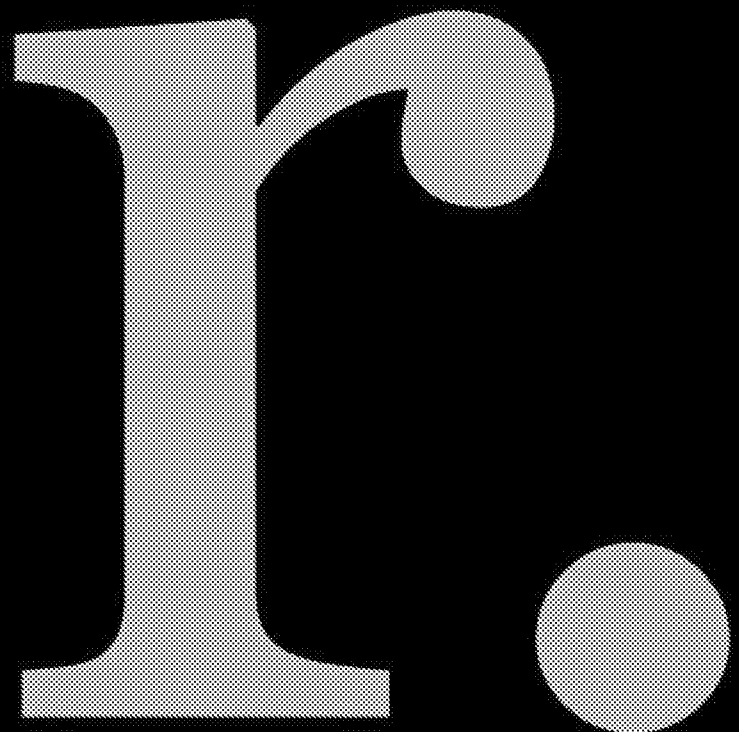


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Land west of Fontwell Avenue, Eastergate

Preliminary Investigation Report





Preliminary Investigation Report

at

**Land west of Fontwell Avenue, Eastergate,
Chichester, West Sussex PO20 3RX**

for

Reside Developments

**Job Reference: 18158/PIR_R26 Rev 1.02
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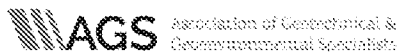
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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.



Commission

Soils Limited was commissioned by Reside Developments to undertake a Preliminary Investigation on a site referred to as Land west of Fontwell Avenue, Eastergate, Chichester, West Sussex, PO20 3RX. The scope of the investigation was outlined in the Soils Limited quotation reference Q22341/rev102, dated 17th January 2019.

This report has been revised following response from Arun District Council on 18th February 2020.

Caveat

Whilst reasonable skill and care has been taken to determine the site history and the environmental setting within the time constraints applied by the project, it should be appreciated that uncertainties may occur owing to the natural variability of soil material within a defined area or as a result of unknowns that are associated with contaminated land assessment in general. The site conditions may be different from that indicated by this Preliminary Investigation, particularly on a site with a history of past development. No responsibility can be accepted should such conditions alter the recommendations made in this report.

This Preliminary Investigation does not include a detailed UXO risk assessment, it does however contain a basic assessment in accordance with CIRIA C681. In preparing a Preliminary Investigation reference is made to historical maps and web-based sources to assess the risk of the site potentially having been impacted by bombing during the World Wars. The data readily available is not necessarily definitive. Certain areas were bombed heavily such as centres of industrial manufacture, airfields, shipyards, docklands, railways sidings and junctions. The assessment is based on the likely area risk, bomb patterns (i.e. lines of recorded bomb impacts with gaps where an impact would be anticipated) and the age of structures on and in close proximity to the site.

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Section I Introduction

I.1 Objective

The Preliminary Investigation Report was undertaken to advise the Reside Developments on the risk pertaining to the site, with special reference to historic and current potential contaminative activities and processes. This also included the assessment of their impact on current and future sensitive receptors such as human health, controlled waters, ecological features, building structures and services.

I.2 Site Location

The site was located at Land west of Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX and had an O.S Land Ranger Grid Reference of SU 947 063.

The site location map is presented in Figure 1 and the full Site Walkover is discussed in Section 2.1 of this report.

I.3 Proposed Development

The proposal comprised construction of a low-rise residential development to include 42No. dwellings with areas of hard landscaping including access roads, driveways and pavements and areas of soft landscaping to include private gardens and public open space.

In compiling this report reliance was placed on drawing 29662A_100-P, dated March 2020, prepared by Clague Architects. Any change or deviation from the scheme outlined in the drawing could invalidate the recommendations presented within this report. Soils Limited must be notified about any such changes.

The proposed development plans have been provided in Appendix A.

I.4 Legislation and Liability

The primary legislative mechanism for contaminated land management in the UK is Part 2A of the Environmental Protection Act, 1990 (EPA). Part 2A was introduced into the EPA under Section 57 of the Environment Act 1995 to help deal with the substantial legacy of land contamination. The legislation provides powers in relation to the identification, remediation and apportionment of liability for contaminated land. Part 2A applies where there is unacceptable risk, assessed on the basis of the current use and the relevant circumstances of the land. It is not directed to assessing risks in relation to a future use of the land that would require a specific grant of planning permission.

Under Part IIA of the Environment Act 1995, Local Authorities are required to identify contaminated land and serve on every person who is an appropriate person a remediation notice setting out what is to be done by way of remediation and the period within which it must be done.

If the person who caused, or knowingly permitted, the contaminating substance cannot be found, the owner and/or, occupier for the time being, of the property can be the appropriate person.

Under the legislation, Contaminated Land is defined as: -

“Land which is in such a condition by reason of substances in, on or under the land that significant harm is being caused or that there is a significant possibility of such harm being caused or that pollution of controlled waters is being, or is likely to be caused.”

Where the Act defines harm as:

“harm to the health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property.”

and pollution of controlled waters is defined as: -

“the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter.”

In addition, The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 introduced the supplementary definition of harm to include: lasting exposure to any person resulting from the after-effects of a radiological emergency, past practice or past work activity.

With regard to contaminated waters, the Environment Act 1995 amends the Water Resources Act 1991 and provides the Environment Agency with the power to force clean-up of historical contamination by issuing a Works Notice, with remediation paid for by the responsible parties.

The Groundwater Regulations (1998) stated that entry of List 1 substances into groundwater must be prevented, and List II substances must be controlled.

1.5 Limitations and Disclaimers

This Preliminary Investigation Report relates to the site located at Land west of Fontwell Avenue, Eastergate, Chichester, West Sussex PO20 3RX and was prepared for the sole benefit of Reside Developments (The “Reside Developments”) for the brief described in the Commission of this report.

Soils Limited disclaims any responsibility to the Reside Developments and others in respect of any matters outside the scope of the above.

This report has been prepared by Soils Limited, with all reasonable skill, care and diligence within the terms of the contract with the Reside Developments, incorporation of

our General Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Reside Developments.

The report is personal and confidential to the Reside Developments and Soils Limited accept no responsibility of whatever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report wholly at its own risk.

The Reside Developments may not assign the benefit of the report or any part to any third party without the written consent of Soils Limited.

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the Reside Developments in accordance with their brief. As such these do not necessarily address all aspects of ground behaviour at the site.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

There may be other sources of information not included in those listed that hold data relevant to the Preliminary Investigation Report undertaken at the site that could materially affect the conclusions made in this report.

Ownership of land brings with it onerous legal liabilities in respect of harm to the environment. "Contaminated Land" is defined in Section 57 of the Environment Act 1995.

Where a contaminative use is identified in the Preliminary Investigation Report this does not determine whether contamination has actually occurred, or if it has the degree to which it may have taken place. An intrusive investigation(s) and analysis is required to establish the nature and degree of any contamination present.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Soils Limited. License is for the sole use of the Reside Developments and may not be assigned, transferred or given to a third party.

Section 2 Site Conditions

2.1 Site Walkover

A site walkover was undertaken in February 2020. During the site walkover observations were made in relation to current activities, evidence of historical activities, sources of potential contamination such as fuel storage tanks, oil drums and chemical storage and evidence of contamination. The walkover also looked for evidence of soil contamination in the form of staining odours and stressed or discoloured vegetation. The notes of the site walkover are presented in Table 2.1 and Table 2.2.

