



**PHASE 1 ENVIRONMENTAL SITE
ASSESSMENT REPORT**

**HOLBEACH FOOD ENTERPRISE
ZONE,
LAND OFF A151,
SPALDING,
PE12 7BF**

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Executive Summary

The preliminary environmental site assessment indicates that the site can be classified as moderate risk in terms of contamination due to the potential for the natural underlying strata to contain peat layers which may generate ground gases (i.e. methane and carbon dioxide). However, it is considered that this risk classification can be reduced to low through the incorporation of CS₂ gas protection measures in line with CIRIA RB17 'A Pragmatic Approach to Ground Gas Risk Assessment'. A remediation strategy and verification plan should be submitted to planning.

During site preparation works, if any unexpected visual or olfactory evidence of contamination is encountered, it is recommended that the material is removed and stockpiled on site and advice is sought from a suitably qualified person (Environmental Consultant) on how to deal with the material. Testing of the material will be necessary to identify whether it is suitable for re-use on site or if it will have to be taken off-site for disposal.

In addition, to ensure that they do not come into contact with contaminated soils and groundwater, it is recommended that workers wear appropriate personal protective equipment (PPE) and that suitable Health and Safety procedures be adopted to ensure that ingestion of contaminated soils and groundwater is avoided (e.g. by washing hands prior to eating, drinking and smoking).

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1 Introduction

1.1 Background

EnviroSolution Ltd was commissioned to undertake a Phase 1 Environmental Site Assessment at a site located at land off the A151 in Holbeach, Spalding. This report was undertaken to inform development plans for commercial type land use at the site.

1.2 Objectives

The objective of the preliminary environmental site assessment was:

1. To provide a summary of the environmental setting and historical land use of the site and immediate surrounding area.
2. To obtain information on the ground conditions present beneath the site.
3. To develop a conceptual site model and complete a generic quantitative risk assessment to identify any environmental risks and liabilities associated with ground conditions at the site.

1.3 Scope of Work

To achieve the objectives, the following scope of work was completed:

1. A desk-based study of the site comprising a review of available environmental information for the site such as geological and hydrogeological data and historical land use information.
2. A site walkover survey.
3. Assessment of potential hazards and constraints during construction and longer term.

This work has been devised to generally comply with the relevant principles and requirements of the following legislation and guidance:

- Part IIA of the Environmental Protection Act, 1990 and Section 57 of the Environmental Act 1995;
- Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, April 2012);
- National Planning Policy Framework (Ministry of Housing, Communities and Local Government, February 2019);
- BS10175: 2011 +A2:2017 "Investigation of Potentially Contaminated Sites- Code of Practice"; and
- Environment Agency (2020) Land Contamination Risk Management Report LCRM "How to assess and manage the risks from land contamination".

1.4 Information Sources

Historical Ordnance Survey maps have been obtained from historical records, ranging from 1879 to 2022. These maps provide high quality information on historical site use.

The British Geological Survey Geoindex database has been used to provide information on geo-environmental aspects of the site and the immediate surrounding area such as geological, hydrogeological and hydrological data.

The Environment Agency website (www.gov.uk/government/organisations/environment-agency) and Magic website (www.magic.gov.uk) was also used to obtain environmental information.

Industry Profiles produced by the Department of the Environment were utilised to obtain information on processes, materials and wastes associated with potential contaminative land uses near the site.

Readily available information sources have been used to produce this desk-based study. Additional information may be requested by the Local Planning Authority (e.g. local authority environmental information request).

2 The Site

2.1 Site Location

The site is located at land of the A151, Spalding, PE12 7BF. The British National Grid Reference for the site is GR: 534608 325640.

The site location is shown on **Figure 1** in **Appendix A**.

2.2 Site Description

The site description is aided by the completion of a site walkover undertaken by EnviroSolution on the 21st of January 2022. Site photographs are included in **Appendix B**.

The site is irregular in shape and has an approximate area of 2,800m².

The site is currently an undeveloped parcel of land previously used as part of an agricultural field.

A newly developed road leading west from the A151 forms the site access way and the southern boundary of the site. Significant development works are underway along this road and the adjacent roundabout.

The site is generally flat and level at an elevation of about 3.0m aOD. A small bund skirts the road to the south.

The site is bounded by agricultural fields to the north and west, residential dwellings to the south and the A151 to the east.

There are no petrol filling stations located within 250m of the site.

The existing site plan is shown on **Figure 2** which is included in **Appendix A**.

2.3 Development Proposals

It is understood that the development proposals comprise the construction of a new electrical contractors' facility featuring a central warehouse, a car park to the east and a concrete yard to the west.

The development proposal is shown in **Figure 3** in **Appendix A**.

2.4 Site History

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area is

summarised in Table 1. Copies of the historical OS maps are included in **Appendix C**. A search buffer of 250m has been used.

Table 1 - Historic Mapping Review

Date	Scale	On Site	Off Site
1888	1:2,500	The site is undeveloped and lies within an agricultural field.	The surrounding area is largely undeveloped open fields. Pump 10m north of the site. Hedgerow forms the western boundary of the site.
1904	1:2,500	No significant change.	No significant change.
1931	1:2,500	No significant change.	Farmhouse built 190m southeast of the site.
1951	1:10,560	No significant change.	No significant change.
1969	1:2,500	No significant change.	Pump no longer marked on the map.
1991	1:2,500	No significant change.	A151 built 190m east of the site.
2000	1:10,000	No significant change.	No significant change.
2022	1:2,500	No significant change.	Residential development 70m south of the site. Development of A151 directly south of the site including a roundabout 190m east of the site.

3 Environmental Setting

3.1 Geology

Geological maps of the area indicate that the site is directly underlain by tidal flat deposits of clay and silt from the Holocene epoch. This consists of soft silty clay, with layers of sand, gravel and peat.

The underlying bedrock consists of the West Walton Formation. The West Walton Formation generally consists of calcareous silty mudstone with subordinate sandstones and limestone.

There are no records of known geological faults located within a 1km radius of the site.

A copy of the geological maps is included in **Appendix D**.

3.2 Radon

The site lies within the lowest band of radon potential where it is estimated that less than 1% of homes are above the action level (low probability). Radon protection measures are therefore not considered necessary for this development.

3.3 Coal Mining Activity

The site does not fall within a coal mining area described as having minable coal deposits or in an area with a historic coal mining legacy. As such, this site is not considered to be at risk from coal mining related hazards.

3.4 Hydrogeology

The superficial tidal flat deposits are considered unproductive strata. This is geological strata with low permeability that have negligible significance for water supply or river base flow.

The underlying bedrock is also considered unproductive strata, described as above.

The site is not located within a groundwater source protection zone (SPZ) and there are no records of groundwater abstraction licences held within a 1km radius of the site.

A copy of the hydrogeological maps is included in **Appendix E**.

3.5 Hydrology

Whaplode River is located 810m west of the site boundary.

No minor surface water features have been identified within a 250m radius of the site.

3.6 Flood Risk

The site is in an area designated 'Flood Zone 3', an area with a high probability of flooding.

Areas within flood zone 3 have been shown to be at a 1% or greater probability of flooding from rivers or 0.5% or greater probability of flooding from the sea

A copy of the flood risk maps is included in **Appendix F**.

3.7 Waste Management Facilities

There is a single record of a historic landfill site located within a 1km radius of the plot. The Main Road landfill is located 690m south of the site. No information is held on the dates of operation, or the type of waste stored there.

There are no records of currently authorised landfill sites or sites operating under environmental permit for waste operations located within a 1kmr radius of the site.

A copy of the landfill map is included in **Appendix G**.

3.8 Environmental Permits, Incidents and Registers

There are several records of sites located within a 1km radius of the site operating under environmental permits for discharges to water and groundwater. The nearest is held by Frontier Agriculture for farm use.

There are no records of pollution incidents having occurred within a 1km radius of the site.

3.9 Designated Environmentally Sensitive Sites

There is a single record of a designated environmentally sensitive site located within a 1km radius of the site boundary. The site lies within a Nitrate Vulnerable Zone.

A copy of the environmental designation map is included in **Appendix H**.

4 Preliminary Conceptual Site Model

4.1 Introduction

In order to assess the environmental risks present, a preliminary conceptual model has been developed for the site. This model has been developed using best practice guidelines in conjunction with the current assessment framework taking into account the development proposals. This preliminary conceptual model is based on the gathered desk-based information (e.g. historical OS data and data sourced from the EA, Geoindex and Magic databases).

The conceptual site model is a representation of the hypothesised relationships between sources, pathways and receptors which allows the identification of potential pollutant linkages and whether these linkages have the potential to comprise significant harm and/or pollution of controlled waters in relation to the site. This model comprises three elements:

Source – the key pollutant hazards associated with the site

Receptor – the key targets at risk from the sources

Pathway – the means by which the contaminant can cause harm to the receptor

If all three elements are present, then a potential pollutant linkage exists, and this may require further assessment.

4.2 Potential Contamination Sources

The site has historically been used as part of an agricultural field until it has recently become disused. It is considered unlikely that there will be ground contamination present at the site associated with this land use.

No off-site sources of contamination have been identified.

Geological mapping shows that the site is directly underlain by tidal flat deposits. These deposits could contain peat layers which could generate ground gases (i.e. methane and carbon dioxide).

4.3 Receptors

The potential receptors considered to be at risk from soil and groundwater contamination associated with the site are summarised in Table 2 below:

Table 2 - Receptor Description

Receptor	Details
Human (On Site)	- Construction workers - Future site users

Receptor	Details
	- Site visitors
Human (Off Site)	- Adjacent site users
Controlled Waters	- Whaplode River
Building/ construction materials	- Foundations and buried services

4.4 Pathways

The potential exposure pathways linking contamination with the receptors identified above are summarised in Table 3 below:

Table 3 - Exposure Pathways Summary

Receptor	Details of Exposure Pathway
Human (on-site)	- Direct ingestion of contaminated soil/groundwater - Dermal contact with soil/groundwater - Inhalation of gases and vapours
Human (off-site)	- Inhalation of fibres and particulates - Inhalation of migrating gases and vapours
Controlled waters	- Vertical and lateral migration of dissolved phase contaminants via preferential pathways to groundwater aquifers - Direct surface water run-off to surface water features
Building/construction	- Buried materials/services - Contact with contaminated soil and/or groundwater

4.5 Potential Pollution Linkages

4.5.1 Human Health

It is understood that the development proposals comprise the construction of a new electrical contractors' facility featuring a central warehouse, a car park to the east and a concrete yard to the west. Small areas of soft landscaping are proposed. This is considered to be a non-sensitive end use.

The presence of buildings and hardstanding would eliminate the risk of exposure, via the dermal contact and ingestion pathways to future site users to any ground contamination that may remain following development.

There could be a potential risk of exposure to any ground contamination that remains following redevelopment in the proposed areas of soft landscaping (i.e. gardens), to future site users, via all possible exposure pathways.

Any ground gases (i.e. methane and carbon dioxide) that are present within the soils beneath the site could potentially ingress into the houses through preferential pathways (e.g. service entry points). Therefore, there would be a risk of exposure via inhalation to future site users.

There is the potential for construction workers and adjacent land users to be exposed to soil and groundwater contamination during site redevelopment. However, the use of appropriate PPE and the adoption of suitable Health and Safety methods will help to reduce the risks posed to human health during this work.

4.6 Controlled Waters

The site is directly underlain by tidal flat deposits which are generally of low permeability and are designated as an Unproductive Aquifer. The tidal flat deposits will act as a barrier, preventing the migration of any contaminants to, or from the site. Additionally, the underlying bedrock aquifer is also designated as Unproductive.

The site is not located within a groundwater source protection zone (SPZ) and there are no records of groundwater abstraction licences held within a 1km radius of the site.

The Whaplode River is considered to be at a sufficient distance (i.e. >250m) from the site to be unaffected by any potential contamination present in the ground beneath the site.

Overall, the risk of impact from any contamination that may be present in the ground beneath the site to the identified controlled water receptors is considered to be negligible

4.7 Building/Construction Materials/Buried Services

The presence of any soil and groundwater contaminants beneath the site could potentially impact on construction materials for the new development, such as below ground structures and services. Concrete foundations are particularly sensitive to aggressive ground conditions, i.e. sulphate attack.

If ground gases and vapour are present in the soil beneath the site, then there would be the potential risk of ingress into the new properties which could present a risk of explosion.

4.8 Preliminary Hazard Assessment

A preliminary hazard assessment is presented in Table 4. The preliminary hazard assessment is a qualitative assessment of the risks posed by each potential pollutant linkage described above and is used to identify the requirement for additional work (e.g. intrusive ground investigation).

Table 4 – Preliminary Hazard Assessment

Source 1	Pathway	Receptor	Likelihood	Effect	Risk	Assessment
Contaminated soil	Ingestion (via soil dust), inhalation (via soil dust and vapours), ingestion through dirty hands, dermal contact with soil/water.	Future site users Adjacent site users Construction workers	1	4	Low	No source potential identified.
Contaminated soil groundwater	Direct contact	Buildings/ services	1	3	Low	No source potential identified.
Contaminated groundwater	Downward or lateral migration	Whaplode River	1	3	Low	No controlled water receptors identified.
Ground gas / vapours	Inhalation, ingress into buildings	Buildings / services Future site users Adjacent site users Construction workers	2	4	Moderate	Ground gas source identified from potential peat deposits within the natural superficial strata beneath the site. It is considered that this can be readily mitigated through the incorporation of CS2 gas protection measures in line with CIRIA RB17 'A Pragmatic Approach to Ground Gas Risk Assessment'.

Using Risk Matrix (Table 5) Degree of Risk (R) = Likelihood (L) x Effect (E)

Table 5 - Risk Matrix, Degree of Risk (R) = Likelihood (L) x Effect (E)

Likelihood	Description	Probability	Effect (E)	Description
5	Almost certain	>70%		
4	Probable	50-70%	4	Severe
3	Likely	30-50%	3	Medium
2	Unlikely	10-30%	2	Mild
1	Negligible	<10%	1	Minor
Risk (R)	Risk Level	Action		
1-5	Low	None required		
6-10	Moderate	Further assessment via Phase 2 intrusive ground investigation.		
>10	High	Further assessment via Phase 2 intrusive ground investigation.		

