets relating to settlement evidence for the medieval period would potentially be concentrated in the vicinity of existing settlements and farmsteads. As such there are notable concentrations of evidence south of Little Bromley and around Thorpe Green and Thorpe-le-Soken, with more widely dispersed finds and cropmark evidence characterising the wider area.
- 5.1.9 Within the Study Area previously unrecorded assets from the post-medieval period are similarly likely to relate to settlement and subsistence and the formation of the landscape into its present state. Assets relating to settlement, commerce, agriculture and industry are likely to be present. Despite the significant growth and urbanisation of the surrounding villages and towns in this period, the Study Area has remained largely rural and agricultural in nature. There are notable concentrations of evidence around Little Bromley and Horsley Cross.
- 5.1.10 Modern assets mainly relate to social housing and defensive measures during WWI and WWII. Previously unrecorded assets from the modern period would likely be similar in nature.
- 5.1.11 The RLB has undergone review and assessment as part of the aerial photographic and LiDAR data assessment undertaken by Air Photo Services Ltd. The full details of this assessment are included in **Appendix 4** of this report. The results provided suggest potential for further discovery of buried archaeological sites/features with the APS assessment confirming a series of cropmark sites across the RLB. The detailed analysis (APS Stage 2 Assessment) of these features has been critical in further defining areas of elevated archaeological potential and sensitivity. However, as none of the cropmarks have been subject to intrusive archaeological investigation, their continued presence, form and purpose remains unknown, though they have been broadly categorized in the APS assessment.

5.2 Summary of significance

- 5.2.1 The summary of significance is guided by the local, regional and national research frameworks that provide a broad picture of the potential significance of as yet unknown archaeological resource (both as finds and extant features).
- 5.2.2 The East of England Research Framework (2021) places considerable emphasis on the need for further recovery of lithics, including individual examples and wider assemblages, as part of a research priority for Palaeolithic, Mesolithic and Neolithic periods. In addition, the research framework highlights a need for the retrieval of paleoenvironmental remains to further understand landscape change. Therefore, the recovery of prehistoric lithics and paleoenvironmental remains would be of at least regional (medium) heritage value.
- 5.2.3 For the prehistoric, Roman, Anglo-Saxon and medieval, further evidence of settlement patterns and the interaction between peoples and the landscape is highlighted in the regional research framework. Although, a large amount of the cropmark data remains undated, their function is legible in most cases and shows that the majority are likely to be pre-post-medieval period in origin. The significance of the remains would be of up to regional (medium) heritage value with intrusive survey allowing their significance to become better refined.
- 5.2.4 The exception to the above is the identified henge that is located 90m south of the Onshore RLB. The henge has been identified already to be of national (high) significance due to its rarity. Cropmarks around the henge that could be contemporary and associated with the

henge may also be of national (high) significance as they may help inform our understanding of the feature. There could also be further archaeological remains around the henge that do not appear as cropmarks, such as ritual or funerary deposits, given the competing theories related to the purpose and use of henges. Such remains would also be of national (high) significance.

- 5.2.5 The development of the farmstead during the post-medieval period and how that reflects changes in agricultural practice remains an important regional research topic. Part of the completion of such work relies on furthering our understanding of how the creation and use of agricultural land influenced the design, use and development of the farmstead. Some of the cropmarks within the RLB are thought to be post-medieval in origin and may predate the field systems evident on historical mapping. Therefore, there is a possibility that some of the later cropmarks could be of local (low) heritage value if they can be accurately identified as part of the pre-enclosure agricultural landscape. This can only be achieved from intrusive investigation.
- 5.2.6 The East England Research Framework does not provide any consideration of the modern period. Extant structures and potential buried remains of WWII structure or complexes inform an important narrative on a critical period of British history. Most sites are well documented, such as the pillboxes located within the Onshore RLB along the foreshore. However, for some of the temporary sites there is little documented history, such as the anti-air defences within the reclaimed marshes adjacent to the Landfall Zone, outside the Onshore RLB (APS_04_LZ). While the site has been mapped during the APS assessment there may be outlying features that do not appear as cropmarks or on aerial photography that extend into the Onshore RLB. Such remains could be of regional value if they further our understanding of regional defensive methods or if they contain an important type of building/site. However, all of the known defences located within the Onshore RLB are WWII pillboxes that are of limited heritage value due to their commonality of their type.

6 IMPACT ASSESSMENT

6.1 Introduction

- 6.1.1 A detailed impact assessment will be provided in the PEIR, however initial assessment of potential impacts is presented below, to form a preliminary indication to inform and guide the PEIR impact assessment.
- 6.1.2 The project will involve the construction, operation and decommissioning of an Offshore Wind Farm comprising up to 41-79 Wind Turbine Generators (WTGs). At this stage some of the decisions for the local of infrastructure and precise technologies and construction methodologies have yet to be confirmed. In this instance a Maximum Design Scenario has been adopted as part of the 'Rochdale Envelope' approach to represent a worst-case scenario.
- 6.1.3 The onshore aspects of the proposals are to involve:
- Infrastructure at landfall and Horizontal Directional Drilling (HDD; or other trenchless technology) installations where the offshore cables are brought ashore.
 - Excavation for the cable route within the onshore RLB.
 - HDD installations (or other trenchless technology) where required.



- Construction of temporary haul roads and construction compounds.
- Construction of an Onshore Substation within the OnSS area; and
- Cables for the grid connection from the OnSS to the National Grid.

6.2 Statement of Potential Impact

6.2.1 The construction of the Onshore elements of the proposed development is anticipated to entail the following sources of ground disturbance and excavations.

- Cut and Cover excavation for the onshore cables;
- Excavation for Transition Joint Bays;
- Excavation for Horizontal Directional Drilling (or other trenchless technology) entrance and exit pits;
- Horizontal Directional Drilling (dependent upon the depth);
- Construction for the OnSS and OnSS compound;
- Construction of temporary construction access roads;
- Construction of permanent operational maintenance access roads; and
- Construction of temporary construction compounds.

6.2.2 The aforementioned works have the potential to result in the damage to or loss of any buried archaeological features which may be present within their footprint. This could in turn result in a total or partial loss of significance of these archaeological assets.

6.2.3 Any adverse impact to buried archaeological features would be permanent and irreversible in nature. This potential adverse effect could be reduced through the implementation of an appropriate scheme of archaeological mitigation which will be agreed with the statutory consultees and set out in the Environmental Statement Chapter.

6.2.4 An assessment of the effects of the development upon elements of the historic landscape such as historic hedgerows and boundaries will be assessed in the PEIR and Environmental Statement Chapter.

7 CONCLUSIONS

7.1 General

7.1.1 This assessment has established that there is an archaeological interest within the Onshore RLB defined as the potential for the presence of buried archaeological remains dating to all periods. Based upon the available information, cropmarks and features that may be archaeological in nature have been found throughout the Onshore RLB with particular concentrations towards the western end of the route. The cropmarks include possible ring ditches, enclosures, field systems, roads and pits. The cropmarks have yet to be subject to intrusive archaeological survey and could date from the prehistoric to the post-medieval periods. In addition to the cropmarks, a number of findspots are recorded by the EHER and PAS that date from the prehistoric to post-medieval period.



- 7.1.2 Due to lack of previous archaeological investigation within the Onshore RLB, the presence and significance of archaeological remains cannot be confirmed on the basis of the available information. As none of the cropmarks recorded within the Onshore RLB have yet to be ground truthed their purpose, form and significance remains unknown. Any adverse impact to buried archaeological features as a result of the implementation of the project would be permanent and irreversible in nature. This potential adverse effect could be reduced through the implementation of an appropriate scheme of archaeological assessment and mitigation, in accordance with national and local planning policy. The need for, scale, scope and any further archaeological works should be agreed through consultation with the statutory authorities.

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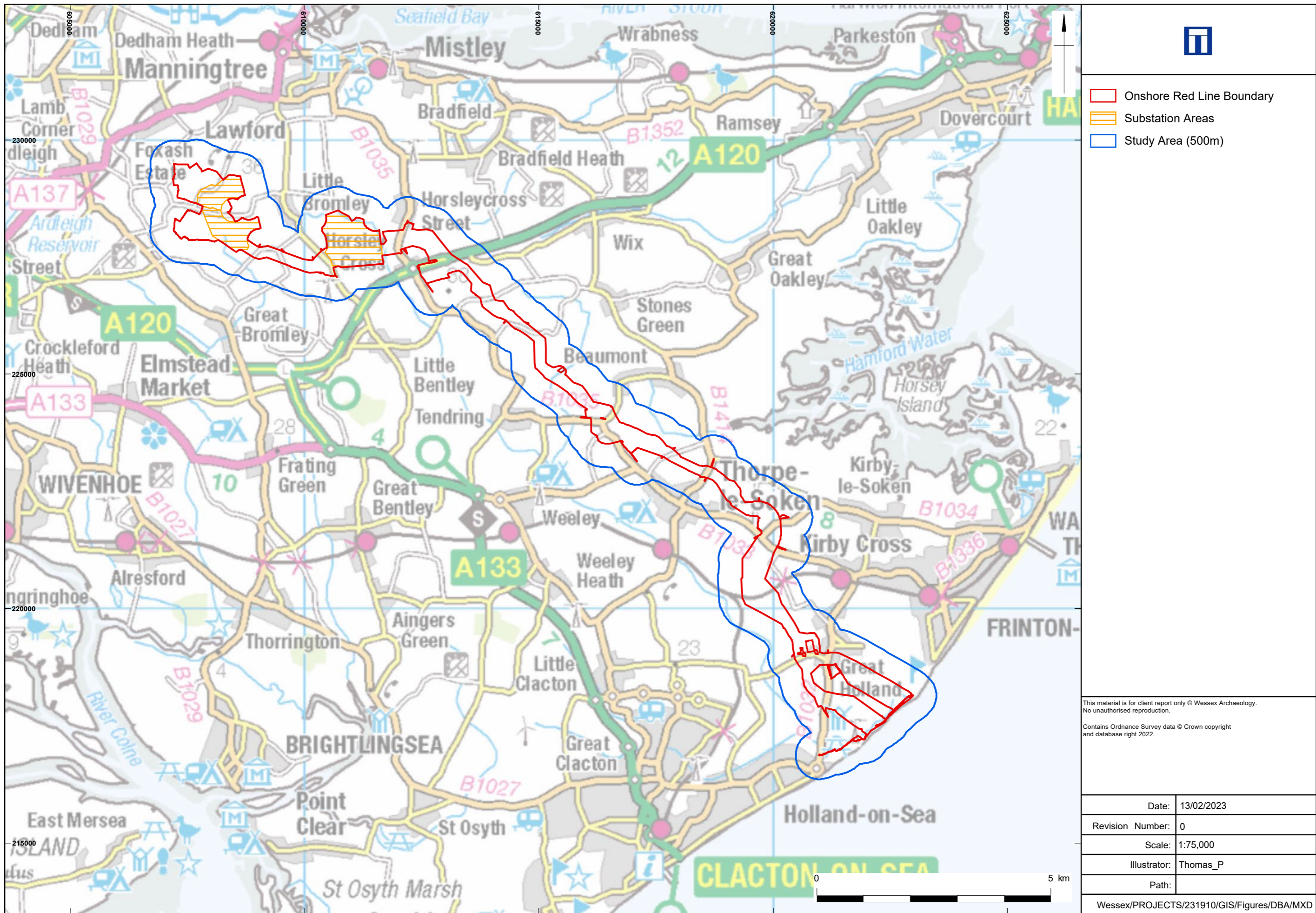
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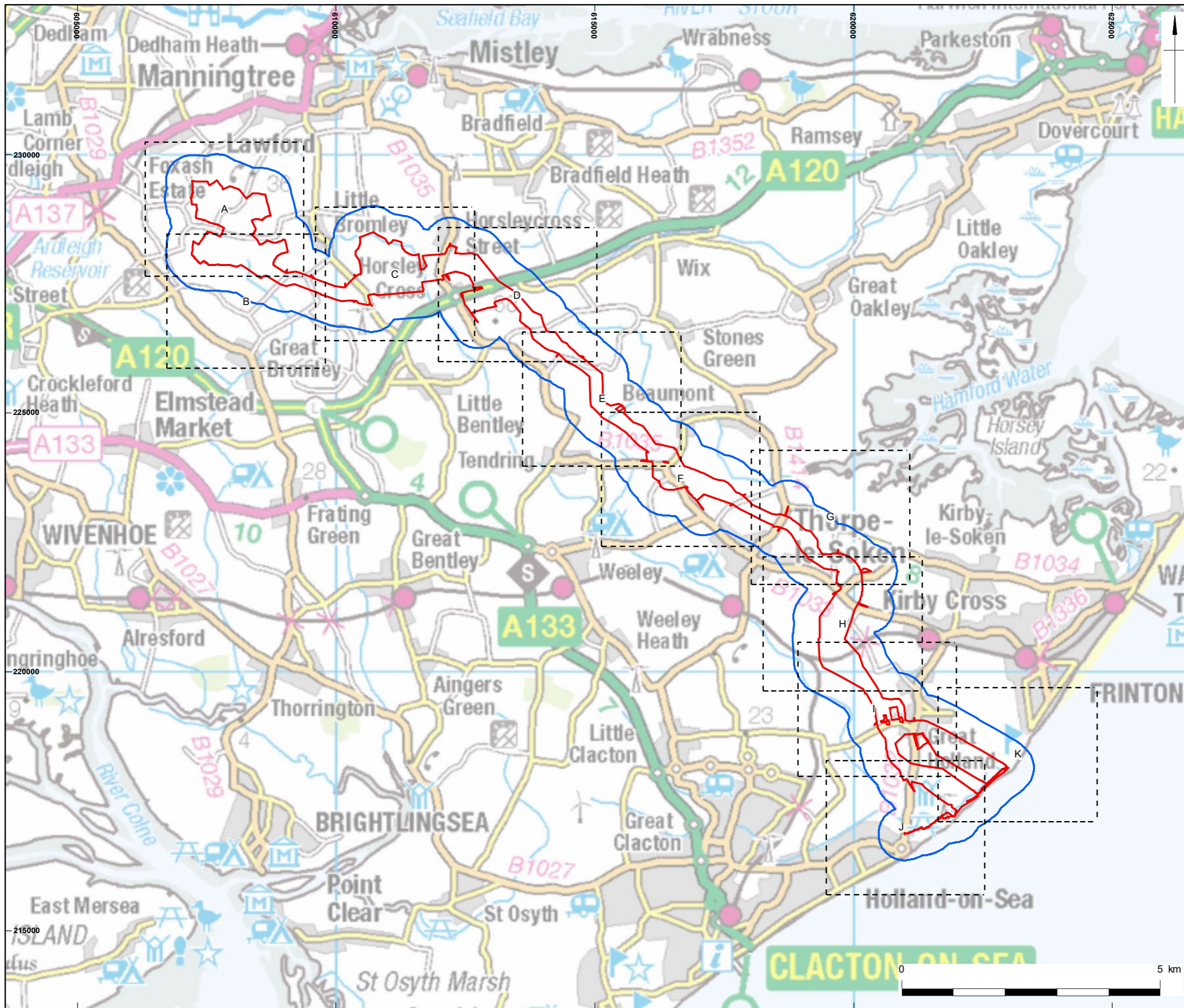
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Onshore Red Line Boundary, Substation Areas and Study Area

Figure 1





- Onshore Red Line Boundary
- Study Area (500m)
- Grid Index

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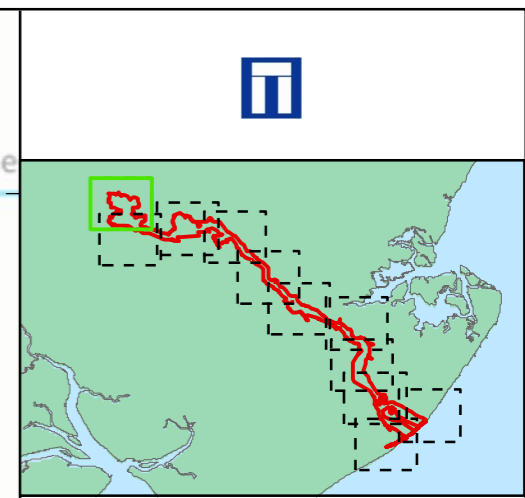
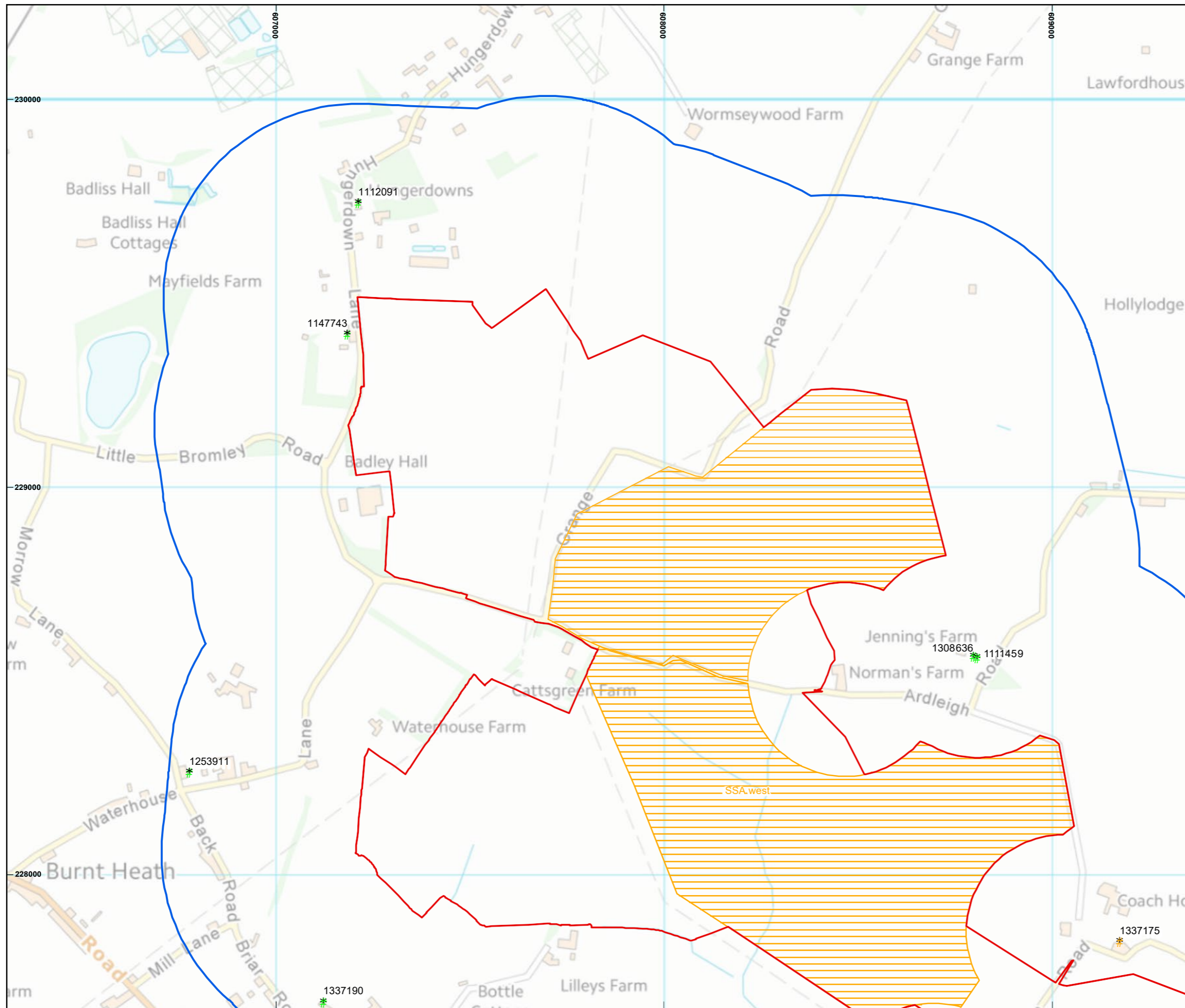
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Onshore Red Line Boundary, Study Area and Grid Extent

Figure 2



Legend

- Onshore Red Line Boundary
- Substation Areas
- Study Area (500m)

Designated Heritage Assets

- * Grade II* Listed Building
- * Grade II Listed Building
- Conservation Areas

0 500 m

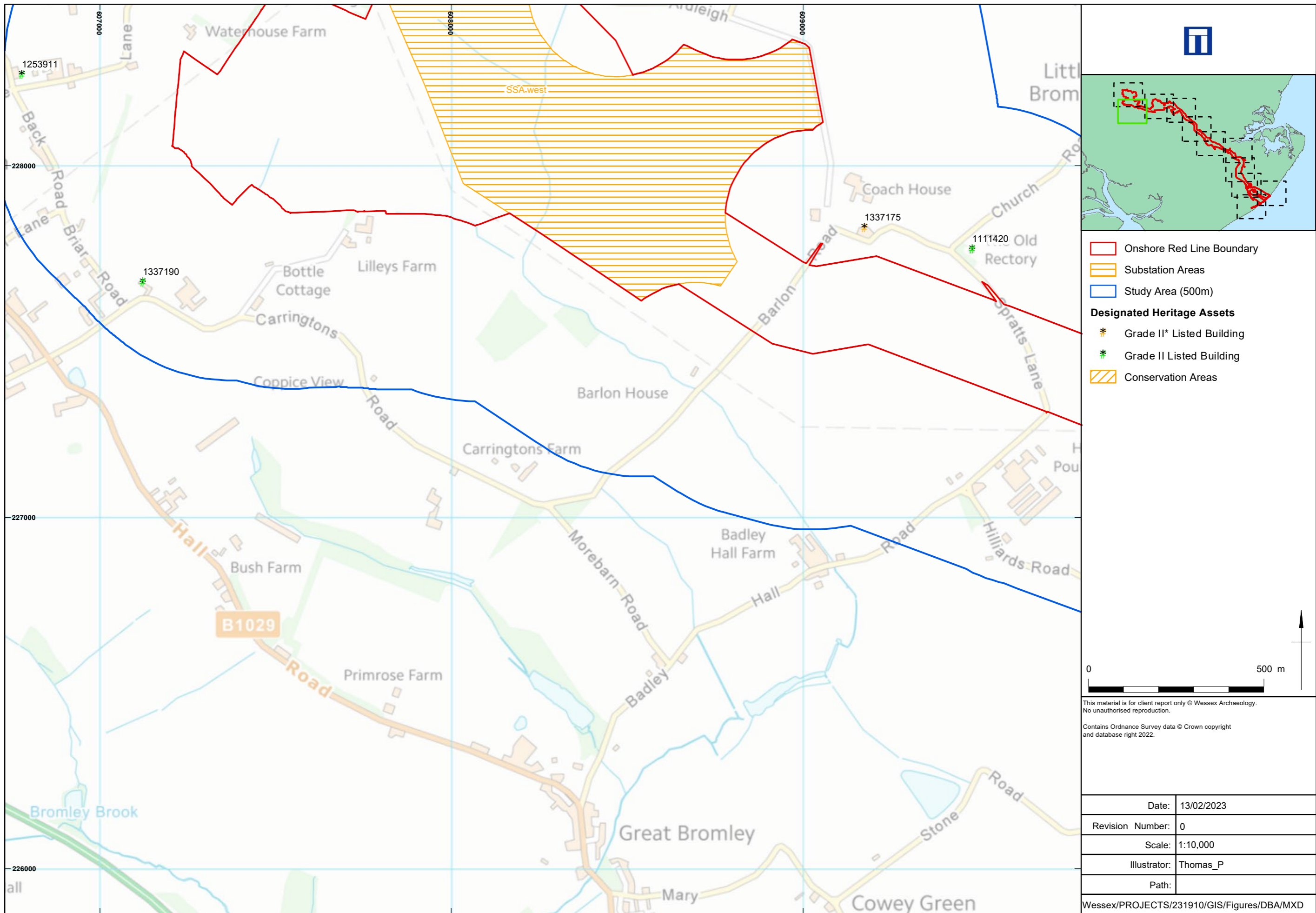
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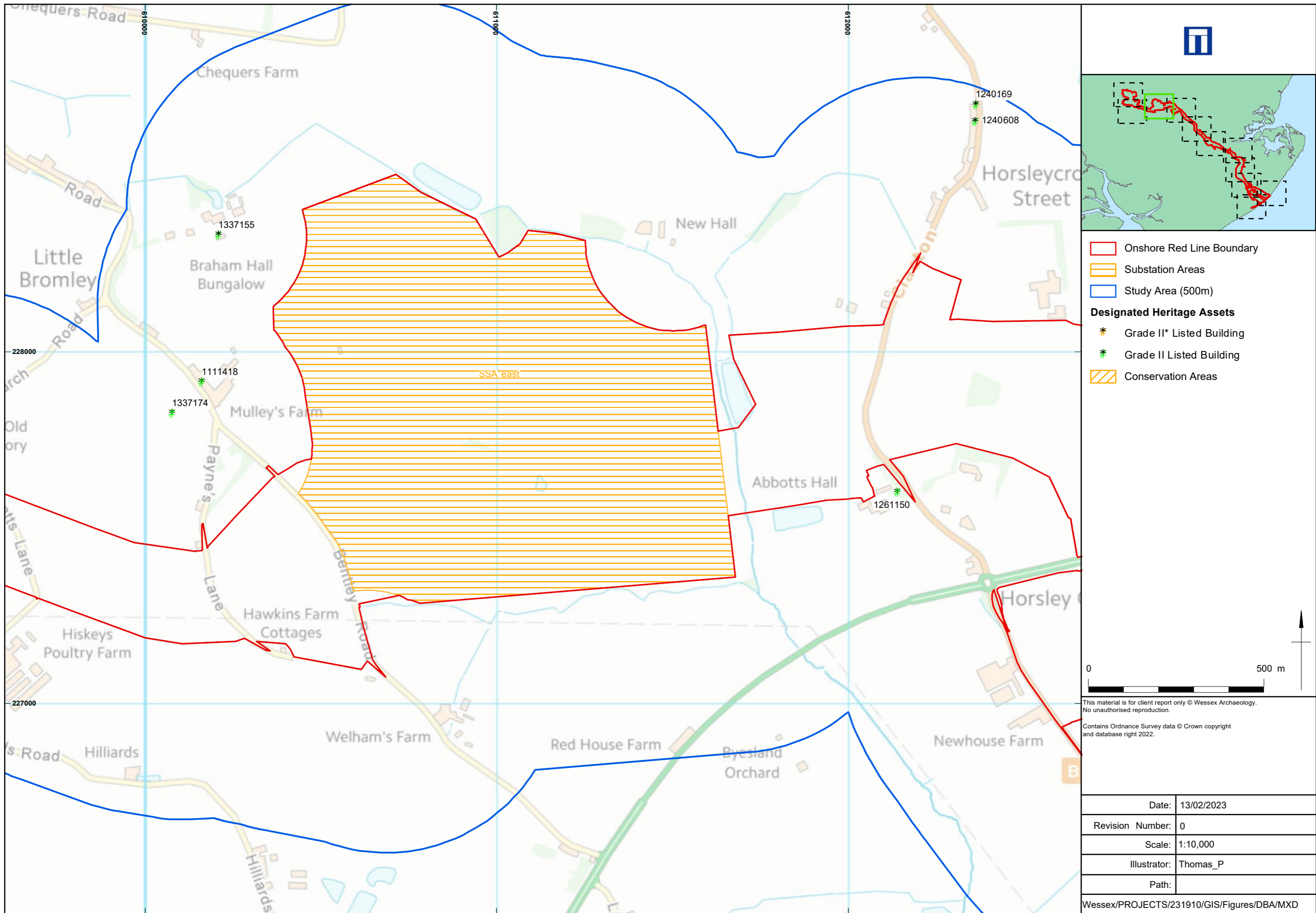
Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3A



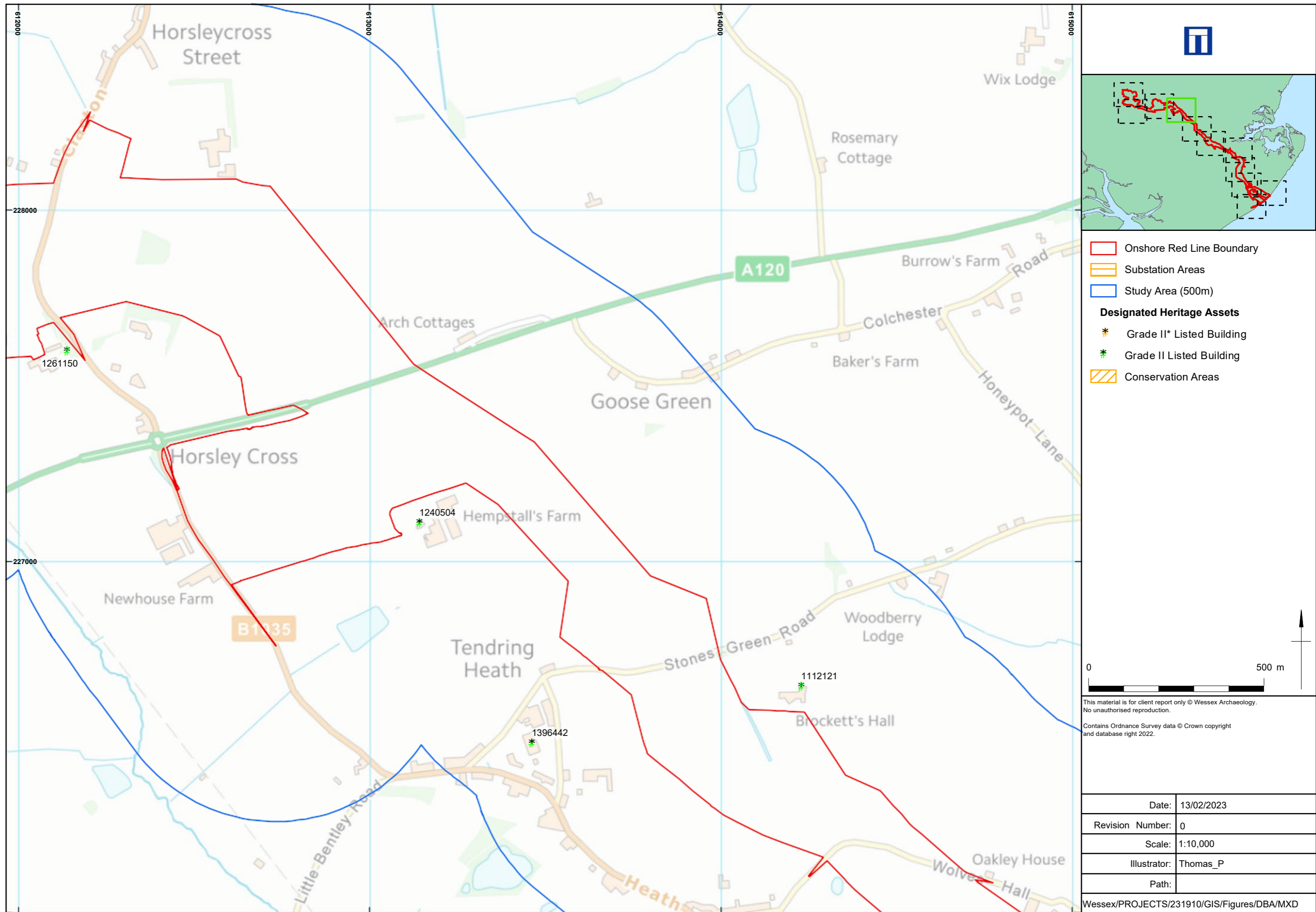
Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3B



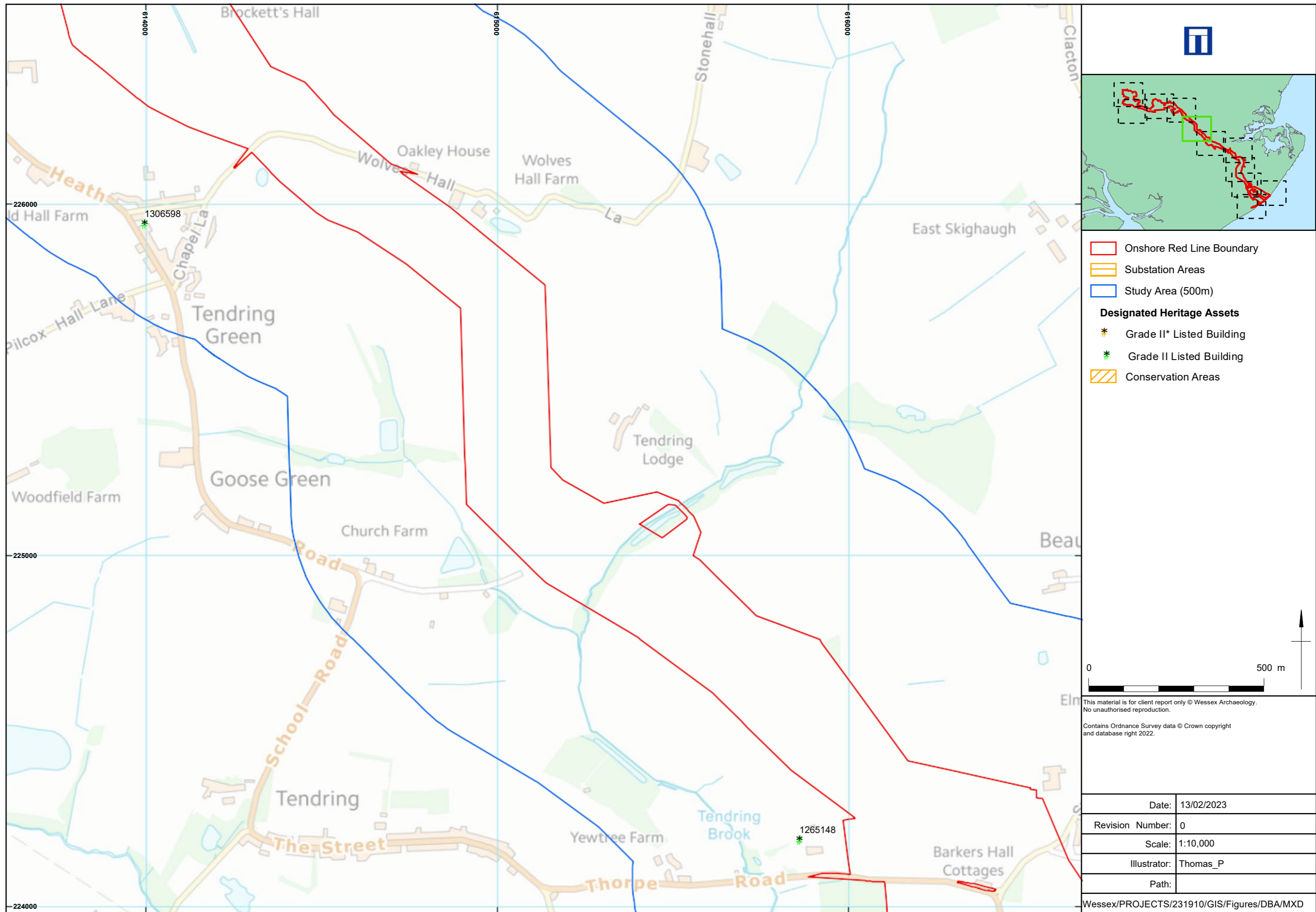
Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3C



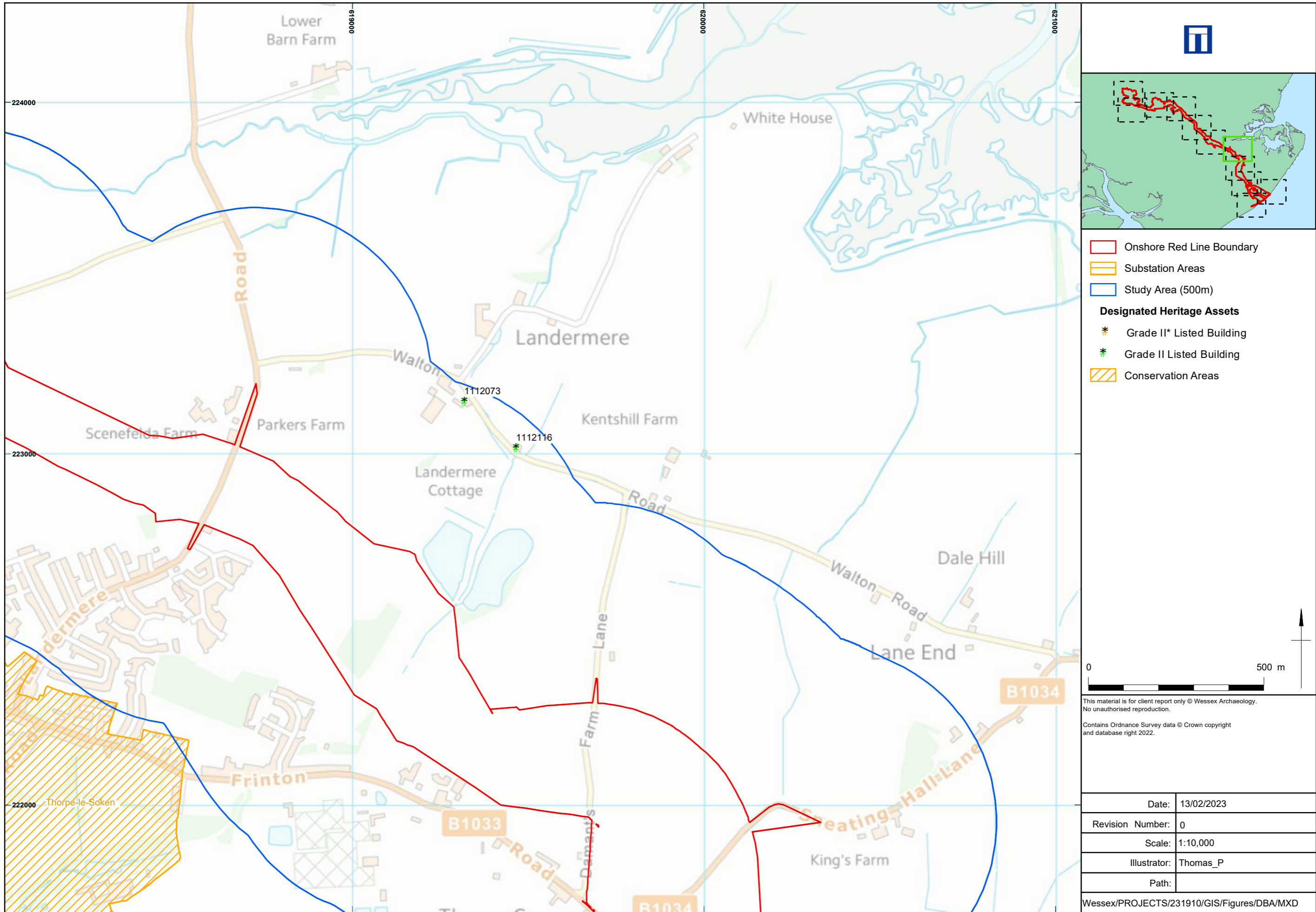
Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3D



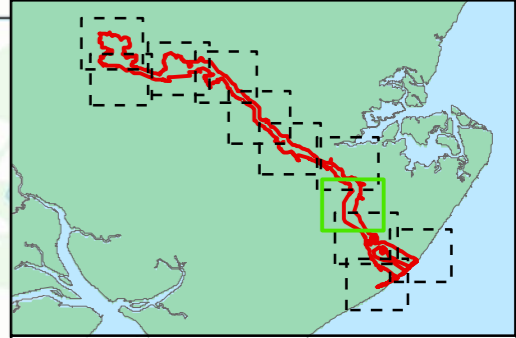
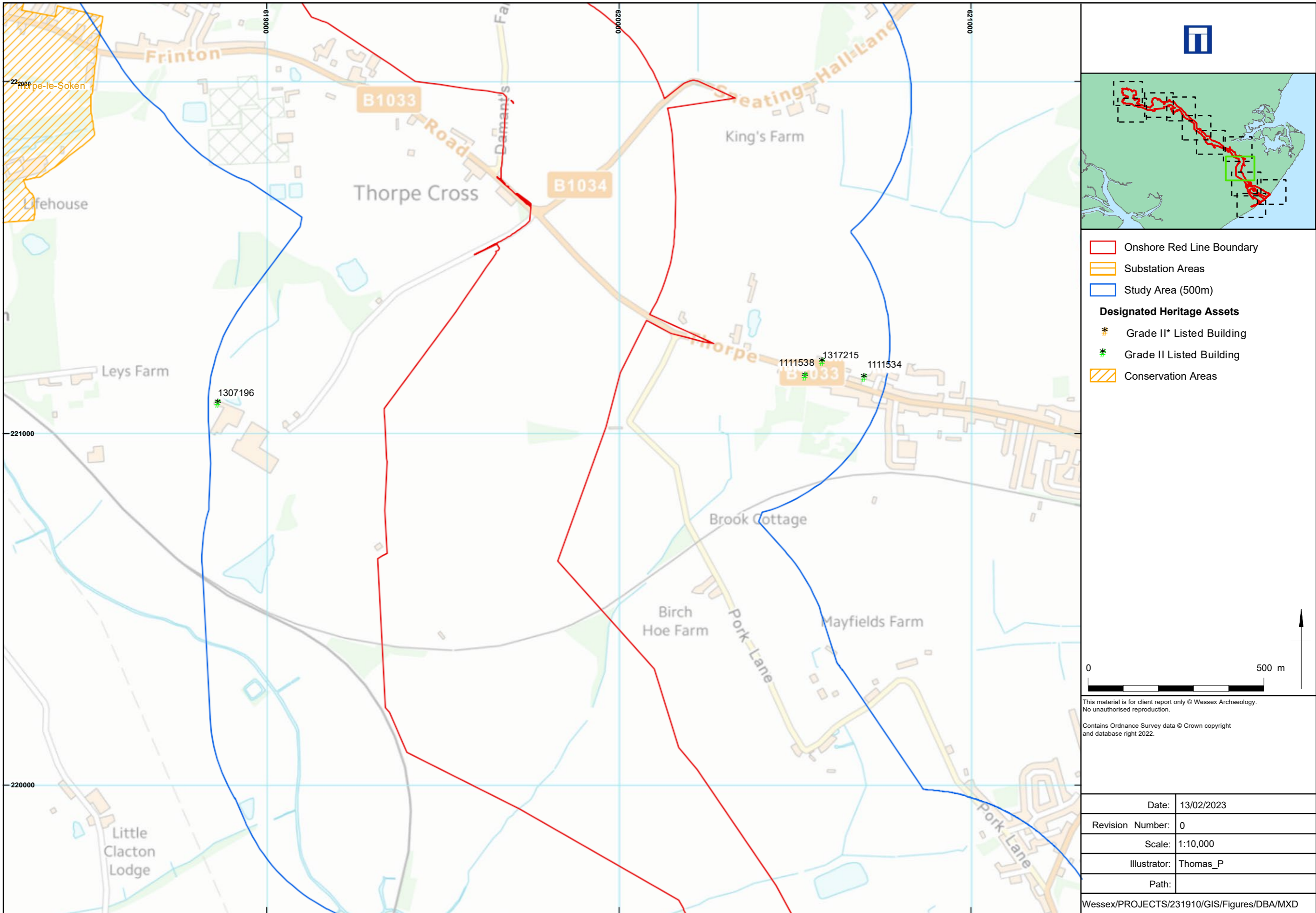
Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3E



Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3G



- Onshore Red Line Boundary
 - Substation Areas
 - Study Area (500m)
- Designated Heritage Assets**
- * Grade II* Listed Building
 - * Grade II Listed Building
 - Conservation Areas



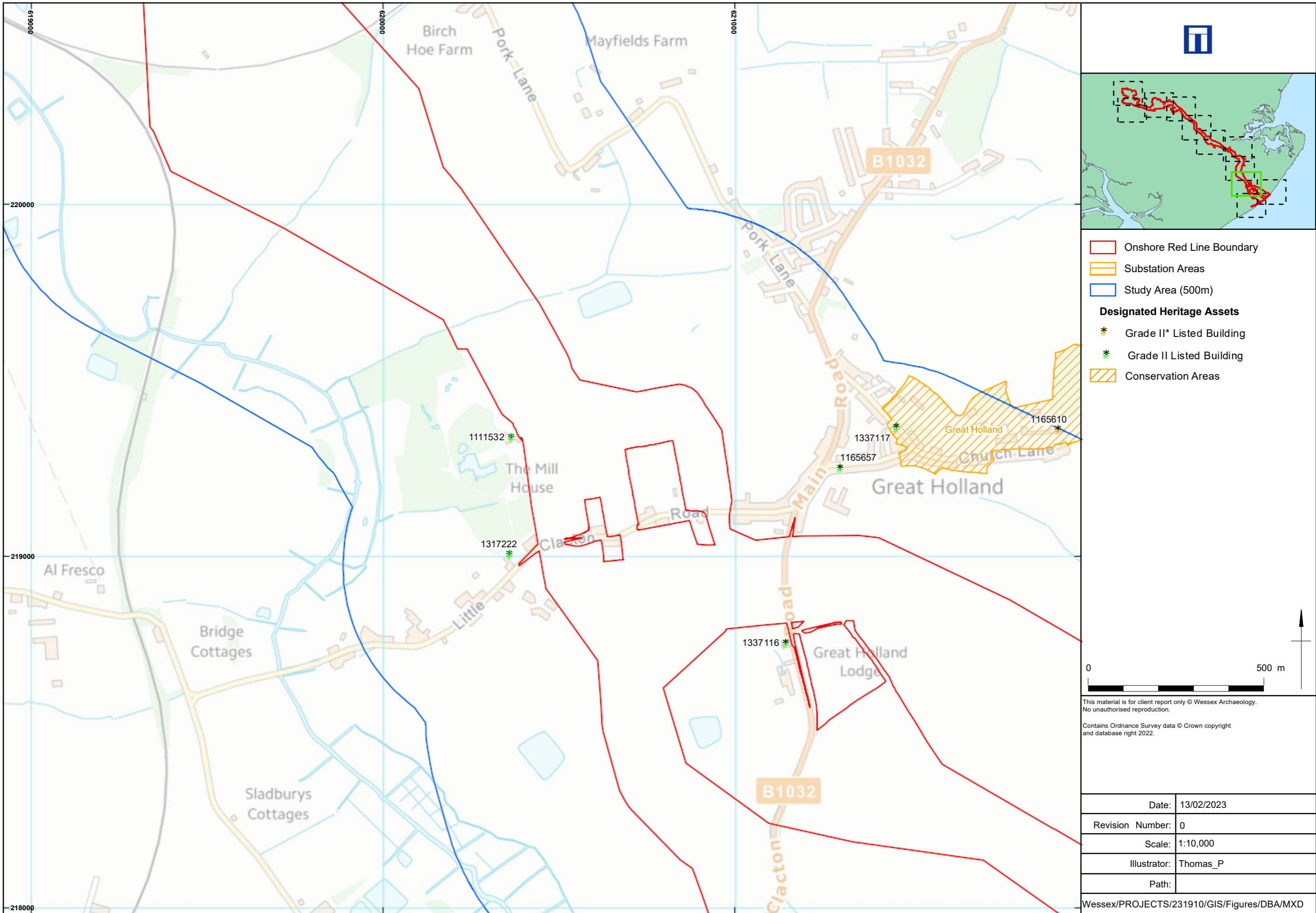
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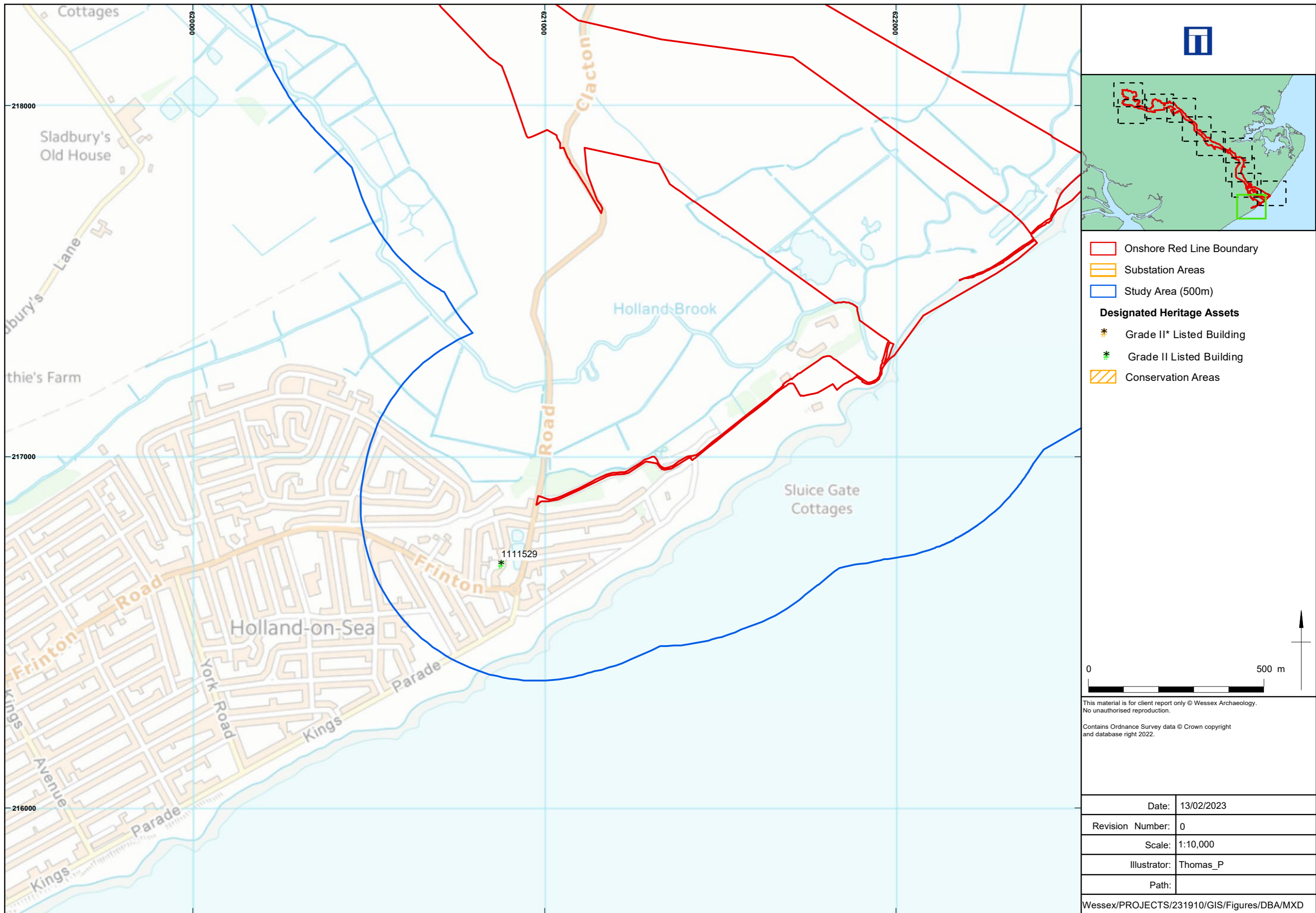
Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3H

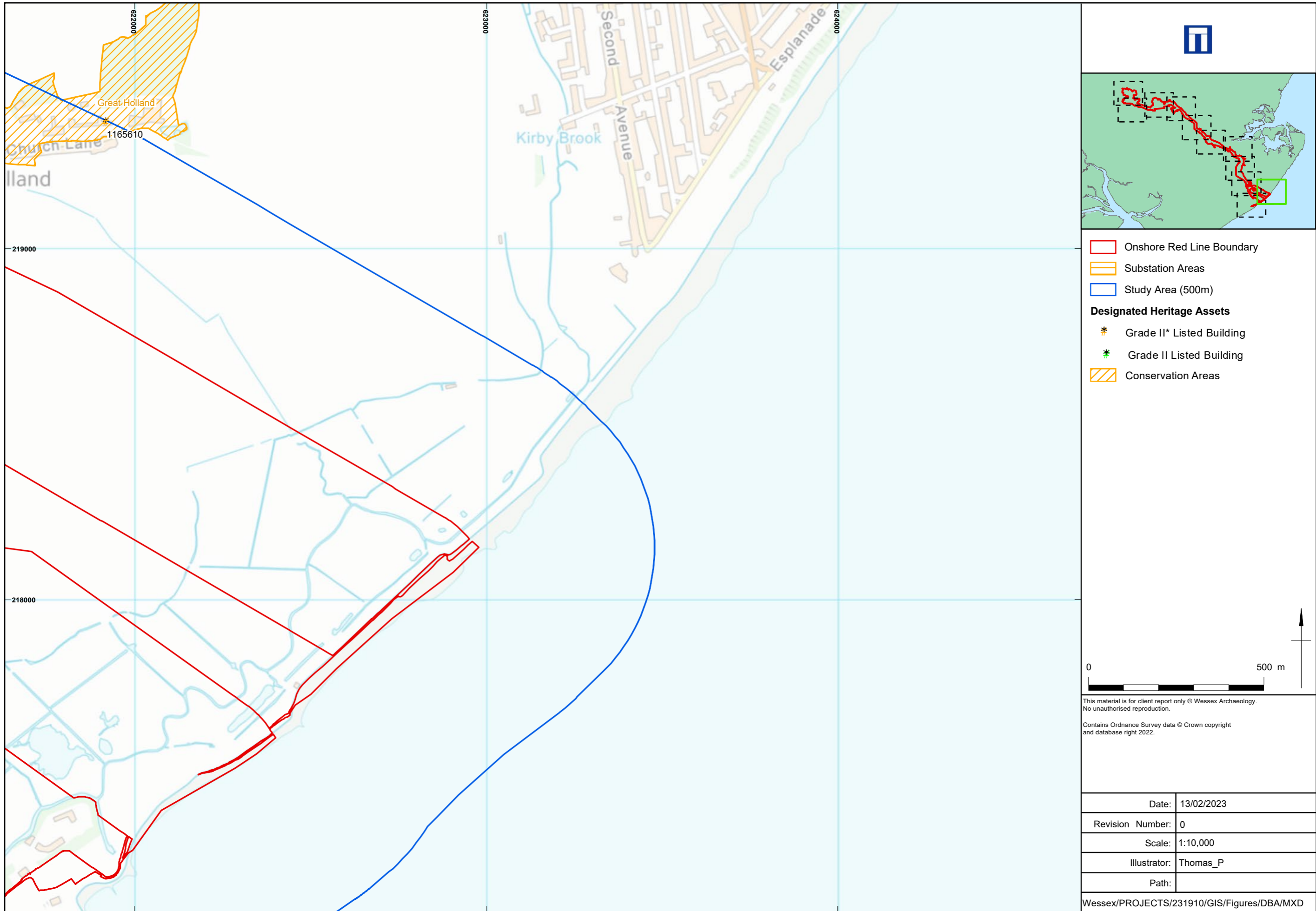


Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 31

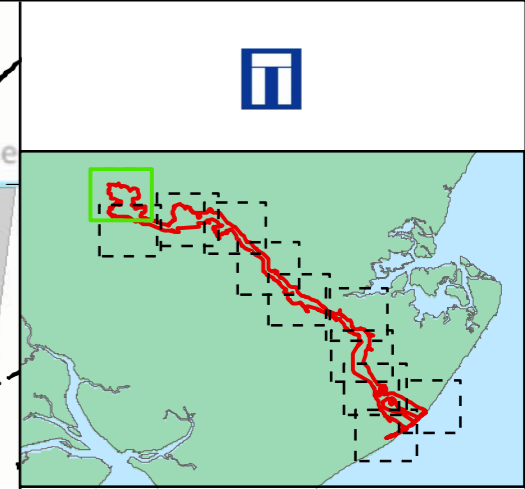
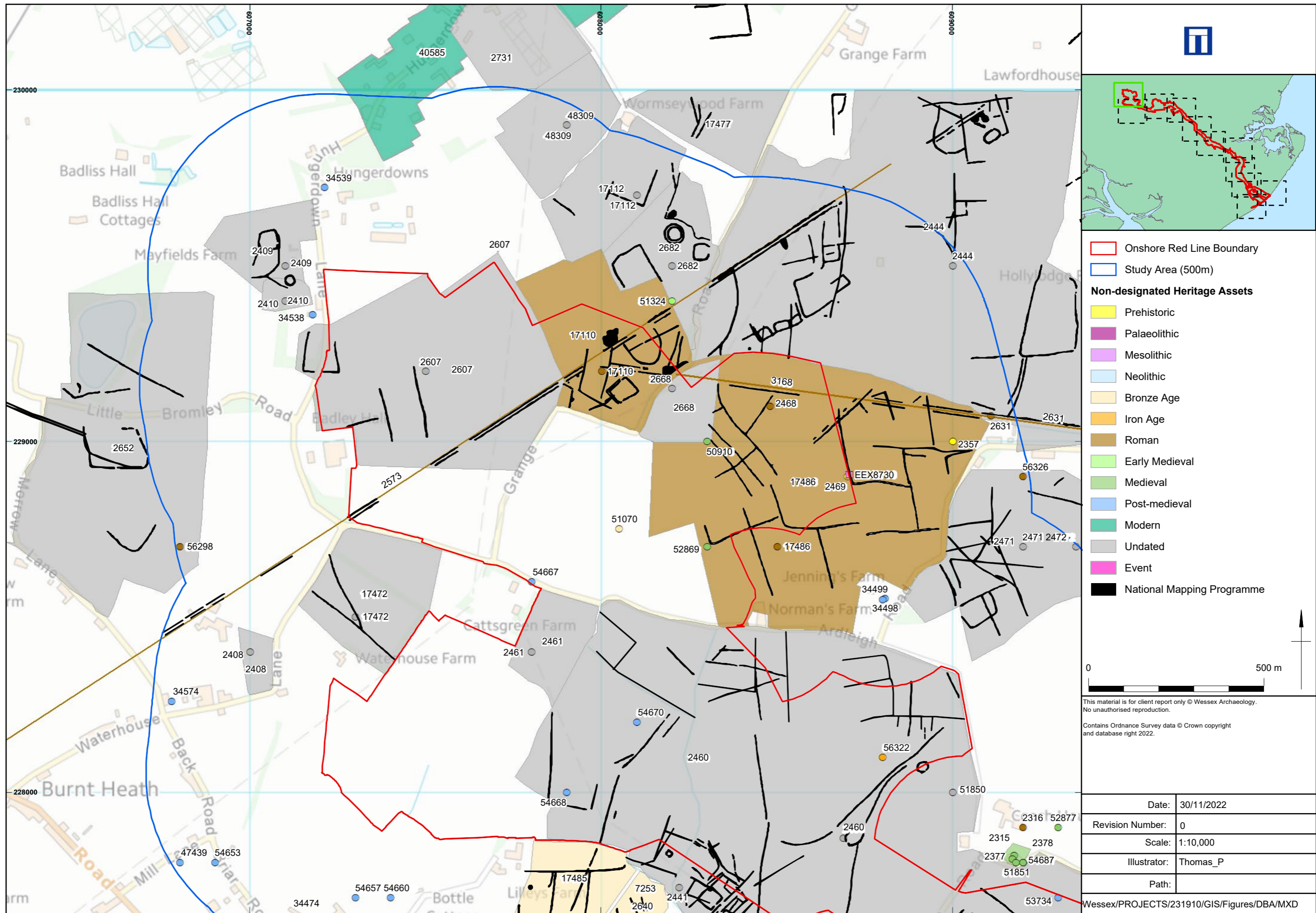


Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets



Onshore Red Line Boundary, Substation Areas, Study Area and Designated Heritage Assets

Figure 3K



Legend

- Onshore Red Line Boundary
- Study Area (500m)

Non-designated Heritage Assets

- Prehistoric
- Palaeolithic
- Mesolithic
- Neolithic
- Bronze Age
- Iron Age
- Roman
- Early Medieval
- Medieval
- Post-medieval
- Modern
- Undated
- Event
- National Mapping Programme

0 500 m

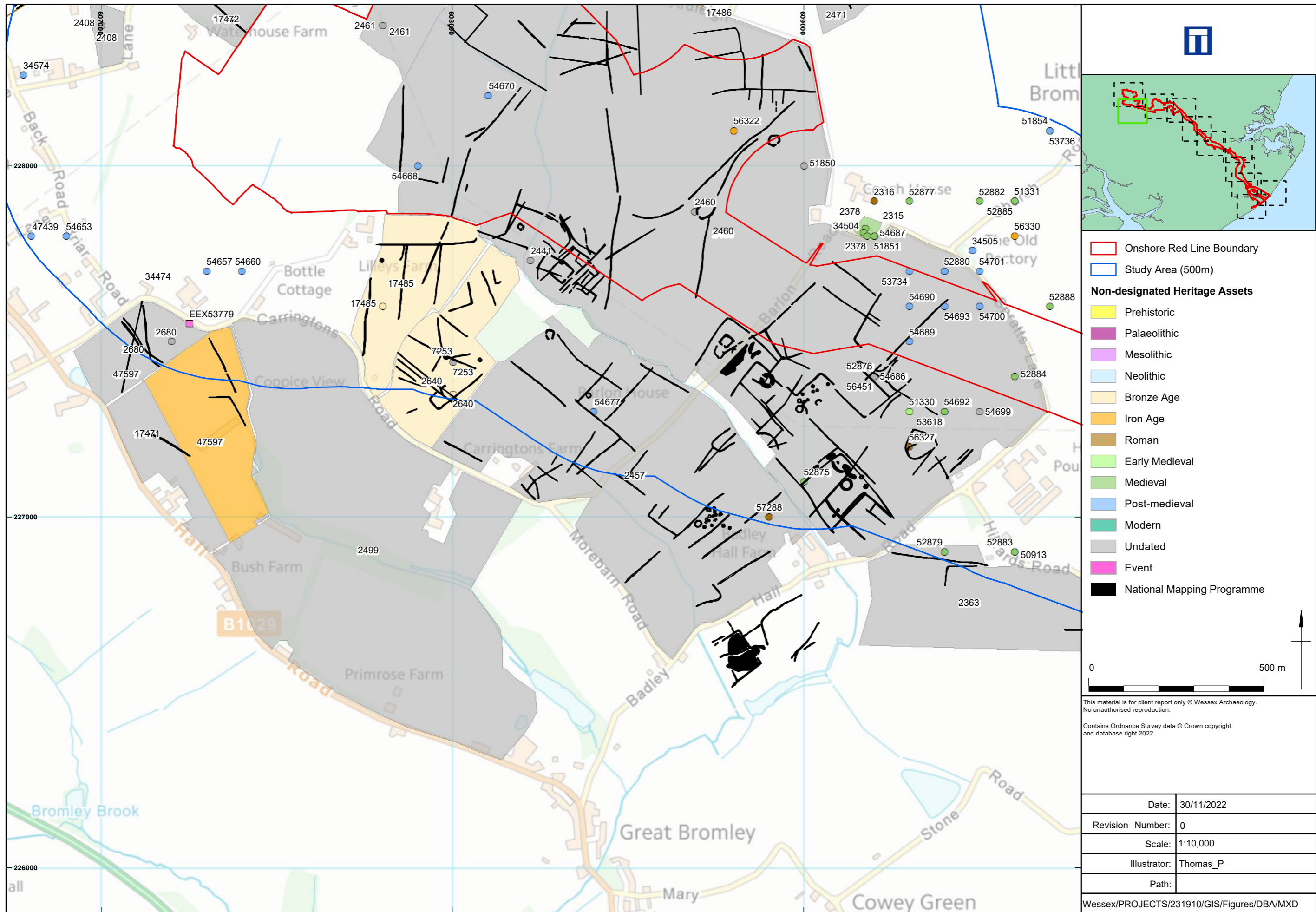
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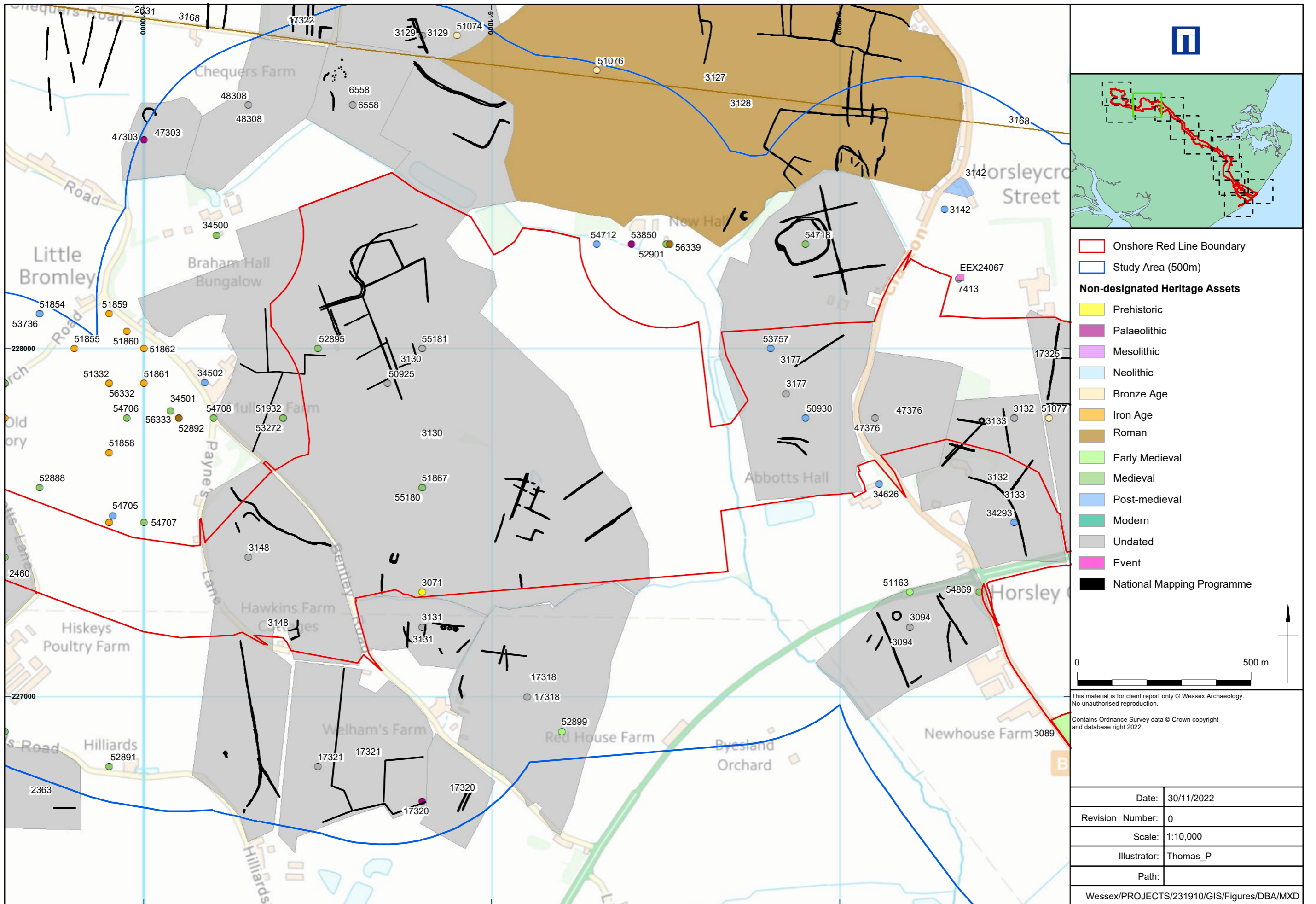
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4A



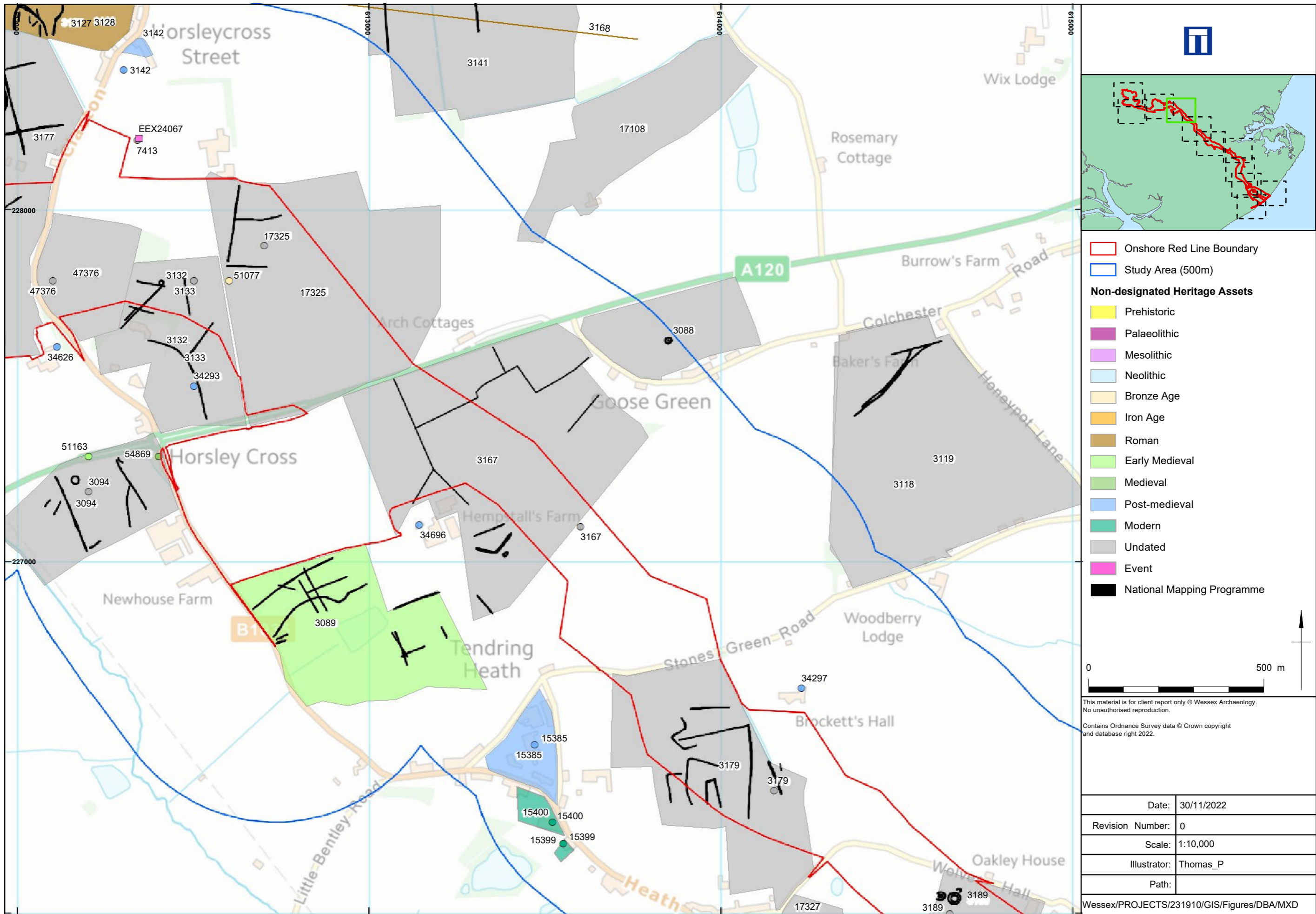
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Figure 4B



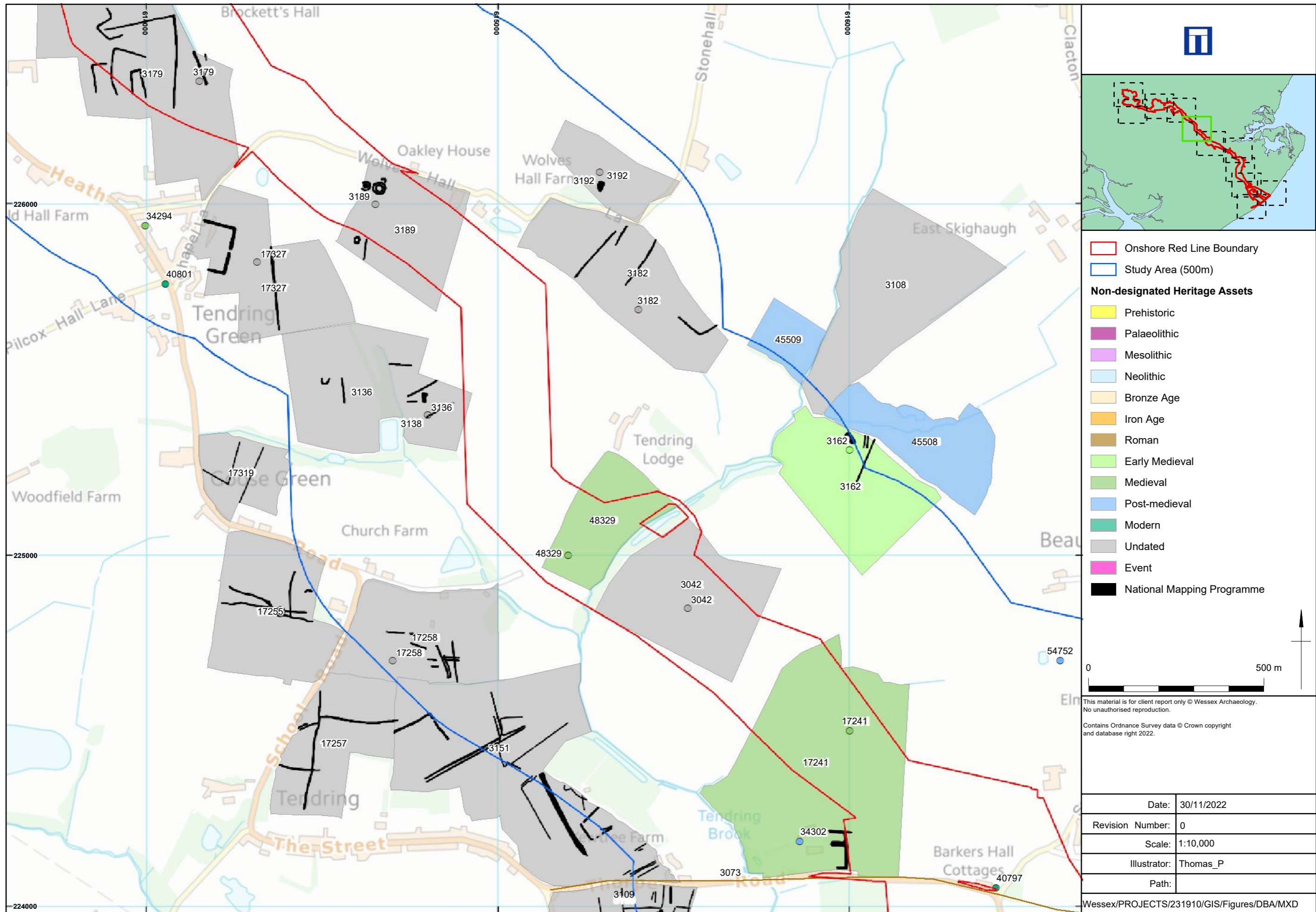
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4C



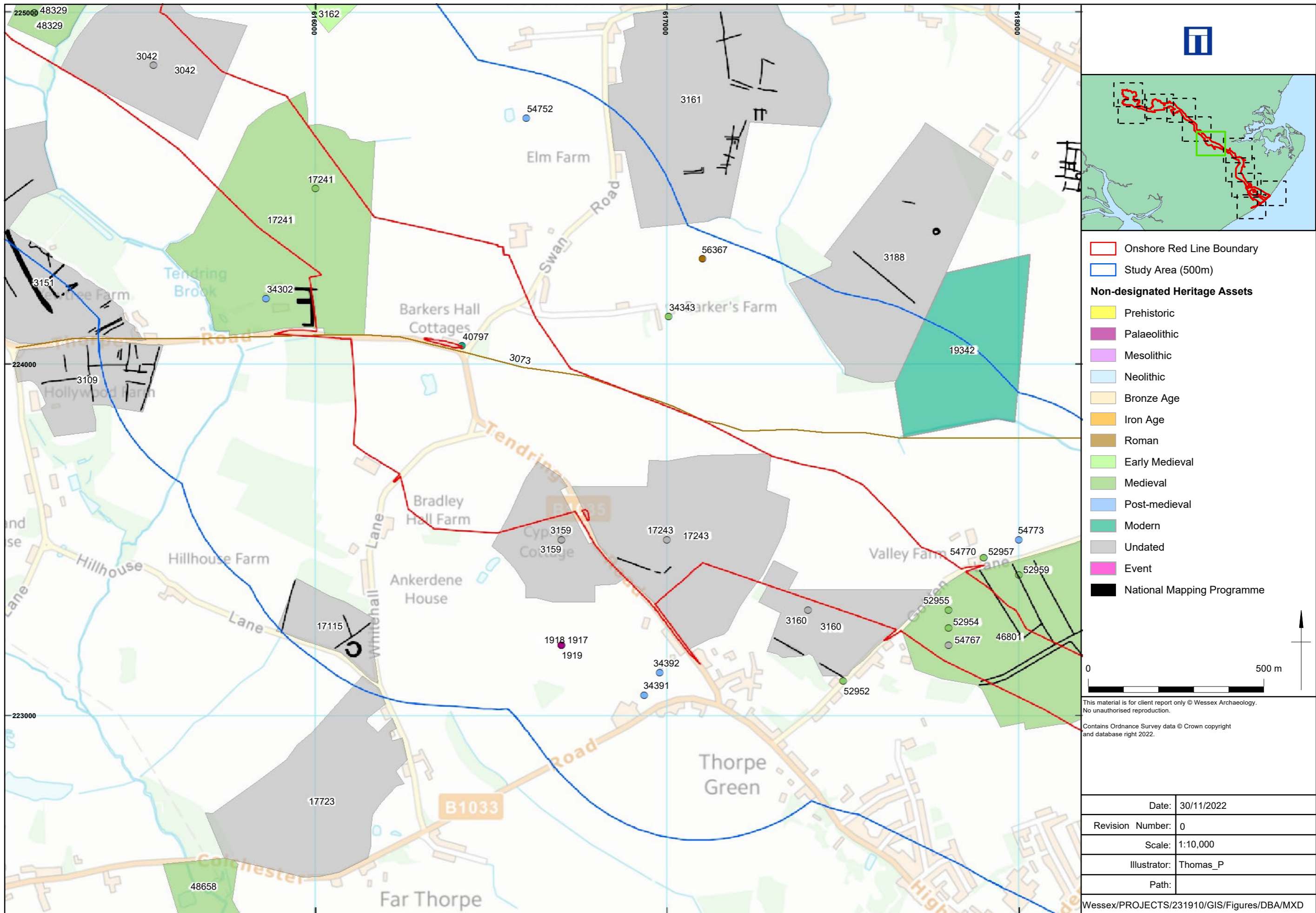
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4D



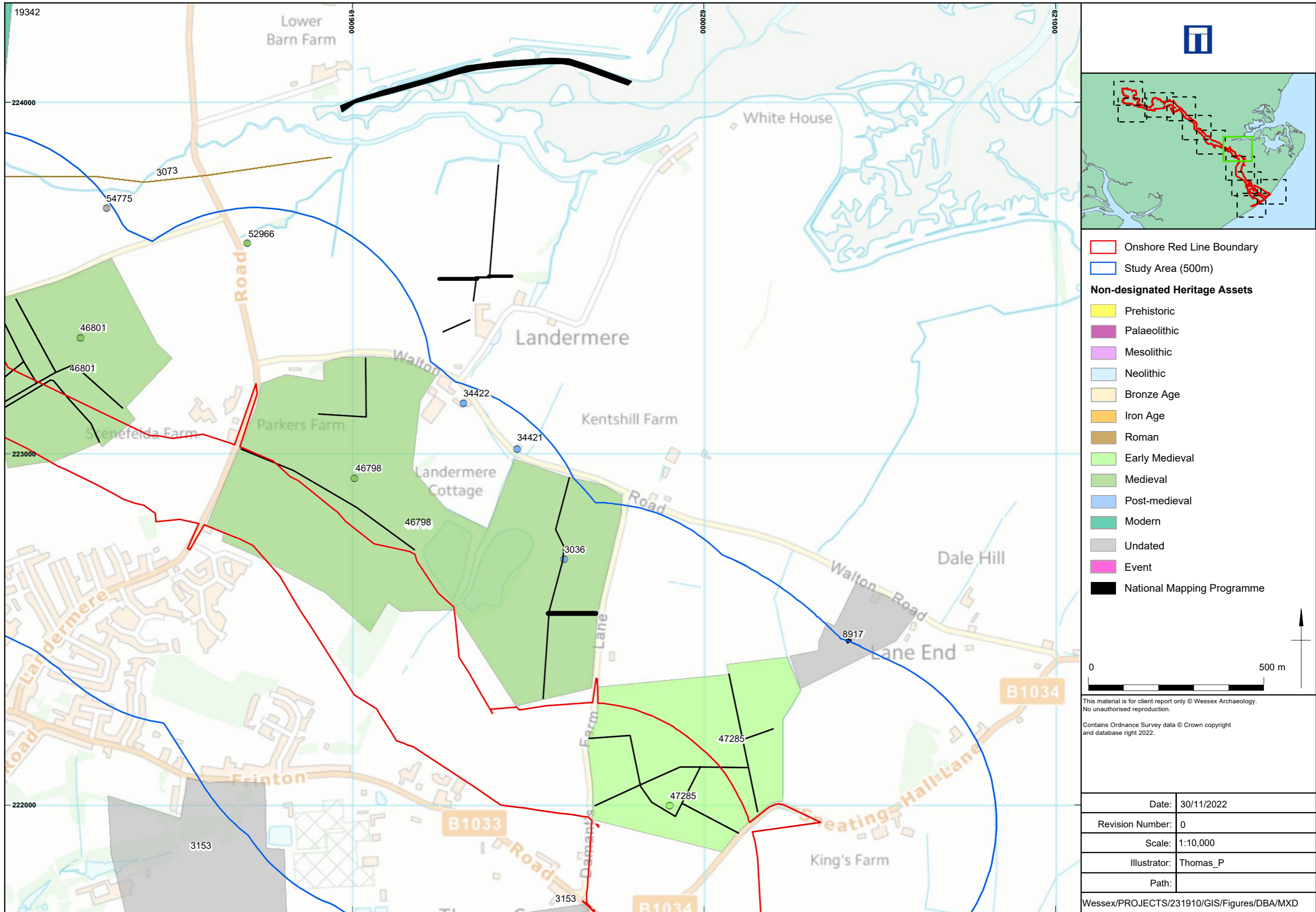
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4E



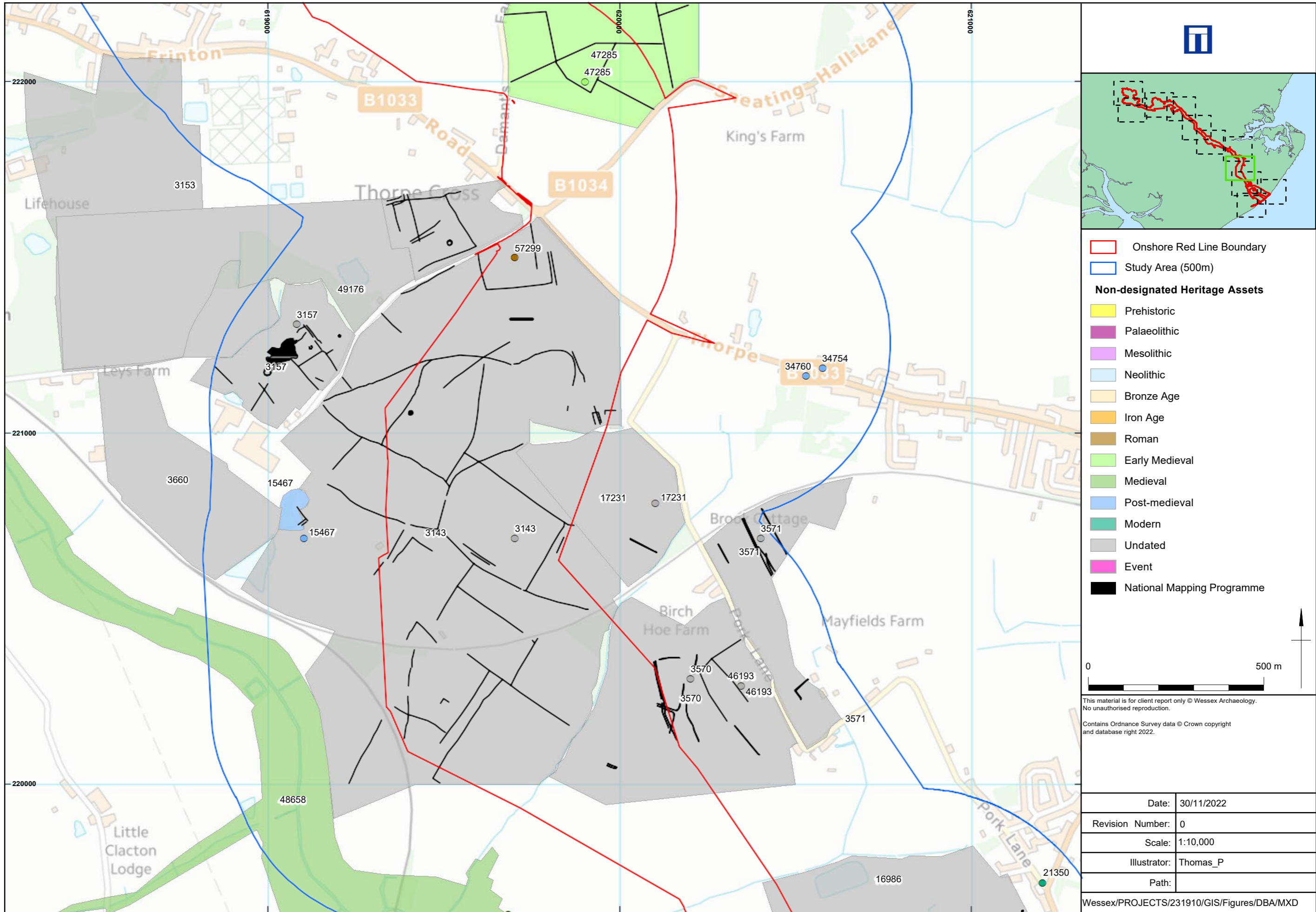
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4F