Table 2.1 Site Walkover Record (On-site)

On-site	Use of site	Pastureland (Photograph 1)
	Structures	None
	Site topography	Slightly undulating with a shallow slope down to the south/southwest
	Site covering	Grass (Photograph 2)
	Vegetation	Mature and semi-mature trees line north, east and west site boundaries
	Potential	None observed
	Contamination Sources	
	Odour	None
	Drainage	Free draining

Table 2.2 Site Walkover Record (Off-site)

Off-site	Use of Land	N	Pastureland
		E	Residential and pastureland
		S	Residential
		W	Pastureland
	Area topography	Undulating with shallow slope down to the south	
	Vegetation	Mature and semi-mature trees off north, east and west site boundaries.	
	Potential Contamination Sources	Electric substation adjacent to north of site.	
Notes:			

2.2 Site Drainage

The site was free draining.

2.3 Site Photographs

The site photographs have been included within Appendix F.

Section 3 Geology, Hydrogeology, Hydrology and Radon

3.1 Anticipated Geology

The 1:50,000 BGS Geology map showed the site to be situated on the Lambeth Group bedrock, with overlying superficial deposits of Head.

3.1.1 Head

Head deposit are drifts produced by solifluxion, the downslope movement of debris outwash during the periglacial period, and characteristically comprise poorly sorted sands gravels and chalk of local derivation

3.1.2 Lambeth Group

Woolwich and Reading Beds, occurs in the London and Hampshire Basins, where it directly overlies the Chalk or Thanet Sand Formation, and is succeeded by the Harwich and London Clay Formations. Although generally less than 50 metres thick, it's lithological variability and position beneath much of London has concerned tunnelling engineers since the early 19th century.

The relationship between the different depositional environments is seen in central and south-east London, where deposits of fine-grained sand, flint gravel beds, mottled clay, shell beds and altered beds form a complex interdigitating sequence, which is divided into three formations, the Woolwich and the Reading Formation, depending on the local succession, both overlying the Upnor Formation.

Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate.

The top of the Lambeth Group is marked by the eroded or interburrowed surface at the base of the overlying Thames Group. The uppermost part of the Lambeth Group can be the Reading Formation or the Woolwich Formation, depending on the local succession, or the Upnor Formation, depending on the depth of pre-Thames Group erosion. The Lambeth Group is overlain by sands, silts, clays or gravel beds of the Harwich Formation, depending on the local sequences, or gravelly sandy clays at the base of the London Clay Formation.

In the Hampshire Basin and the west of the London Basin, the Lambeth Group overlies the Chalk Group.

3.2 Hydrogeology

To assess the vulnerability of groundwater to contamination, consideration must be given to the leaching characteristics of the overlying soils and the characteristics of the strata in the unsaturated zone. Information on the geological strata such as lithological type and permeability characteristics has been combined with the physical properties of the soil to produce varying degrees of vulnerability.

Table 3.1 presents the hydrological data that is relevant to the site.

Table 3.1 Hydrogeological Assessment

Hydrogeological Data		Comment
On-site	Superficial	Secondary A Aquifer ¹
Aquifers	Bedrock	Secondary A Aquifer
Groundwater Vulnerability		Medium Vulnerability
Source Protection Zones (SPZ)		Zone 1c (subsurface activity only) – underlying chalk group Zone 1lc (subsurface activity only) – underlying chalk group
Abstraction	Potable	151m NE – Portsmouth Water Ltd. 157m N – Portsmouth Water Ltd.
	Non-potable	152m N – Portsmouth Water Company
Sensitive Land Uses		Onsite – Nitrate Vulnerable Zone
Surface Water Features		134m S
Flood Risk from Rivers or Seas		None
Flood Risk from Surface Water		Low – 1000 Year Return at east site boundary
Flood Risk from Groundwater		Potential for Groundwater Flooding to Occur at Surface

Notes: ¹Secondary A are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Any works or development which has the potential to have an impact on surface water, aquifer or groundwater quality must be approved by the Environment Agency prior to implementation.

3.3 Hydrology

The approximate elevation of the site was ~15m Above Ordnance Datum (AOD). The anticipated groundwater flow direction is given in Table 3.2.

Table 3.2 Hydrological Assessment

Type	Direction	Notes
Surface water	n/a	Not anticipated due to permeable geology
Groundwater (shallow aquifer)	S	In line with topography
Groundwater (deep chalk aquifer)	N	Towards SPZ abstraction point

3.4 Radon Gas

The Landmark Report indicated that the site **was not situated** within an area where protection or risk assessment against the ingress of radon was required. Radon protection measures **will not be required** within the proposed new development. It is not possible in the course of a survey or inspection to determine whether radon gas is present as the gas is colourless and odourless. Tests can be undertaken to assess the concentration of radon in existing structures.

Section 4 Site History

4.1 Historic Map Study

The object of this study was to report on the evidence of site history and redevelopment of the site and its environs from available County Series and Ordnance Survey Maps dating from the mid to late 19th Century to the present day as downloaded from Landmark Environmental.

The published maps only represent a “snap shot” of the site and its environs at the date of the survey. The detail of the information recorded can vary between epochs, map scale and county areas. It should be noted that changes in land uses, processes or activities may have occurred outside of published epochs and these may not have been recorded on subsequent epochs. Also note that as methods of projection, production and recording have changed over time, this can result in geo-reference errors that may indicate the established site boundary is off-centre from its true location on older historical maps. Where this is potentially significant it will be noted.

Any distances quoted for features remote from the site have been scaled from the maps and are only approximate. Where dates have been noted in brackets, these are the actual dates applicable to the map editions and may not reflect the date of the original survey it is based on. The information reported might not represent all pertinent information that could be obtained. The interpretation of the maps and/or other data commented on in this report is subjective.

As part of the review of the historical plans, only features considered to have or to have had a potential contaminative impact on the site and usually within a notional 250m radius are discussed. The north point and approximate extent of the site are indicated on each figure. The historic maps referred to are appended to this report (Appendix B).

Table 4.1 Historic Development of the Site

Site History	Date Range	
	From	To
Site shown as open land. No contaminative land uses recorded onsite.	1876 ¹	Present

Notes: ¹ Earliest available maps

Table 4.2 Historic Off-site Development

Off-site Development	Date Range	
	From	To
Site shown to be surrounded by open land. Gravel pit was shown 10m to the east of the site. Northfield Farm shown approximately 100m west.	1876 ¹	1897
Pumping station now recorded roughly 130m north of the site. Old Gravel Pits recorded 100m east and 160m south. Orchards now recorded 120m southwest and 230m south of the site. Gravel pit east of the site extended.	1897	1912

Off-site Development	Date Range	
	From	To
Residential dwellings with private gardens now recorded 30 northeast of the site off Fontwell Avenue. Northfield farm buildings constructed 200m west of the site. Orchards recorded 110m southeast of the site.	1912	1937
Orchards recorded 60m southeast.	1937	1974
Electric sub-station recorded adjacent to north site boundary. Works buildings constructed 60m east of the site over former gravel pit. Additional buildings constructed at Northfields Farm to the south. Northfield farm 200m west converted to residential. Nursery recorded 240m east of the site.	1974	2006
Former works buildings developed into residential housing estate.	2006	Present

Notes: ¹ Earliest available maps

Table 4.3 Potential Sources of Pollution Indicated from Historic Maps

Source	Direction	Distance (m)	Date Range	
			From	To
Electric sub-station	N	1	1974	Present
Gravel pit	E	10	1876	1912
Works	E	60	1974	2006
Orchard	SE	60	1937	1979
Northfield Farm	W	100	1897	Present
Old gravel pit	E	100	1997	1912
Orchard	SE	110	1912	2019
Orchard	SW	120	1897	1974
Old gravel pit	S	160	1897	1937
Northfield Farm buildings	W	200	1912	1974
Orchard	S	230	1897	1974
Nursery	E	240	1974	Present

4.2 Bomb damage and the potential for Unexploded Ordnance

In accordance with guidance presented in C681 'Unexploded Ordnance (UXO) A guide for the Construction Industry' a review has been undertaken of the historic maps which has indicated that the site is not in an area that is likely to have been subject to bombing, shelling or has had a military use.

Based on the assessment of the historical maps, it is considered that a specialist UXO risk assessment is not necessary for this site.