5 Conclusions and Recommendations

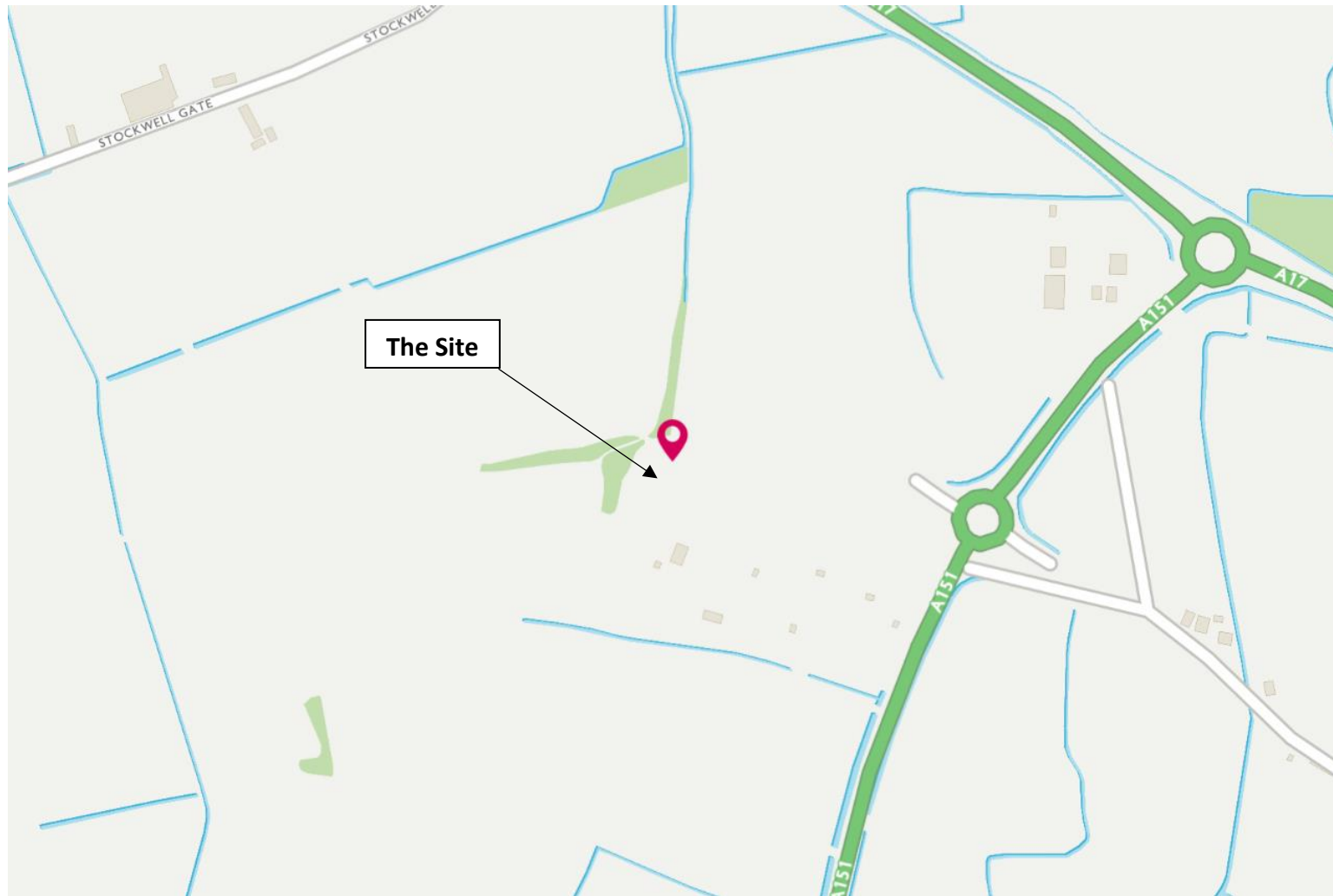
The preliminary environmental site assessment indicates that the site can be classified as moderate risk in terms of contamination due to the potential for the natural underlying strata to contain peat layers which may generate ground gases (i.e. methane and carbon dioxide). However, it is considered that this risk classification can be reduced to low through the incorporation of CS₂ gas protection measures in line with CIRIA RB17 'A Pragmatic Approach to Ground Gas Risk Assessment'. A remediation strategy and verification plan should be submitted to planning.

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APPENDICES

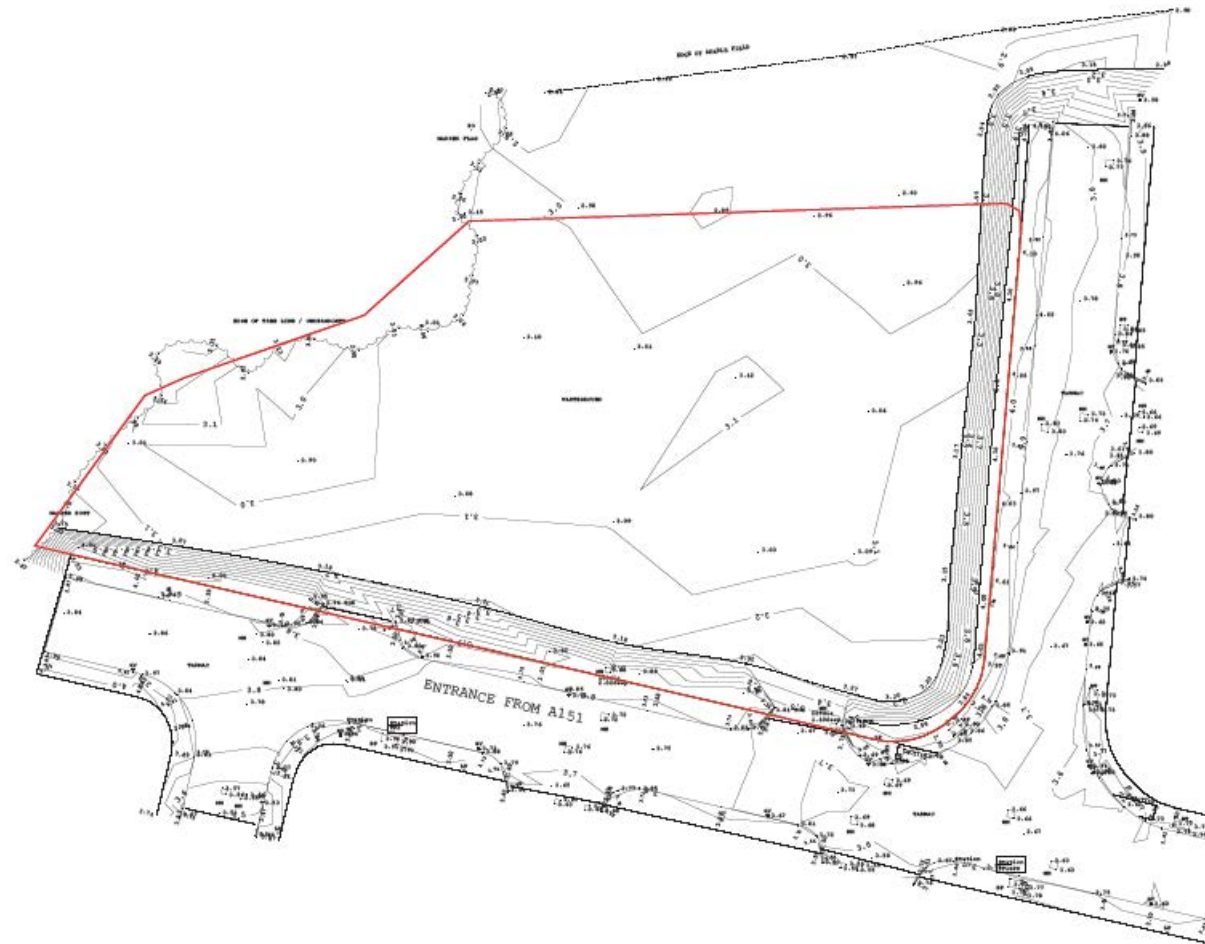
Appendix A – Site Location and Site Plan



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Site Location Map

Figure 1



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Existing Site Plan

Figure 2



Appendix B – Site Photographs



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View looking south towards the site from the A17



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Access track from Hungerdike Gate



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View of site looking west from A151

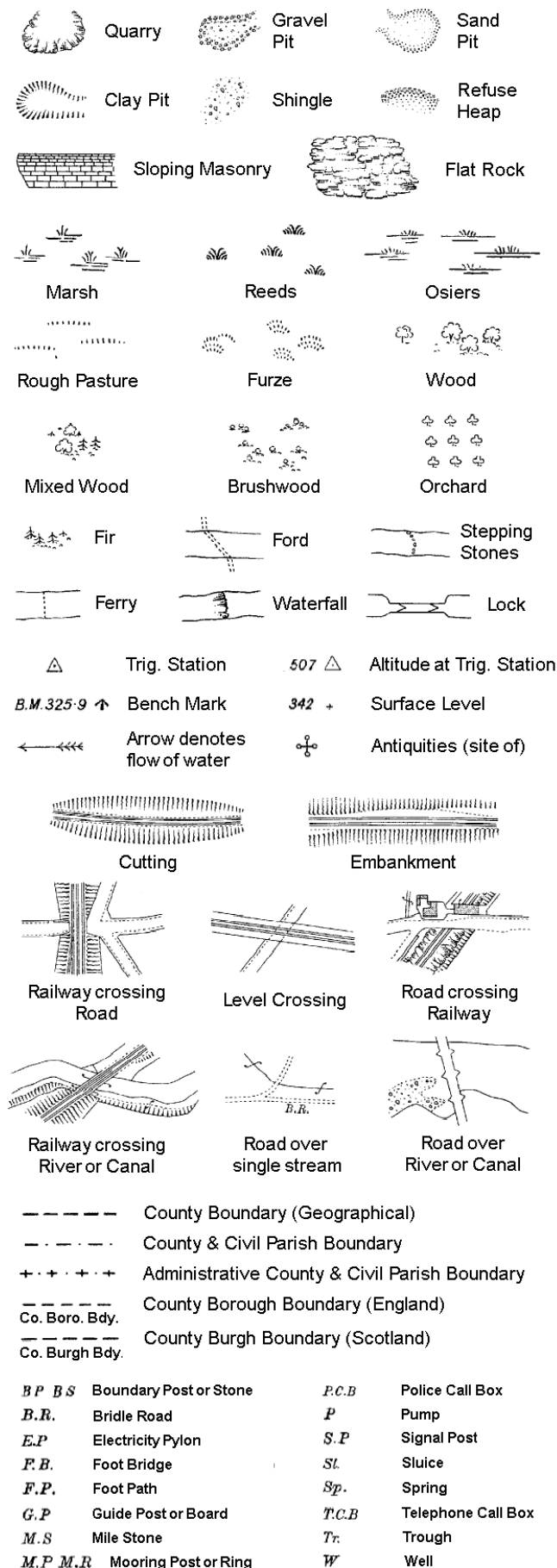


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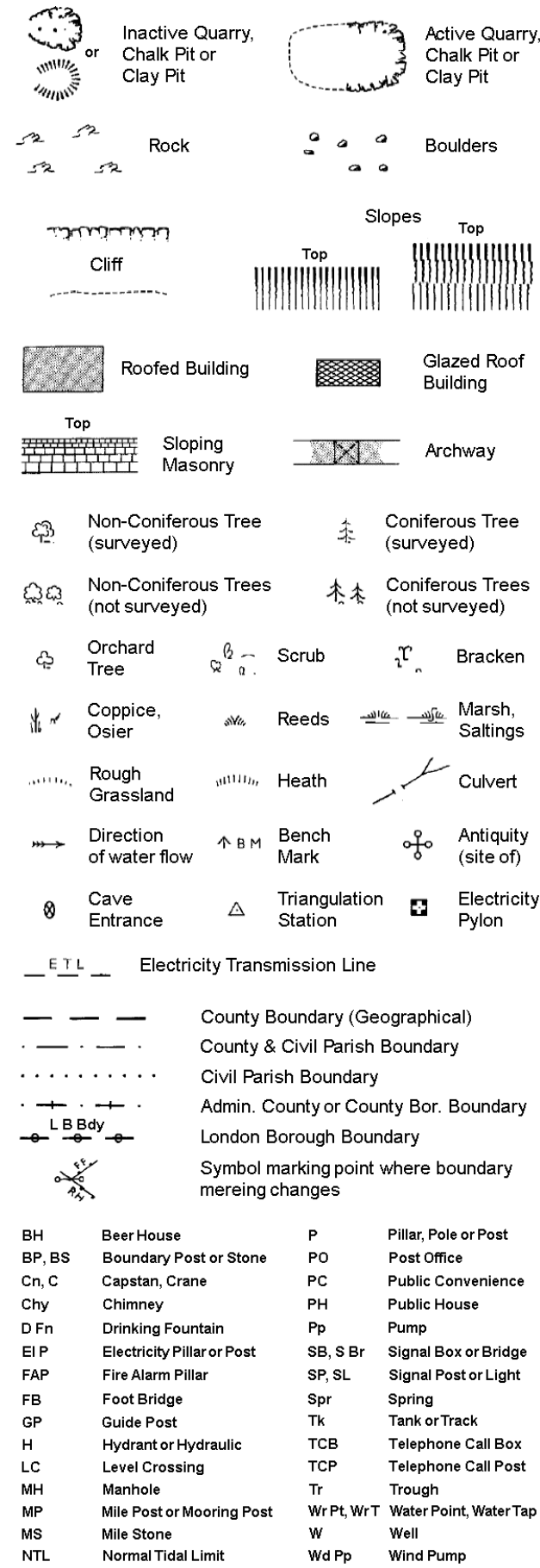
Appendix C - Historical Maps