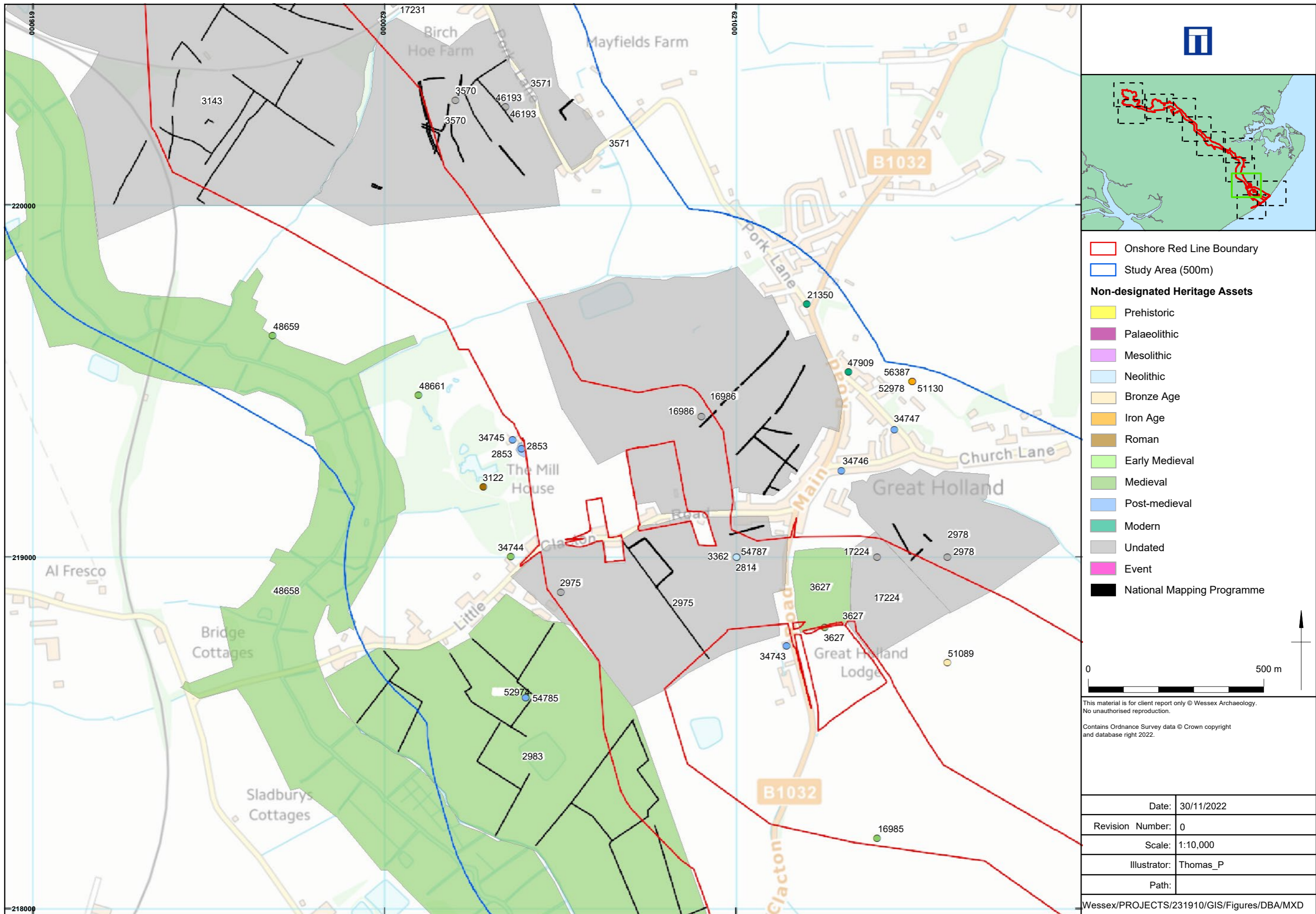
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4G



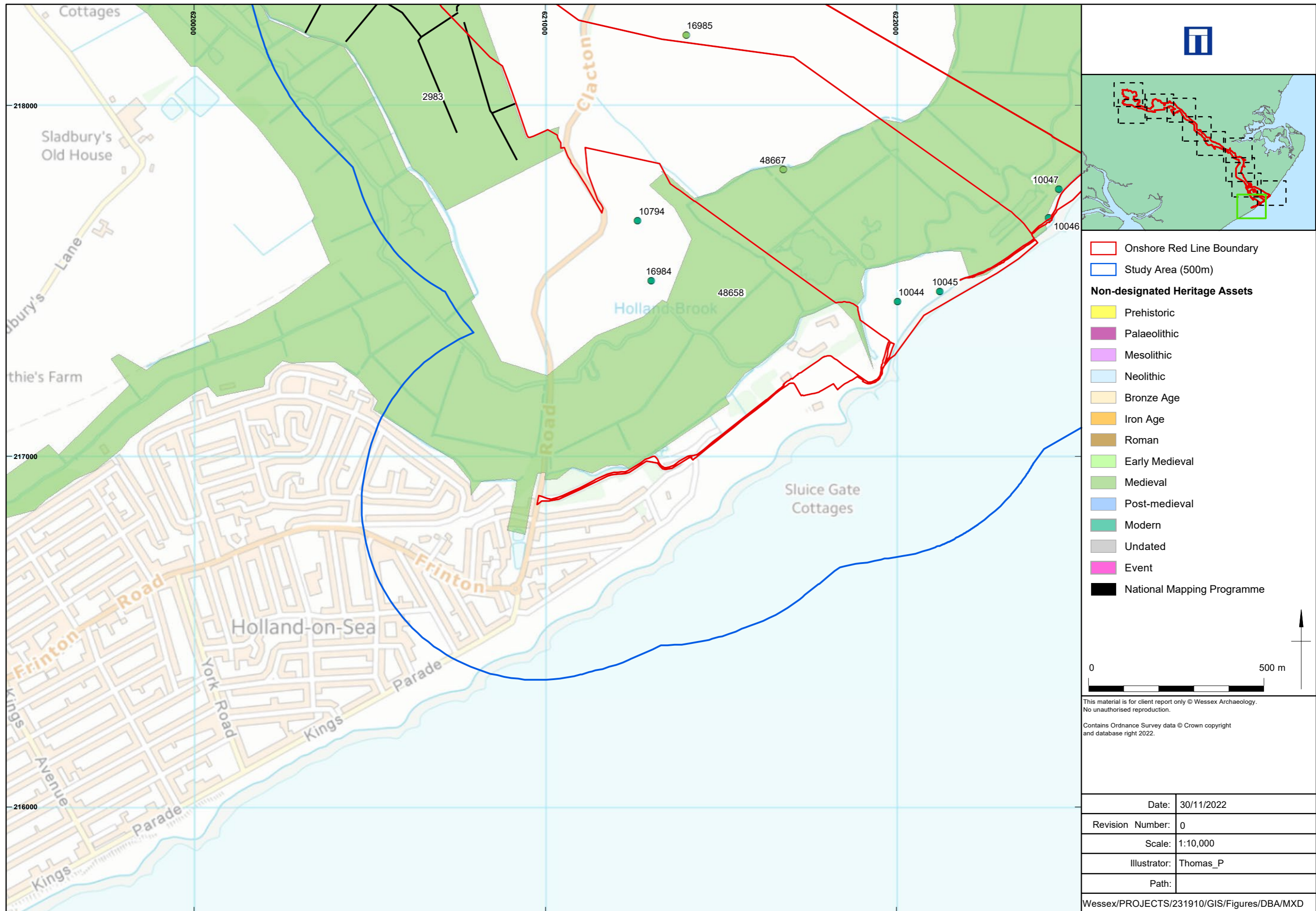
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4H



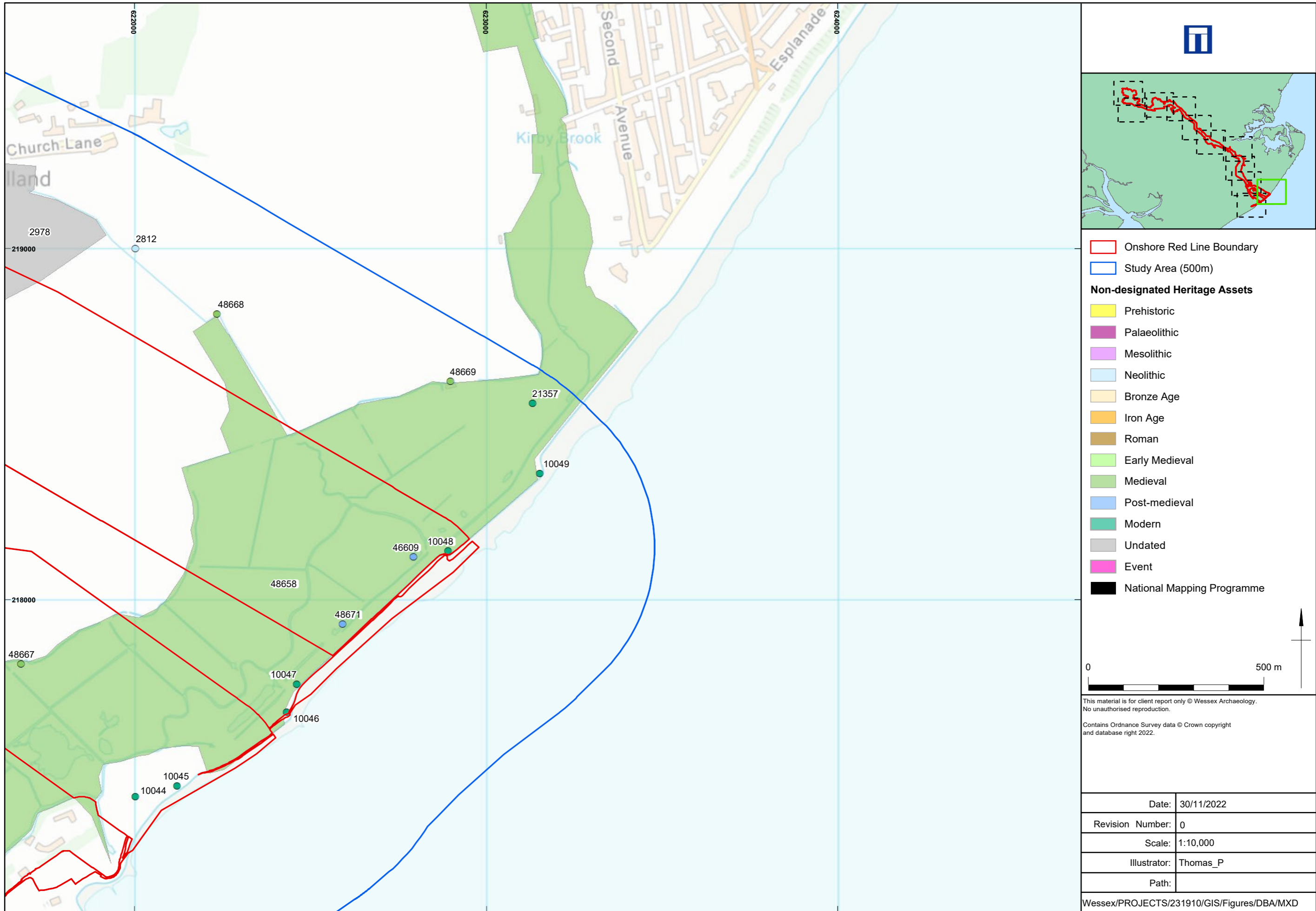
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 41



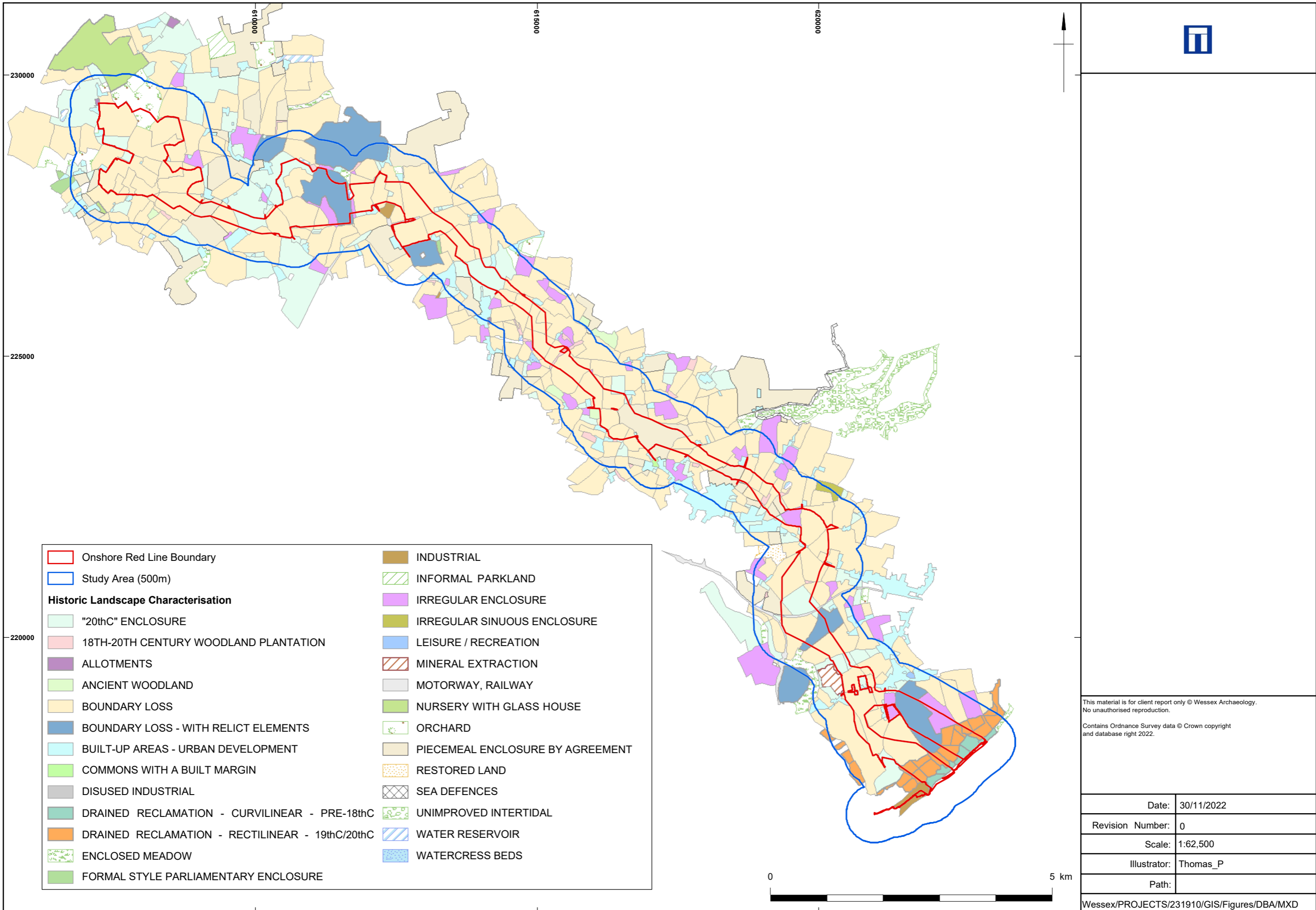
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets

Figure 4J



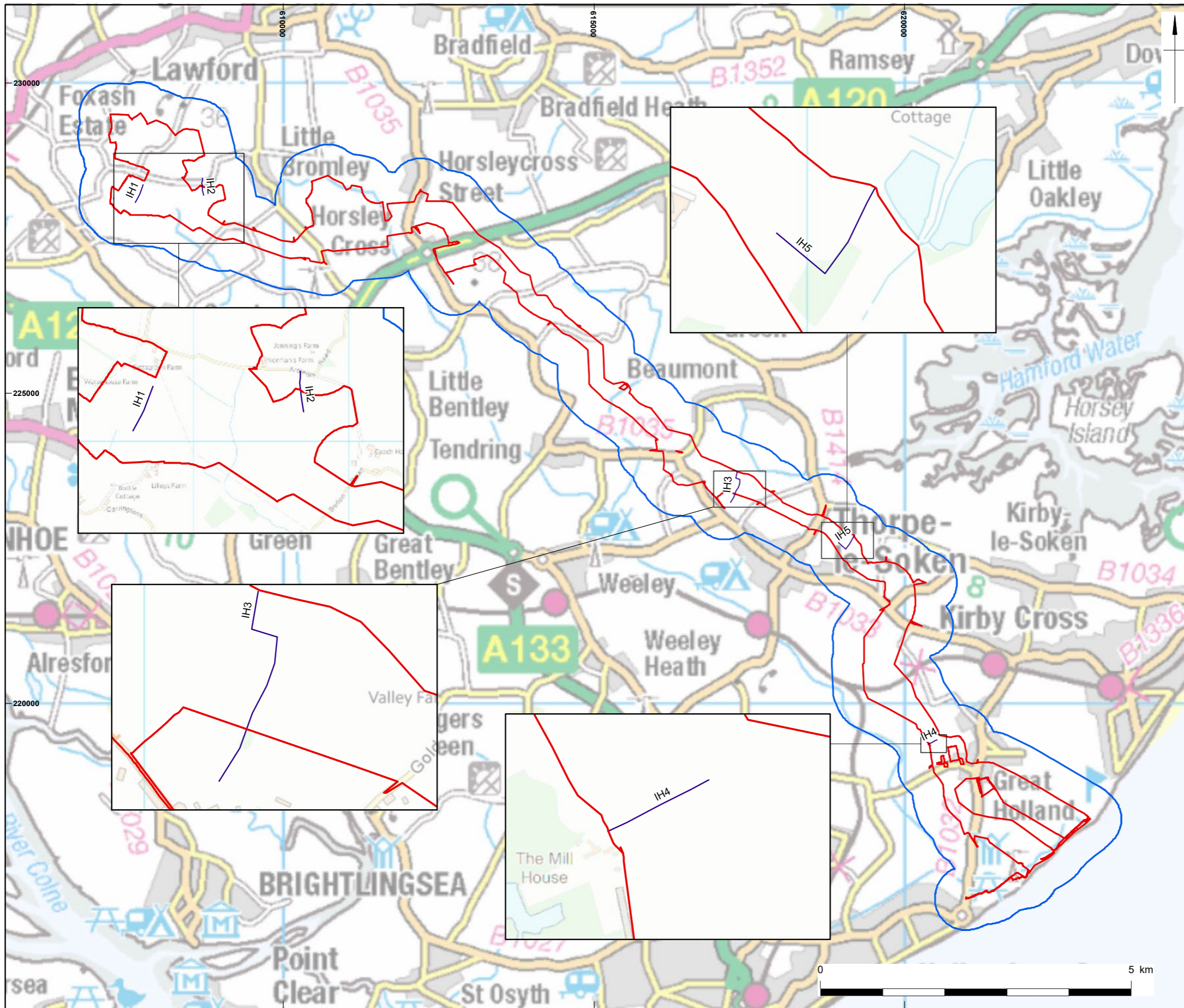
Onshore Red Line Boundary, Study Area, National Mapping Programme Data and Non-designated Heritage Assets


Figure 4K



Onshore Red Line Boundary and Historic Landscape Characterisation

Figure 5





- ▭ Onshore Red Line Boundary
- ▭ Study Area (500m)
- ▭ Potentially Important Hedgerows

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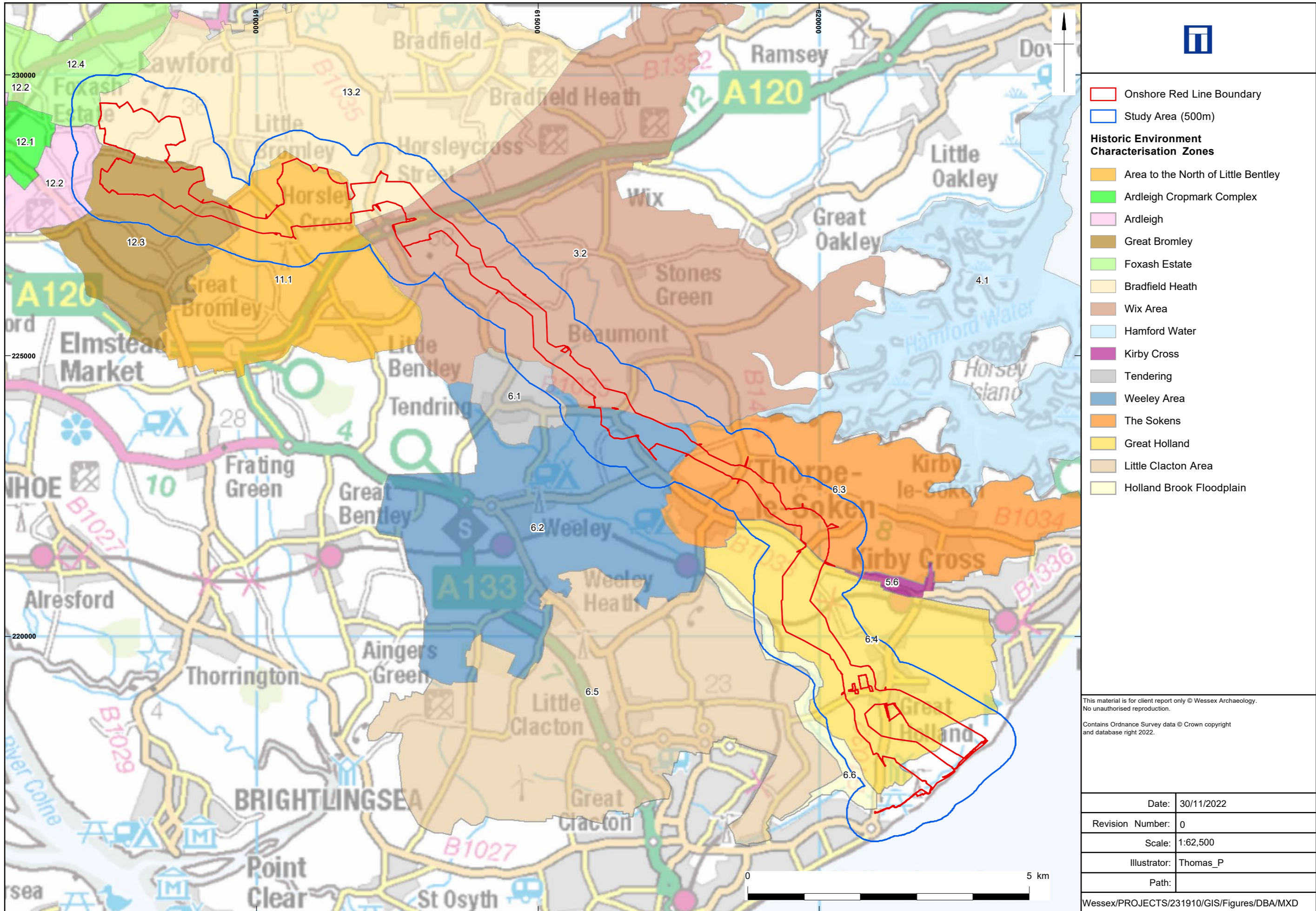
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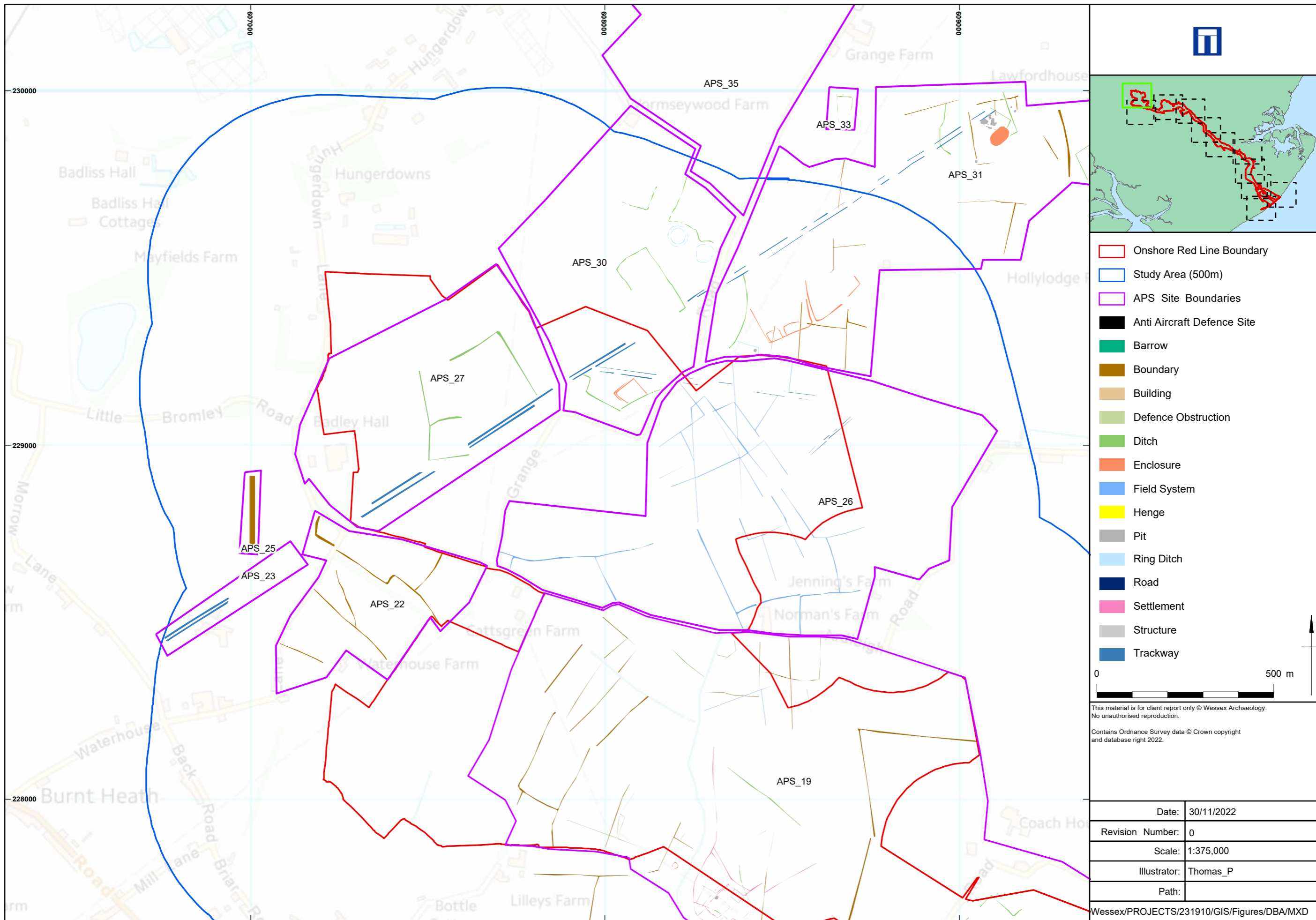
Onshore Red Line Boundary, Study Area and Potentially Important Hedgerows

Figure 6



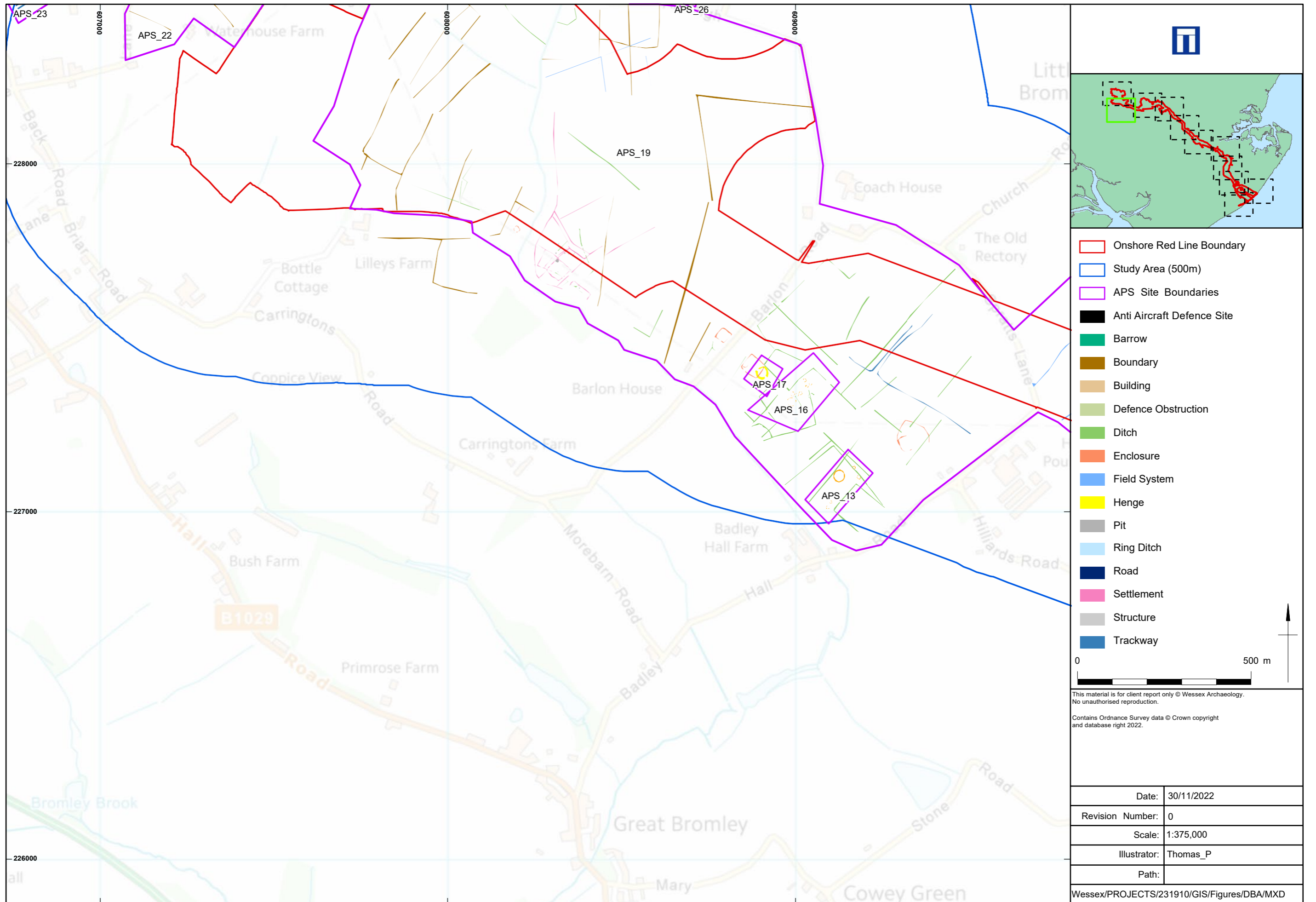
Onshore Red Line Boundary, Study Area and Tendering Historic Environment Characterisation

Figure 7



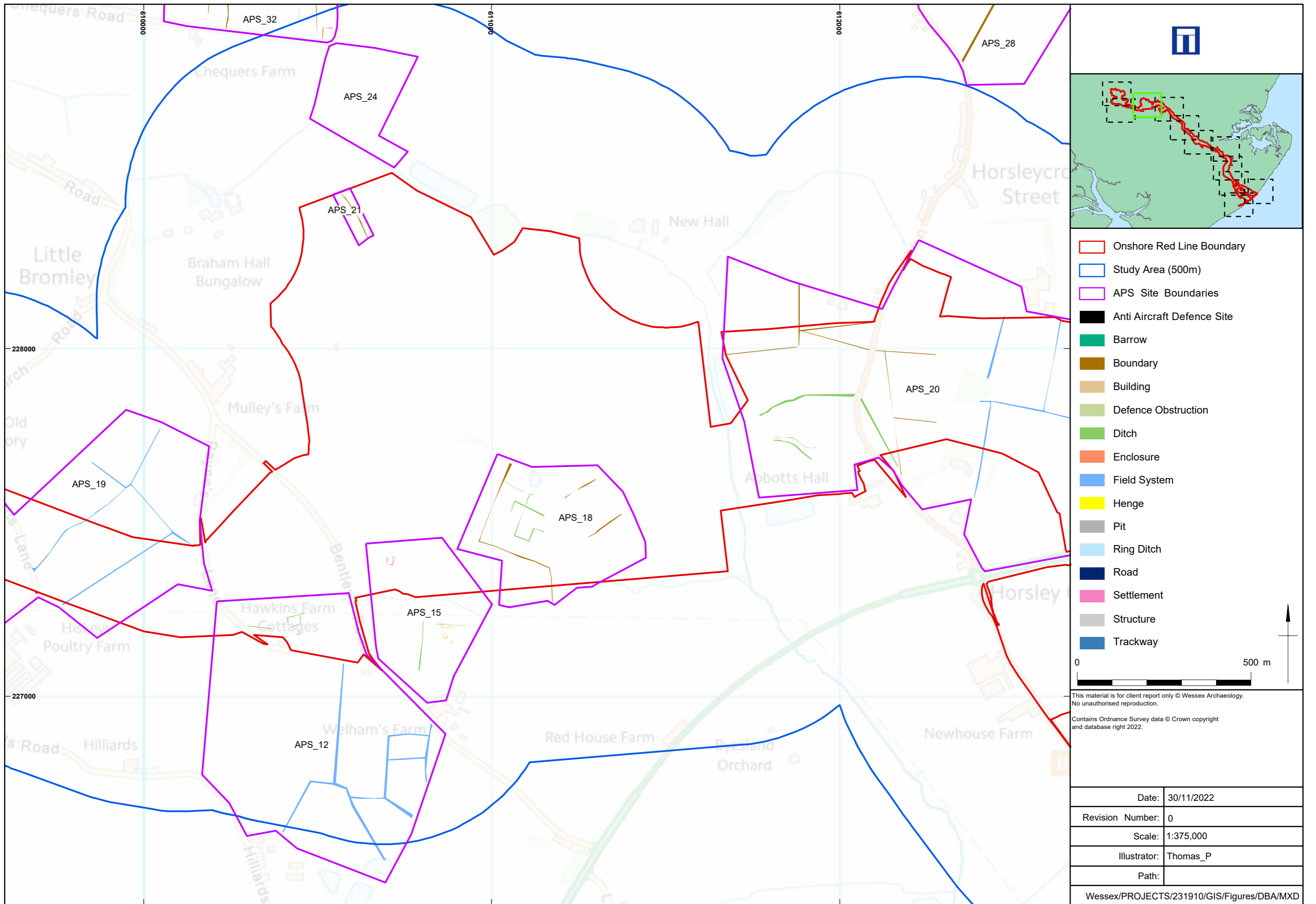
Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)

Figure 8A



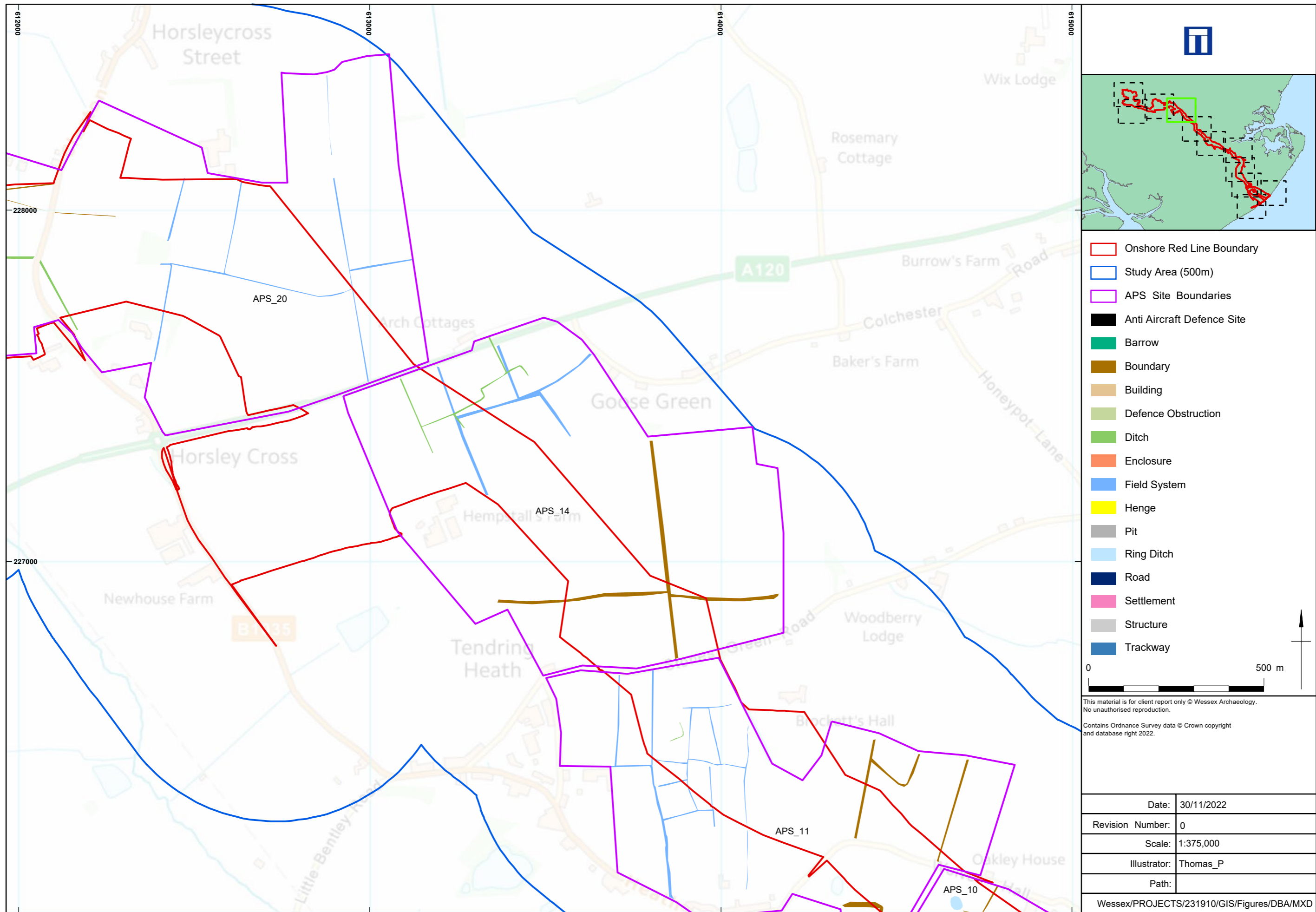
Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)

Figure 8B



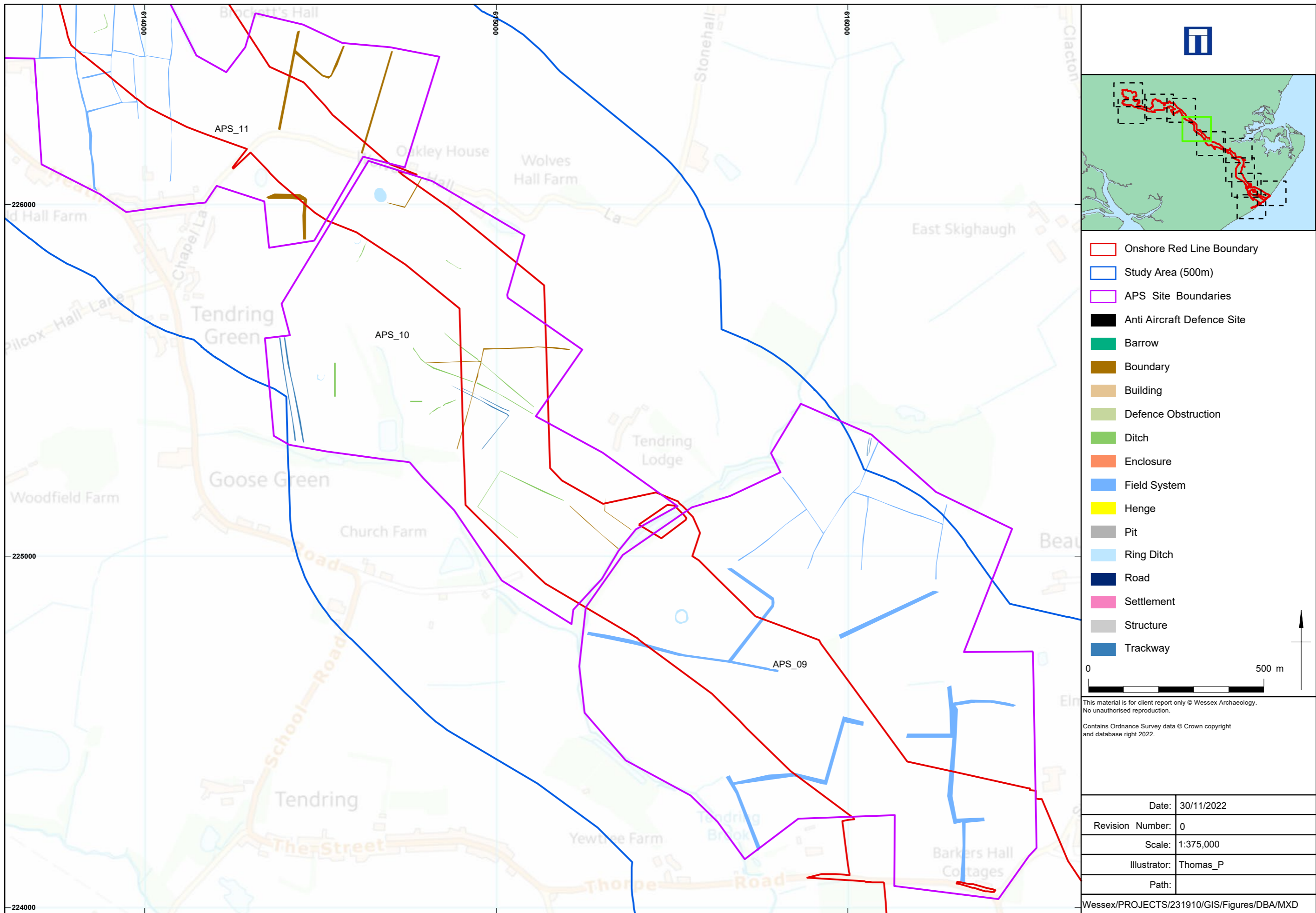
Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)

Figure 8C



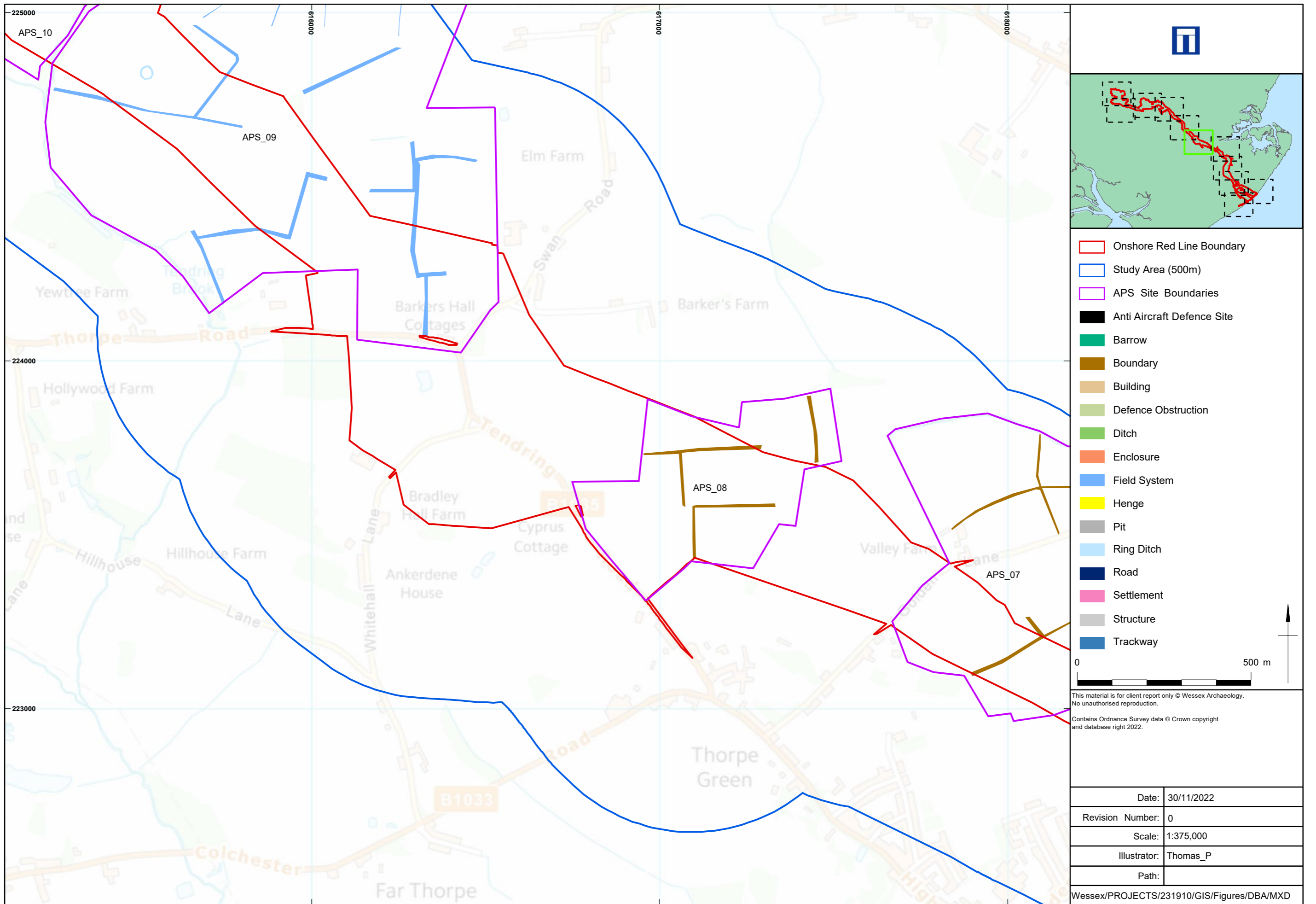
Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)

Figure 8D

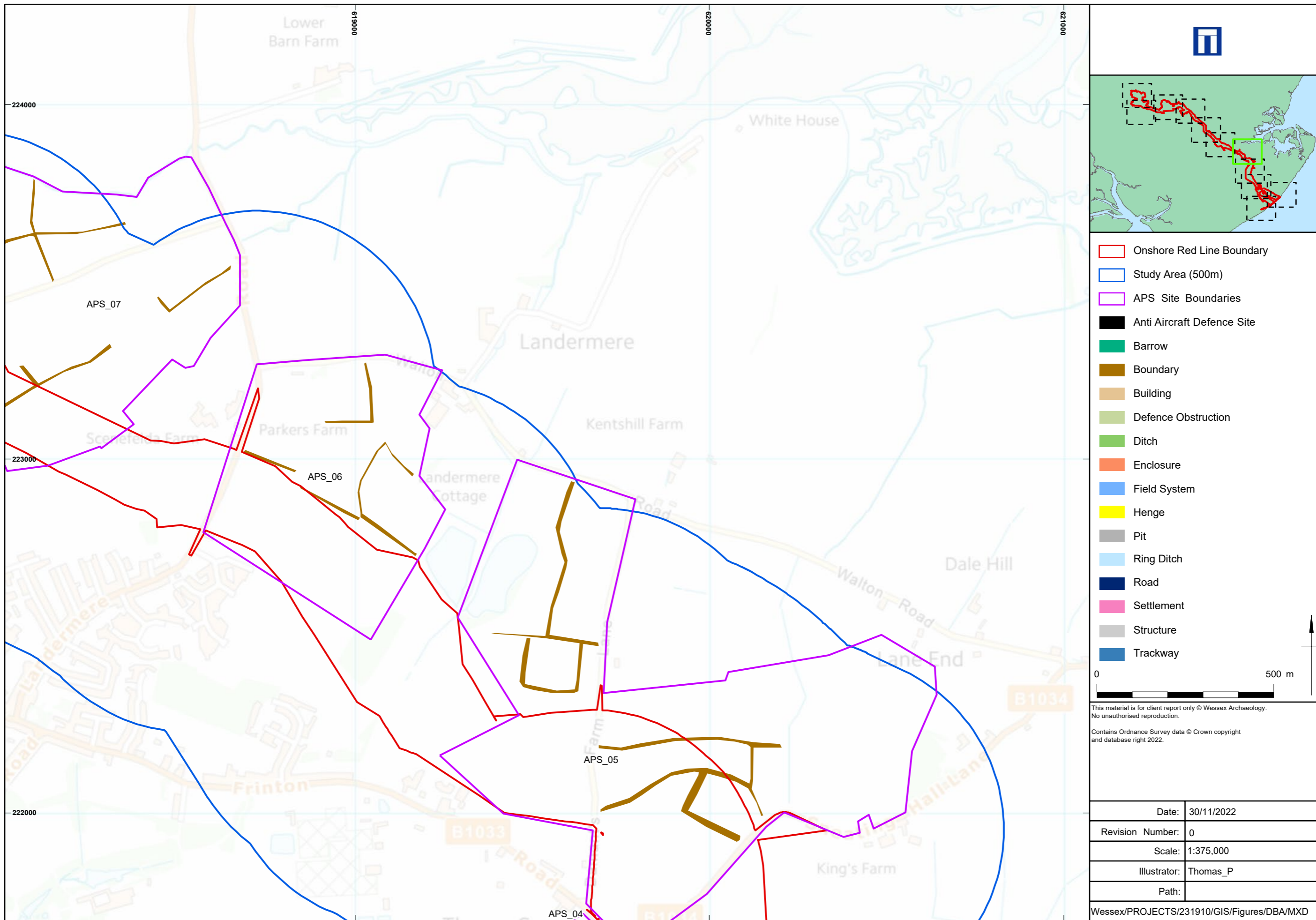


Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)

Figure 8E



Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)



Onshore Red Line Boundary
 Study Area (500m)
 APS Site Boundaries
 Anti Aircraft Defence Site
 Barrow
 Boundary
 Building
 Defence Obstruction
 Ditch
 Enclosure
 Field System
 Henge
 Pit
 Ring Ditch
 Road
 Settlement
 Structure
 Trackway

0 500 m

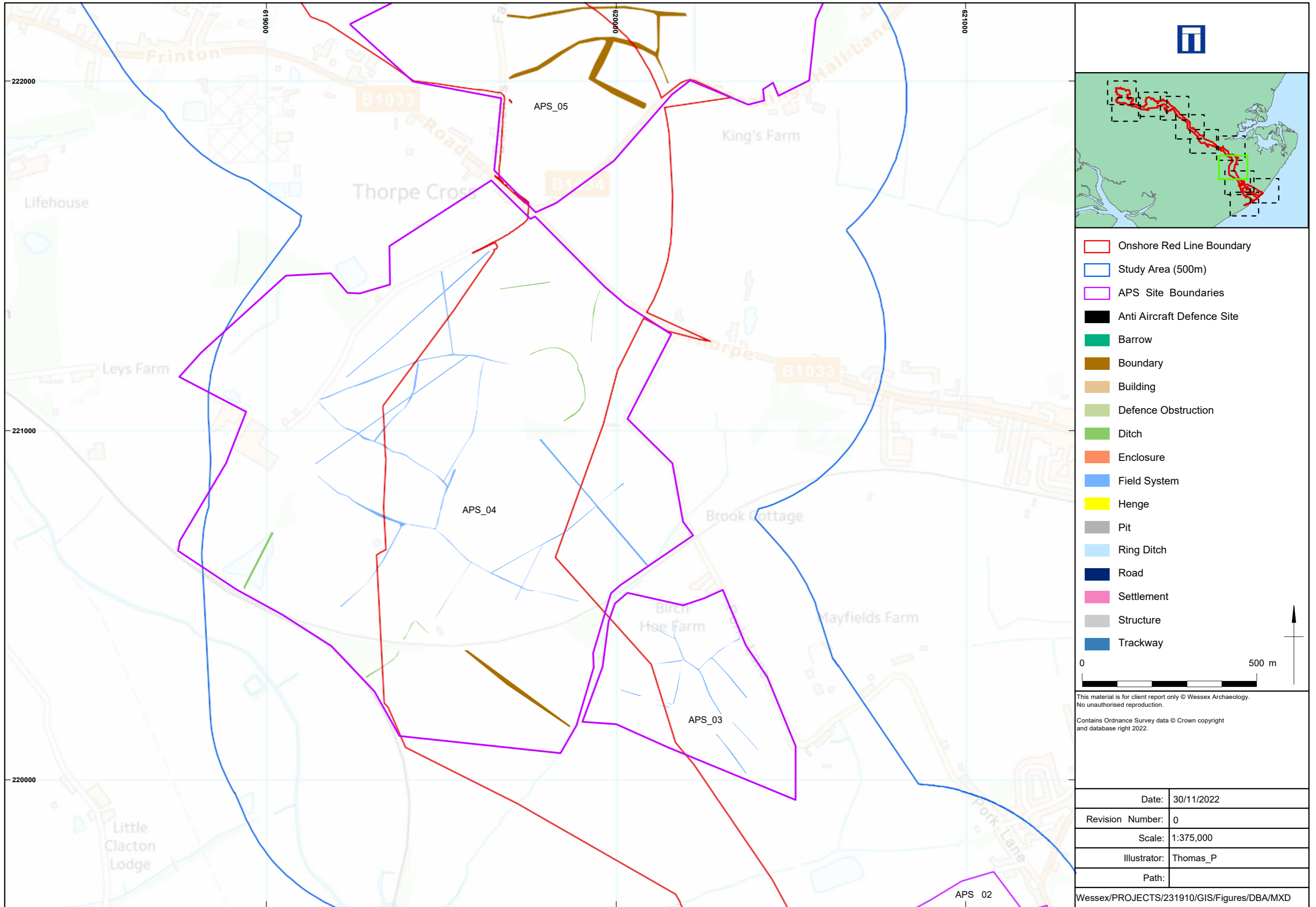
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Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)



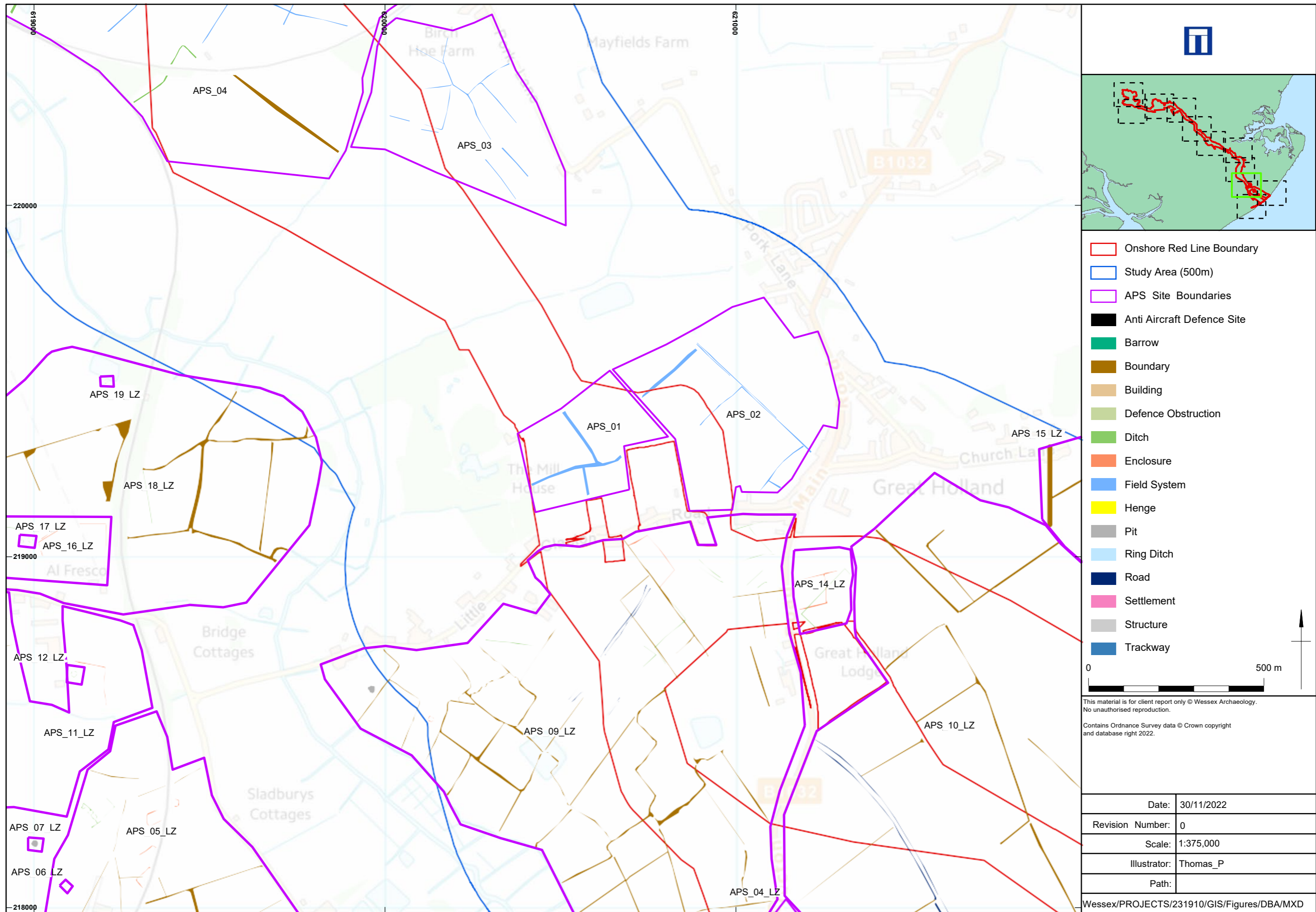
- Onshore Red Line Boundary
- Study Area (500m)
- APS Site Boundaries
- Anti Aircraft Defence Site
- Barrow
- Boundary
- Building
- Defence Obstruction
- Ditch
- Enclosure
- Field System
- Henge
- Pit
- Ring Ditch
- Road
- Settlement
- Structure
- Trackway

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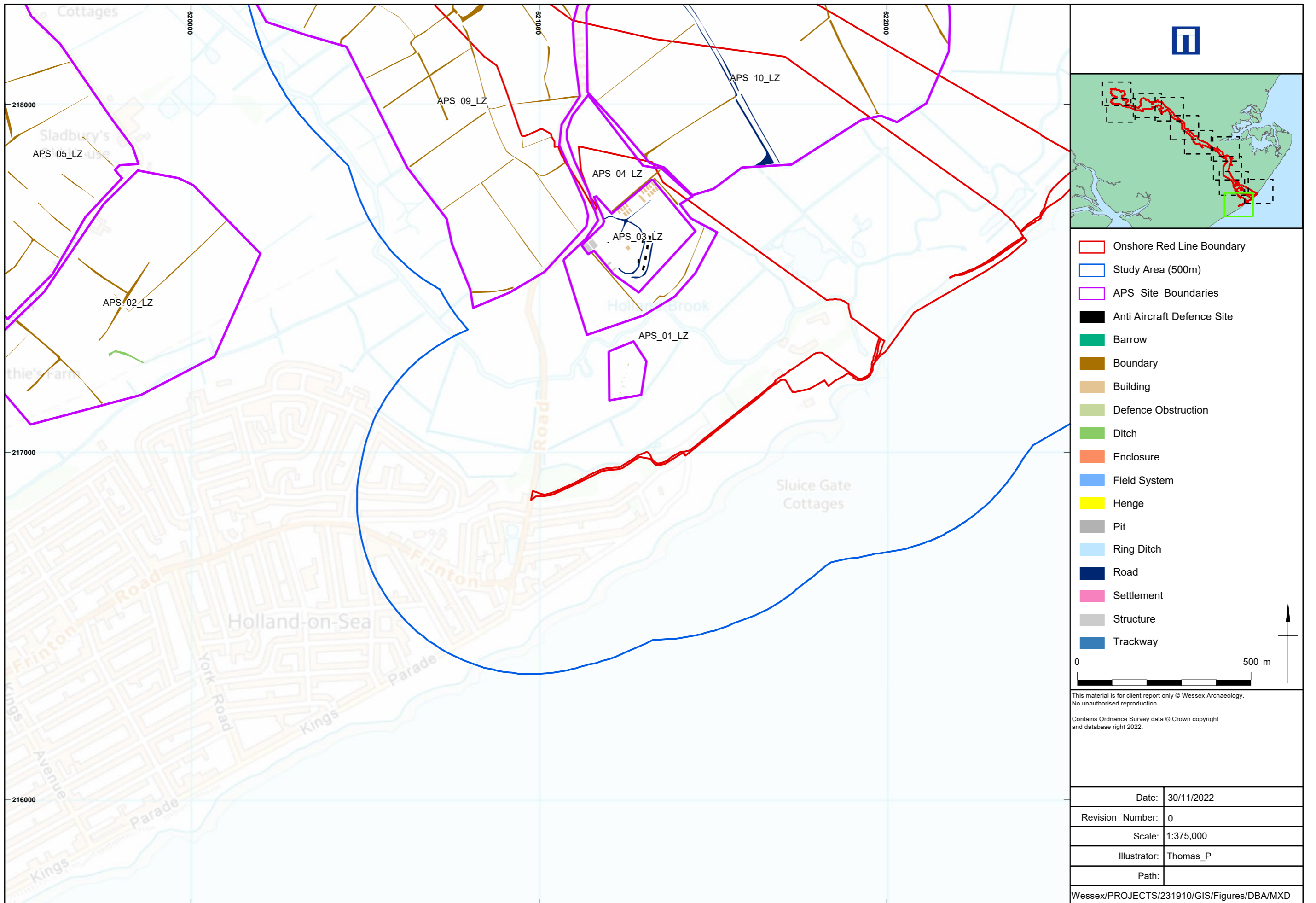
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Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)



Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)

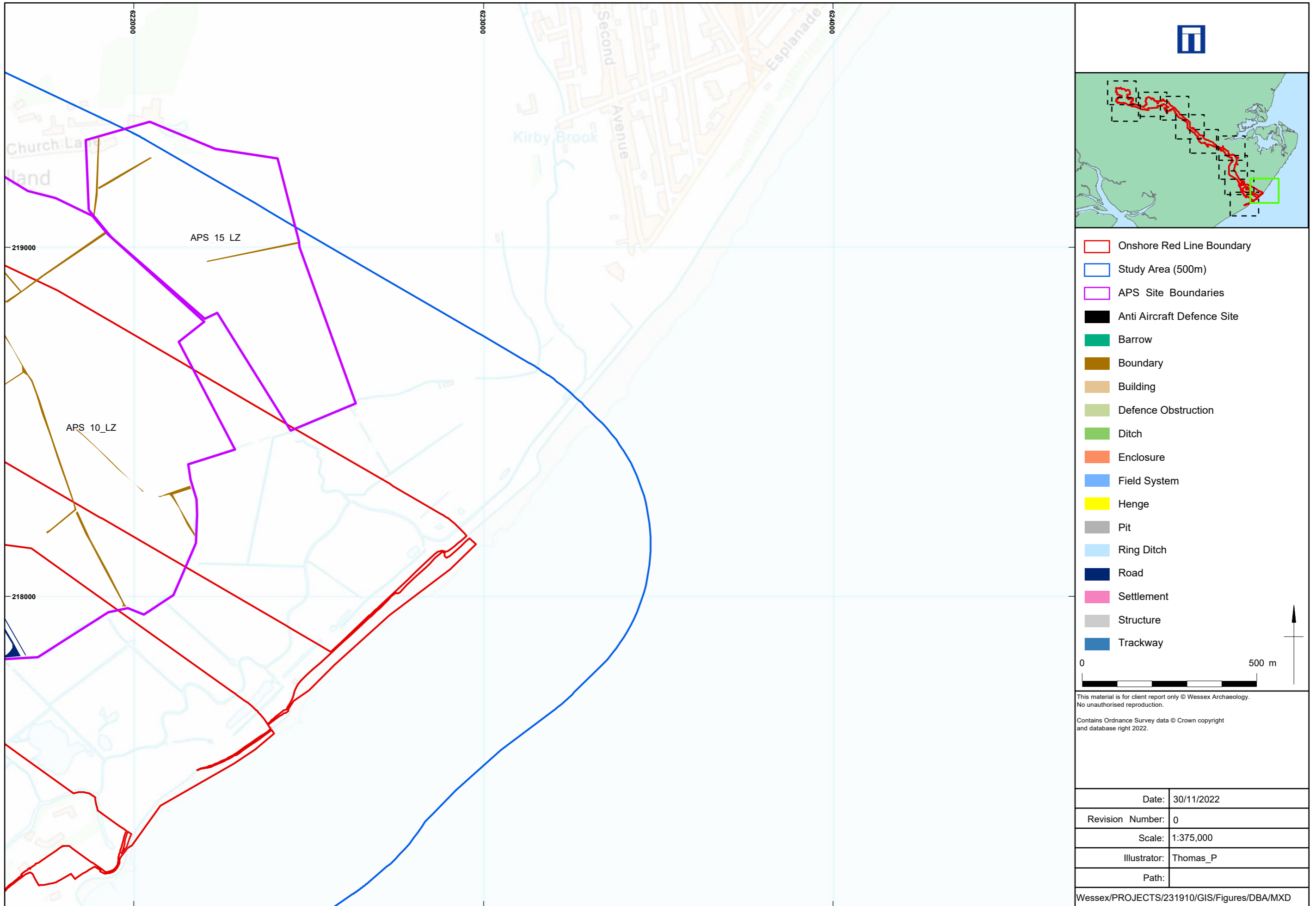


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Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)



Onshore Red Line Boundary, Study Area and Heritage Assets identified from Aerial Imagery by Aerial Photo Services (APS)

Figure 8K



APPENDICES

Appendix 1: Terminology

Glossary

The terminology used in this assessment follows definitions contained within Annex 2 of NPPF:

Archaeological interest	There will be archaeological interest in a heritage asset if it holds, or potentially holds, evidence of past human activity worthy of expert investigation at some point.
Conservation (for heritage policy)	The process of maintaining and managing change to a heritage asset in a way that sustains and, where appropriate, enhances its significance.
Designated heritage asset	A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.
Heritage asset	A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the local planning authority (including local listing).
Historic environment	All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.
Historic environment record	Information services that seek to provide access to comprehensive and dynamic resources relating to the historic environment of a defined geographic area for public benefit and use.
Setting of a heritage asset	The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.
Significance (for heritage policy)	The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting. For World Heritage Sites, the cultural value described within each site's Statement of Outstanding Universal Value forms part of its significance.

Appendix 2: Legislative and planning framework

Designated Heritage Assets

Designation	Associated Legislation	Overview
World Heritage Sites	-	The United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Committee inscribes World Heritage Sites for their Outstanding Universal Value (OUV) – <i>cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity</i> . England protects its World Heritage Sites and their settings, including any buffer zones or equivalent, through the statutory designation process and through the planning system. The National Planning Policy Framework sets out detailed policies for the conservation and enhancement of the historic environment, including World Heritage Sites, through both plan-making and decision-taking.



Designation	Associated Legislation	Overview
Scheduled Monuments and Areas of Archaeological Importance	<i>Ancient Monuments and Archaeological Areas Act 1979</i>	Under the <i>Ancient Monuments and Archaeological Areas Act 1979</i> , the Secretary of State (DCMS) can schedule any site which appears to be of national importance because of its historic, architectural, traditional, artistic or archaeological interest. The historic town centres of Canterbury, Chester, Exeter, Hereford and York have been designated as Archaeological Areas of Importance under Part II of the <i>Ancient Monuments and Archaeological Areas Act 1979</i> . Additional controls are placed upon works affecting Scheduled Monuments and Areas of Archaeological Importance under the Act. The consent of the Secretary of State (DCMS), as advised by Historic England, is required for certain works affecting Scheduled Monuments.
Listed Buildings	<i>Planning (Listed Buildings and Conservation Areas) Act 1990</i>	In England, under Section 1 of the <i>Planning (Listed Buildings and Conservation Areas) Act 1990</i> , the Secretary of State is required to compile lists of buildings of special architectural or historic interest, on advice from English Heritage/Historic England. Works affecting Listed Buildings are subject to additional planning controls administered by Local Planning Authorities. Historic England is a statutory consultee in certain works affecting Listed Buildings. Under certain circumstances, Listed Building Consent is required for works affecting Listed Buildings.
Conservation Areas	<i>Planning (Listed Buildings and Conservation Areas) Act 1990</i>	A Conservation Area is an area which has been designated because of its special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. In most cases, Conservation Areas are designated by Local Planning Authorities. Section 72 (1) of the <i>Planning (Listed Buildings and Conservation Areas) Act 1990</i> requires authorities to have regard to the fact that there is a Conservation Area when exercising any of their functions under the Planning Acts and to pay special attention to the desirability of preserving or enhancing the character or appearance of Conservation Areas. Although a locally administered designation, Conservation Areas may nevertheless be of national importance and significant developments within a Conservation Area are referred to Historic England.
Registered Parks and Gardens and Registered Battlefields	<i>Historic Buildings and Ancient Monuments Act 1953</i> <i>National Heritage Act 1983</i>	The Register of Parks and Gardens was established under the <i>National Heritage Act 1983</i> . The Battlefields Register was established in 1995. Both Registers are administered by Historic England. These designations are non-statutory but are, nevertheless, material considerations in the planning process. Historic England and The Garden's Trust (formerly known as The Garden History Society) are statutory consultees in works affecting Registered Parks and Gardens
Protected Wreck Sites	<i>Protection of Wrecks Act 1973</i>	The <i>Protection of Wrecks Act 1973</i> allows the Secretary of State to designate a restricted area around a wreck to prevent uncontrolled interference. These statutorily protected areas are likely to contain the remains of a vessel, or its contents, which are of historical, artistic or archaeological importance.

National Planning Policy Framework (NPPF)

NPPF Section 16: Conserving and enhancing the historic environment	
Para. 194	In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.
Para. 195	Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.
Para. 197	In determining applications, local planning authorities should take account of:



NPPF Section 16: Conserving and enhancing the historic environment	
	<p>a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;</p> <p>b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and</p> <p>c) the desirability of new development making a positive contribution to local character and distinctiveness.</p>
Para. 199	<p>When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.</p>
Para. 200	<p>Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:</p> <p>a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;</p> <p>b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional⁶⁸.</p> <p>⁶⁸ Non-designated heritage assets of archaeological interest, which are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.</p>
Para. 201	<p>Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:</p> <p>a) the nature of the heritage asset prevents all reasonable uses of the site; and</p> <p>b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and</p> <p>c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and</p> <p>d) the harm or loss is outweighed by the benefit of bringing the site back into use.</p>
Para. 202	<p>Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.</p>
Para. 203	<p>The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.</p>
Para. 205	<p>Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible⁶⁹. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.</p> <p>⁶⁹Copies of evidence should be deposited with the relevant historic environment record, and any archives with a local museum or other public depository.</p>
Para. 206	<p>Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.</p>
Para. 207	<p>Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 195 or less than substantial harm under paragraph 196, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.</p>
Para. 208	<p>Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.</p>



Local Planning Policy

Tendering Local Plan 2022		
PPL 7	Archaeology	<p>Any new development which would affect, or might affect, designated or non-designated archaeological remains will only be considered where accompanied by an appropriate desk-based assessment. Where identified as necessary within that desk-based assessment, a written scheme of investigation including excavation, recording or protection and deposition of archaeological records in a public archive will be required to be submitted to, and approved by, the Local Planning Authority.</p> <p>Proposals for new development affecting a heritage asset of archaeological importance or its setting will only be permitted where it will protect or where appropriate enhance the significance of the asset. Where a proposal will cause harm to the asset, the relevant paragraphs of the NPPF should be applied dependent on the level of the harm caused. Proposals will be treated favourably where they:</p> <ul style="list-style-type: none">a. are explained and justified through an informed assessment and understanding of the significance of the heritage asset (including any contribution made to that significance by its setting); andb. are of a scale, design and use materials and finishes that respect the heritage asset. <p>Within the District the Council keeps a record of scheduled monuments at risk of degradation. The Council will support proposals that protect and enhance heritage assets at risk.</p> <p>Proposals for new development which are not able to demonstrate that known or possible archaeological remains will be suitably protected from loss or harm, or have an appropriate level of recording, will not be permitted.</p> <p>This Policy contributes towards achieving Objective 7 of this Local Plan.</p>
PPL8	Conservation Areas	<p>New development within a designated Conservation Area, or which affects its setting, will only be permitted where it has regard to the desirability of preserving or enhancing the special character and appearance of the area, especially in terms of:</p> <ul style="list-style-type: none">a. scale and design, particularly in relation to neighbouring buildings and spaces;b. materials and finishes, including boundary treatments appropriate to the context;c. hard and soft landscaping;d. the importance of spaces and trees to the character or appearance; ande. any important views into, out of, or within the Conservation Area. <p>Proposals should be explained and justified through an informed assessment and understanding of the significance of the heritage asset (including any contribution made to that significance by its setting).</p> <p>Proposals for new development involving demolition within a designated Conservation Area must demonstrate why they would be acceptable, particularly in terms of the preservation and enhancement of any significance and impact upon the Conservation Area.</p> <p>Where a proposal will cause harm to a Conservation Area, the relevant paragraphs of the NPPF should be applied dependent on the level of harm caused.</p> <p>Within the District the Council keeps a record of conservation areas that are at risk of degradation. The Council will support proposals that protect and enhance the conservation areas at risk.</p> <p>Development should conserve or enhance the significance of the registered parks and gardens (noting that significance may be harmed by development within the setting of an asset).</p> <p>In collaboration with community groups and other interested parties, the Council will consider and support the designation of new Conservation Areas in line with the relevant criteria as set out within the NPPF and legislation. New Conservation Area Management Plans will be prepared in addition to updates to the existing Conservation Area Character Appraisals.</p>



Tendering Local Plan 2022		
		This Policy contributes towards achieving Objective 7 of this Local Plan.
PPL9	Listed Buildings	<p>Proposals for new development affecting a listed building or its setting will only be permitted where they will protect its special architectural or historic interest, its character, appearance and fabric. Where a proposal will cause harm to a listed building, the relevant paragraphs of the NPPF should be applied dependent on the level of harm caused. Proposals will be treated favourably where they:</p> <ul style="list-style-type: none"> A. are explained and justified through an informed assessment and understanding of the significance of the heritage asset (including any contribution made to that significance by its setting); and B. are of a scale, design and use materials and finishes that respect the significance of the listed building (including any contribution made to that significance by its setting). <p>Within the District the Council keeps a record of listed structures and buildings that are at risk of degradation. The Council will support proposals that bring heritage assets into viable use.</p> <p>This Policy contributes towards achieving Objective 7 of this Local Plan</p>

Appendix 3: Gazetteers

Designated Heritage Assets

List Entry	Name	Grade	Easting	Northing
1111418	PAIR OF COTTAGES APPROXIMATELY 10 METRES SOUTH OF THE FOX AND HOUNDS PUBLIC HOUSE	II	610160	227909
1111420	THE OLD RECTORY	II	609480	227760
1111459	JENNING'S FARMHOUSE	II	608808	228552
1111529	LITTLE HOLLAND HALL	II	620876	216690
1111532	GREAT HOLLAND MILL HOUSE	II	620364	219333
1111534	178, THORPE ROAD	II	620695	221158
1111538	WHITE LADIES	II	620528	221162
1112073	NEW HALL	II	619318	223146
1112091	HUNGERDOWNS FARMHOUSE	II	607212	229727
1112107	THORPE GREEN HOUSE	II	616934	223057
1112116	LANDERMERE COTTAGE	II	619465	223014
1112121	BROCKETT'S HALL	II	614228	226641
1147589	MILLINGTON HOUSE	II	616980	223124
1147743	BOUNDS FARMHOUSE	II	607182	229389
1165610	CHURCH OF ALL SAINTS	II*	621918	219356
1165657	MANOR FARMHOUSE	II	621298	219246
1240169	HOLLY TREE COTTAGE	II	612362	228700
1240504	HEMPSTALL'S FARMHOUSE	II	613140	227106
1240608	PEAR TREE COTTAGE	II	612360	228651
1253911	ROSE COTTAGE	II	606777	228257
1261150	ABBOTT'S HALL	II	612137	227594
1265148	HANNAM'S HALL	II	615860	224185
1306598	THATCHED COTTAGE	II	613995	225939



1307196	THORPE PARK FARMHOUSE	II	618860	221082
1308636	PUMP AT REAR, APPROXIMATELY 3 METRES WEST OF JENNING'S FARMHOUSE	II	608799	228556
1317215	BLUE HOUSE FARMHOUSE	II	620576	221189
1317222	HOUSE NOW KNOWN AS RING COTTAGE AND TUDOR COTTAGE TO THE NORTH EAST OF FORMER CHAPEL AND WEST OF TRACK TO NATURE RESERVE	II	620358	219001
1322619	THE OLD VICARAGE	II	617505	222761
1322630	BARKER'S FARMHOUSE	II	617004	224135
1337116	GREAT HOLLAND LODGE	II	621144	218749
1337117	TUDOR COTTAGES	II	621458	219355
1337155	BRAHAM HALL	II	610209	228327
1337174	GROVE FARMHOUSE	II	610076	227820
1337175	CHURCH OF ST MARY	II*	609175	227821
1337190	THE WALNUT TREE	II	607121	227665
1396442	HEATH HOSPITAL	II	613461	226479
	Thorpe-le-Soken	CA	618002	222136
	Great Holland	CA	621799	219364

Non-designated Heritage Assets

HER ID	Site Name	Period	Easting	Northing
3071	Welhams Farm	Prehistoric	610800	227300
2469	North Jenning's Farm	Prehistoric	608700	228900
2357	Holly Lodge	Prehistoric	609000	229000
53850	A Portable Antiquities Scheme findspot of Lower Palaeolithic date.	Palaeolithic	611400	228300
1917	Thorpe le Soken-Bradley Hall Farm	Palaeolithic	616700	223200
1919	Thorpe Green-Bradley Hall Farm	Palaeolithic	616700	223200
17320	Welhams Farm	Palaeolithic	610900	226730
47303	Calves Lane	Palaeolithic	610051	228602
53618	A Portable Antiquities Scheme findspot of Early Mesolithic to Late Mesolithic date.	Mesolithic	609400	227300
1918	Thorpe Green-Bradley Hall Farm	Mesolithic	616700	223200
2812	Great Hall Farm	Neolithic	622000	219000
2814	Near Great Holland	Neolithic	621000	219000
51070	A Portable Antiquities Scheme findspot of Middle Bronze Age to Late Bronze Age date.	Bronze Age	608050	228750
51074	A Portable Antiquities Scheme findspot of Late Bronze Age date.	Bronze Age	610900	228900
51076	A Portable Antiquities Scheme findspot of Late Bronze Age date.	Bronze Age	611300	228800
51077	A Portable Antiquities Scheme findspot of Middle Bronze Age to Late Bronze Age date.	Bronze Age	612600	227800
17485	Harris' Farm	Bronze Age	607905	227601
51130	A Portable Antiquities Scheme findspot of Late Bronze Age to Early Iron Age date.	Bronze Age	621500	219500
2640	North west of Carringtons Farm	Bronze Age	607987	227488
17485	Harris' Farm	Bronze Age	607905	227601
2640	North west of Carringtons Farm	Bronze Age	607987	227488
51089	A Portable Antiquities Scheme findspot of Late Bronze Age date.	Bronze Age	621600	218700
56322	A Portable Antiquities Scheme findspot of Late Iron Age to Early Medieval date.	Iron Age	608800	228100



56331	A Portable Antiquities Scheme findspot of Late Iron Age to Roman date.	Iron Age	609900	227500
51854	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	609700	228100
51855	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	609800	228000
51858	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	609900	227700
51859	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	609900	228100
51860	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	609950	228050
51861	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	610000	227900
51862	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	610000	228000
56325	A Portable Antiquities Scheme findspot of Late Iron Age to Roman date.	Iron Age	609200	227800
56330	A Portable Antiquities Scheme findspot of Late Iron Age date.	Iron Age	609600	227800
56332	A Portable Antiquities Scheme findspot of Late Iron Age to Roman date.	Iron Age	609900	227900
56387	A Portable Antiquities Scheme findspot of Late Iron Age to Roman date.	Iron Age	621500	219500
47597	Land east of Hall Road, Great Bromley	Iron Age	607318	227197
56327	A Portable Antiquities Scheme findspot of Roman date.	Roman	609300	227200
57288	A Portable Antiquities Scheme findspot of Roman date.	Roman	608900	227000
3138	South of Wolfe's Hall Farm	Roman	614800	225400
17110	Grange Road	Roman	608006	229290
2468	Holly Lodge	Roman	608480	229100
57299	A Portable Antiquities Scheme findspot of Roman date.	Roman	619700	221500
17486	North of Cottsgreen Farm	Roman	608602	228855
56298	A Portable Antiquities Scheme findspot of Roman date.	Roman	606800	228700
56326	A Portable Antiquities Scheme findspot of Roman date.	Roman	609200	228900
56333	A Portable Antiquities Scheme findspot of Roman date.	Roman	610100	227800
56339	A Portable Antiquities Scheme findspot of Roman to Early Medieval date.	Roman	611510	228300
56367	A Portable Antiquities Scheme findspot of Roman date.	Roman	617100	224300
3122	South of Great Holland Mill	Roman	620280	219200
2316	Little Bromley Hall	Roman	609200	227900
2631	Extending east-west north of Little Bromley	Roman	609106	229072
17486	North of Cottsgreen Farm	Roman	608602	228855
3128	West of Horsleycross Street	Roman	613748	224715
17110	Grange Road	Roman	608006	229290
47285	Thorpe Cross	Early Medieval	619970	222146
3089	South of Hempstall's Farm	Early Medieval	612969	226820
3162	East of Tendring Lodge	Early Medieval	616020	225185
51324	A Portable Antiquities Scheme findspot of Early Medieval to Medieval date.	Early Medieval	608200	229400
51330	A Portable Antiquities Scheme findspot of Early Medieval date.	Early Medieval	609300	227300
47285	Thorpe Cross	Early Medieval	619970	222146
3162	East of Tendring Lodge	Early Medieval	616020	225185
51163	A Portable Antiquities Scheme findspot of Early Medieval to Medieval date.	Early Medieval	612200	227300



51331	A Portable Antiquities Scheme findspot of Early Medieval to Medieval date.	Early Medieval	609600	227900
51332	A Portable Antiquities Scheme findspot of Early Medieval to Medieval date.	Early Medieval	609900	227900
52899	A Portable Antiquities Scheme findspot of Early Medieval to Medieval date.	Early Medieval	611200	226900
48329	Lodge Lane	Medieval	615318	225100
50910	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	608300	229000
52869	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	608300	228700
52875	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609000	227100
52876	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609200	227400
52880	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609400	227700
52884	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609600	227400
52888	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609700	227600
52895	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	610500	228000
54692	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	609400	227300
54704	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	609900	227500
54707	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	610000	227500
55180	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	610800	227600
17241	Tendring	Medieval	615872	224429
46798	New Hall	Medieval	619173	222782
52966	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	618700	223600
48659	Landing-place on the Gunfleet Estuary, from Park Lane, Frinton	Medieval	619681	219630
46801	Golden Lane	Medieval	618077	223260
52877	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	609300	227900
52879	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609400	226900
52882	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609500	227900
52883	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609600	226900
52885	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609600	227900
52891	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	609900	226800
52892	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	610100	227800
52901	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	611500	228300
52952	A Portable Antiquities Scheme findspot of Medieval to Unknown date.	Medieval	617500	223100
52954	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	617800	223250
52955	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	617800	223300
52957	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	617900	223450
52959	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	618000	223400
53272	A Portable Antiquities Scheme findspot of Medieval date.	Medieval	610400	227800
54706	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	609950	227800
54708	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	610200	227800
54718	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	611900	228300
54770	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	617900	223450
54869	A Portable Antiquities Scheme findspot of Medieval to Unknown date.	Medieval	612400	227300
48661	Landing place on the Gunfleet Estuary, Great Holland	Medieval	620096	219461
2315	Little Bromley Churchyard	Medieval	609180	227825
2377	Saint Mary	Medieval	609170	227810



2378	Saint Mary	Medieval	609180	227825
48658	Former Gunfleet Estuary	Medieval	619498	219458
2983	South of Dairy House Farm	Medieval	620439	218299
3627	South of Great Holland	Medieval	621241	218907
17241	Tendring	Medieval	615872	224429
46801	Golden Lane	Medieval	618077	223260
46798	New Hall	Medieval	619173	222782
48329	Lodge Lane	Medieval	615318	225100
2315	Little Bromley Churchyard	Medieval	609180	227825
2378	Saint Mary	Medieval	609180	227825
16985	Frinton and Walton	Medieval	621424	218190
3627	South of Great Holland	Medieval	621241	218907
48667	Landing-place on the Gunfleet Estuary	Medieval	621676	217817
48668	Landing place, Great Holland Hall, Gunfleet Estuary	Medieval	622233	218814
48669	Landing place at Lower Barn, Gunfleet Estuary	Medieval	622897	218622
52974	A Portable Antiquities Scheme findspot of Medieval to Post Medieval date.	Medieval	620400	218600
50930	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	611900	227800
53734	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Post-medieval	609300	227700
53757	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	611800	228000
54667	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	607800	228600
54670	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	608100	228200
54686	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609200	227400
54689	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609300	227500
54690	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609300	227600
54693	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609400	227600
54694	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609400	227700
54700	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609500	227600
54701	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609500	227700
54705	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609910	227520
54712	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	611300	228300
55181	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	610800	228000
15467	Brick kiln grove at Thorpe-le-Soken	Post-medieval	619071	220771
54752	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	616600	224700
2853	The Mill House	Post-medieval	620387	219306
34293	Knights Farmhouse	Post-medieval	612500	227500
47439	Burnt Heath Mill	Post-medieval	606800	227800
53736	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Post-medieval	609700	228100



54653	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Post-medieval	606900	227800
54657	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	607300	227700
54660	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	607400	227700
54668	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	607900	228000
54677	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	608400	227300
54687	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	609200	227800
54773	A Portable Antiquities Scheme findspot of Post Medieval date.	Post-medieval	618000	223500
3036	North of Damont's Farm	Post-medieval	619587	225248
3142	St John	Post-medieval	612340	228446
2853	The Mill House	Post-medieval	620387	219306
45508	Gravel Wood, Beaumont Estate, Beaumont	Post-medieval	616171	225305
45509	Stonehall Wood, Beaumont Estate, Great Oakley	Post-medieval	615822	225610
15467	Brick kiln grove at Thorpe-le-Soken	Post-medieval	619071	220771
3142	St John	Post-medieval	612340	228446
46609	Martello Tower H, Holland Marsh - site of	Post-medieval	622792	218122
48671	Mr Barton's Pans, Gunfleet Estuary	Post-medieval	622672	217991
54785	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Post-medieval	620400	218600
54787	A Portable Antiquities Scheme findspot of Post Medieval to Unknown date.	Post-medieval	621000	219000
40797	Signpost on B1035 at junction with Swan Lane, Beaumont	Modern	616417	224053
15399	The Firs	Modern	613553	226180
15400	The Limes (Springbank)	Modern	613487	226292
40801	Signpost on B1035 opposite Chapel Lane, Tendring. Heath Road & Pilcox Hall Lane	Modern	614053	225773
21350	Pillbox (destroyed), The Green, Great Holland	Modern	621200	219720
47909	WWI pillbox (destroyed) south of Larges Farm	Modern	621318	219526
15399	The Firs	Modern	613553	226180
15400	The Limes (Springbank)	Modern	613487	226292
40585	69-90 Hungerdown Lane	Modern	607660	230100
19342	WWI landing ground at Beaumont, S of Beaumont Hall	Modern	617841	224054
10044	Pillbox at Holland Haven Country Park	Modern	622000	217440
10045	Pillbox (destroyed) E of Holland Haven Country Park	Modern	622120	217470
10046	Pillbox base at Chevaux de Frise Point	Modern	622430	217680
10047	Pillbox on the sea wall E of Chevaux de Frise Point	Modern	622460	217760
10048	Pillbox on the sea wall at Sandy Point	Modern	622890	218140
10049	Pillbox (destroyed) on the sea wall at Battery Point	Modern	623150	218360
10794	Two pillboxes, Beach Farm, Clacton Road, Great Holland	Modern	621261	217671
16984	'Diver' Site No. K13 (destroyed), Clacton Road, Great Holland	Modern	621242	217524
21357	'Diver' Site No K14 (destroyed), Frinton Golf Course	Modern	623130	218560
17258	Lodge Lane	Undated	614759	224784
17325	Bradfield Lodge	Undated	612868	227750
17327	Tendring Green	Undated	614353	225831