Section 5 Environmental Records and Consultation

5.1 Dataset Information

The Landmark Envirocheck Report was obtained by Soils Limited and includes site specific information. The extent of the search has initially been limited to a radius of 250m as it is considered that sources of contamination beyond 250m are unlikely to impact on the site. This search radius may however, be increased if a significant source of contamination or sensitive receptor is identified within 1000m of the site. A copy of the report is appended to this report in Appendix summarised in Table 5.1, Table 5.2 and Table 5.3.

Table 5.1 Environmental Significance of Data

Source	Direction	Distance (m)
Contaminated Land Register Entries and Notices	None	None
Discharge Consents	SW	116
	W	134
	W	134
	E	233
Integrated Pollution Prevention and Control	None	None
Local Authority Pollution Prevention and Controls	None	None
Local Authority Pollution Prevention and Control Enforcements	None	None
Nearest Surface Water Feature	S	134
Pollution Incidents to Controlled Waters (Significant Incidents only)	None	None
Prosecutions Relating to Authorized Processes	None	None
Registered Radioactive Substances	None	None
Substantiated Pollution Incident Register	None	None
Nearest Potable Abstraction Point	NE	151
	N	157
Nearest Non-Potable Abstraction Point	N	152
Water Industry Act Referrals	None	None
Source Protection Zones	Onsite ¹	0
Extreme Flooding from Rivers or Sea Without Defences	None	None
Flooding from Rivers or Sea Without Defences	None	None
Areas Benefiting from Flood Defences	None	None
Flood Water Storage Areas	None	None
Flood Defences	None	None
BGS Recorded Landfill Sites	None	None
Historical Landfill Sites	E	16
Licensed Waste Management Facilities	S	183
Local Authority Recorded Landfill Sites	E	28
Potentially Infilled Land (Non-Water)	E	41
	S	201
Potentially Infilled Land (Water)	NE	102
	N	108
	NE	193
	NE	236
	N	247
Registered Landfill Sites	None	None

Source	Direction	Distance (m)
Registered Waste Transfer Sites	None	None
Registered Waste Treatment or Disposal Sites	None	None
Control of Major Accident Hazards Sites (COMAH)	None	None
Notification of Installations Handling Hazardous Substances	None	None
Planning Hazardous Substance Consents	None	None

Notes: ¹ Subsurface activity only.

Table 5.2 Contemporary Trade Directory

Contemporary Trade Directory within 250m	Direction	Distance (m)	Status
Joinery Manufacturers	E	9	Inactive
Precision Engineers	E	52	Inactive
Temperature Monitoring Systems Manufacturers	E	88	Inactive
Machinery – Industrial & Commercial	NE	243	Inactive

Table 5.3 Geological Hazards

Source	Nearest Distance from Site/Type
Coal Mining Affected Areas	None
Mining Instability	n/a
Natural and Mining Cavities	1000mNE/Sinkhole
Potential for Collapsible Ground Stability Hazards	Onsite/Very low
Potential for Compressible Ground Stability Hazards	No hazard
Potential for Ground Dissolution Stability Hazards	No hazard
Potential for Landslide Ground Stability Hazards	Onsite/Very low
Potential for Running Sand Ground Stability Hazards	Onsite/Very low
Potential for Shrinking or Swelling Ground Stability Hazards	Onsite/Very low to moderate

5.2 Site Sensitivity Maps

No other significant potential sources of contamination were shown on the Landmark Envirocheck Site Sensitivity Maps, which have not been listed in Table 5.1, Table 5.2 and Table 5.3, and copies of which are appended to this report (Appendix C).

5.3 Regulatory Enquires

As part of the Preliminary Investigation Report the local authority was contacted and asked to provide any information on potential risks pertaining the site. A request for information was made on 27th January 2020. A response from Arun District Council was received on 18th February 2020 and the information provided has been presented in Appendix E and pertinent information outlined below.

- The history of the site and any adjoining areas: The site was recorded as open fields until a pair of building-like structures were noted between 1897 and 1890.

The site and adjoining area have not been identified as potentially contaminated land, although the proximity to a farm may require investigation.

- Review of any previous desk study or site investigation information held for the site: This Department is not aware of any previous desk study or site investigation held for the site.
- The proximity of waste disposal sites: This Department is not aware of any waste disposal facilities on site or adjoining areas.
- Petroleum licenses: This Department is not aware of any petroleum licenses at the site or adjoining areas.

Arun District Council state that it is likely that prior to development, a minimum of a human health-based risk assessment would be required due to the proximity of a farm. In addition, an asbestos survey may also be required.

5.4 Soil Geochemistry

The BGS soil chemistry for environmental assessments dataset coverage, has been developed from BGS G-BASE and Imperial College Wolfson Atlas data. It contains estimated ambient As, Cd, Cr, Ni and Pb background concentrations for rural topsoils across Great Britain. It also contains the locations and measured concentrations (mg kg⁻¹) of As, Cd, Cr, Cu, Ni, Pb, Sn and Zn in urban topsoil samples, collected from geochemical surveys in 23 major urban centres.

The results of this survey are contoured on the Landmark Environmental check report (Appendix C). The results of the local soil chemistry are presented in Table 5.4.

Table 5.4 Soil Geochemistry

Determinant	Indicated Soil Geochemistry (mg kg ⁻¹)
Arsenic	<15
Cadmium	<1.8
Chromium	60-90
Lead	<100
Nickel	15-30

Section 6 Data Collection Summary

6.1 General

The findings of the data collection are summarised below:

Table 6.1 summarises the site Environs, which include geology, hydrogeology, the risk from radon and potential risk from flooding.

Table 6.1 Site Environs

Environs	Summary
Geology	Superficial deposits of Head overlying Lambeth Group bedrock.
Hydrogeology	Superficial Head and Lambeth Group bedrock both designated as Secondary A aquifers which could support groundwater.
Surface Water Flow	Anticipated to be vertically down into the permeable superficial deposits.
Groundwater Flow	Shallow groundwater anticipated to flow down to the south in line with topography.
Source Protection Zone	Deeper groundwater in the chalk aquifer anticipated to flow north towards associated SPZ abstraction point.
Radon	No radon risk.
Flooding	Low risk of surface water flooding recorded at the east site boundary. There was a potential for groundwater flooding to occur at surface.
Geological Hazard	Very low collapsible, landslide and running sand ground stability hazards, and very low to moderate shrinking or swelling ground stability hazards reported for the site.
Local Authority Response	Response from Arun District Council has been presented in Appendix E. The Local Authority state that it is likely a minimum of a human health-based risk assessment would be required prior to development due to proximity of a farm.
Soil Chemistry	Soil geochemistry did not identify any elevated contaminant concentrations.

Table 6.2 provides a summary of potential on-site and off-site contamination sources identified during the study of the historic maps, the Landmark Envirocheck Dataset Report and the Site Walkover.

Table 6.2 Summary of Potential Contamination Sources

Contaminative Sources/Environmental Impact	Direction ¹	Distance (m)	Date Range		Data Source
			From	To	
On-Site					
None	-	-	-	-	-
Off-Site					
Electric sub-station	N	1	1974	Present	WS/HM
Joinery Manufacturers	E	9	-	-	DS
Gravel pit	E	10	1876	1912	HM
Historical landfill site	E	16	1979	1981	DS
Local authority recorded landfill site	E	28	-	-	DS
Precision Engineers	E	52	-	-	DS
Works	E	60	1974	2006	HM
Orchard	SE	60	1937	1979	HM

Contaminative Sources/Environmental Impact	Direction ¹	Distance (m)	Date Range		Data Source
			From	To	
Temperature Monitoring Systems Manufacturers	E	88	-	-	DS
Northfield Farm	W	100	1897	Present	HM/LA
Old gravel pit	E	100	1997	1912	HM
Orchard	SE	110	1912	2019	HM
Orchard	SW	120	1897	1974	HM
Old gravel pit	S	160	1897	1937	HM
Metal recycling site	S	183	1994	Present	DS
Northfield Farm buildings	W	200	1912	1974	HM
Orchard	S	230	1897	1974	HM
Nursery	E	240	1974	Present	HM
Machinery – Industrial & Commercial	NE	243	-	-	DS

Notes: SW – Site walkover, HM – Historic Maps, DS – Datasheet, GC – Geochemistry, LA – Local Authority, GE Google Earth

Section 7 Preliminary Conceptual Site Model

7.1 General

Environment Agency guidance provided in CLR11 indicates that the Conceptual Site Model should identify those contaminants, pathways and receptors which are 'likely' to represent an 'unacceptable' risk either to human health or the surrounding environment. The following sections present potential contaminants, pathways and receptors based on the information collected during the desktop study. Pathways have been established based on scientific knowledge of the behaviour of the contaminants in the ground.