Historical Mapping Legends

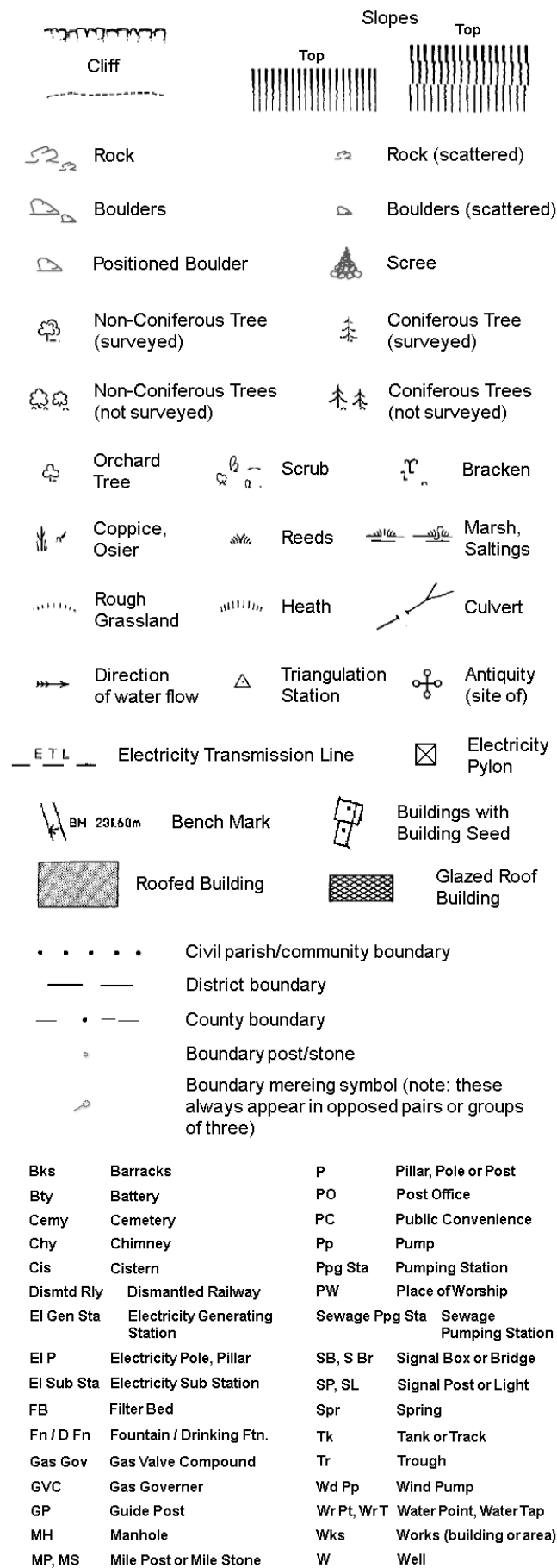
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



Large-Scale National Grid Data 1:2,500 and 1:1,250



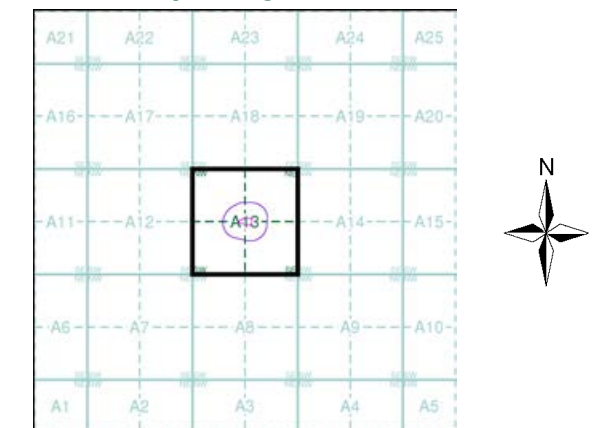
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Lincolnshire	1:2,500	1888	2
Lincolnshire	1:2,500	1904	3
Lincolnshire	1:2,500	1931	4
Ordnance Survey Plan	1:2,500	1969	5
Additional SIMs	1:2,500	1991	6
Large-Scale National Grid Data	1:2,500	1995	7

Historical Map - Segment A13



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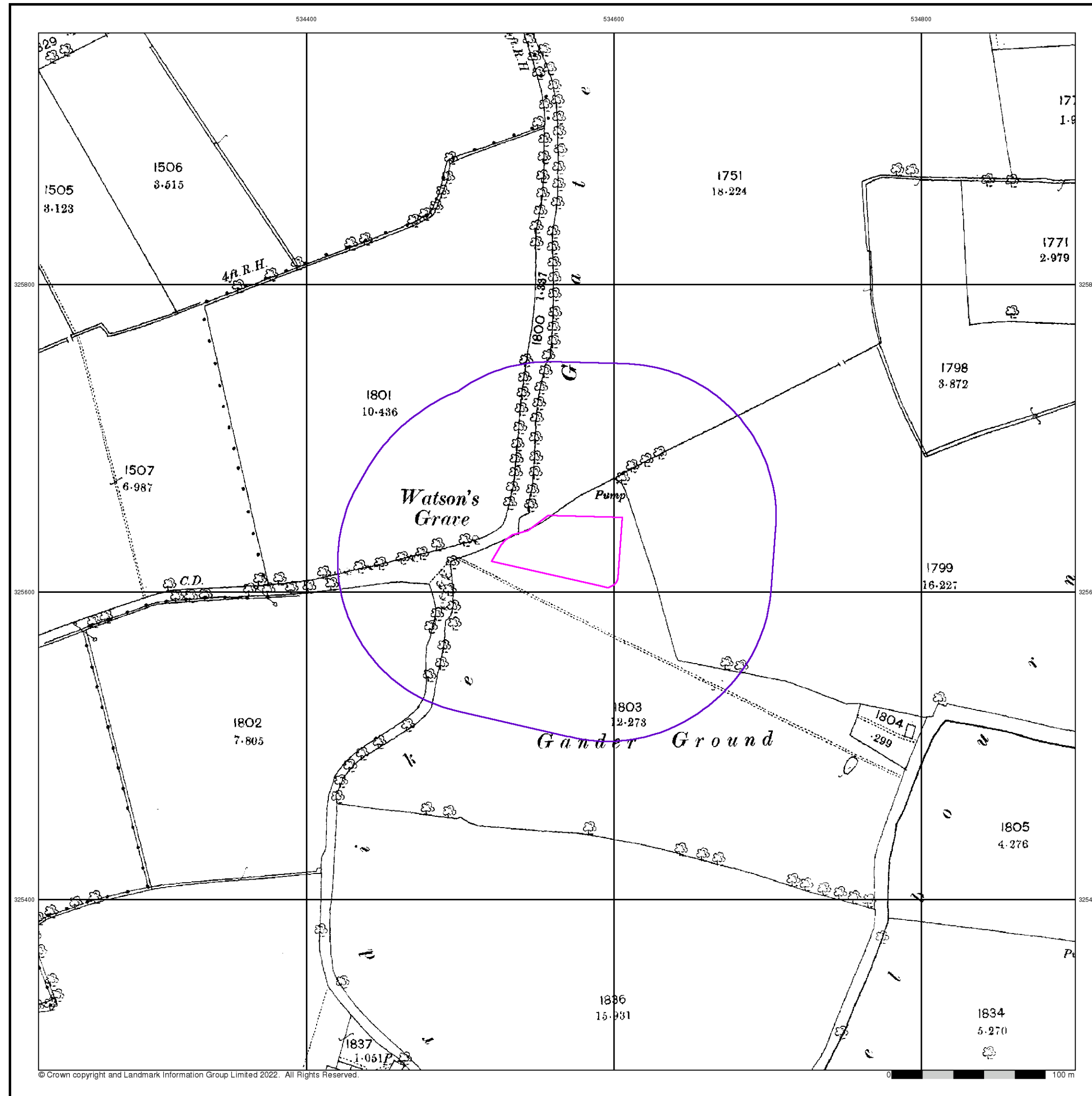
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Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 100

Site Details

Frontier Agriculture Ltd, Welbourne Lane South, Holbeach, SPALDING, PE12 7BF

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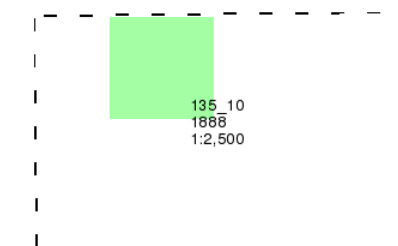
Lincolnshire

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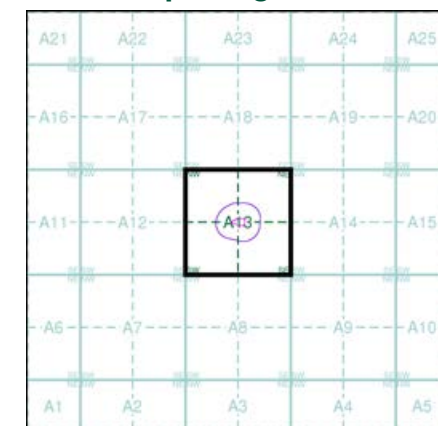
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A13

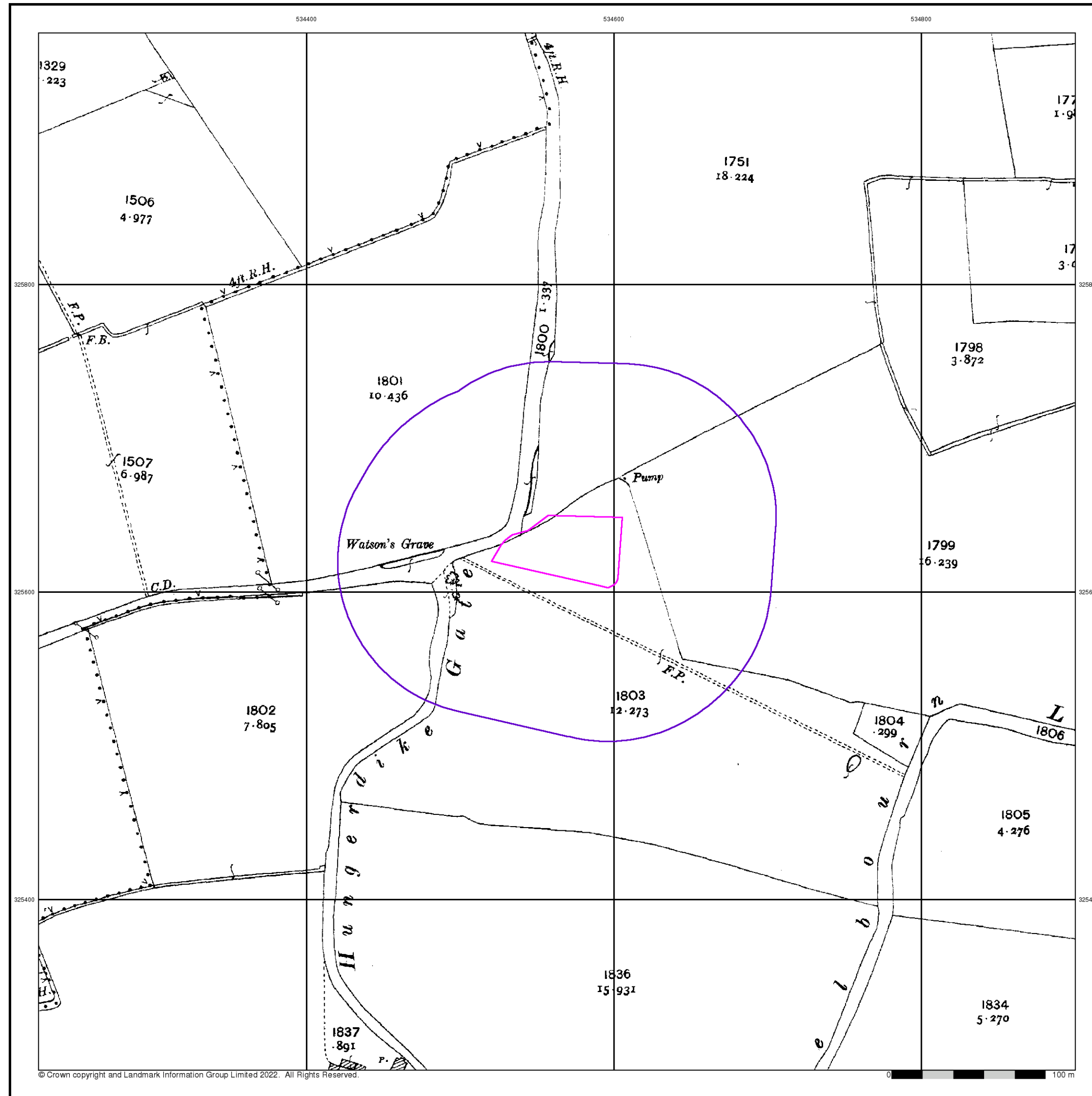


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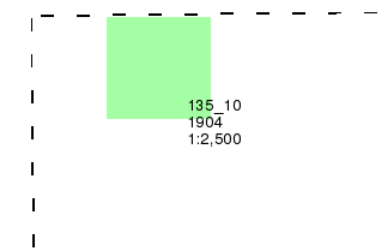
Lincolnshire