47376	Bradfield Lodge	Undated	612203	227811
48309	Wormseywood Farm	Undated	607875	229903
50925	A Portable Antiquities Scheme findspot of unknown date.	Undated	610700	227900
51867	A Portable Antiquities Scheme findspot of unknown date.	Undated	610800	227600
54699	A Portable Antiquities Scheme findspot of unknown date.	Undated	609500	227300
56451	A Portable Antiquities Scheme findspot of unknown date.	Undated	609200	227400
3148	Hawkins Farm	Undated	610383	227131
3129	West of Dickley Hall	Undated	610785	229020
3130	East of Mulley's Farm	Undated	610718	228036
3131	East of Mulley's Farm	Undated	610794	227186
3132	South of Bradfield Lodge	Undated	612433	227619
3133	South of Bradfield Lodge	Undated	612433	227619
3136	South of Wolve's Hall Farm	Undated	614655	225477
3177	North of Abbott's Hall	Undated	611917	228040
3179	North of Tendring Green	Undated	613975	226368
3189	West of Wolve's Hall Farm	Undated	614729	225909
6558	North east of Braham Hall	Undated	610627	228699
3167	East of Hempstall's Farm	Undated	613358	227257
17112	Grange Road	Undated	608035	229719
2460	South and West of Little Bromley Hall	Undated	608722	227718
2607	Badley Hall	Undated	607511	229229
2668	North of Norman's Farm	Undated	608221	229116
2682	Grange Farm	Undated	608170	229514
2444	Near Riddlesdale Farm	Undated	608828	229485
16986	Frinton and Walton	Undated	620853	219475
17243	Thorpe le Soken	Undated	617039	223467
46193	East Clacton reservoir and pumping station, Pork Lane, Great Holland	Undated	620339	220284
54775	A Portable Antiquities Scheme findspot of unknown date.	Undated	618300	223700
3042	Mill Hill	Undated	615540	224874
3143	East of Thorpe Park	Undated	619462	220759
3159	North West of Thorpe Green	Undated	616690	223524
3160	Near Thorpe Green	Undated	617507	223278
3570	Birch Hoe Farm	Undated	620150	220239
17231	Grove Fruit Farm	Undated	619943	220788
17318	Welhams Farm	Undated	611142	226967
17321	Welhams Farm	Undated	610608	226828
17472	Ardleigh	Undated	607341	228545
48308	Chequers Farm	Undated	610323	228673
50913	A Portable Antiquities Scheme findspot of unknown date.	Undated	609600	226900
51850	A Portable Antiquities Scheme findspot of unknown date.	Undated	609000	228000
51851	A Portable Antiquities Scheme findspot of unknown date.	Undated	609200	227800
51932	A Portable Antiquities Scheme findspot of unknown date.	Undated	610400	227800
52978	A Portable Antiquities Scheme findspot of unknown date.	Undated	621500	219500
54767	A Portable Antiquities Scheme findspot of unknown date.	Undated	617800	223200
2975	South West of Great Holland	Undated	620751	218849
3094	Near Horsley Cross	Undated	612193	227151
3157	Near Thorpe Hall	Undated	619012	221224
3182	North of Tendring Lodge	Undated	615355	225769
3192	South of 'Higher Barn Farm'	Undated	615334	226093
3571	Birch Hoe Farm	Undated	620448	220488
7253	North west of Carringtons Farm	Undated	607987	227488
7413	West of Bradfield Heath	Undated	612340	228200
2408	Old Shields Farm, Ardleigh	Undated	607016	228376



2409	Bounds Farm, Ardleigh	Undated	607028	229547
2410	Bounds Farm, Ardleigh	Undated	607105	229418
2441	East of Harris' Farm	Undated	608220	227730
2461	Cattsgreen Farm	Undated	607863	228411
2471	West of Little Bromley	Undated	609152	228648
2472	West of 'Little Bromley'	Undated	609350	228700
2680	Bromley Cross	Undated	607114	227468
17224	Manor Farm	Undated	621462	218895
2975	South West of Great Holland	Undated	620751	218849
2978	South of Great Holland	Undated	621617	219048
16986	Frinton and Walton	Undated	620853	219475
17231	Grove Fruit Farm	Undated	619943	220788
17243	Thorpe le Soken	Undated	617039	223467
17255	Tendring	Undated	614367	224851
17258	Lodge Lane	Undated	614759	224784
17318	Welhams Farm	Undated	611142	226967
17319	Goose Green	Undated	614282	225223
17320	Welhams Farm	Undated	610900	226730
17321	Welhams Farm	Undated	610608	226828
17322	Chequers Wood	Undated	610444	229036
17325	Bradfield Lodge	Undated	612868	227750
17327	Tendring Green	Undated	614353	225831
17477	East of Wormseywood Farm	Undated	608299	229876
17723	Far Thorpe Green	Undated	615974	222829
17471	Great Bromley	Undated	607245	227222
17472	Ardleigh	Undated	607341	228545
46193	East Clacton reservoir and pumping station, Pork Lane, Great Holland	Undated	620339	220284
47303	Calves Lane	Undated	610051	228602
48308	Chequers Farm	Undated	610323	228673
48309	Wormseywood Farm	Undated	607875	229903
3088	Near Burnt Ash Farm	Undated	613857	227665
3094	Near Horsley Cross	Undated	612193	227151
3108	North of Gravel wood	Undated	616155	225723
3109	Hollywood Farm	Undated	615355	223932
3118	South of Spring Farm	Undated	614680	227317
3119	South of Spring Farm	Undated	614677	227313
3127	West of Horsleycross Street	Undated	611604	228861
3129	West of Dickley Hall	Undated	610785	229020
3130	East of Mulley's Farm	Undated	610718	228036
3131	East of Mulley's Farm	Undated	610794	227186
3132	South of Bradfield Lodge	Undated	612433	227619
3133	South of Bradfield Lodge	Undated	612433	227619
3136	South of Wolve's Hall Farm	Undated	614655	225477
3143	East of Thorpe Park	Undated	619462	220759
3148	Hawkins Farm	Undated	610383	227131
3151	North of Hollywood Farm	Undated	615106	224376
3153	North of Thorpe Park	Undated	619013	221628
3157	Near Thorpe Hall	Undated	619012	221224
3159	North West of Thorpe Green	Undated	616690	223524
3160	Near Thorpe Green	Undated	617507	223278
3161	East of Elm Farm	Undated	617148	224724
3167	East of Hempstall's Farm	Undated	613358	227257
3177	North of Abbott's Hall	Undated	611917	228040



3179	North of Tendring Green	Undated	613975	226368
3182	North of Tendring Lodge	Undated	615355	225769
3188	South west of Beaumont Hall	Undated	617637	224319
3189	West of Wolve's Hall Farm	Undated	614729	225909
3192	South of 'Higher Barn Farm'	Undated	615334	226093
3570	Birch Hoe Farm	Undated	620150	220239
3571	Birch Hoe Farm	Undated	620448	220488
3660	Near Thorpe Park	Undated	618776	220885
6558	North east of Braham Hall	Undated	610627	228699
7253	North west of Carringtons Farm	Undated	607987	227488
8917	Cropmarks near Dale Hill Cottages, Thorpe-le-Soken	Undated	620423	222485
17115	Whitehall Lane	Undated	616033	223242
2363	East of Great Bromley	Undated	609487	226770
2408	Old Shields Farm, Ardleigh	Undated	607016	228376
2409	Bounds Farm, Ardleigh	Undated	607028	229547
2410	Bounds Farm, Ardleigh	Undated	607105	229418
2444	Near Riddlesdale Farm	Undated	608828	229485
2457	Badley Hall	Undated	608487	227085
2460	South and West of Little Bromley Hall	Undated	608722	227718
2461	Cattsgreen Farm	Undated	607863	228411
2471	West of Little Bromley	Undated	609152	228648
2499	Longcover Wood, Bluegates Farm Estate, Great Bromley	Undated	607777	226940
2607	Badley Hall	Undated	607511	229229
2652	Area to east of Ardleigh	Undated	606602	228964
2680	Bromley Cross	Undated	607114	227468
2731	Foxash Estate	Undated	607769	230168
49176	Rose Hill Quarry, Thorpe Le Soken	Undated	618905	221423
3042	Mill Hill	Undated	615540	224874
17257	School Road	Undated	614532	224460
47376	Bradfield Lodge	Undated	612203	227811
3141	South of Bradfield Heath	Undated	613248	228751
17108	Crossman's Farm	Undated	613762	228206
17112	Grange Road	Undated	608035	229719
2668	North of Norman's Farm	Undated	608221	229116
2682	Grange Farm	Undated	608170	229514
17224	Manor Farm	Undated	621462	218895
2978	South of Great Holland	Undated	621617	219048
3362	Great Holland	Undated	621000	219000



Plate 1) View over the Holland Haven Marshes Site of Special Scientific Interest (SSSI), facing northeast



Plate 2) View over Frinton Golf Course, facing northeast


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Plate 3) View along the sea wall from the sea wall, facing northeast



Plate 4) View over the foreshore area located within the Landfall Zone, facing north-east


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Plate 5) Example of ground conditions in the northern half of the Landfall Zone south-east of Great Holland, facing south



Plate 6) Example of ground conditions in the northern half of the Landfall Zone south-west of Great Holland, facing south


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Plate 7) Example of ground conditions within the Onshore ECC area north of Thorpe Cross, facing northwest



Plate 8) Example of ground conditions within the Onshore ECC area south of Thorpe Cross, facing south


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Plate 9) Example of ground conditions within the Onshore ECC area north of Thorpe-le-Soken, facing southeast



Plate 10) View of woodland located within the Onshore ECC area north of Thorpe Cross, facing west


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Plate 11) Example of ground conditions within the Onshore ECC area east of Bakers Hall Cottages, facing southeast



Plate 12) Example of ground conditions within the Onshore ECC area north of Bakers Hall Cottages, facing east


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Plate 13) Example of ground conditions within the Onshore ECC area east of Tendring Green, facing southwest



Plate 14) Example of ground conditions within the Onshore ECC area north of Tendring Green, facing southwest


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Plate 15) Example of ground conditions within SSA East southeast of Little Bromley



Plate 16) View of the former Mulberry Farm located within SSA East southeast of Little Bromley


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Plate 17) Example of ground conditions within the Onshore ECC area south of The Church of St Mary (NHLE entry 1337175)



Plate 18) Example of ground conditions within the southern section of SSA West


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Plate 19) Extant remains of Cattsgreen Farm within the southern section of SSA West



Plate 20) Example of ground conditions within the northern section of SSA West


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Plate 21) Example of ground conditions within the northern section of SSA West



Plate 22) View towards the possible medieval well, facing northeast



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Plate 23) View of pillbox EHER ID 10044



Plate 24) View of pillbox EHER ID 10048

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Appendix 4: APS reports (2022)



AIR PHOTO SERVICES

Archaeology • Research • Law • Environment • Planning

North Falls

Offshore Windfarm

Onshore Project Components

Scoping Report:

Assessment of Aerial Imagery for Archaeology

Report: APS 221 05 02

September 2021

NORTH FALLS OFFSHORE WINDFARM
 ONSHORE PROJECT COMPONENTS
 Assessment of Aerial Imagery for Archaeology

Client	Royal Haskoning DHV on behalf of North Falls Offshore Windfarm Limited (NFOW)
Client Project Reference	PB9244
Local Authority	Tendring District Council
Air Photo Services Document	221 05 01 - 01
Air Photo Services Project Number	221 05 01
Site centre National Grid Reference (NGR)	TM 208180
Co-ordinates	620855,218000

Report Status	FINAL
Issue date	2021 09 08
Report prepared by	Chris Cox MA MCIfA FSA, Adam Jarvis ACIfA
Interpretation and Mapping prepared by	Adam Jarvis ACIfA
QA checked by	Chris Cox MA MCIfA FSA (interpretation and mapping) and Nereide Gilhead ACCA Affil. CIfA (report)

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Tables

Table 1	Summary of sites within the Landfall search area
Table 2	Sites identified within the site from aerial photographs, satellite imagery and visualised LiDAR data
Table 3	LiDAR tiles processed

Glossary of abbreviations

APS	Air Photo Services Ltd
ArcGIS	Artificial Intelligence Geographic Information System
ASCII	American Standard Code for Information Interchange
CRS	Coordinate Reference System
CSV	Comma Separated Value file
CUCAP	Cambridge University Collection of Aerial Photography
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
DXF	Drawing Exchange Format
EA	Environment Agency
EPSG	European Petroleum Survey Group
GIS	Geographic Information System
EHHER	Essex Historic Environment Record
ERO	Essex Records Office
LiDAR	Light Detection And Ranging
NA	The National Archives
NFOW	North Falls Offshore Windfarm Ltd
NGR	National Grid Reference
NLP	National LiDAR Programme
NMP	(Historic England) National Mapping Programme
OS	Ordnance Survey
MonUID	EHHER site reference
QGIS	Quantum Geographic Information System
RVT	Relief Visualisation Toolbox
SLRM	Simple Local Relief Model
WWII	World War Two (1939 – 1945)

Summary

- S1. Air Photo Services Ltd (APS) was commissioned to undertake an assessment of airborne remote sensing and satellite imagery data alongside historic map regression analysis, as a scoping procedure for the Onshore Scoping Area (hereafter referred to as 'the Site') for the North Falls Offshore Wind Farm.
- S2. The site lies to the east of the Essex coast between Clacton-on-Sea and Frinton-on-Sea and is shown on **Figure 1**.
- S3. This report represents the work undertaken by APS between May and July 2021.
- S4. The object of this assessment was to provide information on the location and nature of buried and upstanding archaeological features which are visible on historic aerial photographs, modern aerial and satellite imagery and visualised Airborne Laser Scan (ALS) which is also known as Light Detection And Ranging (LiDAR) data to assess the topographic and micro topographic features within the Site.
- S5. Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates. Features dating to the prehistoric, medieval, Post Medieval and modern periods have been identified and mapped. Some of these features have been previously identified by the Essex Historic Environment Record (EHER) and Essex National Mapping Programme (ENMP) survey.
- S6. The assessment identified 19 areas of archaeological interest which are detailed below in **Table 1**.

Table 1: Summary of sites within the Landfall search area

APS_Site	Asset type	Condition on last recorded data source	Period	EHF MonUID
APS_01	Pits, possibly minefield	Levelled, grassmark	WWII	MEX49906
APS_02	Field system	Levelled, cropmark	Post Medieval	MEX10602 MEX1031371
APS_03	Anti-Aircraft defence site	Former structure, now levelled, crop and grassmark	WWII	MEX1031358
APS_04	Field system	Levelled, cropmark	Post Medieval	
APS_05	Field System, settlement features (enclosures) and ring ditches	Levelled, cropmark	Prehistoric – Post Medieval	MEX10628 MEX1031371
APS_06	Round barrow	Levelled, cropmark	Prehistoric	MEX10628
APS_07	Pit	Levelled, cropmark	Unknown, possible prehistoric (Bronze Age)	MEX10628

APS_Site	Asset type	Condition on last recorded data source	Period	EHHER MonUID
APS_08	Square Enclosure	Levelled, cropmark	Medieval	MEX1031368
APS_09	Field System, trackway, boundaries	Levelled, cropmark	Prehistoric/unknown overlain by Post Medieval fields	MEX10655 MEX10609
APS_10	Field System, track	Levelled, cropmark	Post Medieval/Modern	MEX1031361
APS_11	Field System	Levelled, cropmark	Post Medieval	MEX10636 MEX1031368
APS_12	Round barrow	Levelled, cropmark	Prehistoric	MEX10636
APS_13	Ring ditch, likely round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10636

APS_Site	Asset type	Condition on last recorded data source	Period	EHHER MonUID
APS_14	Field system, square enclosure	Levelled, cropmark	Post Medieval	MEX13203
APS_15	Field system	Residual earthwork via LiDAR data	Post Medieval	
APS_16	Ditches, possible buried settlement	Levelled, cropmark	Medieval/Modern	MEX10618
APS_17	Round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10618
APS_18	Field system	Residual earthwork <i>via</i> LiDAR data	Medieval/Modern	
APS_19	Ring ditch	Levelled, cropmark	Possible prehistoric (Bronze Age)	

S7. Map regression analysis shows that the landscape within the site is one of established smaller rural fields, and in the coastal hinterland has been under arable cultivation, with drained land and marshes flanking the coast and Holland Brook. The small hamlets, farms and settlements have been stably present, and the settlements at

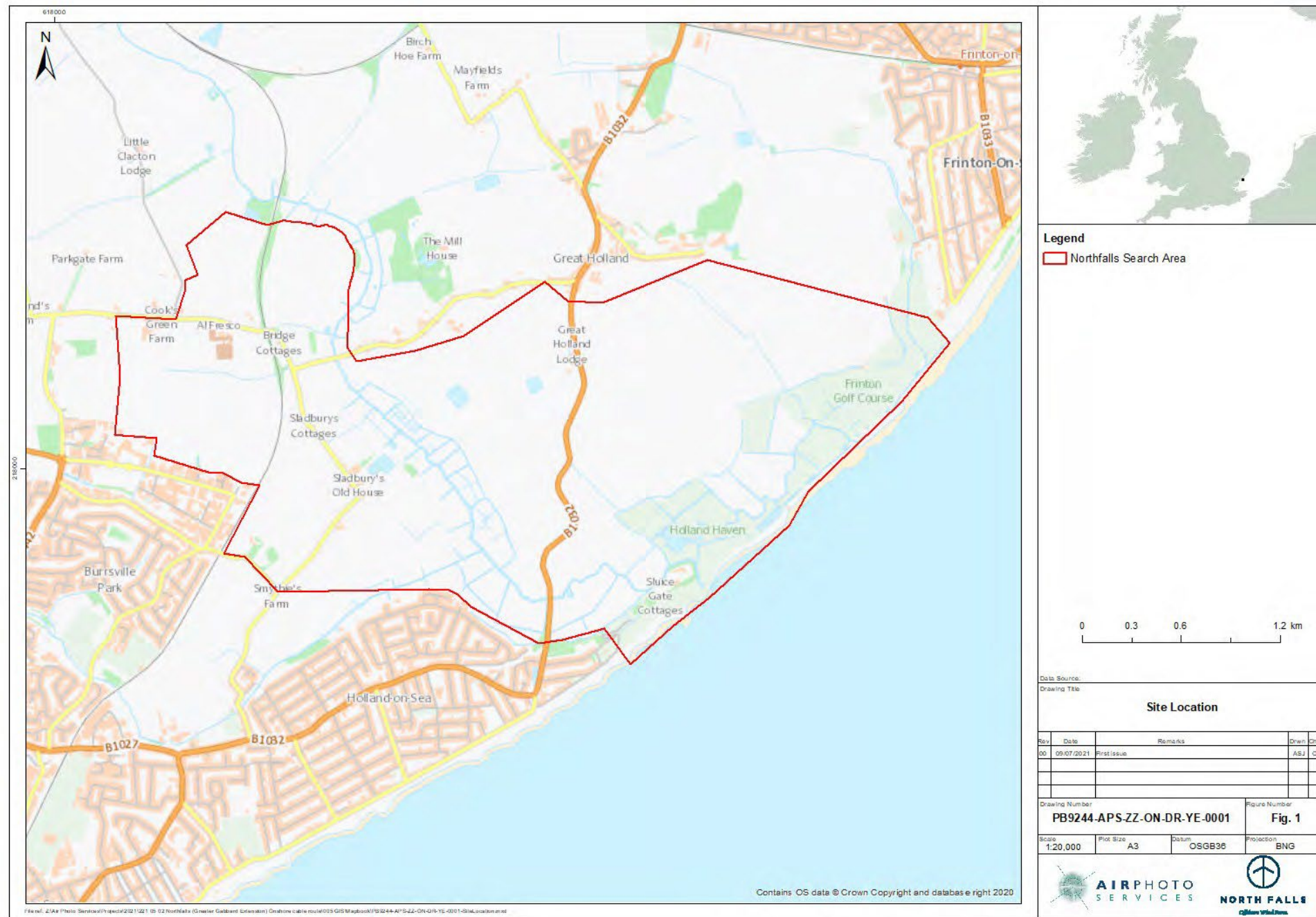
Bursville Park and Holland-on-Sea to the south of the area have developed since the 1960s.

- S8. After 1967, the landscape began to open-up with the removal of large areas of Post Medieval field boundaries which changed the rural environment that had been established following land enclosure, making the way for modern mechanised agricultural cultivation methods.
- S9. The later coloured Ordnance Survey (OS) maps indicate the hydrological features graphically, showing the drainage and character of this coastal hinterland area.

1. Introduction, aims and objectives

- 1.1. Air Photo Services Ltd (APS) was commissioned to undertake an assessment of airborne remote sensing and satellite imagery data alongside historic map regression analysis, as a scoping procedure for the Onshore Scoping Area (hereafter referred to as 'the Site') for the North Falls Offshore Wind Farm.
- 1.2. The Site lies to the east of the Essex coast between Clacton-on-Sea and Frinton-on-Sea and is shown on **Figure 1**.
- 1.3. This scoping report represents the work undertaken by APS between May and July 2021.
- 1.4. The object of this assessment was to provide information on the location and nature of buried and upstanding archaeological features which are visible on historic aerial photographs, modern aerial and satellite imagery and visualised Airborne Laser Scan (ALS) which is also known as Light Detection and Ranging (LiDAR) data to assess the topographic and micro topographic features within the Site.

Figure 1 Site location



Aims and objectives

- 1.5. The aim of this scoping report was to provide information on the location and nature of buried and upstanding archaeological features visible on historic aerial photographs, modern aerial and satellite imagery and visualised LiDAR data to assess the buried, topographic and micro topographic features within the Site.
- 1.6. The analysis aimed to assess the present level of preservation of the buried historic landscape in the study area. This was assessed in respect of the considerable landscape change wrought by intense arable farming over much of the Site to the west of the coast.
- 1.7. The objective of this report is to identify the potential for heritage asset presence and preservation through the assessment of aerial imagery, LiDAR data and map regression analysis.

2. Sources of data

2.1. The **Appendix** to this report details:

- The data sources which were consulted, and their metadata as appropriate;
- Methodologies employed; and
- Conclusions drawn from the data acquisition and processing.

2.2. In summary, the assessment systematically examined the following sources of data:

- Historic and modern aerial photographs *via* online sources;
- Satellite imagery *via* online sources;
- Specialist oblique, military oblique and vertical aerial photographs held at the Historic England Archive in Swindon, under enquiry number 128957, the locations of which are shown on **Figure 2**;
- Online search of the Cambridge University Collection of Aerial Photographs (CUCAP) database at <https://www.cambridgeairphotos.com/map/> which generates a Comma Separated Value file (CSV) file showing the locations of vertical and oblique aerial photographic surveys and site targets which are shown on **Figure 3**. This collection remains in long term closure during its digitisation in Cambridge and it is not possible to see any of the actual images at the time of writing. However, these images have been examined by the Essex National Mapping Programme (NMP) Tendring Extension project;
- Oblique aerial photographs taken during the course of specialist surveys by Helen Saunders at Essex Council, which were provided digitally as high quality scans. The locations of these obliques are shown on **Figure 4**;
- Search data as Shape (SHP) and Portable Document Format (PDF) files from the Essex Historic Environment Record (EHER);
- Department for Environment, Food and Rural Affairs (DEFRA) georeferenced digital aerial imagery data were consulted, and the location of this aerial imagery layer is shown on **Figure 5**;

- The Essex National Mapping Programme (NMP) was used as baseline data (Ingle and Saunders 2003), and covers the whole of the Site. This project was an early NMP, begun in 1993, and interpretation continued to 2017 with the Tendring Enhancement add-on to the original data;
- Environment Agency (EA) and National LiDAR Programme (NLP) LiDAR data were available as shown at **Figure 6**, and were captured in 1999 (2m resolution), and then at 1m resolution in 2010, 2016, 2017, 2018 (NLP) and 2020;
- Enclosure Maps were not available for consultation in the Essex Records Office (ERO) during the timescale of this assessment.
- The Little Clacton Tithe map was made available as an exception to current large document availability rules, by the Essex Records Office, and was consulted alongside large scale vertical aerial photographs taken in 1945, at the ERO;
- The Great Holland Tithe map will be added to the records in due course to complete the map regression; and
- Envirocheck digital Historical Map reports.

Figure 2 Historic England aerial photograph coverage

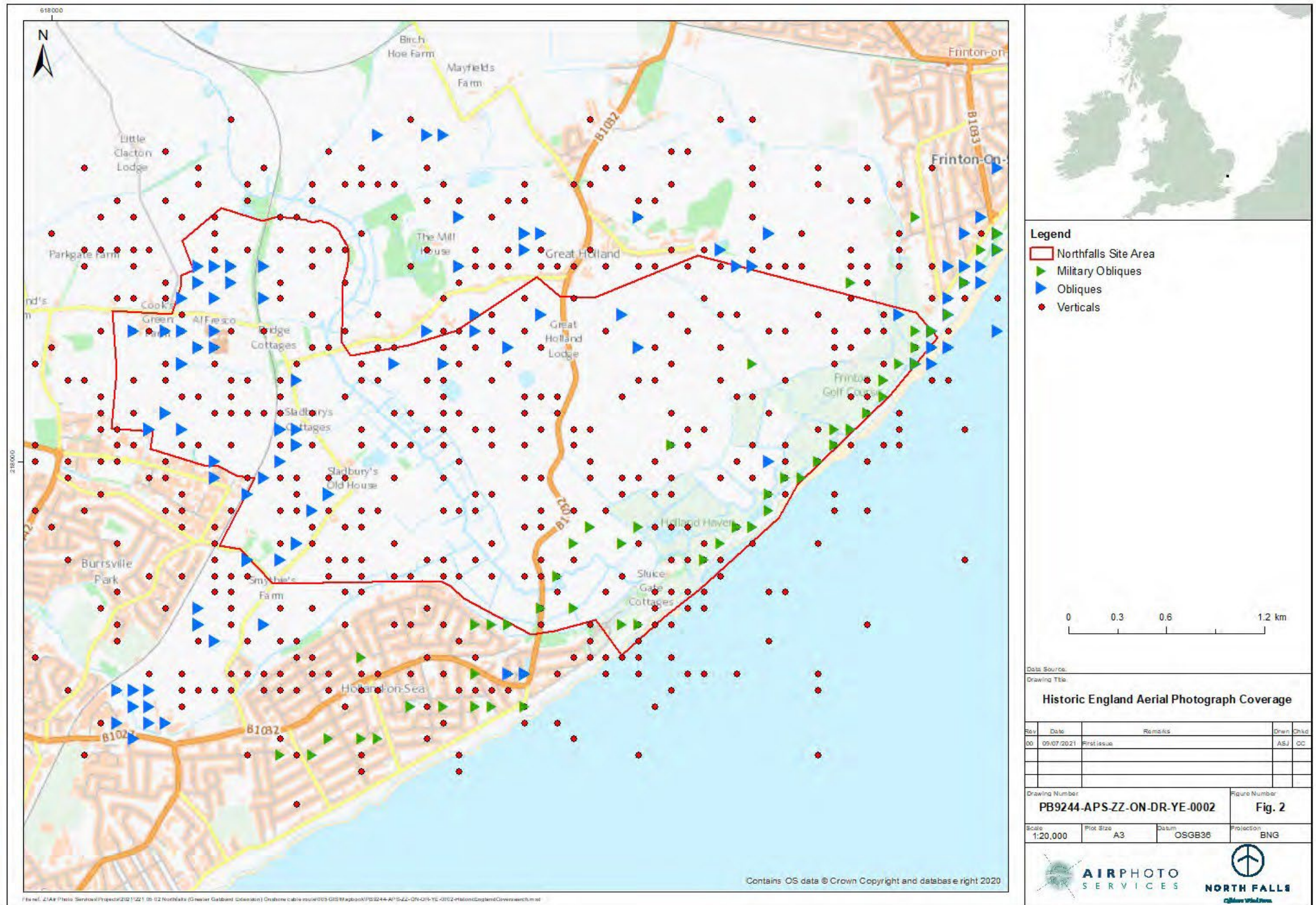


Figure 3 Cambridge University Collection of Aerial Photographs (CUCAP) coverage

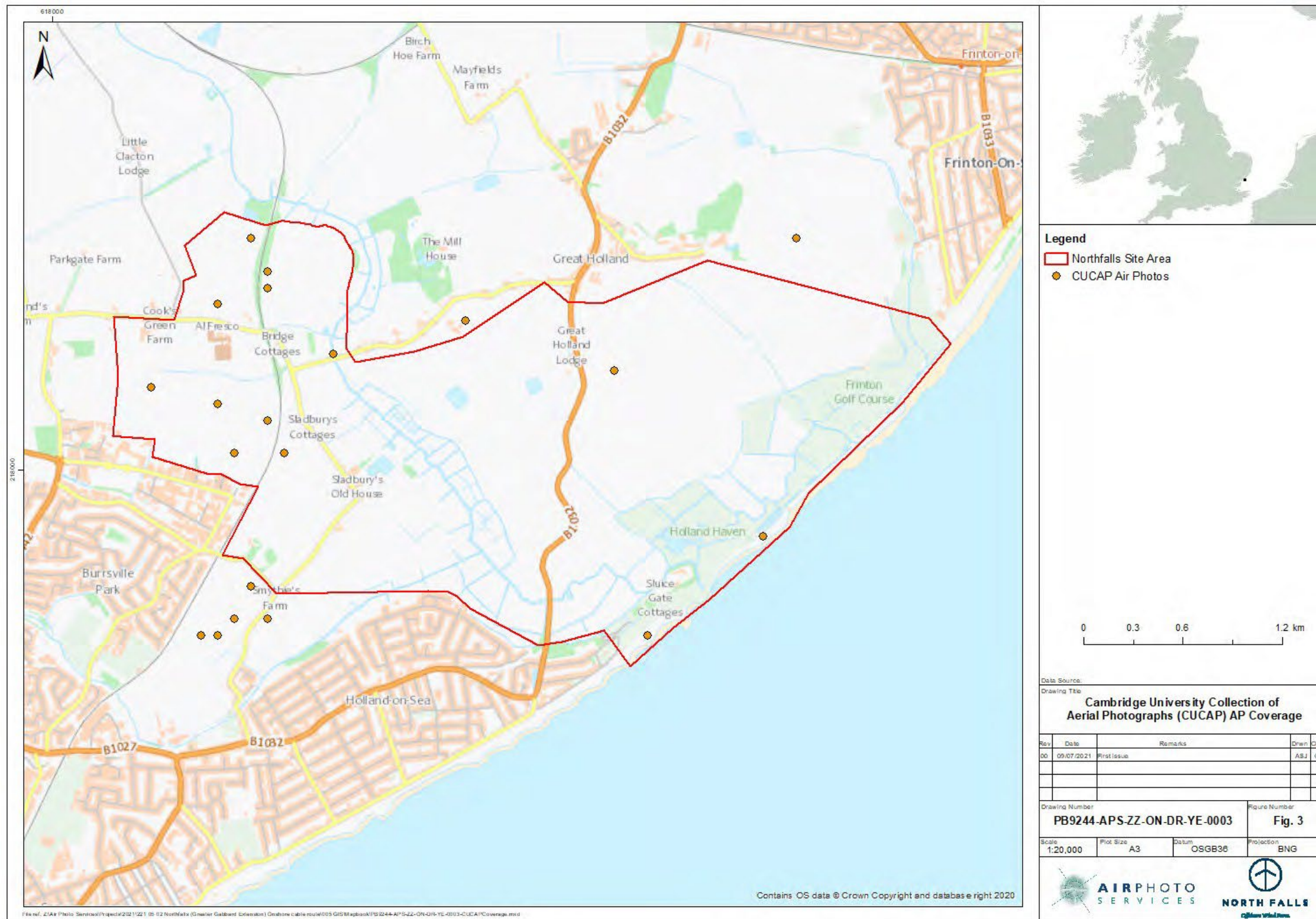


Figure 4 Essex Council aerial photographic coverage

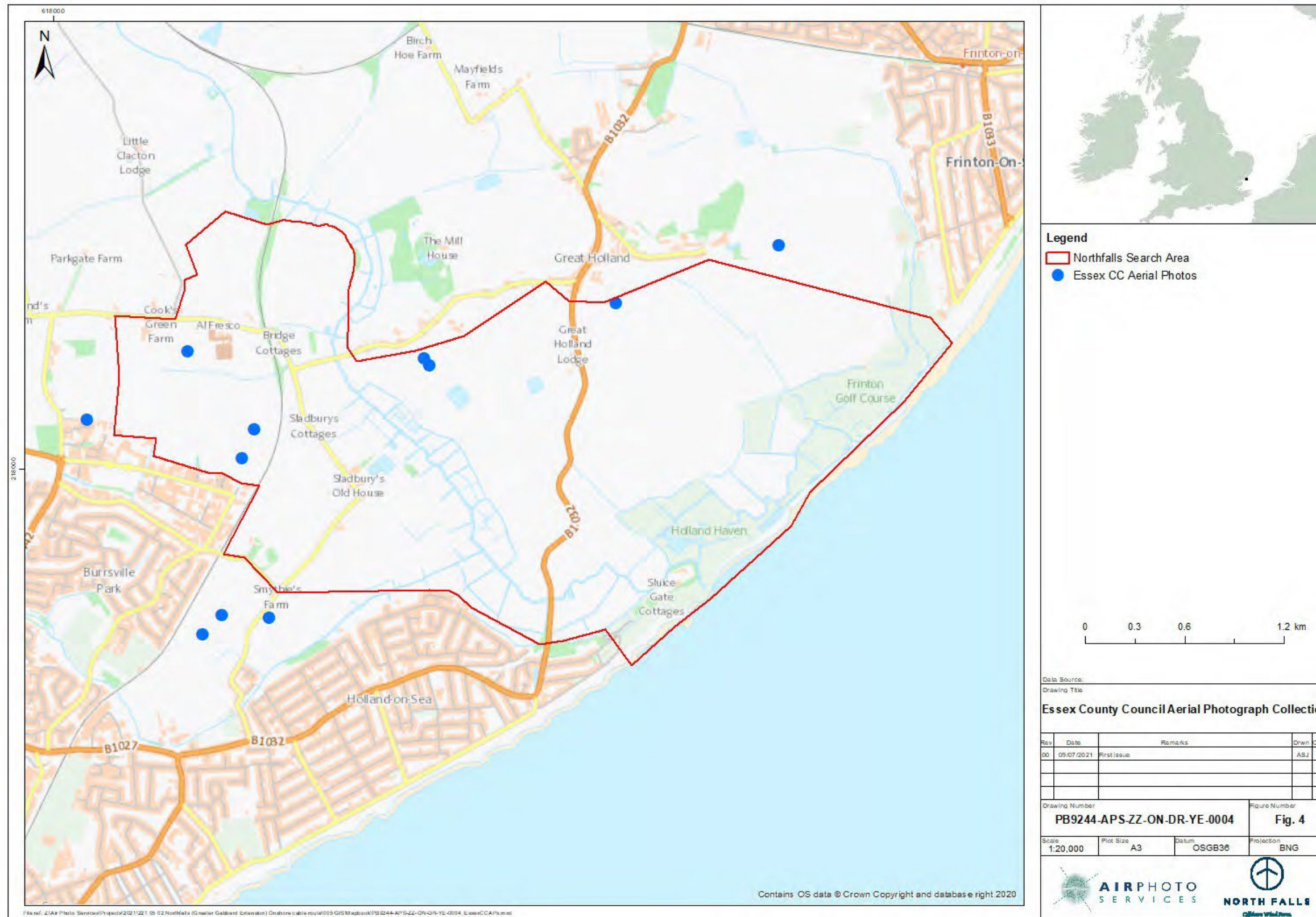


Figure 5 DEFRA vertical aerial photograph coverage

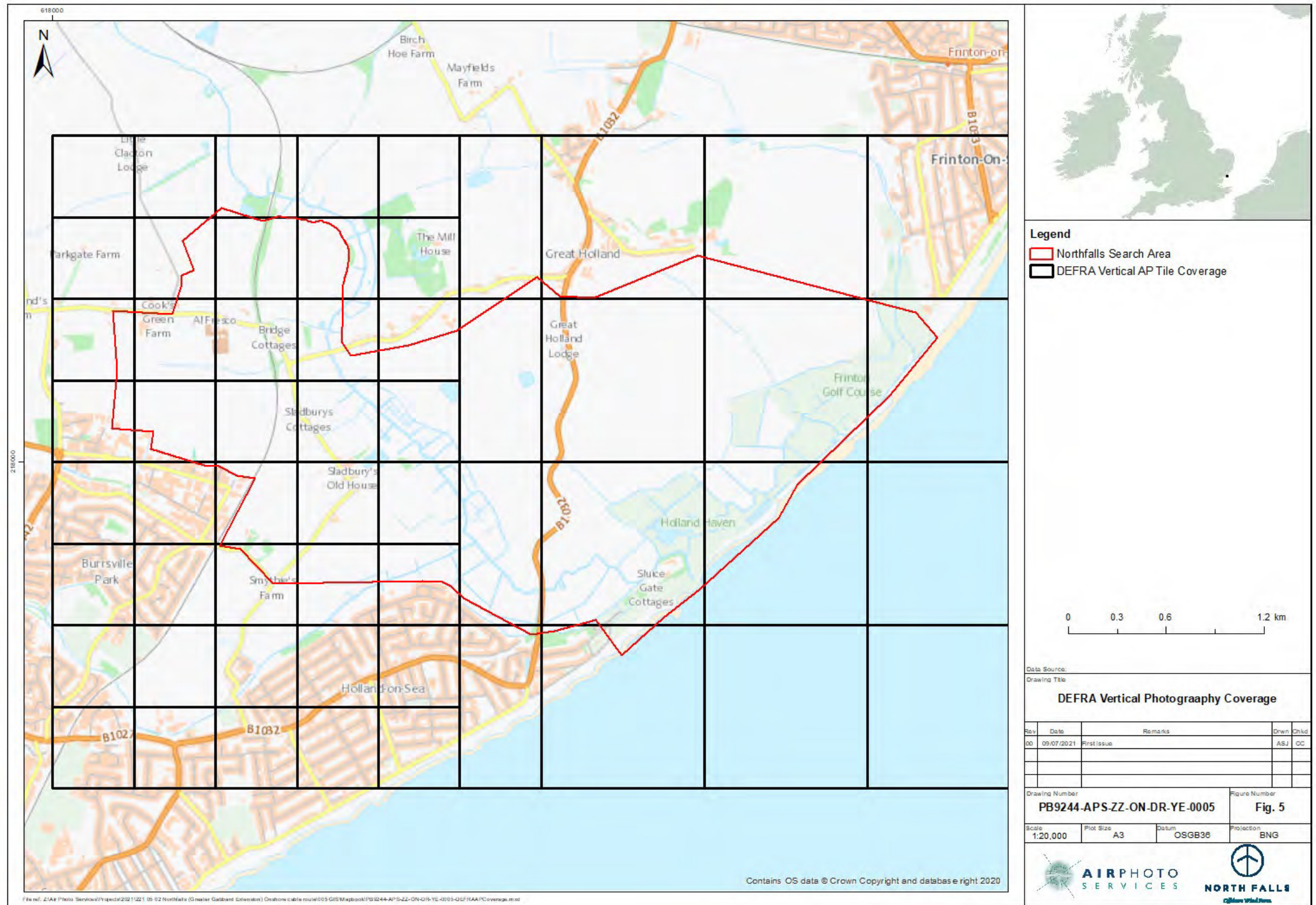
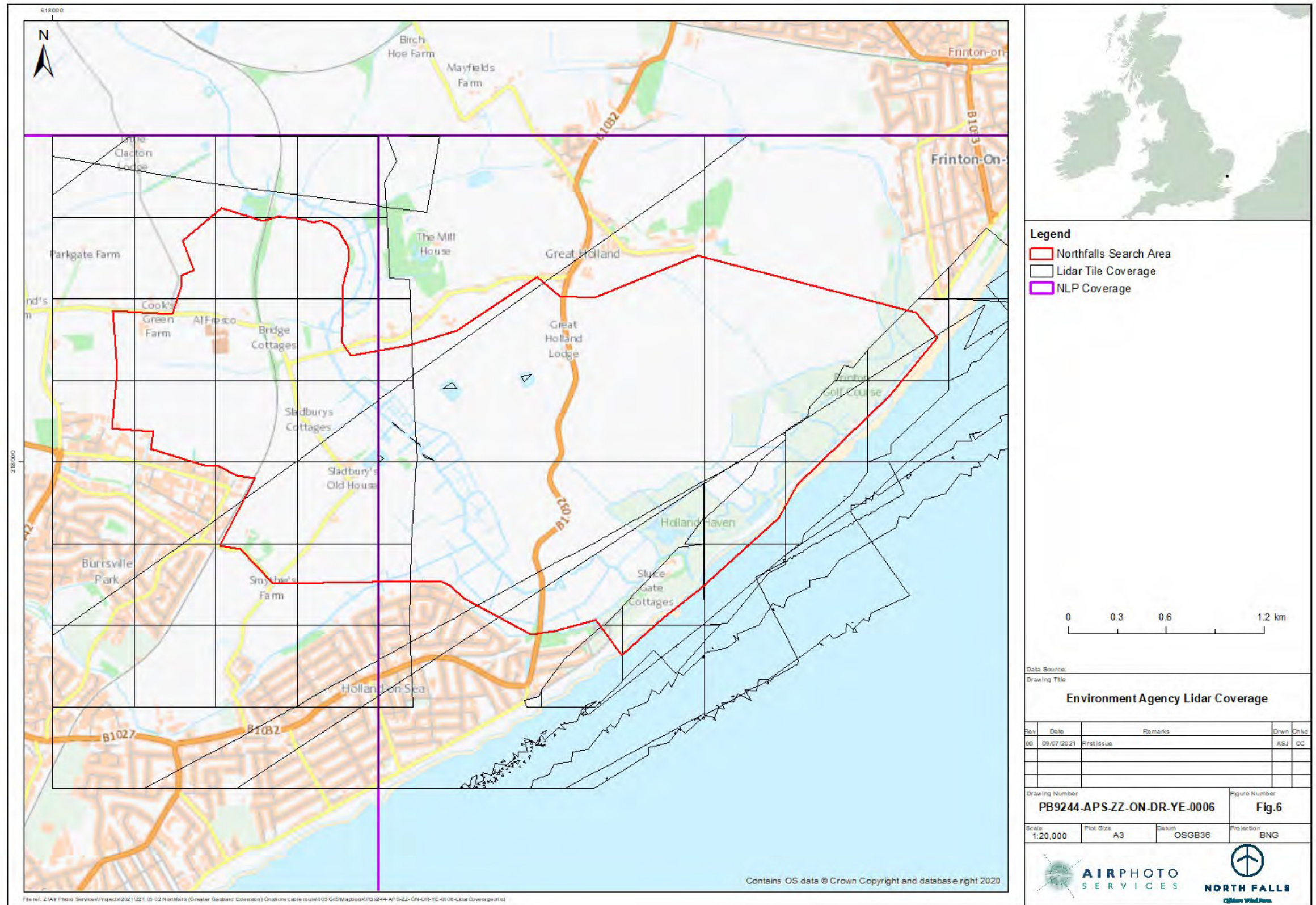


Figure 6 Environment Agency LiDAR data coverage



3. Interpretation and mapping summary

- 3.1. All photos, satellite images and LiDAR data visualisations were interpreted and mapped at a level compatible with a 1:2500 scale base map.
- 3.2. Aerial photographs were closely examined by eye and under 1.5x and 3x magnification and interpreted with the aid of a mirror stereoscope where appropriate, or in detail on screen when consulted as digital files.
- 3.3. Aerial photographs were digitally rectified to an OS base map using the QGIS rectification tool. This was done to remove perspective distortion and ensure correct rectification of aerial photographs to the OS map (Scollar 2002 and 2014). Images from Google Earth were also interpreted and rectified to OS map bases and used in accordance with observations made by Scollar and Palmer, 2008.
- 3.4. In all transformations prepared for this assessment the mean mismatches were less than $\pm 2.5\text{m}$. The rectified files were set as background layers in QGIS where features were interpreted and drawn over the rectified photographs.
- 3.5. The Essex NMP data were taken into careful consideration, used as baseline data and updated where appropriate from newer data sources.
- 3.6. Layers from the final drawing have been used to prepare the illustration for this report and are provided digitally for import to a Geographic Information System, in ESRI Shapefile format. The details of the sources, processing and content of the Shapefiles is detailed in the **Appendix** to this report.
- 3.7. LiDAR data were downloaded, visualised and imported to QGIS and ArcGIS for interpretation and mapping.
- 3.8. Methods of acquisition, processing, transcription and interpretation are detailed in the **Appendix** to this report at **Section 13**, alongside a discussion of the limitation of each survey technique for archaeological discovery and mapping.

4. Environment and known heritage assets

- 4.1. The nature of the environment has a complex effect on both the preservation and visibility of both buried and upstanding features from the air. Many factors combine to influence very marked seasonal and temporal limitations to visibility of cropmarks¹ soil marks² and earthworks³. Land use, agricultural regimes, weather, geology and soil types are all major contributing factors to the visibility of heritage assets from airborne and satellite-derived sources.

Topography and Land Use

- 4.2. The Site lies within a hinterland to the North Sea coast between Great Clacton, Great Holland and Frinton-on-Sea. This very gently undulating land rises from sea level to between 5 and 20m Above Ordnance Datum (AOD) to the west of the coast.
- 4.3. In the east near the coast the area is partially drained reclaimed land, with a pumping station, wildlife sanctuaries, coastal leisure areas and golf facilities between Holland Gap, Sandy Point, Chevaux de Frise Point, Holland Haven Country Park and Holland Haven. The coast is subject to erosion, and at times flooding, from the sea, and was defended particularly during WWII against potential maritime and airborne invasion forces.
- 4.4. To the west of the coast, the land is predominately laid to arable use and drains into Holland Brook which traverses the centre of the area from Fen Bridge to Holland Bridge with isolated farms, nursery glasshouses and some small reservoirs near Lodge Farm and Sladbury's Old House. A local railway line traverses the western part of the area from Clacton to the northwest of Cooks Green and Dairy House.

¹ Where crops grow differentially over buried features such as ditches banks and walls and reveal the pattern of past sites and landscape in the colour and density of their growth.

² Differently coloured and toned soil which is part of buried features which are being directly brought to the surface by ploughing or erosion and are visible in contrast to the surrounding soil.

³ Upstanding ditched and embanked features which show from the air *via* their shadows or *via* the differential topography revealed by visualised LiDAR data.

- 4.5. The area is served by small local access roads and the most major route, the modern B1032, runs northwards through the area from Holland-on-Sea to Great Holland.

Topography and Land Use Conclusion

- 4.6. The Study Area presents some optimal environments for early settlement on the slightly higher ground to the immediate west of the wildlife-rich coastal area.
- 4.7. The slightly higher ground is largely an optimum environment for the recording of buried features from the air, particularly as marks in crops following intensive use for cereal and other arable crop production. Both complex natural features and some detailed archaeological features are readily visible as marks in crops which reveal multi period settlement, agricultural, funerary and defensive land use dating from earlier prehistoric to modern periods.

Soils

- 4.8. The soils and substrates are reasonably well drained over areas of gravel deposits, are easily worked, and enjoy optimal access to watercourses.
- 4.9. The drift geologies **Figure 8** give rise to deep stoneless seasonally wet clayey soils over the coastal marine alluvium⁴, seasonally wet deep clay over tertiary clays and river alluvium⁵, and deep well drained loamy soils over glaciofluvial drift (gravel) areas⁶.
- 4.10. The soils are shown on **Figure 7**.

Geology

- 4.11. The drift deposits (Cranfield University 2021, British Geological Survey (BGS) 2021) comprise Marine Alluvium at the coast, River Alluvium to either side of Holland Brook, and tertiary clay, with areas of glacio-fluvial drift (gravel) over Eocene clay.
- 4.12. The extent, type and location of these deposits is shown on **Figure 8**.

⁴ WALLASEA 1 813f soil type

⁵ WINDSOR 712c soil type (marine) and FLADBURY 1 813b (river)

⁶ WIX 572b soil type

Geology and soils conclusion

- 4.13. The soils in the Study Area present a mixed group of substrates with some soils better draining than others. The well-drained loamy soils over gravels provide slightly higher and better drained areas among some less well drained and more marshy areas over marine and river alluvium. Marks in crops over eroded buried features and removed field boundaries have been recorded on the areas which lie over gravel and some parts of the tertiary clay.
- 4.14. In this area of Essex, the gravel substrate within parts of the Site are well drained, and crops respond readily to differences in the depth and consistency of the top and sub soils, over areas where buried ditched and embanked features are present. This effect also applies to anomalies in the consistency of the substrate. Aerial images in this region show widespread marks in crops over large areas of anomalies which are caused by these geological patterns and anomalies in the gravel in what was a periglacial area (Stephens 1990 Chapter 4). These patterns are particularly visible in some areas of the Site and are discernible from cropmarks caused by archaeological features which are more regular and obviously anthropogenic but can be confusing and somewhat challenging to differentiate from the overlying buried field systems, tracks, ditched enclosures and funerary features.

Figure 7 Soils

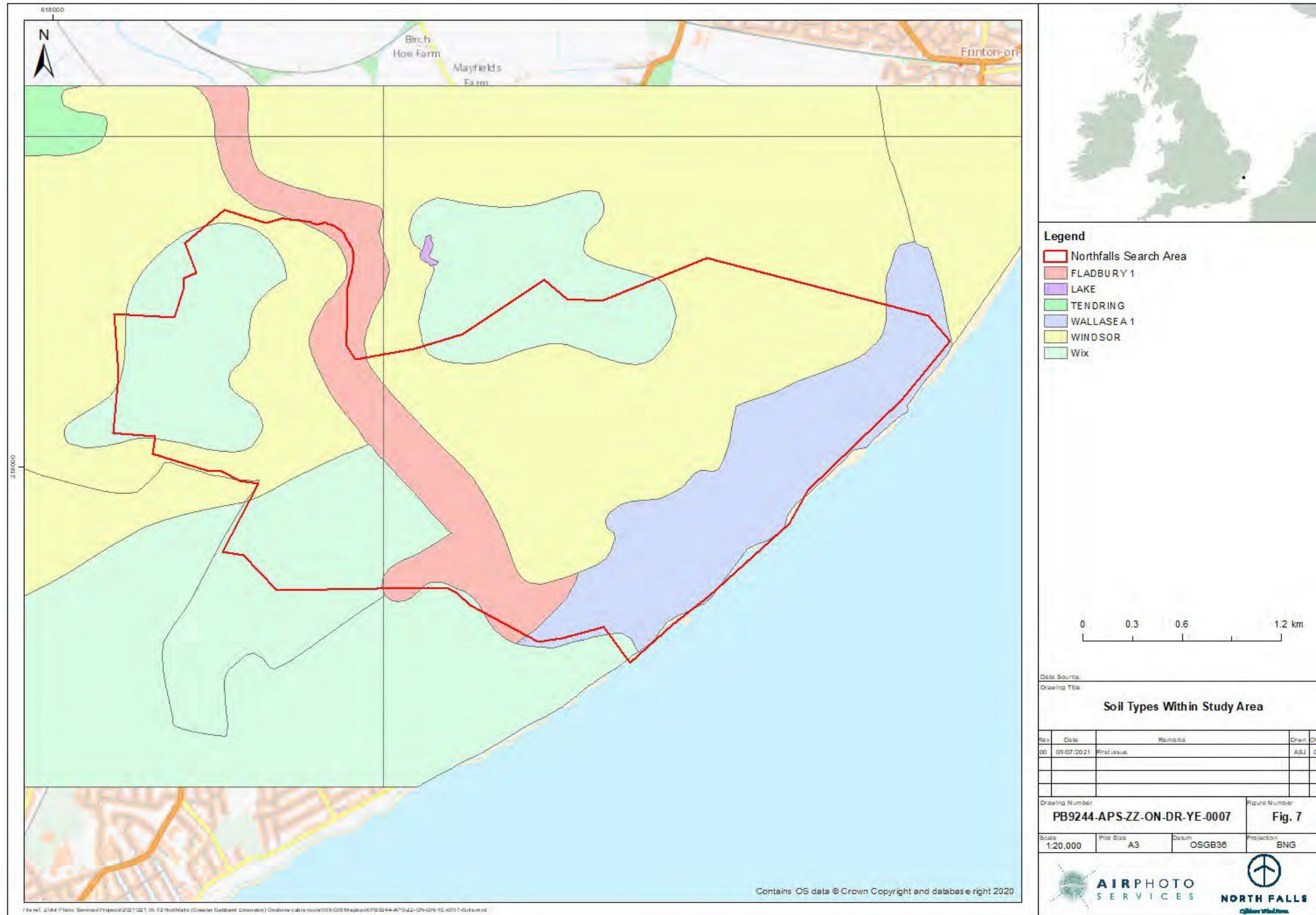
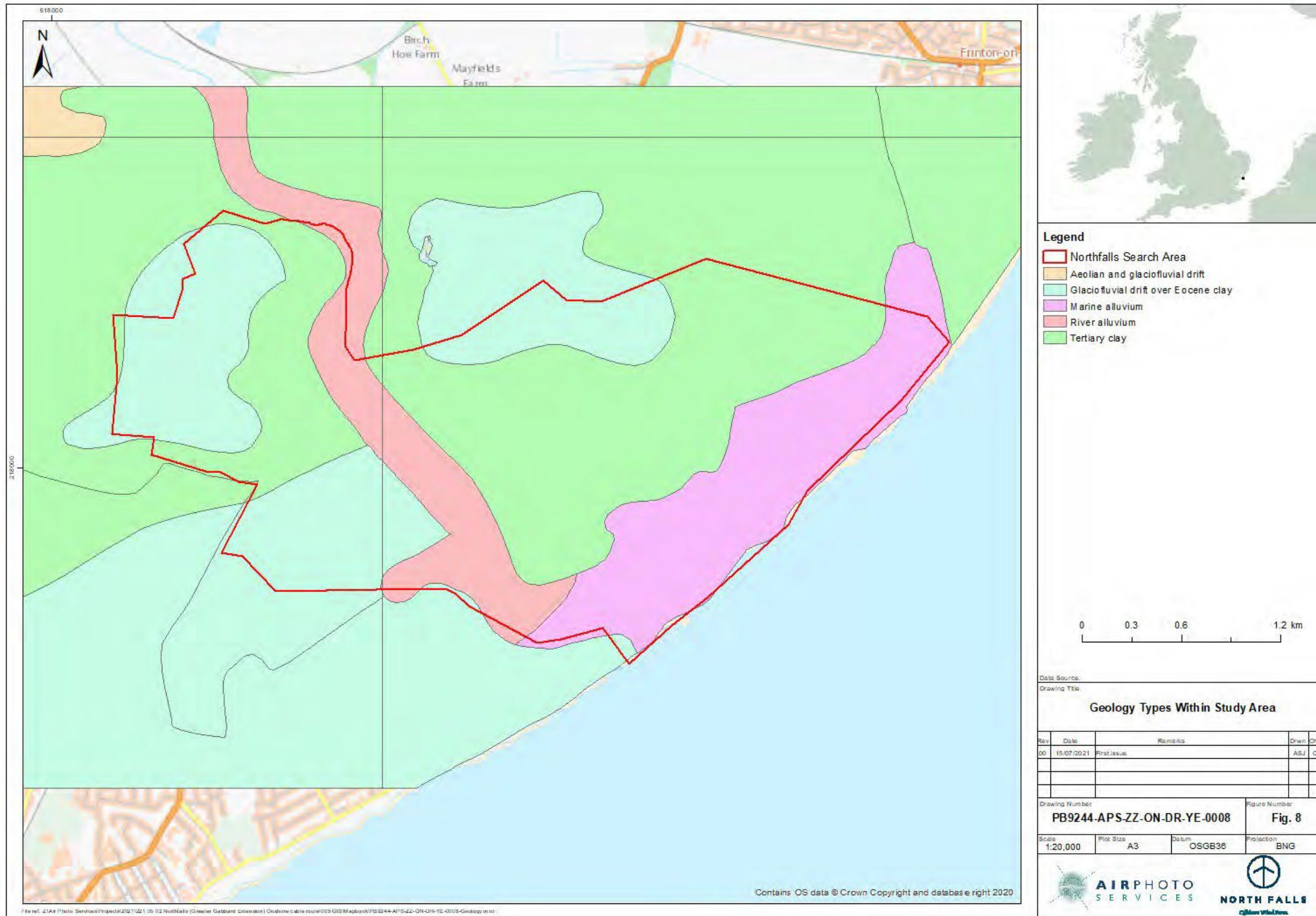


Figure 8 Geology



Previously recorded heritage assets

- 4.15. The EHER demonstrates that the Site contains known evidence for sites and landscapes which date from the earlier prehistoric through to modern periods. The historic landscape is characterised at the coast as pre 18th and 19th century drained and reclaimed land, with some areas of grazing salt marsh which sustain sheep farming.
- 4.16. Further areas of drained reclaimed land and areas with post-1950 boundary loss, with some relict elements, lie further inland among areas of bounded arable fields.
- 4.17. Arable areas show cropmarked remains of ring ditches which indicate likely Bronze Age funerary sites (round barrows) alongside ditched enclosures and tracks, such as those recorded around Cook's Green Farm (MEX101636), north of Bursville Park (MEX10628) and south of Dairy House Farm at MEX10655. These known sites have been recorded by the Essex NMP (Ingle and Saunders 2003) and the EHER, and represent the remains of a buried former landscape which likely dates from the Bronze and Iron Ages through to the Roman period, although some areas of cropmarks remain undated.
- 4.18. In later periods the expansion of more mechanised and widespread agriculture has led to the removal of post-enclosure field boundaries, particularly in the latter part of the 20th century.
- 4.19. The coast area and hinterland was robustly defended during the 19th and 20th centuries. It contains relict or previously observed and destroyed sites which include the site of a Martello tower (MEX100039273) which was built in 1810-12 and is now demolished, WWII defensive pillboxes, a minefield (MEX49906), and a former heavy anti-aircraft battery (MEX49905). A defensive 'Diver' site number K13 (MEX1031358), which was extant in the 1940s, is now visible only as parch marks on aerial photographs over the sites of the former Nissen huts and and-line gun platforms and their associated control huts.

Baseline heritage assets conclusion

- 4.20. Overall the HER demonstrates the range of archaeological resource in the area and has served as an important indication of the type of sites likely to be visible *via* airborne remote sensing data sources.

5. Results

5.1 The results from the interpretation and mapping are presented in **Table 2** and are illustrated by **Figures 9.1 – 9.6** which are indexed at **Figure 9**. The detailed sources and condition notes are recorded in the Shapefile which accompanies this report.

5.2 The fields in **Table2** comprise:

- APS Site Id;
- Stage 1 Id for information (this may be removed when all documents finalised);
- RHDHV Id (to be added);
- Figure number;
- Asset Type;
- Condition on last recorded data source;
- Period;
- EHER MonUID;
- NMP UID;
- Interpretation notes;
- Easting coordinates;
- Northing coordinates; and
- Six figure National Grid Reference (NGR).

Table 2: Sites identified within the site from aerial photographs, satellite imagery and visualised LiDAR data

APS_Site	RHDHV Id	Figure number	Asset type	Condition on last recorded data source	Period	EHER MonUID	NMP UID	Interpretation notes	Easting	Northing	NGR
APS_01	214	9.1	Pits, possibly minefield	Levelled, grassmark	WWII	MEX49906		Correspondence held at Essex Records Office details clearance of military defence works in this area, and what appears to be possible craters of exploded mines are visible on a 1946 photograph. These infilled pits which are visible as marks in grass are possibly filled craters following clearance	621250	217231	TM 212 172
APS_02	219 218	9.2	Field system	Levelled, cropmark	Post Medieval	MEX10602 MEX1031371	2973 16991	Series of former field boundaries visible as extant boundaries in the 1940s and later as cropmarked ditches on aerial photographs and residual earthworks on Environment Agency LiDAR data. Several boundaries mapped by the NMP have been remapped and expanded on from earlier aerial photographic sources	619813	217428	TM 198 174
APS_03	212 210	9.1	Anti-Aircraft defence site	Former structure, now levelled, crop and grassmark	WWII	MEX1031358 MEX1034360	16984	Site of former WWII Anti-Aircraft Diver Battery K13, associated military camp and Nissen huts, removed by 1953. Remains of one of two recorded Pillboxes were visible until 2012 on aerial photographs, satellite imagery and LiDAR data. NMP has previously recorded the location of the gun emplacements. These have been adjusted from rectified photographs and the control huts, roads, pillbox and Nissen huts have been added for reference as these are no longer present and their subsurface remains show only as marks in grass and/or crops	621288	217622	TM 212 176

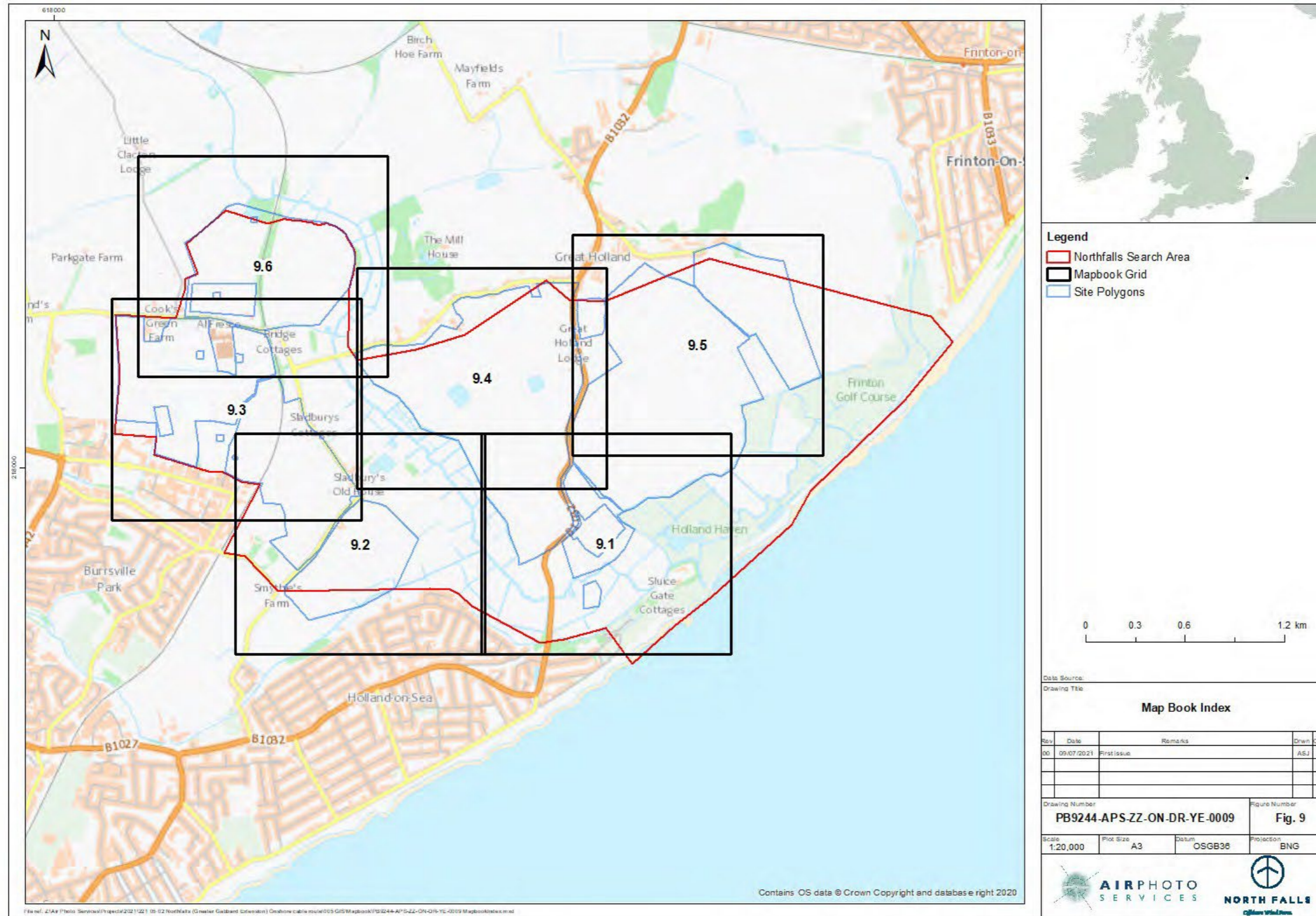
APS_04		9.1	Field system	Levelled, cropmark	Post Medieval			Area of Post Medieval field boundaries which are no longer extant. Visible as extant boundaries on 1940s and 50s aerial photographs and later as cropmarks from satellite imagery and residual earthworks from Environment Agency LiDAR data	621256	217641	TM 212 176
APS_05	217 218	9.2 9.3	Field System, settlement features (enclosures) and ring ditches	Levelled, cropmark	Prehistoric – Post Medieval	MEX10628 MEX1031371	2979 16991	Complex field system consisting of field boundaries, enclosures and ring ditches, visible on aerial photographs, satellite imagery and Environment Agency LiDAR. Area is heavily disturbed by geological cropmarks which may be masking archaeological features. There is also a large number of pits which remain unmapped as they may be natural. Areas of NMP have been remapped where possible for clarity and additions. Features which remain from the NMP could not be confirmed during reinterpretation	619425	217989	TM 194 179
APS_06	217	9.3	Round barrow	Levelled, cropmark	Prehistoric	MEX10628	2979	Ring ditch visible as a cropmark on aerial photographs. NMP has been remapped for clarity.	619092	218062	TM 190 180
APS_07	217	9.3	Pit	Levelled, cropmark	Unknown, possible prehistoric (Bronze Age)	MEX10628	2979	EHER records a possible round barrow or ring ditch based on cropmark evidence. However earlier aerial photographic evidence shows an extant earthwork at a possible extractive pit or pond. The area is heavily disturbed by geological cropmarks which may be masking archaeological features edges. The feature has been remapped from earlier sources showing the extent of the earthwork prior to it being eroded and only visible as a cropmark	619004	218181	TM 190 181

APS_08	191	9.3	Square Enclosure	Levelled, cropmark	Medieval	MEX1031368	16989	Possible square enclosure and ditches visible on oblique aerial photographs and recorded by the NMP. This area shows underlying geological disturbance which causes sinuous natural cropmarks around the enclosure making interpretation less certain	618660	218285	TM 186 182
APS_09	193 122	9.1 9.4	Field System, trackway, boundaries	Levelled, cropmark	Prehistoric/unknown overlain by Post Medieval fields	MEX10655 MEX10609	2975 2983	Field System which overlies earlier boundaries, trackways and possible pit alignments visible as cropmarks and soilmarks on aerial photographs, satellite imagery and visible as residual earthwork banks in Environment Agency LiDAR data. The area is heavily disturbed by geological cropmarks which may be masking archaeological features. There are also a large number of pits which remain unmapped as they may be natural features	620694	218408	TM 206 184
APS_10	190	9.1 9.5	Field System, track	Levelled, cropmark	Post Medieval / Modern	MEX1031361	16985	Former field boundaries visible on aerial photographs and satellite imagery as cropmarks and residual earthwork banks on Environment Agency LiDAR data. Former track has been recorded as two parallel cropmarked ditches by the NMP. The trackway was extant until the 1950s, mapped by the OS as removed in 1967, and marked as an agricultural track on the 1973 OS map	621683	218450	TM 216 184
APS_11	215 191	9.3	Field System	Levelled, cropmark	Post Medieval	MEX10636 MEX1031368	2980, 16989	Post Medieval field system consisting of boundaries, trackways and enclosures which are visible as cropmarks on aerial photographs and Satellite imagery, with residual earthwork remains visible on LiDAR data. Area is heavily disturbed by geological cropmarks which may be masking archaeological	618787	218530	TM 187 185

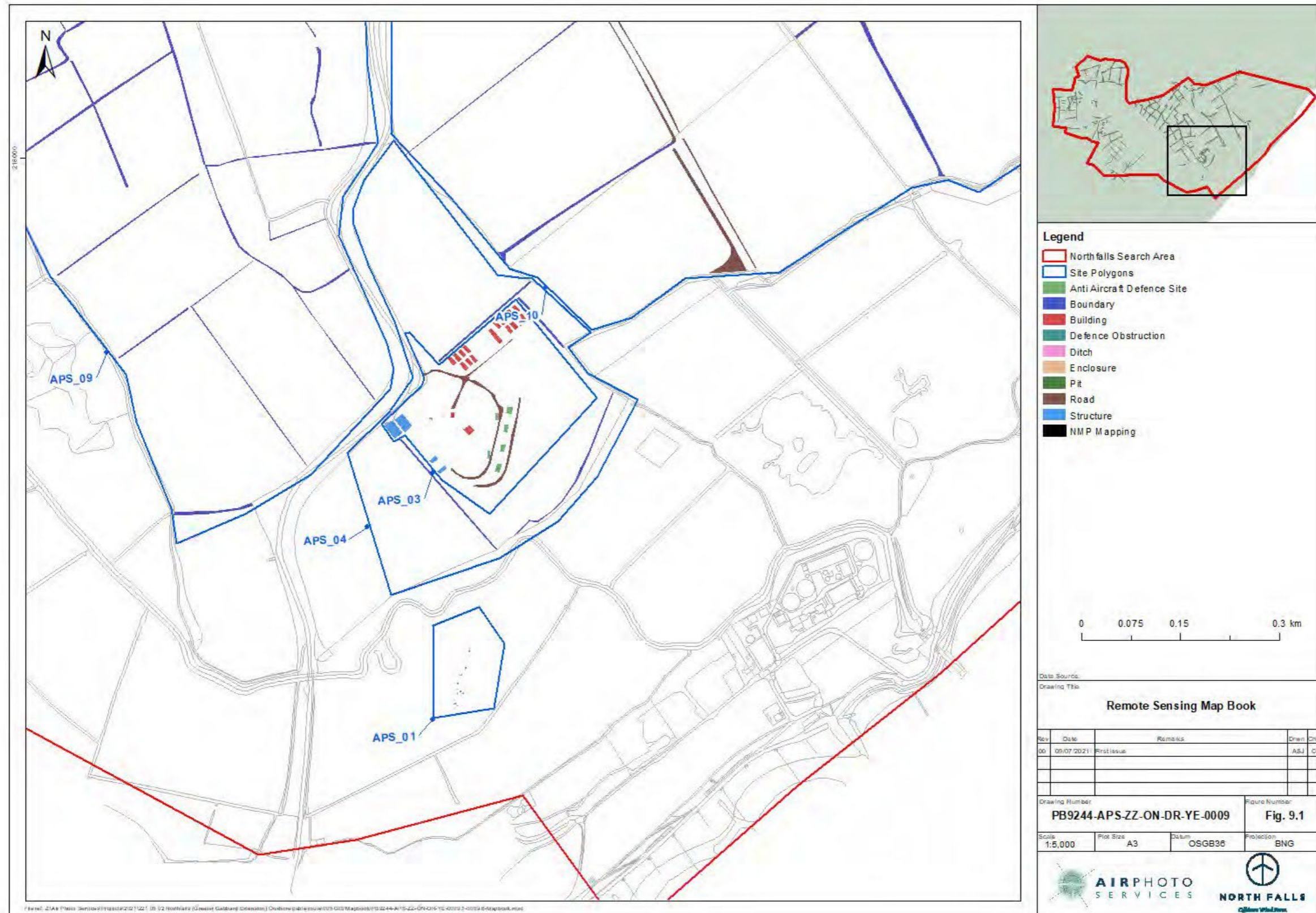
								features. There are also a small number of pits which remain unmapped as they are extensive and may be natural			
APS_12	215	9.3	Round barrow	Levelled, cropmark	Prehistoric	MEX10636	2980	Round barrow previously recorded by the NMP. Visible on multiple aerial photographs as a cropmarked ring ditch. Feature has been remapped for clarity of size	619117	218665	TM 191 186
APS_13	215	9.3	Ring ditch, likely round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10636		Ring ditch visible as a cropmark on a single oblique aerial photograph, which may be the remains of a round barrow	618882	218682	TM 188 186
APS_14	192	9.4	Field system, square enclosure	Levelled, cropmark	Post Medieval	MEX13203	3627	Square enclosures visible as cropmarks on aerial photographs, which are likely part of a post medieval field system which is depicted by the pre-1973 OS mapping. An underlying ditched feature is of unknown origin. Area is heavily disturbed by geological cropmarks which may be masking archaeological features. There is also a small number of pits which remain unmapped as they may be natural. NMP has been remapped and expanded upon from additional sources	621244	218913	TM 212 189
APS_15		9.5	Field system	Residual earthwork via LiDAR data	Post Medieval			Former field boundaries visible as extant boundaries on 1940s aerial photographs, cropmarks on satellite imagery and residual earthworks on Environment Agency LiDAR data	622255	218979	TM 222 189
APS_16	178	9.6	Ditches, possible buried settlement	Levelled, cropmark	Medieval / Modern	MEX10618	2977	Series of ditches representing a possible enclosure are visible as cropmarks on aerial photographs. Area is heavily disturbed by geological cropmarks which may be masking further archaeological features. There are several pits	619026	219024	TM 190 190

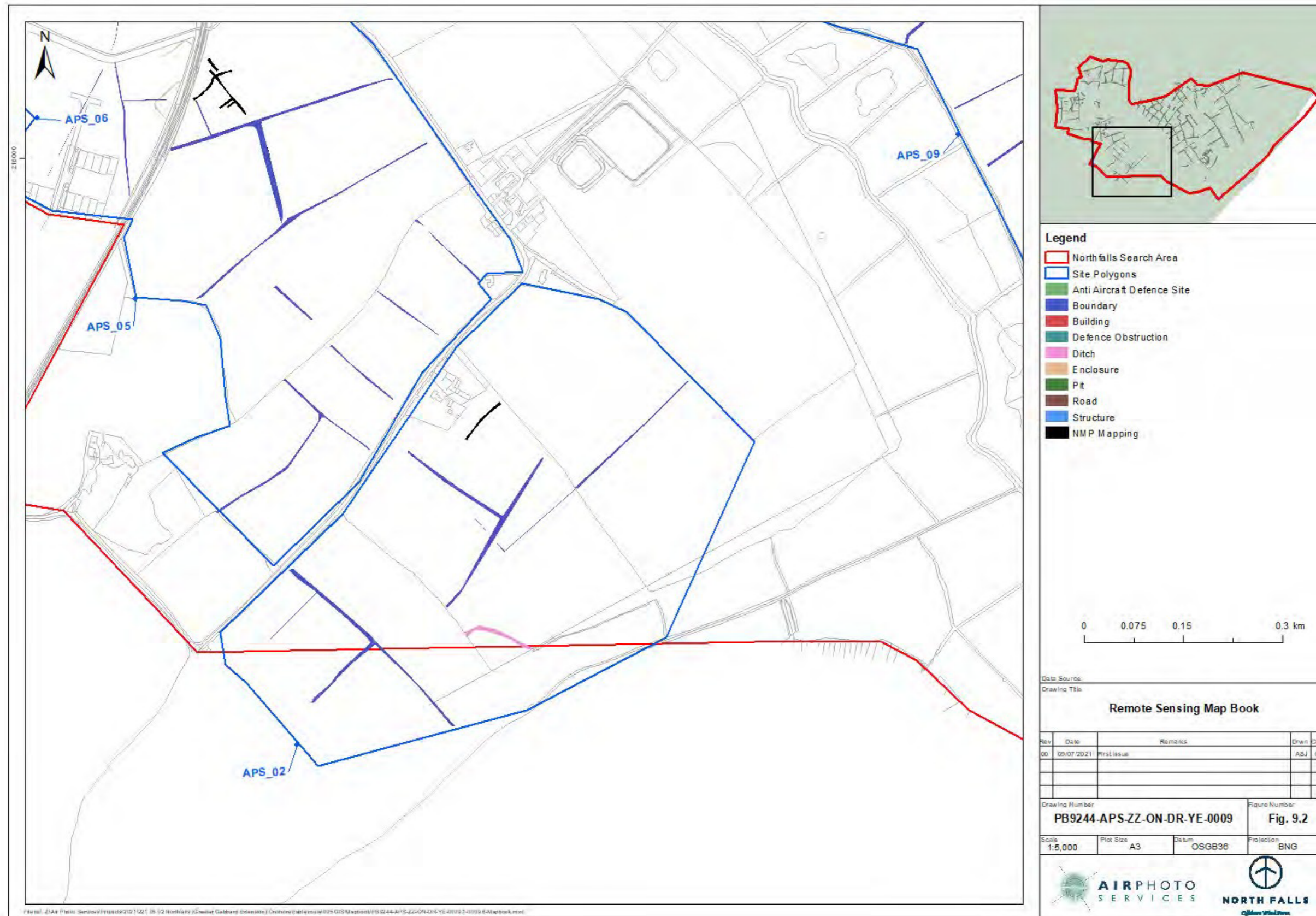
								visible however these could be natural and have been left unmapped. Features have been remapped and repositioned based on new georectified imagery			
APS_17	178	9.6	Round barrow	Levelled, cropmark	Prehistoric (Bronze Age)	MEX10618	2977	Two ring ditches, possibly remains of round barrows, are visible as cropmarks on satellite imagery and oblique aerial photographs. Features have been remapped and repositioned based on new georectified imagery	618981	219044	TM 189 190
APS_18	178	9.6	Field system	Residual earthwork via LiDAR data	Medieval / Modern	MEX10618	2977	Area of former field boundaries visible as earthworks while extant and later as cropmarks in aerial photographs. Residual earthworks remain visible in Environment Agency LiDAR data. Area is heavily disturbed by geological cropmarks which may be masking archaeological features. There are also a large number of pits which remain unmapped as they may be natural. Areas of NMP have been remapped where possible for clarity and additions	619290	219200	TM 192 192
APS_19		9.6	Ring ditch	Levelled, cropmark	Possible prehistoric (Bronze Age)			Possible ring ditch visible as a cropmark on a single oblique aerial photograph. Area is heavily disturbed by geological cropmarks which makes this interpretation a possible feature but could be natural due to underlying geology	619208	219500	TM 192 195

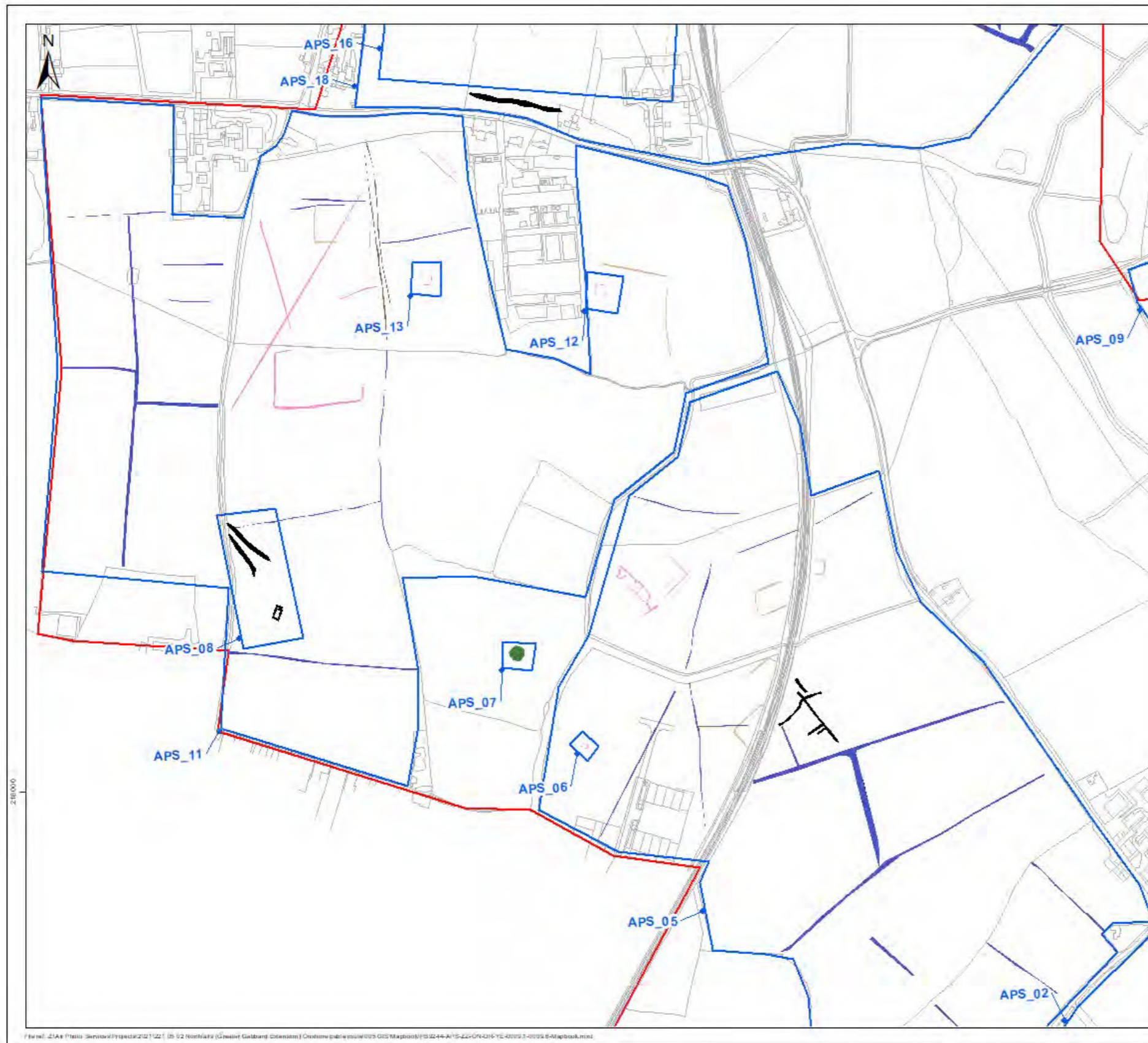
Figure 9 Index to the archaeology mapbook Figures 9.1 – 9.6



Figures 9.1 – 9.6 The archaeology mapbook

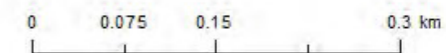






Legend

- ▭ North falls Search Area
- ▭ Site Polygons
- ▭ Anti Aircraft Defence Site
- ▭ Boundary
- ▭ Building
- ▭ Defence Obstruction
- ▭ Ditch
- ▭ Enclosure
- ▭ Pit
- ▭ Road
- ▭ Structure
- ▭ NMP Mapping



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Drawing Title:

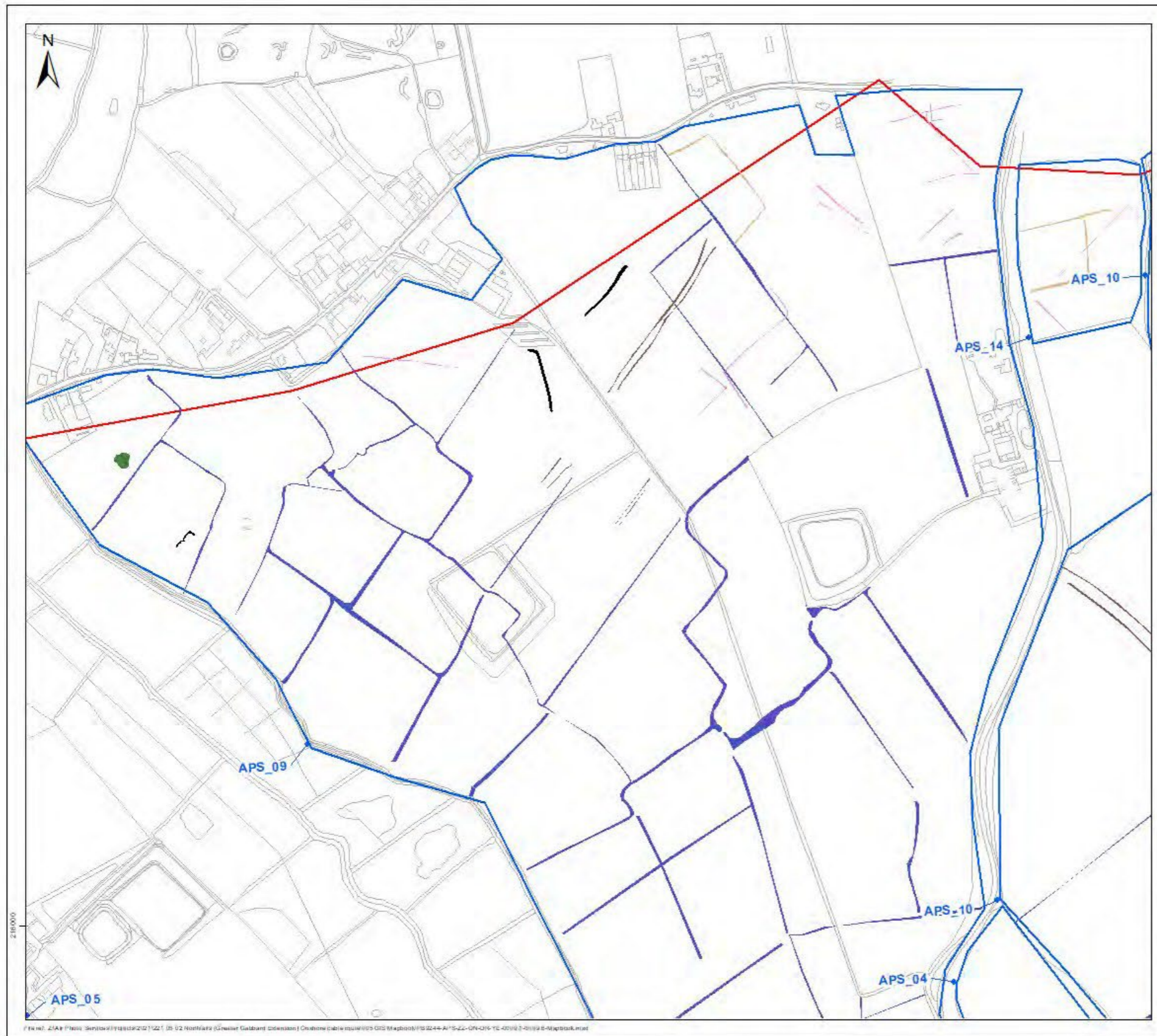
Remote Sensing Map Book

Rev	Date	Remarks	Drawn	Checked
00	09/07/2021	First Issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0009** Figure Number: **Fig. 9.3**

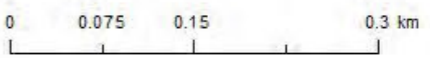
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Legend

- ▭ North falls Search Area
- ▭ Site Polygons
- ▭ Anti Aircraft Defence Site
- ▭ Boundary
- ▭ Building
- ▭ Defence Obstruction
- ▭ Ditch
- ▭ Enclosure
- ▭ Pit
- ▭ Road
- ▭ Structure
- ▭ NMP Mapping



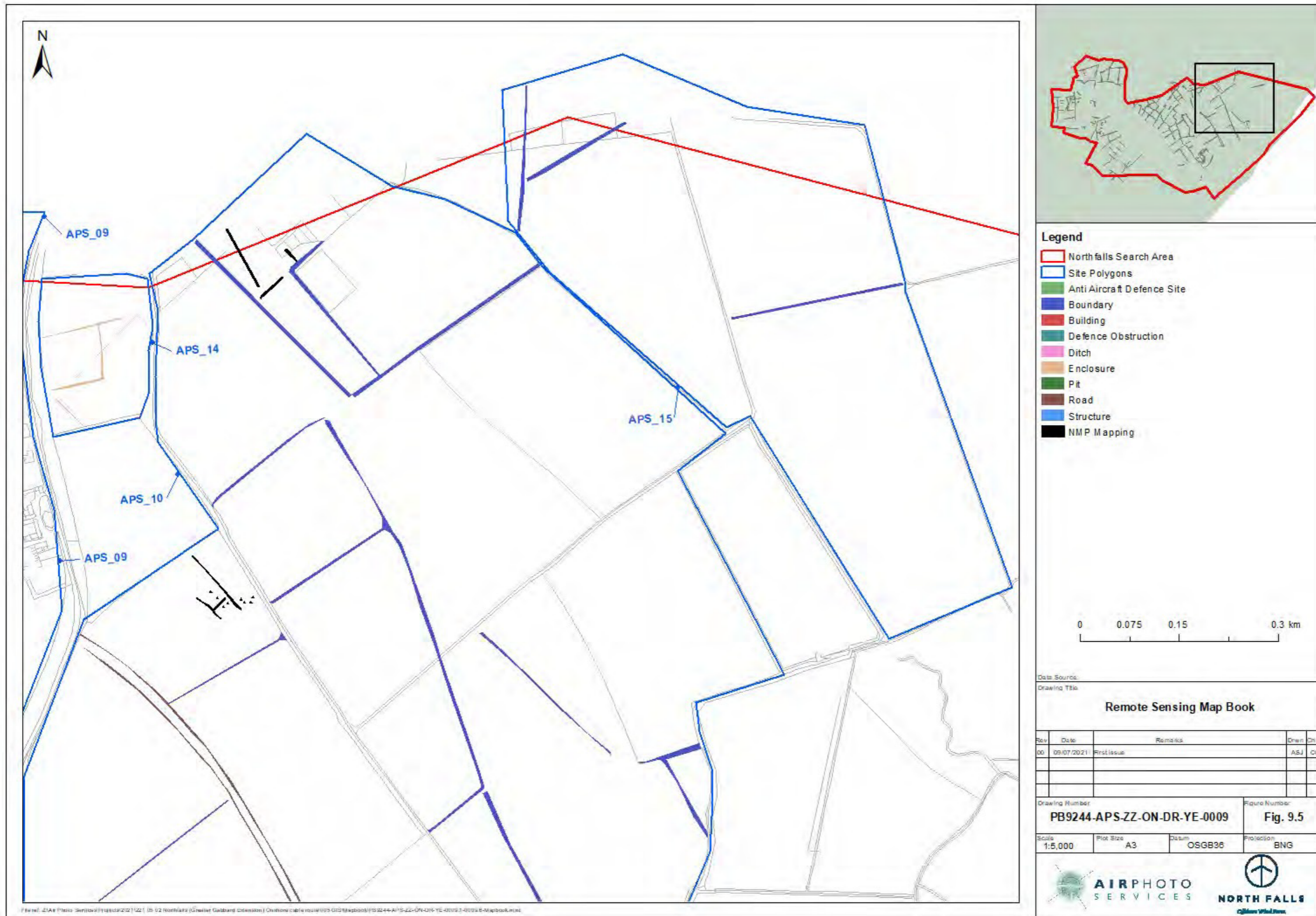
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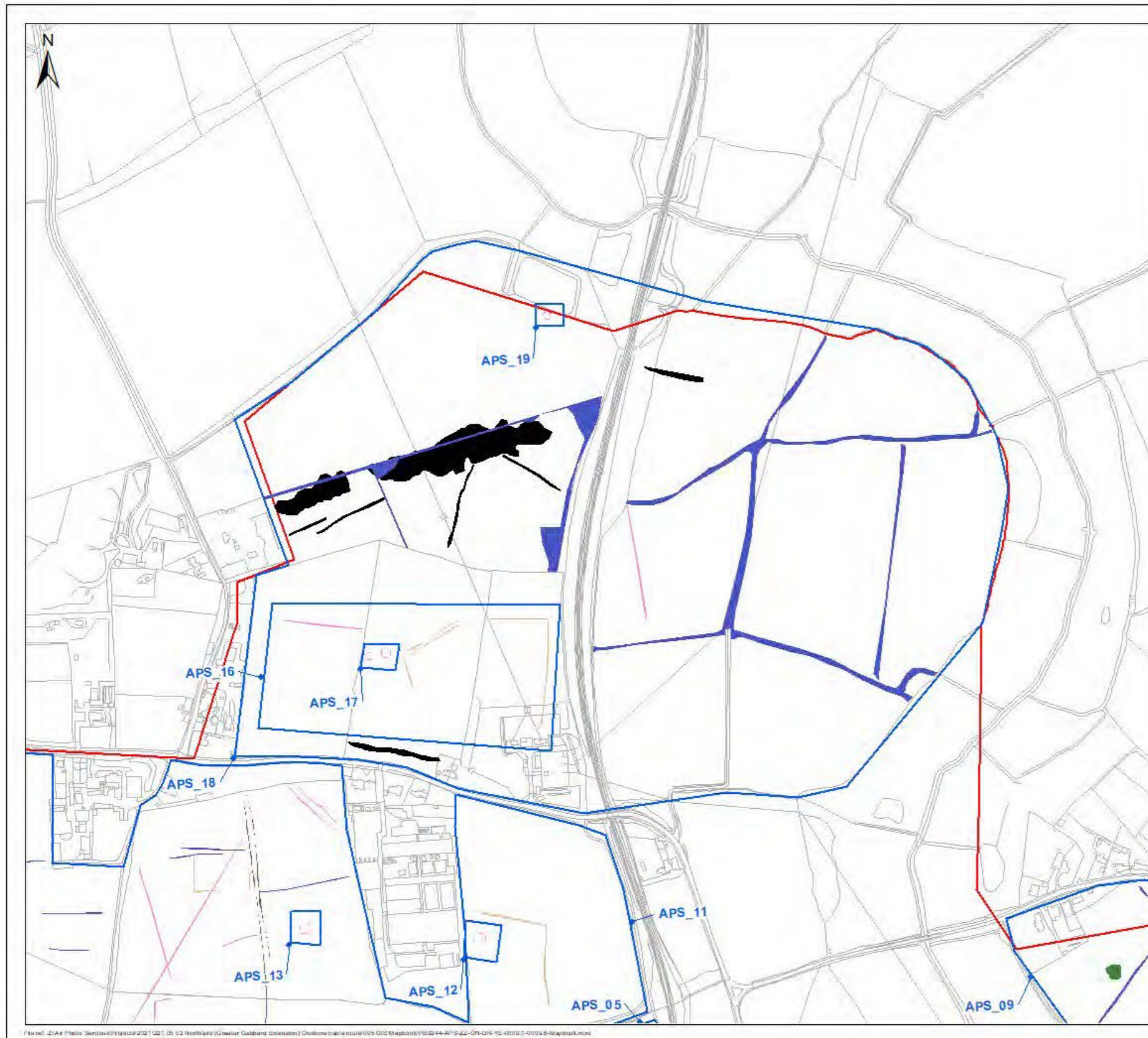
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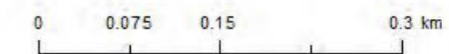
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Legend

- North Falls Search Area
- Site Polygons
- Anti Aircraft Defence Site
- Boundary
- Building
- Defence Obstruction
- Ditch
- Enclosure
- Pit
- Road
- Structure
- NMP Mapping



Data Source:

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Remote Sensing Map Book

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Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0009	Fig. 9.6

Scale	Plot Size	Datum	Projection
1:5,000	A3	OSGB36	BNG



53 This assessment has recorded 19 individual sites or areas within the site. Some of these have been recorded previously by the NMP and the EHER. These previous interpretations have been noted and incorporated fully into the GIS database, where they are acknowledged and separated from the newly interpreted or augmented site interpretations made by APS.