7.2 Sources and Pathways of Contamination

The Landmark Site Specific Envirocheck Report and Site Walkover have been used to identify potential contaminative sources. These sources have been presented in Table 6.2. An assessment of the likely pathways and the likelihood of each contaminative source that was considered a risk has been presented in Sections 7.2.1 to 7.2.3.

7.2.1 Potential Pathways

A review of the potential pathways on and off the site has been undertaken based on the site, ground conditions, hydrology and scientific knowledge of the behaviour of the contaminants in the ground. The pathways applicable to the site and the proposed development have been marked in Table 7.1.

Table 7.1 Applicable Pathways

Pathway	Present	Comment
Inhalation of dust	Yes	Potential for pathway to exist in area of soft landscaping
Inhalation of vapour/gases	Yes	Potential for pathway to exist within the Head deposits
Ingestion and absorption via direct contact	Yes	Potential for pathway to exist in area of soft landscaping
Migration via surface runoff		Unlikely for pathway to exist due to the permeable nature of the underlying Head deposits
Migration in solution via groundwater	Yes	Migration via the superficial Head deposits
Migration of gases via permeable soils	Yes	Migration via the superficial Head deposits
Direct contact with construction material	Yes	Potential for contamination to come into contact with foundation material
Services and Utilities	Yes	Potential for contamination

7.2.2 Potential Sources of On-site Contamination.

A study of Landmark Envirocheck Report and Site Walkover has identified the following potential on-site sources of contamination which may present a risk to future uses of the proposed development.

The sources have presented in Table 7.2.

Table 7.2 On-site Potential Contamination Sources

Source	Likely	Reasoning
No sources identified	-	-

7.2.3 Potential Off-site Sources of Contamination

A study of Landmark Envirocheck Report and Site Walkover has identified the following potential off-site sources of contamination which may present a risk to future uses of the proposed development.

These sources have been presented in given in Table 7.3.

Table 7.3 Off-site Potential Contamination Sources

Source	Direction	Distance (m)	Likely	Reasoning
Electric sub-station	N	1		Offsite source. Highly immobile associated contaminants unlikely to migrate onto site.
Joinery Manufacturers	E	9		No longer recorded, unit redeveloped to residential.
Gravel pit	E	10		Subsequently used as landfill handling inert waste. Now developed to residential.
Historical landfill site	E	16		Wandleys Lane Landfill handled inert waste.
Local authority recorded landfill site	E	28		
Precision Engineers	E	52		Source not in hydraulic continuity with site.
Works	E	60		
Orchard	SE	60		
Temperature Monitoring Systems Manufacturers	E	88		
Northfield Farm	W	100		Land not utilised for arable farming.
Old gravel pit	E	100		Source not in hydraulic continuity with site.
Orchard	SE	110		
Orchard	SW	120		
Old gravel pit	S	160		
Metal recycling site	S	183		
Northfield Farm buildings	W	200		
Orchard	S	230		
Nursery	E	240		
Machinery – Industrial & Commercial	NE	243		

7.3 Potential Contaminants

To ascertain the chemicals associated with identified potential onsite and offsite sources, the Department of the Environment Industry Profiles have been reviewed. In cases where the DOE profiles have no, or limited information other sources have been reviewed detailing the processes involved in the activity carried out on-site.

Table 7.4 presents the range of possible contaminants associated with the onsite and off-site activities and sources identified following a review of historical maps and datasets.

Table 7.4 Potential Contaminants

Potential Contaminative Sources/Activities/Processes	Contaminants/Chemical Properties
None	-

7.4 Potential Exposure Receptors

The receptors to any potential contamination have been evaluated from our understanding of the current and planned land use of the site, an assessment of surrounding land uses and currently available information pertaining to the site.

The assessment for potential receptors is presented in Table 7.5.

Table 7.5 Potential Receptors

Potential Receptor	Present
Human Health	Future users of the site
	Construction workers on-site
	Service and maintenance workers
	Site neighbours and wider public
Groundwater/Controlled Waters	Surface Water
	Groundwater/Future Potable Water Supply
Buildings & Materials	Buildings and confined spaces
	Construction materials
	Services and Utilities (e.g drinking water pipes)
Ecosystems	Flora and fauna

7.5 Preliminary Conceptual Site Model and Risk Assessment

A preliminary risk assessment has been undertaken based on the proposed development. The assessment has been based on the likelihood of the presence of a pollutant linkage.

A pollutant linkage is the relationship between a contaminant source, a pathway and a receptor. Unless all three elements of a pollutant linkage are present, a risk is not considered to exist. Each of the three elements has been considered within Table 7.1 to Table 7.5. The preliminary conceptual site model and risk assessment is presented in Table 7.6. The classification tables on which the level of risk has been determined have been modified from 'Contaminated land risk assessment: A guide to good practice, 2001, CIRIA C552' and are presented in Appendix G.

Table 7.6 Preliminary Conceptual Site Model and Risk Assessment Methodology

Source (See Table 7.2 and Table 7.3)	Potential Contaminant (See Table 7.4)	Exposure Pathway (See Table 7.1)	Receptor (See Table 7.5)	Initial Assessment from Preliminary Investigation Report Information			Comments	Proposed Investigation
				Severity	Probability	Risk		
No credible sources identified.	None	Inhalation of dust	Site Workers/Site Maintenance	-	-	None	No potential risk as no pollution linkage has been established.	Implement discovery strategy during construction phase.
			End Users	-	-	None		
			Off-site Users	-	-	None		
	None	Inhalation of Vapour/gases (including Radon)	Site Workers/Site Maintenance	-	-	None		
			End Users	-	-	None		
			Off-site Users	-	-	None		
	None	Ingestion and absorption via direct contact	Site Workers/Site Maintenance	-	-	None		
			End Users	-	-	None		
	None	Migration via surface runoff	Surface Water	-	-	None		
		Migration in solution via groundwater	Surface Water	-	-	None		
			Shallow Aquifer	-	-	None		
			Deep Aquifer	-	-	None		
		Direct contact with construction material	Buried structures	-	-	None		
			Buried Services	-	-	None		
	None	Migration of gases via permeable soils	Site Workers/Site Maintenance	-	-	None		
			End Users	-	-	None		
			Off-site Users	-	-	None		
			Building and confined spaces	-	-	None		

Section 8 Recommendations

8.1 General

Based on the information obtained during the compilation of this Preliminary Investigation and the preliminary Conceptual Site Model, no risk of contamination has been identified as no pollutant linkage was established.

Any subsequent intrusive investigation may reveal additional on-site sources of contamination that were not identified in the Preliminary Investigation and Site Walkover. Any additional sources of contamination or unexpected ground conditions that may promote the migration of contamination must be included and assessed in terms of significance within an updated Conceptual Site Model.

8.2 UXO

In accordance with guidance presented in C681 'Unexploded Ordnance (UXO) A guide for the Construction Industry' a review has been undertaken of the historic maps which has indicated that the site is not in an area that is likely to have been subject to bombing, shelling or has had a military use.

Based on the assessment of the historical maps, it is considered that a specialist UXO risk assessment is not necessary for this site.

8.3 Proposed Further Site Works

An intrusive investigation with respect to site contamination is not considered necessary for this site.

8.4 Discovery Strategy

There may be areas of contamination not identified during the course of the investigation. Such occurrences may also be discovered during the demolition and construction phases for the redevelopment of the site.

Care should be taken during excavation works especially to investigate any soils which appear by eye (e.g. such as fibrous materials, large amounts of ash and unusual discolouration), odour (e.g. fuel, oil and chemical type odours or unusual odours such as sweet odours or fishy odours) or wellbeing (e.g. light headedness and/or nausea, burning of nasal passages and blistering or reddening of skin due to contact with soil) to be contaminated or of unusual and/or different character to standard soils or those analysed.