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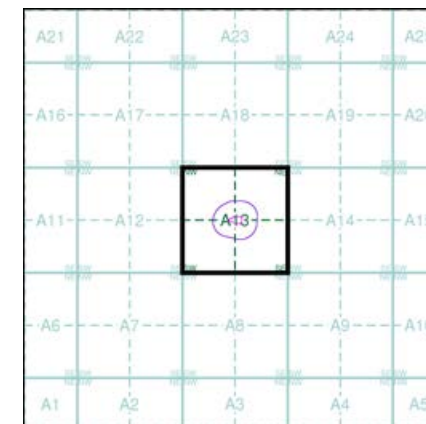
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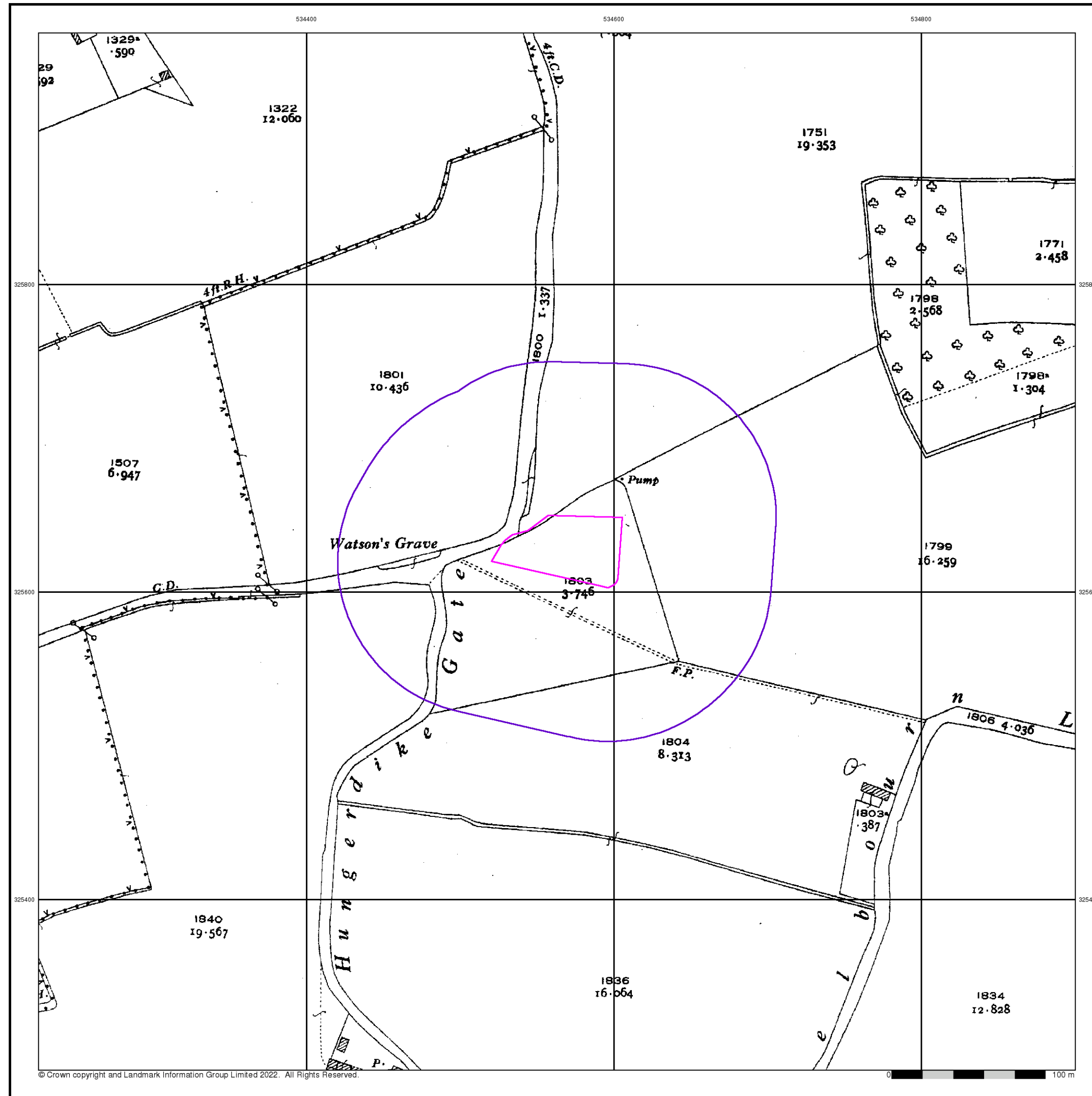
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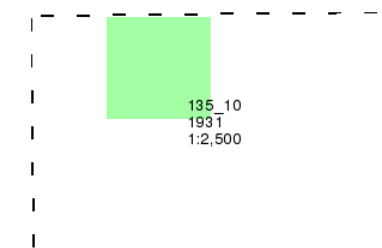
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Published 1931

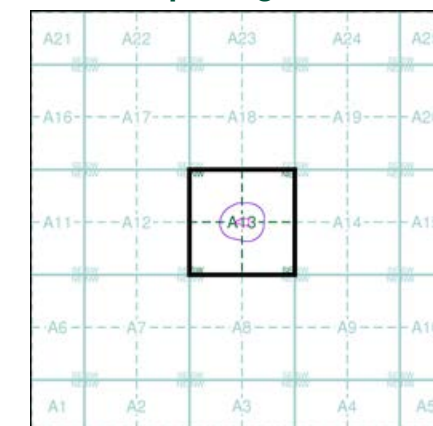
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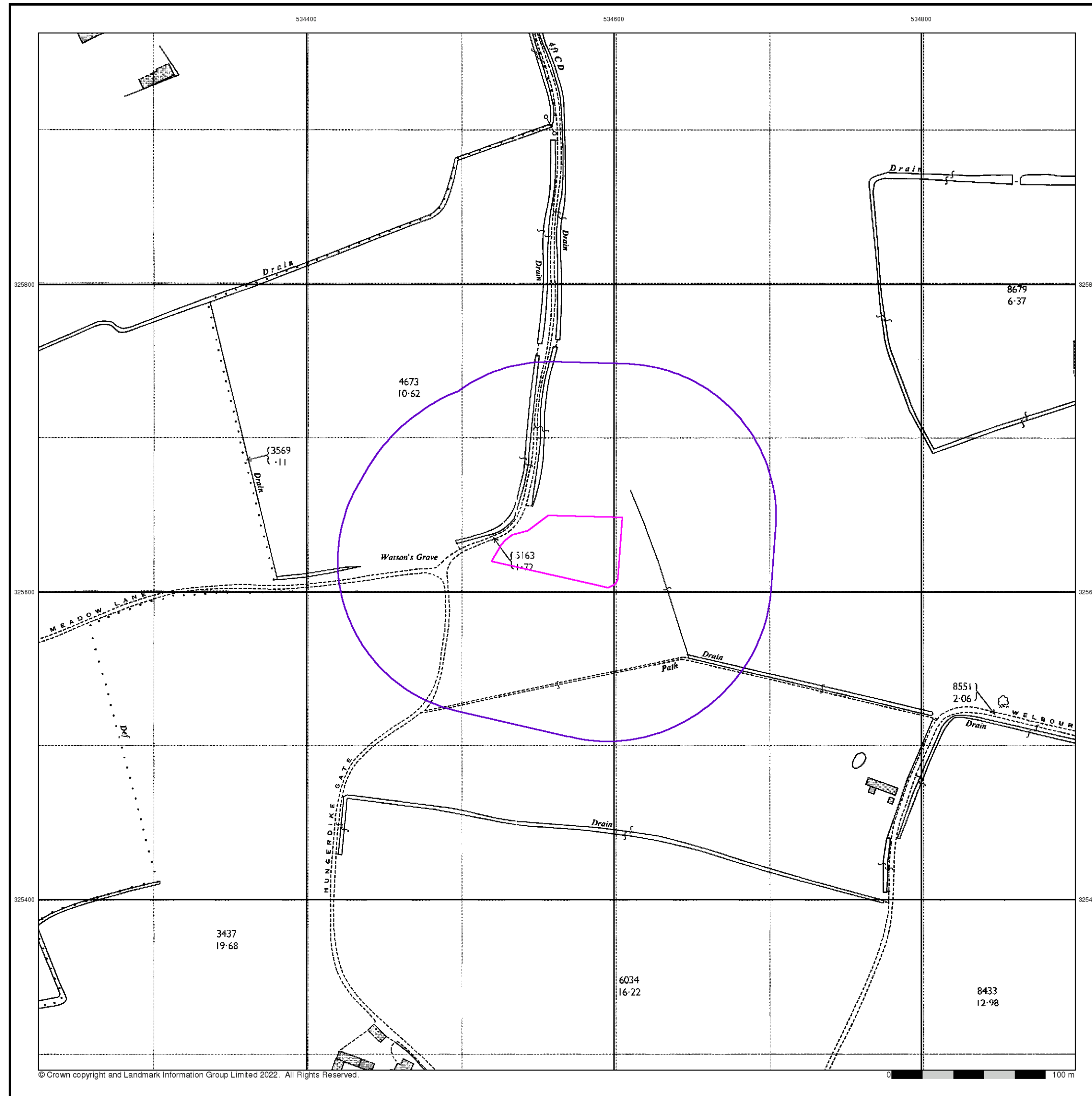
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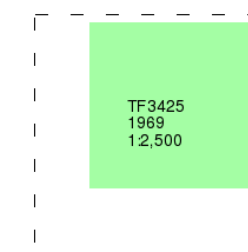
Ordnance Survey Plan

Published 1969

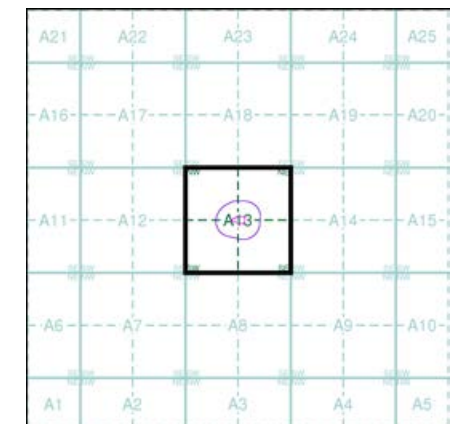
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Site Details

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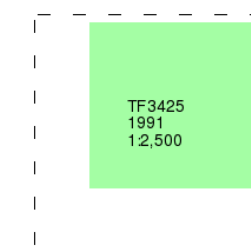
Additional SIMs

Published 1991

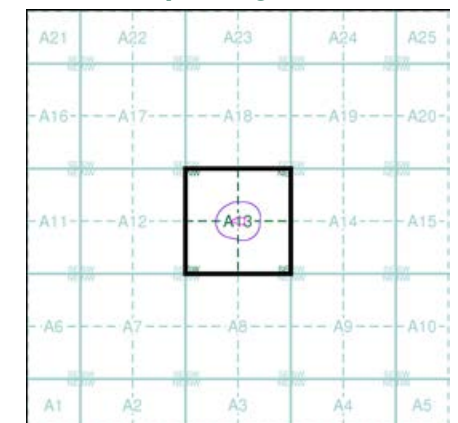
Source map scale - 1:2,500

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13

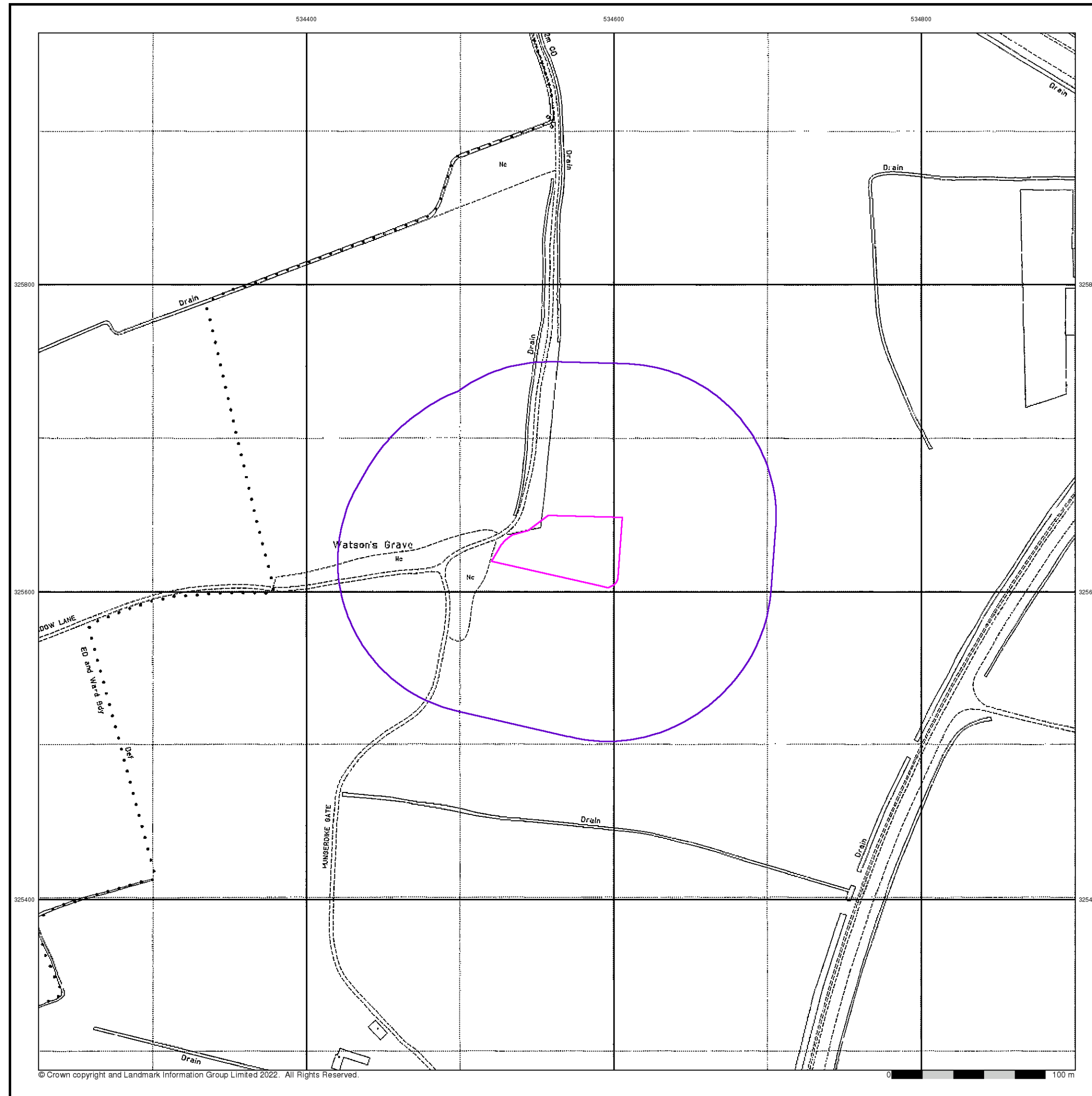


Order Details

Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 100

Site Details

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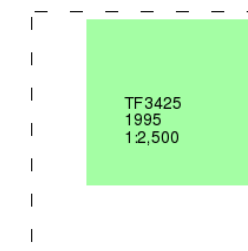
Large-Scale National Grid Data