54 The majority of the site to the west of the coastal marshes has been heavily ploughed and the majority of the cropmarked remains do not display any significant microtopography, as evidenced by examination of LiDAR data. There is however obvious potential for the discovery of sub-surface features and deposits in and around the visible foci of cropmarked enclosures, tracks, boundaries and ring ditches.

Prehistoric features

55 The search area contains evidence for Bronze Age funerary monuments known as ‘round barrows’. These were circular or sub circular mounds over either inhumation or cremation sites with a retaining ring ditch from which the mound was usually excavated. Ploughing and erosion reduces these mounds and flattens them, leaving evidence in the sub and topsoils for residual mounds and more frequently the retaining ring ditch which shows as a cropmark under appropriate environmental conditions.

56 **APS_06** is a cropmarked ring ditch which lies to the immediate north of Bursville Park which was mapped from specialist oblique aerial photographs. The ring ditch indicates the position of a former barrow, dated by EHER record MEX10628.

57 The EHER records a ring ditch, **APS_07**, again within the landscape recorded as EHER MEX10628, which showed as a cropmark on oblique aerial photos⁷ 140m to the northwest of the likely eroded barrow at **AP_06**. Earlier vertical photos⁸ taken in the 1940s however indicate an embanked depression at this site which maybe an extraction pit or pond. However, the interpretation has not been dated by any field

⁷ TM 1918/2 308 310 (1976)

⁸ RAF/106G/UK/1367 7130 and RAF/106G/UK/1673 3087 (1946)

investigation, and remains open to discussion. The feature was infilled and eroded between 1946 and 1976 and is of unknown date.

- 5.8 To the west of Cook's Green Farm, cropmarks visible on a single oblique aerial photo⁹ indicate a ring ditch, likely to have been a round barrow, **APS_13** (MEX 10636). To the east of the Farm **APS_12** (MEX10636) records a further cropmarked ring ditch which was noted by the NMP as a likely round barrow, which was visible on multiple aerial photo sources¹⁰.
- 5.9 At **APS_17** (MEX10618) two ring ditches which are likely eroded round barrows are visible as cropmarks on specialist obliques¹¹ and the 2005 and 2009 timeline images at Google Earth, to the east of Bond's Farm. These features are recorded by EHER as part of MEX10618.
- 5.10 A possible ring ditch, which is undated but likely to be a prehistoric feature, is visible as a cropmark on an oblique aerial photograph ¹²at **APS_19**, to the north of Bond's Farm.
- 5.11 Site **APS_05** (EHER MEX10628 and 103171) encompasses three foci of fragmentary ditched enclosures and other ditches which may be outlying fields, to the north of Bursville Park and south of Bridge Cottages. These enclosures and ditches are pre-modern, and are likely to date to the Iron Age or Roman periods and are visible as cropmarks on specialist oblique images¹³. These features underlie a Post Medieval field system which has been partially removed and is discussed below.
- 5.12 **Site APS_09** (MEX10655 and 10609) is a similar site, where likely prehistoric remains of ditched enclosures, tracks and boundaries are visible alongside and predominately to the north of, a Post Medieval field system. The likely Iron Age – Roman features are visible between Lodge Farm, White Lodge and Dairy House Farm, where in places they

⁹ TM 1819/1/275 (1974)

¹⁰ TM 1819/1/275 (1974) and TM 1919/2 314 315 316 (1976)

¹¹ TM 1819/1 277 278 1974, TM 1919/1 302 303 1976, TM 1919/2 318 1976, TM 1819/2 165 166 167 168 1979, TM1819/4 174, TM 1919/3 149 (1979), SWBW24-8-2977

¹² TM 1919/2 318 (1976)

¹³ TM 1918/2 306 307 308 (1976), TM 1919/2 314 1976, TM1917/3 163 164 (1979) EX/13/08 299 (2013)

are overlain by the remains of more modern post enclosure boundaries. The earlier cropmarked features lie within the northern sector of site **APS_09**, and are easily discernible as they adopt an entirely different alignment to that of the later partially-extant field systems.

5.13 The EHER, at MEX13203, notes ‘a single large ring ditch with trackway running northeast to southwest, which was seen on ‘AP, unknown, 1979’ and ‘AP NMR¹⁴ 1976 TM2118/3/366, to the south of Great Holland. This feature is recorded to the south of **APS_14**, east of **APS_09** and to the north of **APS_10** (MEX10626), where fragmentary undated, likely prehistoric, ditches and pits are visible as cropmarks beneath a cohesive landscape of Post Medieval field boundaries which have been removed, over some extremely complex natural environmental anomalies which also show as cropmarks.

5.14 MEX13203 is not included in the NMP mapping, or this present assessment of aerial imagery. Close examination of the obliques TM2118/3/365 and 366 show that this area also contains wide curvilinear and sinuous features which show as well defined cropmarks and are natural periglacial anomalies in the underlying glaciofluvial drift (gravel) substrate. This identification is likely to have been made in relation to the underlying natural environmental features. However, **APS_09**, and **10** and the wide areas over gravel substrate contains many pits and anomalies, some of which are mapped alongside ditches and overlying field boundaries within **AP_09** and **10** where there is a high likelihood of finding more buried heritage assets which date to the prehistoric or Roman periods than have been visible to date *via* cropmarks on aerial photographs.

Medieval and Post Medieval features

5.15 As noted above, cropmarked remains of earlier tracks, enclosures and likely associated field boundaries are visible beneath an overlying post-enclosure landscape. Many of the ‘modern’ boundaries which were set out when the land was enclosed following land enclosure legislation which was enacted between 1604 and 1914. These

¹⁴ National Monuments Record, now known as the Historic England Archive.

boundaries are recorded on the Ecclesiastical Parish Tithe maps, the administrative Enclosure maps, and are depicted through the First Editions of the 1:10,560 and 1:2,500 OS mapping, which dates from the latter part of the 19th century through revisions into the mid-20th century. These boundaries overlie or are visible in the same general locations as the likely-prehistoric buried remains of small enclosures, settlement and funerary features.

- 5.16 They are visible as extant features on 1940s aerial photos, and subsequently as marks in crops and as microtopography on visualised LiDAR data across the central part of the site. They were systematically removed since the 1950s, to make way for modern agricultural regimes, and are easily differentiated from the underlying earlier fields and enclosures by their regular nature, the manner in which they ‘fit’ with the wider modern landscape and their depictions on former editions of the OS and the available Tithe mapping.
- 5.17 **APS_10** (MEX103161) includes an extensive area of Post Medieval field systems and the cropmarked remains of a former track or road, which was a former access directly to MEX1049134, a Medieval to Post Medieval landing-place on the Gunfleet estuary. This track and the nearby military ‘K13 Diver’ site **AP_03** were seen as extant features on 1950s vertical aerial photos¹⁵, have now been removed, and were situated in land to the east of Great Holland Lodge. Both now show as marks in crops and grass respectively. The track is depicted as an extant landscape feature on the 1st Edition OS 1:10560 map of 1880 (**Figure10.2**).
- 5.18 A square enclosure, which is dated to the Medieval period by the NMP and EHER, and some possibly associated ditches, were recorded at **APS_08** from specialist oblique aerial photographs¹⁶. These features are recorded as cropmarks to the north of Bursville Park at MEX 1031368.

¹⁵ RAF/87/723/1366 133 (1953)

¹⁶ TM 1818/11 118 1980, TM 1818/14 122 (1980)

- 5.19 A further square enclosure, which likely to underlie or be part of a Post Medieval field system, is visible as cropmarks on specialist oblique images¹⁷ at **APS_14** to the south of Great Holland.
- 5.20 Additional areas of former Post Medieval removed field boundaries were recorded at **APS_02, 11, 15** and **18**. **APS_18** at Bond's Farm also contains some areas of former infilled extractive pits which now show as marks in crops.
- 5.21 There are no noted traces of Medieval fields observed from aerial imagery in the Site.

Modern sites

- 5.22 As noted above, the east coast of England was heavily defended, particularly during WWII, against invasion from the air and from the North Sea.
- 5.23 Defensive pillboxes (MEX31496 (within the sea wall), 31495 (base only), 31493 (destroyed) and 1034361 (destroyed) are recorded by the EHER at the coast, alongside a destroyed Diver Site, K14, a minefield (MEX49906), a former heavy anti-aircraft battery (MEX49905) and an anti-aircraft gun site 'C4 Clacton: Little Holland' (MEX49905) have been destroyed or damaged by coastal erosion along with the sites of 19th century Martello Towers G (MEX1039274) and H (MEX1039273) which are not recorded from aerial photographs.
- 5.24 Inland, **APS_03** is recorded from the air as extant features in the 1940s¹⁸ and later as parch marks in grass¹⁹ and slight micro-topographic features²⁰ over the Nissen hut bases, former pillboxes (MEX103436 at Beach Farm) and site of the adjacent heavy anti-aircraft battery at Diver Site K13 (MEX1031358) near Clacton Road, Great Holland.
- 5.25 **APS_01** records a series of pits which show as marks in crop or grass²¹ on vertical aerial photos taken in 1953, to the east of Holland Bridge at MEX49906. This area is recorded as the site of WWII minefield number 45/40. The pits photographed in 1953

¹⁷ TM 2018/2 355, TM 2018/5 23, TM 2118/3 365 (1976)

¹⁸ RAF/106G/UK/1673 3090 3091 (1946)

¹⁹ Google Earth timelines 2005, 2009

²⁰ 2010 1m EA LiDAR

²¹ RAF/82/723/1366 0144 0212 (1953)

retain slight micro-topography which is recorded as uneven ground *via* visualised LiDAR data²².

²² 2010 1m EA Lidar, 2016 1m EA Lidar, 2018 1m NLP Lidar, 2020 1m EA Lidar

6. Aerial photograph and LiDAR survey conclusion

- 6.1 Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates.
- 6.2 Features dating to the prehistoric, Medieval, Post Medieval and Modern periods have been identified and mapped. Some of these features have been previously identified by the EHER and Essex NMP survey.
- 6.3 In some cases this assessment has augmented and added to these data from modern airborne and satellite imagery sources.
- 6.4 It is obvious that the below-ground archaeological deposits which cause the marks in crops and grass in this area are more extensive, both horizontally and vertically, than shown *via* the aerial imagery. Absence of cropmark evidence does not necessarily indicate an absence of archaeological deposits in apparently blank areas. This search area also contains extensive natural periglacial features which will further mask overlying archaeological deposits.
- 6.5 WWII defensive features have also been mapped from aerial photos.
- 6.6 The separation of dating into specific periods of prehistory and history can only be confirmed by ground-based or documentary analyses, but some dating evidence for sites within the Landfall search area has been proposed by the EHER and NMP and by observation of morphological characteristics of cropmarked sites.
- 6.7 From an aerial perspective, this landscape may be analysed in a 'living' manner as one which developed over time and contains many multi-period elements. These will be more deeply stratified and extensive below the ground than is apparent in the results of the survey. The remains visible as cropmarks are all likely to have been impacted by agricultural cultivation, to some degree, and retain minimal or no micro-topographic features visible on the ground surface.
- 6.8 The assessment leads into and has benefited from a concurrent study of historic maps, which detail the development of the landscape over the past two centuries. This map regression study is presented below.

7. Map regression analysis

- 7.1 An historic map regression study was undertaken concurrent with the aerial imagery and LiDAR analysis to provide understanding of the development of the modern landscape.

Aims and Objectives of the Map Regression Analysis

- 7.2 The aim of the map regression analysis was to collect appropriate and available historic maps, including, Tithe and Enclosure maps where present, in areas where Ecclesiastical Parishes levied Tithes, followed by OS 19th century First Edition (1880), subsequent 19th and 20th century revisions and modern cartographic sources.
- 7.3 The objective was to investigate and demonstrate any landscape changes within the site over the 18th, 19th, 20th and 21st centuries.

Cartographic Sources

18th century mapping, showing the landscape before enclosure

- 7.4 John Chapman and Peter André's map of Essex was surveyed at a scale of two inches to one mile, and published in 1777. John Chapman was a land surveyor from Suffolk who later came to work in London with Mrs Mary Ann Rocque, widow of the cartographer John Rocque. Chapman had previously been involved in producing county maps of Durham, Staffordshire and Nottinghamshire and died the year after his Essex map was published. Peter André was of Huguenot descent, like many others involved in county surveys. Chapman and André were proficient in surveys of large areas of land, and their Essex map is of exceptional accuracy and cartographic excellence.
- 7.5 It pre-dates the Board of Ordnance (later the Ordnance Survey) by almost 40 years, as one of a series of county maps published by private cartographers in the later 18th century. It was surveyed before Parliamentary Enclosure and the apportionment of land Tithes in this area. The map records landscape features which were to be changed and remodelled over the next five decades, as parts of the open land were better drained, enclosed and apportioned to tenants and private owners. It was the first map that accurately portrayed detail in the boundaries roads and villages within the wider

landscape, and allows analysis of contemporary landscape patterns such as areas of commons, woodlands and wetlands.

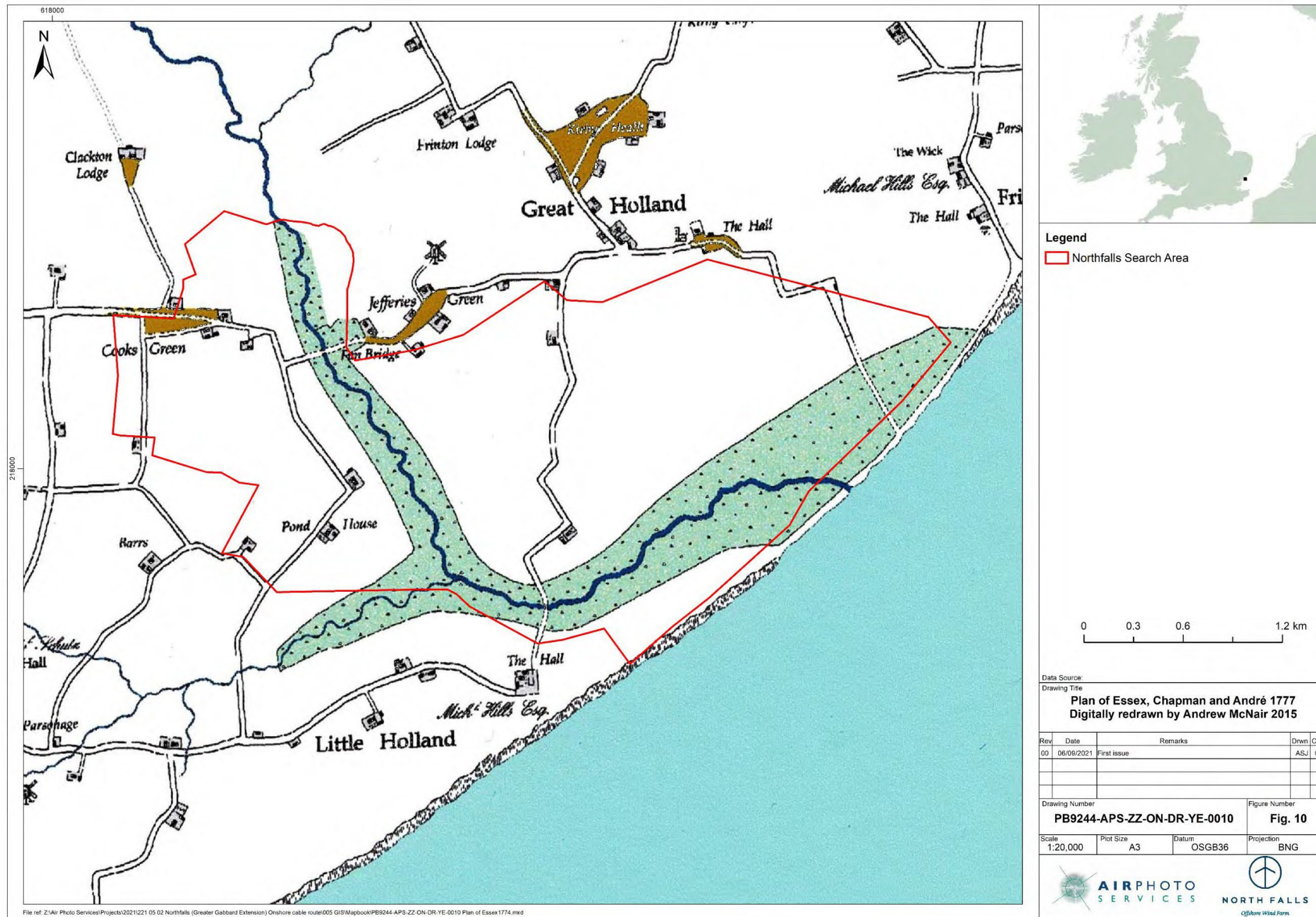
- 7.6 The map is presented in this report in its original form, with hachured contours below for information.



Chapman and André, 1777, presented digitally at **Figure 10**

- 7.7 It was digitally redrawn by Alastair MacNair in 2015 for clarity of interpretation, which is referenced at <http://www.chapmanandremapofessex.co.uk/>
- 7.8 This re-drawing is presented at **Figure 10**.
- 7.9 The map was originally published in 26 sheets, and further reprints were made in 1785 and 1833.

Figure 10 Chapman and André's map of Essex 1777, digitally redrawn by Alastair MacNair, 2015

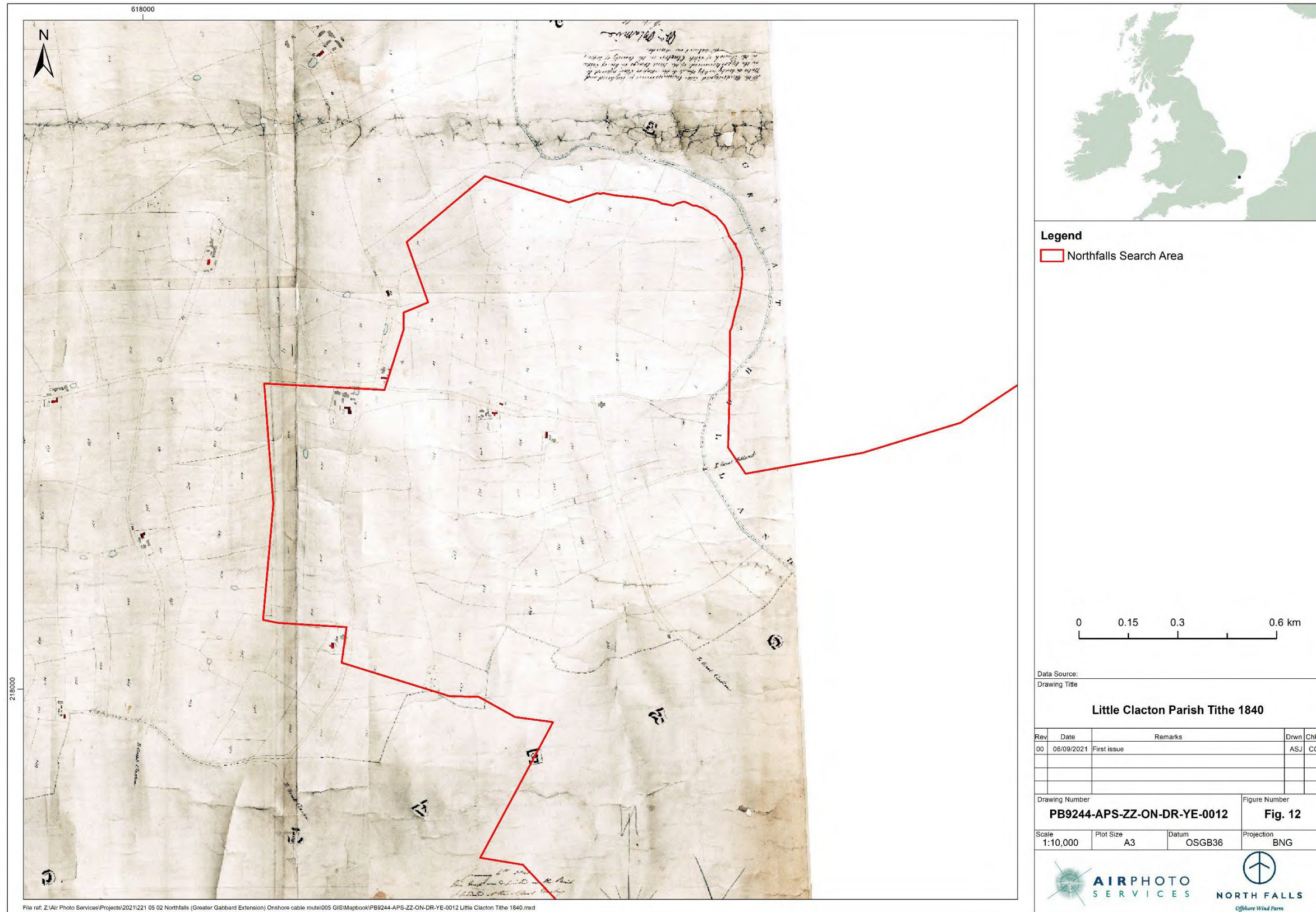


- 7.10 In 1777, the roads between The Hall and Great Holland, Little Holland and Cooks Green, to Fen bridge and Jefferies Green and from The Hall at Great Holland to the coast were established. Farms at Pond House, Cooks Green and to the south of Great Holland.
- 7.11 The land around these roadways is depicted as open. The watercourse is clearly depicted along with an area of marsh to either side, and contouring shows the small drop in level to the watercourse on the original engraved version.

Tithe Maps

- 7.12 Tithe maps are a detailed survey of the rural landscape within ecclesiastical parish boundaries in force at the time of survey. Tithe apportionment documents show the landholders and tenants of areas subject to tithe. The primary function of the Tithe maps is to provide a graphic index or visual means of reference to the apportionments, for taxation purposes within each ecclesiastical parish. Each piece of land liable to tithes was depicted and given a plot number, unique within that parish, by which it could be identified in the apportionment. The maps are detailed, and present a dated surveyed record of the land.
- 7.13 The Great Holland (1839) **Figure 11** and Little Clacton (1840) **Figure 12** Tithe maps cover the site, and indicate a well bounded and established rural landscape which is reflected in the later surveys undertaken by the OS from 1880, in contrast to the open land depicted by Chapman and André some 63 years earlier.

Figure 12 Little Clacton parish Tithe map, 1840



Enclosure awards

- 7.14 In the Post Medieval period, open fields lands and commons were enclosed and bounded in parts following the Enclosure bills enacted by Parliament between 1604 and 1914.
- 7.15 Enclosure describes various ways in which land was redistributed into designated units, usually consolidating small landholdings into larger farms. This included the conversion of commons, wasteland and open fields to formally enclosed units of land, the conversion of arable land to pasture and the partition of large areas of communally farmed land into small fields farmed and owned or tenanted by individuals.
- 7.16 In this area of Essex, only the enclosure one small area at Holland Green is archived, and this map presents no differing information to the Tithe maps which show the established boundaries comprehensively.

Historic Ordnance Survey Maps

- 7.17 From the mid-19th century, the OS surveyed, published then revised mapping from their first editions, which in this area were published in 1880, at 1:2,500 (the 'County series') and 1:10560 scale (Oliver, 2013).
- 7.18 **Figure 13** is a mapbook which contains sheets 1 – 11 (**Figures 13.1 – 13.11**) which present the OS mapping data and is presented at the end of this section. The landscape is shown at the following survey or revision dates:

OS County Series 1:10,560 scale

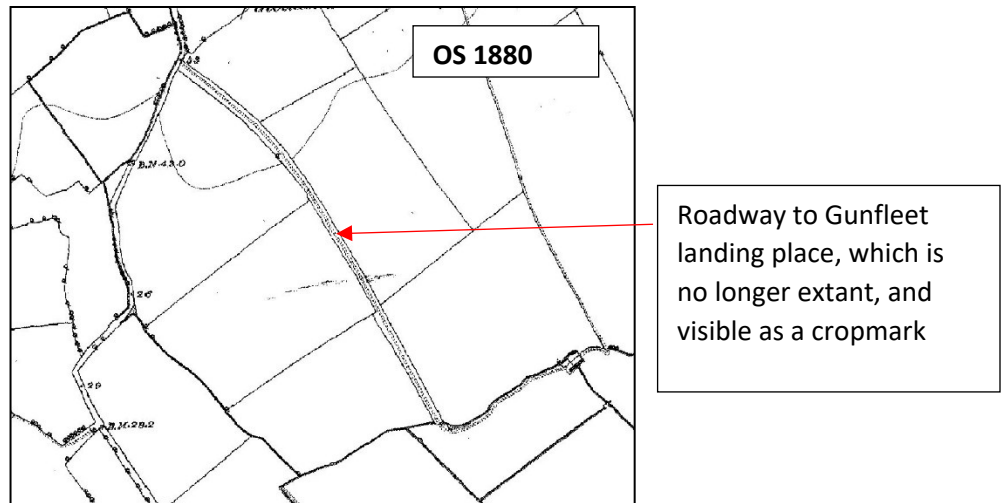
- **1880**
- **1898**
- **1925**
- **1938**
- **1958**
- **1967**

OS 1:10000 scale

- **1973**
- **1999**
- **2006**
- **2016**
- **2021**

1880

- 7.19 The 1880 First Edition 1:10,560 scale OS mapping records the landscape with all the extant field boundaries which were laid down at Enclosure and reflected within the Tithe mapping produced some 40 years earlier.
- 7.20 This map is shown at **Figure 13.1** and largely reflects the stable rural landscape of hedged fields and drains which prevails today, and is reflected in the cropmarked and relict remains of the boundaries which had been removed from the second half of the 20th century. The drains which flank Holland Brook are extant, as is the trackway which connects to the Gunfleet landing place (EHER MEX1049134) to its south. This trackway was later removed and is now visible as a well-defined curvilinear mark in crops, and is recorded as part of **APS-10** from aerial imagery.



1898

7.21 The 1880 mapping was revised in **1898 (Figure 13.2)**, when no material landscape changes are evident to the rural boundaries and coastal landscape, but the Clacton-on-Sea Branch of the Great Eastern Railway (GER) has been added to the mapping since 1880 and traverses the western sector of the Site from south to north.

1925 and 1938

7.22 Again, little change in the rural environment is reflected in the **1925 or 1938** revisions (**Figures 13.3 and 13.4**). By 1925, the golf links have been established alongside the coast to the east of Holland Gap.

7.23 The 1925 and 1938 maps also depict disused gun emplacements at Holland Gap and Chevaux de Frise Point. None of the earlier maps depict the Martello Towers at the coast, which are now destroyed and recorded within the EHER.

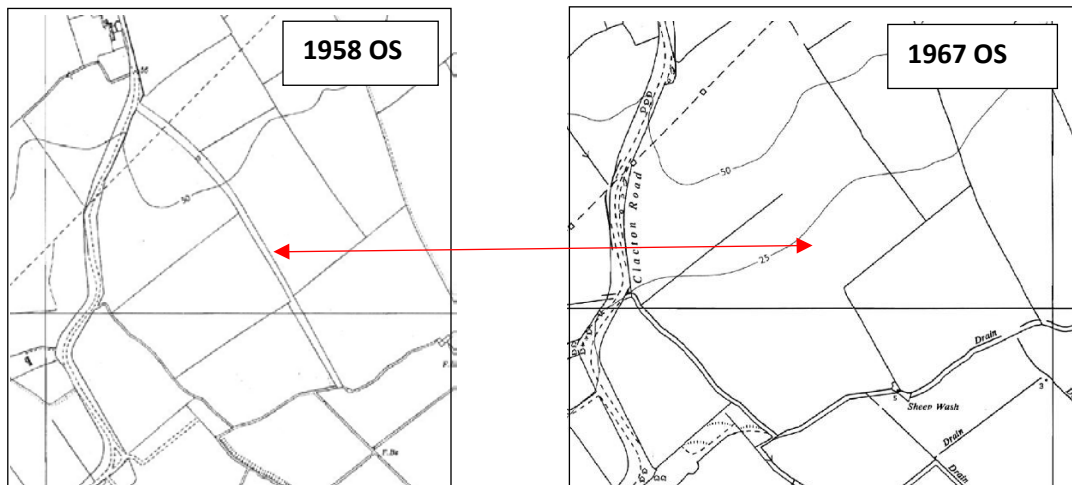
7.24 By **1938** the GER is re-labelled as the London Northeast Railway, (LNER).

1958

7.25 The **1958** OS map (**Figure 13.5**) shows that the post-WWII landscape remains the same, with no indication of any defensive features (beyond the pre-war gun emplacement sites on the coast), as is usual on non-military OS mapping in this area. The golf links are now renamed as Frinton Golf Course and housing development at Bursville Park to the north of Clacton is now present.

1967

- 7.26 The trackway which was mapped as a cropmark in **APS_10** may have been removed between **1958** and **1967**, as it and the Gunfleet landing space are not present on the **1967 (Figure 13.6)** OS mapping, when a sheep wash is depicted at the southern end of the former track.



- 7.27 The trackway which was mapped as a cropmark in **APS_10** was altered or removed between 1958 and 1967, as it and the Gunfleet landing space are not present on the 1967 OS mapping. The feature is depicted, however, in 1973, when it is marked as a track with a dashed line (which leads directly to a sheep wash, which was also depicted in earlier years). Apart from minor changes, the rural landscape depicted by the OS changed little between 1880 and 1967.

1973

- 7.28 The difference between the **1973** 1:10000 scale map (**Figure 13.7**) and the 1967 map is marked, as large areas of small fields have been opened up and the boundaries removed by 1973. This change is reflected in the aerial imagery assessment, which records areas of removed boundaries which showed as cropmarks over their residual sub-surface buried ditches from the mid-1970s onwards. This loss of boundaries is evident between Clacton Road and the drains flanking Holland Brook. Further housing development is also evident at Holland-on-Sea.

1999

- 7.29 The **1999** digital 1:10000 scale coloured OS mapping (**Figure 13.8**) graphically indicates changes to the centre of the site between Wood Hall, Frinton Golf Course and Holland Brook, and south of Cook's Green, which is now largely open land where smaller fields were once bounded by hedges and ditches. The fields can be reconstructed and compared to the pre-1973 OS mapping *via* their appearance as extant features on pre-1970s aerial photos, and their cropmarked remains, which show on specialist oblique, post 1970s verticals and post-1999 digital images from airborne and satellite platforms. Their residual micro-topography in the form of slight banks and ditches is evident in some areas *via* visualised LiDAR data. The 1999 edition of the OS map also emphasises the hydrology of this drained coastal hinterland in its use of colour.

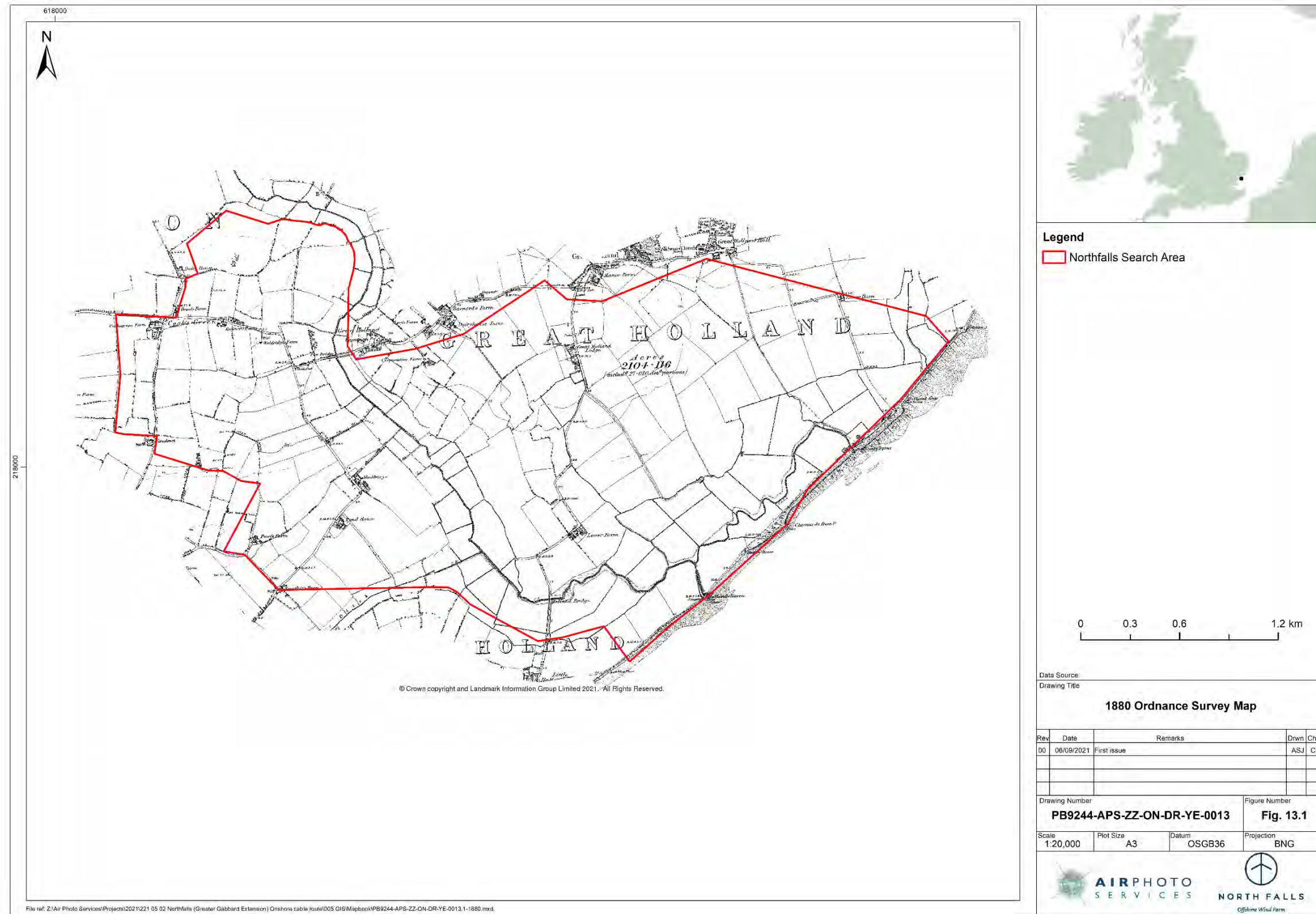
2006, 2016 and 2021

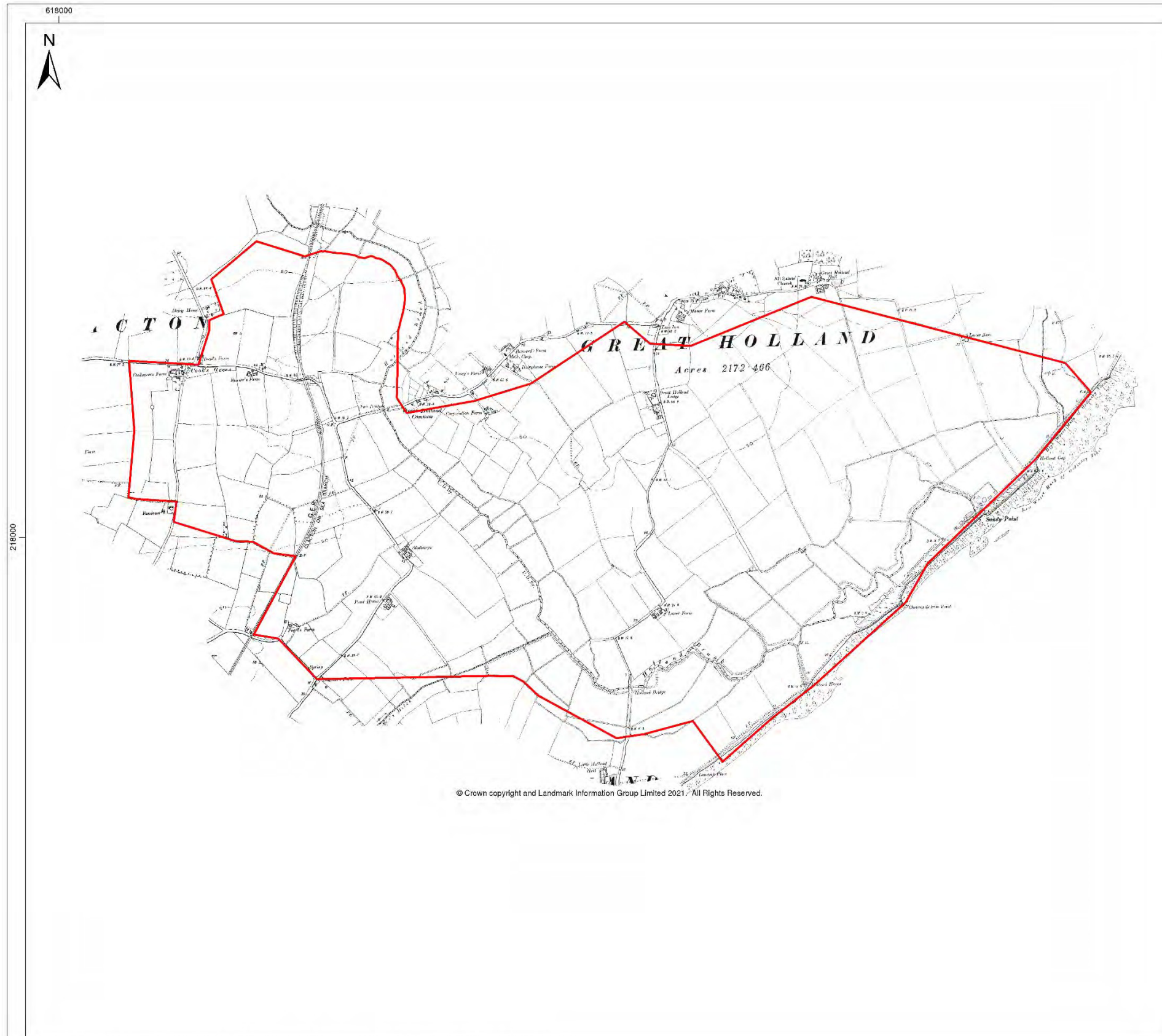
- 7.30 The **2006** coloured OS map (**Figure 13.9**) shows a very similar landscape, which continues through **2016** (**Figure 13.10**) to **2021** (**Figure 13.11**).

8. Map Regression Conclusion

- 8.1 The landscape within this Study Area is rural, and in the coastal hinterland has been under arable cultivation, with drained land and marshes flanking the coast and Holland Brook. The modern landscape boundaries were established during the 19th century.
- 8.2 The GER (later LNER) Railway line was first evident on OS 1:10,560 mapping in 1898.
- 8.3 After 1967, the landscape began to open up with the removal of large areas of Post Enclosure field boundaries which changed the rural environment since it was established following land enclosure, making the way for modern mechanised agricultural cultivation methods.
- 8.4 The small hamlets, farms and settlements have been stably present and mapped since at least the 18th century and likely before, and the settlements at Bursville Park and Holland-on-Sea to the south of the area have developed since the 1960s.
- 8.5 The later coloured OS maps indicate the hydrological features graphically, showing the drainage and character of this coastal hinterland area.

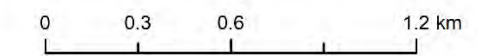
Figure 13 sheets 1 – 11 OS map regression 1880 – 2021





Legend

Northfalls Search Area



Data Source:
Drawing Title

1898 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

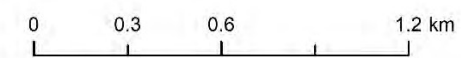
Drawing Number PB9244-APS-ZZ-ON-DR-YE-0013		Figure Number Fig. 13.2	
Scale 1:20,000	Plot Size A3	Datum OSGB36	Projection BNG





Legend

Northfalls Search Area



Data Source:

Drawing Title
1925 Ordnance Survey Map

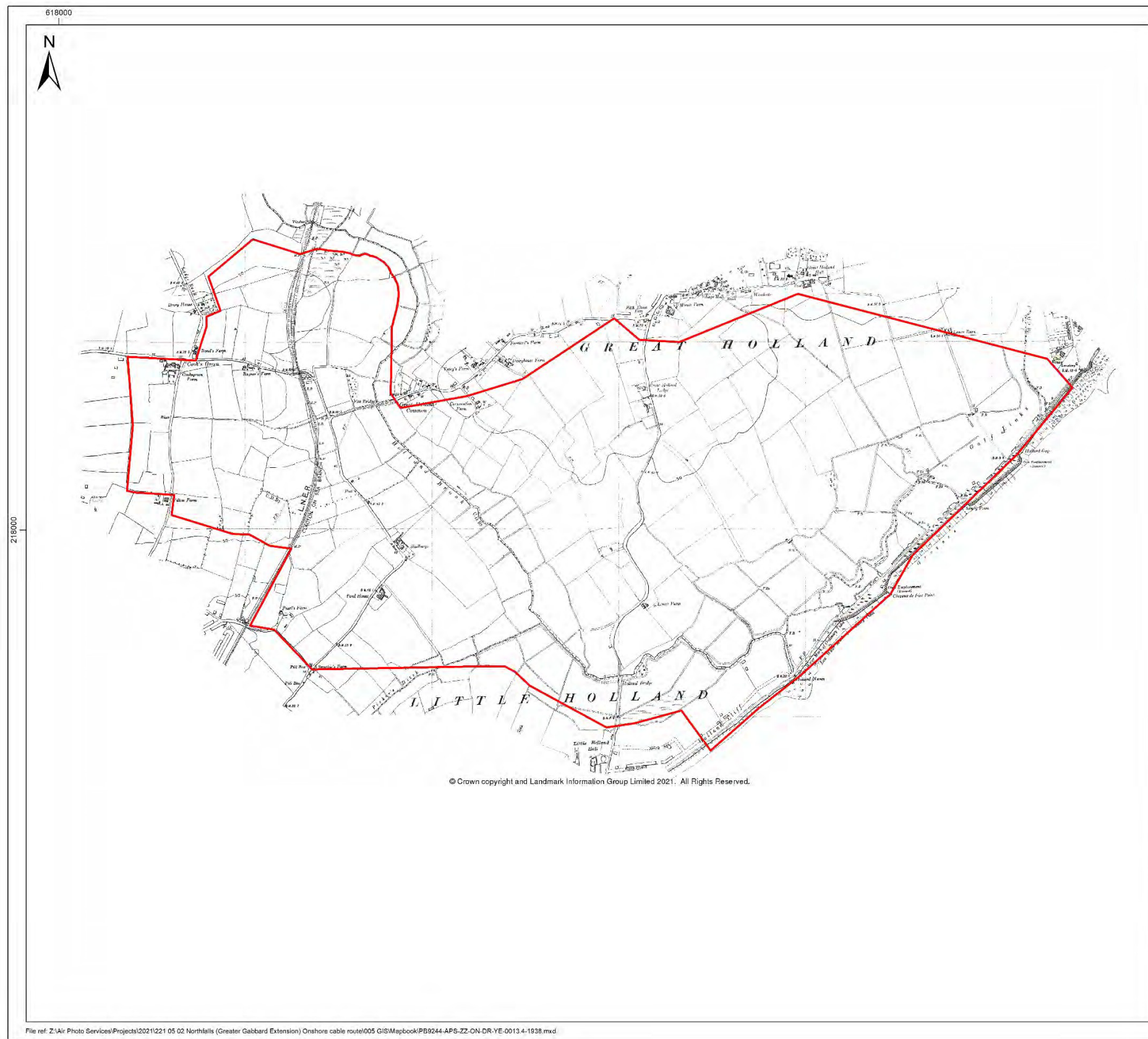
Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0013** Figure Number: **Fig. 13.3**

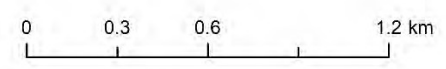
Scale: 1:20,000 Plot Size: A3 Datum: OSGB36 Projection: BNG



File ref: Z:\Air Photo Services\Projects\2021\221 05 02 Northfalls (Greater Gabbard Extension) Onshore cable route\005 GIS\Mapbook\PB9244 APS ZZ-ON-DR-YE-0013.3-1925.mxd



Legend
 Northfalls Search Area



Data Source:
 Drawing Title

1938 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0013** Figure Number: **Fig. 13.4**

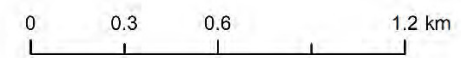
Scale: 1:20,000 Plot Size: A3 Datum: OSGB36 Projection: BNG





Legend

Northfalls Search Area



Data Source:
Drawing Title

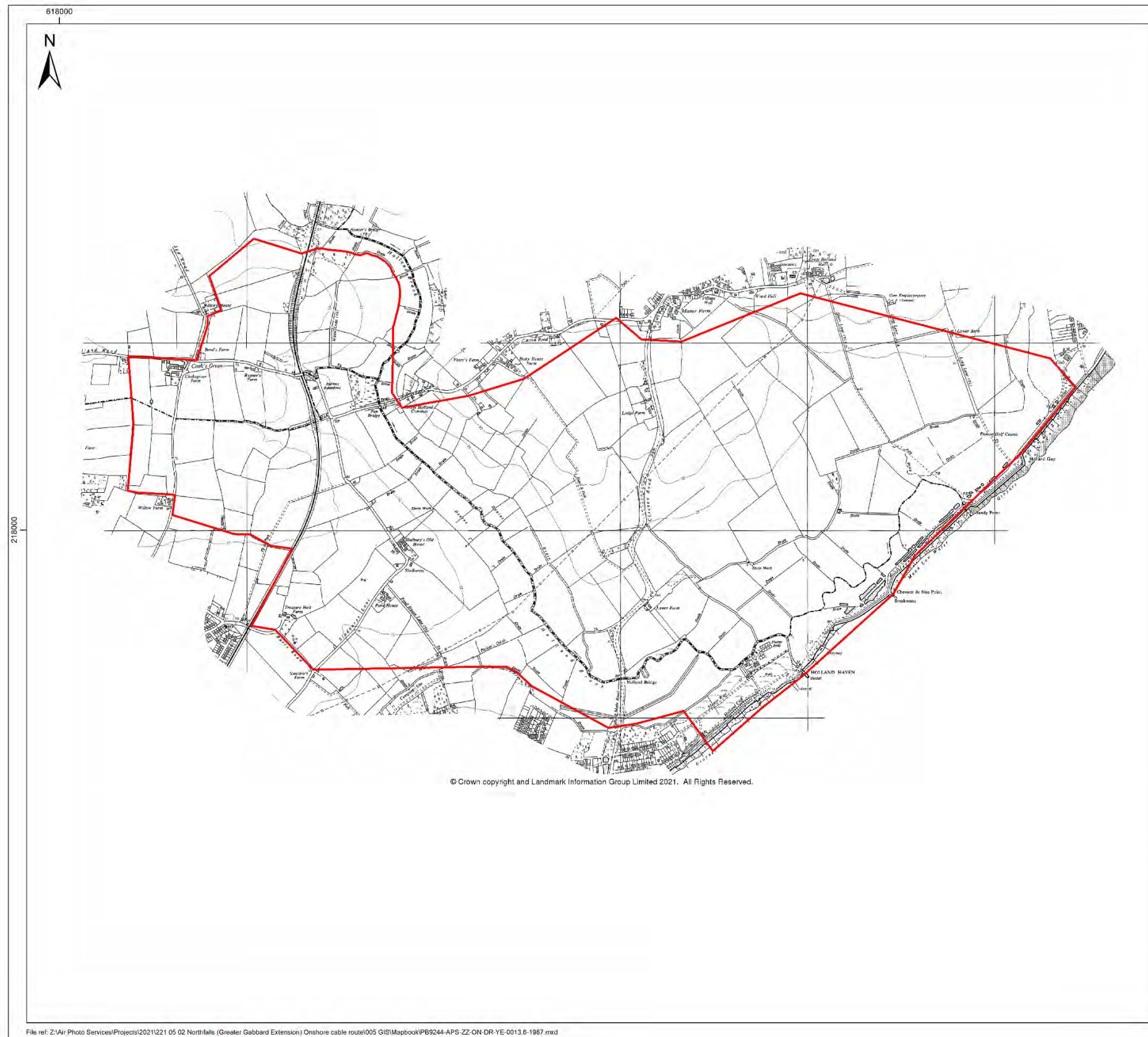
1958 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

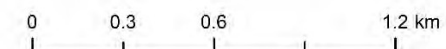
Drawing Number		Figure Number	
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Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG



File ref: Z:\Air Photo Services\Projects\2021\221 05 02 Northfalls (Greater Gabbard Extension) Onshore cable route\005 GIS\Mapbook\PB9244-APS-ZZ-ON-DR-YE-0013.5-1958.mxd



Legend
 Northfalls Search Area

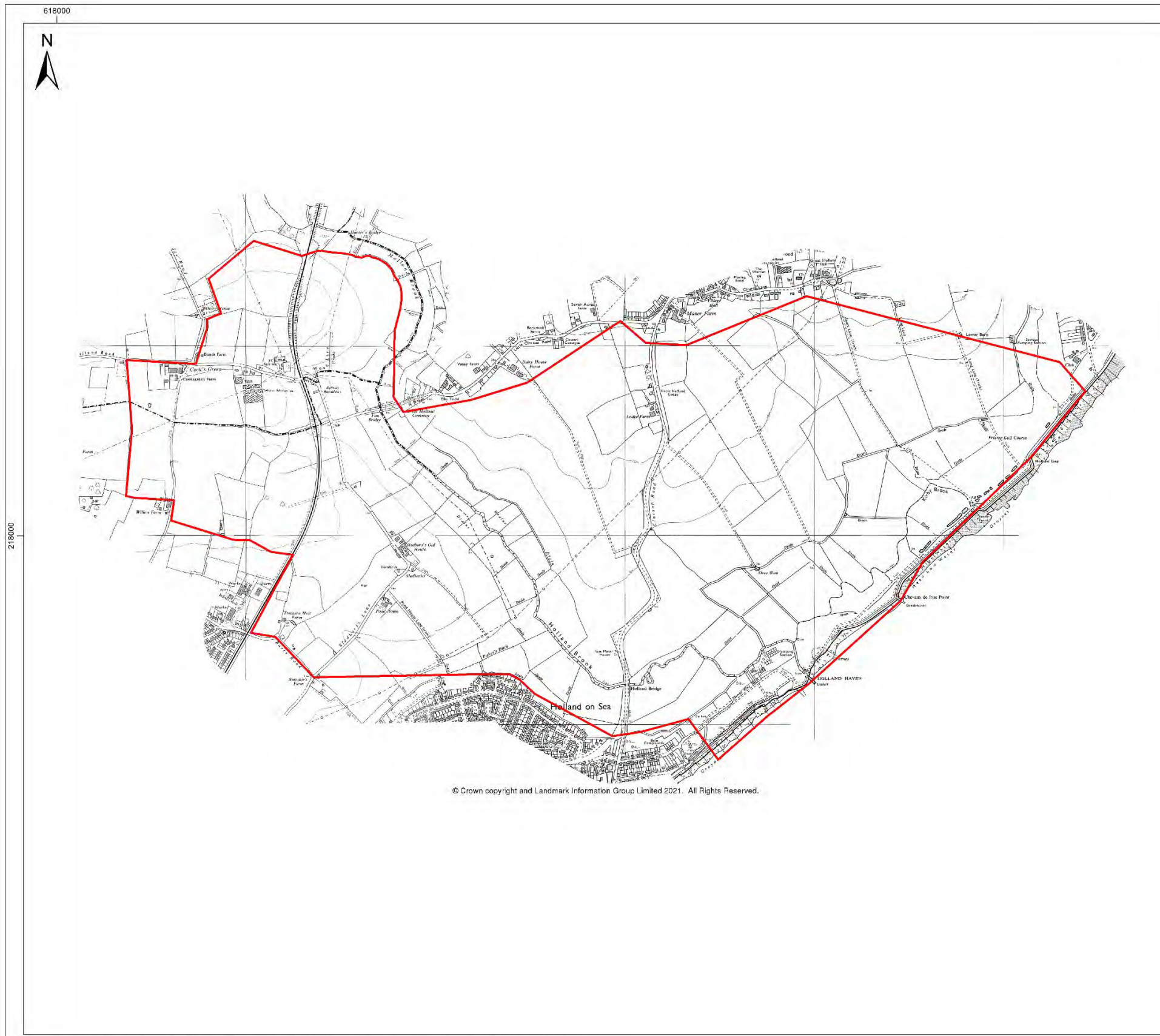


Data Source:
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1967 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
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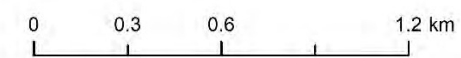
Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0013** Figure Number: **Fig. 13.6**
 Scale: 1:20,000 Plot Size: A3 Datum: OSGB36 Projection: BNG





Legend

Northfalls Search Area



Data Source:

Drawing Title

1973 - 1976 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number	Figure Number
PB9244-APS-ZZ-ON-DR-YE-0013	Fig. 13.7

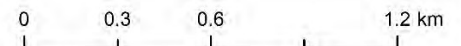
Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG





Legend

Northfalls Search Area



Data Source:

Drawing Title

1999 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

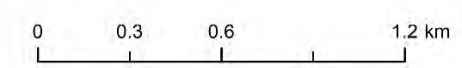
Drawing Number		Figure Number	
PB9244-APS-ZZ-ON-DR-YE-0013		Fig. 13.8	
Scale	Plot Size	Datum	Projection
1:20,000	A3	OSGB36	BNG



File ref: Z:\Air Photo Services\Projects\2021\221 05 02 Northfalls (Greater Gabbard Extension) Onshore cable route\005 GIS\Mapbook\PB9244-APS-ZZ-ON-DR-YE-0013.8-1999.mxd



Legend
 Northfalls Search Area



Data Source:
 Drawing Title

2006 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

Drawing Number PB9244-APS-ZZ-ON-DR-YE-0013		Figure Number Fig. 13.9	
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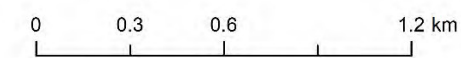


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Legend

Northfalls Search Area



Data Source:
Drawing Title

2016 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First issue	ASJ	CC

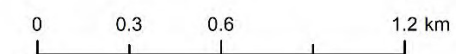
Drawing Number PB9244-APS-ZZ-ON-DR-YE-0013		Figure Number Fig. 13.10	
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Legend
 Northfalls Search Area



Data Source:
 Drawing Title

2021 Ordnance Survey Map

Rev	Date	Remarks	Drwn	Chkd
00	06/09/2021	First Issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0013** Figure Number: **Fig. 13.11**

Scale: 1:20,000 Plot Size: A3 Datum: OSGB36 Projection: BNG



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9. Appendix Airborne remote sensing data sources, processing, interpretation, mapping methodology and limitations

Data Type and Sources

9.1. This survey has utilised a range of sources and archives in order to identify, interpret and map heritage features from the air and from satellites. This section gives details about the methodology employed to search each archive, the type of data available for study and the interpretation methods applied to each data set.

Online Aerial and Satellite-Derived Images

9.2. Since 1999, digital mosaics of multiple timelines of georeferenced aerial photographs have been uploaded to geoportals such as Google Earth and at Bing.com. The dates attributed to these images are not 100% assured or authenticated, but for heritage survey purposes this has no legal implication in this instance. They are available in real time as open-source imagery online, with some copyright requirements. The imagery may change when new sources are uploaded.

9.3. All available online aerial and satellite derived images which constitute the open-source mosaics of aerial imagery displayed on Google Earth and Bing.com/Maps (aerial and birds-eye if available) were consulted for this survey. All timelines available on these geoportals were systematically consulted, between 1st and 30th June 2021.

9.4. Following magnification, relevant images were captured at the highest resolution using the 'save-image' function in Google Earth Pro or a screen snipping tool. They were saved, labelled and filed for geo-referencing.

9.5. Summer timelines at Google Earth were very helpful in the recording of cropmarked buried sites.

9.6. Aerial images displayed at Bing Maps was used in the same manner but with the limitations that there was a restricted single view timeline and less flexible image capture mechanisms. The Microsoft 'snipping tool' was used to capture the relevant images which generally were not as informative as the comprehensive timeline datasets at Google Earth

Aerial photographs held at the Historic England Archive

- 9.7. Paper based copies of all vertical, military oblique and specialist oblique aerial photos held under enquiry number 128957 were examined in detail in the Historic England Public Search Room, by Adam Jarvis in June 2021. Relevant photographs were recorded using a high resolution digital camera, filed and selected images georeferenced for the project archive. A map showing the Historic England aerial photograph coverage is presented at **Figure 2**. The Historic England Archive could only arrange access to the 1940s – 1960s verticals due to CV19 restrictions.

Aerial photographs held at The Cambridge University collection of Aerial photographs (CUCAP)

- 9.8. The CUCAP collection was fully consulted by the Essex NMP. The collection is closed for digitisation, but a coversearch was obtained online at <https://www.cambridgeairphotos.com/map/>. A map showing the CUCAP aerial photograph coverage is presented at **Figure 3**.

Aerial photographs held at Essex Council

- 9.9. Digital images were supplied by Essex Council and were processed received from Helen Saunders and georeferenced as needed for interpretation. A map showing the Essex Council aerial photograph coverage is presented at **Figure 4**.

Essex NMP Data

- 9.10. Essex NMP data were supplied in GIS-ready shapefiles, which were derived from scanning individual drawn OS quarter sheet overlays depicting the NMP data. These data were integrated into this report as separate shapefile layers to maintain the integrity and acknowledgement of the source of these data. They were updated and all features re-digitised to bring them into line with modern recording standards where appropriate. The data covered the site fully, and were derived from the Tendring Enhancement NMP project for this area.

Environment Agency LiDAR Data

- 9.11. The Environment Agency has collected LiDAR data from airborne survey platforms in recent years at varying resolutions, which are available for downloading, processing, visualising and interpreting *via* the EA website <https://environment.data.gov.uk/DefraDataDownload/?Mode=Survey> (Environment Agency, 2020).

- 9.12. LiDAR data indicate variation in the height of the ground surface. Data is collected by an active laser beam fired in pulses which scans the ground surface. The reflected pulses are recorded by the sensor on board a geolocated airborne survey platform, fitted with an inertial measurement unit to record the roll, pitch and yaw of the aircraft.
- 9.13. The point cloud data derived from the survey are processed into a series of Digital Elevation Models (DEM) usually in American Standard Code for Information Interchange (ASCII) format. These include Digital Surface Models (DSM) which contain tree cover and buildings, and Digital Terrain Models (DTM) which remove tree cover and can reveal features beneath the tree canopy (Bennett *et al* 2012; Hesse 2010; Štular *et al* 2012, Historic England, 2018).
- 9.14. These data are of assistance in recording micro and macro topographic features which may indicate relict or extant archaeological features and historic landscapes alongside more modern features. LiDAR data are best interpreted and used in conjunction with modern and historic aerial photographs and maps to provide ground truth information for features and sites recorded *via* this prospection method.
- 9.15.** The data needed were identified by using the EA timestamp shapefile detailing the LiDAR file names within the area of interest and the OS 10km and 5km grid square to identify the grids and quarter sheets. Digital Terrain Models were selected as the primary data source as the ability to remove the vegetation cover makes it ideal for prospection. All available LiDAR data for this site were downloaded for completeness of evidence. The metadata for the LiDAR downloaded for this assessment can be seen at **Table 2**.
- 9.16. The whole study area was covered by NLP LiDAR data at 1m resolution with other data available in individual survey areas.
- 9.17.** A map detailing the LiDAR data coverage is presented at **Figure 6**.
- 9.18. The data were visualised into Hillshade, Multi Directional Hillshade, Sky View Factor, Open Positive and Open Negative using the Relief Visualisation Toolbox (RVT) Version 2.2.1. These visualisations were chosen as they are of most use for archaeological prospection. The multiple ASCII tiles were merged before being

visualised for ease of use in the GIS. The data were analysed alongside the aerial photographs and base mapping to double check the topography and nature of features interpreted from LiDAR data.

- 9.19. An additional visualisation was created using a simplified process based upon the methodology proposed by Hesse to create a Simple Local Relief Model (SLRM) (Hesse, 2010). A low pass filter was applied to nearest neighbour resampling, and the resampled model was removed from the original DTM, creating a Local Relief Model. This was then processed through the RVT with a smoothing factor of 20m.

Table 3: LiDAR tiles processed

Tile Name	Resolution (m)	Date Captured
TM1515	1	11/02/2018
TM1816	1	22/10/2018
TM1816	1	02/12/2017
TM1816	1	26/11/2010
TM1816	1	03/10/2016
TM1816	2	30/04/1999
TM1816NE	0.25	23/04/2009
TM1816NW	0.25	23/04/2009
TM1817NE	0.25	23/04/2009
TM1817NW	0.25	23/04/2009
TM1817SE	0.25	23/04/2009
TM1817SW	0.25	23/04/2009
TM1818	1	19/11/2016
TM1818	1	26/11/2010
TM1818	1	03/10/2016
TM1818	2	30/04/1999
TM1818NE	0.25	23/04/2009
TM1818NW	0.25	23/04/2009
TM1818SE	0.25	23/04/2009
TM1818SW	0.25	23/04/2009
TM1819NE	0.25	23/04/2009
TM1819NW	0.25	23/04/2009
TM1819SE	0.25	23/04/2009
TM1819SW	0.25	23/04/2009
TM1916NE	0.25	23/04/2009
TM1916NW	0.25	23/04/2009
TM1917NE	0.25	23/04/2009

TM1917NW	0.25	23/04/2009
TM1917SE	0.25	23/04/2009
TM1917SW	0.25	23/04/2009
TM1918NE	0.25	23/04/2009
TM1918NW	0.25	23/04/2009
TM1918SE	0.25	23/04/2009
TM1918SW	0.25	23/04/2009
TM1919NE	0.25	23/04/2009
TM1919NW	0.25	23/04/2009
TM1919SE	0.25	23/04/2009
TM1919SW	0.25	23/04/2009
TM2015	1	11/02/2018
TM2016	1	22/10/2018
TM2016	1	03/10/2016
TM2016	1	02/12/2017
TM2016	1	26/11/2010
TM2016NE	0.25	23/06/2008
TM2016NW	0.25	23/04/2009
TM2017NW	0.25	23/04/2009
TM2017SW	0.25	23/04/2009
TM2018	1	03/10/2016
TM2018	1	19/11/2016
TM2018	1	26/11/2010
TM2018NW	0.25	23/04/2009
TM2018SW	0.25	23/04/2009
TM2019NW	0.25	23/04/2009
TM2019SW	0.25	23/04/2009
TM2116NE	0.25	23/06/2008
TM2116NW	0.25	23/06/2008
TM2117NE	0.25	23/06/2008
TM2117SE	0.25	23/06/2008
TM2117SW	0.25	23/06/2008
TM2216	1	02/12/2017
TM2216	1	22/10/2018
TM2216	1	03/10/2016
TM2216	1	26/11/2010
TM2216NW	0.25	23/06/2008
TM2217NE	0.25	23/06/2008
TM2217NW	0.25	23/06/2008
TM2217SE	0.25	23/06/2008
TM2217SW	0.25	23/06/2008
TM2218	1	02/12/2017
TM2218	1	03/10/2016

TM2218	1	26/11/2010
TM2218NE	0.25	23/06/2008
TM2218SE	0.25	23/06/2008
TM2218SW	0.25	23/06/2008
TM2318NE	0.25	23/06/2008
TM2318NW	0.25	23/06/2008
TM2318SW	0.25	23/06/2008
TM2319SE	0.25	23/06/2008
TM2319SW	0.25	23/06/2008

Data Processing

- 9.20. The collected digitised photographs and images were labelled and archived and selected frames were georectified to the OS digital map base with the QGIS and ArcGIS georectification tools for interpretation and mapping. The project used an OSGB/1936 British National Grid European Petroleum Survey Group (EPSG):27700 Coordinate Reference System (CRS).
- 9.21. Interpretative or source queries were addressed as appropriate by further reference to the archived photographs in the survey files.
- 9.22. Following comparison to other airborne sources and all EHER data, extent of area polygons were digitised around the interpreted extent of features identified, and a site database created in QGIS as an attribute table within a shapefile.
- 9.23. When all data sources had been examined, interpretative polygons were digitised to further shapefiles to indicate the form, extent and type of extant features within areas.

Data Presentation

- 9.24. The data were presented in shapefile data format within the project GIS. A shapefile contains geographical reference data as individual objects such as a ditch, a bank, a structure or a coordinate area. Features exist as 'objects' and their 'attributes' where the interpretations are recorded within the shapefile.

- 9.25. In addition to the shapefile, the data derived from the survey are presented in the Technical Mapbook sheets 01 - 06 which is indexed at **Figure 10**.
- 9.26. The map book presents keyed, labelled and individually numbered illustrations at a consistent scale.
- 9.27. The data are also presented as a gazetteer of sites at **Table 1**. The gazetteer is derived from selected attributes within the extent of area mapping shapefile. It summarises the location, type, condition and interpretation of each individually identified site or area of features.

Interpretative Mapping

Extent of Area Mapping

- 9.28. Extent of area mapping was undertaken initially to identify archaeological assets through 'APS Site Polygons'. These polygons indicate the extent of area around a feature or group of archaeological features. A detailed supporting attribute table was compiled at this stage detailing the following for each feature:

- APS Site Number;
- Asset Type;
- Broad Type;
- NMP coverage;
- APS derived records;
- Evidence Type (1-10);
- Source (1-10);
- Period;
- Monument UID Number;
- Source HER;
- Comment;
- Geological Disturbance;
- NMP Additions/Remapping;
- By;
- Supplier;
- Client;
- Project;

- Easting;
- Northing;
- National Grid Reference;
- Map Source; and
- Map Book Number.

9.29. This process created a database which forms the basis for all detailed mapping and analysis.

9.30. Aerial imagery and LiDAR analysis is a non-intrusive survey method, and not all features which are identified may be accurately dated by this means alone.

Assumptions and Limitations

Historic Aerial Photographs

9.31. The assumption that aerial photographic survey and vertical and oblique aerial photographs show all features and will reveal a complete archaeological record in any given area is erroneous. This is due to many interactive survey, seasonal, environmental, meteorological and perception and interpretation issues which are set out below.

9.32. Interpretation of aerial photographs relies either on visual identification of the effect heritage assets have on crops and other vegetation, marks in soils or visible features or earthworks which are more visible at times of clear low light.

9.33. It is important to note that aerial photographs usually only show part of the horizontal and vertical extent of buried and upstanding features. Their capacity to reveal features as cropmarks, vegetation marks, soil marks or as the shadows cast by banks, ditches and walls, depends upon several environmental and agricultural factors prevalent at the time of the photographic survey. It is possible for many years' photography over one site to show nothing at all, and then during one instance of survey to reveal complex buried cropmark features. The direction of light at the time of photography, with reference to shadows cast and crop or soil marked features highlighted, can also affect the visibility of features on aerial photographs. Unlike digitally processed LiDAR and other data, the azimuth of the sun cannot be changed on a conventional aerial photograph.

- 9.34. Past and present land use also presents limitations to visibility of features. A cropped arable regime of cereals often allows the formation of cropmarks, whereas grassland, unless seen in times of extreme moisture stress, can mask the appearance of buried features. The time of year is thus important in gaining maximum benefit from aerial photographic sorties. In winter, the low leaf index and lower light angle assists visibility of topographic and earthwork features. In summer, ripening crops, often from April through to harvest in July/August, may show differential marks over buried features. Dry conditions will often cause parching in grass, which will then reveal areas of former foundations as the grass dies over the harder less moisture retentive buried features. Following harvest, weathering and ploughing, marks in soil often show where buried archaeological deposits are being actively ploughed and brought to the surface.
- 9.35. In this area of Essex, away from the marine-alluviated coast, the arable areas have been intensively eroded by ploughing. The areas of lighter shallow soils over well drained substrates are conducive to the formation of cropmarks over both buried heritage assets and complex and extensive geological anomalies in the substrates.
- 9.36. In constructing a comprehensive interpretation of the archaeological landscape, it is essential to examine a range of photographs, taken under a variety of environmental conditions, as has been done in his case.
- 9.37. The aerial photographs taken in the 1940s often recorded extant landscapes which have been altered or carry evidence for pre-modern fields and extant military features, particularly in coastal areas. These historic photos provide a starting point for the assessment of landscape change, in conjunction with the study of historic maps and modern aerial and satellite-derived imagery.
- 9.38. The remit of past oblique aerial surveys, the survey areas chosen and the visibility of sites to the aerial archaeologist can often determine the content and coverage of oblique aerial photography. Observer led flights may be heavily biased and may miss features which were present but were not seen or recorded. This area has been surveyed carefully by aerial archaeologists and subject to past mapping by the NMP, but some additions and clarifications to former mapping and interpretations have been made as expected.

9.39. It is also important to note that the perception of the environment and expectation of what is to be found may often limit the air photo analyst's mental 'openness' to features. This perception factor is mitigated by repeated examination of imagery taken in different years and under different conditions, and by teamwork between two or more interpreters checking the data. 'Photo fatigue' is also a factor in drop-off rates of discovery or perception of features. It is mitigated by alternating activities and personnel, checking interpretations with other team members and taking adequate visual breaks.

Online aerial photographs and satellite-derived images

9.40. Google Earth regularly uploads new images and attributes some images with the name of the provider and a date of capture. These dates are not verified, but for archaeological survey this is not a legally essential element of the metadata. The issue with data derived from geoportals such as Google Earth is that it changes and is added to; it is a dynamic collection of varied mosaiced dated images and varied resolutions of data derived from aerial photography and satellite imagery. During 2017-2018, Google began to capture its own data, and these layers are largely 'unattributed' in terms of provider. The main UK providers to Google Earth include Getmapping, Infoterra and Bluesky, The GeoInformation Group (now Geomni/Verisk), Maxar and CNES/Airbus. The mosaic 'cuts' where images have been blended together and captured in different seasons are readily apparent, often within the same 'timeline' data.

Aerial Imagery Limitations: Conclusion

9.41. Aerial photograph assessments are often based on sequences of historical imagery which provide a series of 'snapshots' of the landscape under different conditions. In contrast, LiDAR and multi-spectral data are typically gathered at a single or series of closely spaced points in time. Levelled features which are now only visible as cropmarks are not usually visible *via* LiDAR data unless they are recorded as substantially differing vegetation heights within a DSM, or the features causing the cropmarks are still extant as micro topographic differences in the ground surface.

9.42. The limitations of these data sources are appreciated and considered during survey and use of multiple data sources. Multiple times of survey increases the discovery

rate and certainty of interpretation from all airborne data sources when they are examined concurrently.

LiDAR Data

- 9.43. LiDAR data are collected for multiple environmental and engineering survey purposes and are therefore sometimes not in compliance with optimum timeframes for heritage survey requirements. An optimum LiDAR survey date for recovery of micro and macro topographic heritage data spans late November to mid-March in the northern hemisphere. This is when leaf canopy and vegetation are at their lowest and a higher proportion of bare earth is exposed in both woodland and open areas to ensure that the laser pulses reach and return to and from the ground in sufficient density to record topography to create an accurate and detailed DTM.
- 9.44. Whilst of excellent high resolution, some data are not gathered at an optimal time for specific heritage survey purposes, as they are provided to serve the needs of multi-disciplinary surveys. A lower resolution survey captured during the winter months very often provides more data due to the lack of intervening vegetation which prevents sufficient laser points from reaching the ground surface. A low density of vegetation and leaf canopy is essential to the effectiveness of LiDAR survey in that it ensures maximum penetration of light signals to the ground surface in vegetated areas. The LiDAR data are, however, of assistance in recording some micro and more macro topographic features which may indicate relict or extant archaeological features and historic landscapes. They were used over the survey area in multiple visualisations alongside the aerial photographs and satellite image data. LiDAR data are best interpreted and used in conjunction with modern and historic aerial photographs and maps to provide ground truth information, and this was achieved in this survey.
- 9.45. For LiDAR data captured during 'leaf / crop on' conditions, less data is recorded due to foliage and vegetation masking the route of the laser. Similarly, areas of water will absorb the laser giving no returned points.
- 9.46. The majority of the NLP LiDAR data were collected between October and March, with varied dates for smaller surveys.

- 9.47. When the point cloud is processed into a DTM, reduced ground coverage results in a simplified geometry surface interpolated from the few available data points which can obstruct features of interest.
- 9.48. The horizontal cell resolution of LiDAR data can also influence the detection rates of archaeological features. This can occur where the spacing of point measurements is sufficiently wide to conceal or reduce the visibility of small archaeological features. This may have affected this assessment in areas where LiDAR data were gathered at 2m, 1m and 50cm resolutions as opposed to the more detailed 25cm resolution data.
- 9.49. It is also important to note that LiDAR visualisation techniques are continually developing and advancing. The multiple visualisations now applied to DSM and DTM data *via* the RVT used for this survey are effective in heritage interpretation. Hillshade, and particularly fixed-direction Hillshade, visualisations do not show the correct position of the actual features, only the position of their virtual 'shadows' on the ground. It is thus important to use multiple visualisations of LiDAR data to ensure accurate positioning of recorded features and optimise the results.

LiDAR data: conclusion

- 9.50. The majority of the LiDAR data were captured at times of low leaf index; however these data did not reveal consistently significant topographic heritage assets over the whole of this area. This is due to the eroded and buried nature of the cropmarked sites which constitute the majority of the aerial evidence which is largely eroded to sub-surface level.