In the event of any discovery of potentially contaminated soils or materials, this discovery should be quarantined and reported to the most senior member of site staff or the designated responsible person at the site for action. The location, type and quantity must be recorded, and the Local Authority and a competent and appropriate third-party

Engineer/Environmental consultant notified immediately. An approval from the Local Authority must be sought prior to implementing any proposed mitigation action.

The discovery strategy must remain on-site at all times and must demonstrate a clear allocation of responsibility for reporting and dealing with contamination. A copy of the strategy must be placed on the health and safety notice board and /or displayed in a prominent area where all site staff are able to take note of and consult the document at any time. Any member of the workforce entering the site to undertake any excavation must be made aware of the potential to discover contamination and the discovery strategy.

**Figure 1 – Site Location Map**

Job Number
18158

Project
Land west of Fontwell Avenue, Eastergate,
Chichester, West Sussex, PO20 3RX

Reside Developments
Reside Developments

Date
February 2020

Appendix A Proposed Development Plans



NOTES:

Do Not Scale.

Report all discrepancies, errors and omissions.

Verify all dimensions on site before commencing any work on site or preparing shop drawings.

All materials, components and workmanship are to comply with the relevant British Standards, Codes of Practice, and appropriate manufacturers recommendations that from time to time shall apply.

For all specialist work, see relevant drawings.

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Rev	Date	Description	
Schedule of accommodation			
Private Plots			
1 Bed	2 Bed	3 Bed	4 Bed
	12,13,14,16,20,23	1,2,3,5,6,7,8,9,10,11,18,19,21,22,24,25,27,28,29	4,15,17,26
Affordable Plots			
1 Bed	2 Bed	3 Bed	4 Bed
36,37,38,39	31,32,33,35,41,42	30,34,40	
Private 29 units Affordable 13 units Total: 42 Units			

- Trees To Be Removed
- Root Protection Zones
- 5m Water main easement
- Parking space
- Visitors Parking space
- Bin Collection Point
- Site Boundary

Project Title

Proposed Residential Development
Fontwell Avenue
West Sussex

Drawing Description

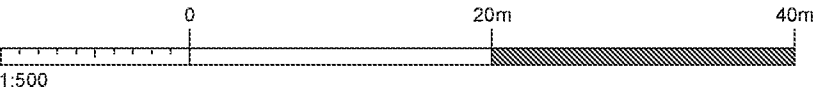
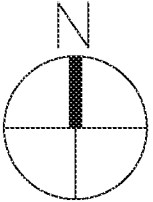
Site Block Plan

Scale	Drawn by
1:500 @ A1	AS
Date	Checked by
March 2020	CSS

CLAGUE ARCHITECTS

62 Burgate, Canterbury Kent CT1 2BH	01227 762060	
Kinsbourne Court, Luton Road, Harpden, Hertfordshire AL5 3BL	01582 765102	
8, Disney Street London SE1 1JF	0203 597 6112	
CANTERBURY	LONDON	HARPDEN

Drawing Number	Revision
29662A_100	P



Appendix B Country Series and Ordnance Survey Maps

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		
	Administrative County, County Borough or County of City		
	Municipal Borough, Urban or Rural District, Burgh or District Council		
	Borough, Burgh or County Constituency		
	Civil Parish		
	Boundary Post or Stone		Police Station
	Church		Post Office
	Club House		Public Convenience
	Fire Engine Station		Public House
	Foot Bridge		Signal Box
	Fountain		Spring
	Guide Post		Telephone Call Box
	Mile Post		Telephone Call Post
	Mile Stone		Well

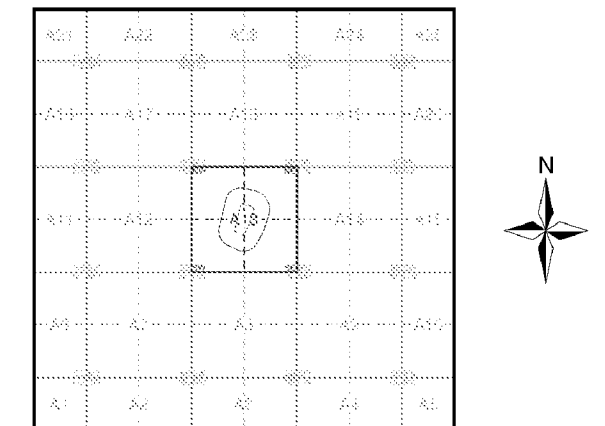
1:10,000 Raster Mapping

	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:10,560	1880	2
Sussex	1:10,560	1899	3
Sussex	1:10,560	1914	4
Sussex	1:10,560	1914	5
Sussex	1:10,560	1914	6
Sussex	1:10,560	1914	7
Historical Aerial Photography	1:10,560	1947 - 1949	8
Sussex	1:10,560	1951	9
Ordnance Survey Plan	1:10,000	1961 - 1962	10
Ordnance Survey Plan	1:10,000	1967	11
Ordnance Survey Plan	1:10,000	1970 - 1979	12
Ordnance Survey Plan	1:10,000	1979	13
Ordnance Survey Plan	1:10,000	1980	14
Ordnance Survey Plan	1:10,000	1992 - 1993	15
10K Raster Mapping	1:10,000	2000	16
10K Raster Mapping	1:10,000	2006	17
VectorMap Local	1:10,000	2019	18

Historical Map - Slice A



Order Details

Order Number: 231681923_1_1
Customer Ref: 18158
National Grid Reference: 494710, 106270
Slice: A
Site Area (Ha): 1.55
Search Buffer (m): 1000

Site Details

1 Northfields Farm Cottages, Fontwell Avenue, Eastergate,
CHICHESTER, PO20 3RX

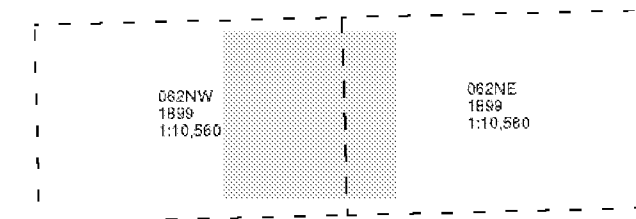
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Published 1899

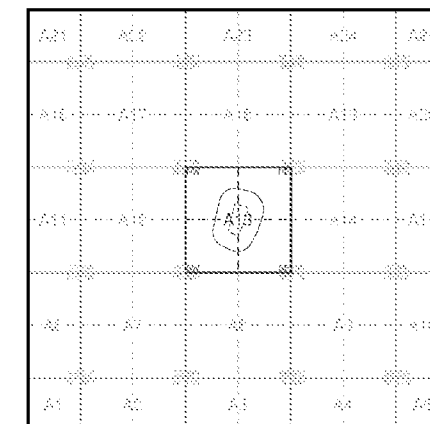
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Map Name(s) and Date(s)