Published 1995

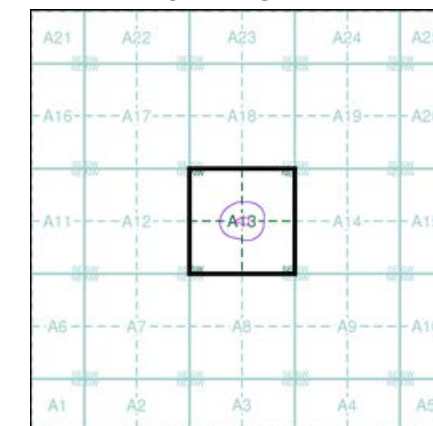
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 100

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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		
	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		
	BP, BS 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

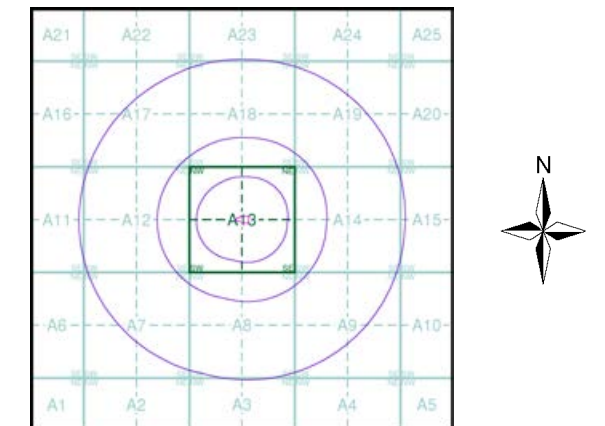
1:10,000 Raster Mapping

	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
Lincolnshire	1:10,560	1887	2
Lincolnshire	1:10,560	1906	3
Lincolnshire	1:10,560	1906	4
Lincolnshire	1:10,560	1931 - 1932	5
Lincolnshire	1:10,560	1931	6
Lincolnshire	1:10,560	1938 - 1952	7
Lincolnshire	1:10,560	1951	8
Ordnance Survey Plan	1:10,000	1956 - 1959	9
Ordnance Survey Plan	1:10,000	1970 - 1977	10
Ordnance Survey Plan	1:10,000	1992	11
10K Raster Mapping	1:10,000	2000	12
Street View	Variable		13

Historical Map - Slice A

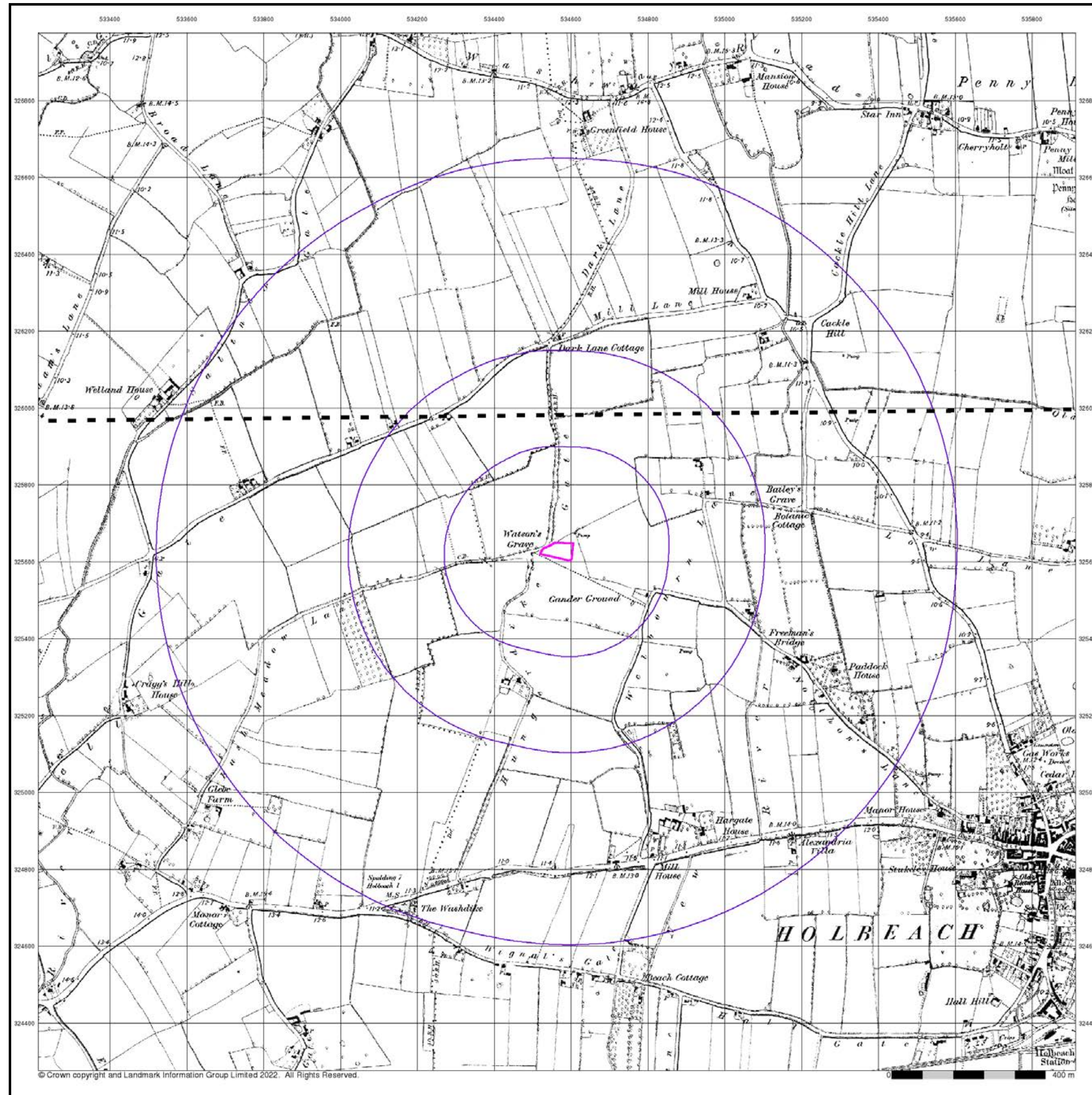


Order Details

Order Number: 289953871_1_1
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National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 1000

Site Details

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Lincolnshire

Published 1887

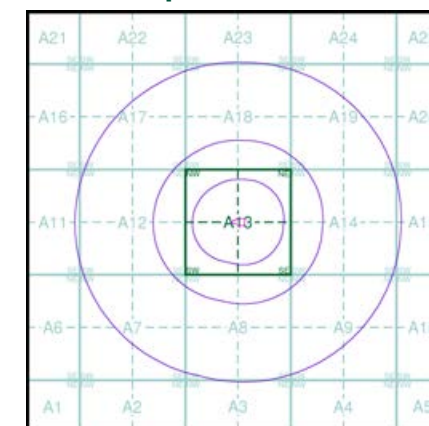
Source map scale - 1:10,560

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)

135NW
1887
1:10,560
135SW
1887
1:10,560

Historical Map - Slice A

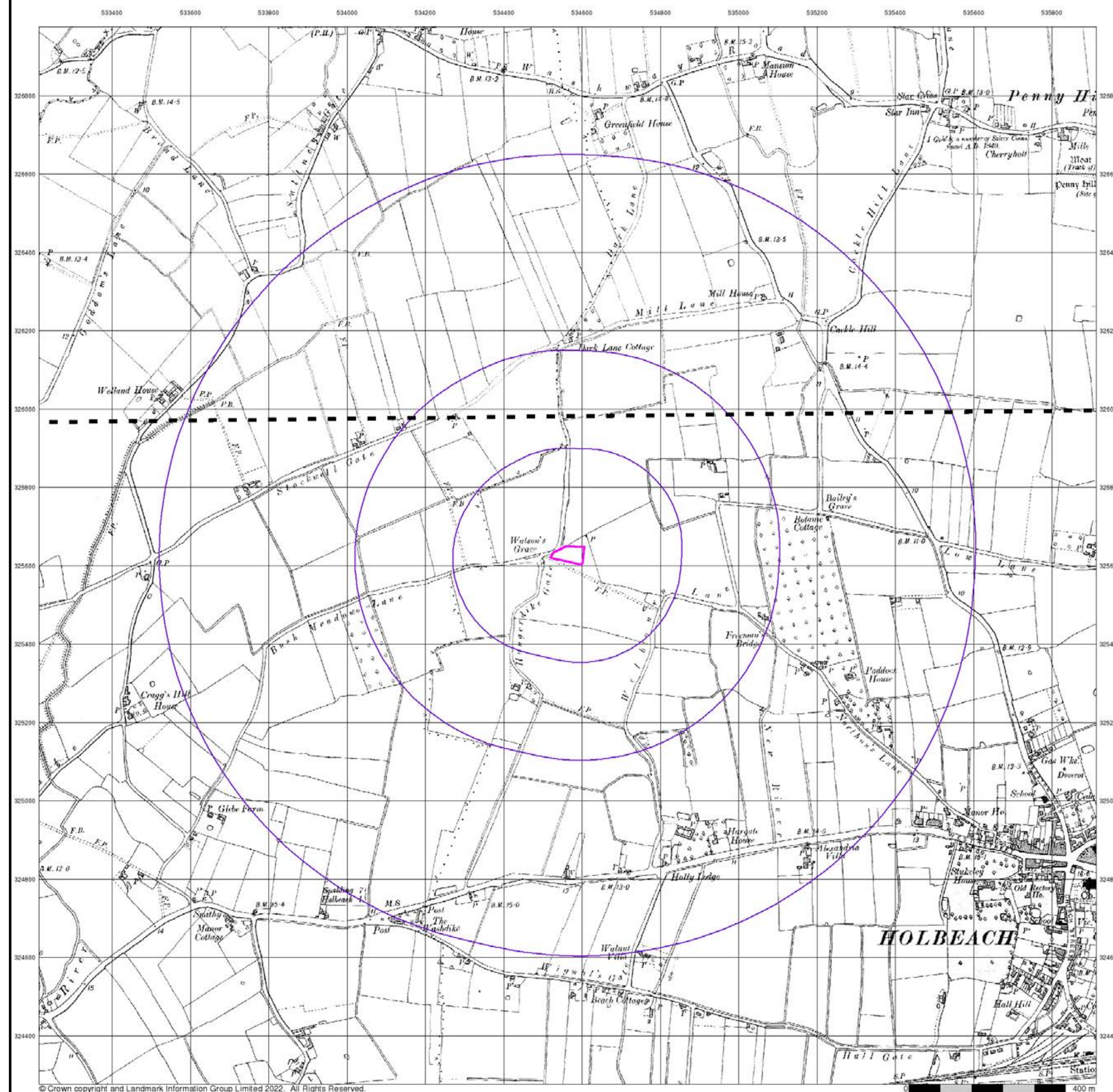


Order Details

Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 1000

Site Details

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Lincolnshire

Published 1906

Source map scale - 1:10,560

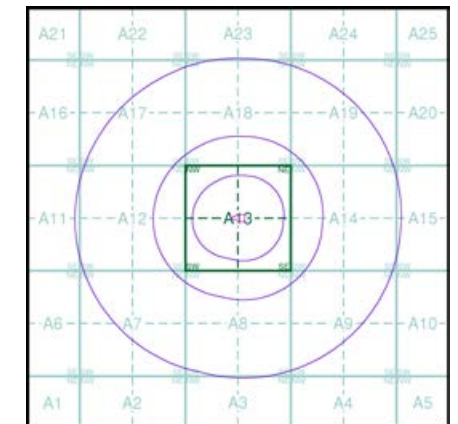
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some 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)

135NW
1906
1:10,560

135SW
1906
1:10,560

Historical Map - Slice A



Order Details

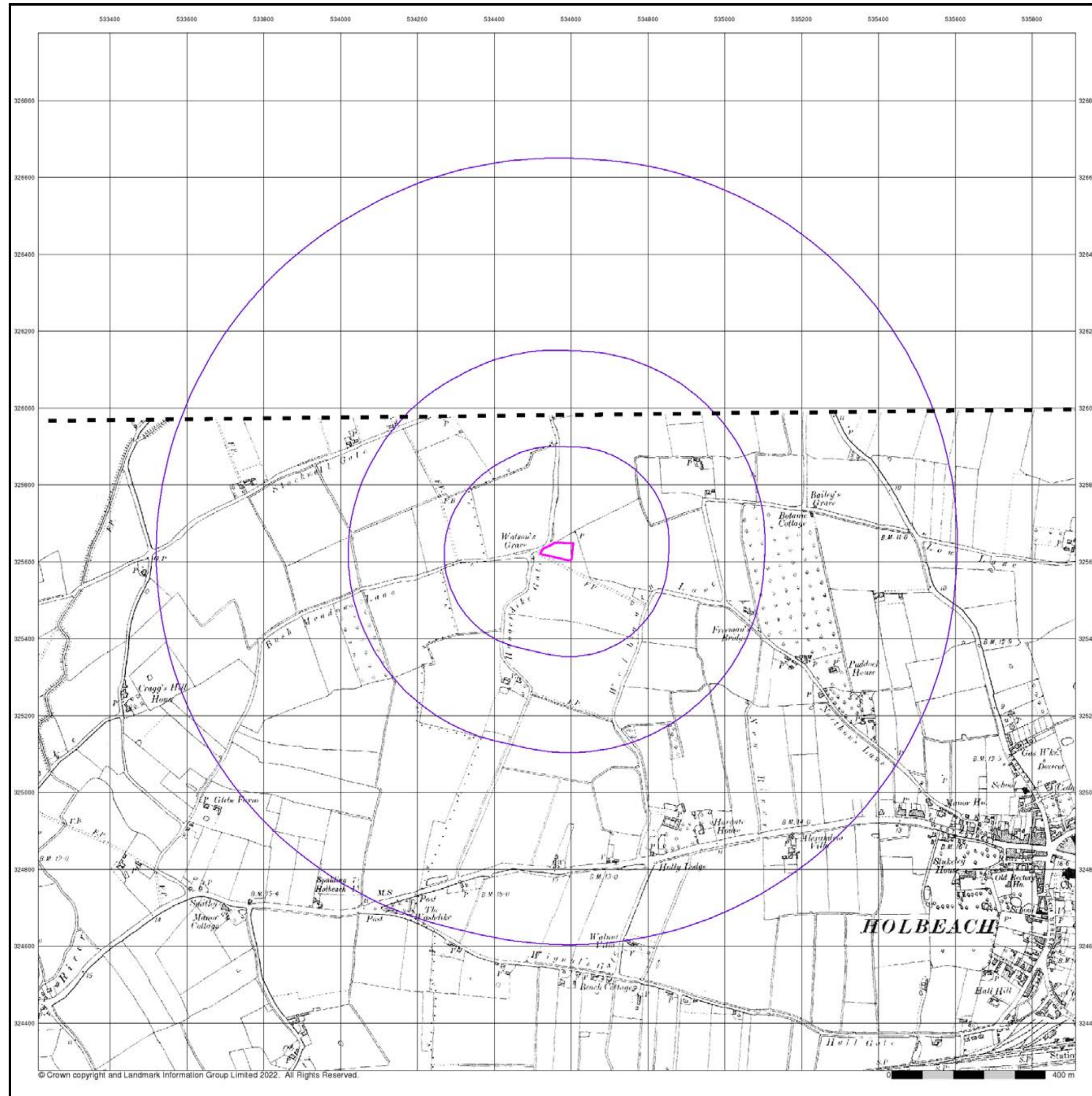
Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 1000