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11. Acknowledgements

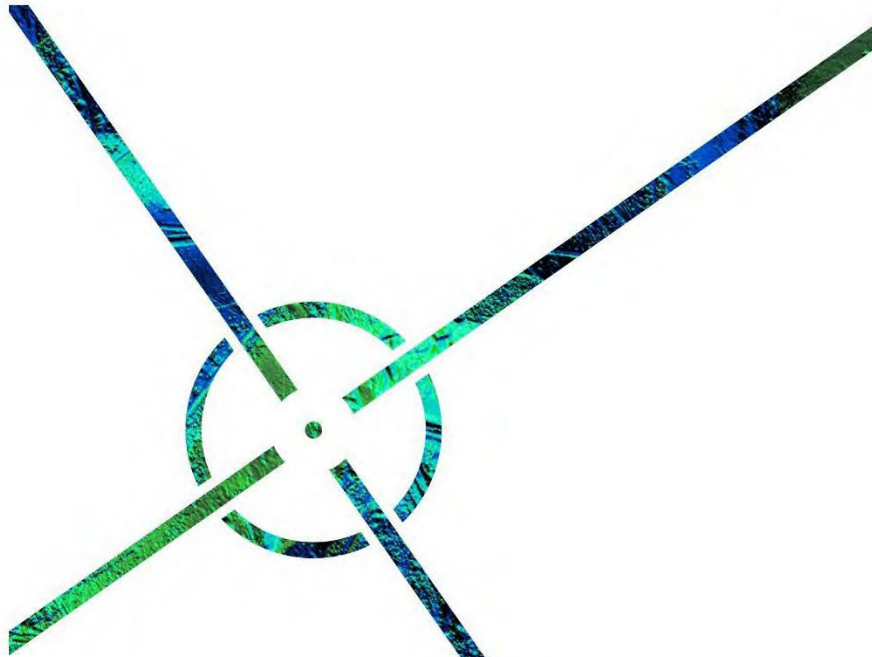
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North Falls Offshore Wind
Farm

Onshore Cable Corridors and
Substation Options

Assessment Report

Assessment of airborne and satellite remote
sensing data and map regression analysis for
archaeology

NORTH FALLS OFFSHORE WIND FARM
ONSHORE CABLE CORRIDORS AND SUBSTATION OPTIONS
Assessment of airborne and satellite remote sensing data and
map regression analysis for archaeology

Client	Royal HaskoningDHV on behalf of North Falls Offshore Windfarm Limited (NFOW)
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Local Authority	Tendring District Council
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Aerial photograph, satellite imagery and LiDAR data interpretation and mapping, GIS data management	Adam Jarvis ACIfA
QA checked by	Chris Cox MA MCIfA FSA (interpretation and mapping), Nereide Gilhead ACCA Affil. CIfA (report) David Lang BA PCIfA (GIS data attribute tables and gazetteer of sites)

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Figures

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PB9244-APS-ZZ-ON-DR-YE-0014-SiteLocation.mxd	Figure 1	Site Location
PB9244-APS-ZZ-ON-DR-YE-0015-HistoricEnglandCoversearch.mxd	Figure 2	Historic England aerial photographs
PB9244-APS-ZZ-ON-DR-YE-0016-CUCAPCoverage.mxd	Figure 3	CUCAP aerial photographs
PB9244-APS-ZZ-ON-DR-YE-0017_EssexCCAPs.mxd	Figure 4	Essex County Council aerial photographs
PB9244-APS-ZZ-ON-DR-YE-0018-LidarCoverage.mxd	Figure 5	LiDAR data coverage
PB9244-APS-ZZ-ON-DR-YE-0019-Geology.mxd	Figure 6	Geology
PB9244-APS-ZZ-ON-DR-YE-0020-Soils.mxd	Figure 7	Soils
The following figures are supplied as PDF files because they are too large and voluminous to fit into a standard Word document.		
2PB9244-APS-ZZ-ON-DR-YE-0021 Mapbook Index.mxd	Figure 8	Heritage mapbook Index
PB9244-APS-ZZ-ON-DR-YE-0022.1-23-Mapbook.mxd	Figure 9	Heritage mapbook
PB9244-APS-ZZ-ON-DR-YE-0023-Plan of Essex1777.mxd	Figure 10	Chapman and André's map of Essex, 1777
PB9244-APS-ZZ-ON-DR-YE-0024-ParishIndex.mxd	Figure 11	Parish index
PB9244-APS-ZZ-ON-DR-YE-0025-GreatHolland1839.mxd	Figure 12	Great Holland Tithe map 1839

Filename	Figure no.	Title
PB9244-APS-ZZ-ON-DR-YE-0026-Thorpe-le-Soken1841.mxd	Figure 13	Thorpe le Soken Tithe map 1841
PB9244-APS-ZZ-ON-DR-YE-0027-Beaumont1839.mxd	Figure 14	Beaumont Tithe map 1839
PB9244-APS-ZZ-ON-DR-YE-0028-Tendring1842.mxd	Figure 15	Tendring Tithe map 1942
PB9244-APS-ZZ-ON-DR-YE-0029-Wix1837.mxd	Figure 16	Wix Tithe map 1837
PB9244-APS-ZZ-ON-DR-YE-0030-Bradfield1838.mxd	Figure 17	Bradfield Tithe map 1838
PB9244-APS-ZZ-ON-DR-YE-0031-Mistley1843.mxd	Figure 18	Mistley tithe map 1843
2PB9244-APS-ZZ-ON-DR-YE-0032-LittleBentley1841.mxd	Figure 19	Little Bentley Tithe map 1841
PB9244-APS-ZZ-ON-DR-YE-0033-LittleBromley1841.mxd	Figure 20	Little Bromley Tithe map 1841
PB9244-APS-ZZ-ON-DR-YE-0034-GreatBromley1839.mxd	Figure 21	Great Bromley Tithe map 1839
PB9244-APS-ZZ-ON-DR-YE-0035-Ardleigh1842.mxd	Figure 22	Ardleigh Tithe map 1842
PB9244-APS-ZZ-ON-DR-YE-0036-Lawford1839.mxd	Figure 23	Lawford tithe map 1839
2PB9244-APS-ZZ-ON-DR-YE-0037-OS1874-1875.mxd	Figure 24	OS map, 1874-1875
PB9244-APS-ZZ-ON-DR-YE-0038-1898.mxd	Figure 25	OS map 1898
PB9244-APS-ZZ-ON-DR-YE-0039-1922-1925.mxd	Figure 26	OS map 1922-25
PB9244-APS-ZZ-ON-DR-YE-0040-1953-1958.mxd	Figure 27	OS map 1953-1958
PB9244-APS-ZZ-ON-DR-YE-0041-1966-1967.mxd	Figure 28	OS map 1966-1967
PB9244-APS-ZZ-ON-DR-YE-0042-1976-1983.mxd	Figure 29	OS map 1976-1983
PB9244-APS-ZZ-ON-DR-YE-0043-1994.mxd	Figure 30	OS map 1994

Tables

Table 1	Sites identified within the site from aerial photographs, satellite imagery and visualised LiDAR data
Table 2	Sites recorded within the EHER but not mapped for this assessment
Table 3	Tithe maps which were used for this assessment
Table 4	OS maps which were used for this assessment
Table 5	LiDAR tiles which were downloaded and processed for this assessment

Glossary of abbreviations

APS	Air Photo Services Ltd
ArcGIS	Artificial Intelligence Geographic Information System
ASCII	American Standard Code for Information Interchange
CRS	Coordinate Reference System
CSV	Comma Separated Value file
CUCAP	Cambridge University Collection of Aerial Photography
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
DXF	Drawing Exchange Format
EA	Environment Agency
EPSG	European Petroleum Survey Group
GIS	Geographic Information System
EHER	Essex Historic Environment Record
ERO	Essex Records Office
LiDAR	Light Detection And Ranging
NA	The National Archives
NFOW	North Falls Offshore Windfarm Ltd
NGR	National Grid Reference
NLP	National LiDAR Programme
NMP	(Historic England) National Mapping Programme
OS	Ordnance Survey
MonUID	EHER site reference
QGIS	Quantum Geographic Information System
RVT	Relief Visualisation Toolbox
SLRM	Simple Local Relief Model
WWI	World War One (1914-1918)
WWII	World War Two (1939 – 1945)

Summary

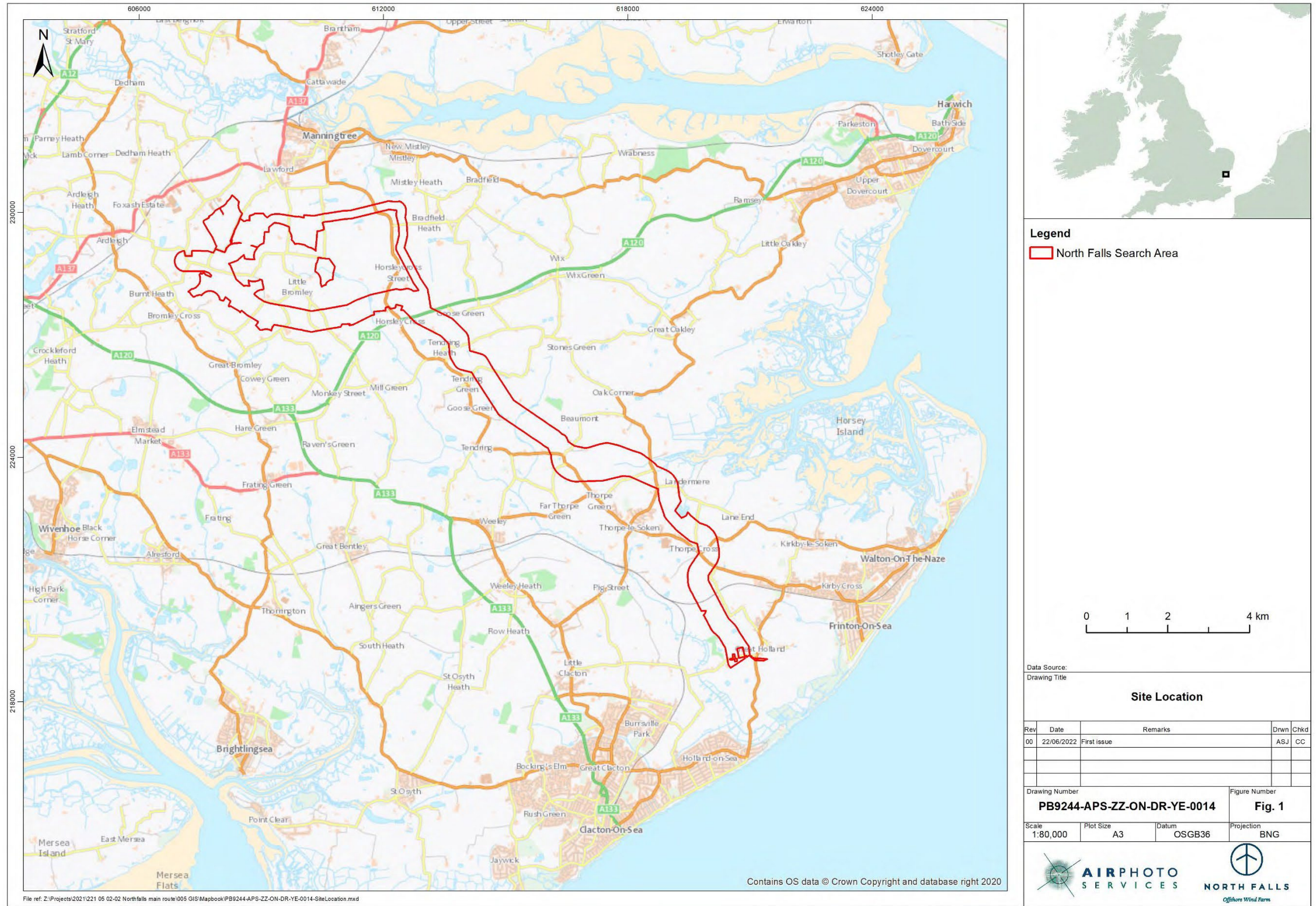
- S1. Air Photo Services Ltd (APS) was commissioned to undertake an assessment of airborne remote sensing and satellite imagery data alongside historic map regression analysis, as part of the baseline surveys for the onshore project area components (hereafter referred to as 'the Site') for the onshore cable corridors and substation options for the North Falls Offshore Wind Farm.
- S2. The site lies to the west of the Essex coast between Great Holland in its southeast and an area to the south of Lawford and Manningtree in its northwest and is shown on **Figure 1**.
- S3. This report represents the work undertaken by APS between January and June 2022.
- S4. The object of this assessment was to provide information on the location and nature of buried and upstanding archaeological features which are visible on historic aerial photographs, modern aerial and satellite imagery and visualised Airborne Laser Scan (ALS) which is also known as Light Detection And Ranging (LiDAR) data to assess the topographic and micro topographic features within the site.
- S5. Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, ritual, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates. Multi-period features dating from prehistoric to likely modern times have been identified and mapped. Some of these features have been previously identified by the Essex Historic Environment Record (EHER) and the Essex National Mapping Programme (ENMP) survey.
- S6. The assessment identified thirty five areas of archaeological interest which are detailed below in the report at **Table 1**.

- S7. Map regression analysis which considers mapping surveyed between 1777 and 1994 shows that the landscape within the site is one of established smaller rural fields which increase in size as field boundaries are progressively removed since the 1950s.
- S8. The small hamlets, farms and settlements have been stably present. One antiquity, a *tumulus* was depicted by the Ordnance Survey (OS) until the 1950s.
- S9. After 1967, the landscape began to open-up with the ongoing removal of large areas of Post Medieval field boundaries which changed the rural environment that had been established following land enclosure, making the way for modern mechanised agricultural cultivation methods.

1. Introduction, aims and objectives

- 1.1. Air Photo Services Ltd (APS) was commissioned to undertake an assessment of airborne remote sensing and satellite imagery data alongside historic map regression analysis, as a baseline survey for the cable corridors and substation options (hereafter referred to as 'the Site') for the North Falls Offshore Wind Farm.
- 1.2. The Site is a linear onshore cable route corridor and lies to the west of the Essex coast between Great Holland in its southeast extent and an area under consideration for substation options to the south of Lawford and Manningtree in its northwest, as shown on **Figure 1**.
- 1.3. This report represents the work undertaken by APS between January and June 2022.

Figure 1 Site location



Aims and objectives

14. The aim of this assessment report was to provide information on the location and nature of buried and upstanding archaeological features visible on historic aerial photographs, modern aerial and satellite imagery and visualised LiDAR data to assess the buried, topographic and micro topographic features within the Site.
15. The analysis aimed to assess the present level of preservation of the buried and residual or extant historic landscape features in the Site. This was assessed in respect of the considerable landscape change wrought by intense arable farming over much of the Site to the west of the coast.
16. The objective of this report is to identify the potential for heritage asset presence and preservation through the assessment of aerial imagery, LiDAR data and map regression analysis.

2. Sources of data

2.1. The **Appendix** to this report details:

- The data sources which were consulted, and their metadata as appropriate;
- Methodologies employed; and
- Conclusions drawn from the data acquisition and processing.

2.2. In summary, the assessment systematically examined the following sources of data:

- Historic and modern aerial photographs *via* online sources;
- Satellite imagery *via* online sources;
- Specialist oblique, military oblique and vertical aerial photographs held as accessible prints and digital files at the Historic England Archive in Swindon, the locations of which are shown on **Figure 2**;
- Online search of the Cambridge University Collection of Aerial Photographs (CUCAP) database at <https://www.cambridgeairphotos.com/map/> which generates a Comma Separated Value file (CSV) file showing the locations of vertical and oblique aerial photographic surveys and site targets which are shown on **Figure 3**. This collection remains in long term closure during its digitisation in Cambridge and it is not possible to see any of the actual images at the time of writing. However, these images have been examined by the Essex National Mapping Programme (NMP) Tendring Extension project;
- Oblique aerial photographs taken during the course of specialist surveys by Helen Saunders at Essex Council, which were provided digitally as high quality scans. The locations of these obliques are shown on **Figure 4**;
- Search data as Shape (SHP) and Portable Document Format (PDF) files from the Essex Historic Environment Record (EHER);
- The Essex National Mapping Programme (NMP) was used as baseline data (Ingle and Saunders 2003) and covers the whole of the Site. This project was an early NMP, begun in 1993, and interpretation continued to 2017 with the Tendring Enhancement add-on to the original data;

- Environment Agency (EA) and National LiDAR Programme (NLP) LiDAR data were available as shown at **Figure 5** and detailed at **Table 5**;
- Tithe maps covering all pre-modern parishes traversed by the Site, derived from the <https://www.thegenealogist.co.uk/tithe/>. Larger items such as the original paper-based Tithe and the minimal amount of enclosure maps for this area were not available for consultation in the Essex Records Office (ERO) during the timescale of this assessment due to health and safety restrictions on archive activities due to CV19. The online Tithe records present an appropriate data source in this instance and reflect the landscape in the 1830s and 1840s; and
- Georeferenced historical OS mapping provided as a digital package for commercial use by Groundsure (www.groundsure.com).

Figure 2 Historic England aerial photograph coverage

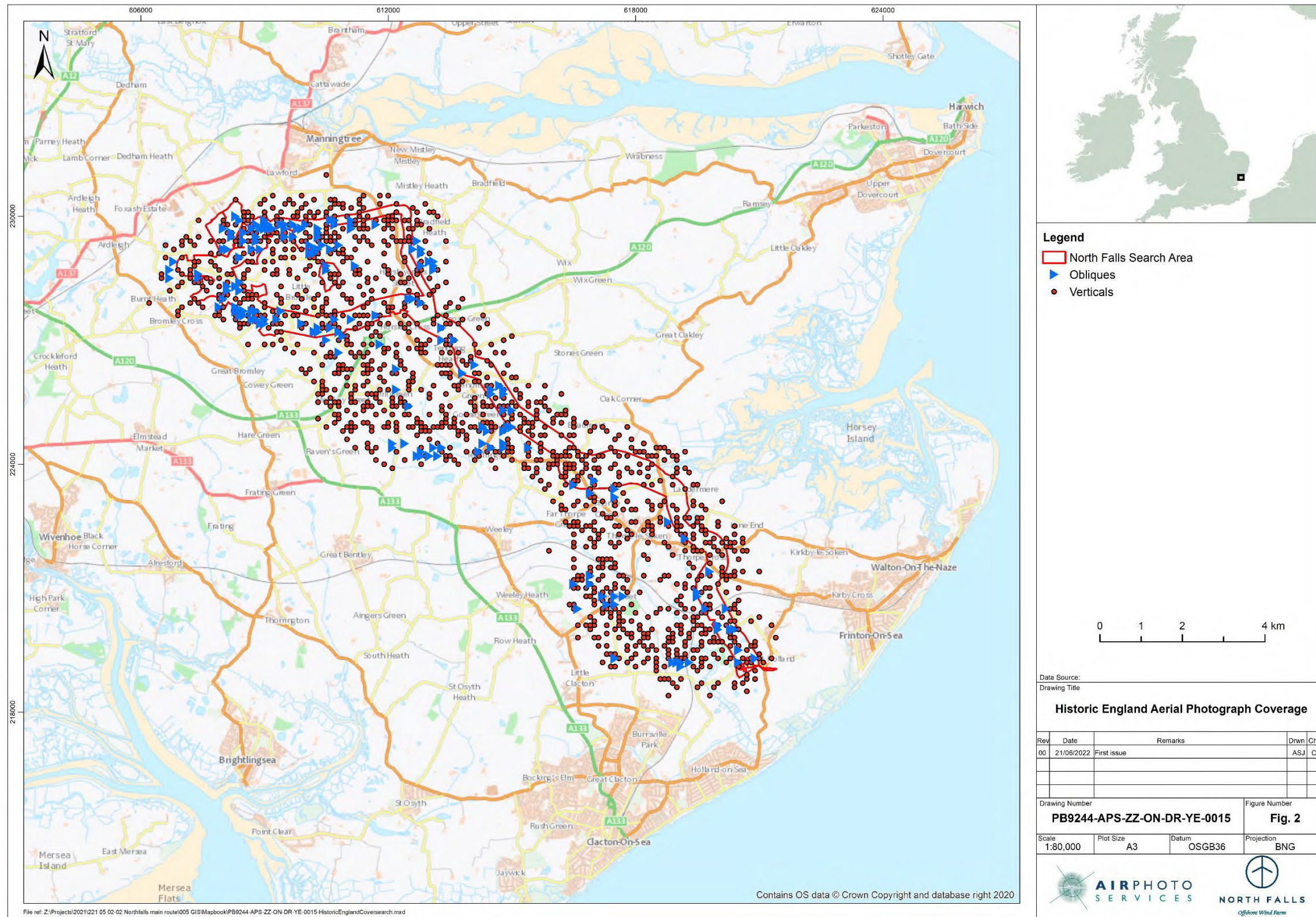
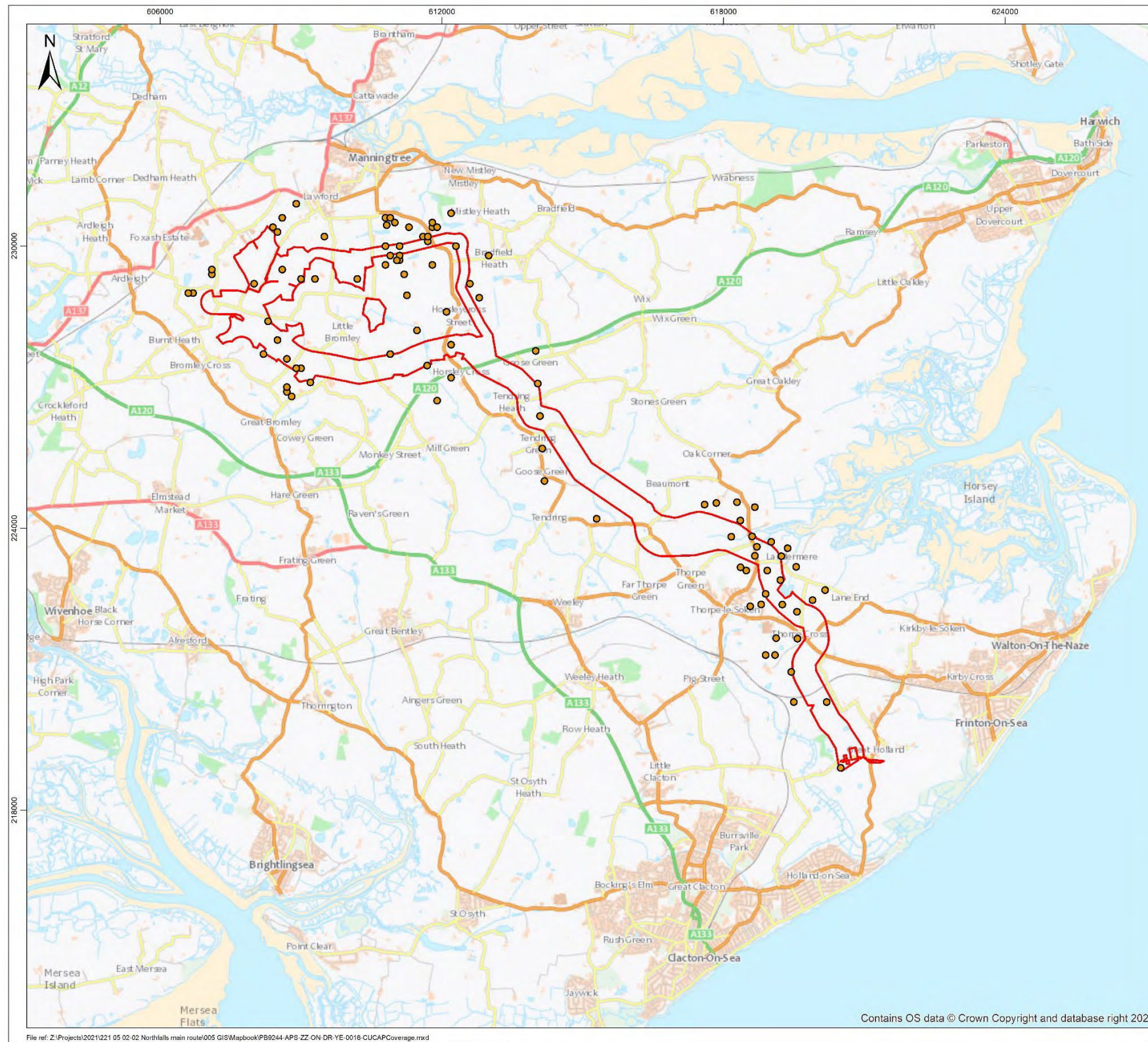


Figure 3 Cambridge University Collection of Aerial Photographs (CUCAP) coverage



Legend
 North Falls Search Area
● CUCAP Air Photos

0 1 2 4 km

Data Source:
 Drawing Title
Cambridge University Collection of Aerial Photographs (CUCAP) AP Coverage

Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

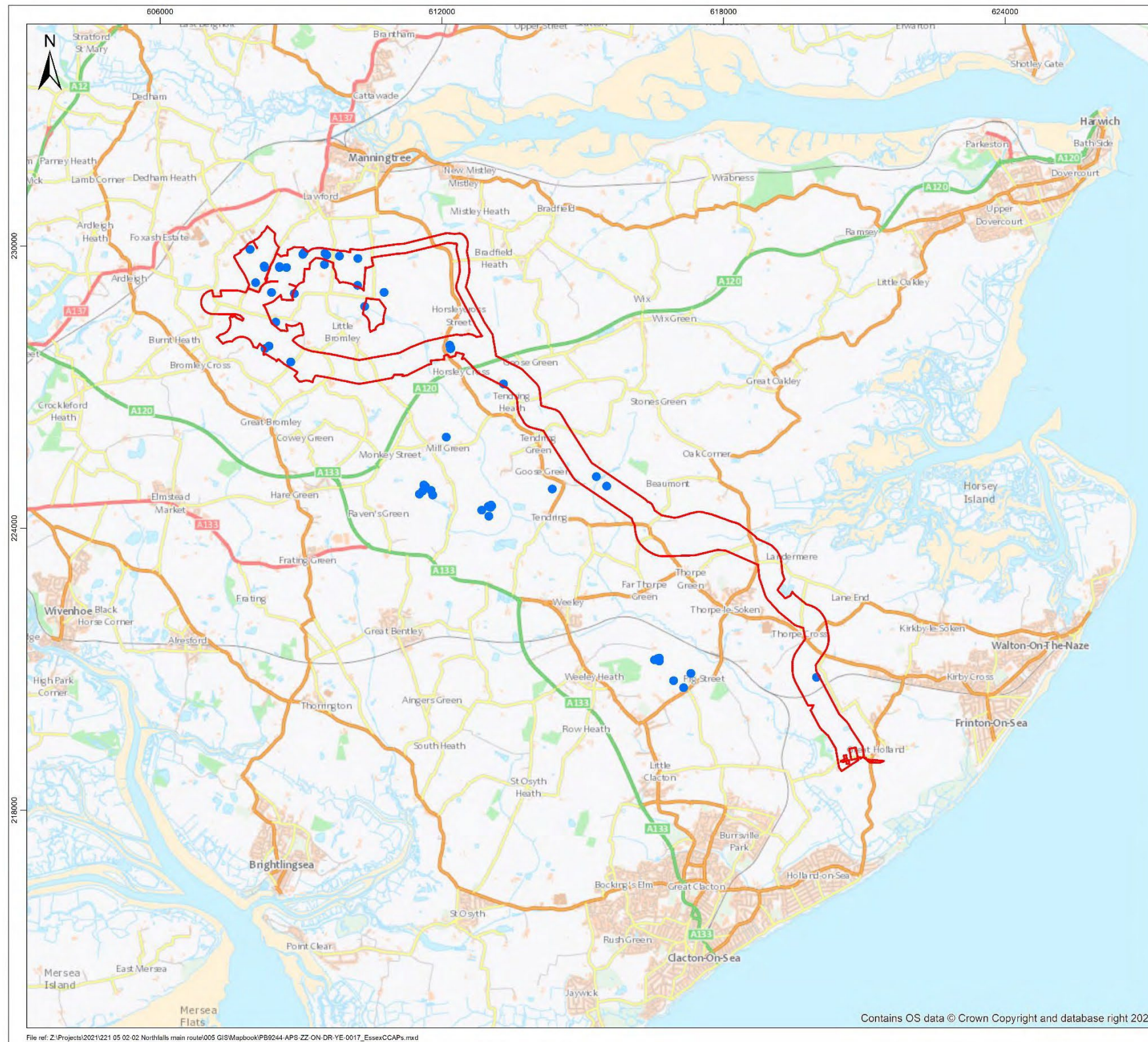
Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0016** Figure Number: **Fig. 3**

Scale: 1:80,000 Plot Size: A3 Datum: OSGB36 Projection: BNG

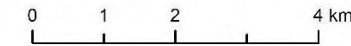
Contains OS data © Crown Copyright and database right 2020

File ref: Z:\Projects\2021\221 05 02_02 North Falls main route\005 GIS\Mapbook\PB9244-APS-ZZ-ON-DR-YE-0016 CUCAPCoverage.mxd

Figure 4 Essex Council aerial photographic coverage



- Legend**
- North Falls Search Area
 - Essex CC Aerial Photos



Data Source:
Drawing Title

Essex County Council Aerial Photograph Collection

Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0017** Figure Number: **Fig. 4**

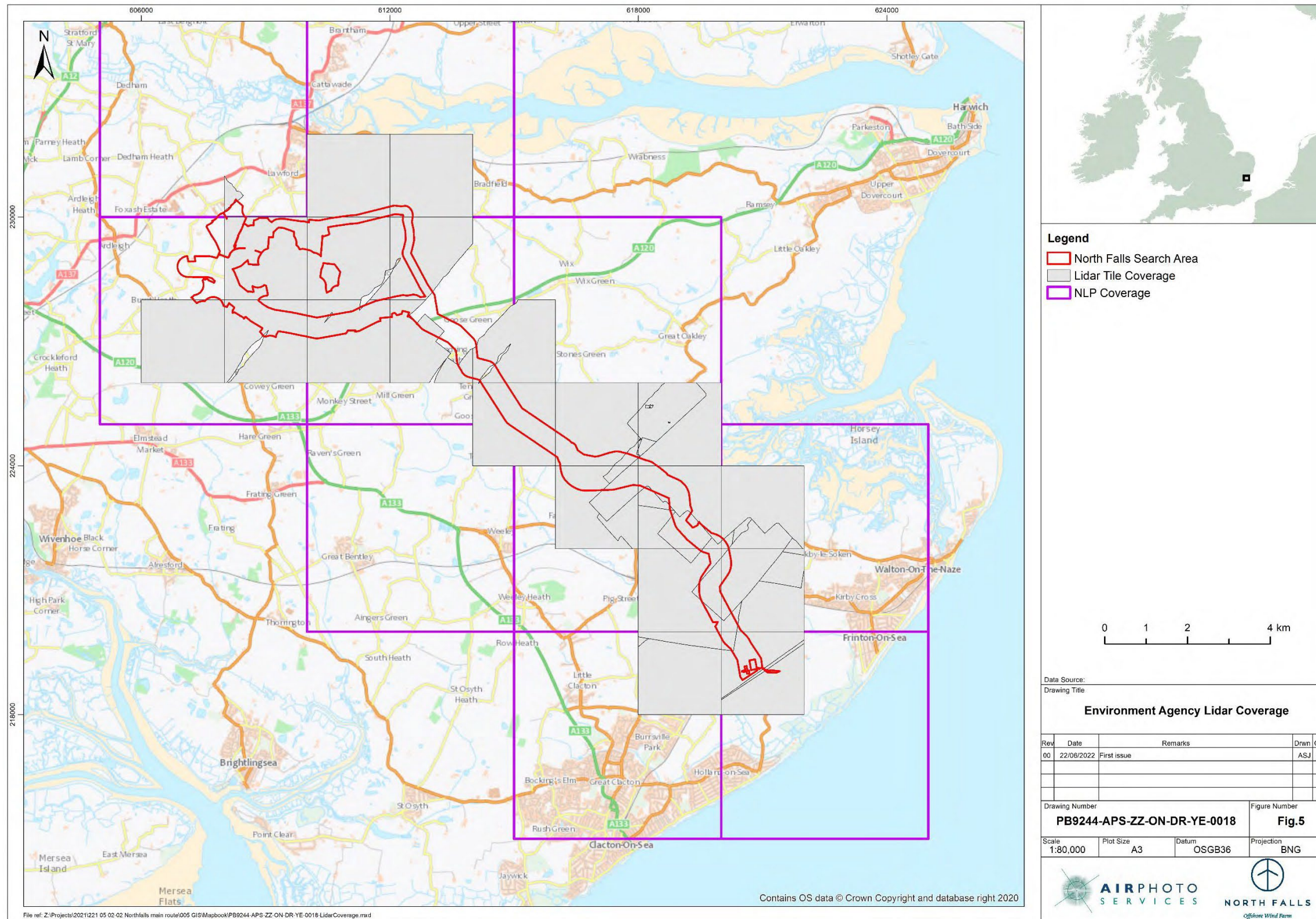
Scale: 1:80,000 Plot Size: A3 Datum: OSGB36 Projection: BNG



Contains OS data © Crown Copyright and database right 2020

File ref: Z:\Projects\2021\221 05 02_02 North Falls main route\005 GIS\Mapbook\PB9244-APS-ZZ-ON-DR-YE-0017_EssexCCAPs.mxd

Figure 5 Environment Agency LiDAR data coverage



3. Interpretation and mapping summary

- 3.1. All photos, satellite images and LiDAR data visualisations were interpreted and mapped at a level compatible with a 1:2500 scale OS digital base map.
- 3.2. Aerial photographs were closely examined by eye on screen and as paper copies which were photographed at high resolution. Vertical aerial photos were examined with the aid of a mirror stereoscope where appropriate, or in detail on screen when consulted as digital files.
- 3.3. Selected aerial photographs were digitally rectified to an OS base map using the QGIS rectification tool. This was done to remove perspective distortion and ensure correct rectification of aerial photographs to the OS map (Scollar 2002 and 2008. Images from Google Earth were also interpreted and rectified to OS map bases and used in accordance with observations made by Scollar and Palmer, 2008.
- 3.4. The rectified files were set as background layers in QGIS where features were interpreted and drawn over the rectified photographs.
- 3.5. The Essex NMP data were taken into careful consideration, used as baseline data and updated where appropriate from newer data sources, as discussed with Essex Council. These data are important records, as they include interpretations from CUCAP photos which are not presently available for consultation.
- 3.6. Layers from the final drawing have been used to prepare the illustration for this report and are provided digitally for import to a Geographic Information System (GIS), in ESRI Shapefile format.
- 3.7. LiDAR data were downloaded, visualised and imported to QGIS and ArcGIS for interpretation and mapping.
- 3.8. Methods of acquisition, standards and guidance, processing, transcription and interpretation are detailed in the **Appendix** to this report, alongside a discussion of the limitation of each survey technique for archaeological discovery and mapping.

4. Environment and known heritage assets

- 4.1. The nature of the environment has a complex effect on both the preservation and visibility of both buried and upstanding features from the air. Many factors combine to influence very marked seasonal and temporal limitations to visibility of cropmarks¹ soil marks² and earthworks³. Land use, agricultural regimes, weather, geology and soil types are all major contributing factors to the visibility of heritage assets from airborne and satellite-derived sources.

Topography and Land Use

- 4.2. The Site lies within a hinterland to the North Sea coast between Great Holland in its southeast and an area to the south of Manningtree and Lawford in its northwest.
- 4.3. This gently undulating land rises from sea level to between 5 and 30m Above Ordnance Datum (AOD) to the west of the coast.
- 4.4. The land is now predominately laid to arable use with some small areas of deciduous woodland and some boundaries which act as land drains to ponds and streams, and a watercourse which runs to the sea at Beaumont Cut.

Topography and Land Use Conclusion

- 4.5. The Site presents some optimal environments for early settlement on the slightly higher ground to the immediate west of the wildlife-rich coastal area.
- Within the site and its environs, buried features are recorded from the air as marks in crops following intensive use for cereal and other arable crop production. These cropmarks reveal multi period settlement, agricultural, funerary and possible ritual land use dating from earlier prehistoric through to modern periods.

¹ Where crops grow differentially over buried features such as ditches banks and walls and reveal the pattern of past sites and landscape in the colour and density of their growth.

² Differently coloured and toned soil which is part of buried features which are being directly brought to the surface by ploughing or erosion and are visible in contrast to the surrounding soil.

³ Upstanding ditched and embanked features which show from the air *via* their shadows or *via* the differential topography revealed by visualised LiDAR data.

Geology

- 4.6. The varied drift deposits (Cranfield University 2022, British Geological Survey (BGS) 2022) comprise Glaciofluvial drift (gravel) over Eocene clay, Tertiary clay, aeolian and glaciofluvial drift (gravel), with a very small area of marine alluvium to the immediate west of Beaumont Cut, a marine inlet which lies outside and to the east of the Site. Gravel deposits generally give rise to well drained soils.
- 4.7. The extent, type and location of the geological deposits is shown on **Figure 6**.

Soils

- 4.8. The varied substrates throughout the Site give rise to deep loam⁴ over well drained glaciofluvial drift, less well drained seasonally wet deep clay⁵ over Tertiary clay, better drained deep loam⁶, with saltmarsh over marine alluvium⁷ in a very small area to the west of Beaumont Cut. The soils are shown on **Figure 7**.

Geology and soils conclusion

- 4.9. In this area of Essex, the gravel substrate within parts of the Site are well drained, and crops respond readily to differences in the depth and consistency of the top and sub soils, over areas where buried ditched and embanked features are present. This effect also applies to anomalies in the consistency of the substrate. The soils in the Site present a mixed group of substrates with some soils better draining than others.
- 4.10. The well-drained loamy soils over gravels provide slightly higher and better drained areas among some less well drained and more marshy areas over clays. Marks in crops over eroded buried features and removed field boundaries have been recorded on the areas which lie over gravel and some parts of the areas over clay substrates, throughout the extent of the Site.

⁴ WIX soil association, soil map symbol 573b

⁵ WINDSOR soil association, soil map symbol 712c

⁶ TENDRING soil association, soil map symbol 582e

⁷ SALINE 1 soil association, soil map symbol 22

Figure 6 Geology

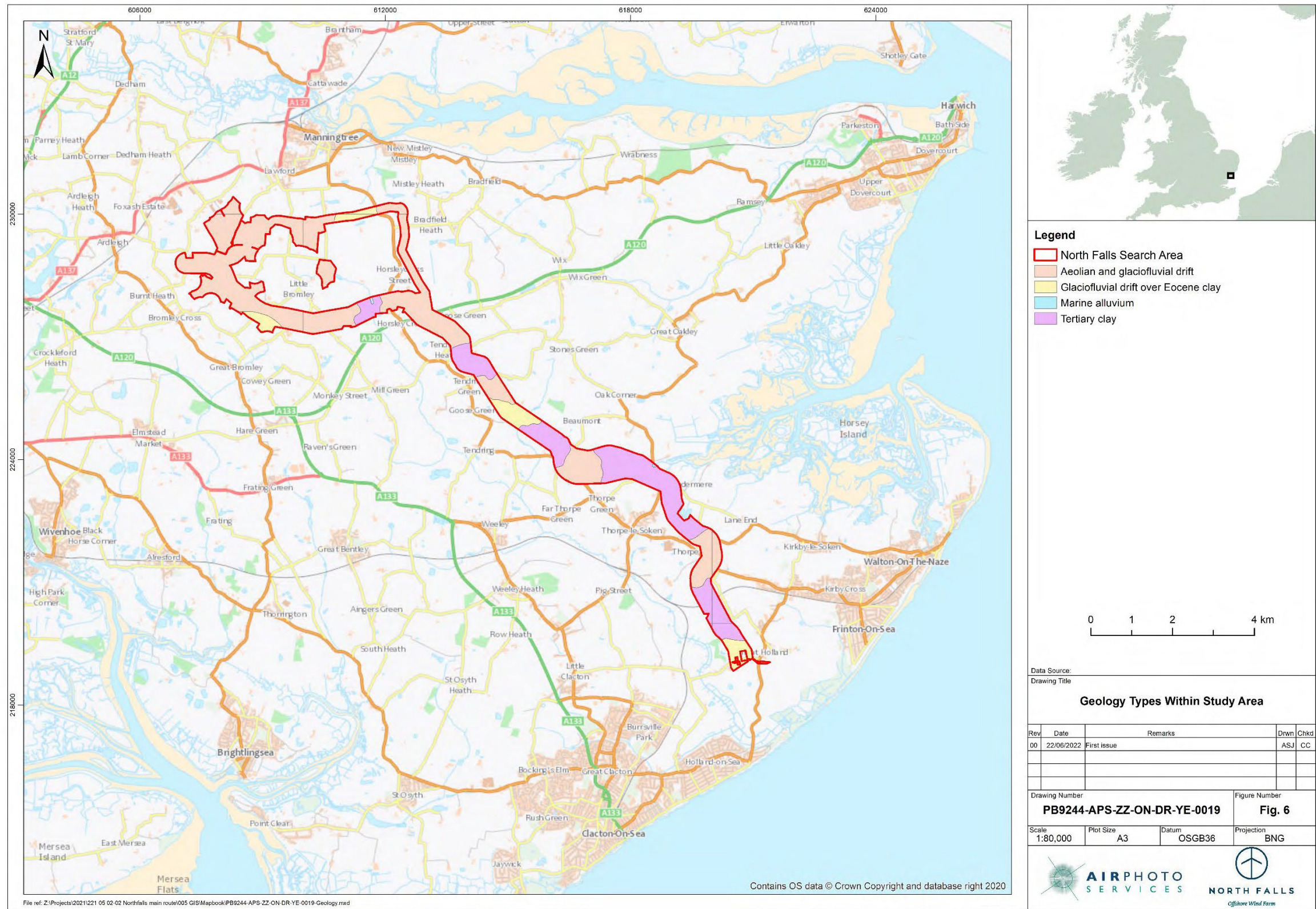
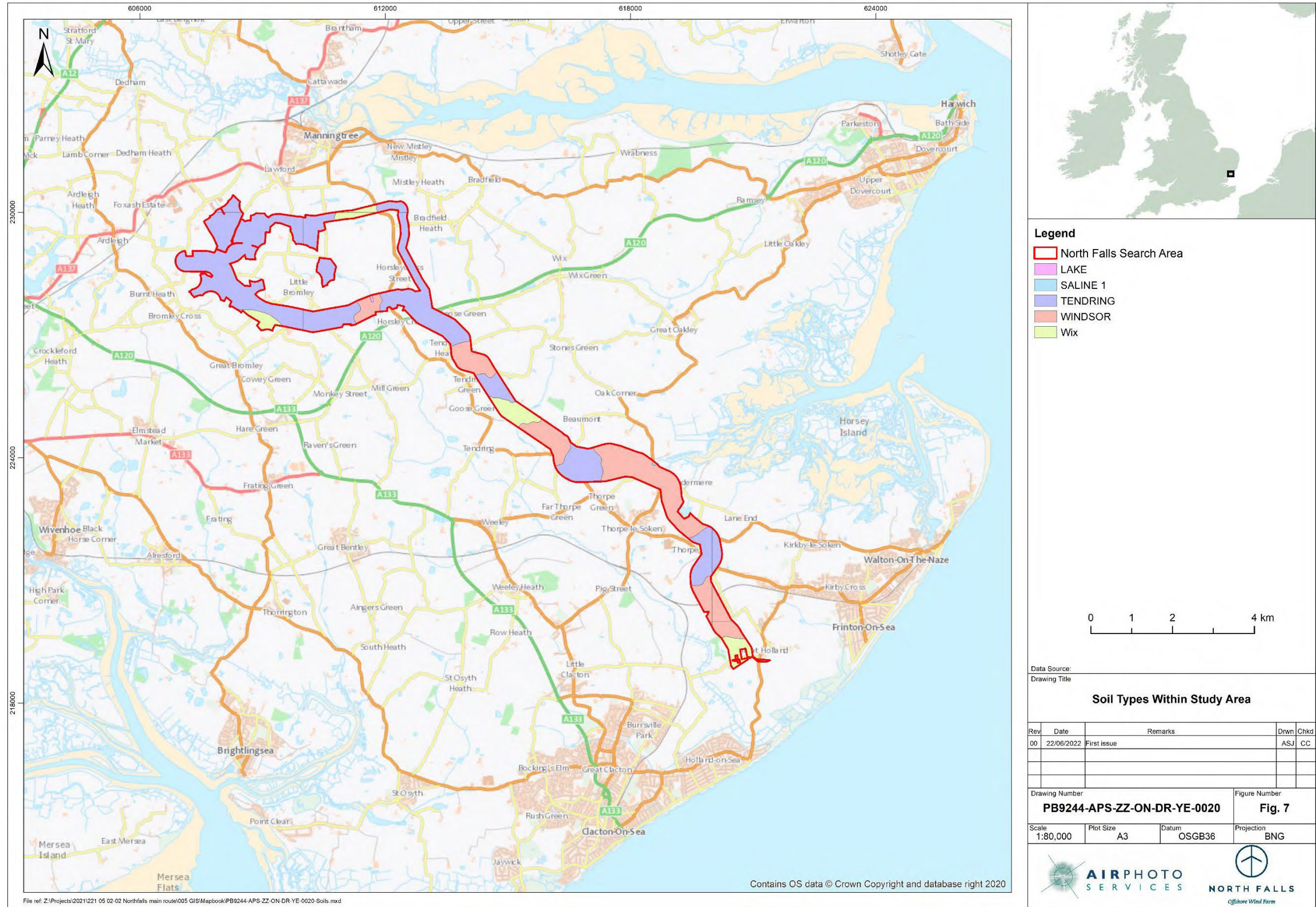


Figure 7 Soils



Previously recorded heritage assets

- 4.11. The Site contains no statutorily protected Scheduled Monuments, Parks and Gardens or battlefields. The EHER demonstrates that the Site contains known evidence for features and landscapes which date from the earlier prehistoric through to modern periods.
- 4.12. Arable areas show cropmarked remains of ring ditches which indicate likely Bronze Age funerary sites (round barrows) alongside ditched enclosures and tracks and possible ritual sites. A Roman road traversed the northwest of the site and is now recorded *via* marks in crops over the position of its buried *fossae*⁸.
- 4.13. These known sites have been recorded previously by the Essex NMP from aerial photographic sources (Ingle and Saunders 2003) and others by the EHER and represent the remains of a buried former landscape which dates from the Neolithic, Bronze and Iron Ages through to the Roman period, although some areas of cropmarks remain undated. Similar landscapes were recorded from airborne remote sensing and satellite imagery sources within the landfall area to the south of and contiguous with the Site (Cox and Jarvis 2021).
- 4.14. In later periods the expansion of more mechanised and widespread agriculture has led to the removal of post-enclosure field boundaries, particularly in the latter part of the 20th century. Some areas of drained low lying land and areas with post-1950s boundary loss, with some relict elements, lie among areas of bounded modern arable fields.
- 4.15. The North Sea coast and its hinterland were robustly defended during the 19th and 20th centuries. This ‘inland’ area within this linear Site however contains no major traces of World War II (WWII) defensive features. A World War I (WWI) night-time landing strip is recorded in the EHER. According to documentary sources this landing area was used between April and August 1916, but likely does not persist in the below-ground archaeological record nor show on aerial photographs following its return to agricultural use after 1916.

⁸ Ditches which flanked and drained the slightly higher embanked or paved surface (the ‘agger’) of a Roman road.

Baseline heritage assets conclusion

- 4.16. Overall the EHER and Essex NMP demonstrate the range of previously recorded archaeological resource in the area and have served as an important indication of the type of sites which are visible *via* airborne remote sensing data sources.

5. Results of the archaeological survey

5.1 The results from the interpretation and mapping are presented in **Table 1** and are illustrated by the heritage mapbook presented at **Figures 9.1 – 9.23** which are indexed at **Figure 8**. The detailed sources and condition notes are recorded in the Shapefile which accompanies this report.

5.2 The fields in **Table 1** comprise:

- APS Site Id;
- RHDHV Id (to be added);
- Figure number;
- Asset Type;
- Condition on last recorded data source;
- Period;
- EHER MonUID;
- Essex Sites and Monuments Record (SMR) reference;
- Interpretation notes;
- Easting coordinates;
- Northing coordinates; and
- Six figure National Grid Reference (NGR).

Table 1 Sites identified within the site from aerial photographs, satellite imagery and visualised LiDAR data

APS site ID	RHDHV site ID TBA as needed	Mapbook sheet Figure 9.1 - 9.23	Asset_Type	Condition when last recorded	Period	EHER MonUID	Essex SMR reference	Interpretation notes	Easting coordinate	Northing coordinate	NGR
APS_01		1	Field Boundary	Micro topography	Undated - modern	MEX1031364	N/A	Field boundaries visible as cropmarks on historic aerial photographs with residual earthwork remains visible on LiDAR data. Area also includes a modern sand and gravel pit which was mapped by the OS on the 1976 – 83 map series.	620570	219317	TM 205 193
APS_02		1	Field Boundary	Micro topography	Undated	MEX1031364	16986	Field boundaries visible as cropmarks on historic aerial photographs and satellite imagery with residual earthwork remains visible on LiDAR data. NMP mapping has been added to and partially remapped. Not all NMP features could be confirmed in this study	621004	219441	TM 210 194
APS_03		2	Field Boundary	Cropmarked buried feature	Undated	MEX12997	3570	Field boundaries visible as cropmarks on historic aerial photographs and satellite imagery. NMP mapping has been added to and partially remapped. Not all NMP features could be confirmed in this study	620222	220261	TM 202 202
APS_04		2, 3	Field Boundary	Micro topography	Undated	MEX11450 MEX1031415 MEX11519	3143 3157	Field boundaries visible as cropmarks on historic aerial photographs and satellite imagery with residual earthwork remains visible on LiDAR data. NMP mapping has been added to and partially remapped. Not all NMP features could be confirmed in this study	619508	220881	TM 195 208
APS_05		4, 5	Field Boundary	Micro topography	Medieval/Post Medieval	MEX1040163 MEX1039613	47285 46798	Field boundaries visible as cropmarks on satellite imagery with residual earthwork remains visible on LiDAR data. NMP mapping has been added to and partially remapped. Not all NMP features could be confirmed in this study	619871	222266	TM 198 222
APS_06		5	Field Boundary	Micro topography	Medieval	MEX1039613	46798	Field boundaries visible as cropmarks on satellite imagery with residual earthwork remains visible on LiDAR data	618933	222937	TM 189 229
APS_07		6	Field Boundary	Micro topography	Medieval	MEX1039612	46801	Field boundaries visible as cropmarks on historic aerial photographs with residual earthwork remains visible on LiDAR data. NMP mapping has been added to and partially remapped. Not all NMP features could be confirmed in this study	618150	223442	TM 181 234
APS_08		6, 7	Field Boundary	Micro topography	Undated	MEX1031438	17243	Field system visible as residual earthworks on Lidar data, to add to the ditches previously mapped by NMP	617143	223636	TM 171 236
APS_09		8, 9	Funerary site (round barrow); Field Boundary	Micro topography	Medieval	MEX1031435 MEX10843	3162	A <i>tumulus</i> depicted on the earlier edition OS mapping indicates the position of a likely Bronze Age round barrow which was visible later as a cropmark on aerial photographs over its retaining ditch. Field boundaries visible as cropmarks on satellite imagery with residual earthwork remains visible on LiDAR data. Mostly newly identified features, with NMP remapping undertaken where needed	615935	224696	TM 159 246

APS site ID	RHDHV site ID TBA as needed	Mapbook sheet Figure 9.1 - 9.23	Asset_Type	Condition when last recorded	Period	EHM MonUID	Essex SMR reference	Interpretation notes	Easting coordinate	Northing coordinate	NGR
APS_10		8, 9	Field Boundary	Micro topography	Undated	MEX11405 MEX11650 MEX1031514	3136 3189	Cropmarks of ring ditches and linear ditches and possible trackways visible on aerial photographs and satellite imagery. NMP mapping has been added to and partially remapped. Not all NMP features could be confirmed in this study	614811	225552	TM 148 255
APS_11		10	Field Boundary	Micro topography	Undated	MEX11615	3179	Field system and possible drainage visible as earthworks on LiDAR data. NMP mapping has been added to and mostly remapped. Not all NMP features could be confirmed in this study	614145	226311	TM 141 263
APS_12		13	Field Boundary	Micro topography	Undated	MEX11474 MEX1031508	17321 3148	Field and parish boundaries visible as cropmarks on satellite imagery and residual earthworks on LiDAR data. NMP mapping has been added to and mostly remapped. Not all NMP features could be confirmed in this study	610491	226896	TM 104 268
APS_13		14	Barrow Cemetery	Cropmarked buried feature	Undated, likely Bronze Age	MEX8620	2460	Site of barrow cemetery visible as cropmarks on aerial photographs. Barrows have been remapped and repositioned with new rectifications of photographs. Maculae have been left from NMP as are suggestive of environment	609124	227073	TM 091 270
APS_14		11	Field Boundary	Micro topography	Undated	MEX11561	3167	Field system visible while extant in 1950's aerial photographs and cropmarks on satellite imagery. Residual earthworks remain on LiDAR data and add to the previously mapped NMP features. Some have been remapped and repositioned	613584	227159	TM 135 271
APS_15		13	Barrow Cemetery	Cropmarked buried features	Undated, likely Bronze Age	MEX11390	3130 3131	Cropmarks of linear ditches and a series of 5 ring ditches visible on historic aerial photographs and satellite imagery. Locations of the three ring ditches, including two possible ring ditches to the south have been remapped from new rectifications	610803	227242	TM 108 272
APS_16		14, 15	Barrow Cemetery	Cropmarked buried features	Undated, likely Bronze Age	MEX8620	2460	Barrow cemetery visible as cropmarks on historic aerial photographs. Features have been remapped to update positions from NMP mapping	609005	227338	TM 090 273
APS_17		15	Henge	Parchmark in grass	Prehistoric	MEX8620	2460	Possible Class II henge, visible on aerial photographs. Feature has been remapped to update position from NMP mapping	608908	227393	TM 089 273
APS_18		13	Ditch	Micro topography	Undated	MEX11382	3130	Cropmarks of field boundaries and possible trackways visible on aerial photographs and satellite imagery. Residual earthwork remains of field boundaries visible on LiDAR data which add to the existing NMP mapping	611174	227479	TM 111 274
APS_19		14, 15	Field Boundary	Micro topography	Undated	MEX8620	2460	Extensive field system visible as cropmarks on historic aerial photographs and satellite imagery and residual earthworks on LiDAR data. Features have been remapped and repositioned from new rectifications. Some NMP features could not be confirmed	608841	227777	TM 088 277

APS site ID	RHDHV site ID TBA as needed	Mapbook sheet Figure 9.1 - 9.23	Asset_Type	Condition when last recorded	Period	EHF MonUID	Essex SMR reference	Interpretation notes	Easting coordinate	Northing coordinate	NGR
APS_20		12	Field Boundary	Micro topography	Undated	MEX11391 MEX1040370 MEX1031512	3132 17325	Enclosures and field boundaries visible as cropmarks on historic aerial photographs and satellite imagery which expand on previously mapped features from NMP. Not all NMP mapped features could be confirmed and have been left for reference	612466	227876	TM 124 278
APS_21		23	Field Boundary	Cropmarked buried feature	Undated	MEX11382	N/A	Ditch which may relate to further features found east of Mulley's Farm MEX11382. Newly identified feature	610603	228382	TM 106 283
APS_22		16	Ditch	Cropmarked buried feature	Undated	MEX1031611	17472	Series of ditches, possibly former field boundaries visible as cropmarks on satellite imagery. Additional ditches have been mapped, features have been remapped to update positions from NMP mapping	607333	228557	TM 073 285
APS_23		16	Roman road	Cropmarked buried features	Roman	MEX43488	2573	Roman road, linking Mistley with Colchester, mapped across several sites as per HER and NMP grouping. Crosses APS sites 27, 30 and 31. Remapped from new rectifications	606948	228570	TM 069 285
APS_24		23	Ditch	Cropmarked buried feature	Undated	MEX21957	6558	Ditches and pits which correlate with NMP mapping for MEX21957. No remapping undertaken	610790	228719	TM 107 287
APS_25		16	Field Boundary	Cropmarked buried feature	Undated	N/A	N/A	Field boundary visible as a cropmark ditch on aerial photographs. Newly identified feature	607000	228807	TM 070 288
APS_26		17	Trackway	Cropmarked buried feature	Roman	MEX1031552	17110 17486	Site of Roman road and associated linear features including field boundaries. Recorded as grouped by HER MEX1031552. Many boundaries have been repositioned and remapped from new rectifications	608451	228836	TM 084 288
APS_27		16	Trackway	Cropmarked buried feature	Roman	MEX9188	2573	Roman road, linking Mistley with Colchester. Site is connected to APS sites 23, 30 and 31	607494	229120	TM 074 291
APS_28		22	Field Boundary	Micro topography	Undated	N/A	N/A	Former field boundaries visible on historic aerial photographs, satellite imagery and LiDAR data. Newly identified ditches	612415	229130	TM 124 291
APS_29		19, 23	Field Boundary	Micro topography	Undated	MEX8755	2475	Cropmarks of former field system, possible trackways and enclosures visible on historic aerial photographs and satellite imagery. Enclosure ditches have been remapped to update positions from NMP mapping. Additional Features added	609871	229475	TM 098 294
APS_30		17, 18	Enclosure	Cropmarked buried feature	Roman	N/A	17110 17112 2573 2682	Complex area of overlapping enclosures, ditches, a double-ditched ring ditch and a Roman road. Area covers several HER and NMP features due to possible interaction, and is linked to APS Sites 23, 27 and 31 <i>via</i> the Roman road	608047	229495	TM 080 294
APS_31		17, 18, 19	Enclosure	Cropmarked buried feature	Undated	MEX8489	2444 17104	Possible Prehistoric enclosures and Roman road are visible as cropmarks on historic aerial photographs and satellite imagery. Partly remapped from new rectifications, and is linked to APS Sites 23, 27 and 30 <i>via</i> the Roman road	608843	229653	TM 088 296

APS site ID	RHDHV site ID TBA as needed	Mapbook sheet Figure 9.1 - 9.23	Asset_Type	Condition when last recorded	Period	EHF MonUID	Essex SMR reference	Interpretation notes	Easting coordinate	Northing coordinate	NGR
APS_32		19, 20, 23	Ditch	Cropmarked buried feature	Undated	MEX10930	3055 3522	Complex of ditches, trackways and enclosures visible as cropmarks on historic air photos and satellite imagery. Area mostly consists of previous NMP mapping and there was no need to update it	610576	229667	TM 105 296
APS_33		18	Enclosure	Cropmarked buried feature	Undated	MEX1031543	17476	Cropmarks of a sub-rectangular enclosure are visible on historic aerial photographs. Ditches have been remapped to update position from NMP mapping	608668	229950	TM 086 299
APS_34		20, 21	Ditch	Cropmarked buried feature	Undated	N/A	N/A	Area of trackways, field boundaries and ring ditches, previously mapped by NMP (raster mapping) as visible on Historic England's Aerial Mapping portal	612033	230161	TM 120 301
APS_35		18	Ditch	Cropmarked buried feature	Undated	MEX9864 MEX1031544	17476 2771	Cropmarks of former field boundaries visible as cropmarks on historic aerial photographs and satellite imagery. No remapping undertaken	608371	230186	TM 083 301

- 53 This assessment has recorded thirty five individual sites or areas within the Site. Some of these have been recorded previously by the Essex NMP and the EHER. These previous interpretations have been noted and incorporated fully into the GIS database, where they are acknowledged and separated from the newly interpreted or augmented site interpretations made by APS.
- 54 **Figures 8 to 30** are supplied separately as pdf files, as they are too large to include into a standard word document, for accessibility purposes.
- 55 The following sites, listed at **Table 2** below, are recorded within the EHER, but have not been mapped during this assessment.

Table 2 Sites recorded within the EHER but not mapped for this assessment

EHER Mon_UID	Comment
MEX11536	Cropmarks comprising pits and two ring ditches. While the cited air photo is held within the EHER the ring-ditches are not identifiable on the photograph, although there is some evidence of <i>possible</i> pits. This site was not mapped for the NMP or the NMP update (2008), and is not mapped for this present assessment as is not considered to be a conclusive feature
MEX11615	Cropmarks comprising a possible ring ditch, plus linear features which may be geological or field drainage. No ring-ditch was mapped for the NMP, although several linear features were and are mapped for this assessment

- 56 The majority of the site has been heavily ploughed and the majority of the cropmarked remains of pre-modern features do not display any significant microtopography, as evidenced by examination of LiDAR data. There is however obvious potential for the discovery of sub-surface features and deposits in and around the visible foci of cropmarked enclosures, tracks, boundaries and ring ditches.

5.7 Relict post-enclosure field systems are evident where their boundaries have been removed in the 20th century to facilitate modern agriculture. These more recent features show as very slightly upstanding microtopography *via* visualised LiDAR data and as cropmarks on aerial photographs where they have been removed.

Prehistoric features

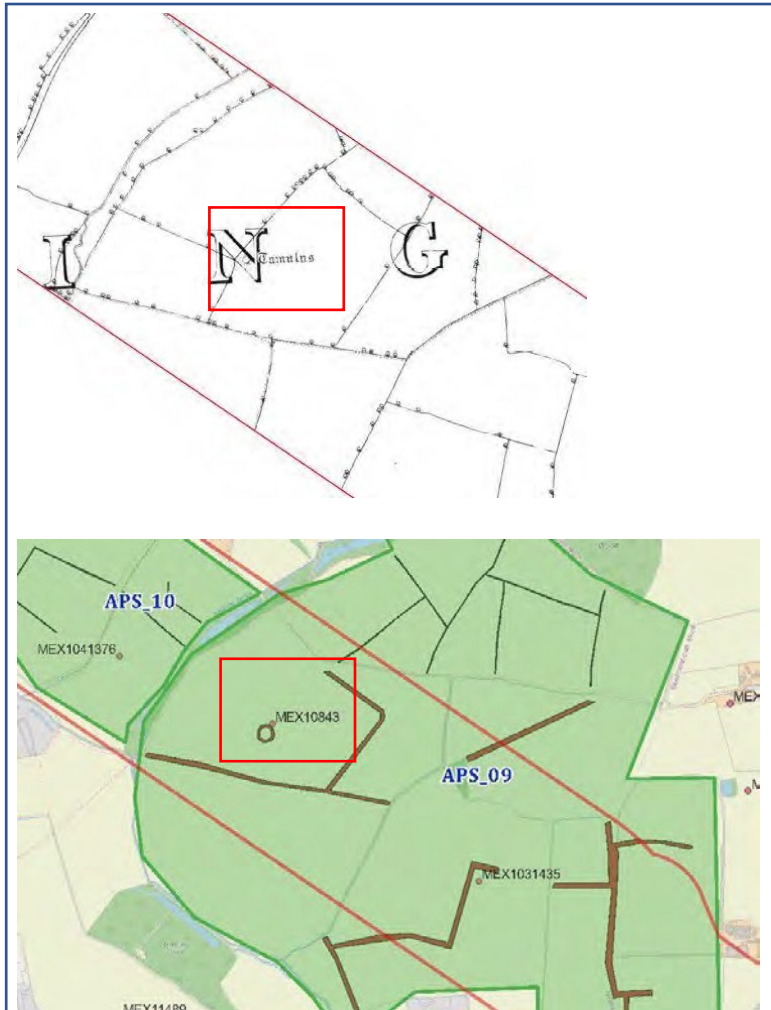
5.8 The search area contains evidence for the buried eroded remains of a possible Class II henge monument, which was mapped by the Essex NMP from aerial photographs as a parchmarked feature, at **APS_17**, EHER MEX8620. This subcircular ditch with internal bank (which in this case shows as a light toned parchmark) may date to the Neolithic period, and possibly reflects ritual rather than settlement use. A Class II henge typically has two rather than one entrances.

5.9 Bronze Age funerary monuments known as 'round barrows' were circular or sub circular mounds over either inhumation or cremation sites with a retaining ring ditch from which the mound was usually excavated. Ploughing and erosion reduces these mounds and flattens them, leaving evidence in the sub and top soils for residual mounds and more frequently the retaining ring ditch which shows as a cropmark under appropriate environmental conditions.

5.10 Site **APS_09** contains a cropmarked ring ditch indicative of a former likely Bronze Age round barrow (MEX10843, alongside a later post-enclosure (Post Medieval) field system. This likely Bronze Age funerary monument is depicted as a mound (labelled as an antiquity, a *tumulus*) on the 1st edition 1874-75 OS map, **Figure 24, Page 7**.

5.11 The present mapping and the 1874-75 1st edition OS map are shown below at **Plate 1**.

Plate 1 APS-09 1874-5 and present condition, mapped from aerial photos as a cropmarked feature



- 5.12 Sites **APS_13** (EHER MEX8620), **APS_15** (EHER MEX11390) and **APS_16** (again EHER MEX8620, adjacent to enclosures MEX1044566) record the presence of cropmarked ring ditches which indicate likely Bronze Age barrow cemeteries within this Site.
- 5.13 **APS_30** records a complex area of overlapping buried ditched enclosures, ditches, a double ring ditch and the side ditches of a Roman road. The double ring ditch at this location may be the remains of a buried Bronze Age funerary monument.
- 5.14 Possible prehistoric (although presently undated) cropmarked settlement features and enclosures are recorded at **APS_31** (EHER MEX8489), again adjacent to the Roman road. **APS_33** (EHER MEX1031543) is a further cropmarked sub rectangular ditched

enclosure which is as yet undated but is likely to be a prehistoric, possibly Iron Age, settlement feature.

Roman feature

- 5.15 The side ditches of a Roman road which linked Colchester (*Camulodunum*) and Mistley and associated linear field boundaries are visible as cropmarks at **APS_23, 26** and **27** (EHER MEX9188 and 1031552). **APS_30**, discussed above, may be associated with the former road in this area.

Medieval features

- 5.16 The EHER records some areas of former field boundaries as Medieval and Post Medieval features at **APS_05, 06, 07** and **09** (MEX1039613, 1040163, 1039612 and 1039613).

Undated features

- 5.17 **APS_18, 22, 24, 32, 34** and **35** (18 -34 recorded as EHER MEX11382, 1031611, 21957 and 10930) are areas where cropmarked ditches, trackways and enclosures indicate likely prehistoric to Roman settlement and agricultural access features.
- 5.18 Areas of former field boundaries are visible as cropmarks throughout the Site and are recorded as undated features by the EHER. These boundaries are recorded on the Essex Tithe maps and early editions of the OS mapping in this area, which are presented in the historic map regression analysis below retain slight micro-topography which is recorded as uneven ground *via* visualised LiDAR data⁹.
- 5.19 A modern sand and grave pit is recorded as part of **APS_001** at the southeast part of the Site. This extractive pit removed all deposits down to the natural substrate at this location, and was first recorded by the OS in the 1976-1983 map series, as shown at **Figure 29** in the map regression analysis illustrations.

⁹ 2010 1m EA Lidar, 2016 1m EA Lidar, 2018 1m NLP Lidar, 2020 1m EA Lidar

6. Aerial photograph and LiDAR survey conclusion

- 6.1 Aerial photographs and LiDAR survey data gathered between the 1940s and the present time show a former landscape of buried eroded funerary, settlement, access and agricultural features which are mainly visible on the lighter soils over gravel substrates.
- 6.2 Features dating to the prehistoric, Roman, Medieval, Post Medieval periods have been identified and mapped. Some of these features have been previously identified by the EHER and Essex NMP survey.
- 6.3 In some cases this assessment has augmented and added to these data from modern airborne and satellite imagery sources.
- 6.4 It is likely that the below-ground archaeological deposits which cause the marks in crops and grass in this area are more extensive, both horizontally and vertically, than shown *via* the aerial imagery. Absence of cropmark evidence does not necessarily indicate an absence of archaeological deposits in apparently blank areas.
- 6.5 The separation of dating into specific periods of prehistory and history can only be confirmed by ground-based or documentary analyses, but some dating evidence for sites within the Site has been proposed by the EHER and NMP and by observation of morphological characteristics of cropmarked sites.
- 6.6 From an aerial perspective, this landscape may be analysed in a 'living' manner as one which developed over time and contains many multi-period elements. These will be more deeply stratified and extensive below the ground than is apparent in the results of the survey. The remains visible as cropmarks are all likely to have been impacted by agricultural cultivation, to some degree, and retain minimal or no micro-topographic features visible on the ground surface.
- 6.7 The assessment leads into and has benefited from a concurrent study of historic maps, which detail the development of the landscape over the past two centuries. This map regression study is presented below.

7. Map regression analysis

- 7.1 An historic map regression study was undertaken concurrent with the aerial imagery and LiDAR analysis to provide understanding of the development of the modern landscape.

Aims and Objectives of the Map Regression Analysis

- 7.2 The aim of the map regression analysis was to collect appropriate and available historic maps, Tithe maps where present, in areas where Ecclesiastical Parishes levied Tithes, followed by OS 19th century First Edition (1880), subsequent 19th and 20th century revisions and modern cartographic sources.
- 7.3 The objective was to investigate and demonstrate any landscape changes within the site over the 18th, 19th, 20th and 21st centuries.

Cartographic Sources

18th century mapping, showing the landscape before enclosure

- 7.4 John Chapman and Peter André's map of Essex was surveyed at a scale of two inches to one mile, and published in 1777. John Chapman was a land surveyor from Suffolk who later came to work in London with Mary Ann Rocque, a cartographer who worked with, and was the widow of, John Rocque. Chapman had previously been involved in producing county maps of Durham, Staffordshire and Nottinghamshire and died the year after his Essex map was published. Peter André was of Huguenot descent, like many others involved in county surveys. Chapman and André were proficient in surveys of large areas of land, and their Essex map is of exceptional accuracy and cartographic excellence.
- 7.5 It pre-dates the Board of Ordnance (later the Ordnance Survey) by almost 40 years, as one of a series of county maps published by private cartographers in the later 18th century. It was surveyed before Parliamentary Enclosure and the apportionment of land Tithes in this area. The map records landscape features which were to be changed and remodelled over the next five decades, as parts of the open land were better

- 7.6 drained, enclosed and apportioned to tenants and private owners. It was the first map that accurately portrayed detail in the boundary's roads and villages within the wider landscape, and allows analysis of contemporary landscape patterns such as areas of commons, woodlands and wetlands.
- 7.7 The map was originally drawn with hachured contours. It was digitally redrawn by Alastair MacNair in 2015 for clarity of interpretation, is referenced at <http://www.chapmanandremapofessex.co.uk/>. This re-drawing is presented at **Figure 10**.
- 7.8 The map was originally published in 26 sheets, and further reprints were made in 1785 and 1833. The map show open land and contemporary main roads and settlements, with a different extent of woodlands to that in the modern period. It does not show boundaries or antiquities.

Tithe Maps

- 7.9 Tithe maps are a detailed survey of the rural landscape within ecclesiastical parish boundaries in force at the time of survey. Tithe apportionment documents show the landholders and tenants of areas subject to tithe. The primary function of the Tithe maps is to provide a graphic index or visual means of reference to the apportionments, for taxation purposes within each ecclesiastical parish. Each piece of land liable to tithes was depicted and given a plot number, unique within that parish, by which it could be identified in the apportionment. The maps are detailed, and present a dated surveyed record of the land (Kain and Oliver 1995) and its boundaries as it was after the Enclosure acts in 1773.
- 7.10 Tithe maps from the following parishes, listed at **Table 3**, were used for this assessment. The parishes in relation to the Site are shown on **Figure 11**.

Table 3 Tithe maps which were used for this assessment

Parish	Tithe map survey date	Figure
Great Holland	1839	12
Thorpe-le-Soken CP	1841	13
Beaumont	1839	14
Tendring	1842	15
Wix	1837	16
Bradfield	1838	17
Mistley	1843	18
Little Bentley	1841	19
Great Bentley	1841	20
Great Bromley	1839	21
Ardleigh	1842	22
Lawford	1839	23

7.11 The Tithe maps all cover the site, and indicate a well bounded and established rural landscape which is reflected in the later surveys undertaken by the OS from 1880, in contrast to the open land depicted by Chapman and André over 63 years earlier.

Enclosure awards

7.12 In the Post Medieval period, open fields lands and commons were enclosed and bounded in parts following the Enclosure Bills enacted by Parliament between 1604 and 1914.

7.13 Enclosure describes various ways in which land was redistributed into designated units, usually consolidating small landholdings into larger farms. This included the conversion of commons, wasteland and open fields to formally enclosed units of land, the conversion of arable land to pasture and the partition of large areas of communally farmed land into small fields farmed and owned or tenanted by individuals.

7.14 In this area of Essex, only the enclosure one small area to the south of the Site at Holland Green is archived, and this map at this location presents no differing information to the Tithe maps which show the 19th century established boundaries comprehensively and lead into the presentation of the historic OS maps which were surveyed and published from the mid-19th century.

Historic Ordnance Survey Maps

- 7.15 From the mid-19th century, the OS surveyed, published then revised mapping from their first editions, which in this area were published in 1875, at 1:2,500 (the ‘County series’) and 1:10560 scale (Oliver, 2013).
- 7.16 The following map dates which are listed at **Table 4** are shown in mapbooks, **Figures 24 – 30**, which cover the entire length of the Site.

Table 4: OS maps which were used for this assessment

OS map date	Mapbook Figure
1874-75	24
1898	25
1922 - 1925	26
1953 - 1958	27
1966 - 1967	28
1976 - 1983	29
1994	30

1874-1875

- 7.17 The 1874-75 First Edition 1:10,560 scale OS mapping records the landscape with all the extant field boundaries which were laid down at Enclosure and reflected within the Tithe mapping produced c.40 years earlier.
- 7.18 This map is shown at **Figure 24** and largely reflects the stable rural landscape of hedged fields and drains which prevails today, and is reflected in the cropmarked and relict remains of the boundaries which had been removed from the second half of the 20th century. An extant *tumulus*, which reflects the presence of a mounded antiquity or round barrow, indicative of a probably Bronze Age funerary monument, is depicted on the map at **Figure 24** page 7. This feature was recorded by this assessment from aerial photographs, as a buried cropmarked ring ditch (**APS_09, Figure 9.8, and Plate 1, EHER MEX10843**) following the erosion of the original mound. It is the only ‘antiquity’ marked on the OS maps and is not depicted on the more modern editions.

1898

7.19 The rural landscape is essentially the same in 1898 as it was in 1874-5, as shown at **Figure 25**.

1922-1925

7.20 Again, slight change in the rural environment is reflected in the **1922-25** revisions (**Figure 26**) The *tumulus* at APS-09 is again depicted as a hachured upstanding feature. Some field boundaries have been removed.

1953-1958

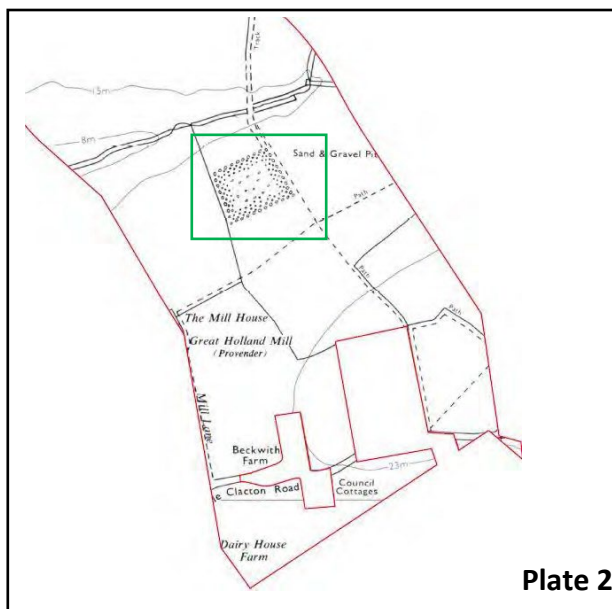
7.21 The 1953-58 OS map (**Figure 27**) shows that the post-WWII landscape remains the same, with reducing numbers of small fields and field divisions. The *tumulus* at APS_09 is no longer depicted and is likely to have been plough eroded by this date.

1966-1967

7.22 The landscape is again very similar, but with fewer field divisions and small field than in 1953-58 (**Figure 28**).

1976-1983

7.23 The rural landscape remains essentially the same, with further attrition of field boundaries. At the south of the Site, a sand and gravel pit, which is recorded as part of **APS_001**, is depicted for the first time, (**Figure 29**) and is shown at **Plate 2**, below.



1994

- 7.24 The 1994 OS map (**Figure 30**) is the first digitally produced 'modern' map edition, and again shows the reduction in the smaller fields in favour of larger units with fewer boundaries.

8. Map Regression Conclusion

- 8.1 The landscape within this Site is rural, and in the coastal hinterland has been under arable cultivation since first recorded in detail on the Tithe maps flowing Chapman and André's mapping in the late 18th century. The modern landscape boundaries were established during the 19th century following the enclosure acts and are recorded in detail by the ecclesiastical Tithe maps.
- 8.3 After the 1950s, the landscape began to open up with the removal of large areas of Post Enclosure field boundaries which changed the rural environment since it was established following land enclosure, making the way for modern mechanised agricultural cultivation methods.
- 8.4 The small hamlets, farms and settlements have been stably present and mapped since at least the 18th century and likely before.
- 8.5 The only antiquity depicted is a tumulus, likely a Bronze Age round barrow, which was not present by the 1950s, and is now visible only as a completely eroded feature *via* marks in the crops over its former retaining ditch.

9. Appendix Airborne remote sensing data sources, processing, interpretation, mapping methodology and limitations

Data Type and Sources

9.1. This survey has utilised a range of sources and archives in order to identify, interpret and map heritage features from the air and from satellites. This section gives details about the methodology employed to search each archive, the type of data available for study and the interpretation methods applied to each data set.

Online Aerial and Satellite-Derived Images

9.2. Since 1999, digital mosaics of multiple timelines of georeferenced aerial photographs have been uploaded to geoportals such as Google Earth and at Bing.com. The dates attributed to these images are not 100% assured or authenticated, but for heritage survey purposes this has no legal implication in this instance. They are available in real time as open-source imagery online, with some copyright requirements. The imagery may change when new sources are uploaded.

9.3. All available online aerial and satellite derived images which constitute the open-source mosaics of aerial imagery displayed on Google Earth and Bing.com/Maps (aerial and birds-eye if available) were consulted for this survey. All timelines available on these geoportals were systematically consulted, between 1st and 30th June 2021.

9.4. Following magnification, relevant images were captured at the highest resolution using the 'save-image' function in Google Earth Pro or a screen snipping tool. They were saved, labelled and filed for geo-referencing.

9.5. Summer timelines at Google Earth were very helpful in the recording of cropmarked buried sites.

9.6. Aerial images displayed at Bing Maps was used in the same manner but with the limitations that there was a restricted single view timeline and less flexible image capture mechanisms. The Microsoft 'snipping tool' was used to capture the relevant images which generally were not as informative as the comprehensive timeline datasets at Google Earth.

Aerial photographs held at the Historic England Archive

- 9.7. Paper based copies of all vertical and oblique and specialist oblique aerial photos held at the HE Archive were examined in detail in the Historic England Public Search Room, by Adam Jarvis between January and May 2021. Relevant photographs were recorded using a high resolution digital camera and filed. Selected images georeferenced for the project archive. A map showing the Historic England aerial photograph coverage is presented at **Figure 2**.

Aerial photographs held at The Cambridge University collection of Aerial photographs (CUCAP)

- 9.8. The CUCAP collection was fully consulted by the Essex NMP. The collection is closed for digitisation, but a coversearch was obtained online at <https://www.cambridgeairphotos.com/map/>. A map showing the CUCAP aerial photograph coverage is presented at **Figure 3**.

Aerial photographs held at Essex Council

- 9.9. Digital images were supplied by Essex Council and were processed received from Helen Saunders and georeferenced as needed for interpretation. A map showing the Essex Council aerial photograph coverage is presented at **Figure 4**.

Essex NMP Data

- 9.10. Essex NMP data were supplied in GIS-ready shapefiles, which were derived from scanning individual drawn OS quarter sheet overlays depicting the NMP data. These data were integrated into this report as separate shapefile layers to maintain the integrity and acknowledgement of the source of these data. They were updated and all features re-digitised to bring them into line with modern recording standards where appropriate. The data covered the site fully and were derived from the Tendring Enhancement NMP project for this area.

Environment Agency LiDAR Data

- 9.11. The Environment Agency has collected LiDAR data from airborne survey platforms in recent years at varying resolutions, which are available for downloading, processing, visualising and interpreting *via* the EA website <https://environment.data.gov.uk/DefraDataDownload/?Mode=Survey>

- 9.12. LiDAR data indicate variation in the height of the ground surface. Data is collected by an active laser beam fired in pulses which scans the ground surface. The reflected pulses are recorded by the sensor on board a geolocated airborne survey platform, fitted with an inertial measurement unit to record the roll, pitch and yaw of the aircraft.
- 9.13. The point cloud data derived from the survey are processed into a series of Digital Elevation Models (DEM) usually in American Standard Code for Information Interchange (ASCII) format. These include Digital Surface Models (DSM) which contain tree cover and buildings, and Digital Terrain Models (DTM) which remove tree cover and can reveal features beneath the tree canopy (Bennett *et al* 2012; Hesse 2010; Štular *et al* 2012, Historic England, 2018).
- 9.14. These data are of assistance in recording micro and macro topographic features which may indicate relict or extant archaeological features and historic landscapes alongside more modern features. LiDAR data are best interpreted and used in conjunction with modern and historic aerial photographs and maps to provide ground truth information for features and sites recorded *via* this prospection method.
- 9.15.** The data needed were identified by using the EA timestamp shapefile detailing the LiDAR file names within the area of interest and the OS 10km and 5km grid square to identify the grids and quarter sheets. Digital Terrain Models were selected as the primary data source as the ability to remove the vegetation cover makes it ideal for prospection. All available LiDAR data for this site were downloaded for completeness of evidence. The metadata for the LiDAR downloaded for this assessment can be seen at **Table 5**.
- 9.16. The whole study area was covered by NLP LiDAR data at 1m resolution with other data available in individual survey areas.
- 9.17.** A map detailing the LiDAR data coverage is presented at **Figure 5**.
- 9.18. The data were visualised into Hillshade, Multi Directional Hillshade, Sky View Factor, Open Positive and Open Negative using the Relief Visualisation Toolbox (RVT) Version 2.2.1. These visualisations were chosen as they are of most use for archaeological prospection. The multiple ASCII tiles were merged before being

visualised for ease of use in the GIS. The data were analysed alongside the aerial photographs and base mapping to double check the topography and nature of features interpreted from LiDAR data.

- 9.19. An additional visualisation was created using a simplified process based upon the methodology proposed by Hesse to create a Simple Local Relief Model (SLRM) (Hesse, 2010). A low pass filter was applied to nearest neighbour resampling, and the resampled model was removed from the original DTM, creating a Local Relief Model. This was then processed through the RVT with a smoothing factor of 20m.

Table 5 LiDAR tiles which were downloaded and processed for this assessment

OS Tile Name	Year Flown	Resolution (m)
TM0525	2018	1
TM0530	2018	1
TM0626	1999	2
TM0826	1999	2
TM0828	1999	2
TM0830	2002	2
TM1020	2018	1
TM1025	2018	1
TM1026	1999	2
TM1028	1999	2
TM1030	2018	1
TM1030	1999	2
TM1226	1999	2
TM1228	1999	2
TM1230	1999	2
TM1424	1999	2
TM1426	1999	2
TM1515	2018	1
TM1520	2018	1
TM1525	2018	1
TM1622	2009	1
TM1622	2020	1
TM1622	1999	2
TM1624	2009	1
TM1624	2020	1
TM1624	1999	2
TM1724	2015	0.5

OS Tile Name	Year Flown	Resolution (m)
TM1818	2010	1
TM1818	2016	1
TM1818	1999	2
TM1820	2010	1
TM1820	2016	1
TM1820	2017	1
TM1820	1999	2
TM1822	2009	1
TM1822	2016	1
TM1822	2017	1
TM1822	2020	1
TM1822	1999	2
TM1823	2015	0.5
TM1823ne	2008	0.25
TM1824	2015	0.5
TM1824	2009	1
TM1824	2020	1
TM1824	1999	2
TM1919ne	2009	0.25
TM1920se	2009	0.25
TM1923	2015	0.5
TM1923nw	2008	0.25
TM1923sw	2008	0.25
TM2015	2018	1
TM2018	2010	1
TM2018	2016	1
TM2018	2016	1
TM2018	2020	1
TM2018	1999	2
TM2019nw	2009	0.25
TM2020	2010	1
TM2020	2016	1
TM2020	2017	1
TM2020	2018	1
TM2020	1999	2
TM2022	2016	1
TM2022	2017	1
TM2022	2020	1
TM2022	1999	2

Data Processing

- 9.20. The collected digitised photographs and images were labelled and archived and selected frames were georectified to the OS digital map base with the QGIS and ArcGIS georectification tools for interpretation and mapping. The project used an OSGB/1936 British National Grid European Petroleum Survey Group (EPSG):27700 Coordinate Reference System (CRS).
- 9.21. Interpretative or source queries were addressed as appropriate by further reference to the archived photographs in the survey files.
- 9.22. Following comparison to other airborne sources and all EHER data, extent of area polygons were digitised around the interpreted extent of features identified, and a site database created in QGIS as an attribute table within a shapefile.
- 9.23. When all data sources had been examined, interpretative polygons were digitised to further shapefiles to indicate the form, extent and type of extant features within areas.

Data Presentation

- 9.24. The data were presented in shapefile data format within the project GIS. A shapefile contains geographical reference data as individual objects such as a ditch, a bank, a structure or a coordinate area. Features exist as 'objects' and their 'attributes' where the interpretations are recorded within the shapefile.
- 9.25. In addition to the shapefile, the data derived from the survey are presented in the heritage mapbook which is indexed at **Figure 8**.
- 9.26. The mapbook presents keyed, labelled and individually numbered illustrations at a consistent scale.
- 9.27. The data are also presented as a gazetteer of sites at **Table 1**. The gazetteer is derived from selected attributes within the extent of area mapping shapefile. It summarises the location, type, condition and interpretation of each individually identified site or area of features.

Interpretative Mapping

Extent of Area Mapping

- 9.28. Extent of area mapping was undertaken initially to identify archaeological assets through 'APS Site Polygons.' These polygons indicate the extent of area around a

feature or group of archaeological features. A detailed supporting attribute table was compiled at this stage detailing the following for each feature:

- APS Site Number;
- Asset Type;
- Broad Type;
- NMP coverage;
- APS derived records;
- Evidence Type (1-10);
- Source (1-10);
- Period;
- Monument UID Number;
- Source HER/SMR;
- Comment;
- NMP Additions/Remapping;
- By;
- Supplier;
- Client;
- Project;
- Easting;
- Northing;
- National Grid Reference;
- Map Source; and
- Mapbook Number.

9.29. This process created a database which forms the basis for all detailed mapping and analysis.

9.30. Aerial imagery and LiDAR analysis is a non-intrusive survey method, and not all features which are identified may be accurately dated by this means alone.

Assumptions and Limitations

Historic Aerial Photographs

- 9.31. The assumption that aerial photographic survey and vertical and oblique aerial photographs show all features and will reveal a complete archaeological record in any given area is erroneous. This is due to many interactive survey, seasonal, environmental, meteorological and perception and interpretation issues which are set out below.
- 9.32. Interpretation of aerial photographs relies either on visual identification of the effect heritage assets have on crops and other vegetation, marks in soils or visible features or earthworks which are more visible at times of clear low light.
- 9.33. It is important to note that aerial photographs usually only show part of the horizontal and vertical extent of buried and upstanding features. Their capacity to reveal features as cropmarks, vegetation marks, soil marks or as the shadows cast by banks, ditches and walls, depends upon several environmental and agricultural factors prevalent at the time of the photographic survey. It is possible for many years' photography over one site to show nothing at all, and then during one instance of survey to reveal complex buried cropmark features. The direction of light at the time of photography, with reference to shadows cast and crop or soil marked features highlighted, can also affect the visibility of features on aerial photographs. Unlike digitally processed LiDAR and other data, the azimuth of the sun cannot be changed on a conventional aerial photograph.
- 9.34. Past and present land use also presents limitations to visibility of features. A cropped arable regime of cereals often allows the formation of cropmarks, whereas grassland, unless seen in times of extreme moisture stress, can mask the appearance of buried features. The time of year is thus important in gaining maximum benefit from aerial photographic sorties. In winter, the low leaf index and lower light angle assists visibility of topographic and earthwork features. In summer, ripening crops, often from April through to harvest in July/August, may show differential marks over buried features. Dry conditions will often cause parching in grass, which will then reveal areas of former foundations as the grass dies over the harder less moisture retentive buried features.

Following harvest, weathering and ploughing, marks in soil often show where buried archaeological deposits are being actively ploughed and brought to the surface.

- 9.35. In this area of Essex, away from the marine-alluviated coast, the arable areas have been intensively eroded by ploughing. The areas of lighter shallow soils over well drained substrates are conducive to the formation of cropmarks over both buried heritage assets and complex and extensive geological anomalies in the substrates.
- 9.36. In constructing a comprehensive interpretation of the archaeological landscape, it is essential to examine a range of photographs, taken under a variety of environmental conditions, as has been done in this case.
- 9.37. The aerial photographs taken in the 1940s often recorded extant landscapes which have been altered or carry evidence for pre-modern fields and extant military features, particularly in coastal areas. These historic photos provide a starting point for the assessment of landscape change, in conjunction with the study of historic maps and modern aerial and satellite-derived imagery.
- 9.38. The remit of past oblique aerial surveys, the survey areas chosen and the visibility of sites to the aerial archaeologist can often determine the content and coverage of oblique aerial photography. Observer led flights may be heavily biased and may miss features which were present but were not seen or recorded. This area has been surveyed carefully by aerial archaeologists and subject to past mapping by the NMP, but some additions and clarifications to former mapping and interpretations have been made as expected.
- 9.39. It is also important to note that the perception of the environment and expectation of what is to be found may often limit the air photo analyst's mental 'openness' to features. This perception factor is mitigated by repeated examination of imagery taken in different years and under different conditions, and by teamwork between two or more interpreters checking the data. 'Photo fatigue' is also a factor in drop-off rates of discovery or perception of features. It is mitigated by alternating activities and personnel, checking interpretations with other team members and taking adequate visual breaks.

Online aerial photographs and satellite-derived images

- 9.40. Google Earth regularly uploads new images and attributes some images with the name of the provider and a date of capture. These dates are not verified, but for archaeological survey this is not a legally essential element of the metadata. The issue with data derived from geoportals such as Google Earth is that it changes and is added to; it is a dynamic collection of varied mosaiced dated images and varied resolutions of data derived from aerial photography and satellite imagery. During 2017-2018, Google began to capture its own data, and these layers are largely 'unattributed' in terms of provider. The main UK providers to Google Earth include Getmapping, Infoterra and Bluesky, The GeoInformation Group, Maxar and CNES/Airbus. The mosaic 'cuts' where images have been blended together and captured in different seasons are readily apparent, often within the same 'timeline' data.

Aerial Imagery Limitations: Conclusion

- 9.41. Aerial photograph assessments are often based on sequences of historical imagery which provide a series of 'snapshots' of the landscape under different conditions. In contrast, LiDAR and multi-spectral data are typically gathered at a single or series of closely spaced points in time. Levelled features which are now only visible as cropmarks are not usually visible *via* LiDAR data unless they are recorded as substantially differing vegetation heights within a DSM, or the features causing the cropmarks are still extant as micro topographic differences in the ground surface.
- 9.42. The limitations of these data sources are appreciated and considered during survey and use of multiple data sources. Multiple times of survey increases the discovery rate and certainty of interpretation from all airborne data sources when they are examined concurrently.

LiDAR Data

- 9.43. LiDAR data are collected for multiple environmental and engineering survey purposes and are therefore sometimes not in compliance with optimum timeframes for heritage survey requirements. An optimum LiDAR survey date for recovery of micro and macro topographic heritage data spans late November to mid-March in the northern hemisphere. This is when leaf canopy and vegetation are at their lowest and

a higher proportion of bare earth is exposed in both woodland and open areas to ensure that the laser pulses reach and return to and from the ground in sufficient density to record topography to create an accurate and detailed DTM.