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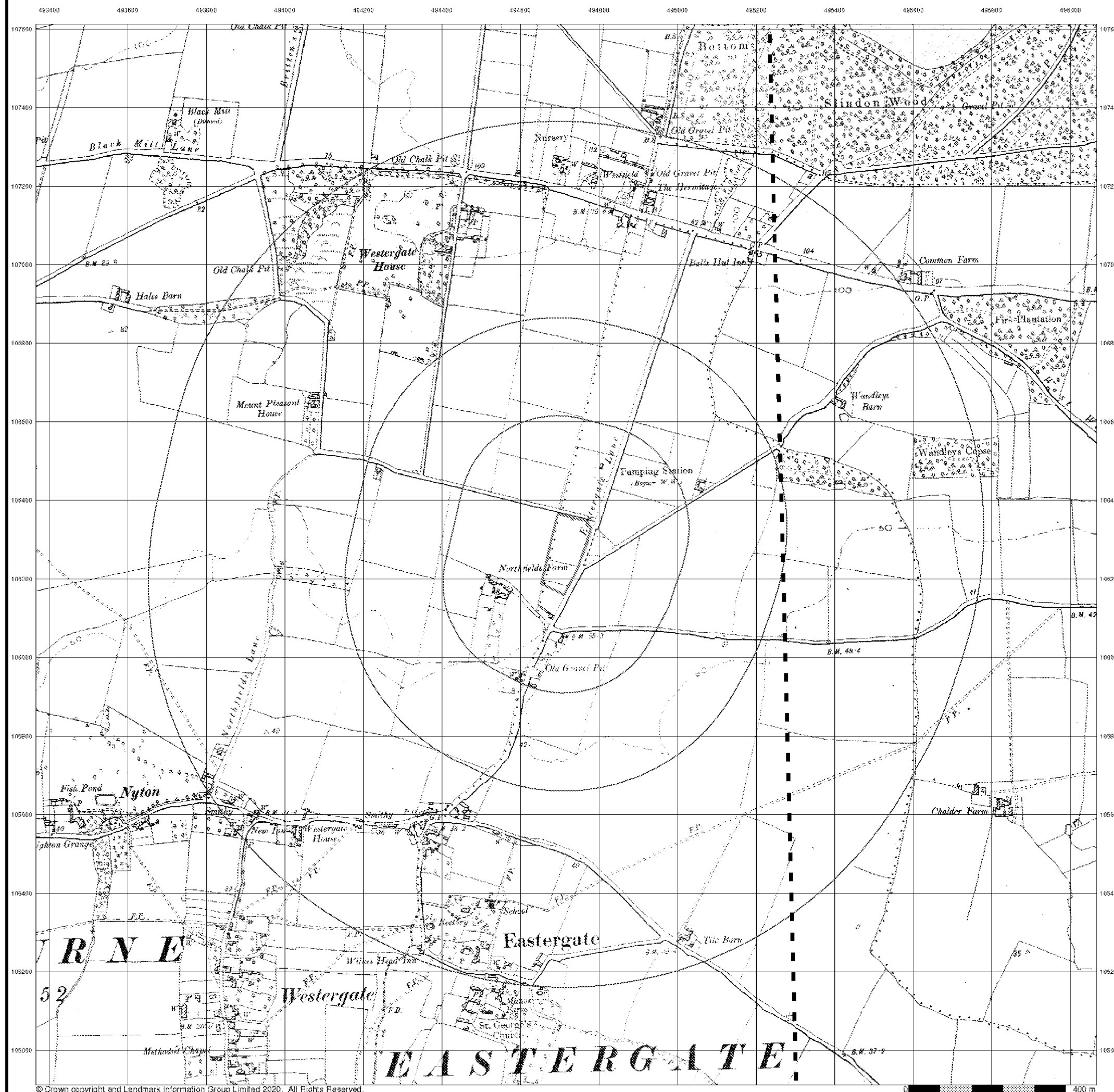


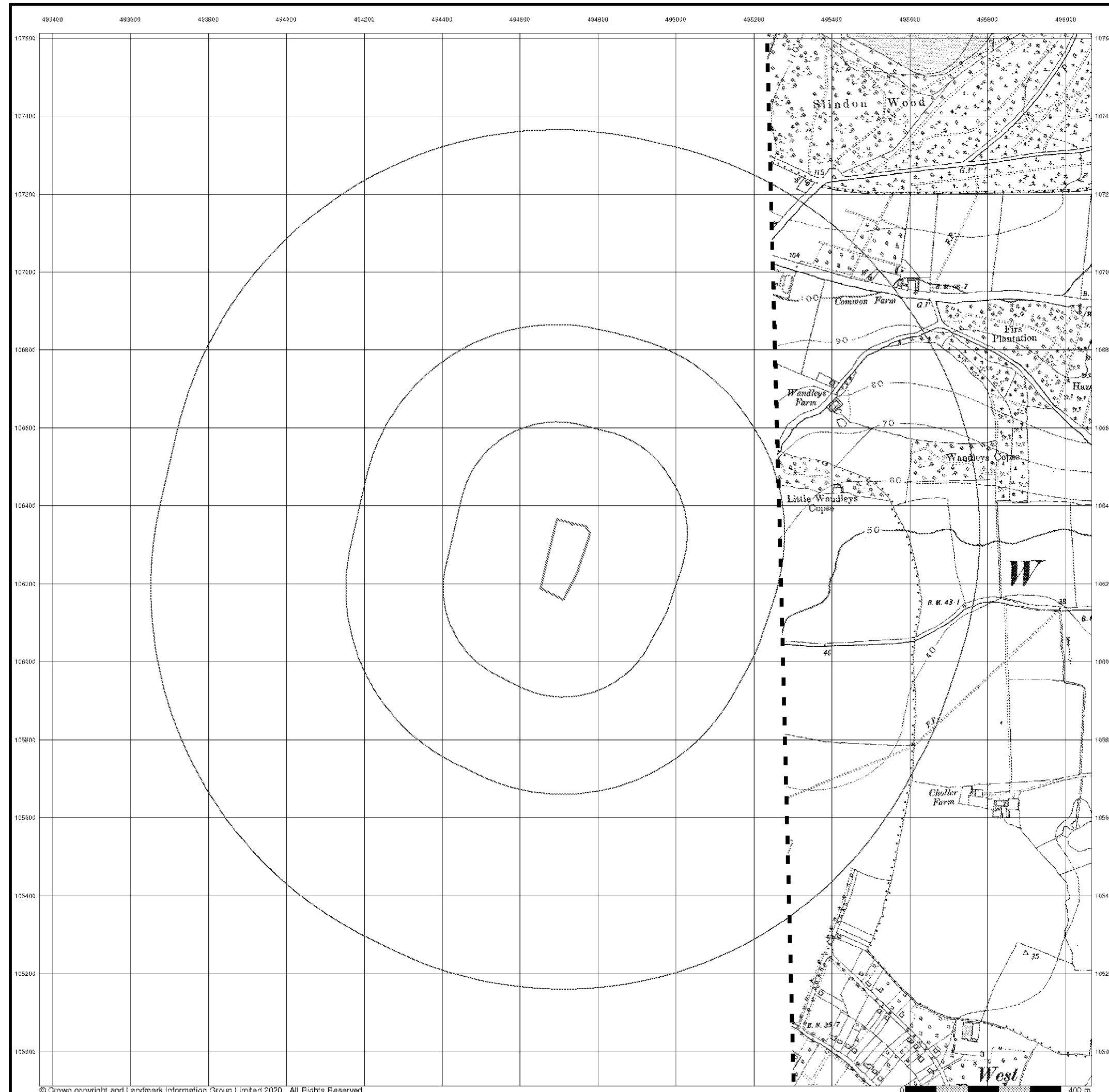
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Site Details

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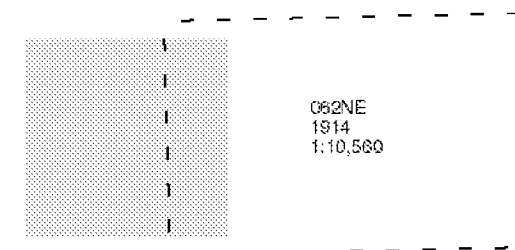
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Published 1914