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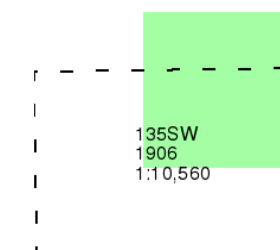
Lincolnshire

Published 1906

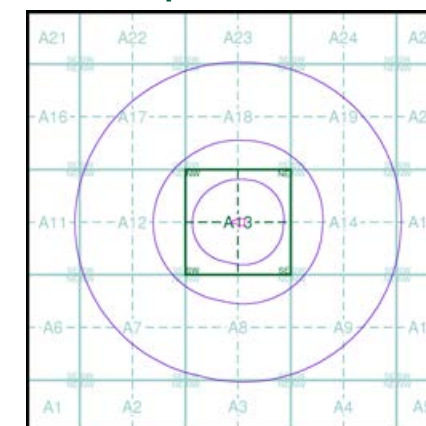
Source map scale - 1:10,560

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)



Historical Map - Slice A



Order Details

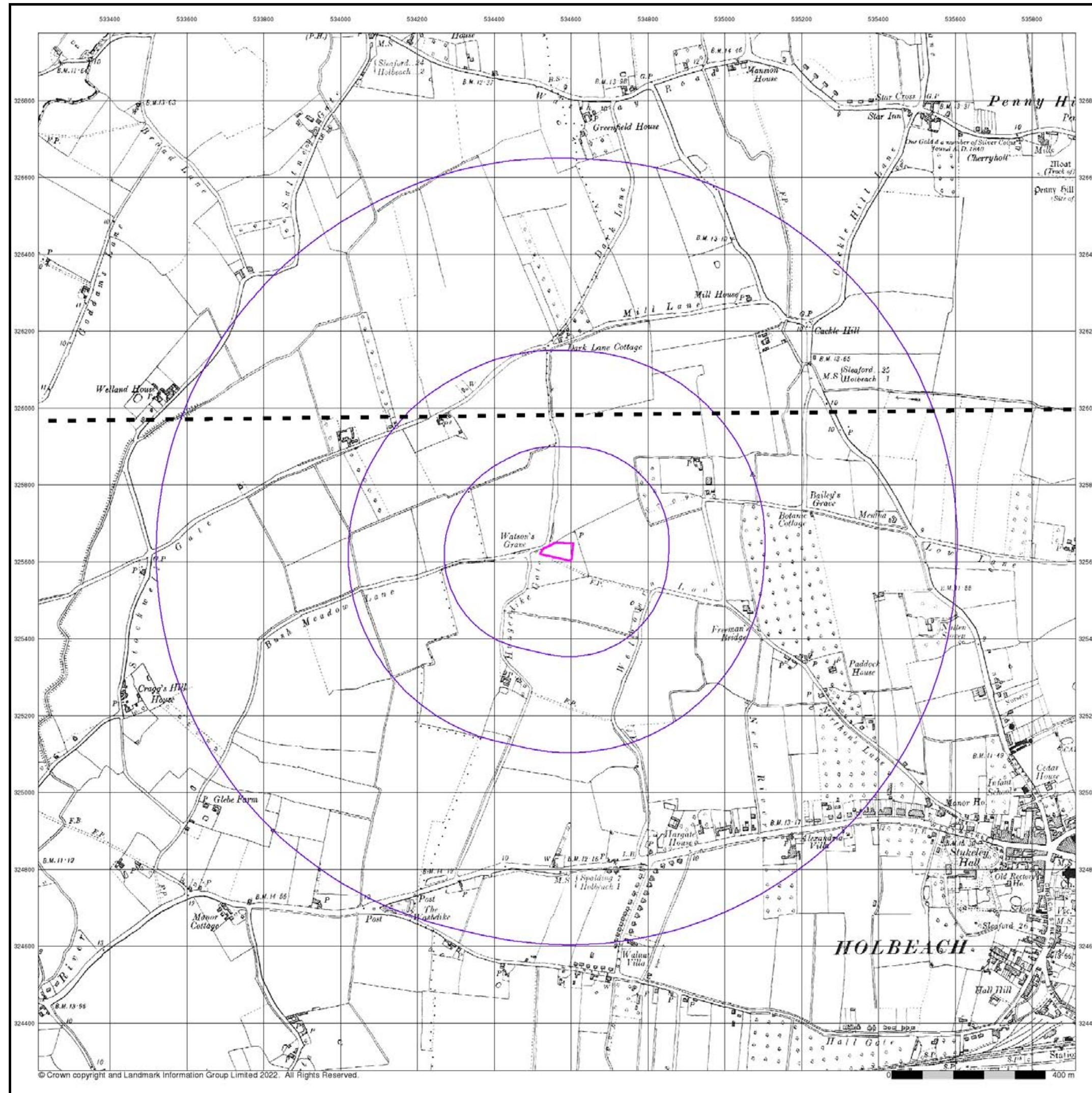
Order Number: 289953871_1_1
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National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 1000

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Lincolnshire

Published 1931 - 1932

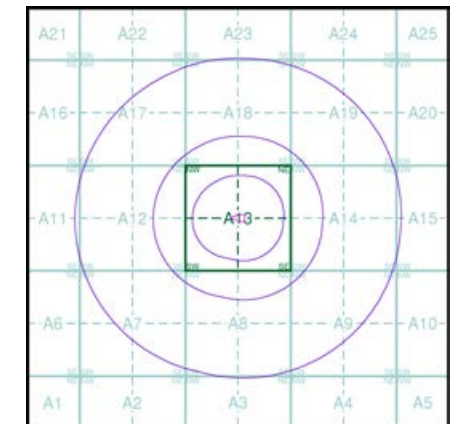
Source map scale - 1:10,560

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)

135NW
1931
1:10,560
135SW
1932
1:10,560

Historical Map - Slice A

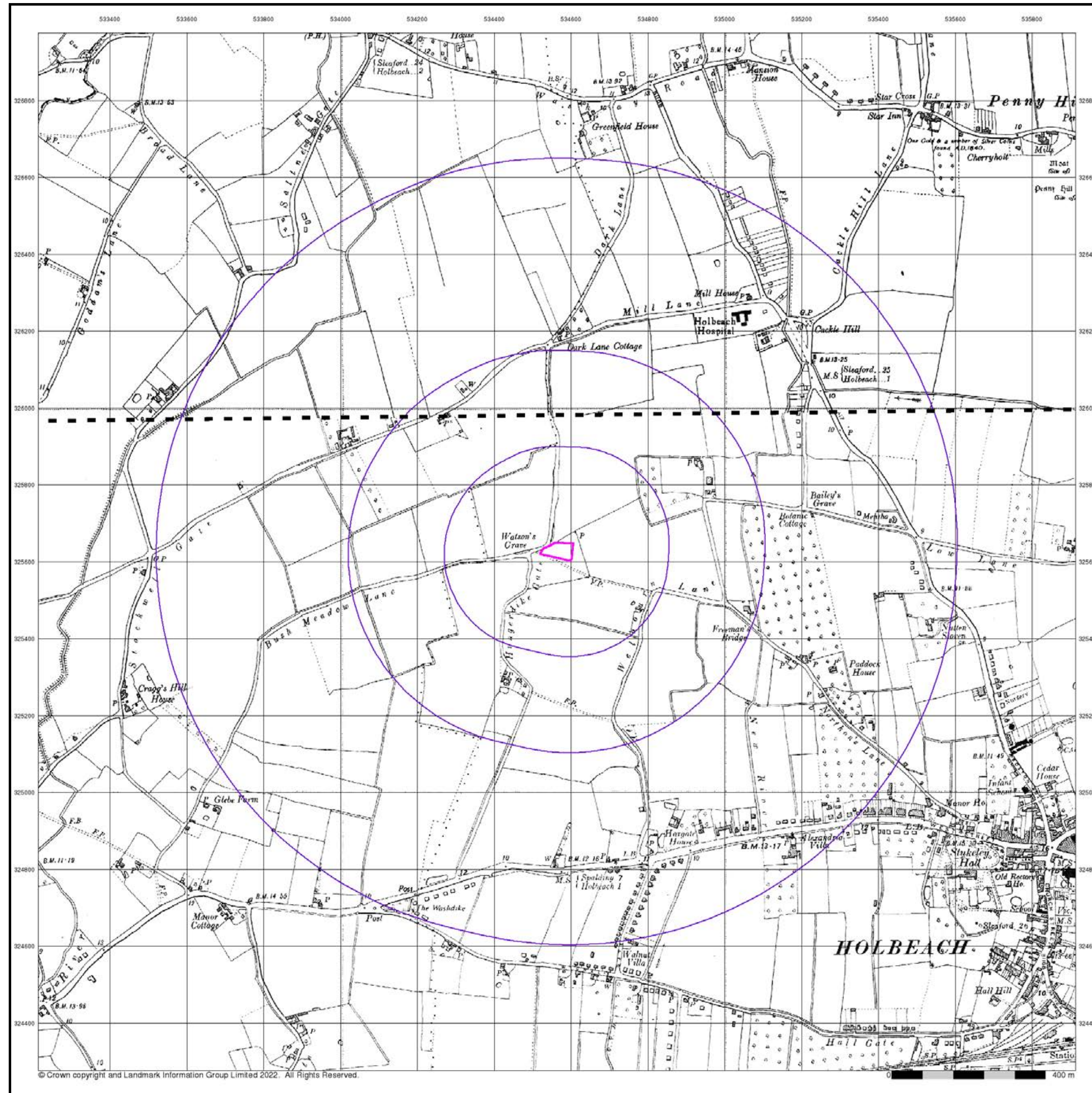


Order Details

Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
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Site Area (Ha): 0.28
Search Buffer (m): 1000

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Lincolnshire

Published 1938 - 1952

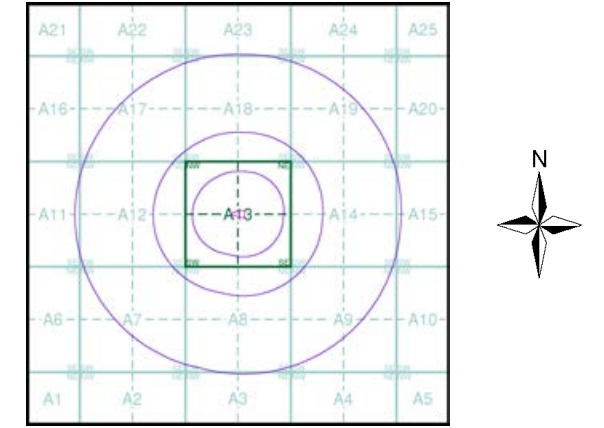
Source map scale - 1:10,560

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)