- 9.44. Whilst of excellent high resolution, some data are not gathered at an optimal time for specific heritage survey purposes, as they are provided to serve the needs of multi-disciplinary surveys. A lower resolution survey captured during the winter months very often provides more data due to the lack of intervening vegetation which prevents sufficient laser points from reaching the ground surface. A low density of vegetation and leaf canopy is essential to the effectiveness of LiDAR survey in that it ensures maximum penetration of light signals to the ground surface in vegetated areas.

The LiDAR data are, however, of assistance in recording some micro and more macro topographic features which may indicate relict or extant archaeological features and historic landscapes. They were used over the survey area in multiple visualisations alongside the aerial photographs and satellite image data. LiDAR data are best interpreted and used in conjunction with modern and historic aerial photographs and maps to provide ground truth information, and this was achieved in this survey.

- 9.45. For LiDAR data captured during 'leaf / crop on' conditions, less data is recorded due to foliage and vegetation masking the route of the laser. Similarly, areas of water will absorb the laser giving no returned points.
- 9.46. The majority of the NLP LiDAR data were collected between October and March, with varied dates for smaller surveys.
- 9.47. When the point cloud is processed into a DTM, reduced ground coverage results in a simplified geometry surface interpolated from the few available data points which can obstruct features of interest.
- 9.48. The horizontal cell resolution of LiDAR data can also influence the detection rates of archaeological features. This can occur where the spacing of point measurements is sufficiently wide to conceal or reduce the visibility of small archaeological features. This may have affected this assessment in areas where LiDAR data were gathered at 2m, 1m and 50cm resolutions as opposed to the more detailed 25cm resolution data.

- 9.49. It is also important to note that LiDAR visualisation techniques are continually developing and advancing. The multiple visualisations now applied to DSM and DTM data *via* the RVT used for this survey are effective in heritage interpretation. Hillshade, and particularly fixed-direction Hillshade, visualisations do not show the correct position of the actual features, only the position of their virtual 'shadows' on the ground. It is thus important to use multiple visualisations of LiDAR data to ensure accurate positioning of recorded features and optimise the results. LiDAR data: conclusion
- 9.50. The majority of the LiDAR data were captured at times of low leaf index; however, these data did not reveal consistently significant topographic heritage assets over the whole of this area. This is due to the eroded and buried nature of the cropmarked sites which constitute the majority of the aerial evidence which is largely eroded to sub-surface level.

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11. Acknowledgements

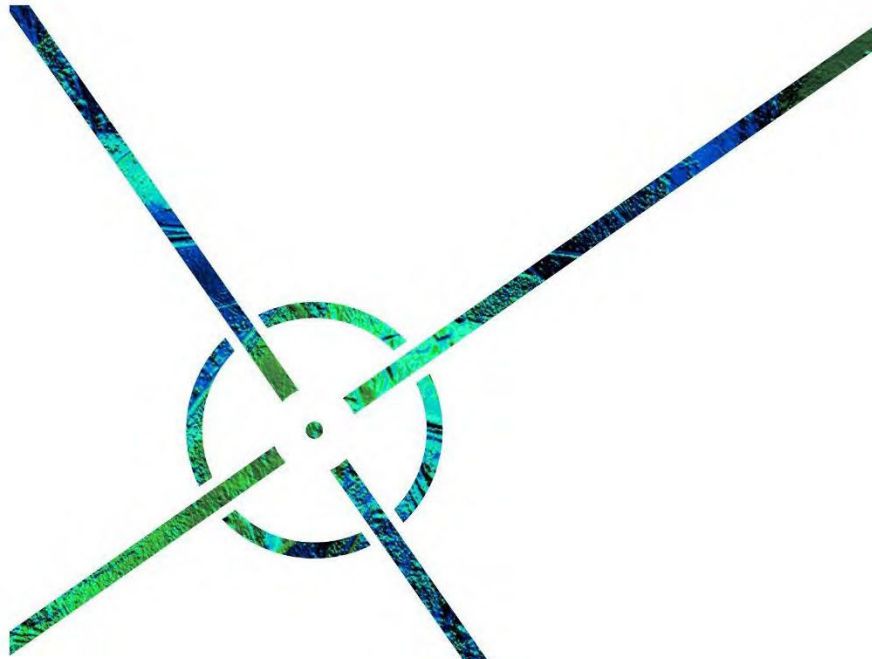
Many thanks to those who have supported this assessment through the provision of research materials and advice on sourcing documents during a time of restricted access:

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- Historic England Archive, Swindon for provision of multiple coversearches and access to the aerial photographs in the Historic England Public Search Room; and
- Kate Bassett and George Burden at Groundsure Ltd for supply of digital historic map data.

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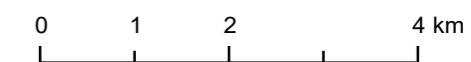
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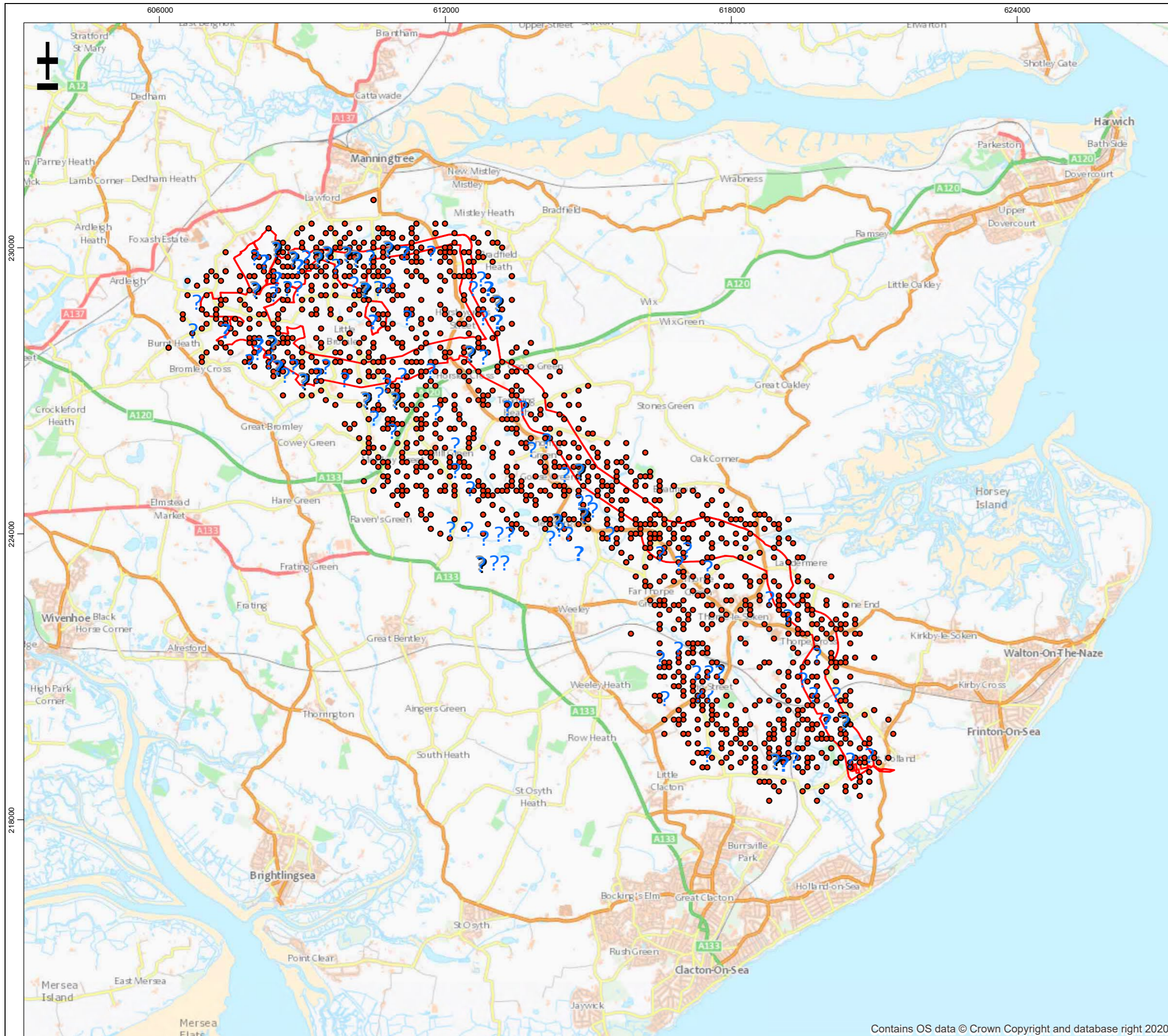
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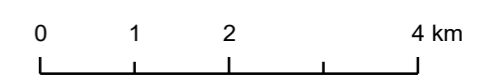
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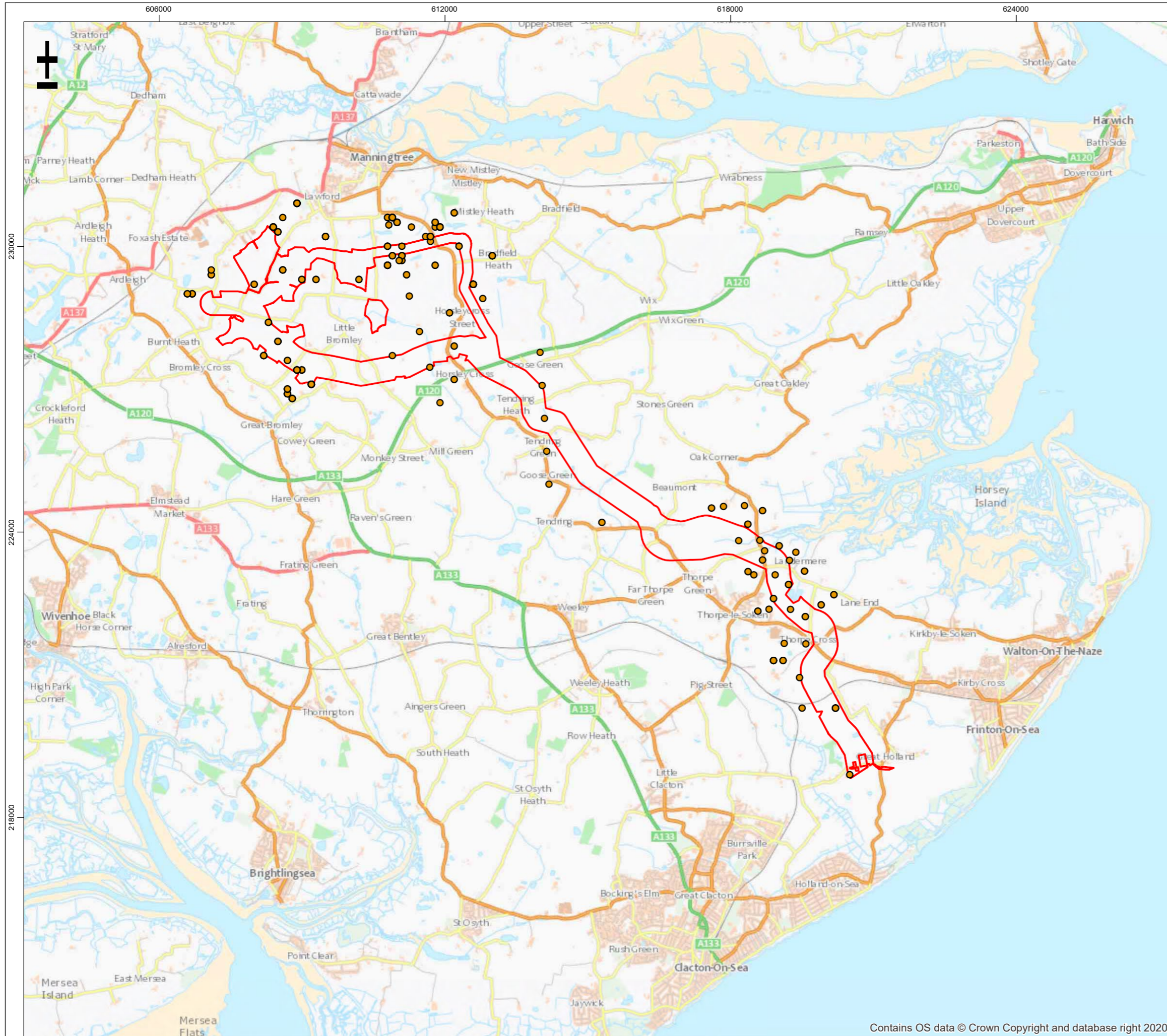
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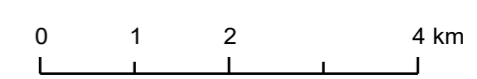


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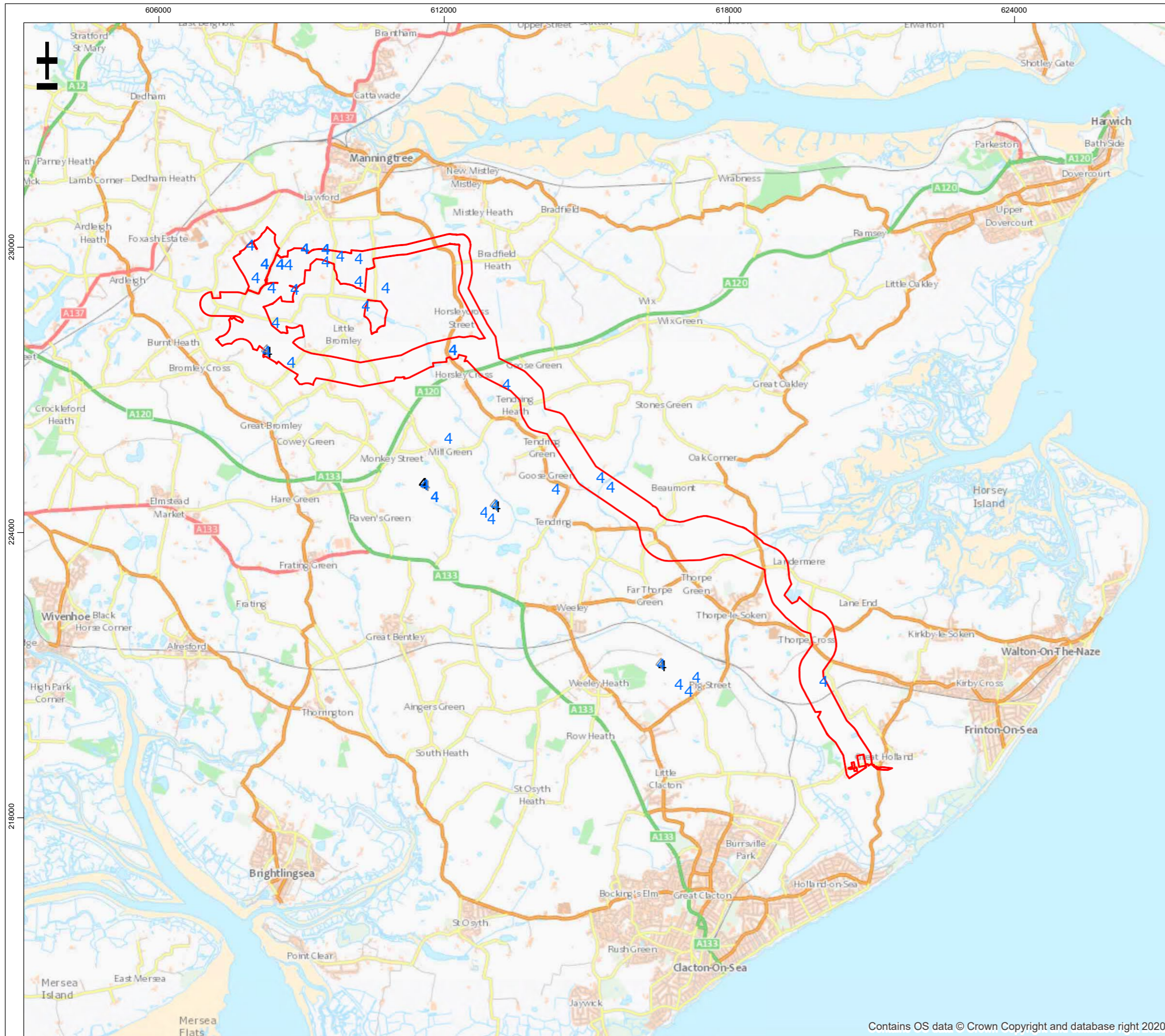
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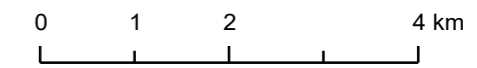


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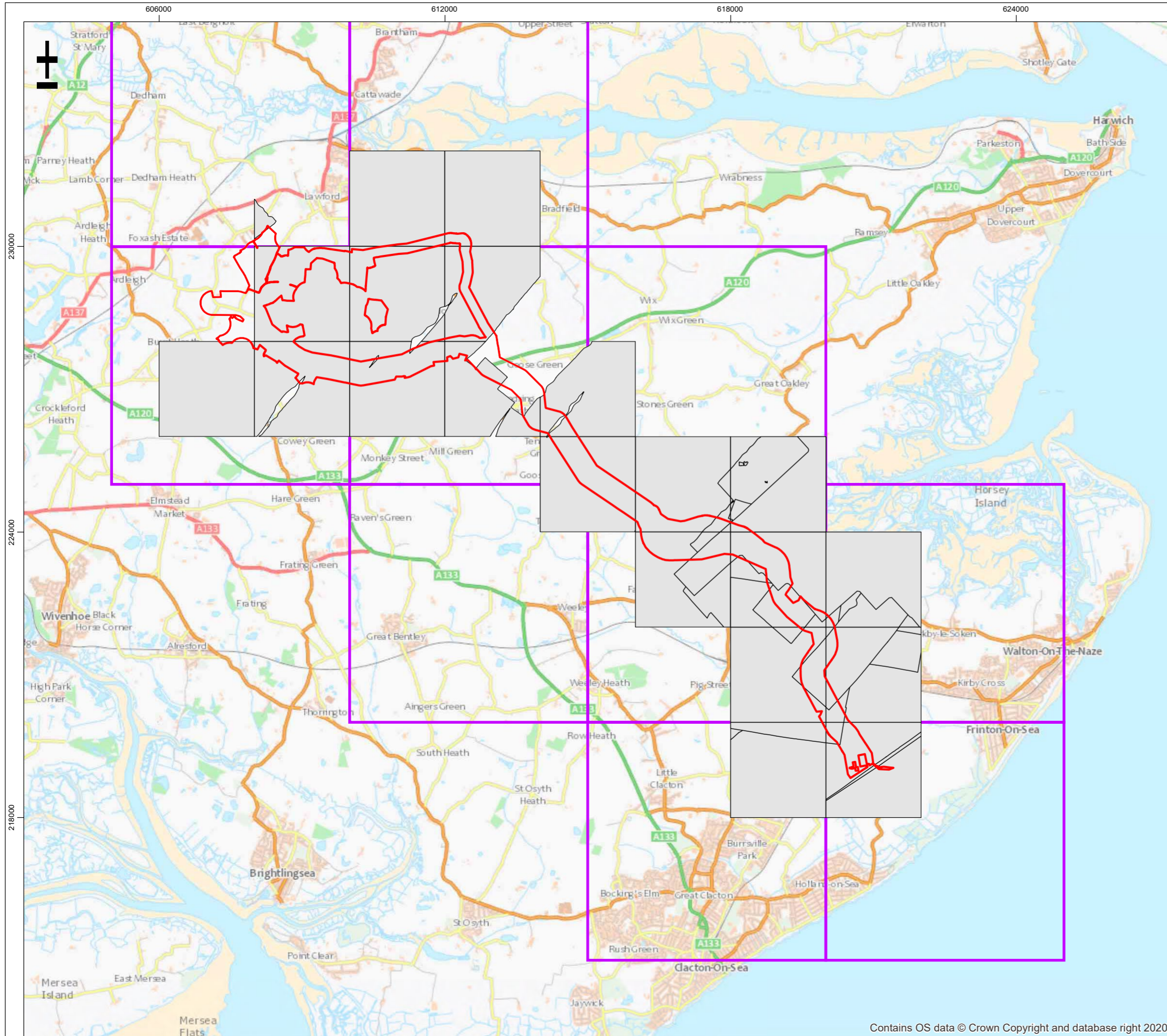
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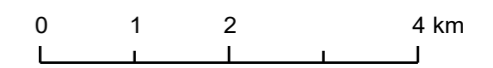
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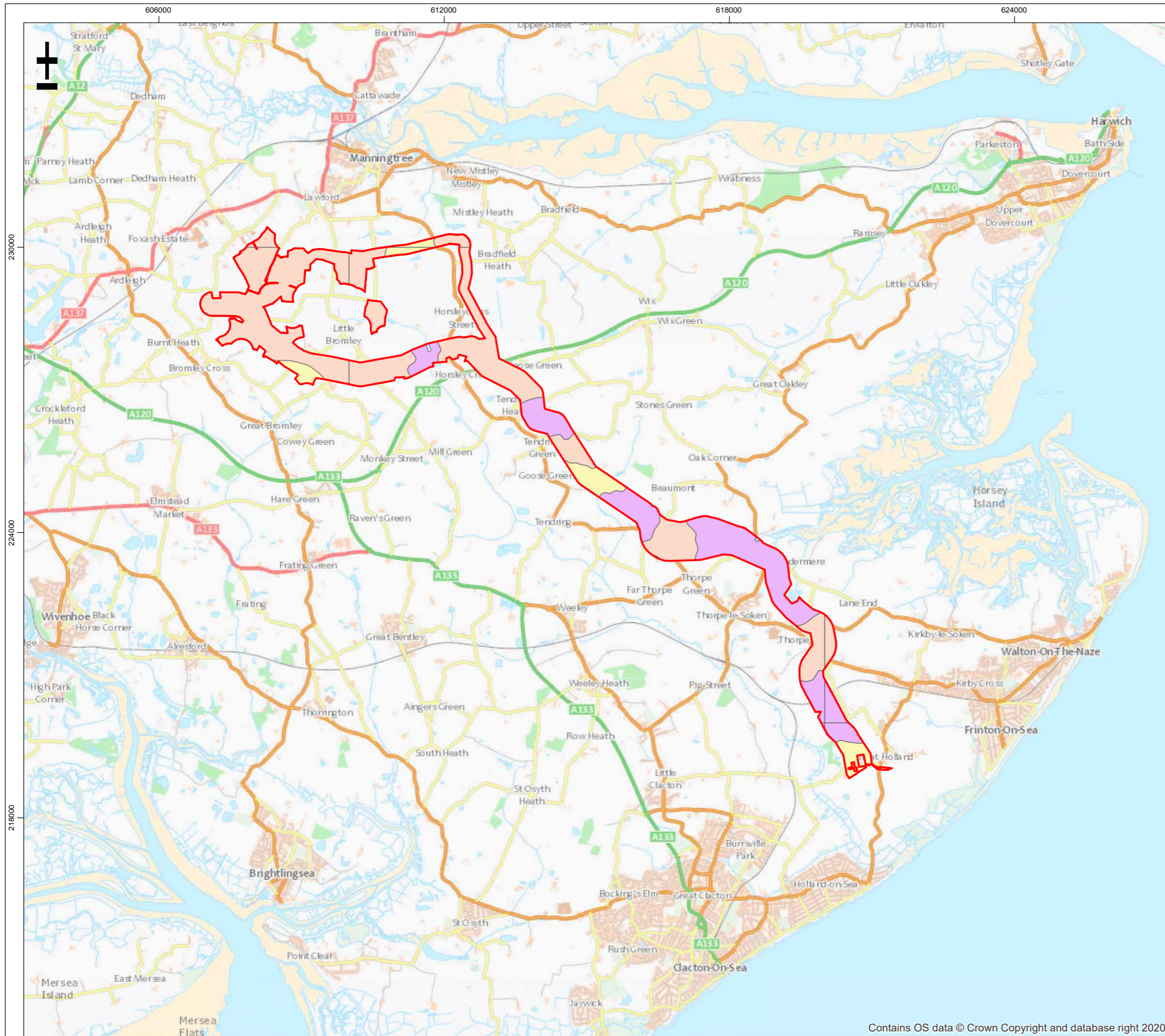
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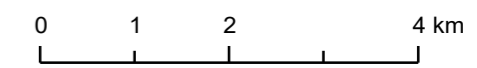
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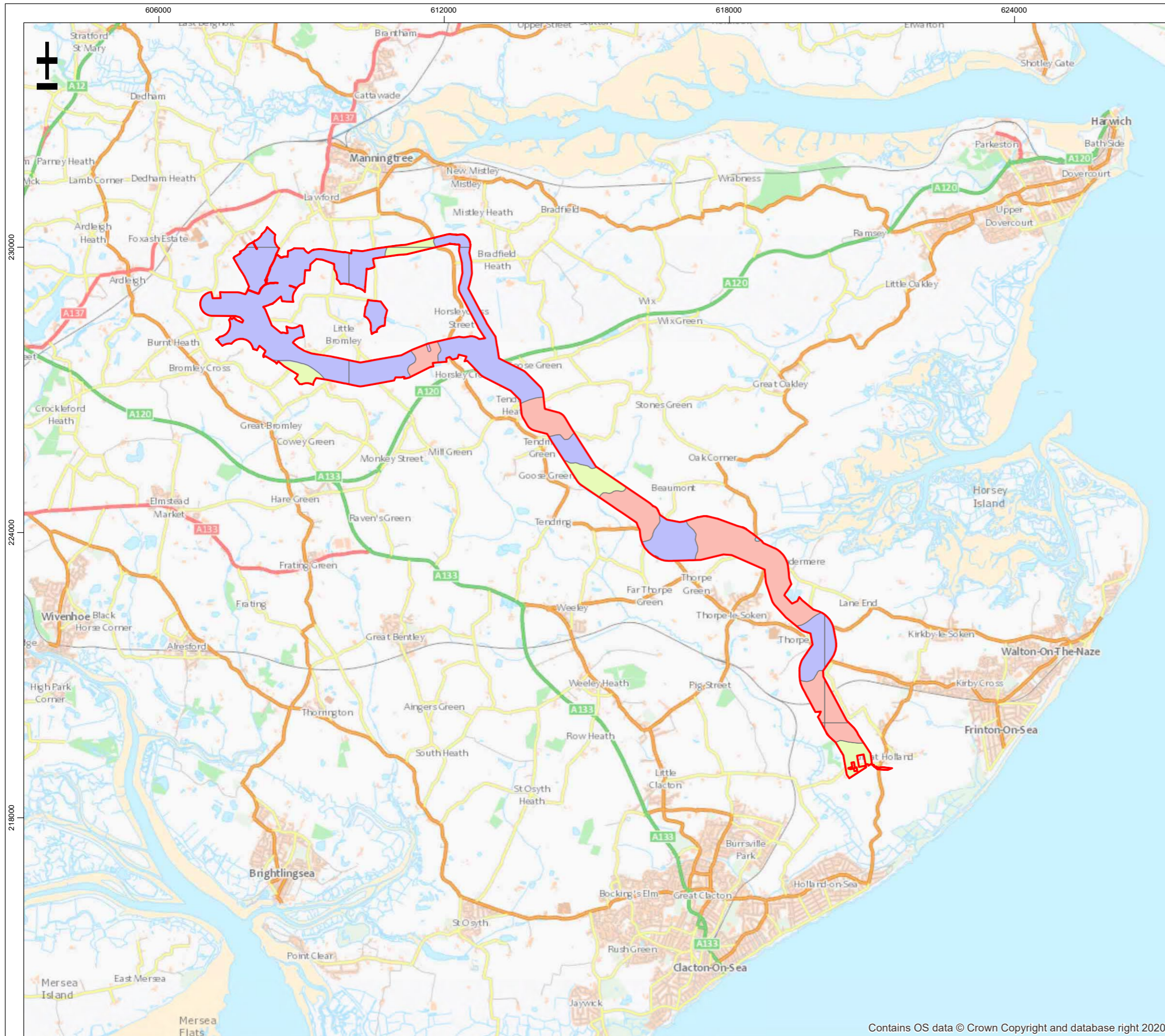
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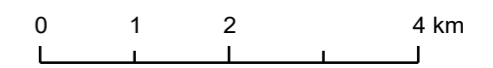
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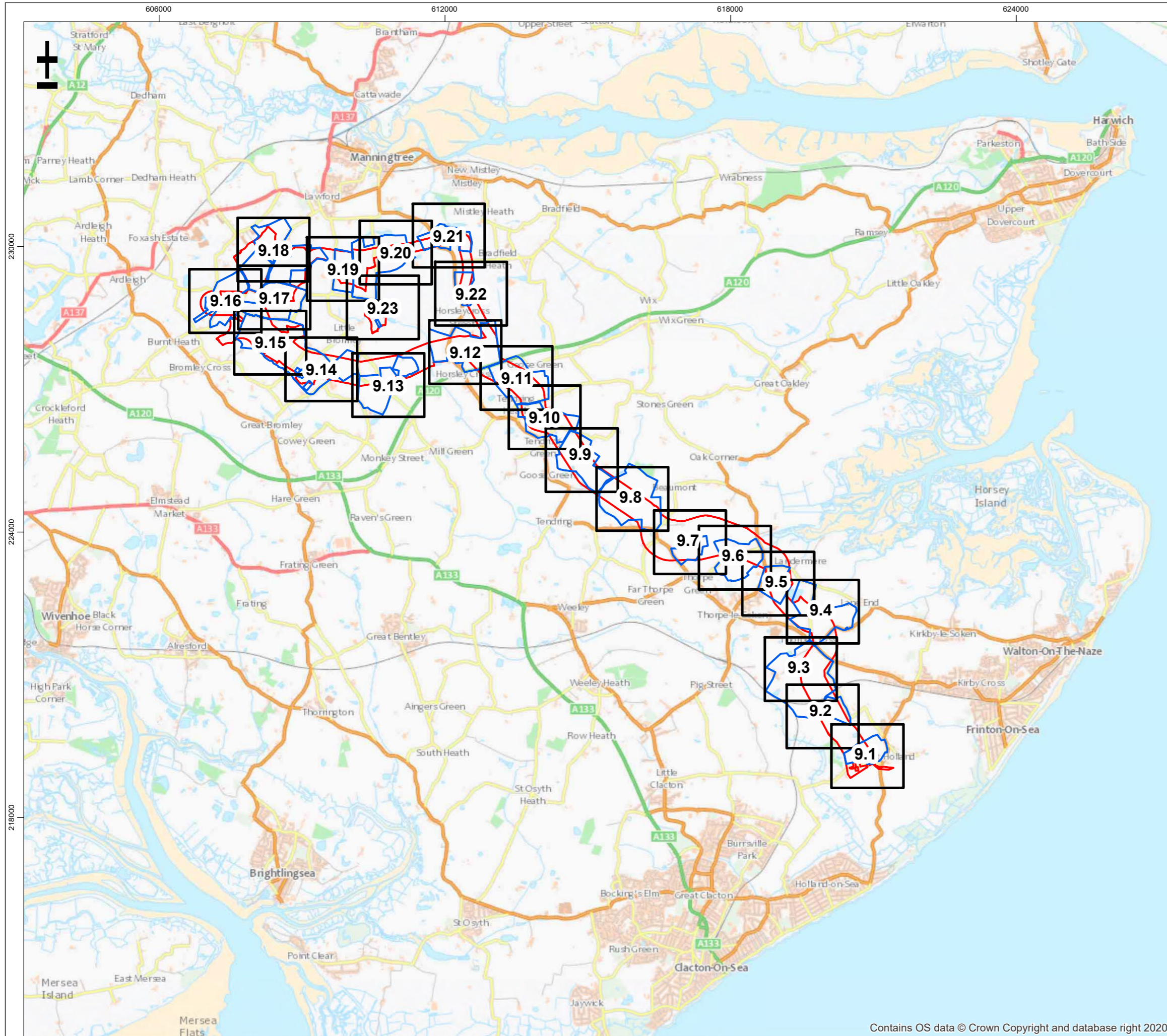
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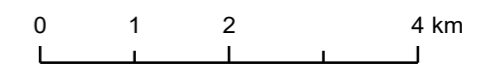
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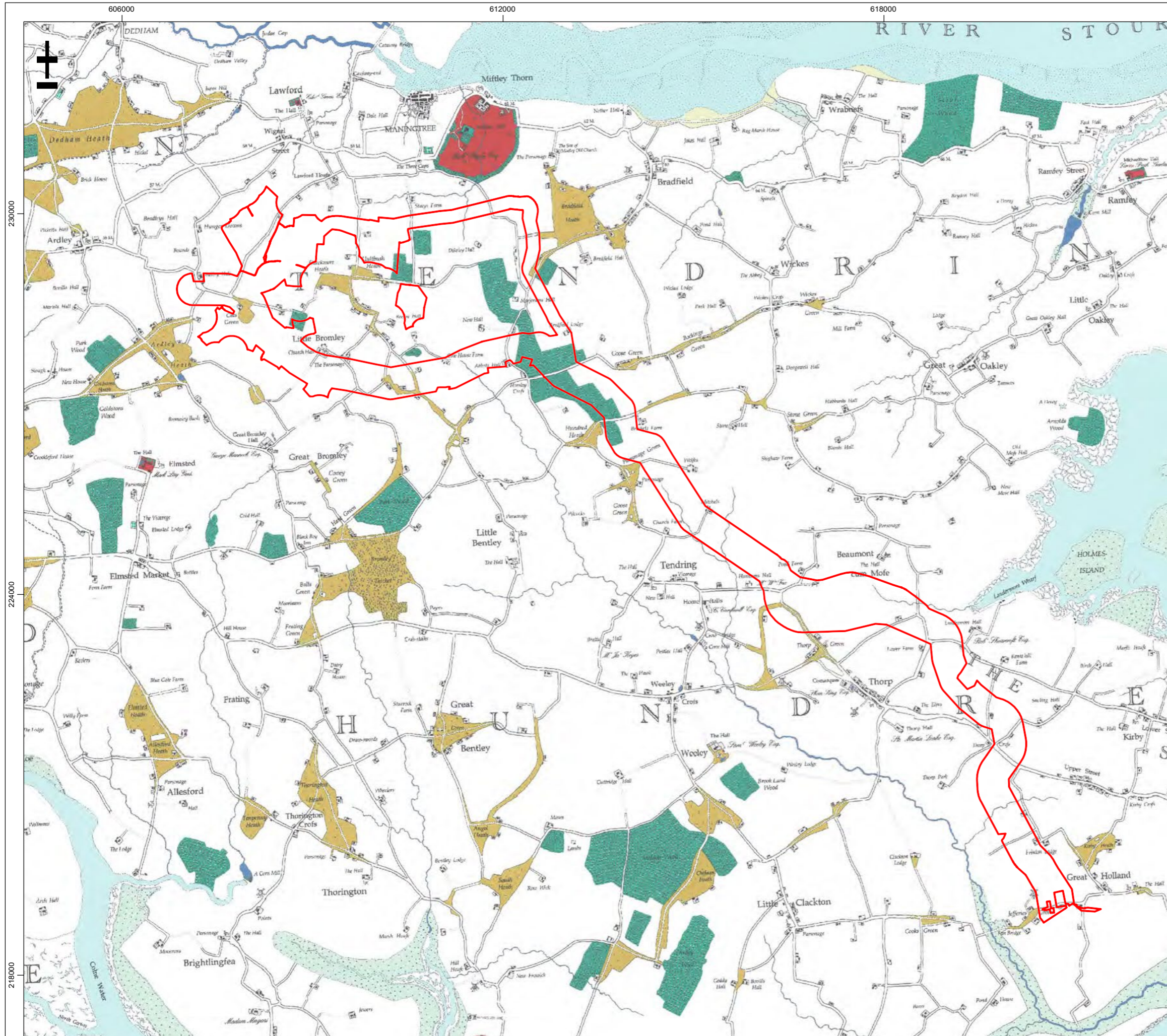
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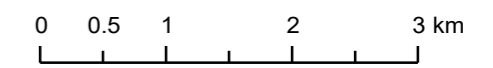
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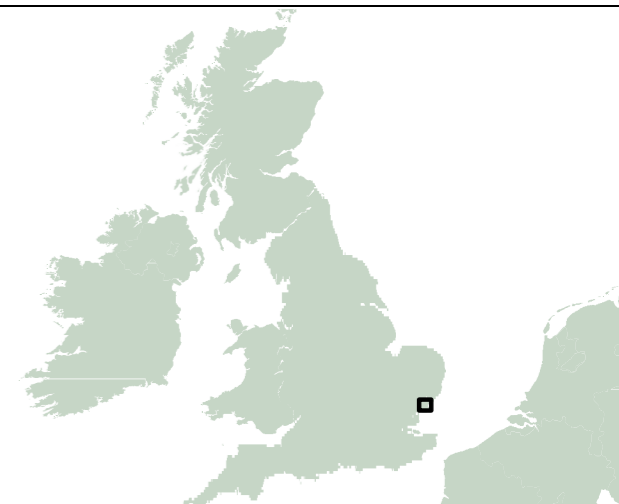
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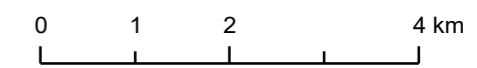




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North Falls Search Area

Parishes *Note - Frinton and Walton covers Great Holland Parish



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Parish Tithe Map Index

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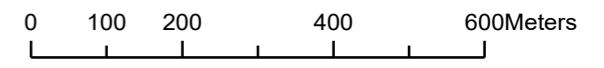


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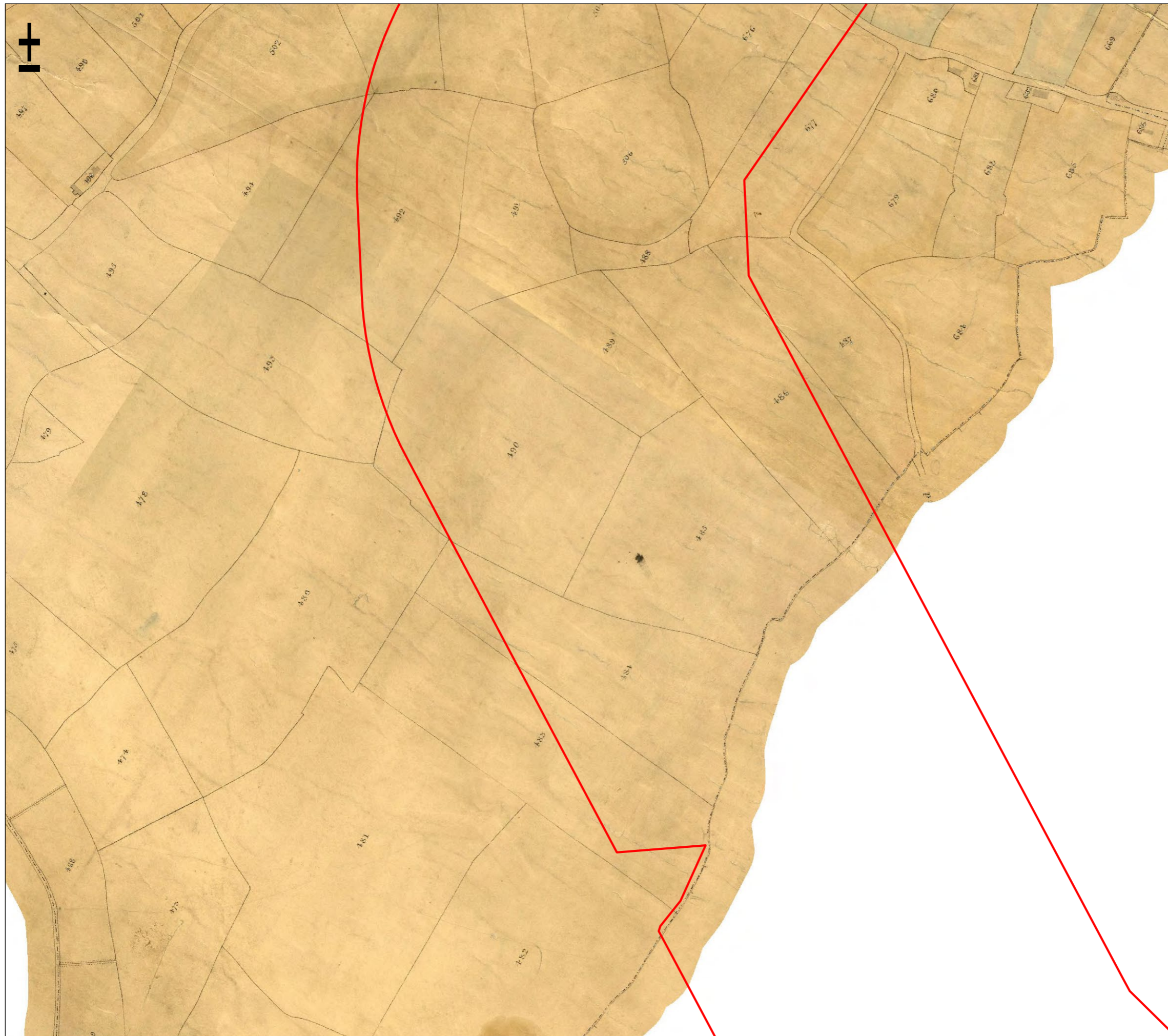
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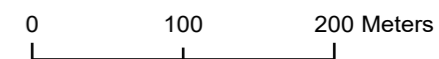
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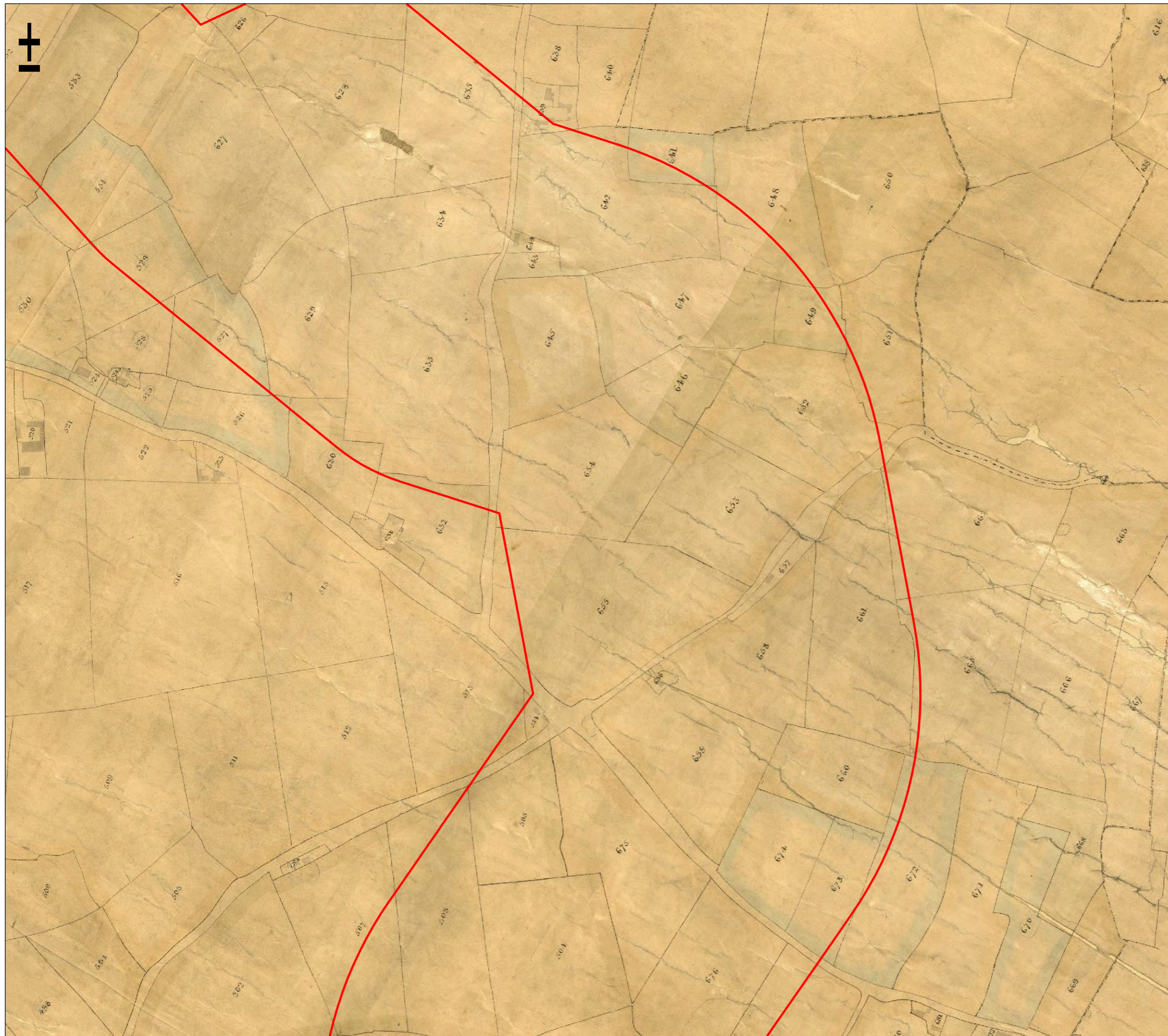
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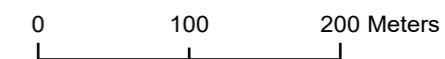
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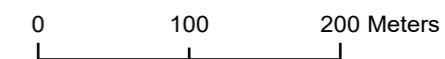
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North Falls Search Area



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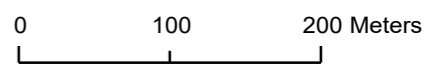
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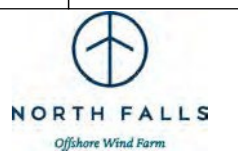
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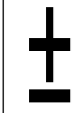
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Fig. 13

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North Falls Search Area



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Thorpe-le-Soken Parish Tithe Map 1841
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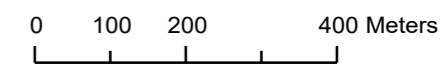
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Fig. 13

Scale 1:5,000	Plot Size A3	Datum OSGB36	Projection BNG
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Legend
 North Falls Search Area



Data Source:

Drawing Title
Beaumont Parish Tithe Map 1839

Rev	Date	Remarks	Drwr	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0027** Figure Number: **Fig. 14**

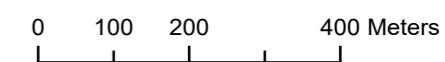
Scale: 1:10,000 Plot Size: A3 Datum: OSGB36 Projection: BNG





Legend

North Falls Search Area



Data Source:

Drawing Title

Tendring Parish Tithe Map 1842

Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0028

Figure Number
Fig. 15

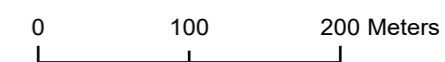
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Legend

North Falls Search Area



Data Source:

Drawing Title

Wix Tithe Map 1837

Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0029

Figure Number
Fig. 16

Scale: 1:5,000 | Plot Size: A3 | Datum: OSGB36 | Projection: BNG

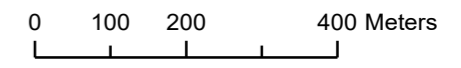


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Legend

North Falls Search Area



Data Source:

Drawing Title

Bradfield Parish Tithe Map 1838

Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0030

Figure Number
Fig. 17

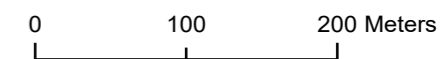
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Legend

North Falls Search Area



Data Source:

Drawing Title

Mistley Parish Tithe Map 1843
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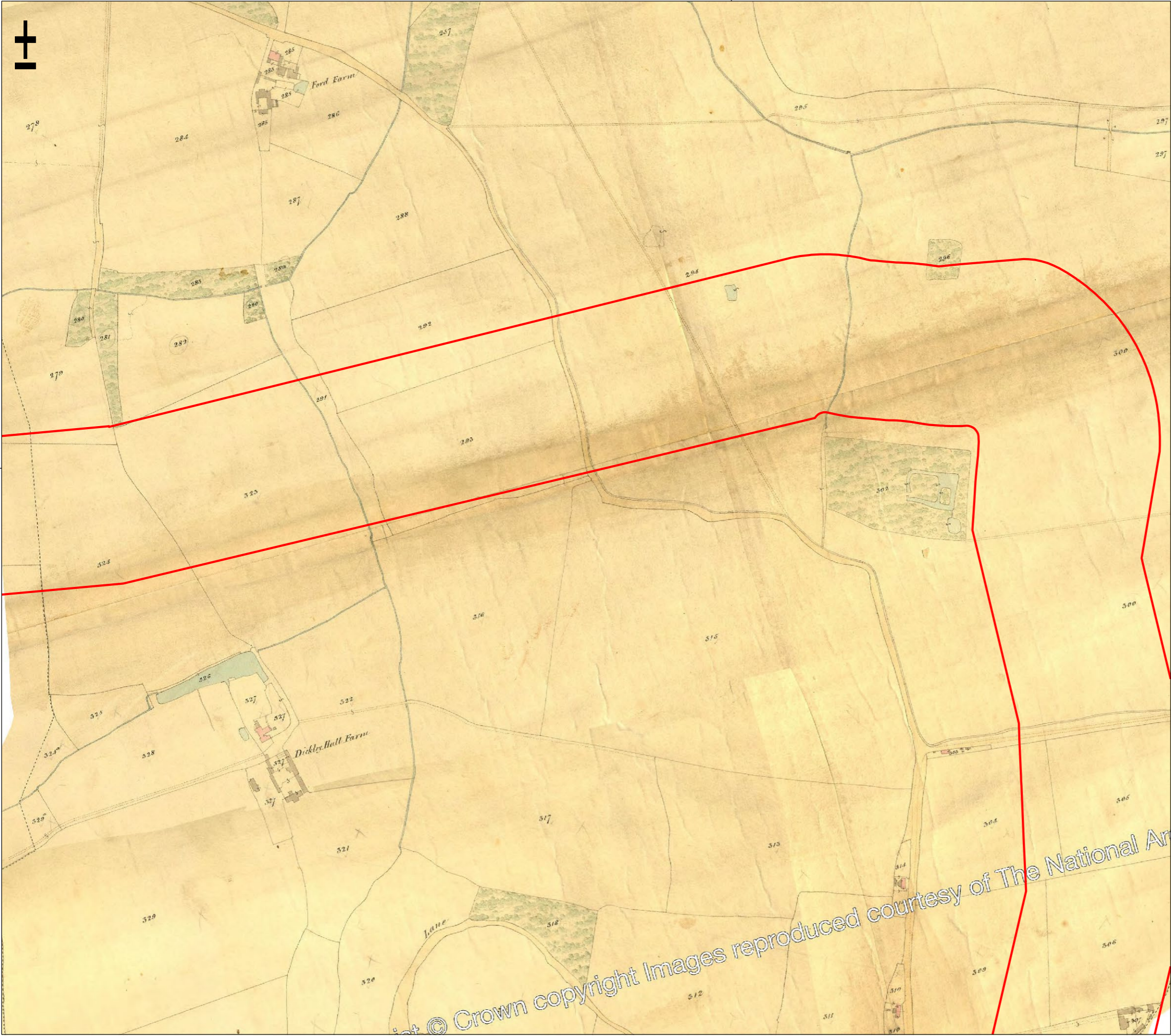
Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0031

Figure Number
Fig. 18

Scale 1:5,000 | Plot Size A3 | Datum OSGB36 | Projection BNG



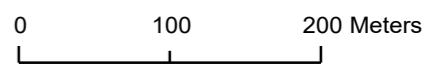


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Legend

North Falls Search Area



Data Source:

Drawing Title
Mistley Parish Tithe Map 1843
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Rev	Date	Remarks	Drwr	Chkd
00	22/06/2022	First issue	ASJ	CC

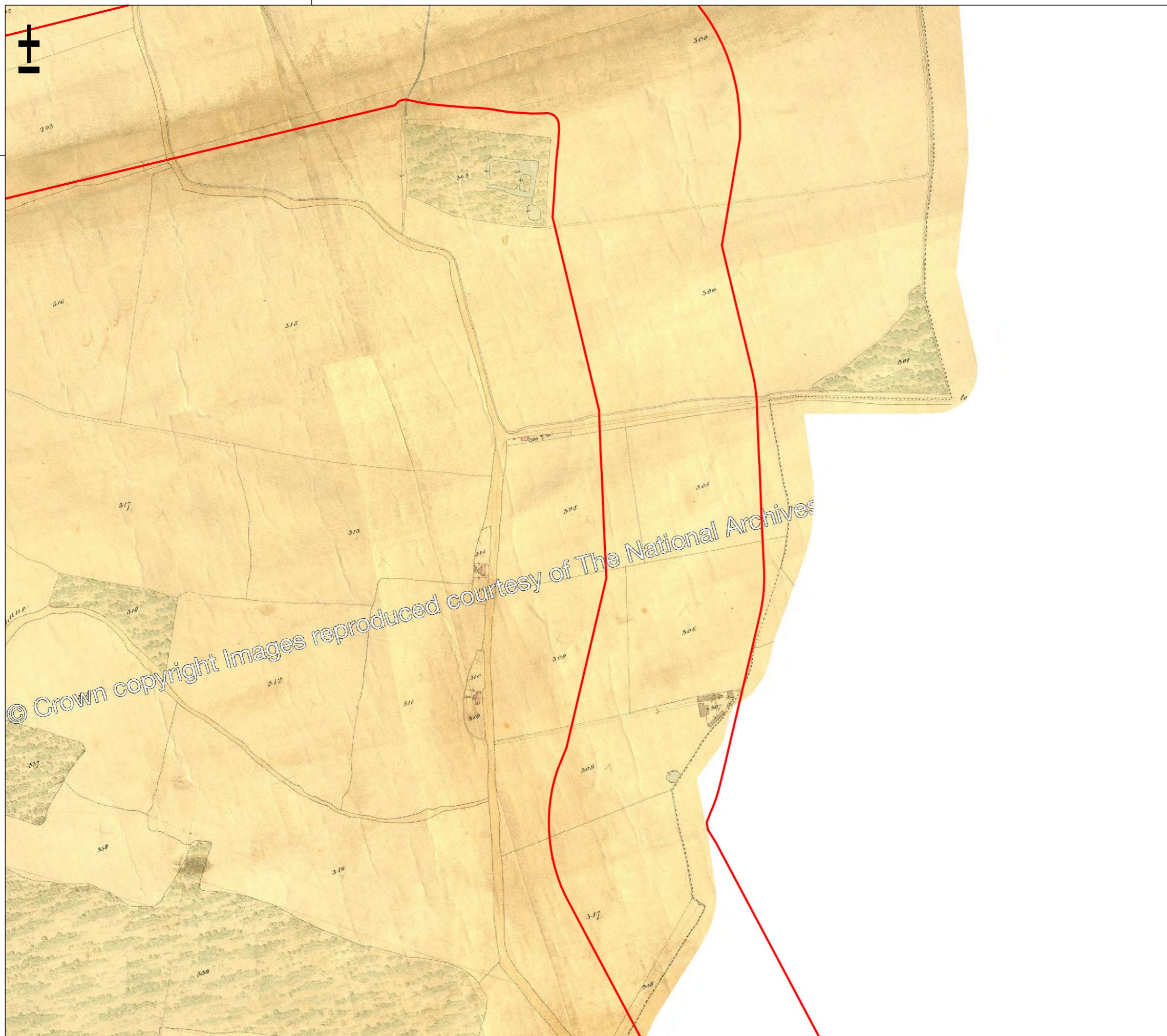
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Scale: 1:5,000 Plot Size: A3 Datum: OSGB36 Projection: BNG



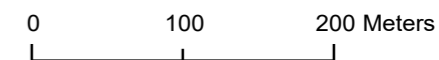
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Legend

North Falls Search Area



Data Source:

Drawing Title

Mistley Parish Tithe Map 1843
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00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0031

Figure Number
Fig. 18

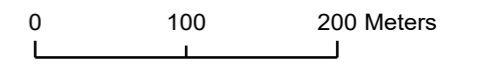
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Legend

North Falls Search Area



Data Source:

Drawing Title
Little Bentley Parish Tithe Map 1841

Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0032** Figure Number: **Fig. 19**

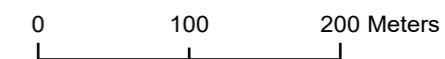
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Legend

 North Falls Search Area



Data Source:

Drawing Title

Little Bromley Parish Tithe Map 1841
Page 1 of 6

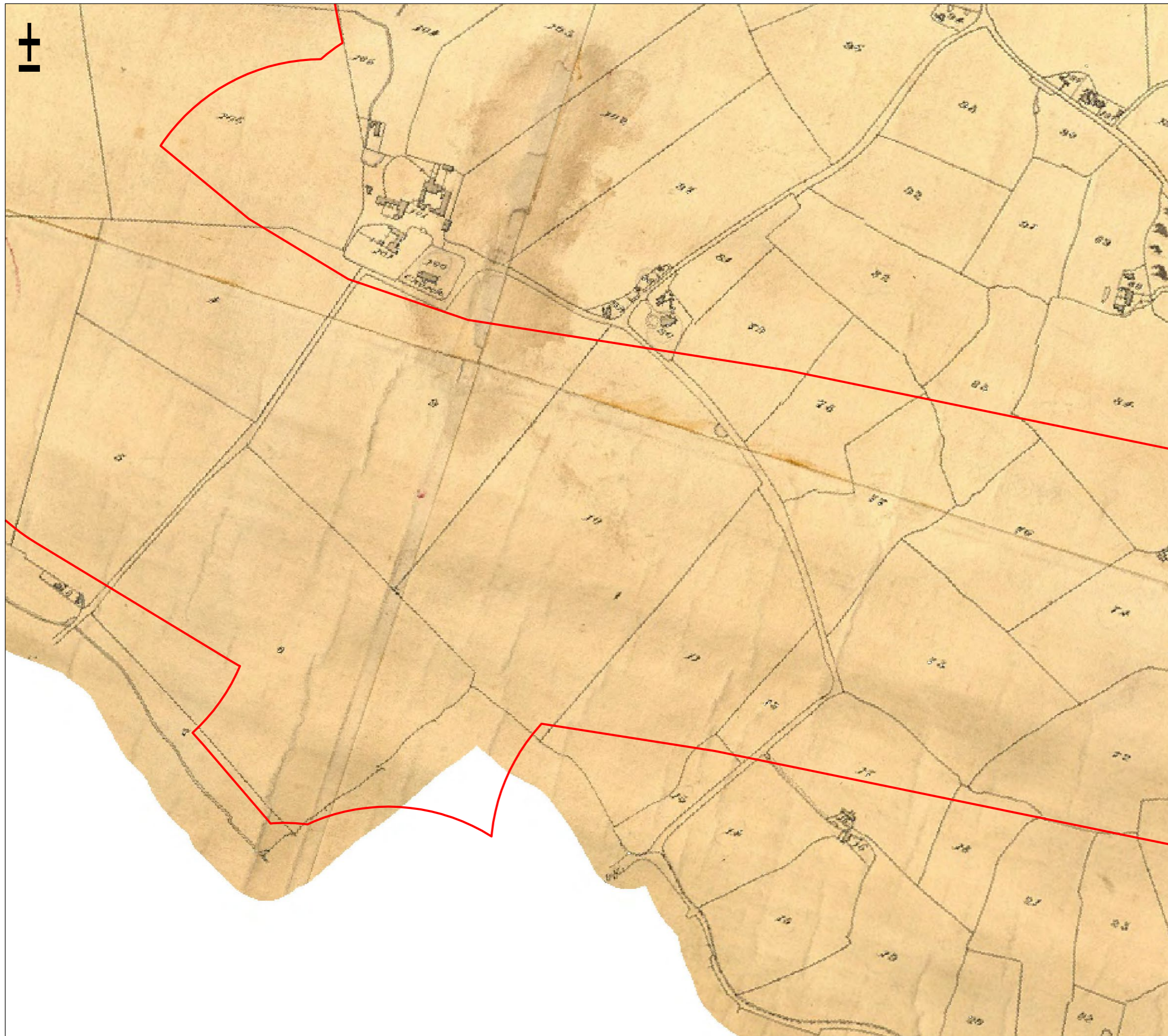
Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0033

Figure Number
Fig. 20

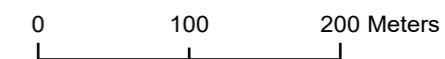
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Legend

North Falls Search Area



Data Source:

Drawing Title

Little Bromley Parish Tithe Map 1841
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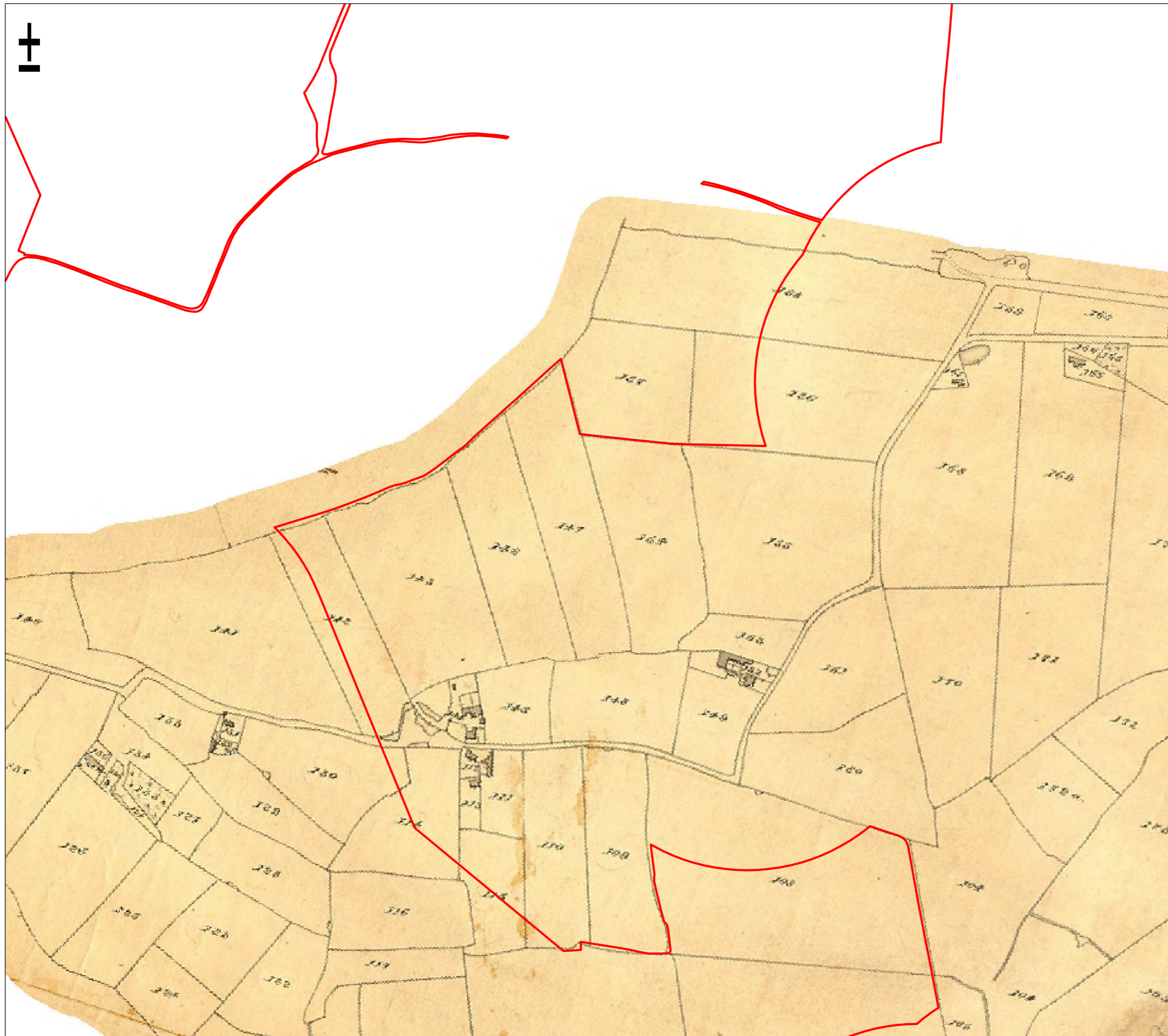
Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0033

Figure Number
Fig. 20

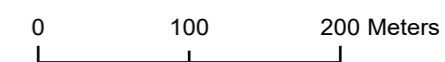
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Legend

North Falls Search Area



Data Source:

Drawing Title
Little Bromley Parish Tithe Map 1841
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00	22/06/2022	First issue	ASJ	CC

Drawing Number PB9244-APS-ZZ-ON-DR-YE-0033	Figure Number Fig. 20
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Scale 1:5,000	Plot Size A3	Datum OSGB36	Projection BNG
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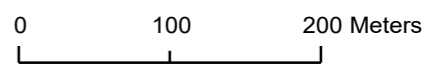




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Legend
 North Falls Search Area



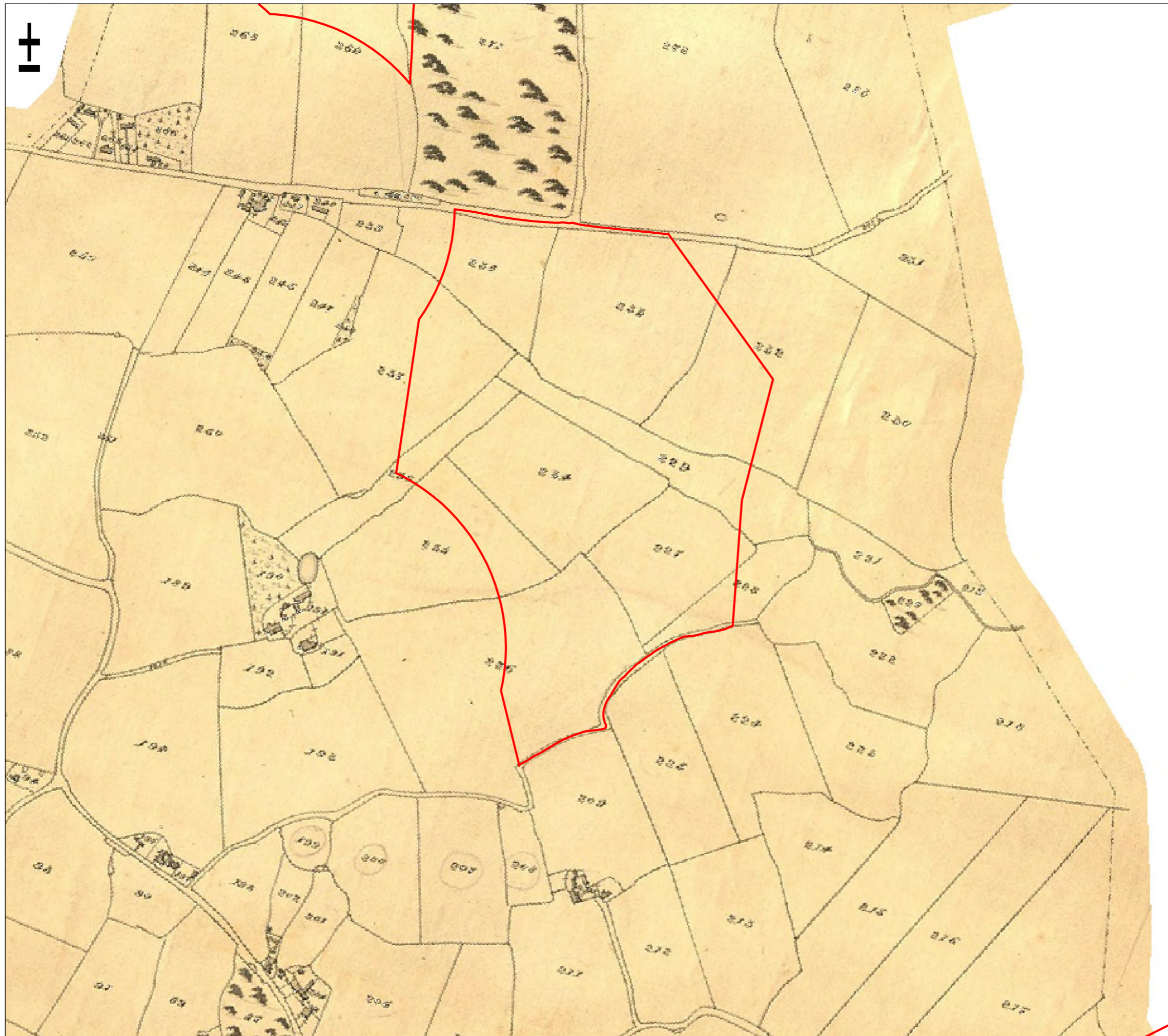
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 Drawing Title
Little Bromley Parish Tithe Map 1841
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Rev	Date	Remarks	Drwr	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0033** Figure Number: **Fig. 20**

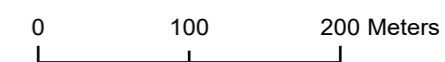
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Legend

North Falls Search Area



Data Source:

Drawing Title

Little Bromley Parish Tithe Map 1841
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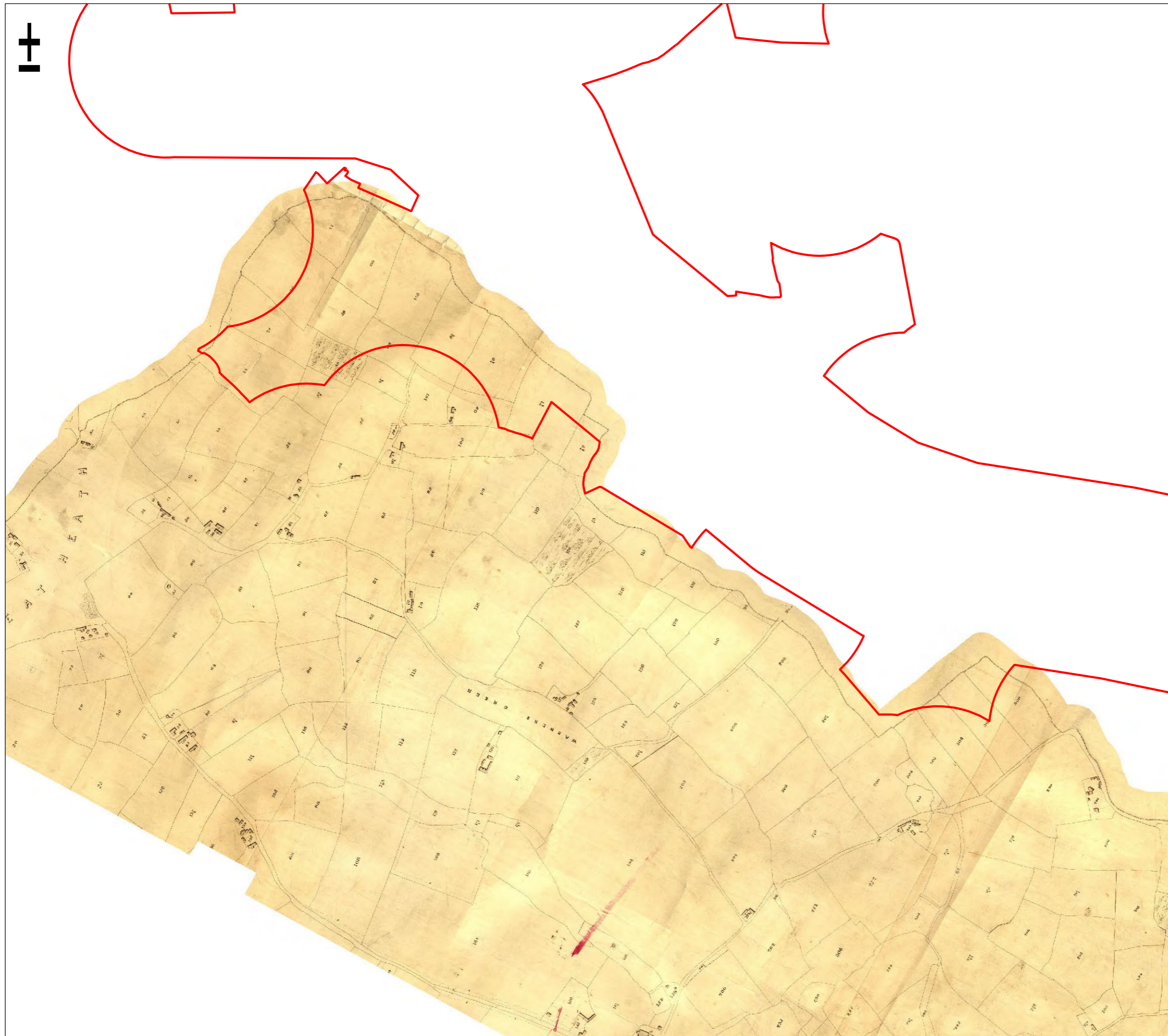
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00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0033

Figure Number
Fig. 20

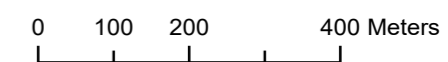
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Legend

North Falls Search Area



Data Source:

Drawing Title

Great Bromley Parish Tithe Map 1839

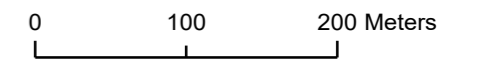
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00	22/06/2022	First issue	ASJ	CC

Drawing Number PB9244-APS-ZZ-ON-DR-YE-0034		Figure Number Fig. 21	
Scale 1:10,000	Plot Size A3	Datum OSGB36	Projection BNG





Legend
 North Falls Search Area



Data Source:
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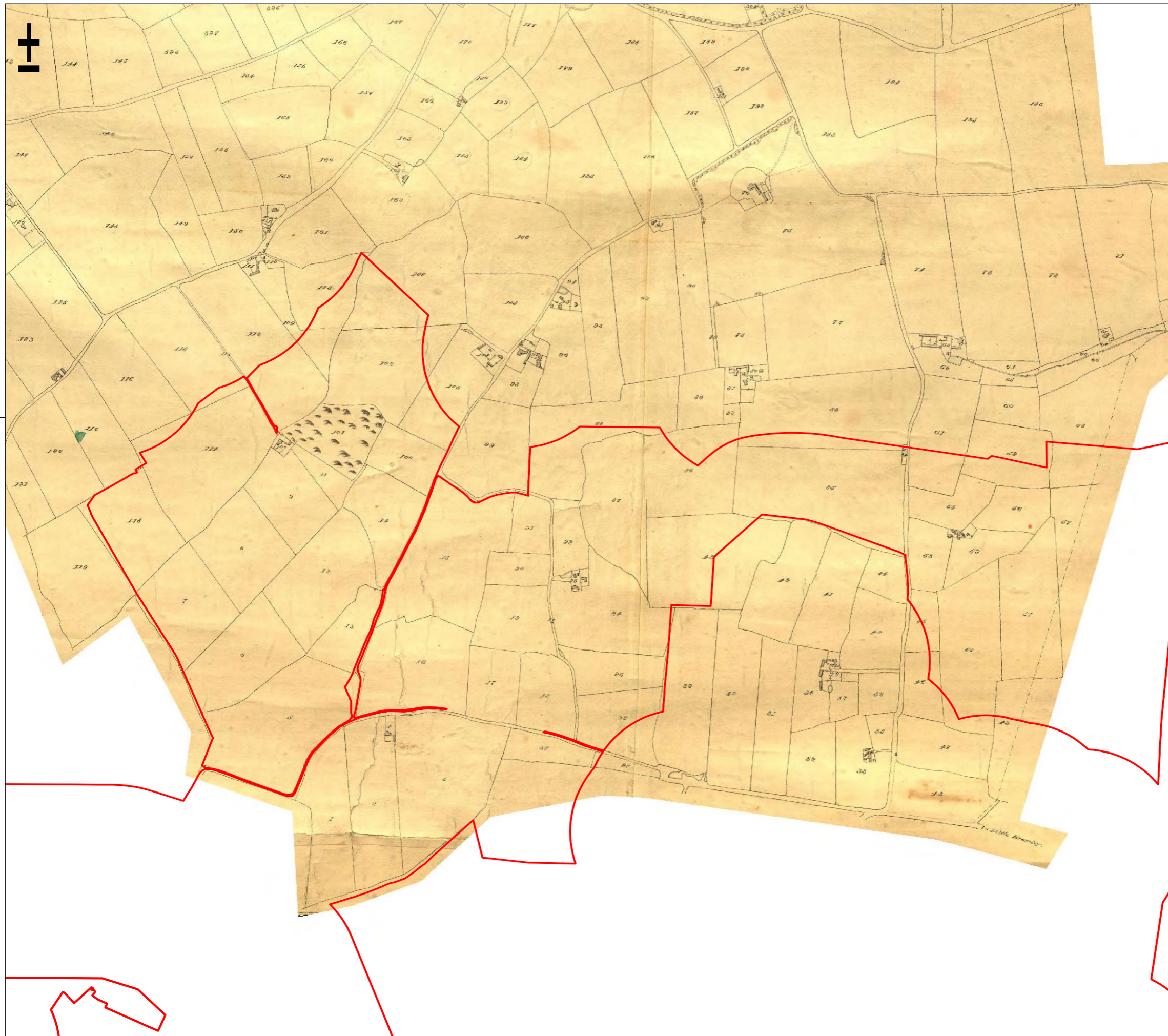
Ardleigh Parish Tithe Map 1842

Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number PB9244-APS-ZZ-ON-DR-YE-0035	Figure Number Fig. 22
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Scale 1:5,000	Plot Size A3	Datum OSGB36	Projection BNG
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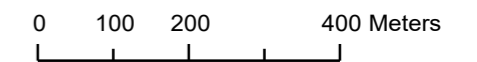


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Legend

North Falls Search Area



Data Source:

Drawing Title

Lawford Parish Tithe Map 1839

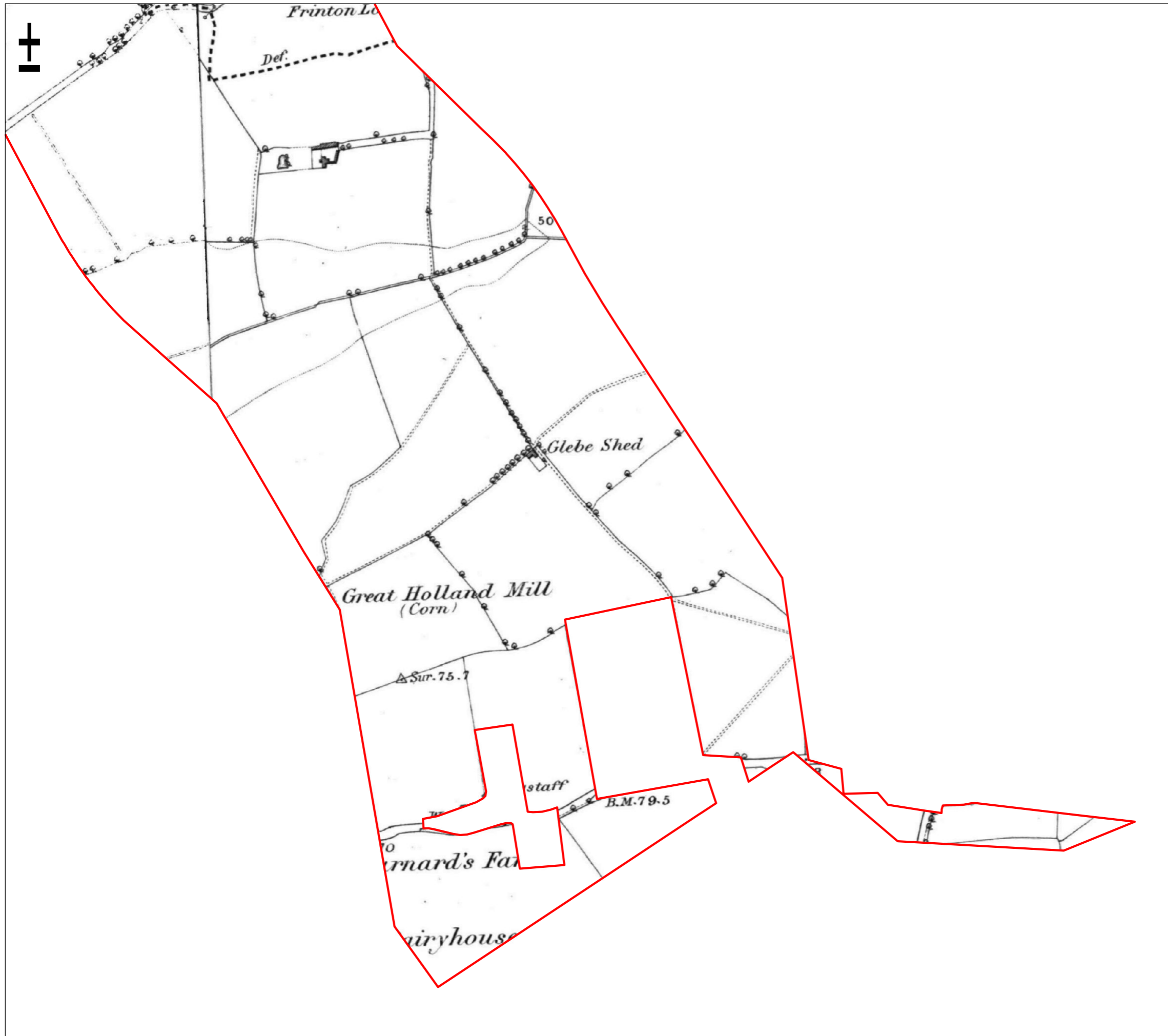
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00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0036

Figure Number
Fig. 23

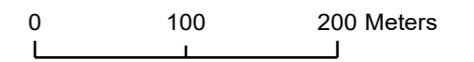
Scale 1:10,000 Plot Size A3 Datum OSGB36 Projection BNG





Legend

North Falls Search Area



Data Source:

Drawing Title

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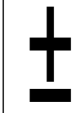
Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0037


Figure Number
Fig. 24

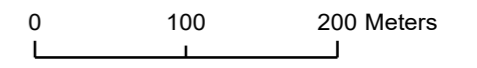
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Legend

 North Falls Search Area



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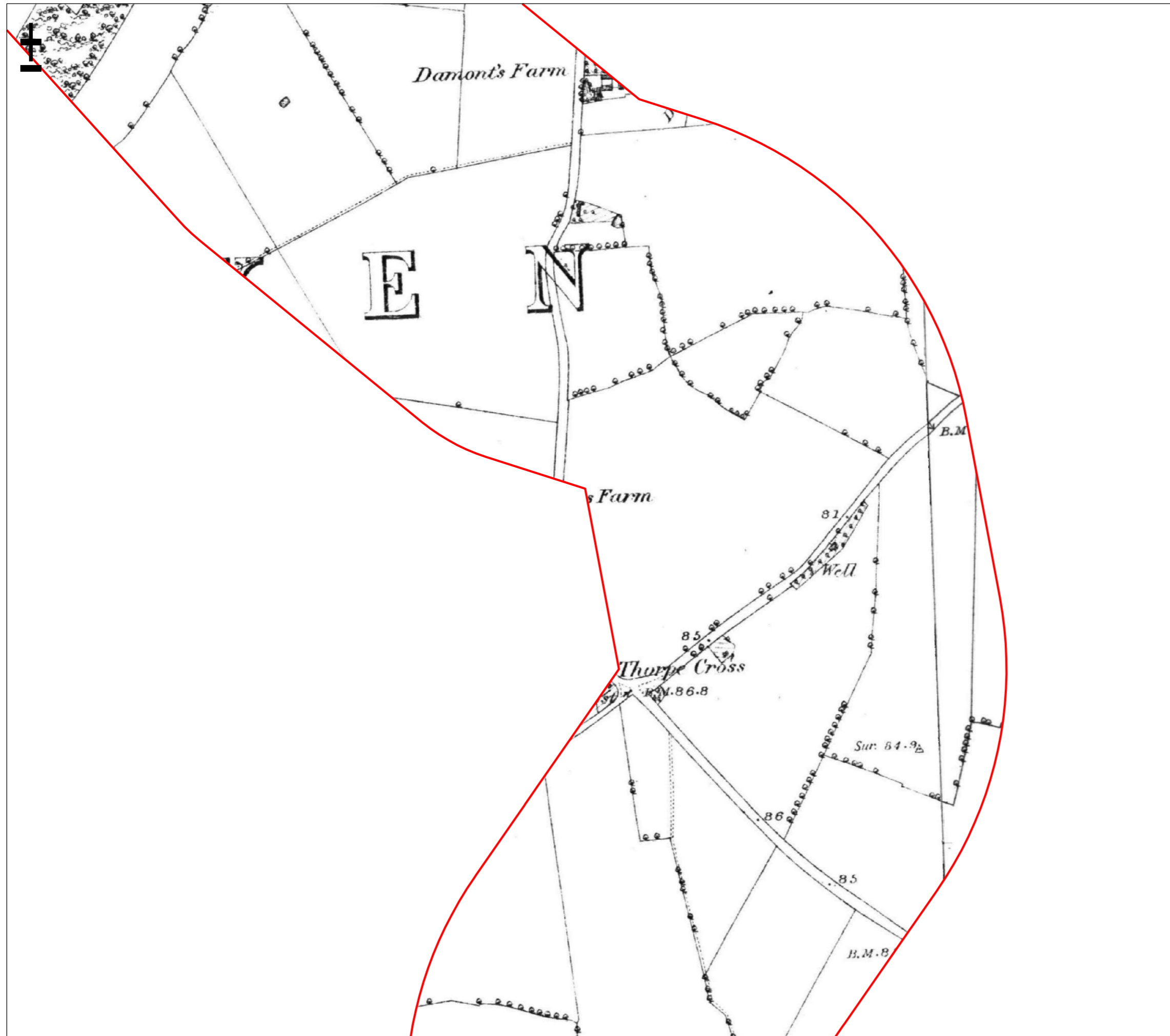
Drawing Title
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Drawing Number **PB9244-APS-ZZ-ON-DR-YE-0037** Figure Number **Fig. 24**

Scale 1:5,000 Plot Size A3 Datum OSGB36 Projection BNG





Legend

North Falls Search Area



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Figure Number
Fig. 24

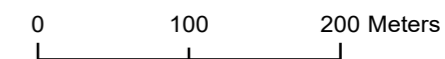
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Legend

North Falls Search Area



Data Source:

Drawing Title

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00	22/06/2022	First issue	ASJ	CC

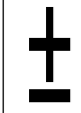
Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0037

Figure Number
Fig. 24

Scale: 1:5,000 | Plot Size: A3 | Datum: OSGB36 | Projection: BNG



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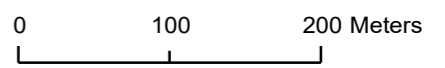


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Legend

North Falls Search Area



Data Source:

Drawing Title

1874 - 1875 Ordnance Survey Mapping
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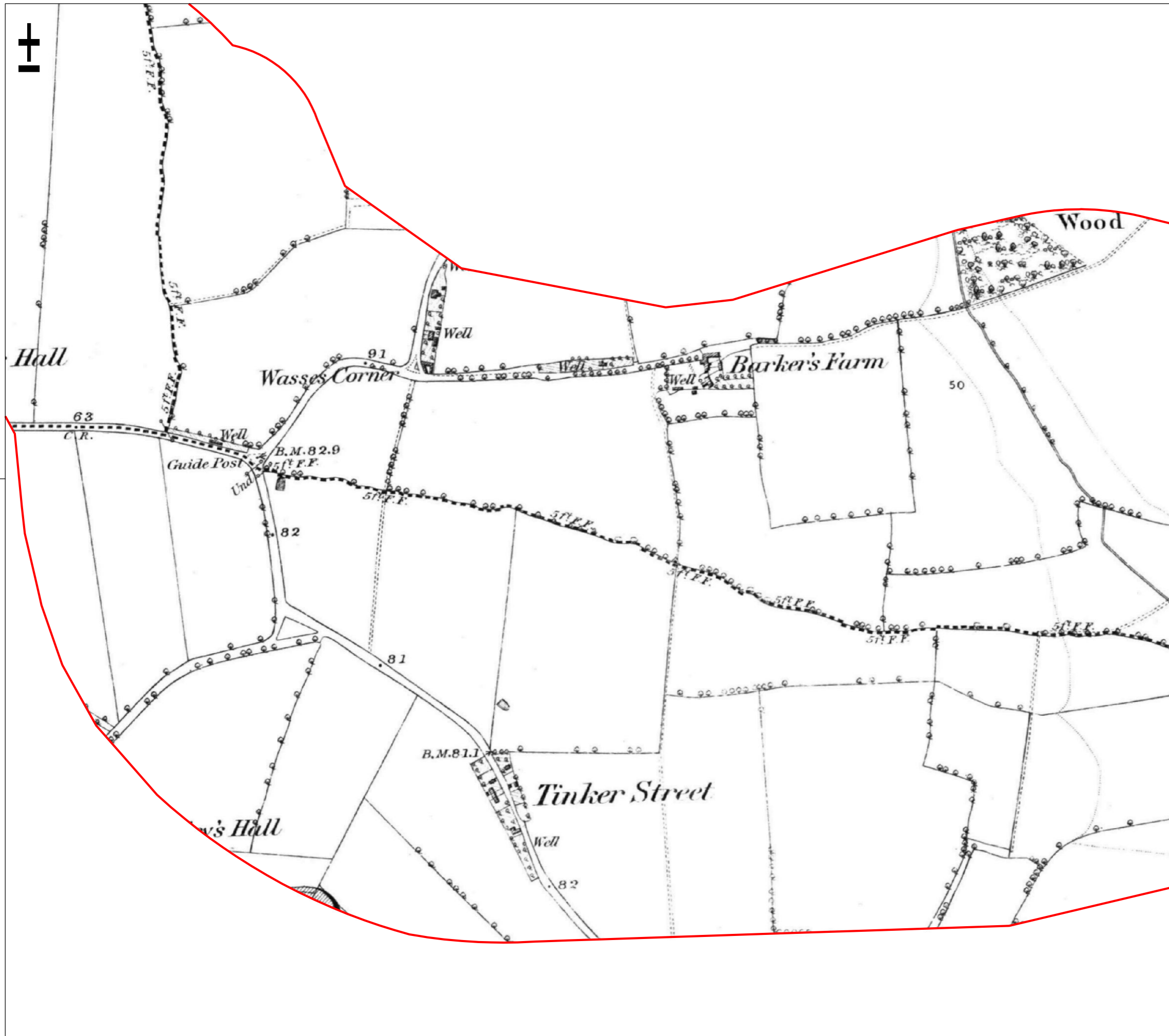
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00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0037

Figure Number
Fig. 24

Scale 1:5,000	Plot Size A3	Datum OSGB36	Projection BNG
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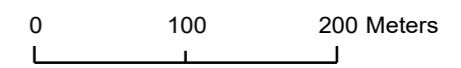




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Legend
 North Falls Search Area



Data Source:
 Drawing Title
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00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0037** Figure Number: **Fig. 24**

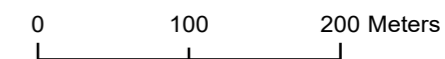
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Legend

 North Falls Search Area



Data Source:

Drawing Title

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00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0037

Figure Number
Fig. 24

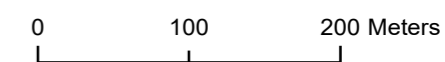
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Legend

North Falls Search Area



Data Source:

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Drawing Number PB9244-APS-ZZ-ON-DR-YE-0037		Figure Number Fig. 24	
Scale 1:5,000	Plot Size A3	Datum OSGB36	Projection BNG





Legend

North Falls Search Area



Data Source:

Drawing Title

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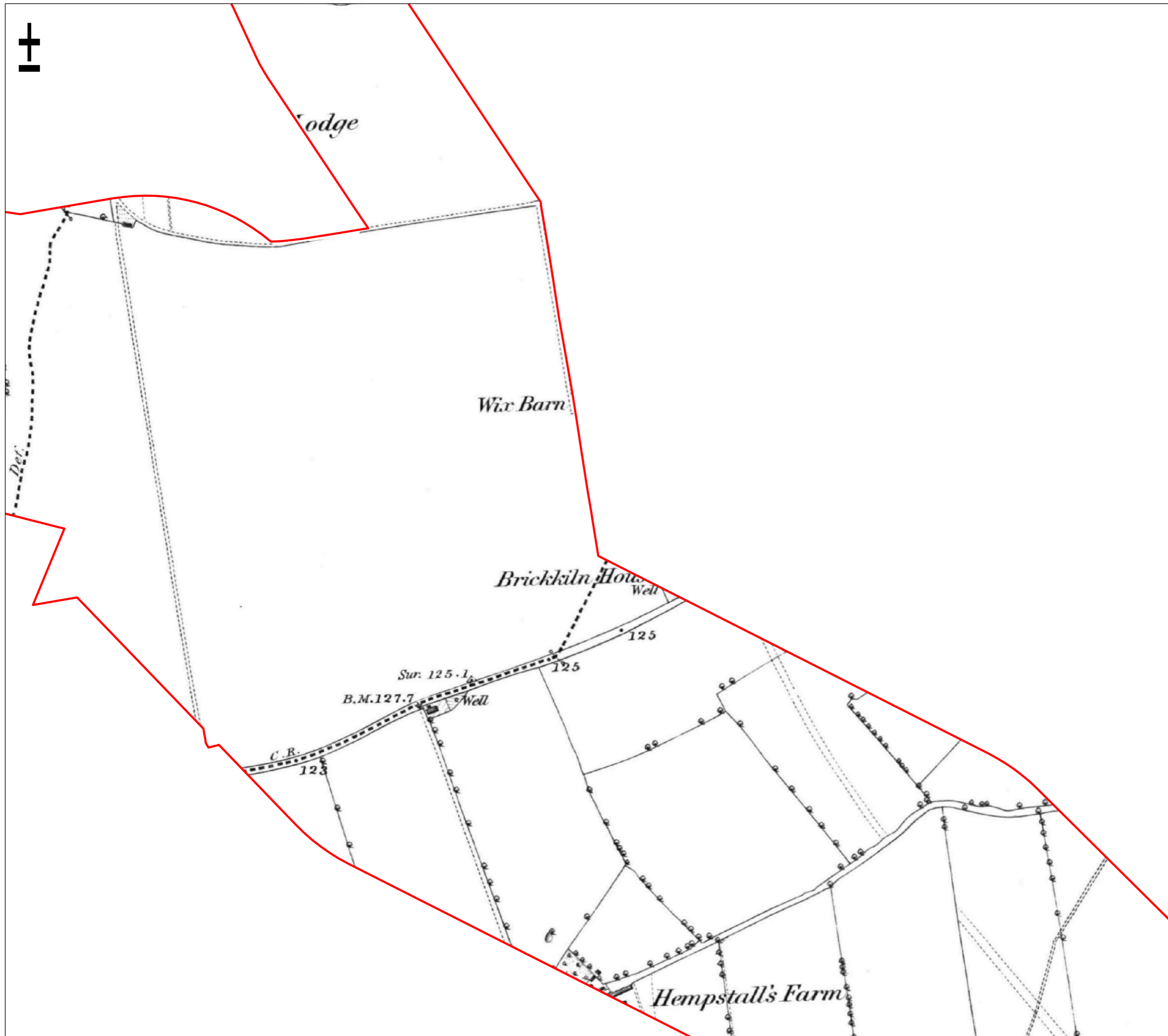
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00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0037

Figure Number
Fig. 24

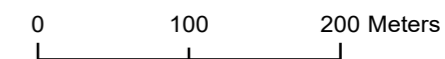
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Legend

North Falls Search Area



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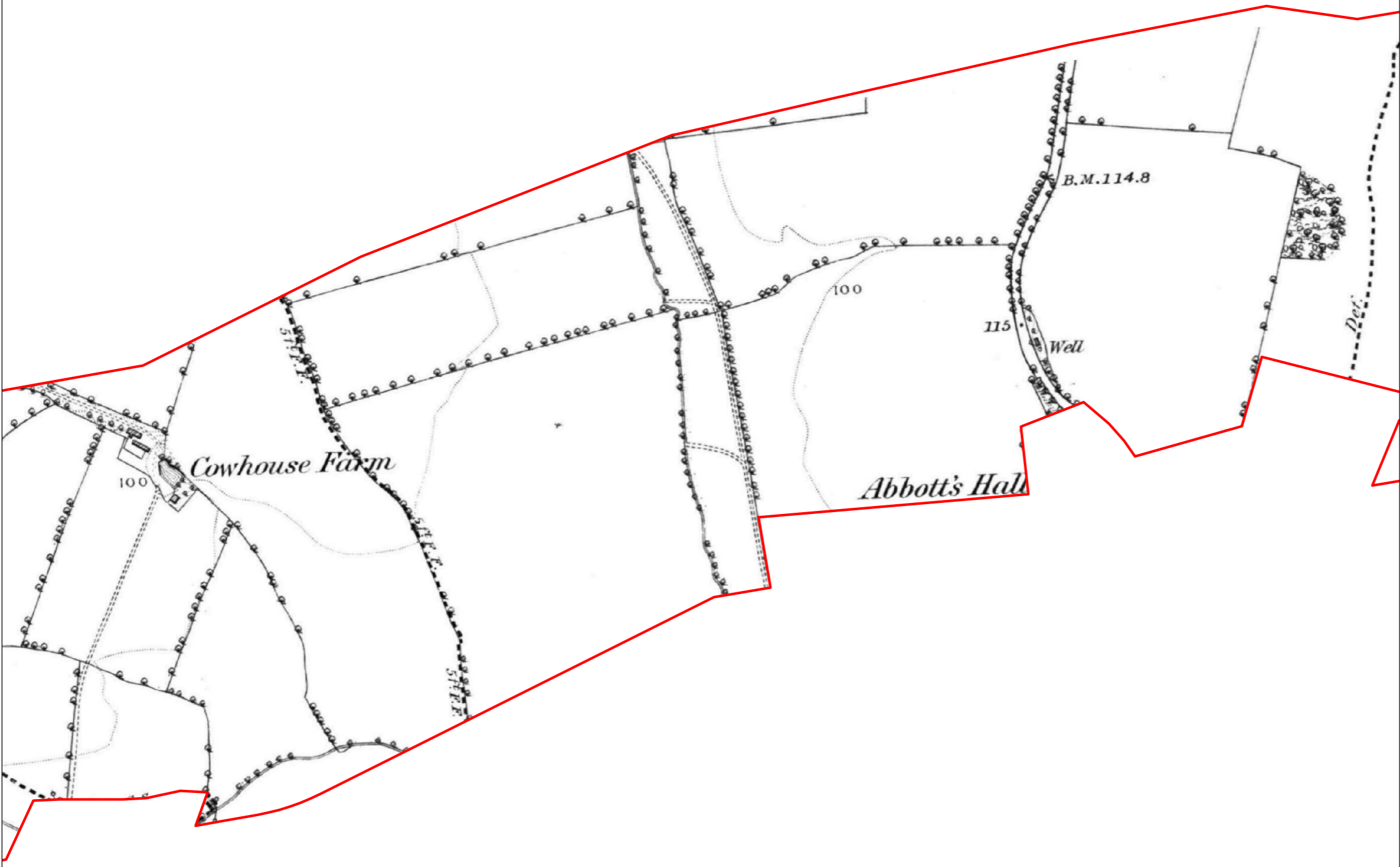
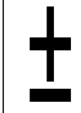
Drawing Title
1874 - 1875 Ordnance Survey Mapping
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Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number **PB9244-APS-ZZ-ON-DR-YE-0037** Figure Number **Fig. 24**

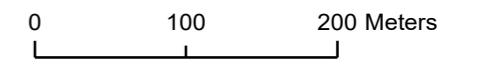
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Legend

North Falls Search Area



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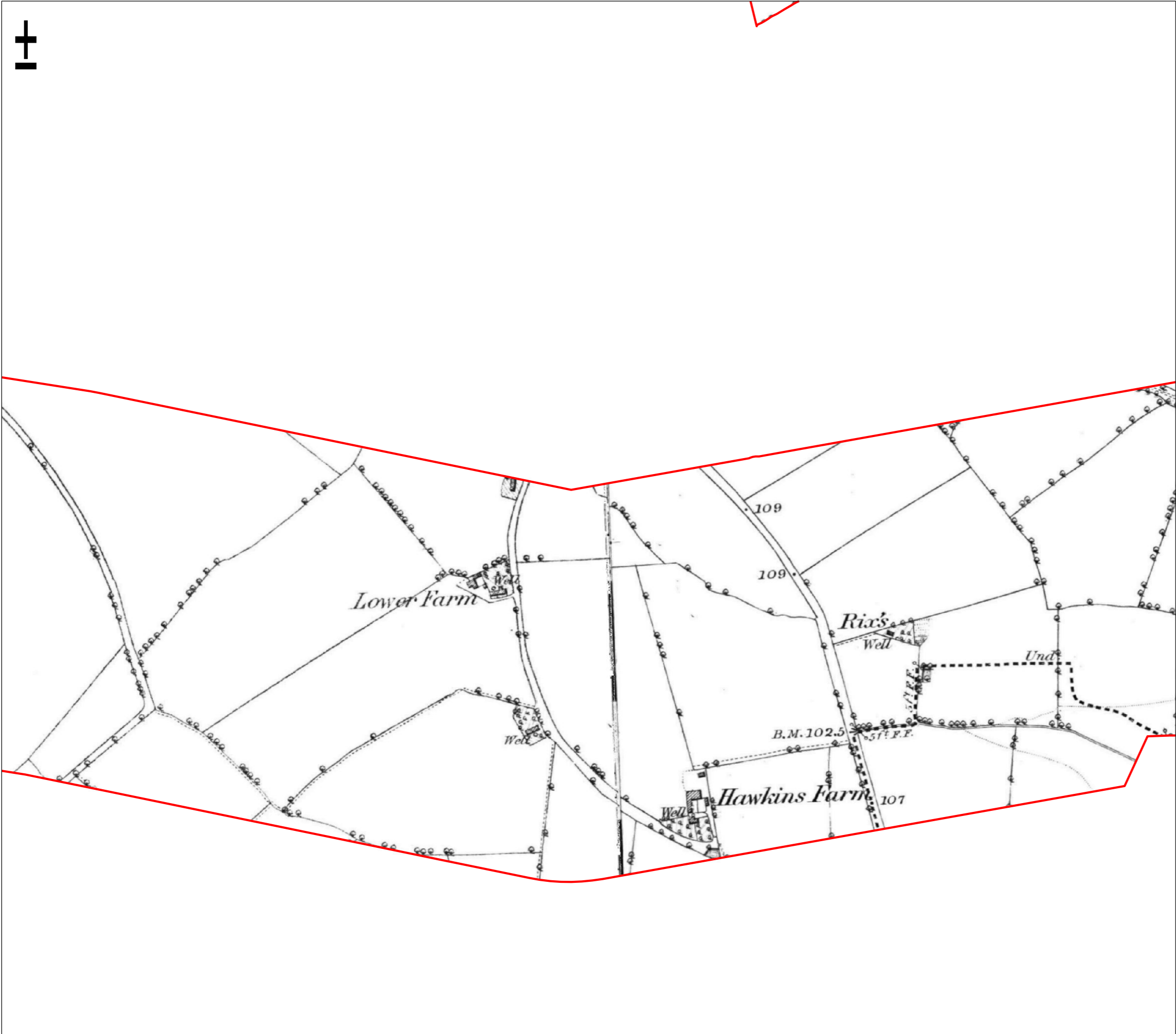
Drawing Title
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Rev	Date	Remarks	Drwn	Chkd
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Drawing Number PB9244-APS-ZZ-ON-DR-YE-0037	Figure Number Fig. 24
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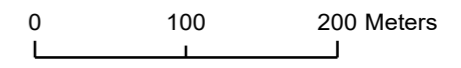
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Legend

North Falls Search Area



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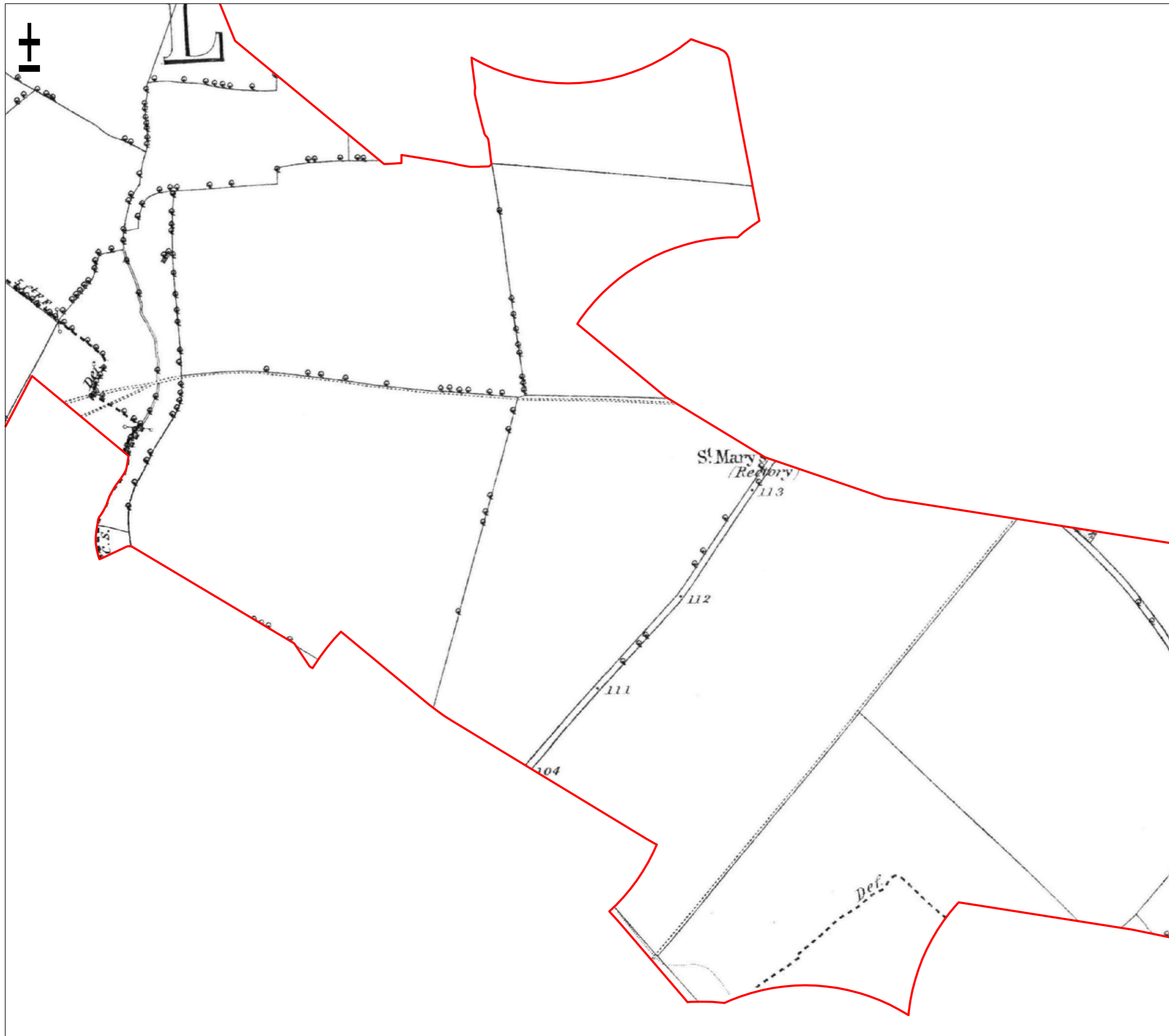
Drawing Title
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Rev	Date	Remarks	Drwn	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0037** Figure Number: **Fig. 24**

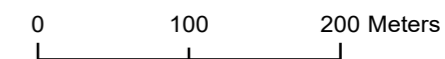
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North Falls Search Area



Data Source:

Drawing Title

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Drawing Number
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Figure Number
Fig. 24

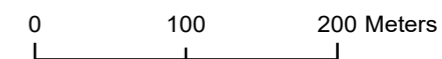
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North Falls Search Area



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00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0037** Figure Number: **Fig. 24**

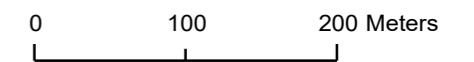
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Legend

North Falls Search Area



Data Source:

Drawing Title

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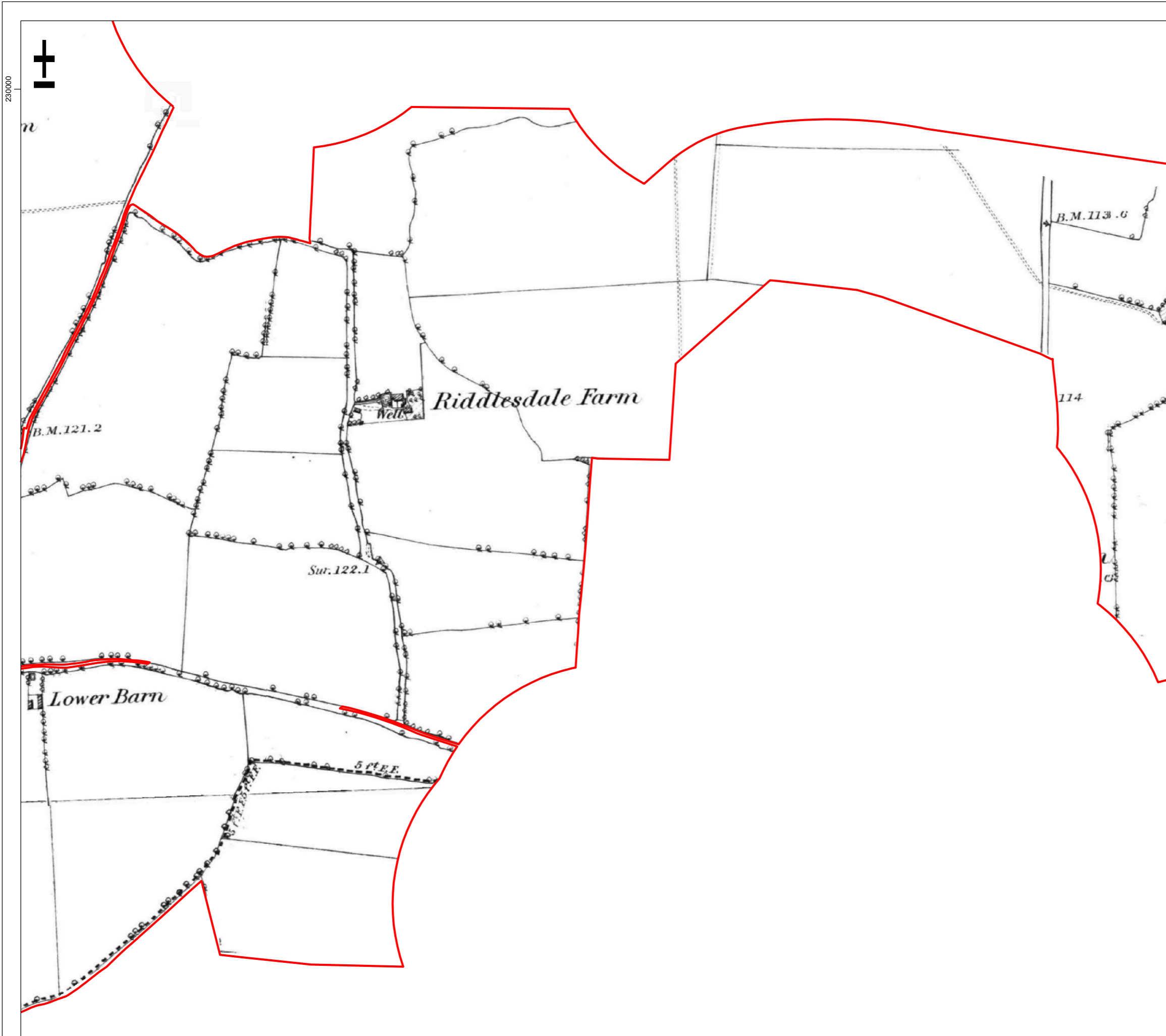
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00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0037

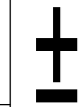
Figure Number
Fig. 24

Scale: 1:5,000 Plot Size: A3 Datum: OSGB36 Projection: BNG





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Legend

North Falls Search Area



Data Source:

Drawing Title

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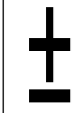
Rev	Date	Remarks	Drwr	Chkd
00	22/06/2022	First issue	ASJ	CC

Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0037

Figure Number
Fig. 24

Scale 1:5,000	Plot Size A3	Datum OSGB36	Projection BNG
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230000



Legend

North Falls Search Area



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Drawing Number **PB9244-APS-ZZ-ON-DR-YE-0037**

Figure Number **Fig. 24**

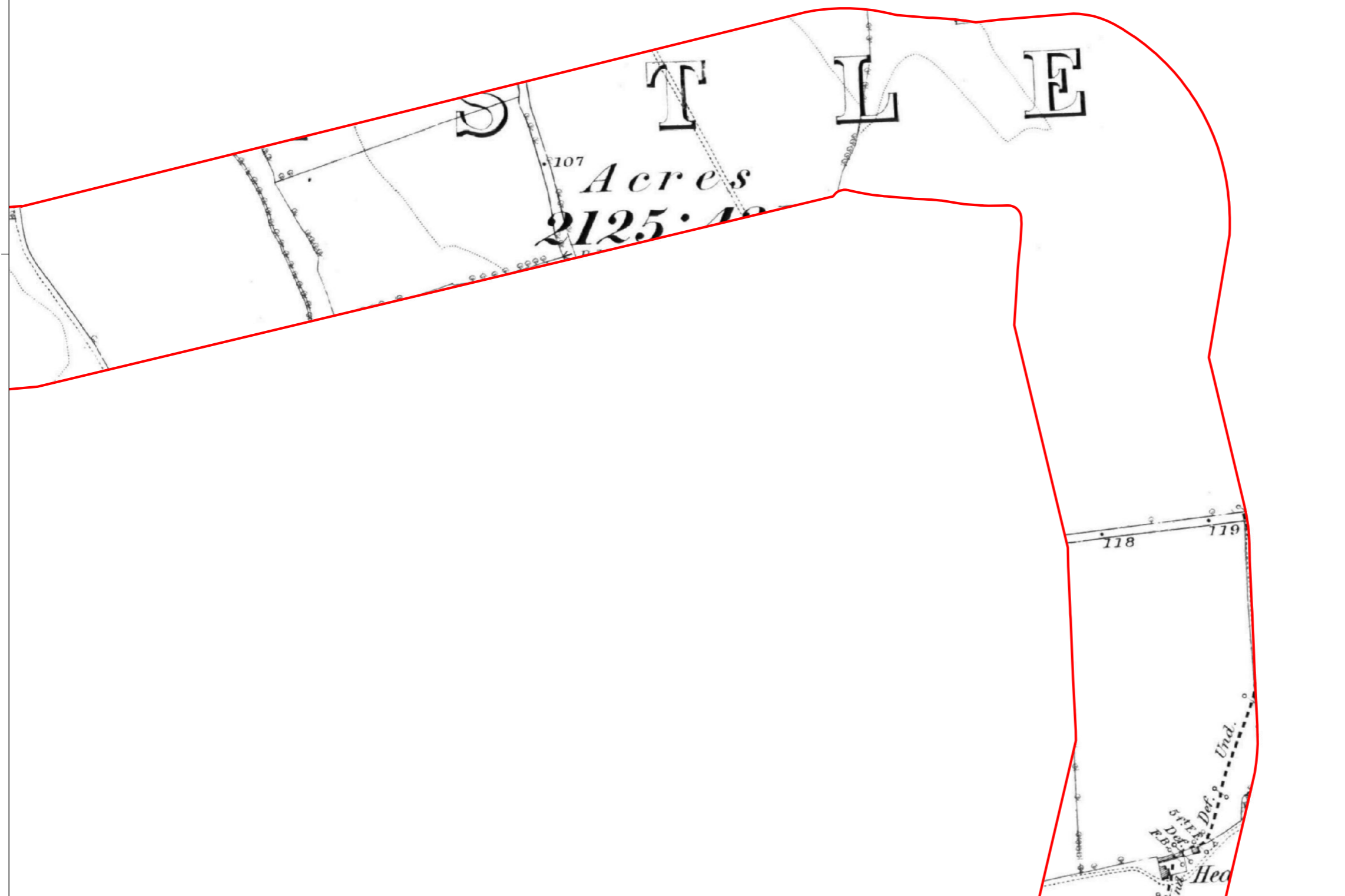
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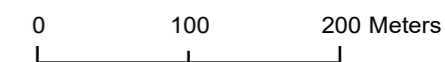


230000



Legend

North Falls Search Area



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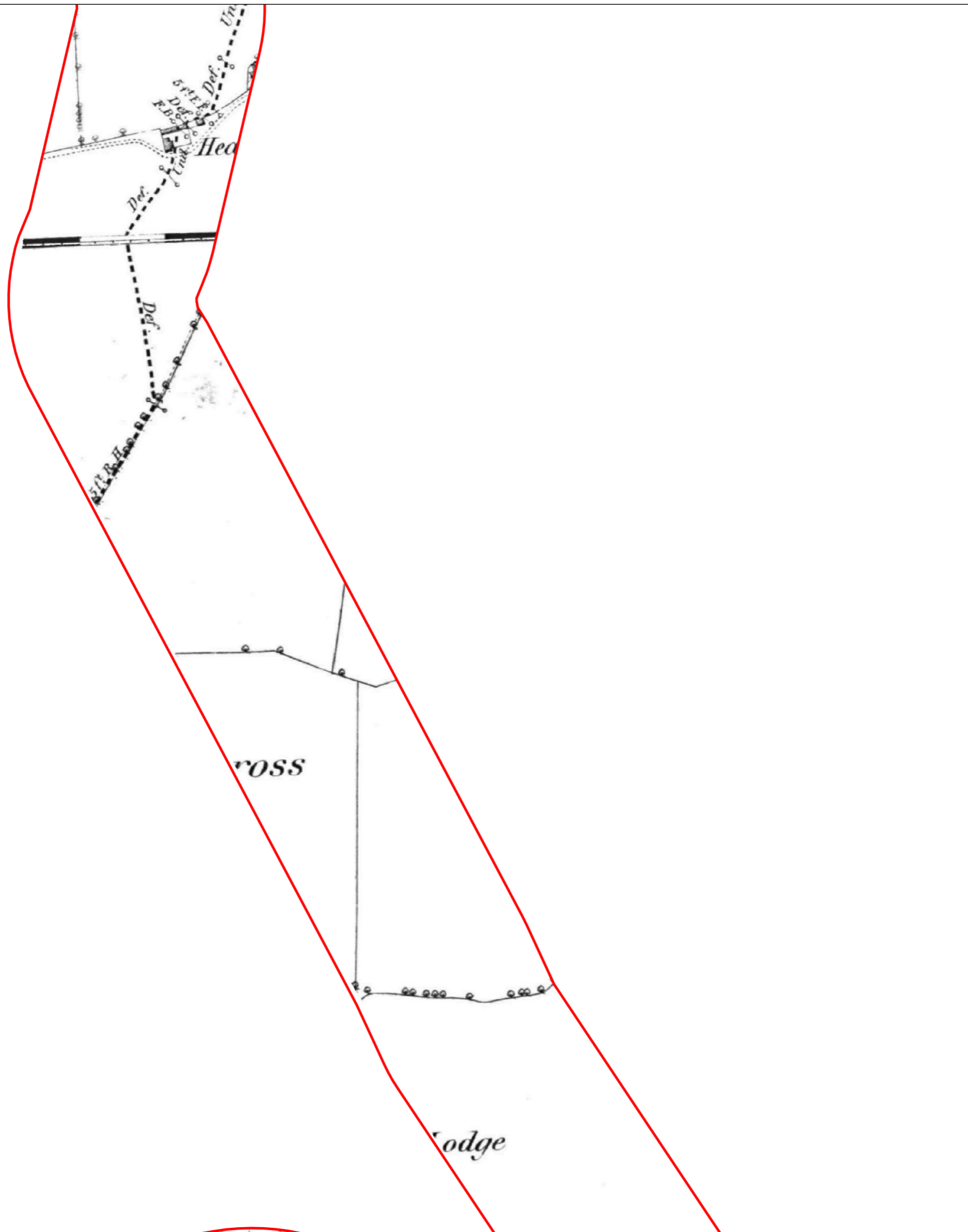
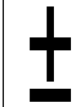
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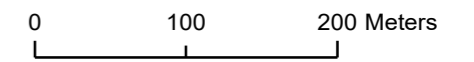
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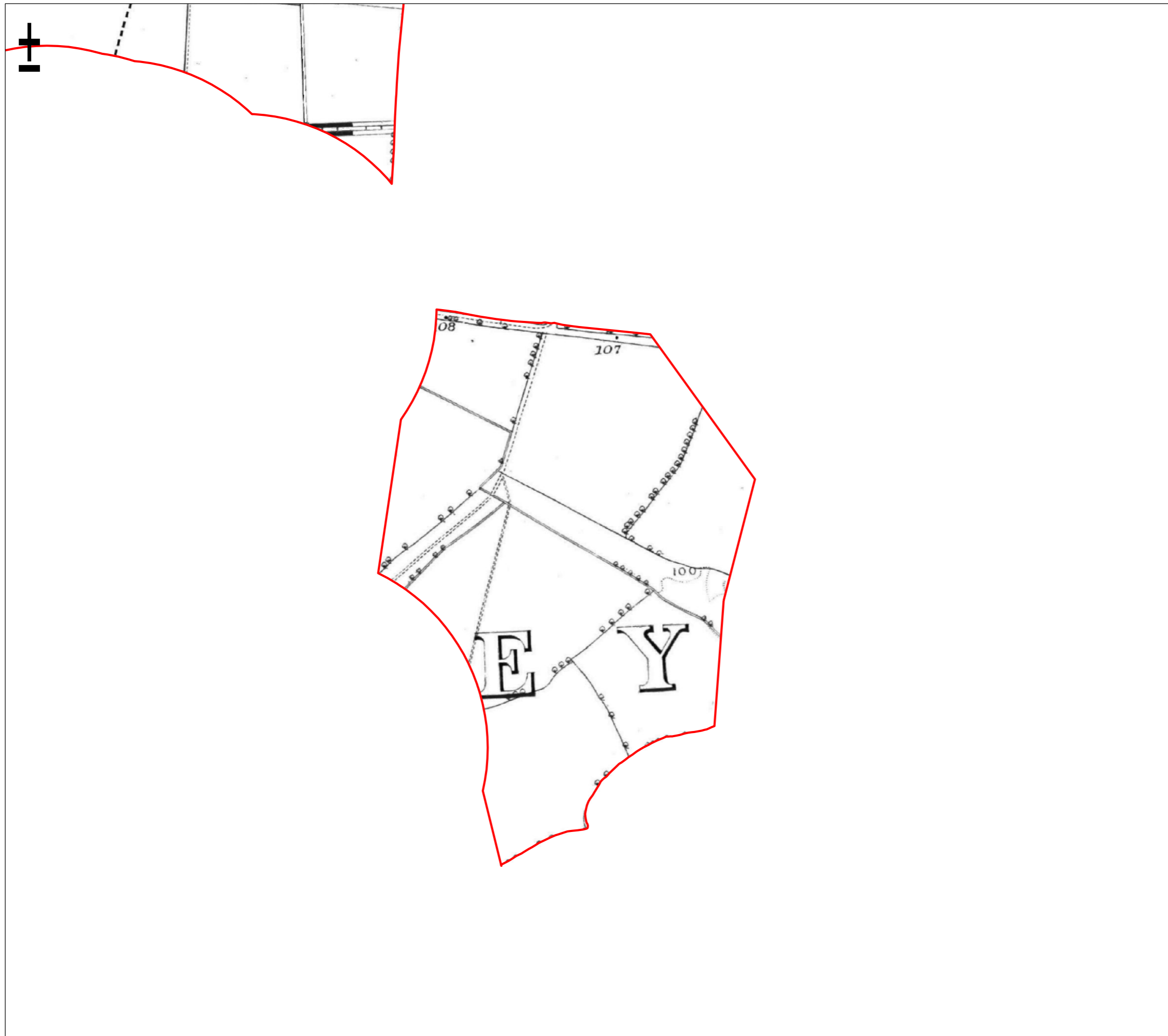
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Figure Number
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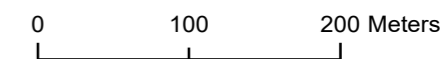
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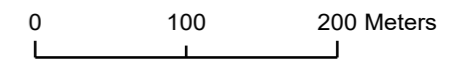
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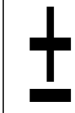
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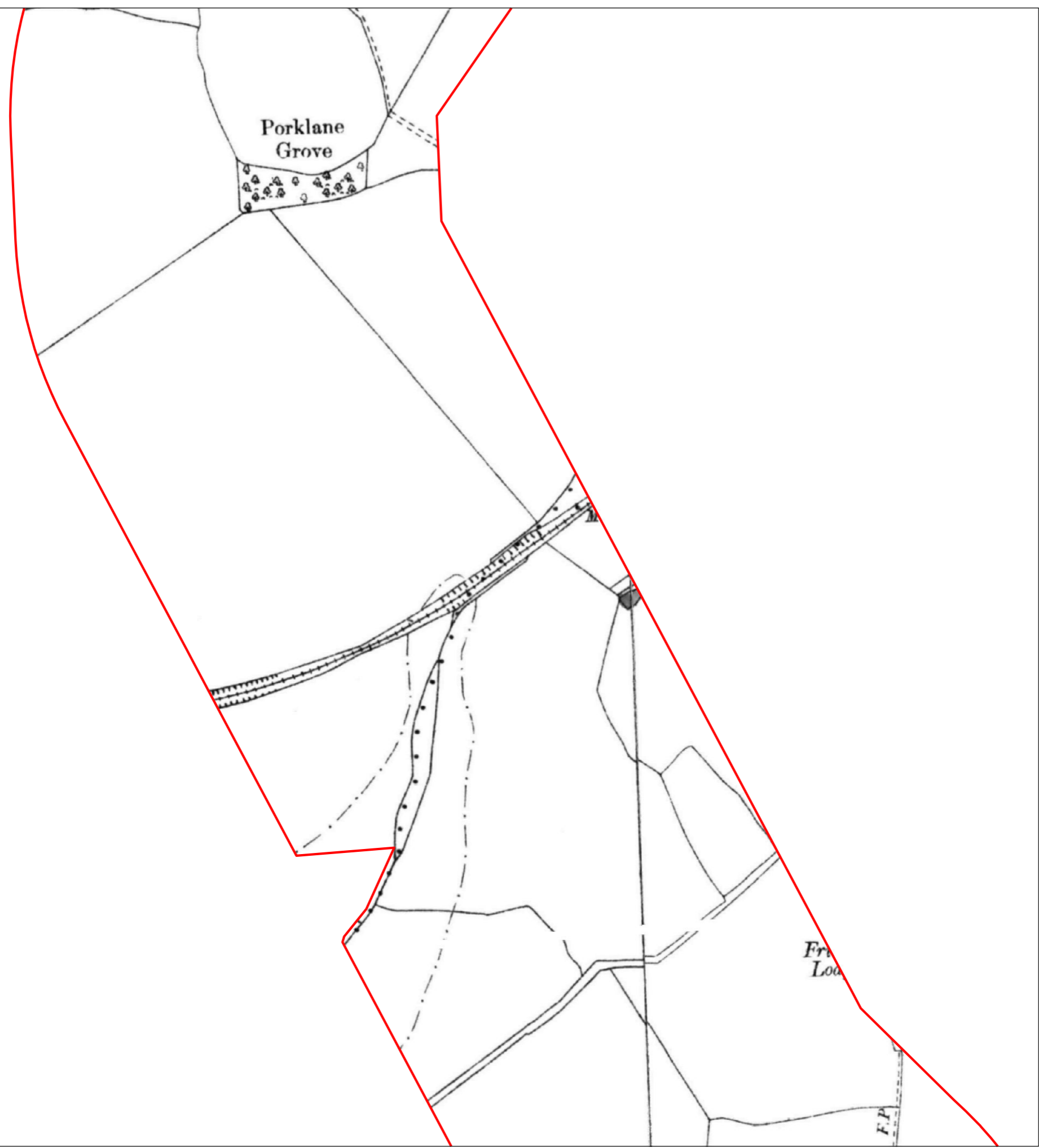
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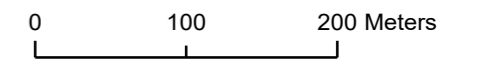


Porklane Grove



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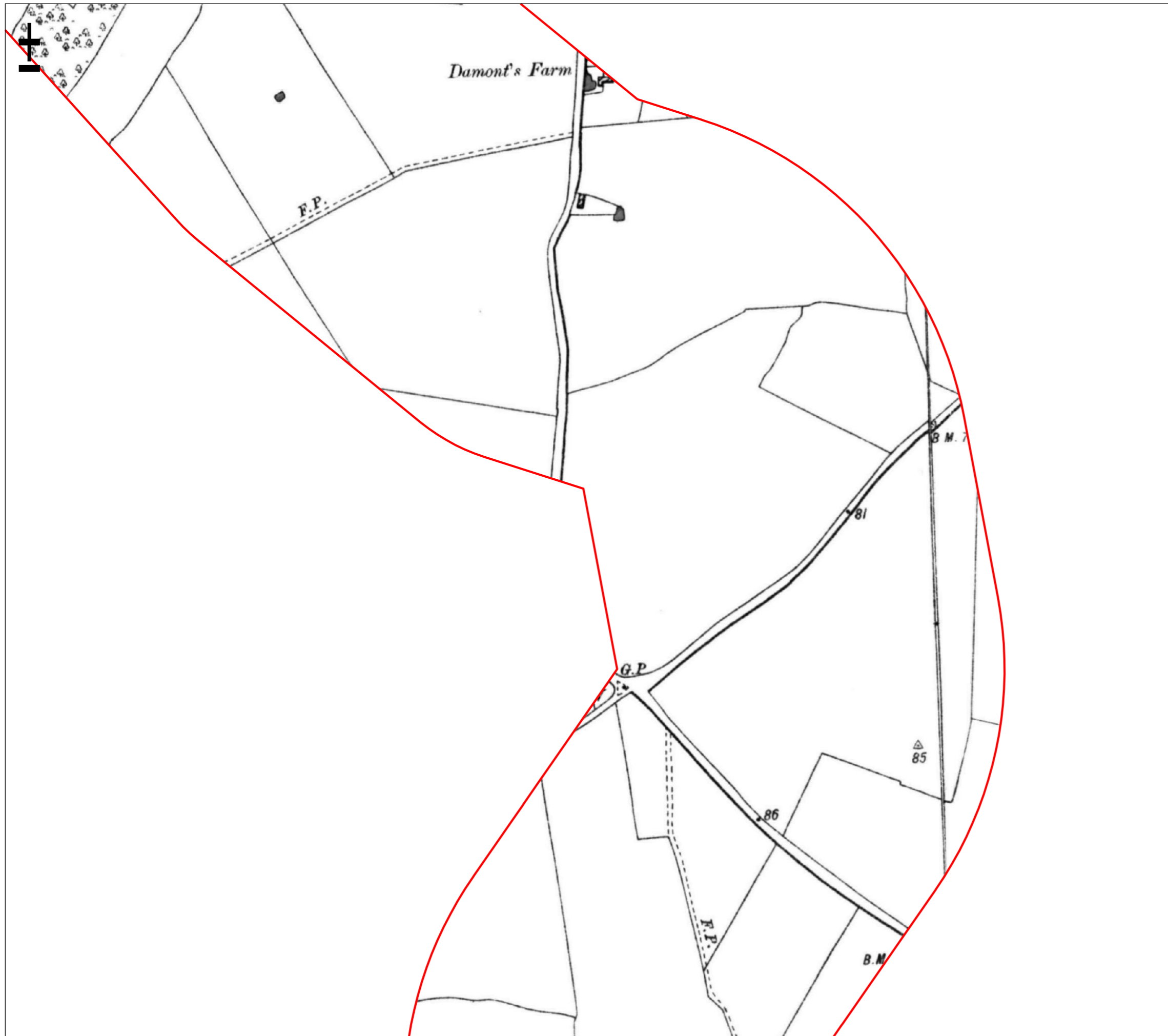
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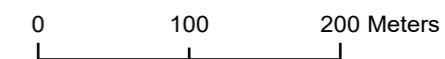
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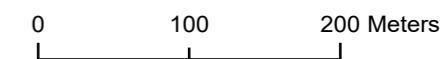
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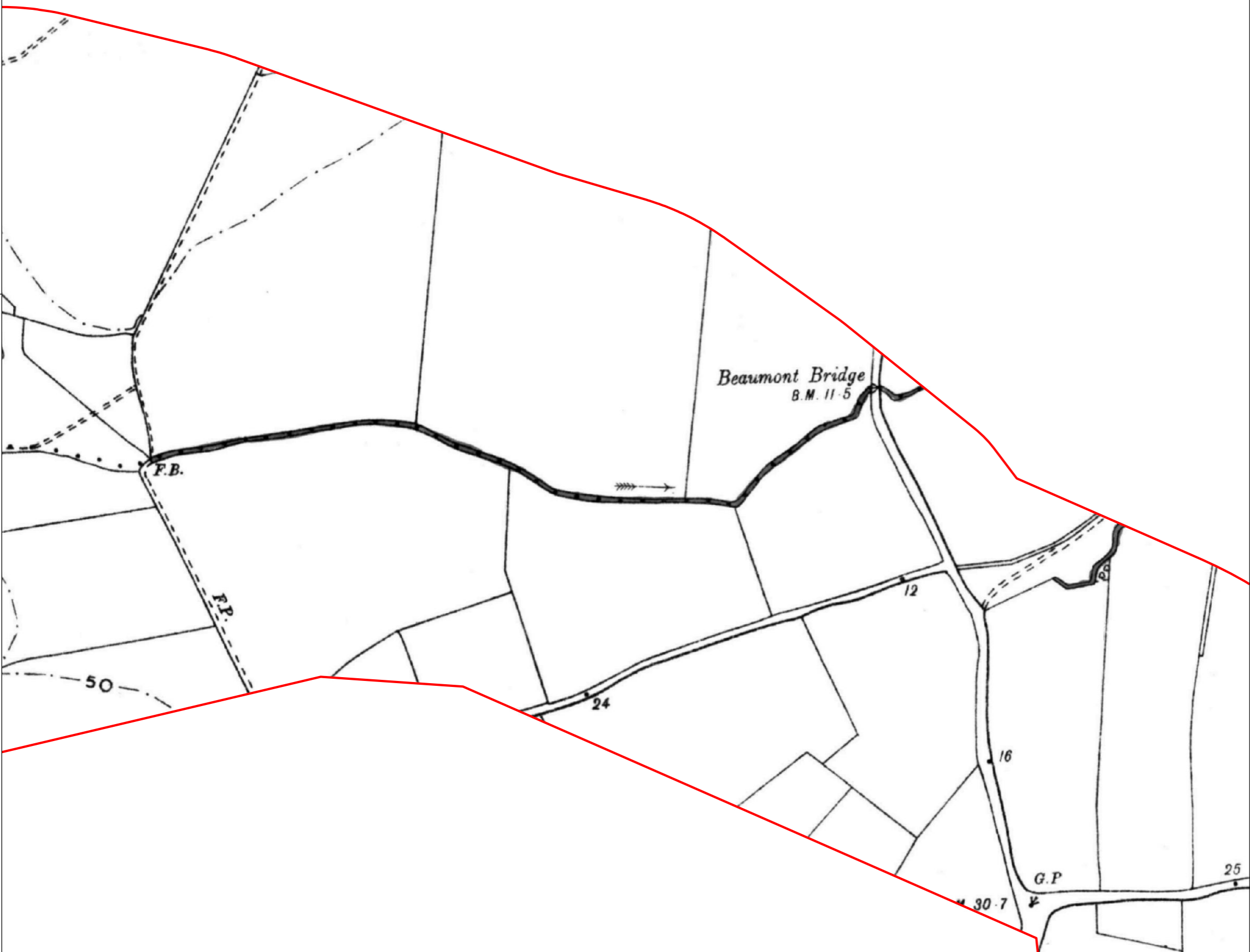
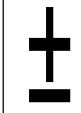
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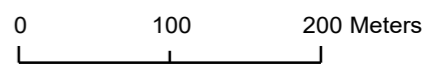


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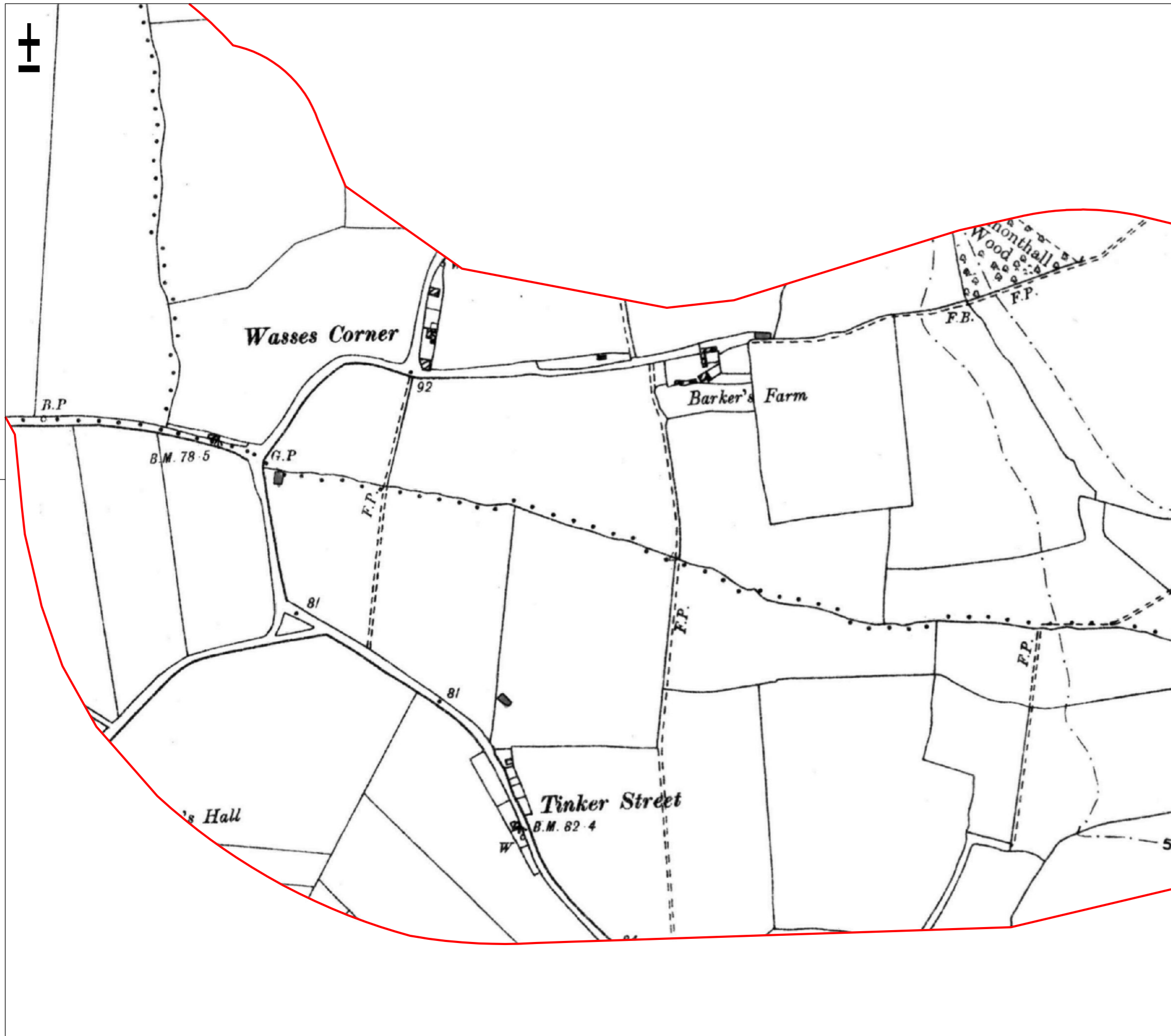
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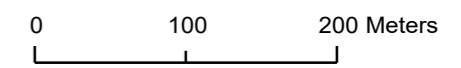


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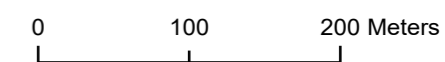
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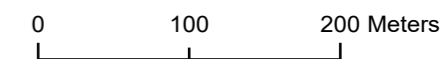
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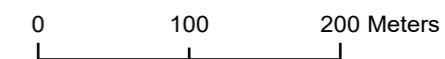
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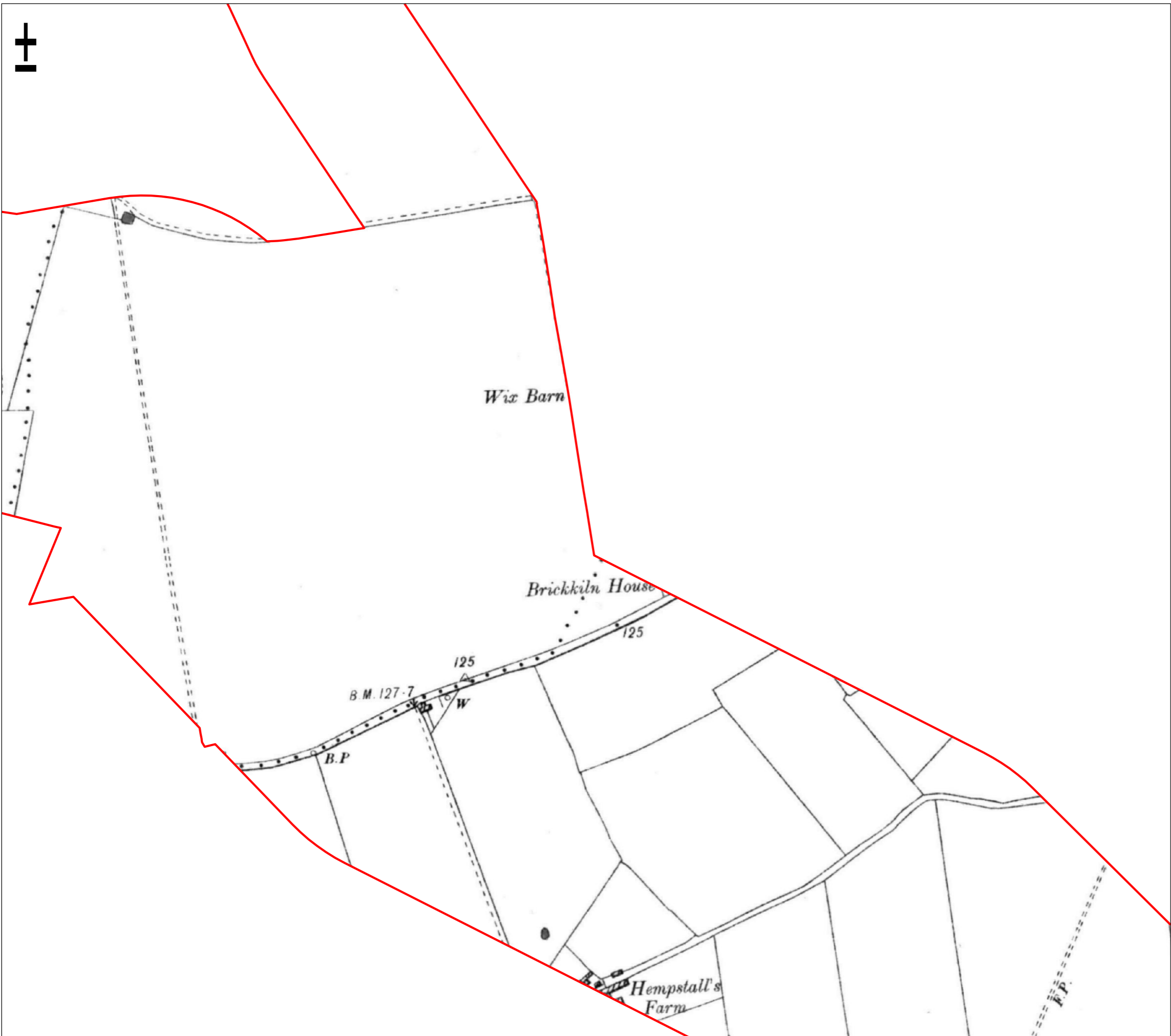
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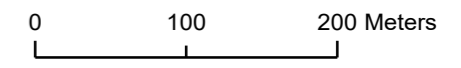
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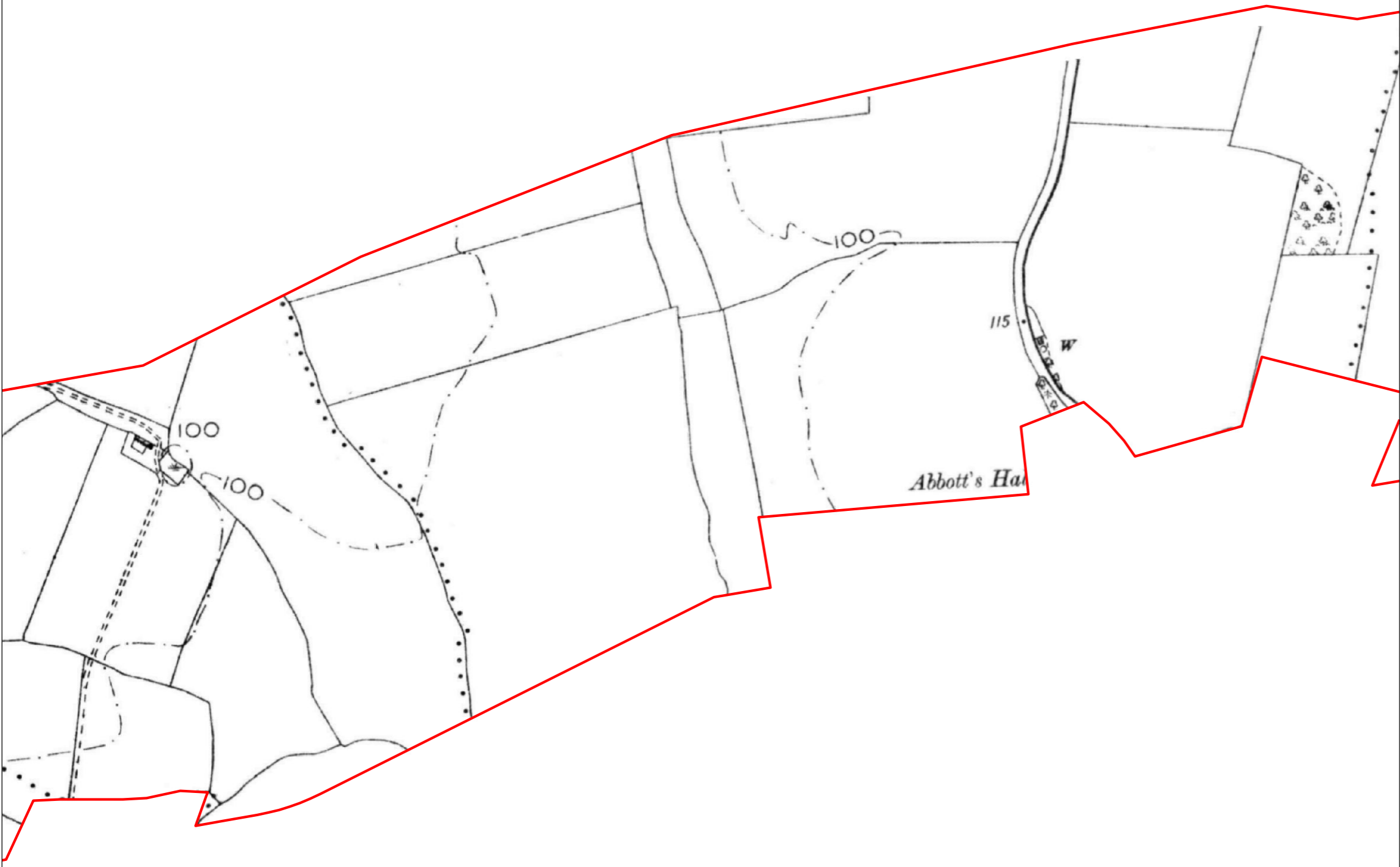
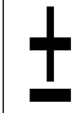
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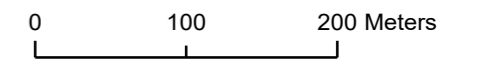
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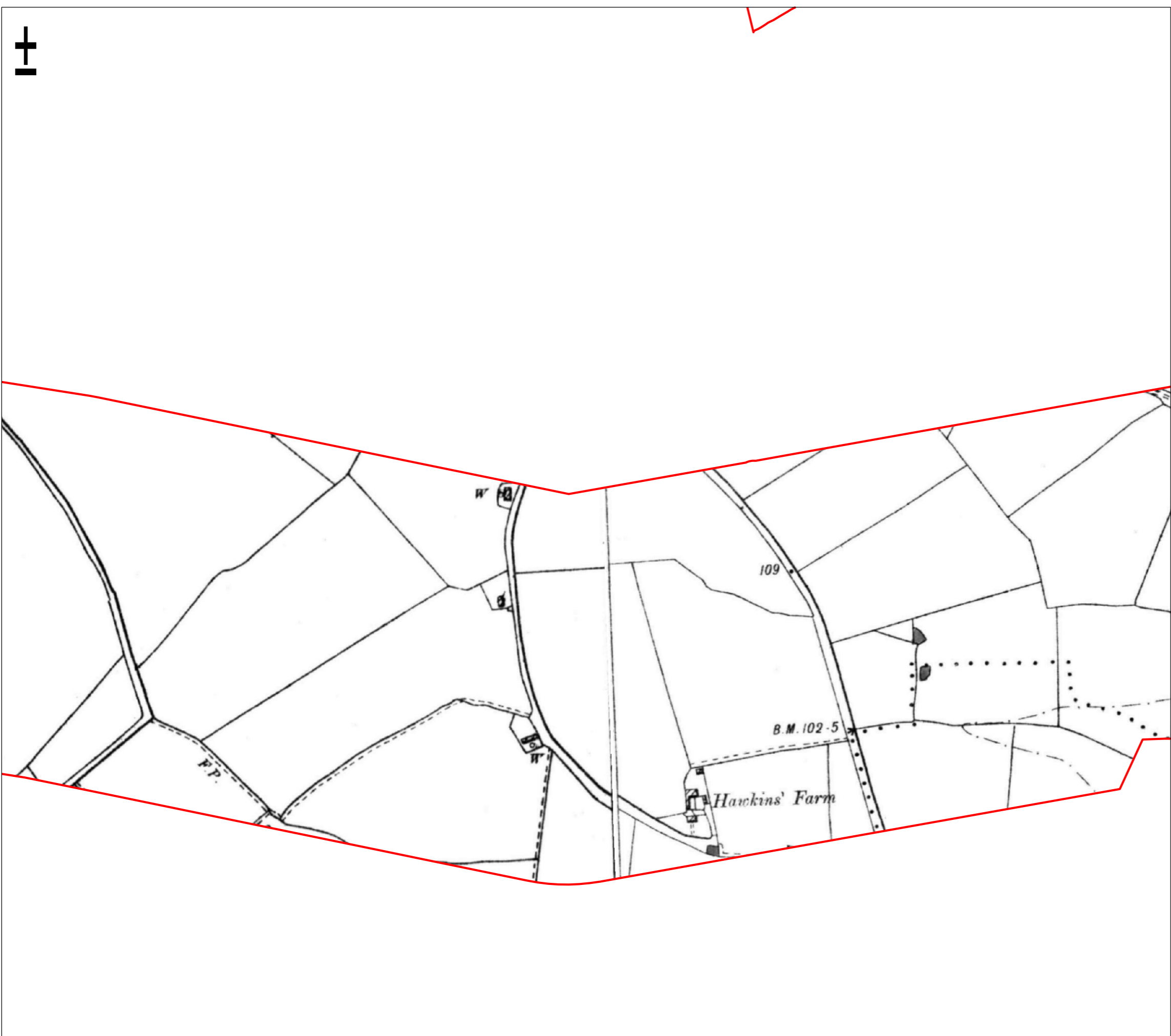
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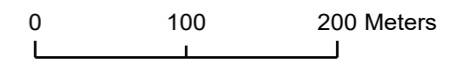
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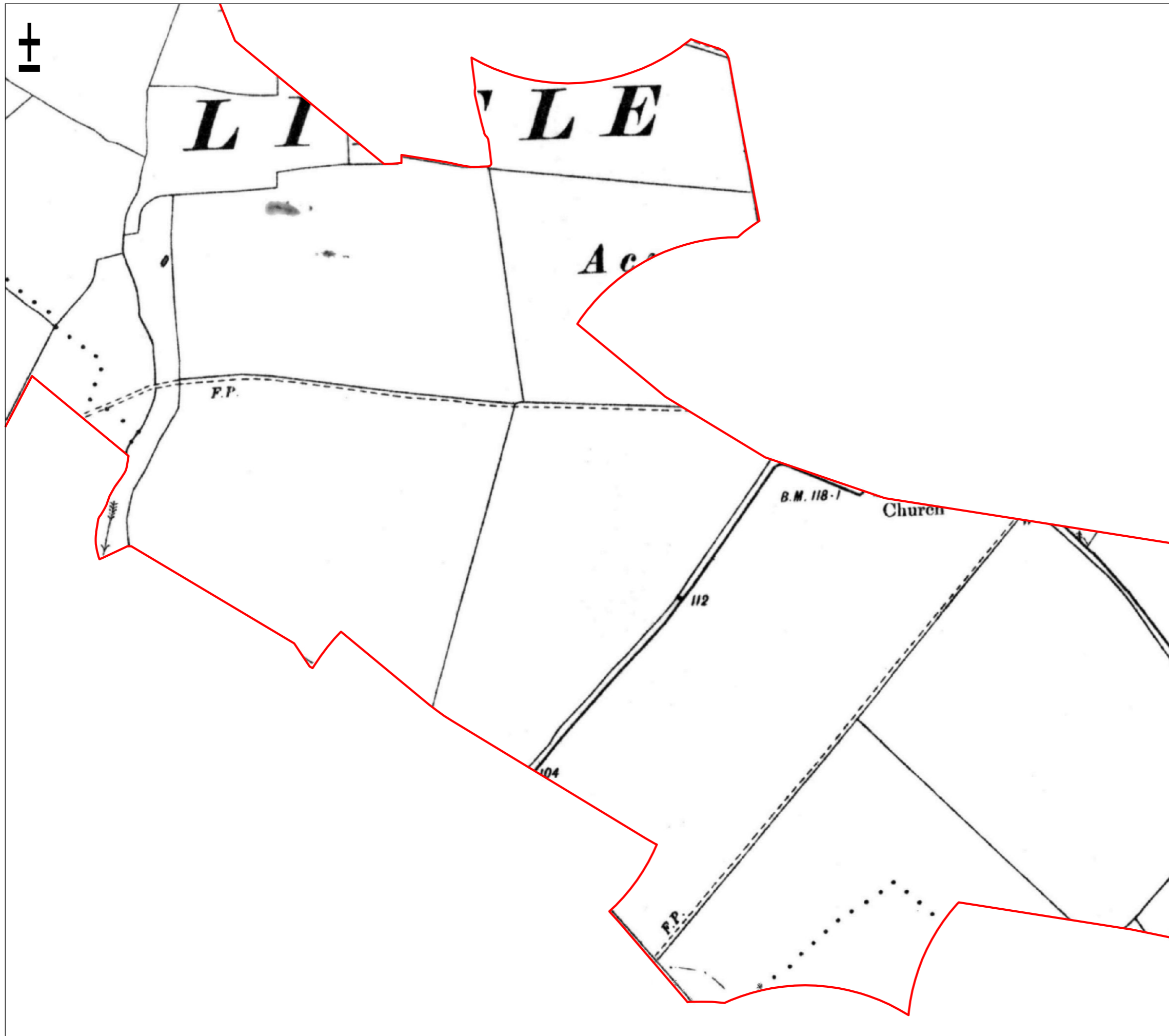
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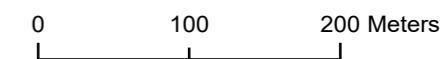
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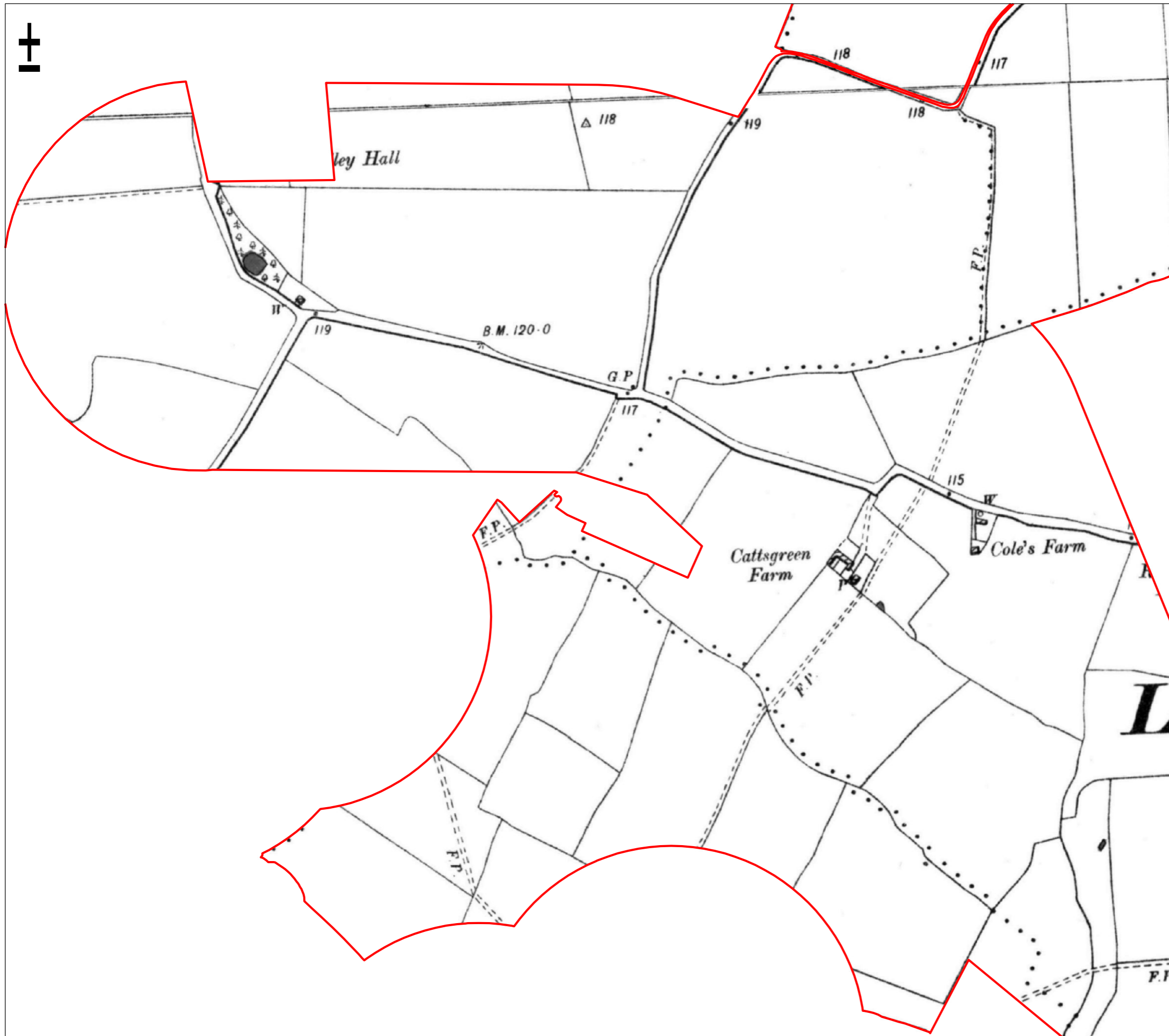
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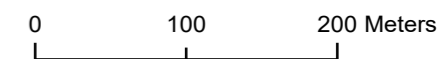
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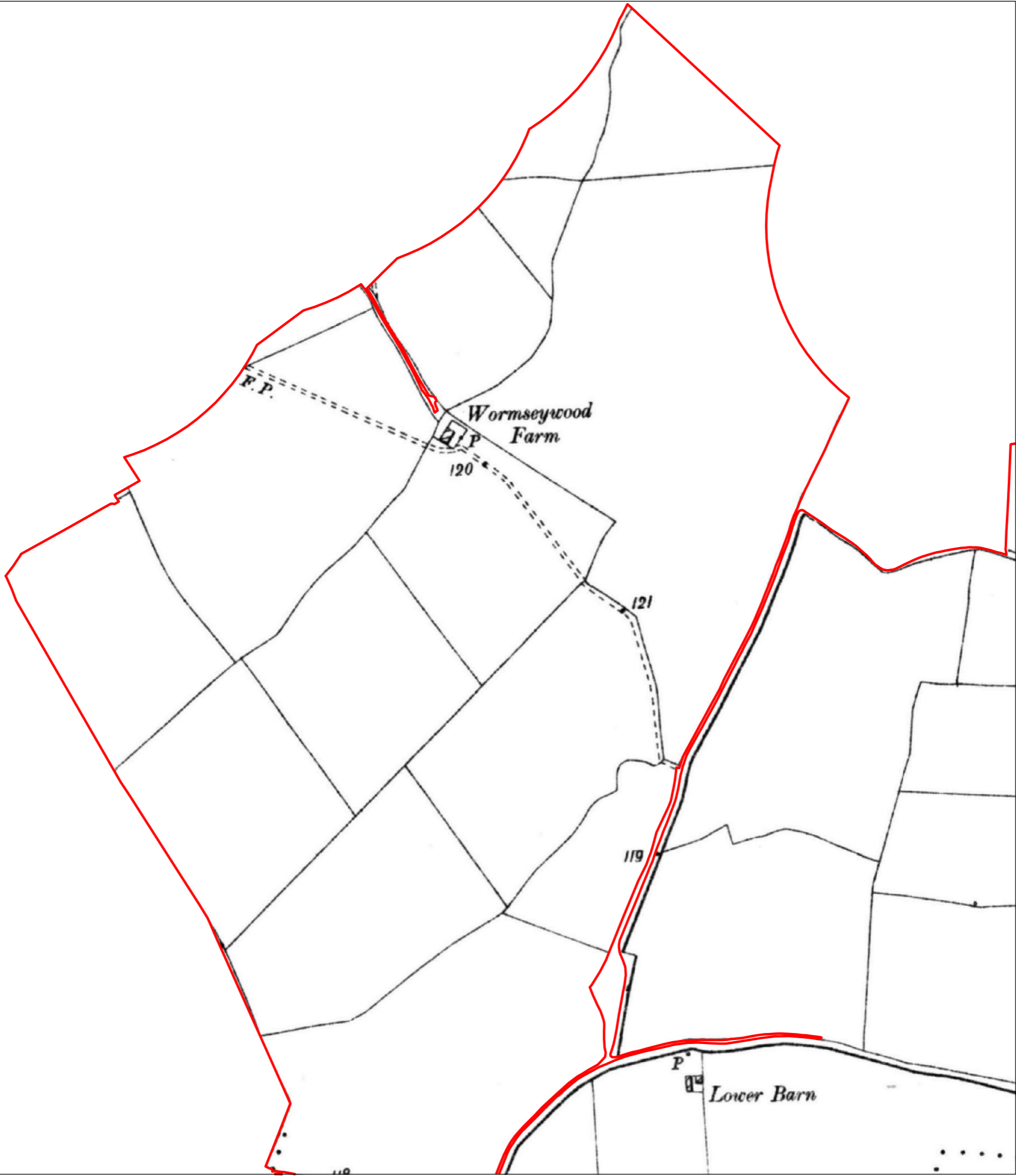
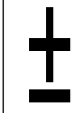
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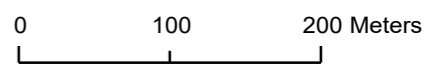


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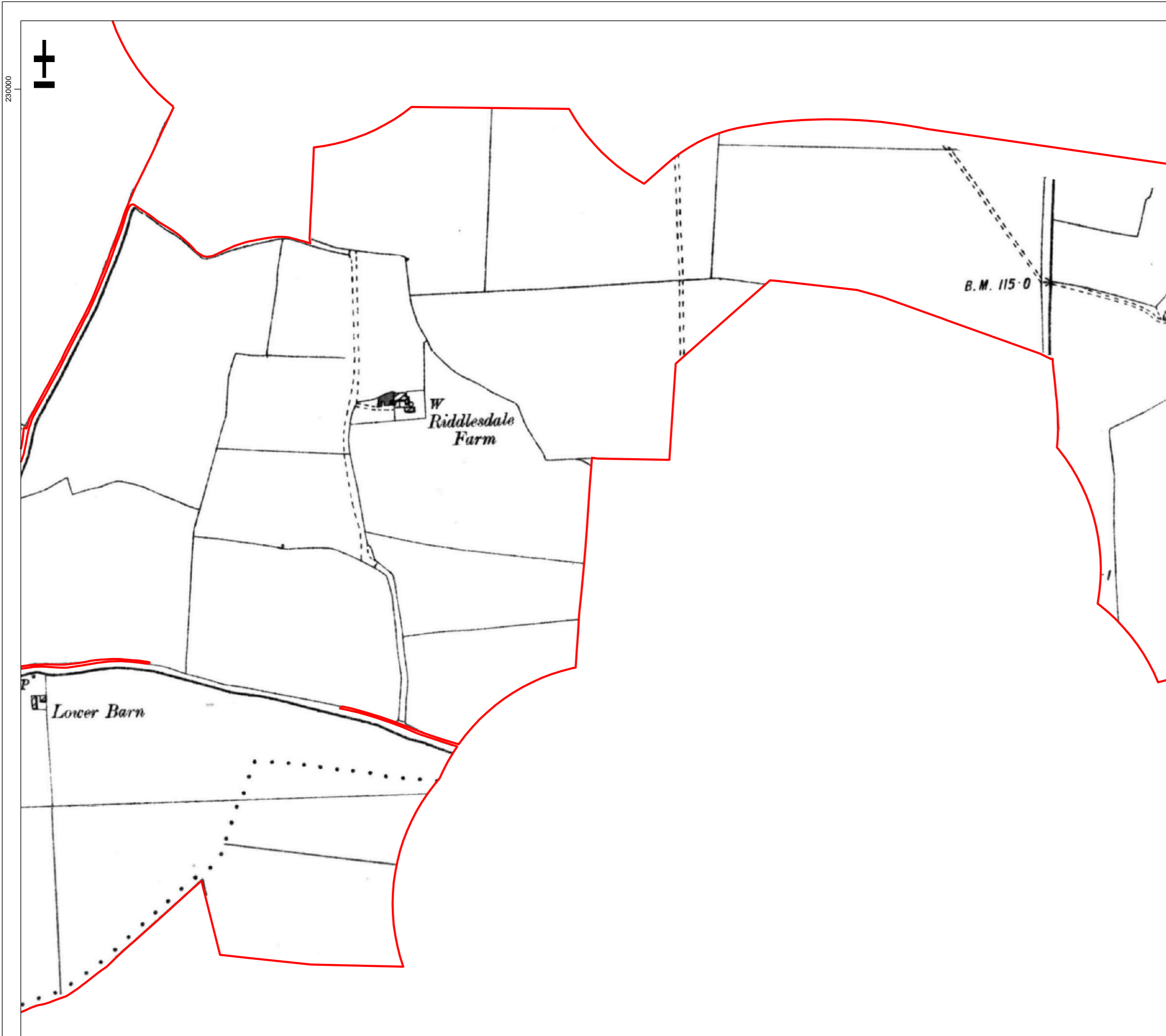
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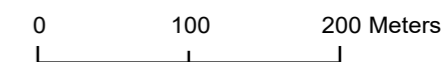


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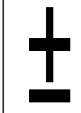
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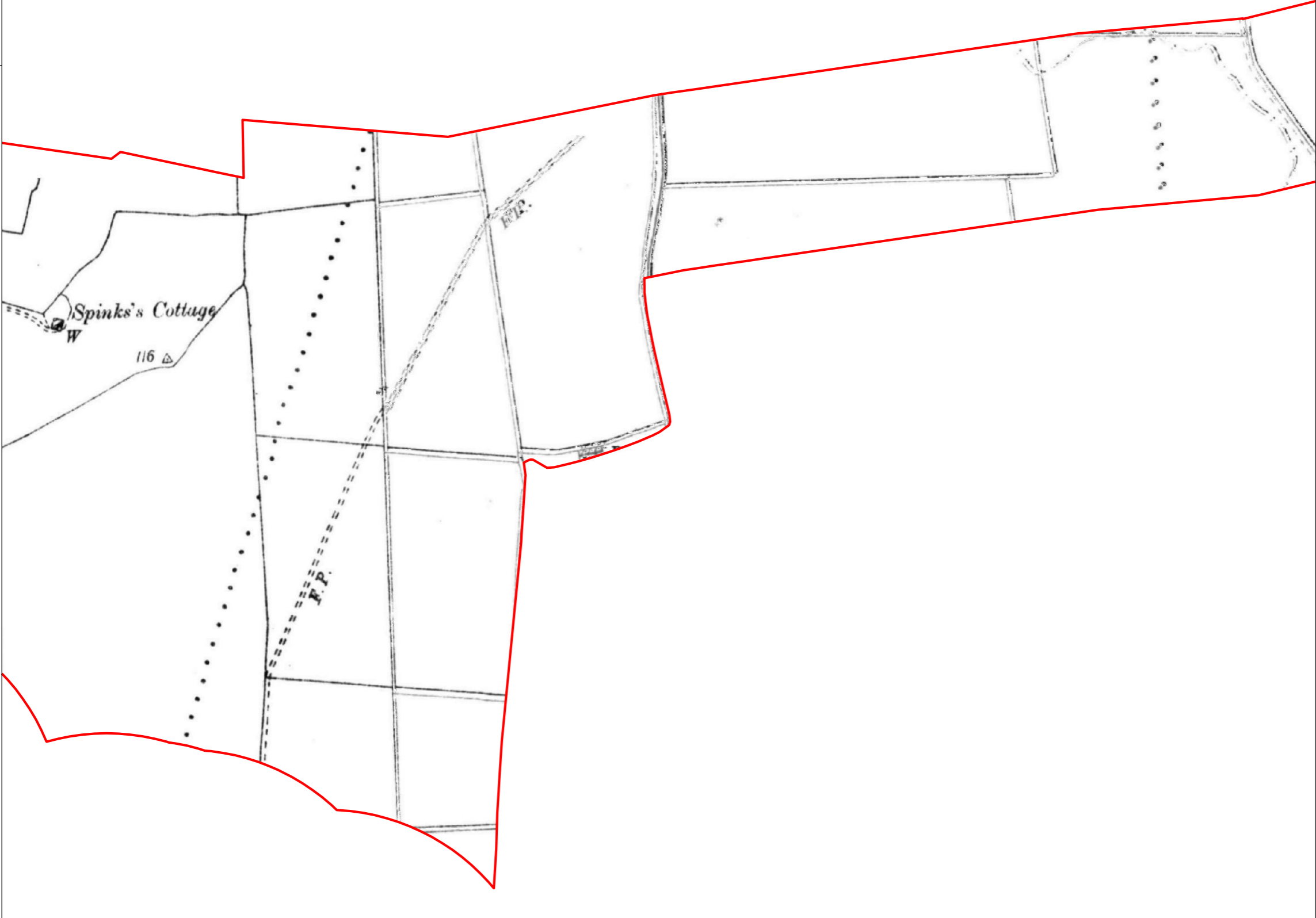
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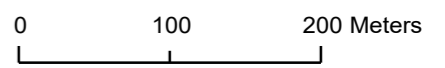


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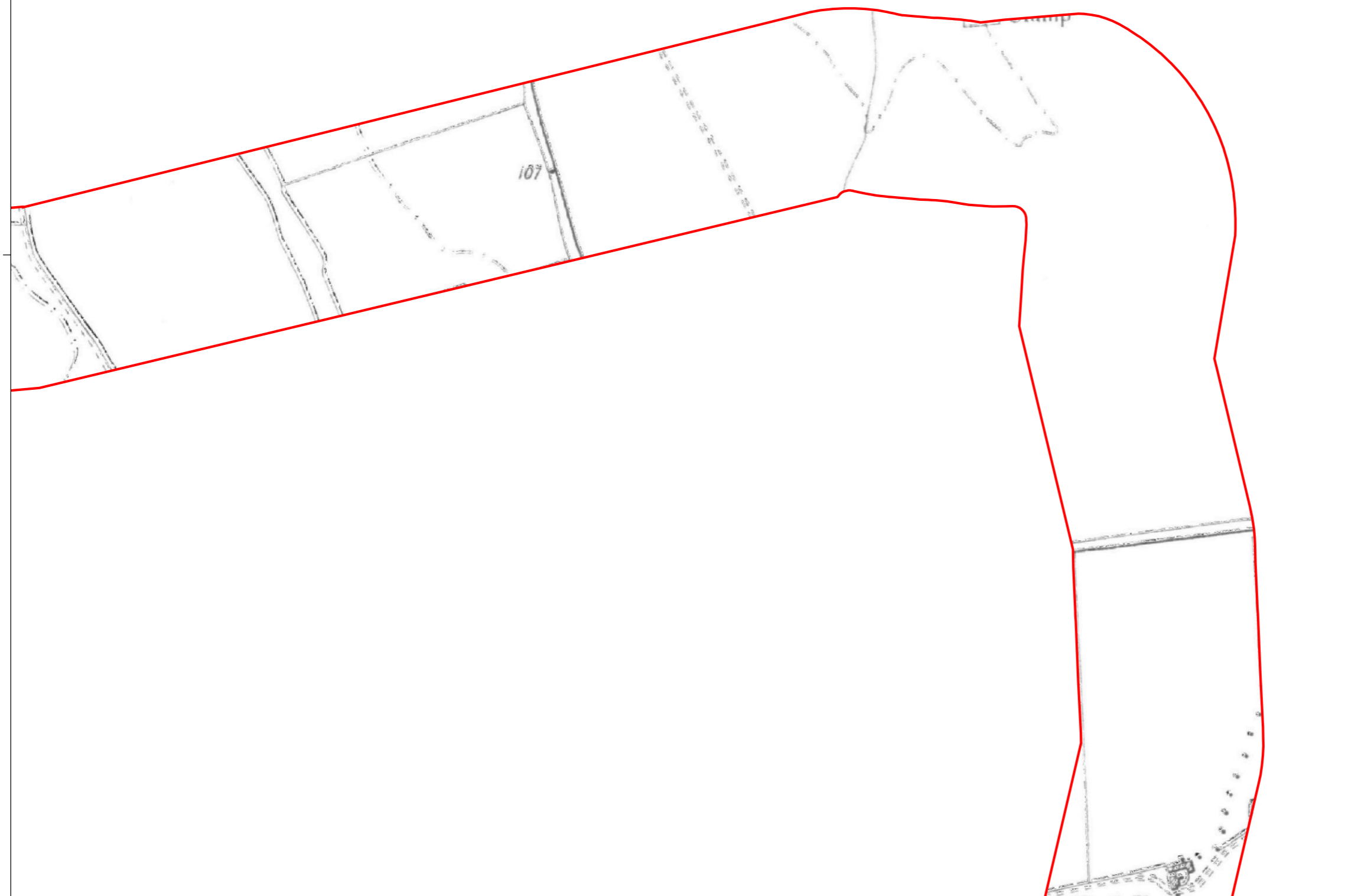
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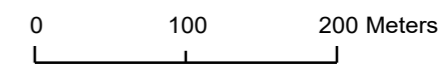