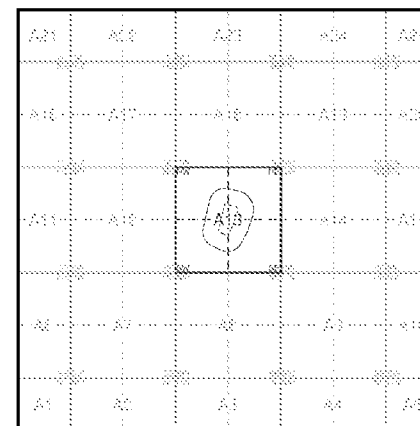
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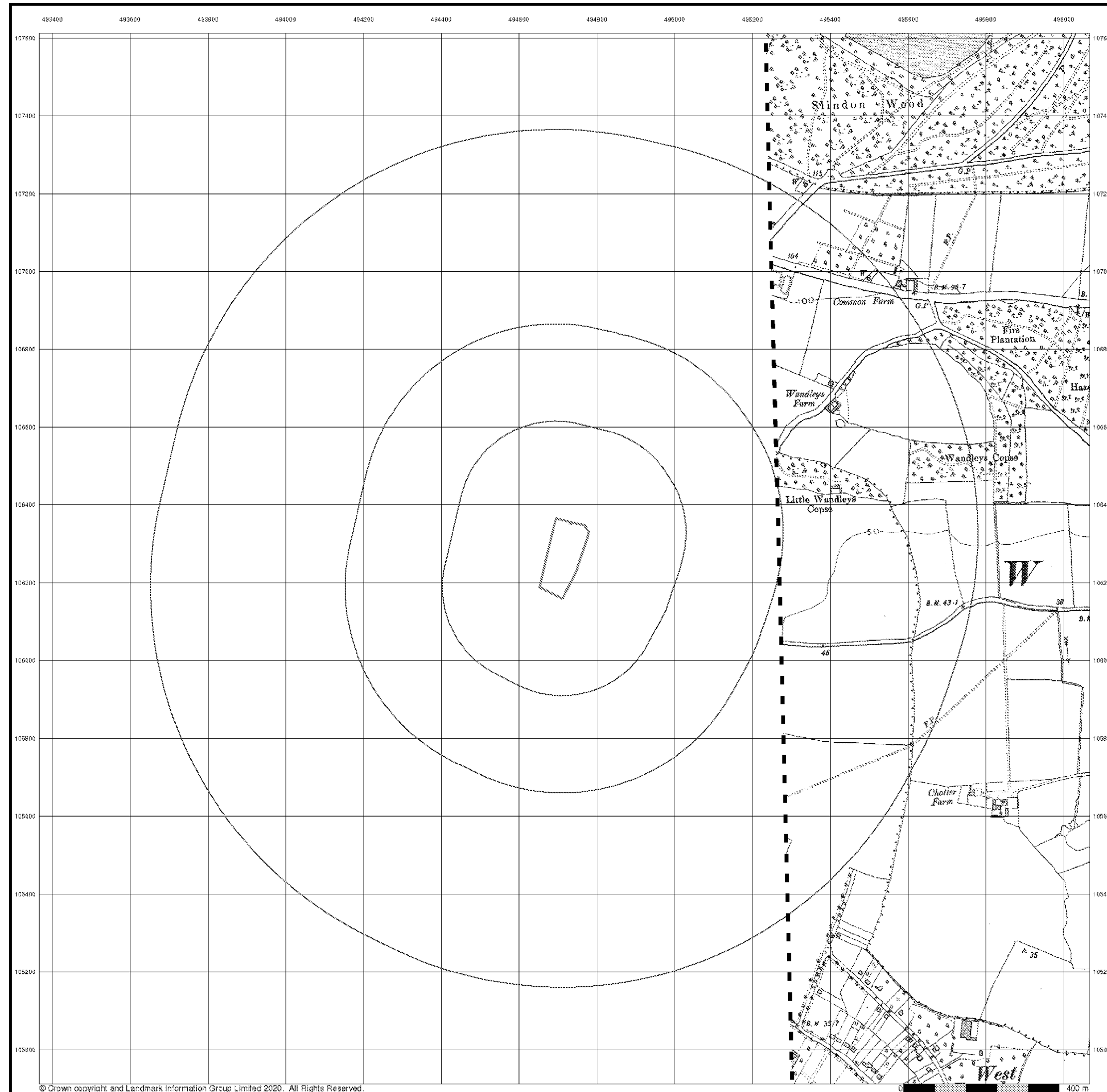
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1 Northfields Farm Cottages, Fontwell Avenue, Eastergate, CHICHESTER, PO20 3RX



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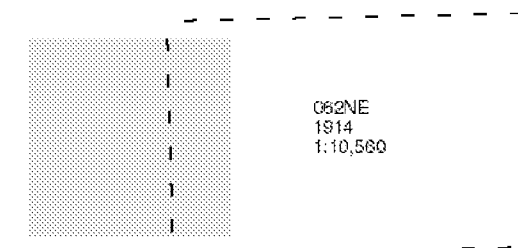
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Published 1914

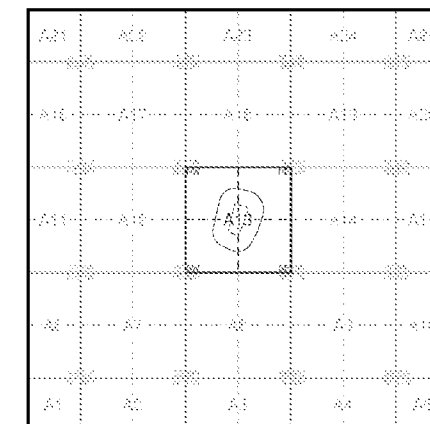
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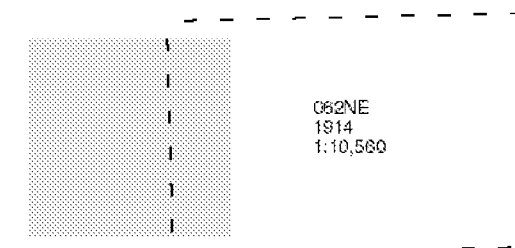
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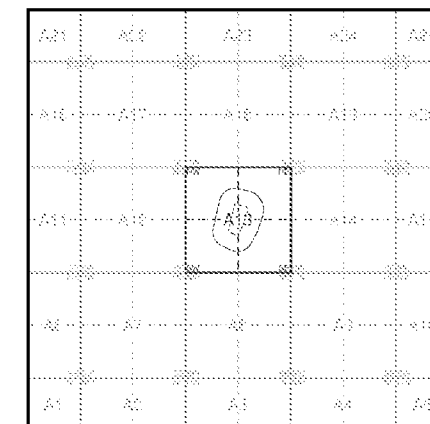
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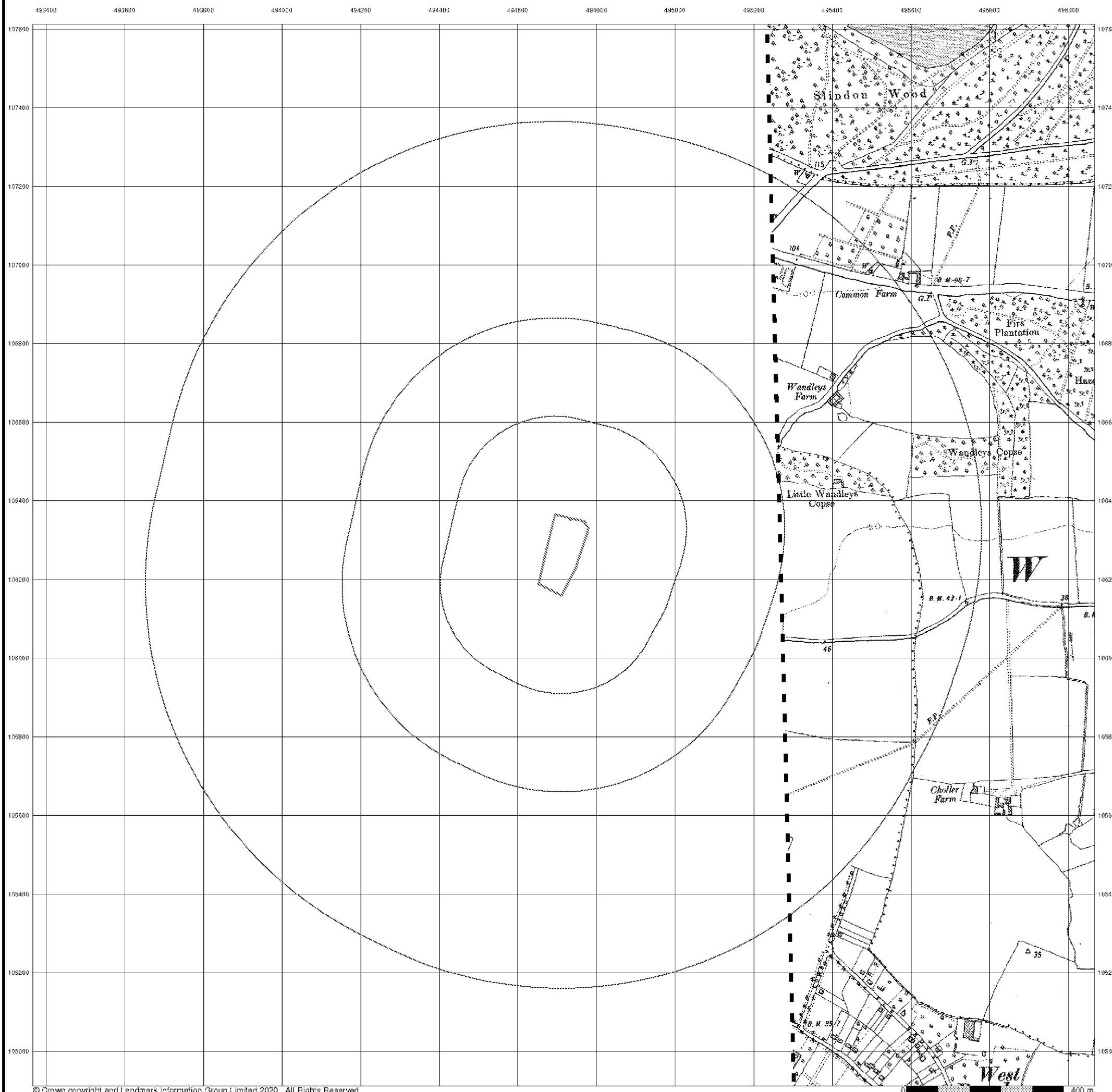