135NW	1952	1:10,560
135SW	1938	1:10,560

Historical Map - Slice A

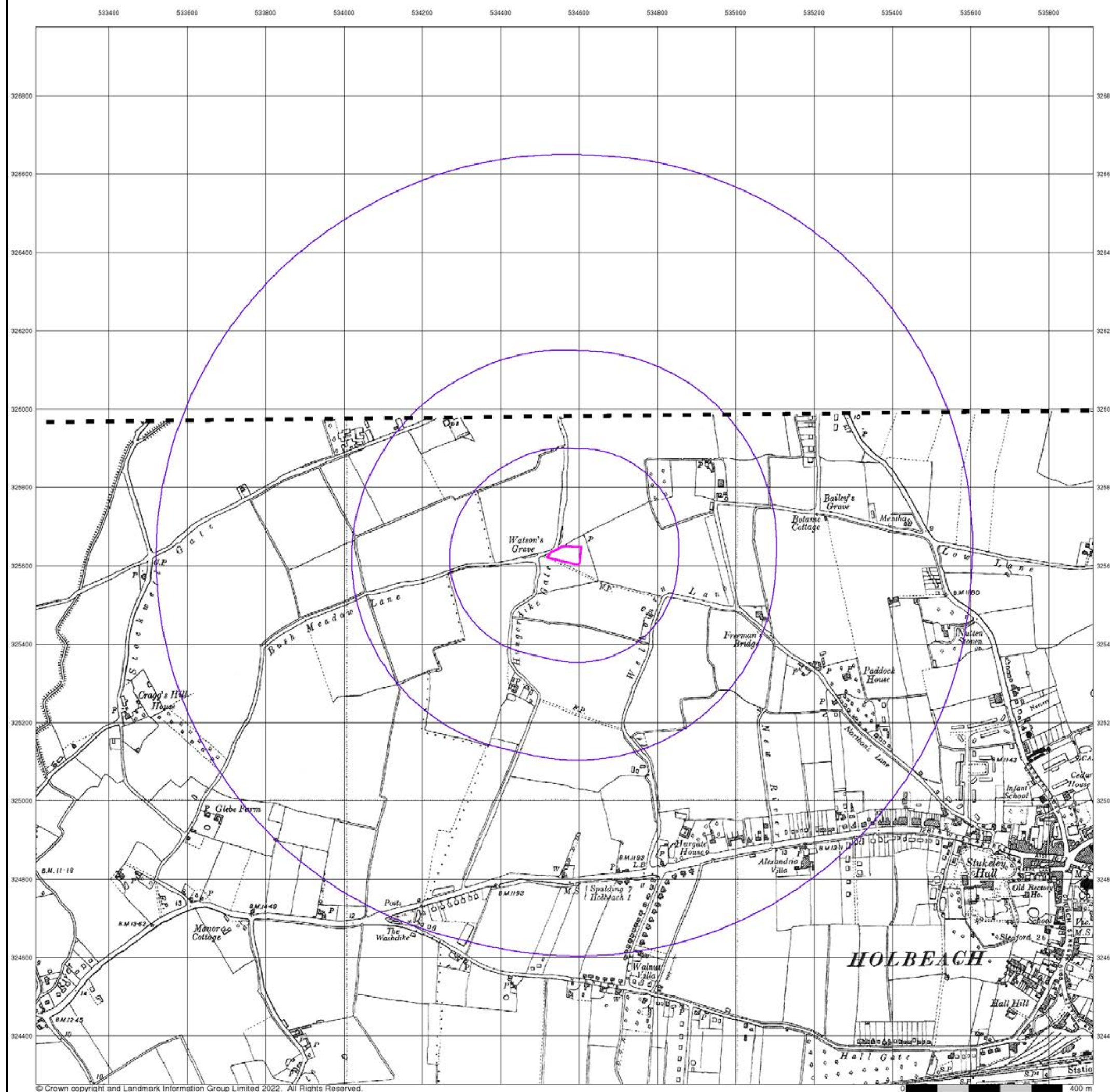


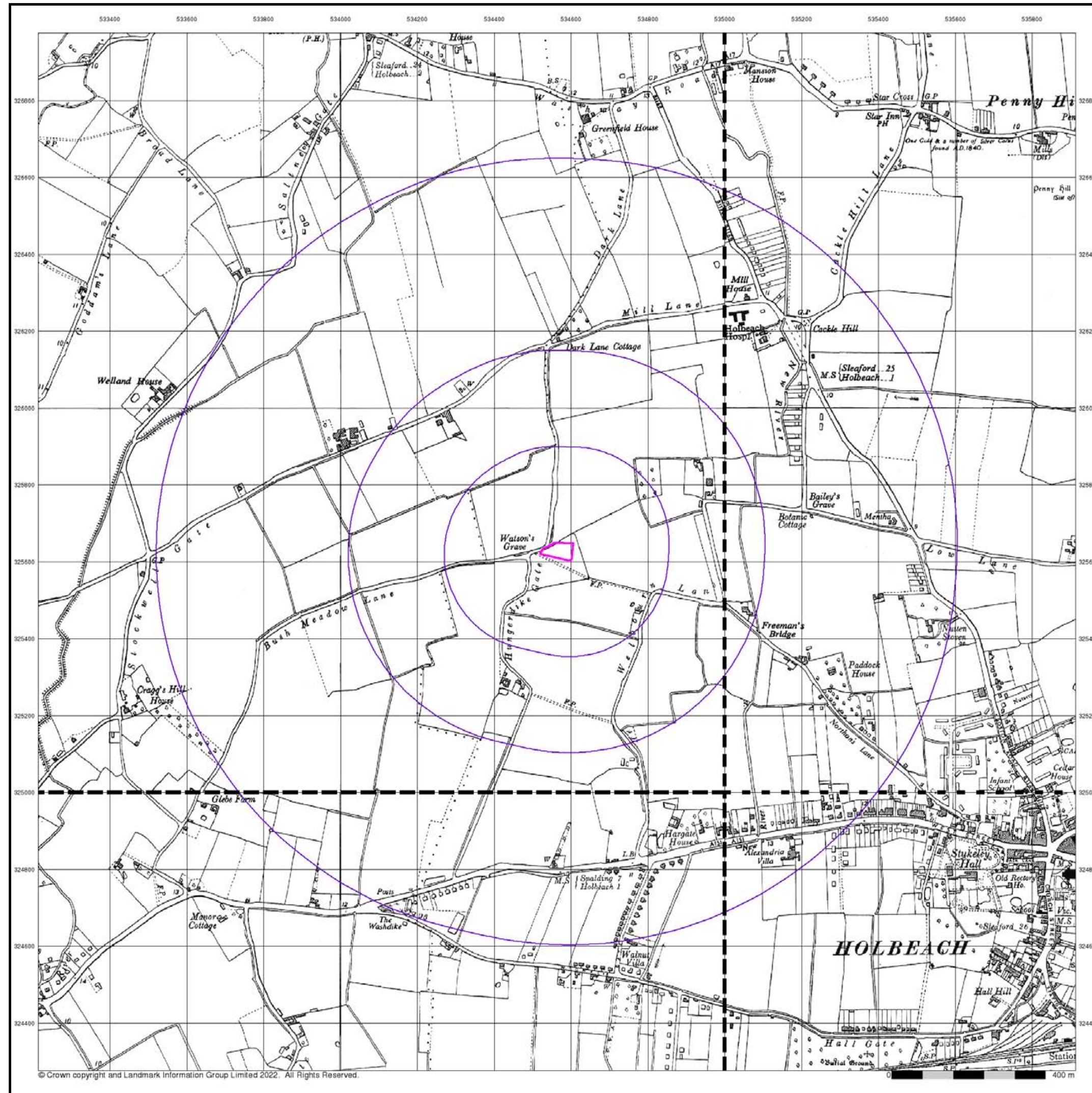
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Ordnance Survey Plan

Published 1956 - 1959

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)

TF32NW	TF32NE
1956	1956
1:10,560	1:10,560
TF32SW	TF32SE
1958	1959
1:10,560	1:10,560

Historical Map - Slice A

Order Details

Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 1000

Site Details

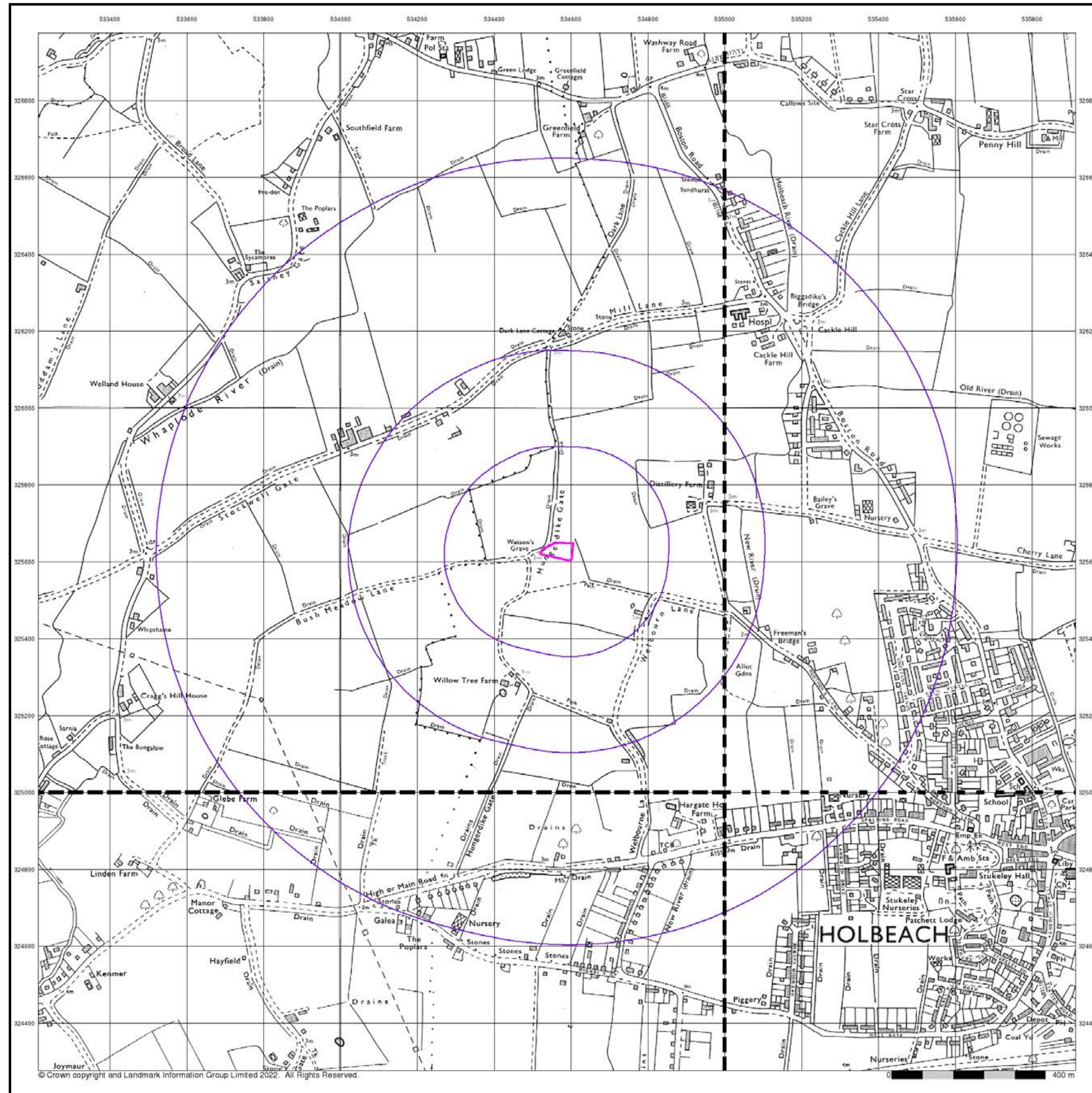
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Ordnance Survey Plan

Published 1970 - 1977

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)

TF32NW	1977	1:10,000
TF32NE	1977	1:10,000
TF32SW	1971	1:10,000
TF32SE	1970	1:10,000

Historical Map - Slice A

Order Details

Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 1000

Site Details

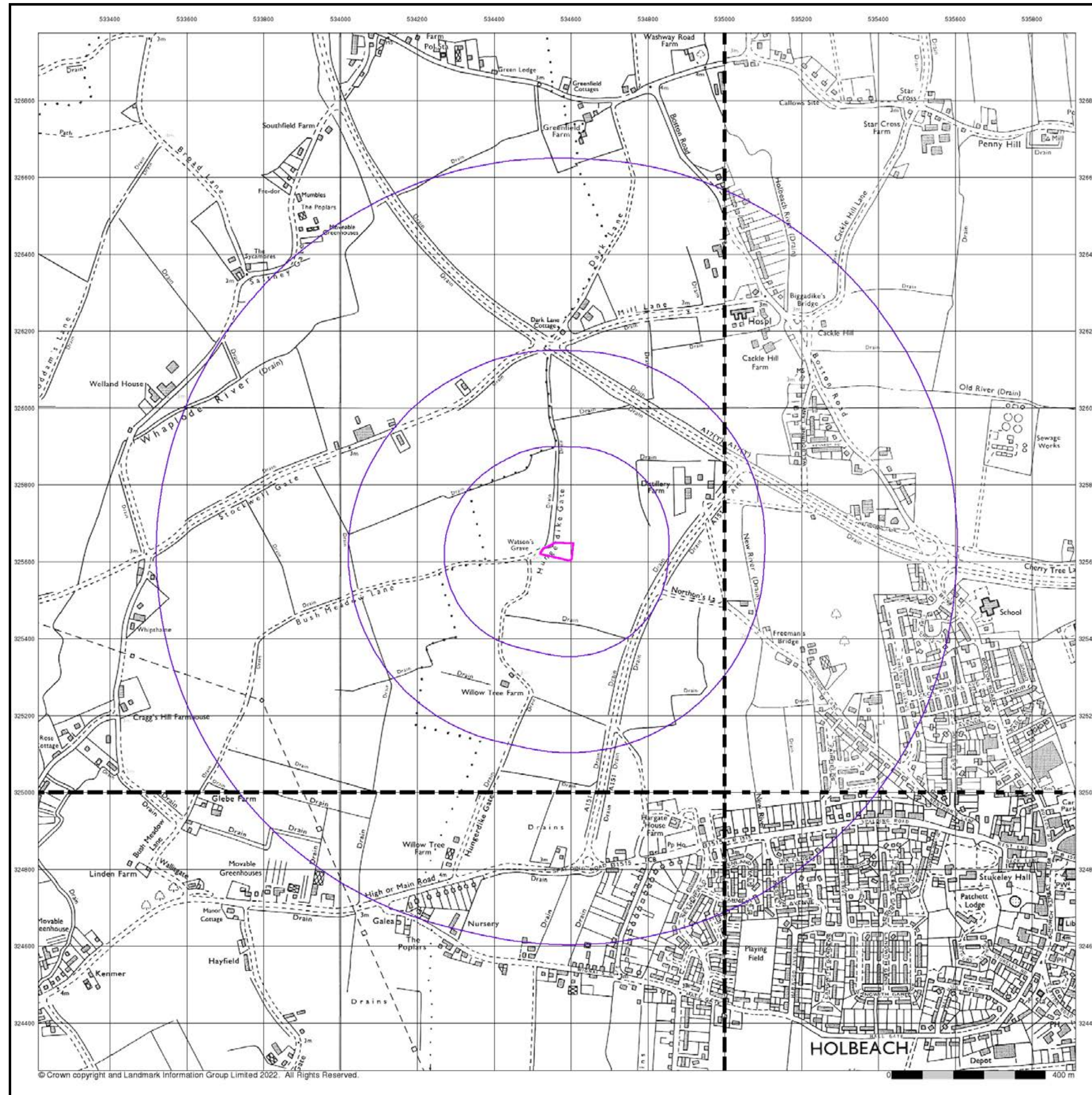
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Ordnance Survey Plan