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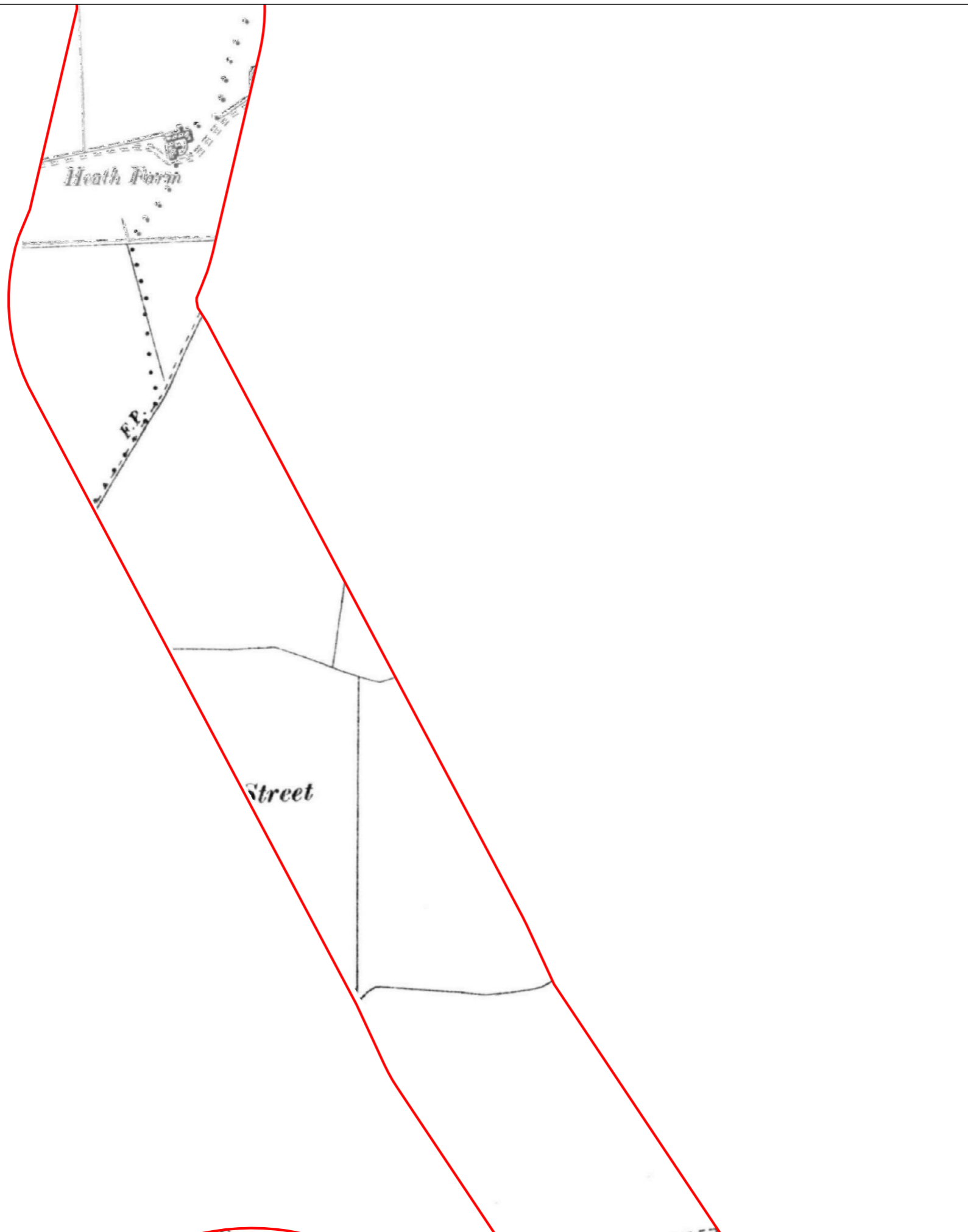
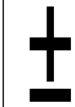
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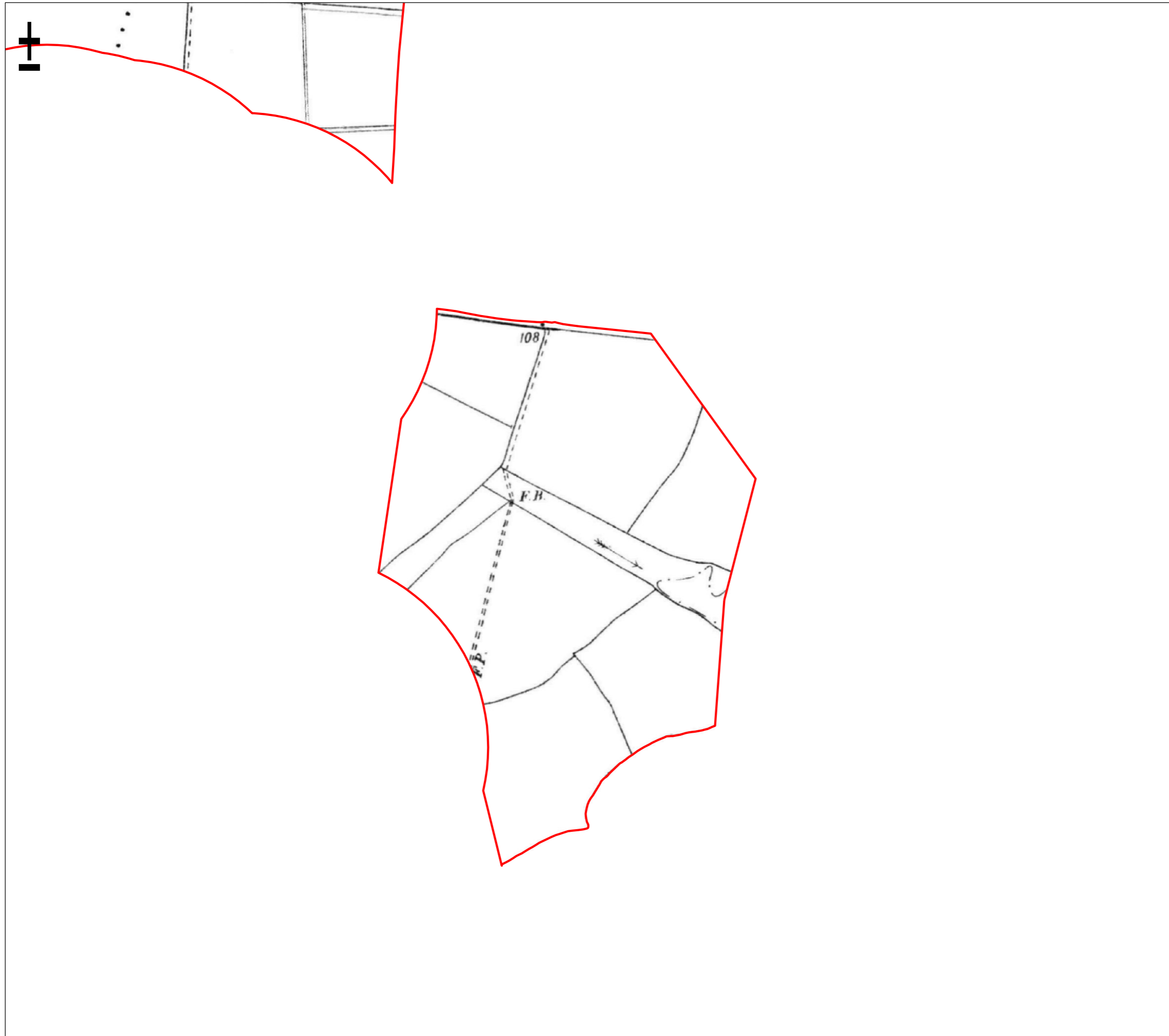
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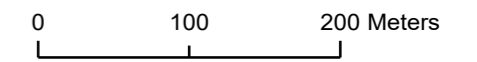
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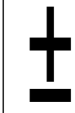
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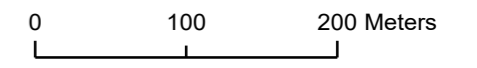
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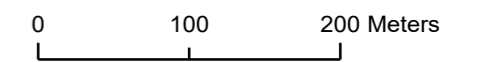
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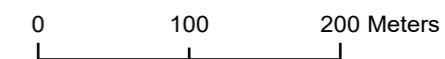
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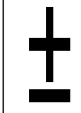
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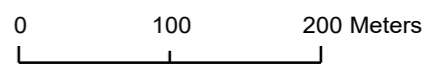


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Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0039** Figure Number: **Fig. 26**

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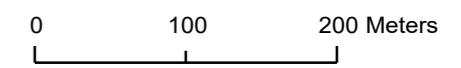


224000



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Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0039** Figure Number: **Fig. 26**

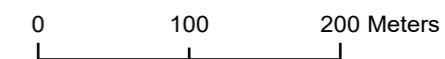
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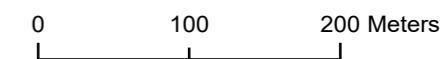
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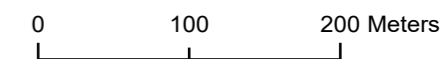
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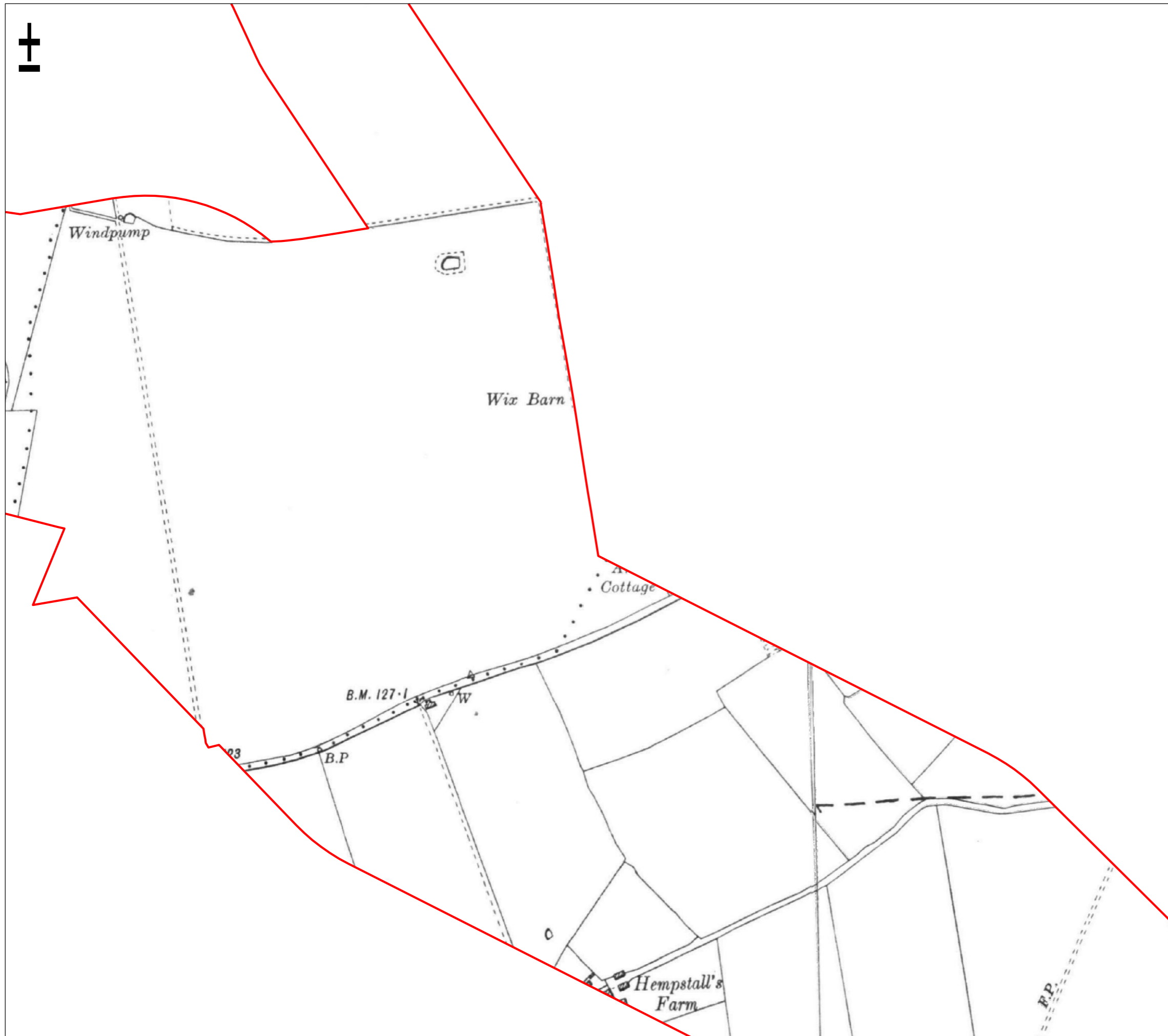
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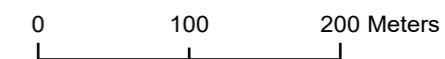
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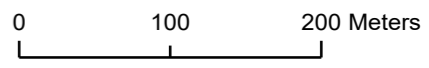
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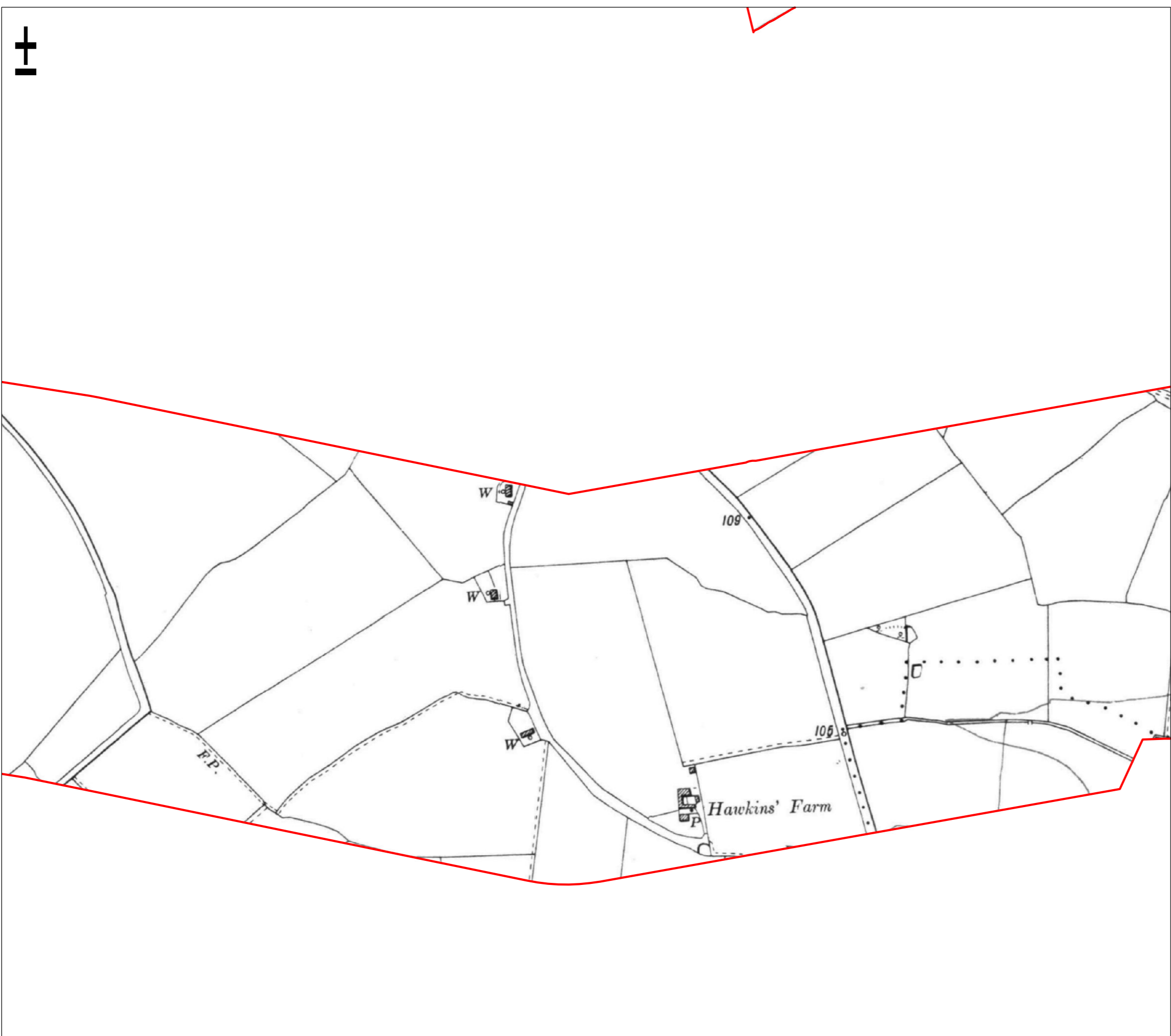
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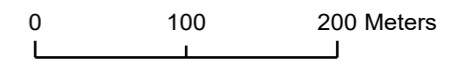
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Legend

North Falls Search Area



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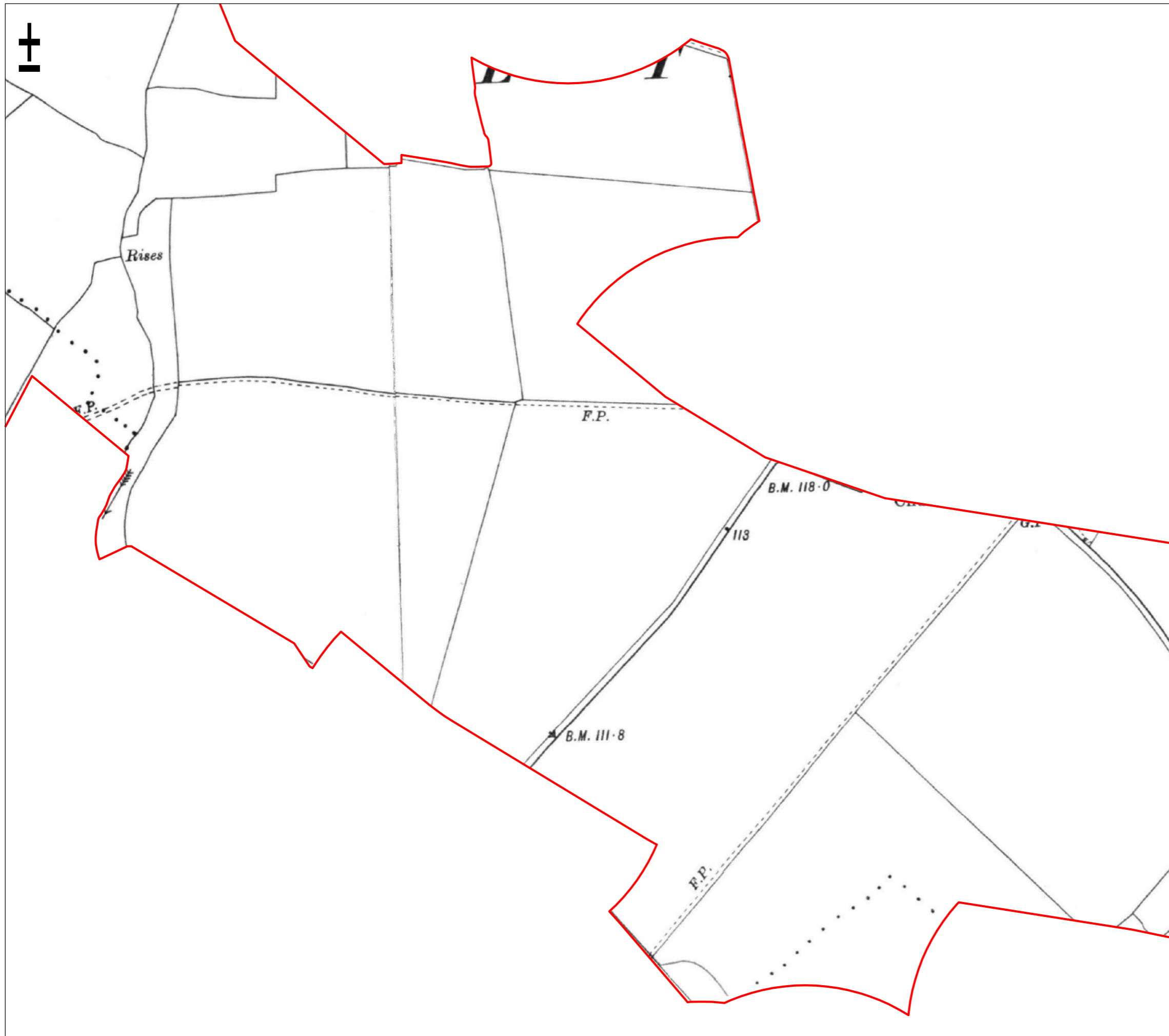
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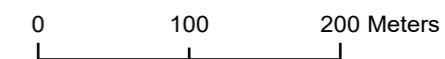
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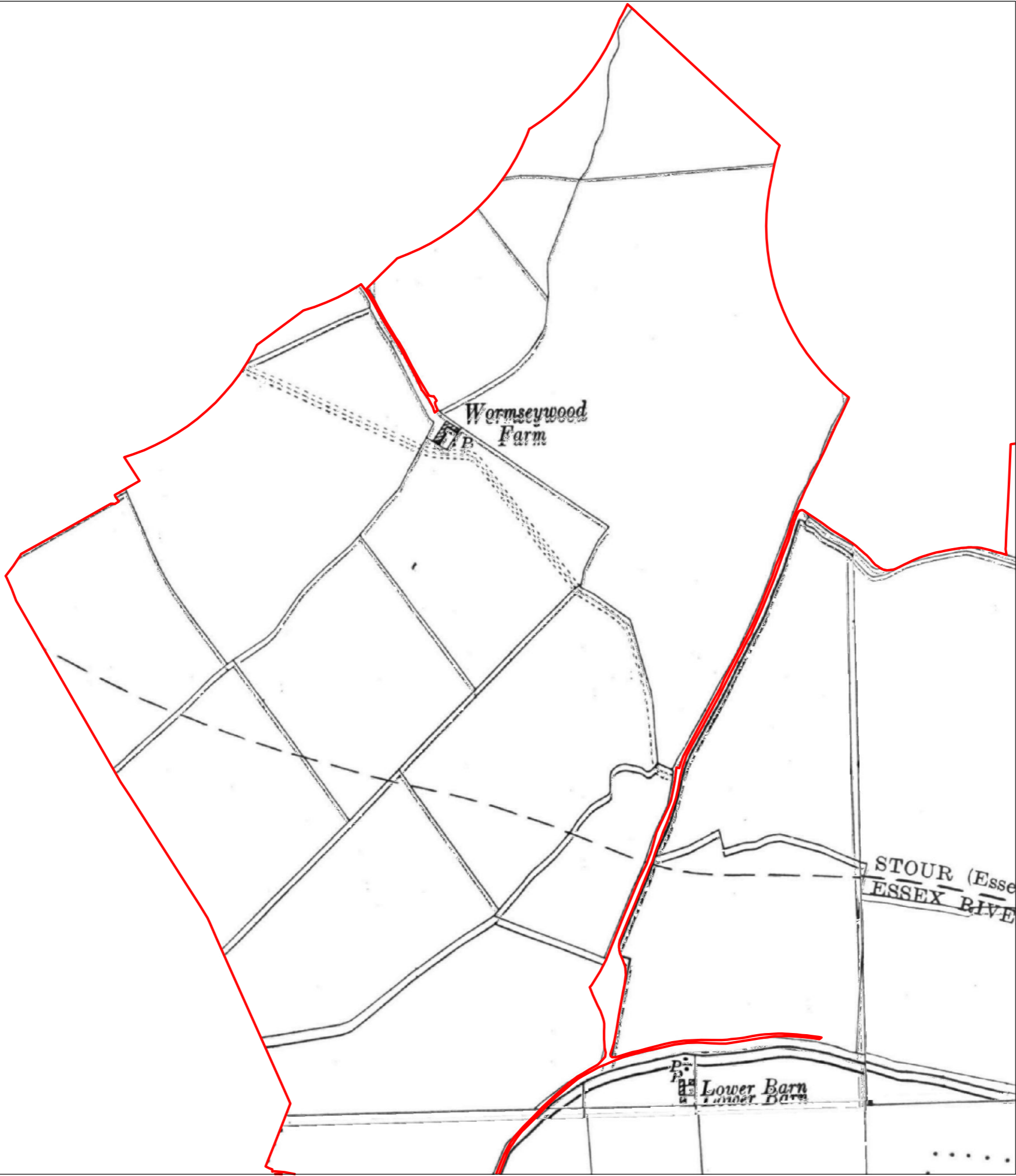
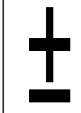


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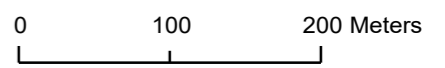


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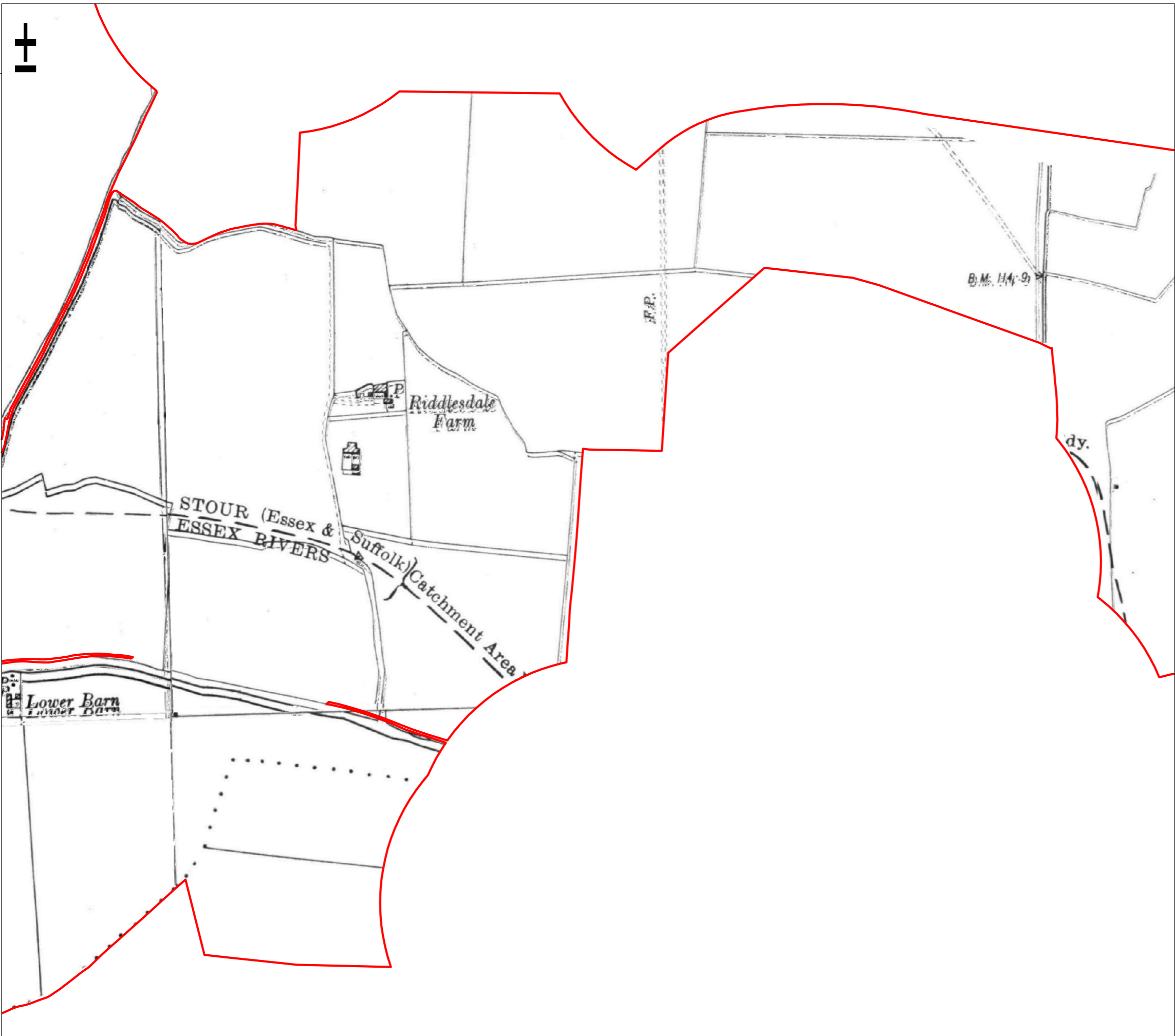
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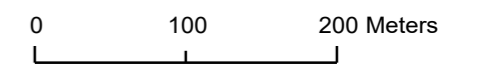


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North Falls Search Area



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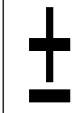
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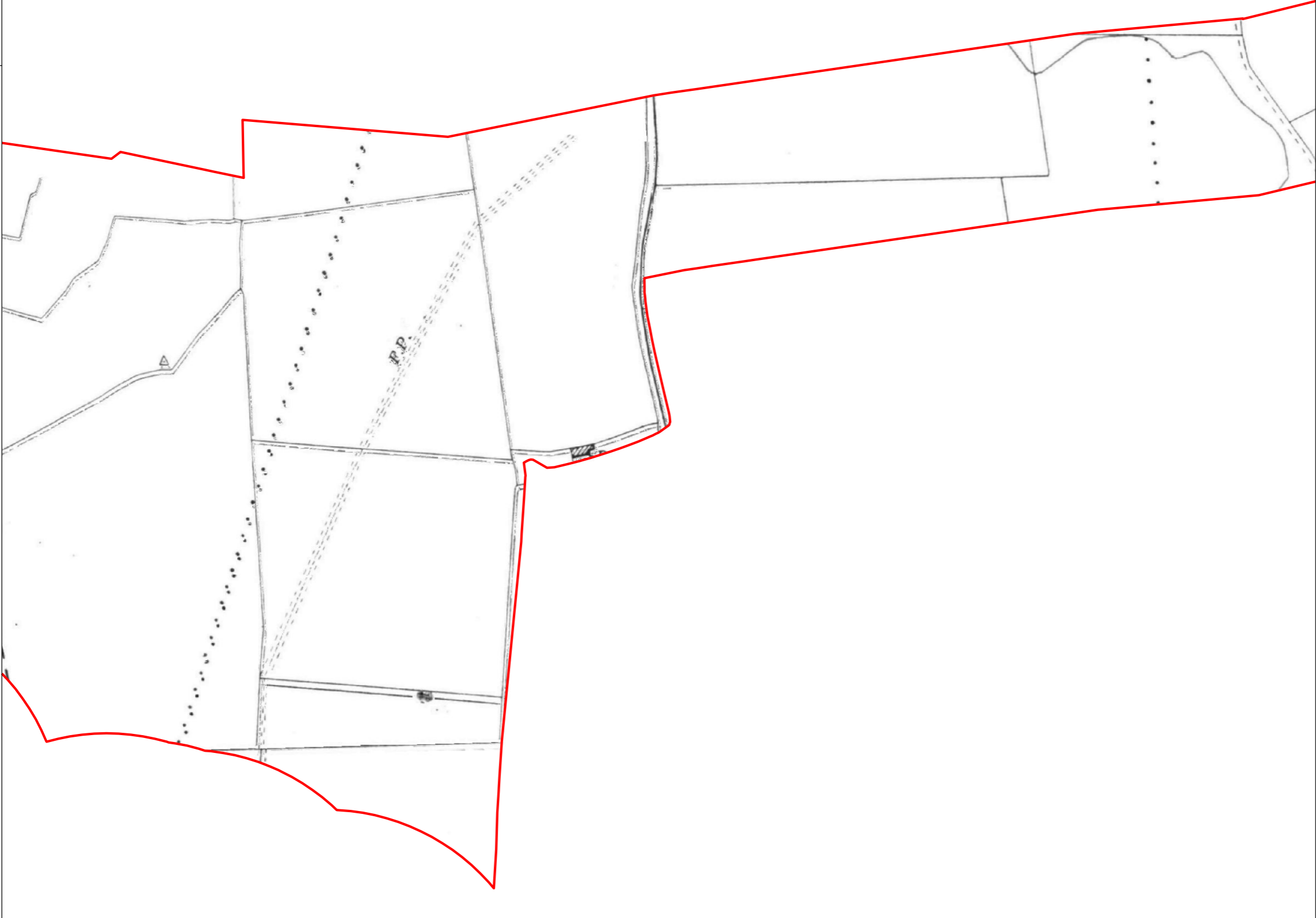
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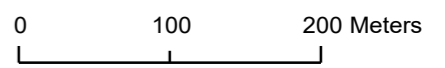


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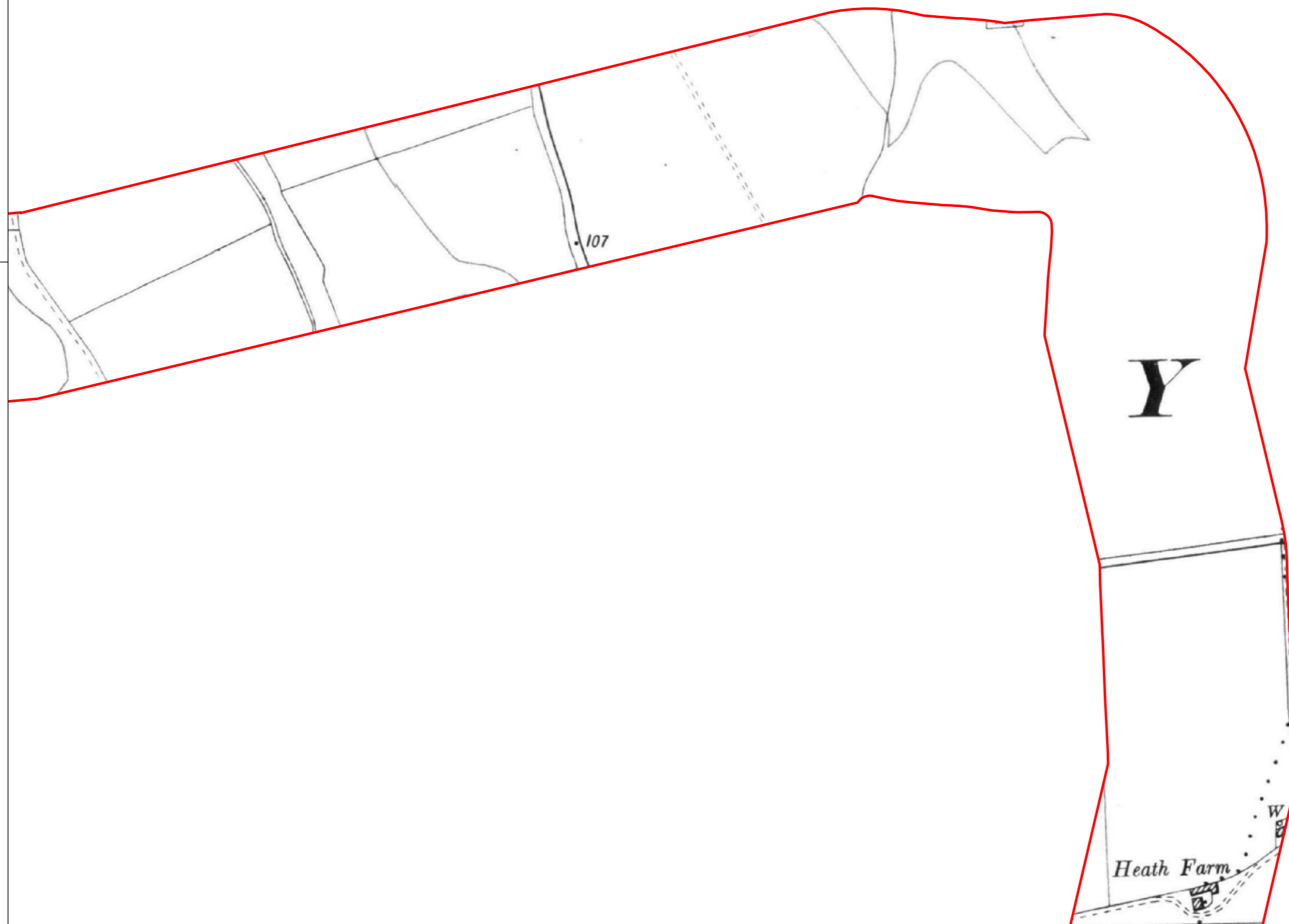
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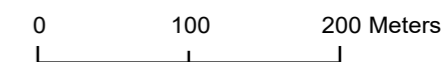


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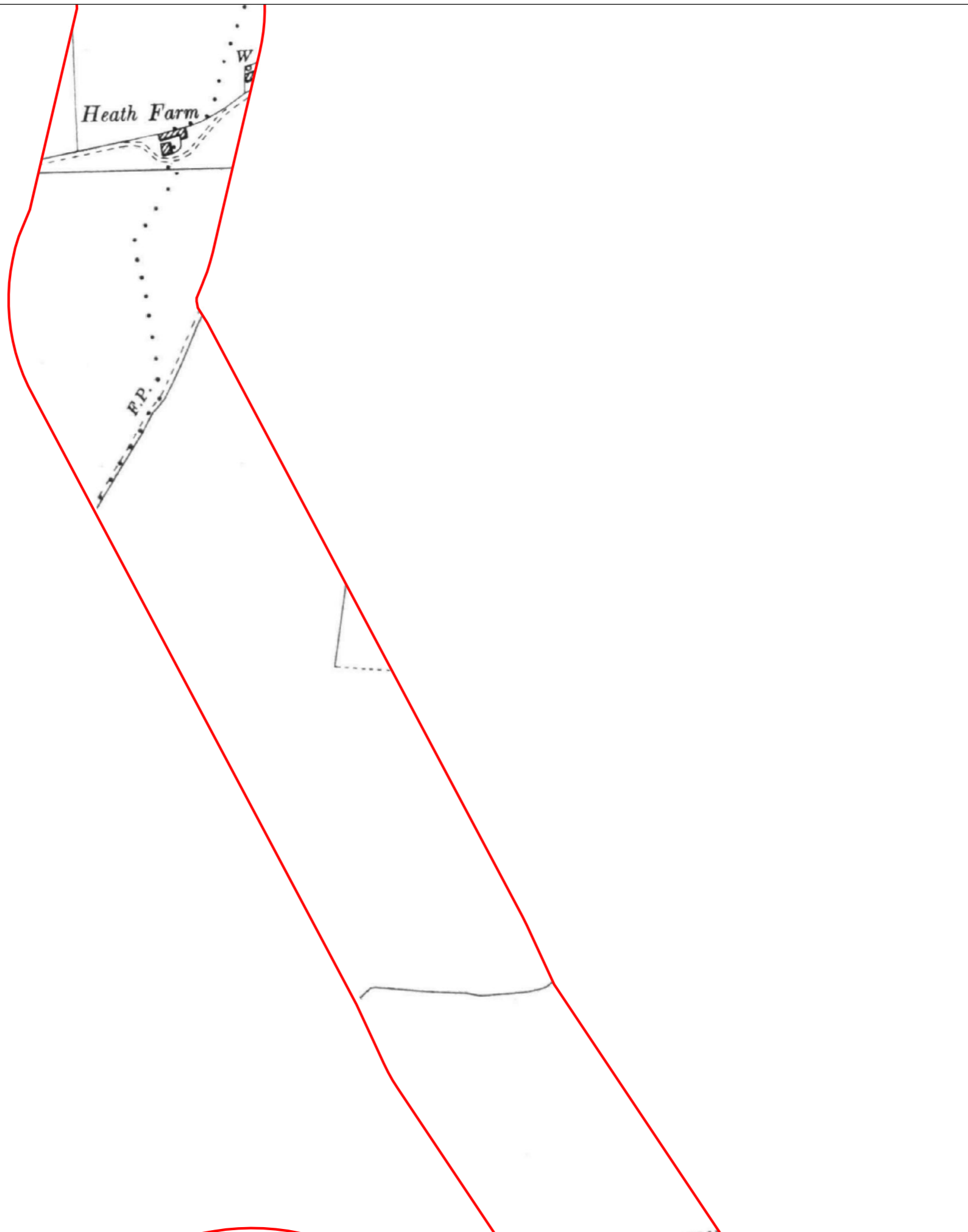
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Fig. 26

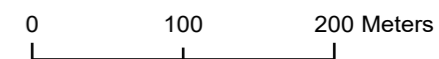
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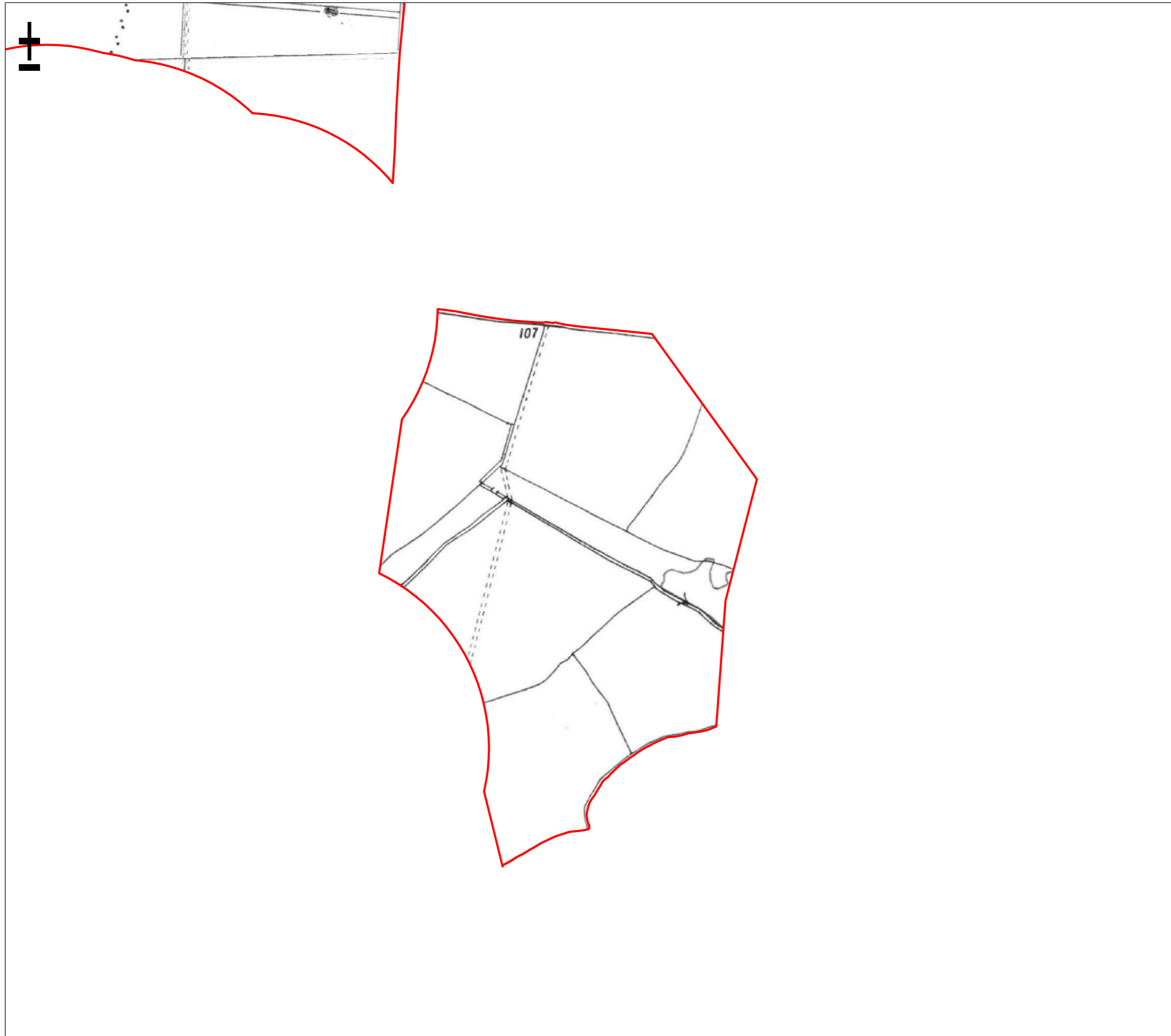
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Figure Number
Fig. 26

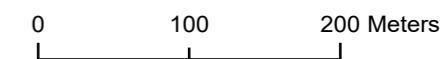
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Scale 1:5,000 Plot Size A3 Datum OSGB36 Projection BNG





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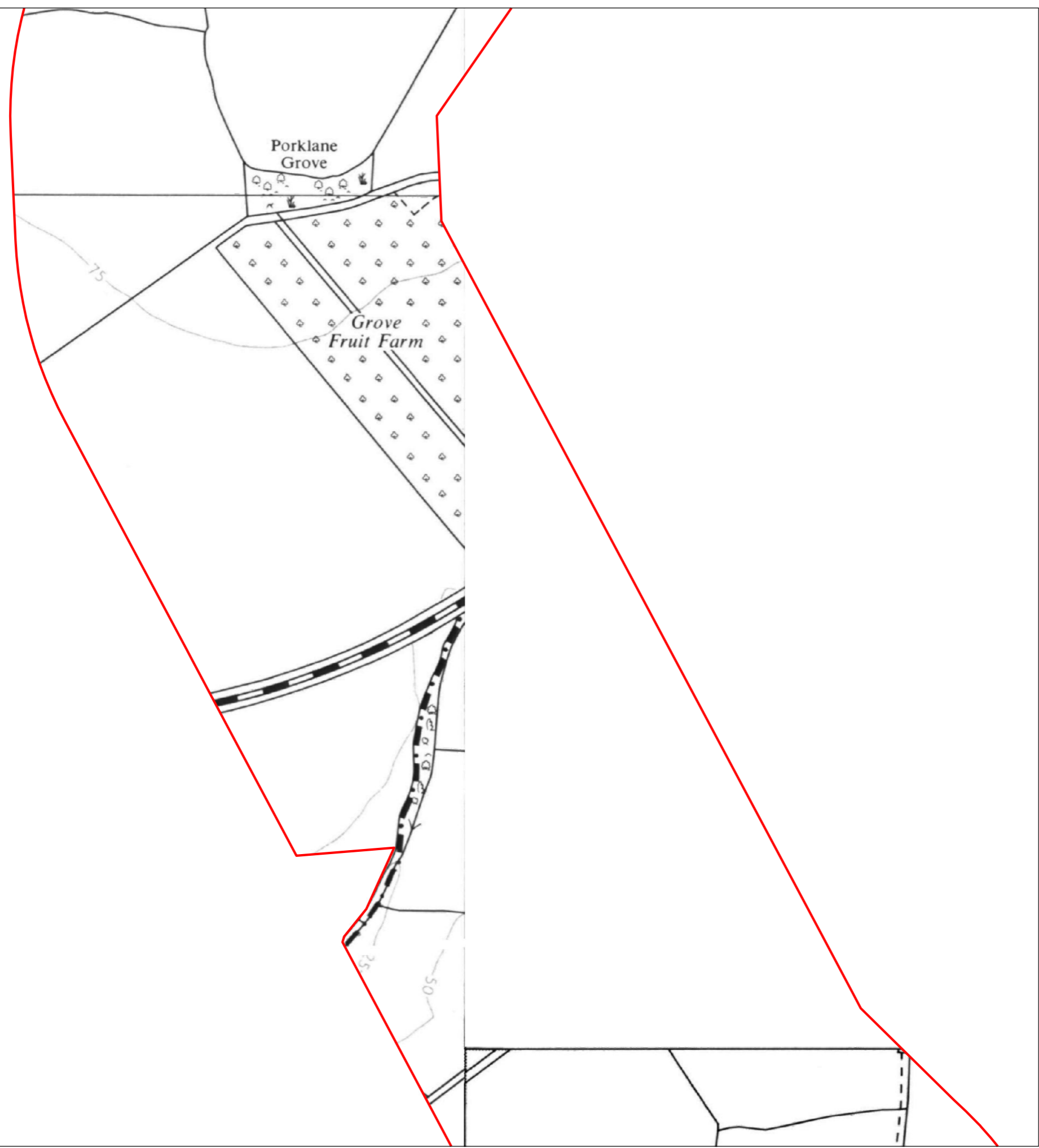
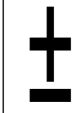
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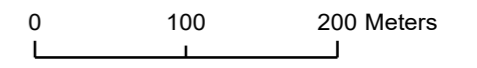
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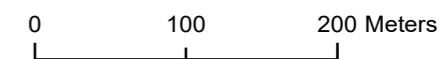
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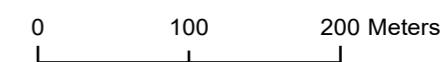
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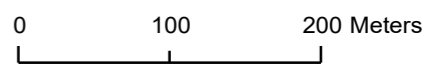


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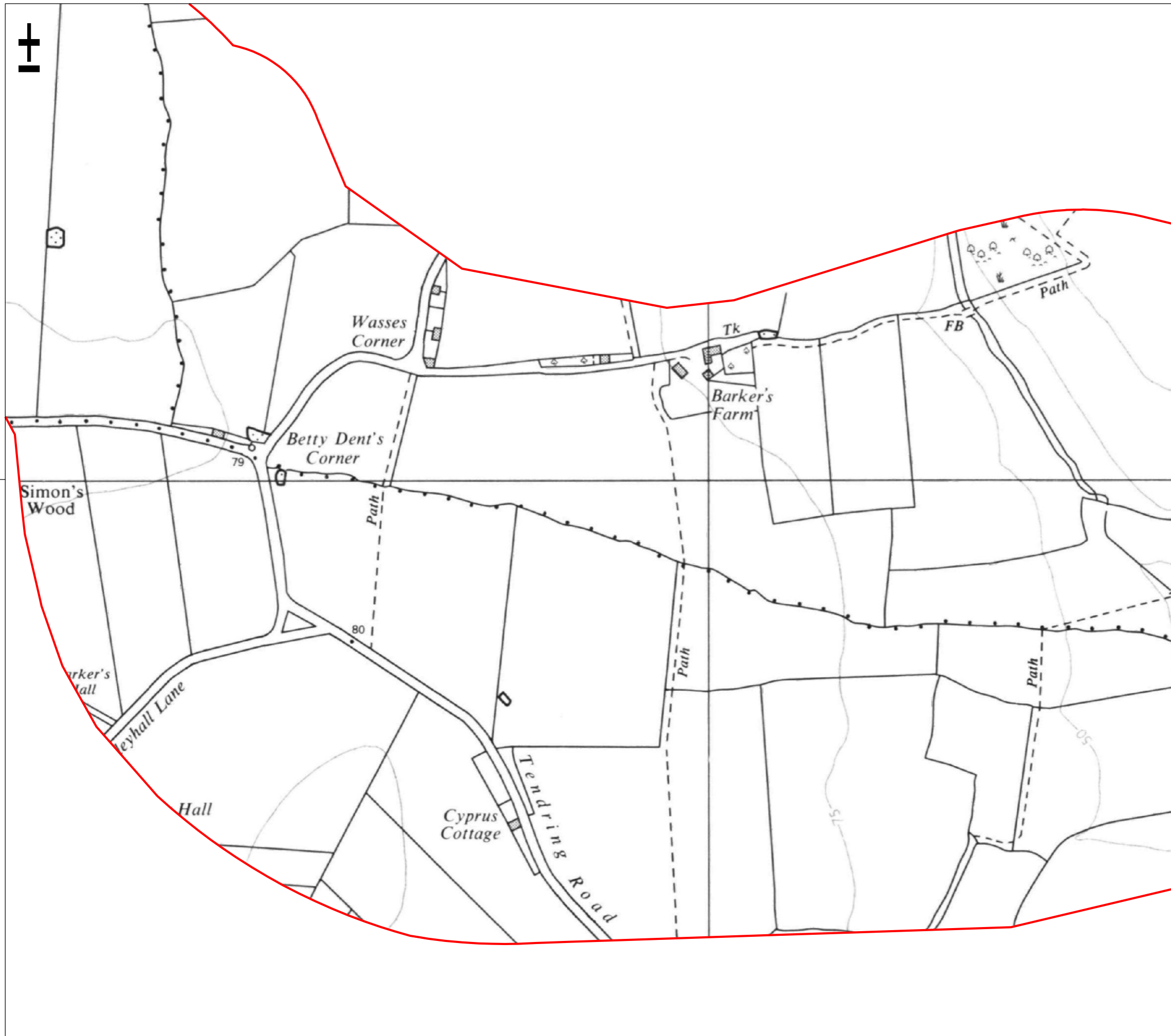
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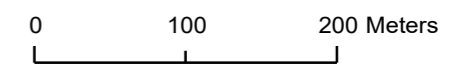


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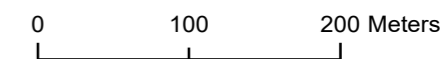
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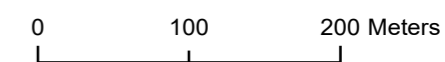
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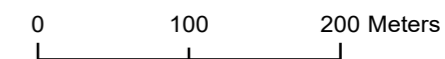
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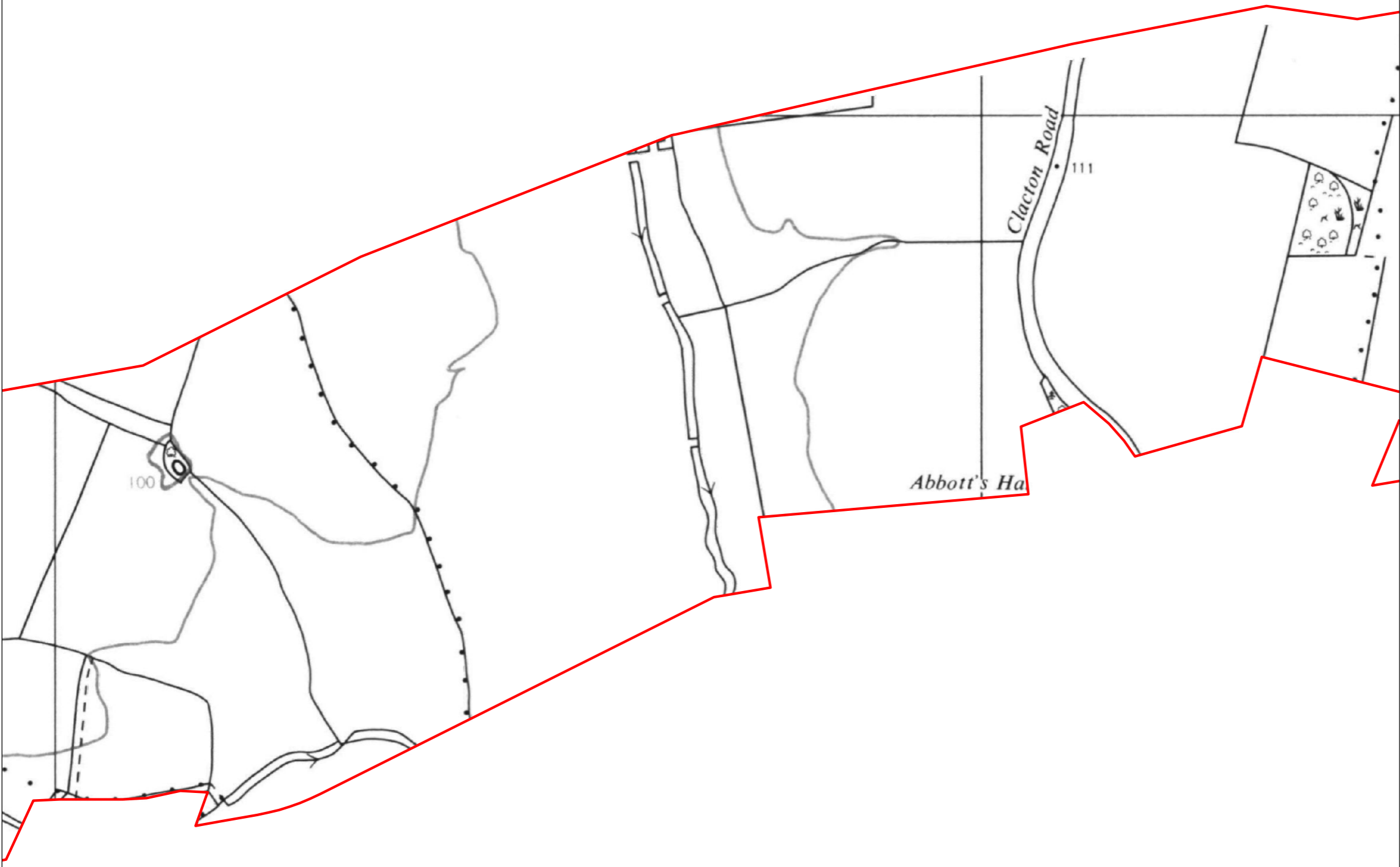
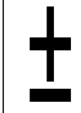
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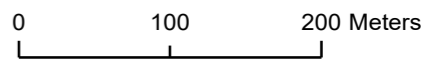
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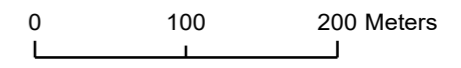
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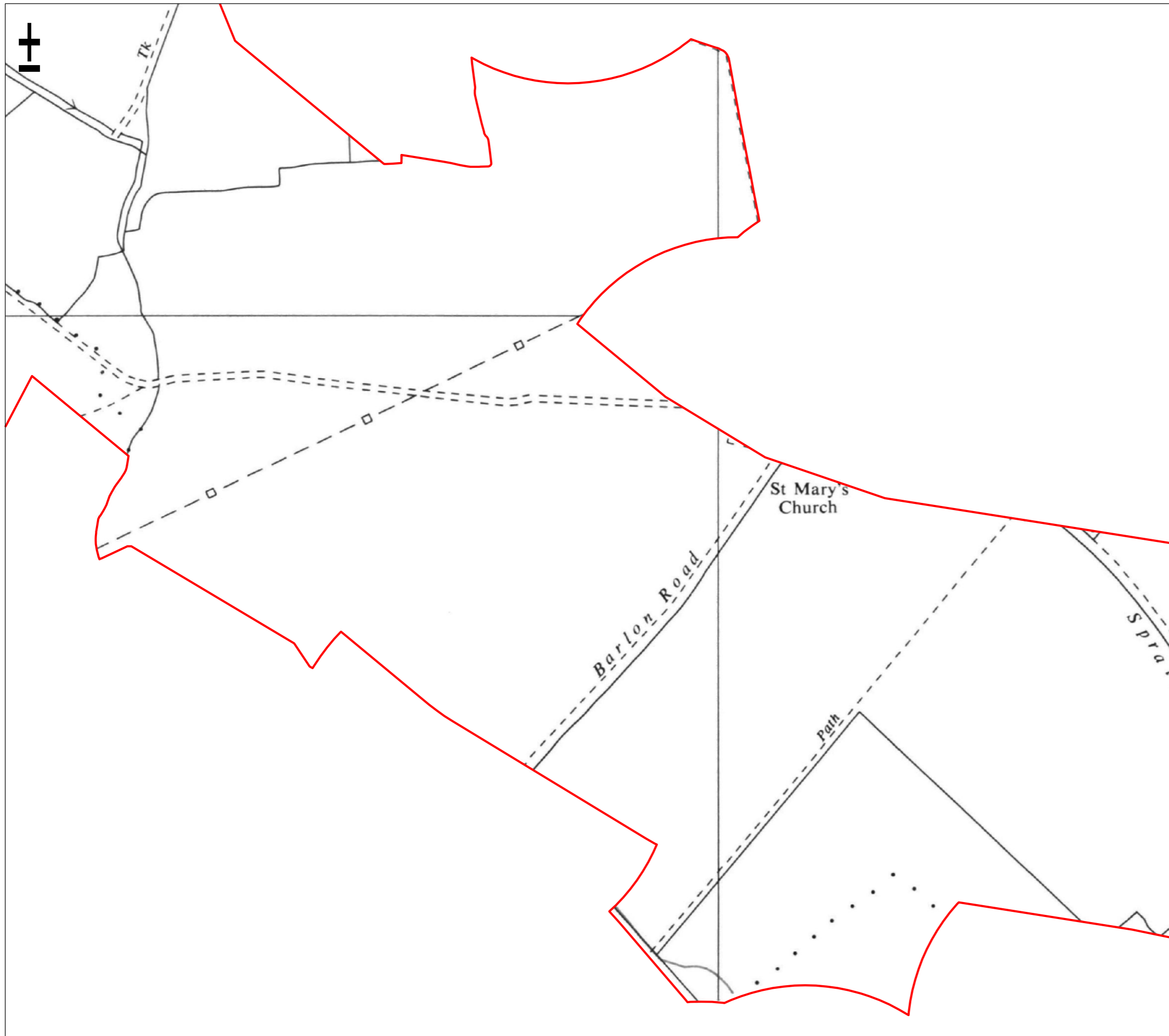
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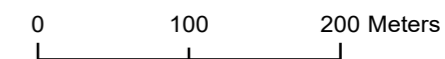
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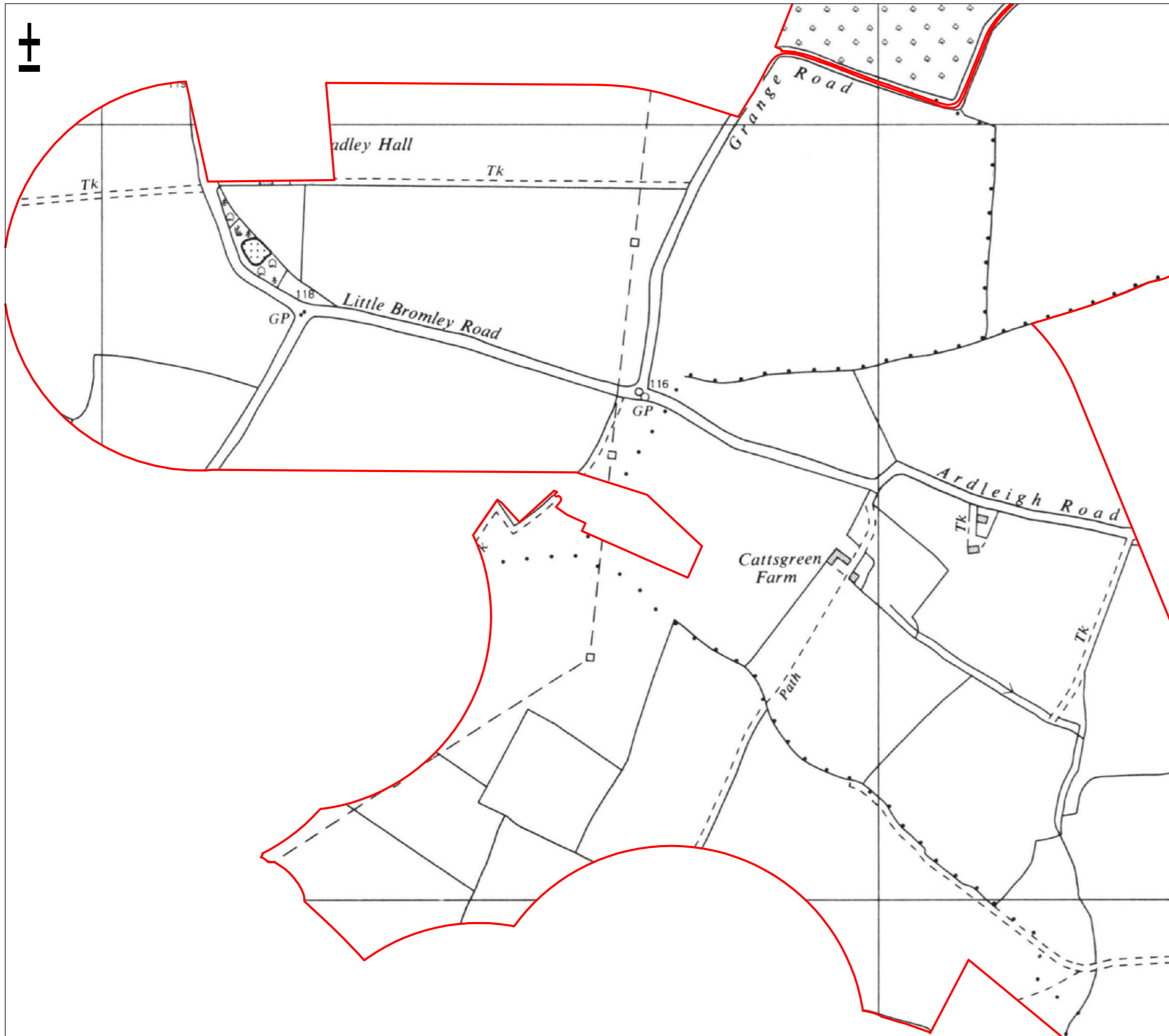
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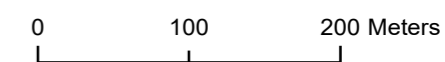
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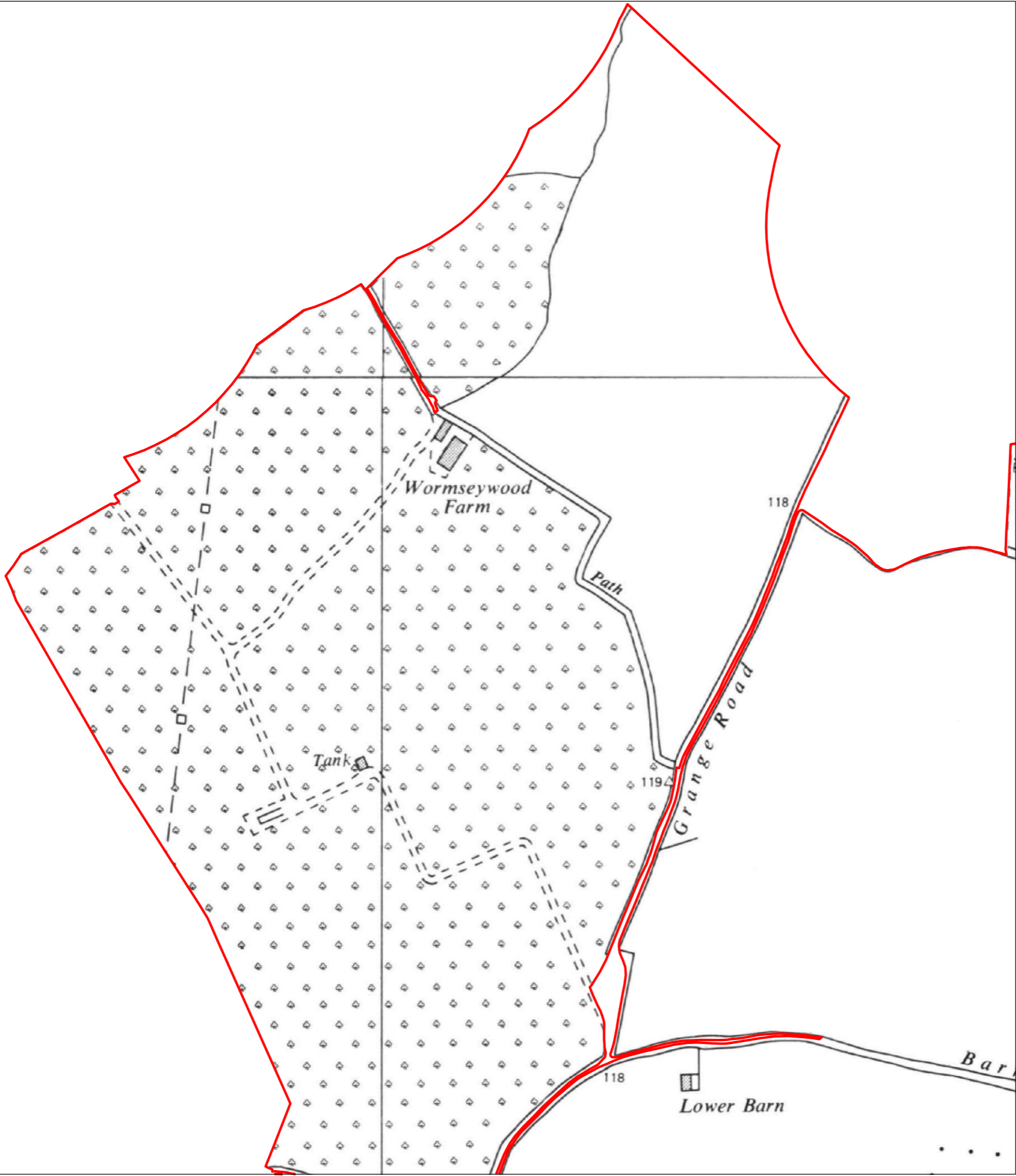
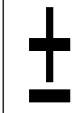
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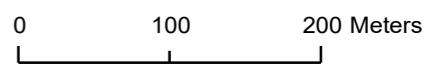




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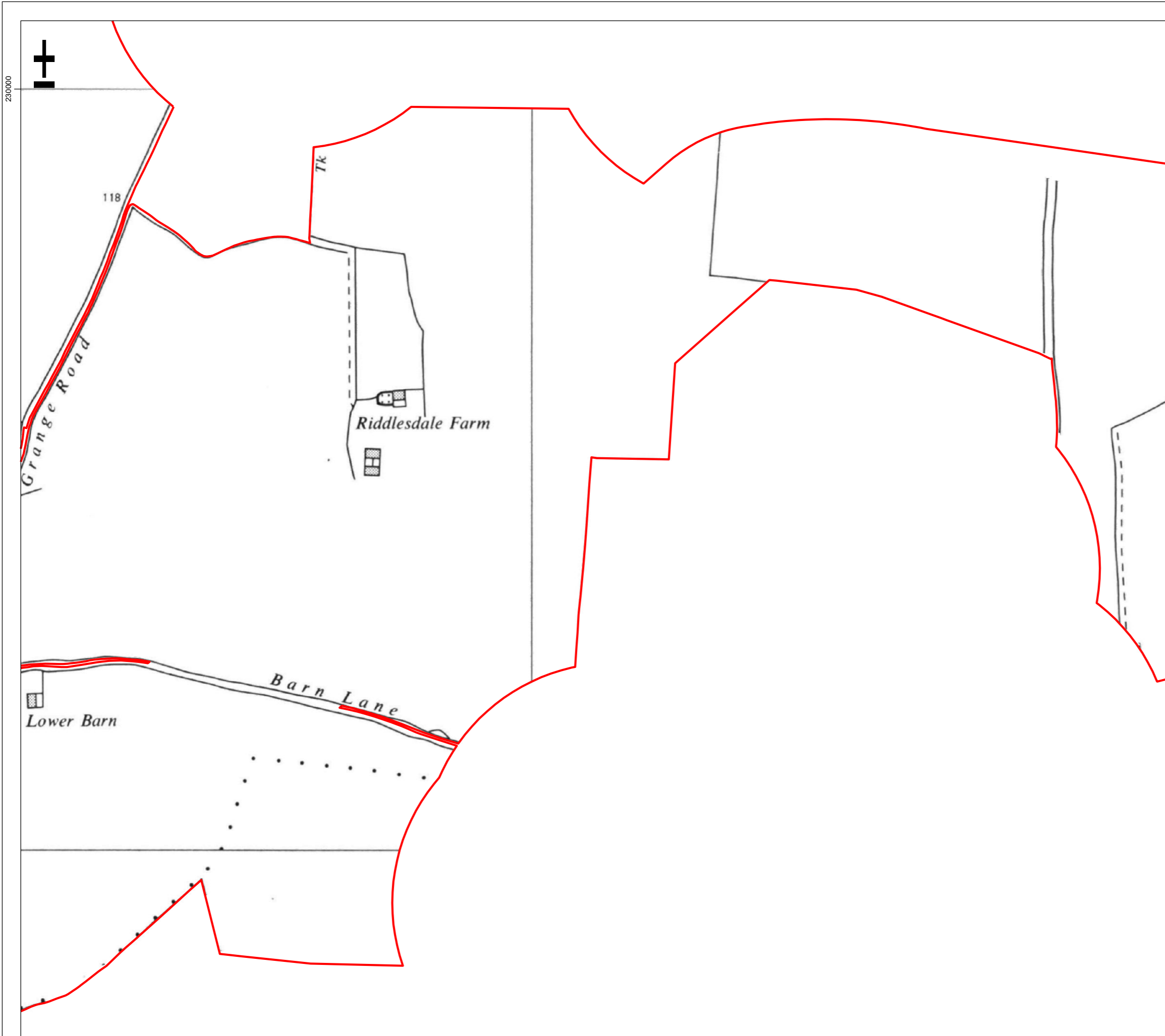
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00	22/06/2022	First issue	ASJ	CC

Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0041** Figure Number: **Fig. 28**

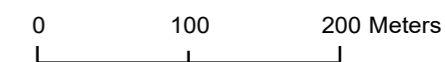
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Legend

North Falls Search Area



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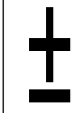
Drawing Title
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Rev	Date	Remarks	Drwr	Chkd
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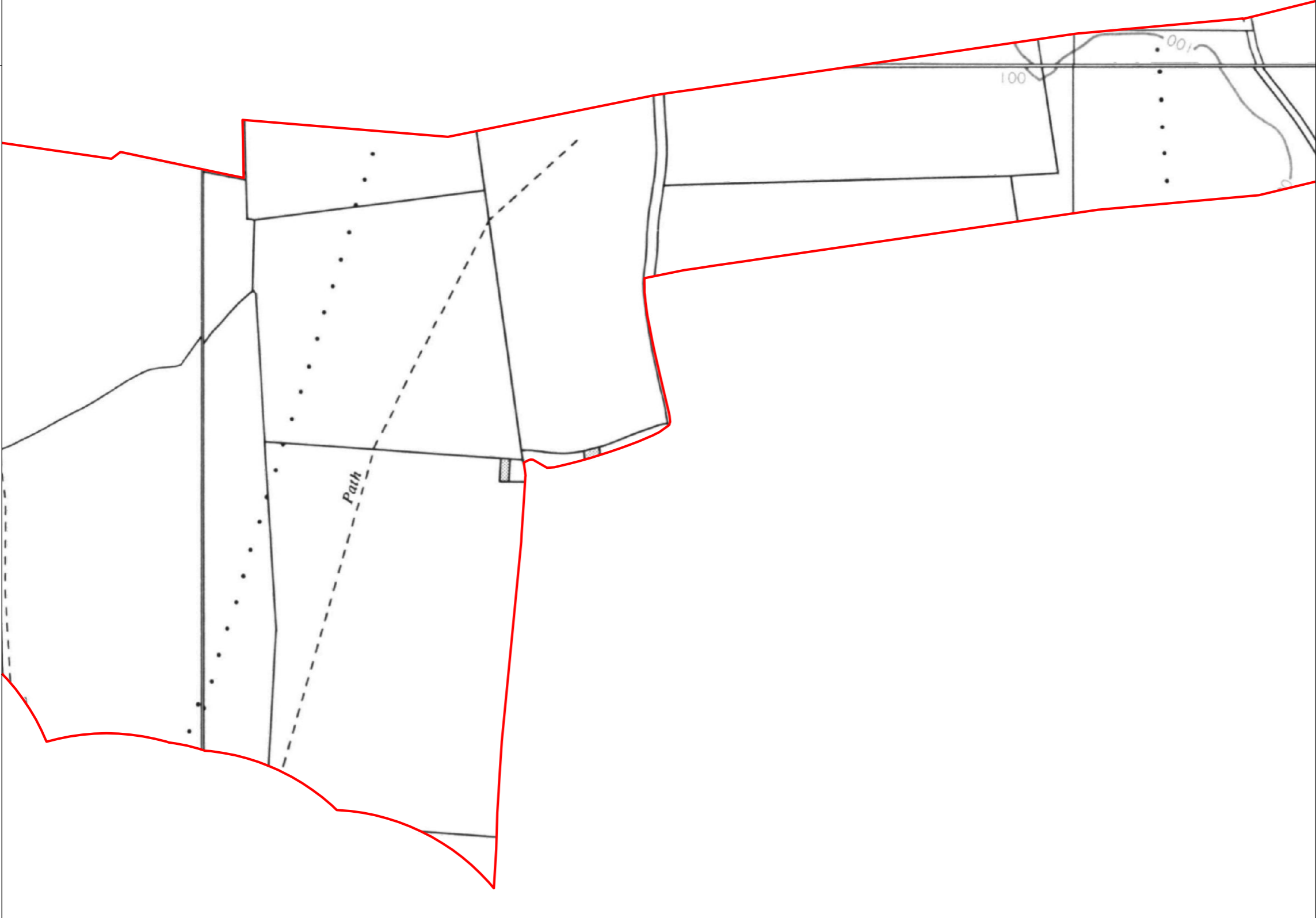
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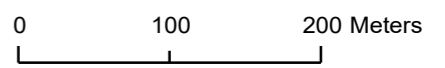


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Legend

North Falls Search Area



Data Source:

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Drawing Number: **PB9244-APS-ZZ-ON-DR-YE-0041** Figure Number: **Fig. 28**

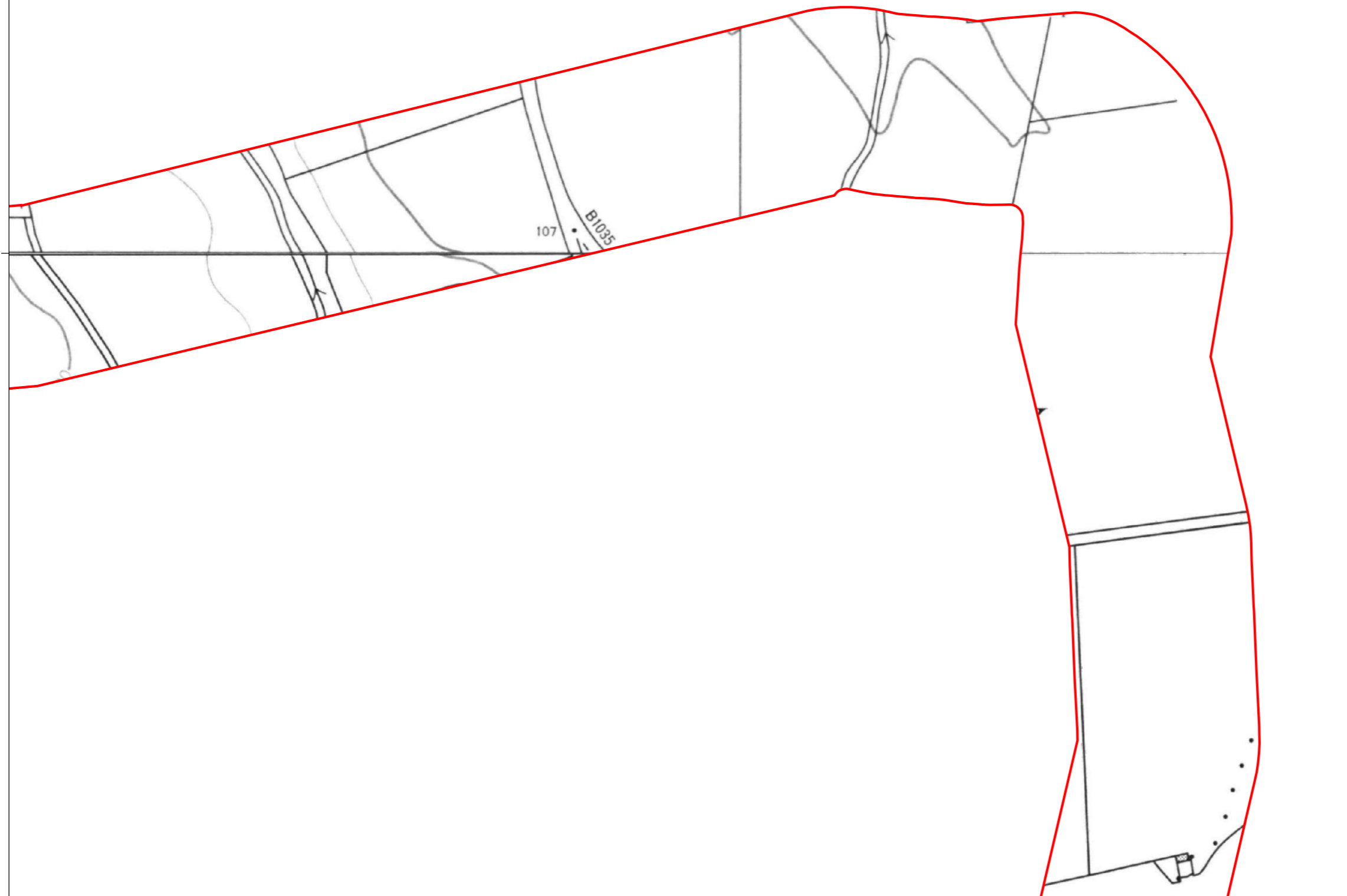
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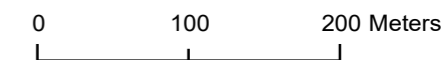


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Legend

 North Falls Search Area



Data Source:

Drawing Title

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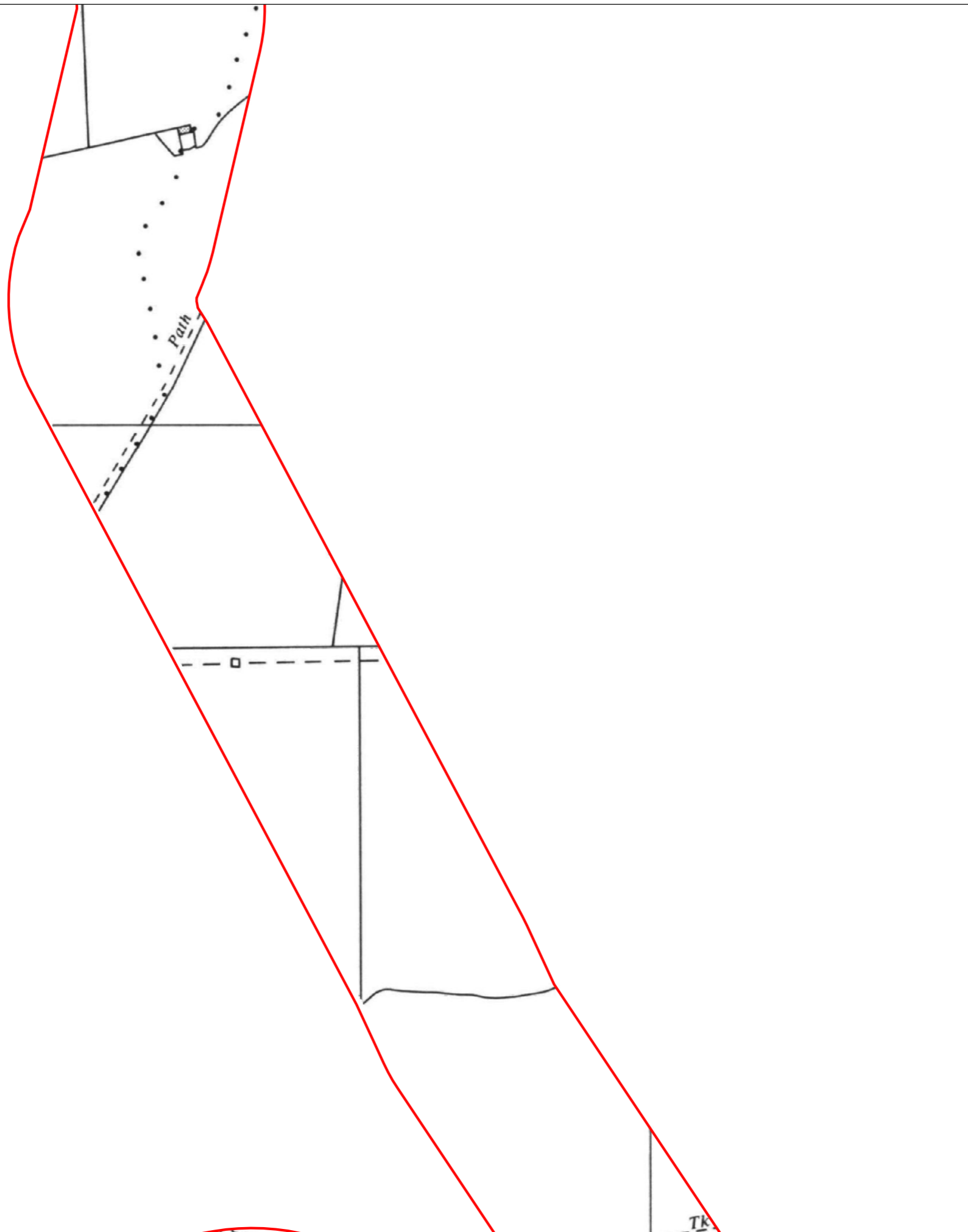
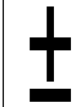
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Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0041

Figure Number
Fig. 28

Scale 1:5,000	Plot Size A3	Datum OSGB36	Projection BNG
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Legend

North Falls Search Area



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Drawing Number
PB9244-APS-ZZ-ON-DR-YE-0041

Figure Number
Fig. 28

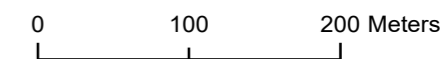
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Legend

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Drawing Number
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Figure Number
Fig. 28

Scale: 1:5,000 Plot Size: A3 Datum: OSGB36 Projection: BNG





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