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Historical Aerial Photography
Published 1947 - 1949
Source map scale - 1:10,560

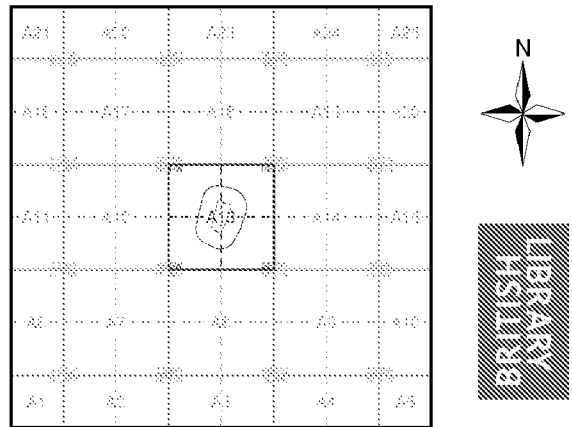
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

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Map Name(s) and Date(s)

SU90NW 1949 1:10,560	SU90NE 1947 1:10,560
SU90SW 1947 1:10,560	SU90SE 1947 1:10,560

Historical Aerial Photography - Slice A



Order Details

Order Number: 231681923_1_1
Customer Ref: 18158
National Grid Reference: 494710, 106270
Slice: A
Site Area (Ha): 1.55
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Web: www.environcheck.co.uk



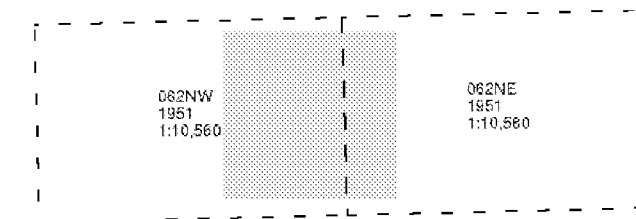
Sussex

Published 1951

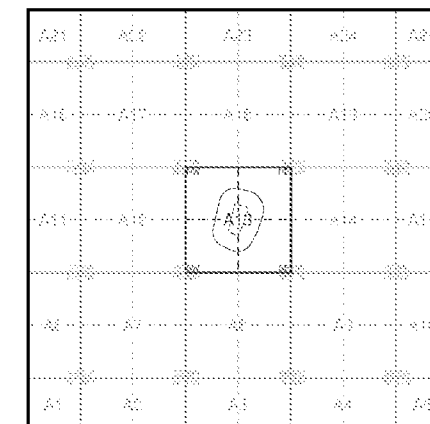
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Map Name(s) and Date(s)



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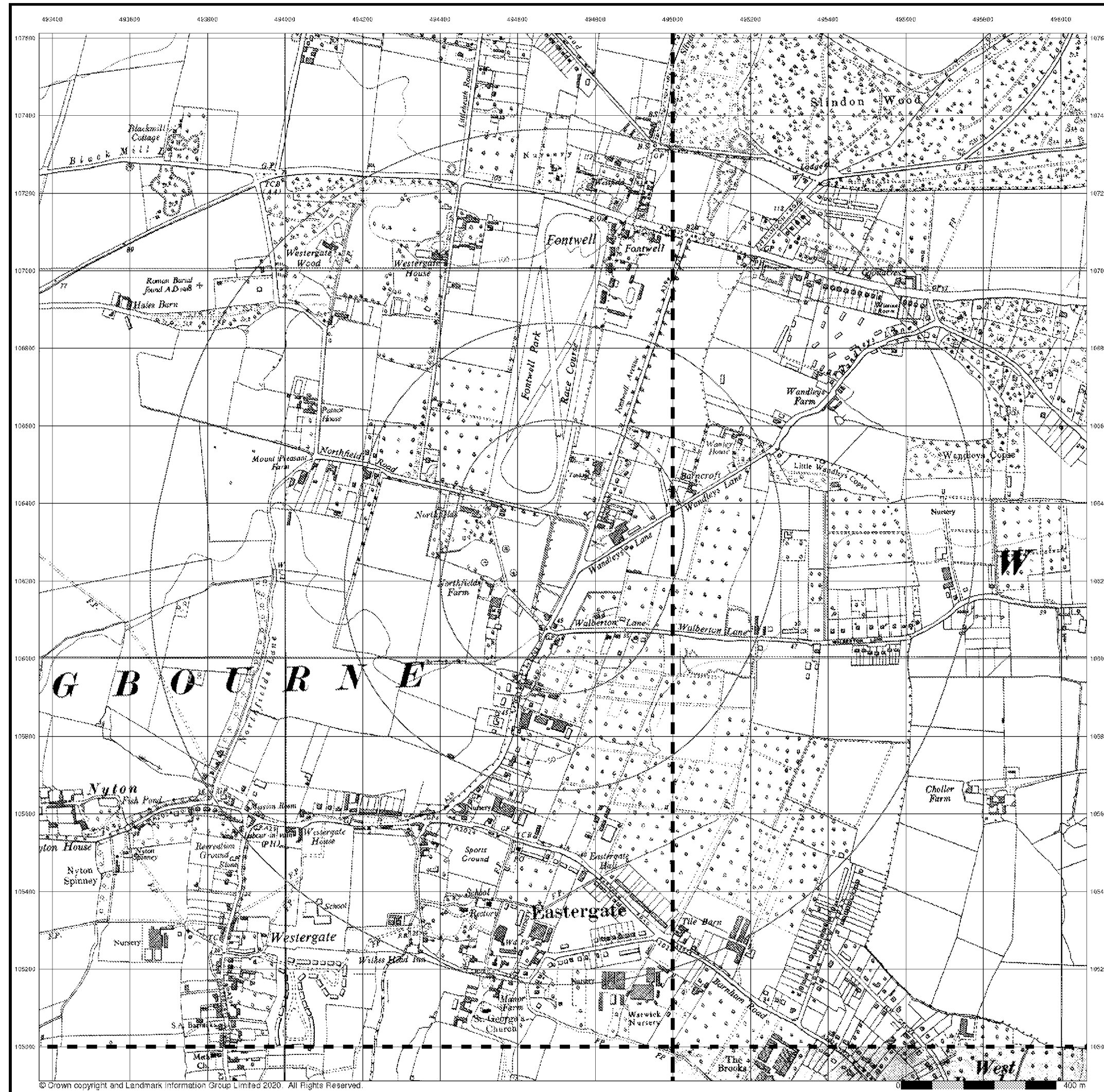


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Ordnance Survey Plan

Published 1961 - 1962

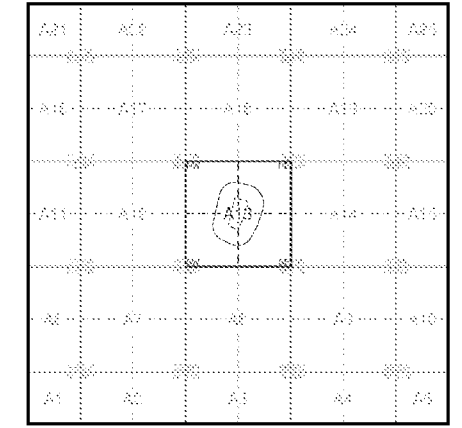
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

SU90NW	SU90NE
1961	1961
1:10,560	1:10,560
SU90SW	SU90SE
1961	1962
1:10,560	1:10,560

Historical Map - Slice A



Order Details

Order Number: 231681923_1_1
Customer Ref: 18158
National Grid Reference: 494710, 106270
Slice: A
Site Area (Ha): 1.55
Search Buffer (m): 1000

Site Details

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