Published 1992

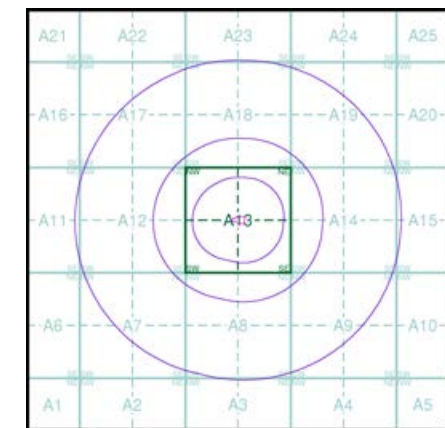
Source map scale - 1:10,000

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)

TF32NW	TF32NE
1992	1992
1:10,000	1:10,000
TF32SW	TF32SE
1992	1992
1:10,000	1:10,000

Historical Map - Slice A

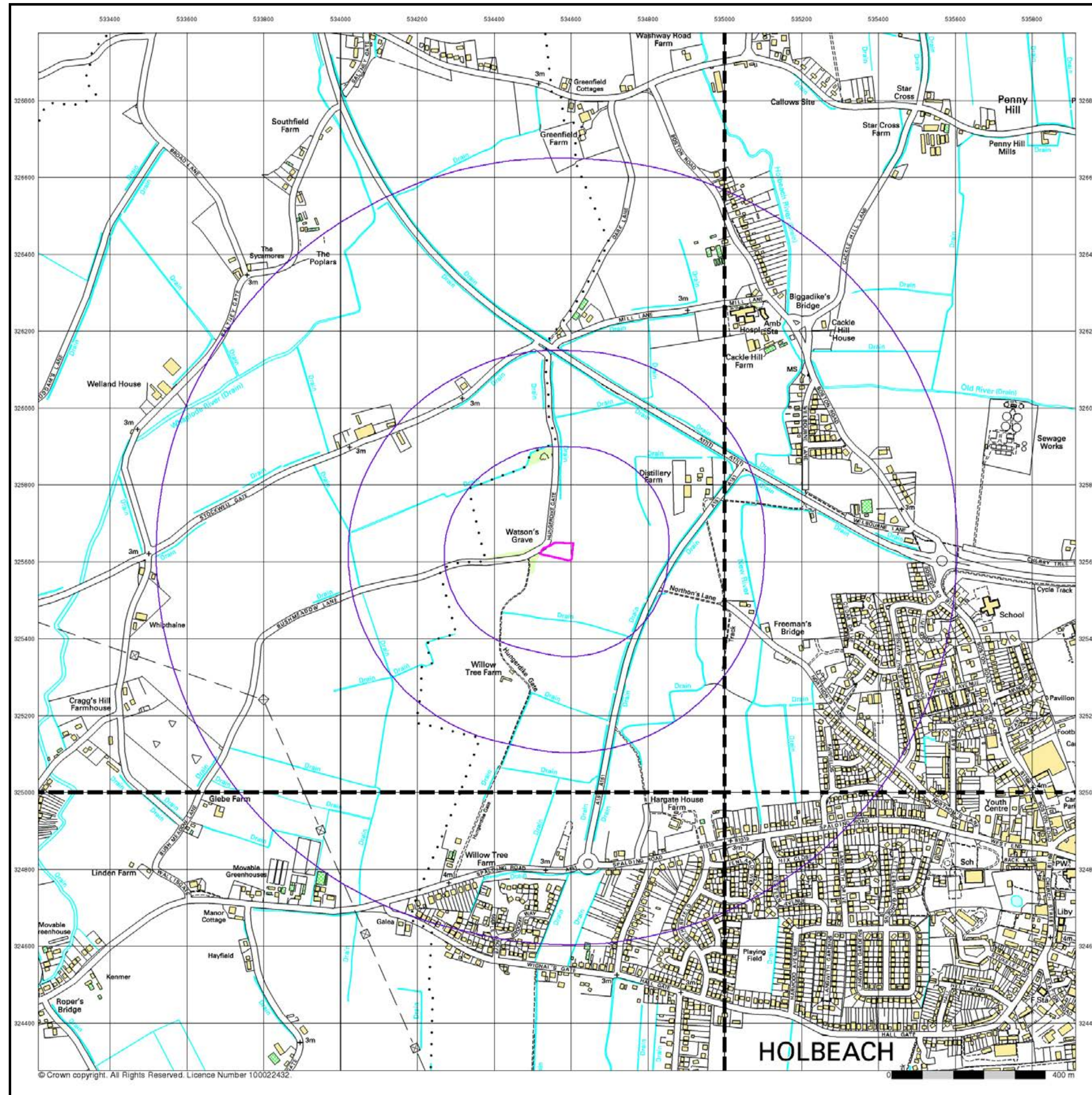


Order Details

Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
Search Buffer (m): 1000

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10k Raster Mapping

Published 2000

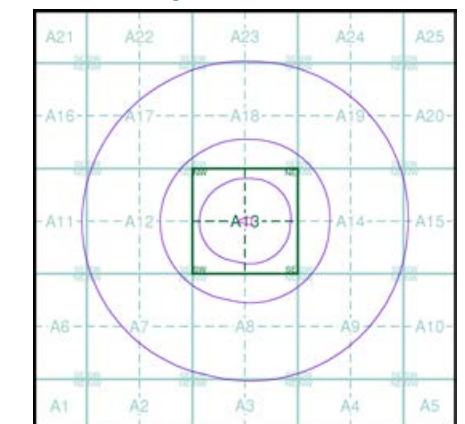
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TF32NW	TF32NE
2000	2000
1:10,000	1:10,000
TF32SW	TF32SE
2000	2000
1:10,000	1:10,000

Historical Map - Slice A



Order Details

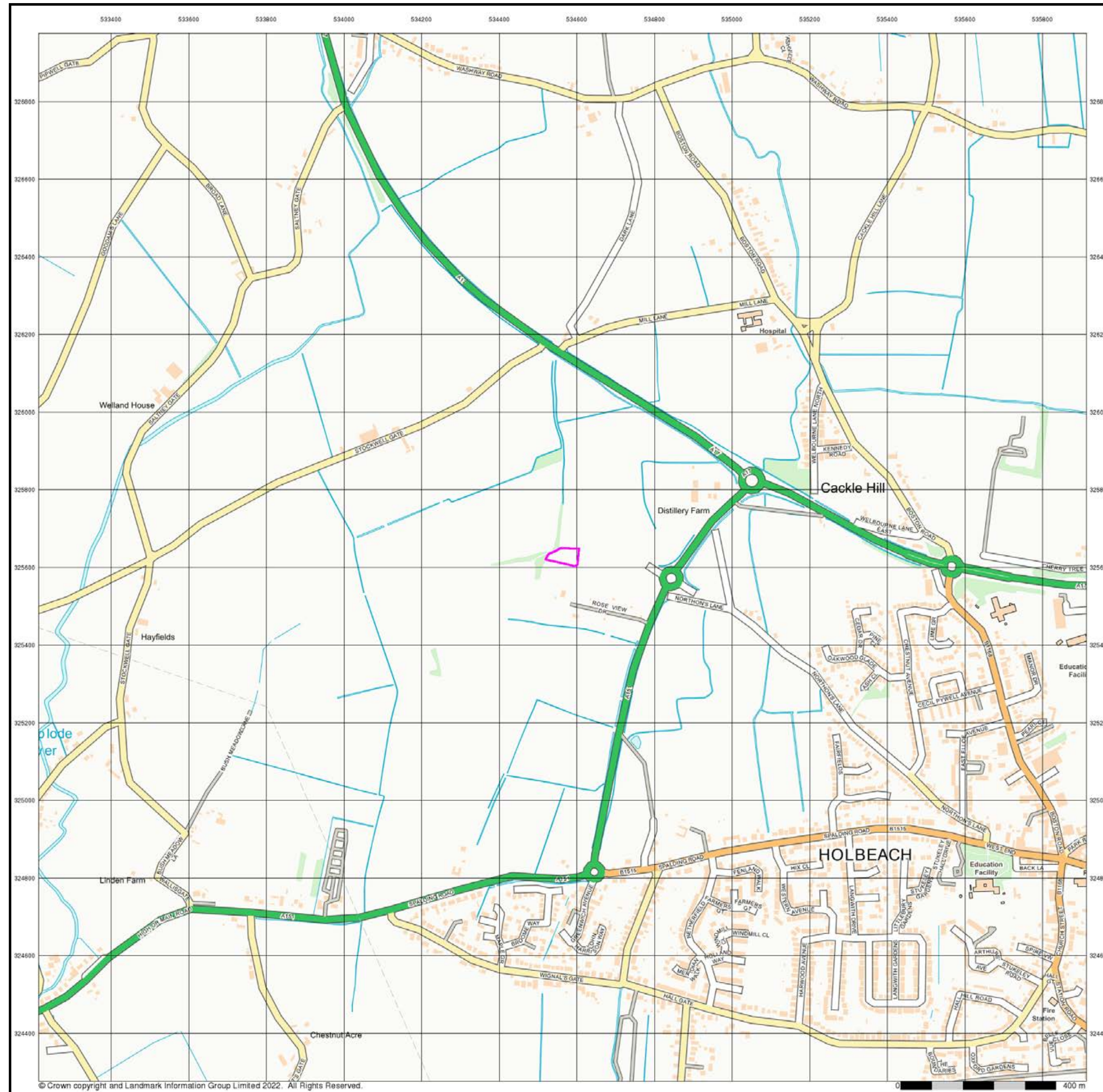
Order Number: 289953871_1_1
Customer Ref: ES190122
National Grid Reference: 534570, 325630
Slice: A
Site Area (Ha): 0.28
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Street View

Published 2022

Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)

Street View Map - Slice A

Order Details

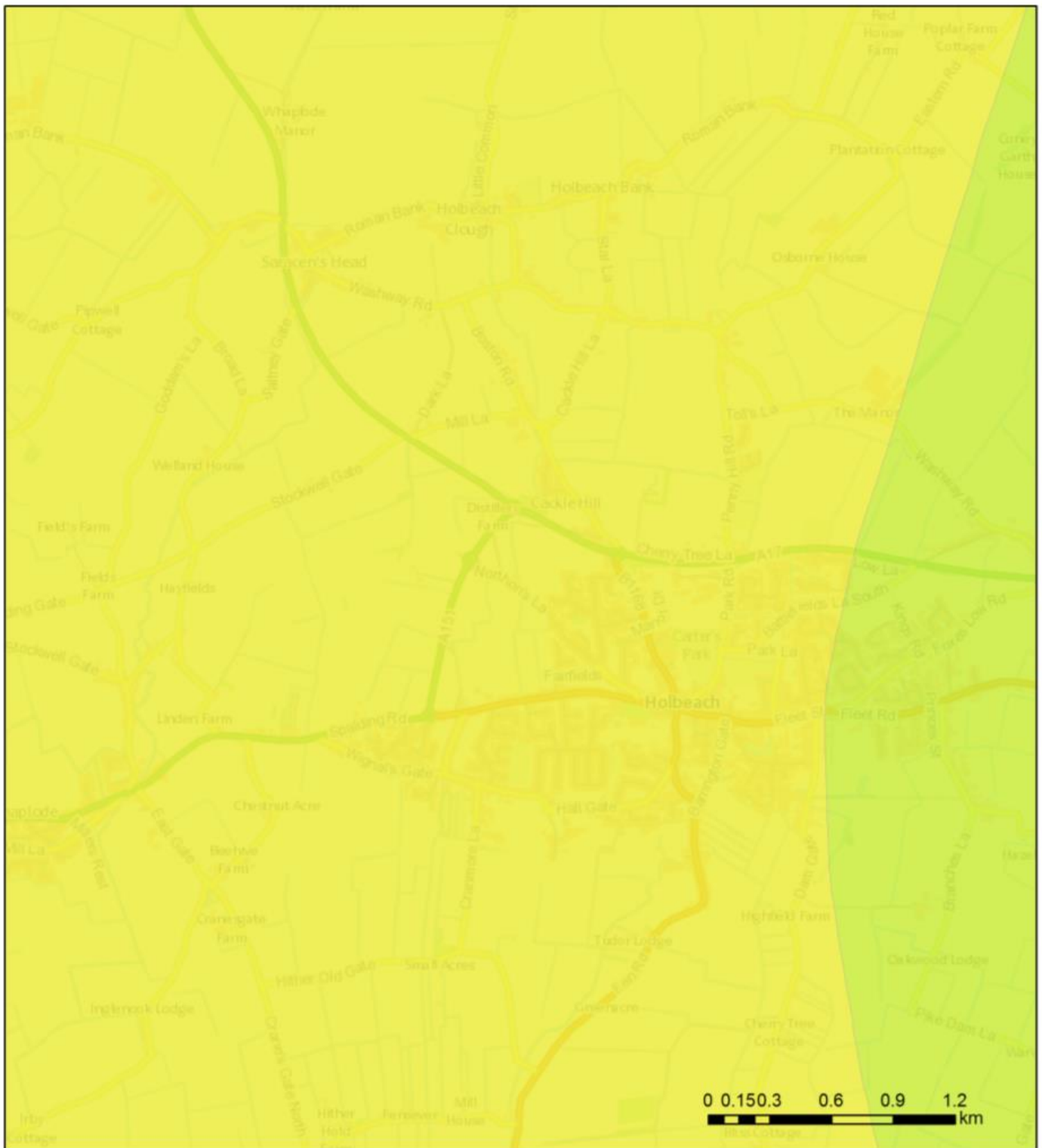
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Customer Ref:	ES190122
National Grid Reference:	534570, 325630
Slice:	A
Site Area (Ha):	0.28
Search Buffer (m):	1000

Site Details

Frontier Agriculture Ltd, Welbourne Lane South, Holbeach, SPALDING, PE12 7BF

Appendix D – Geological Maps

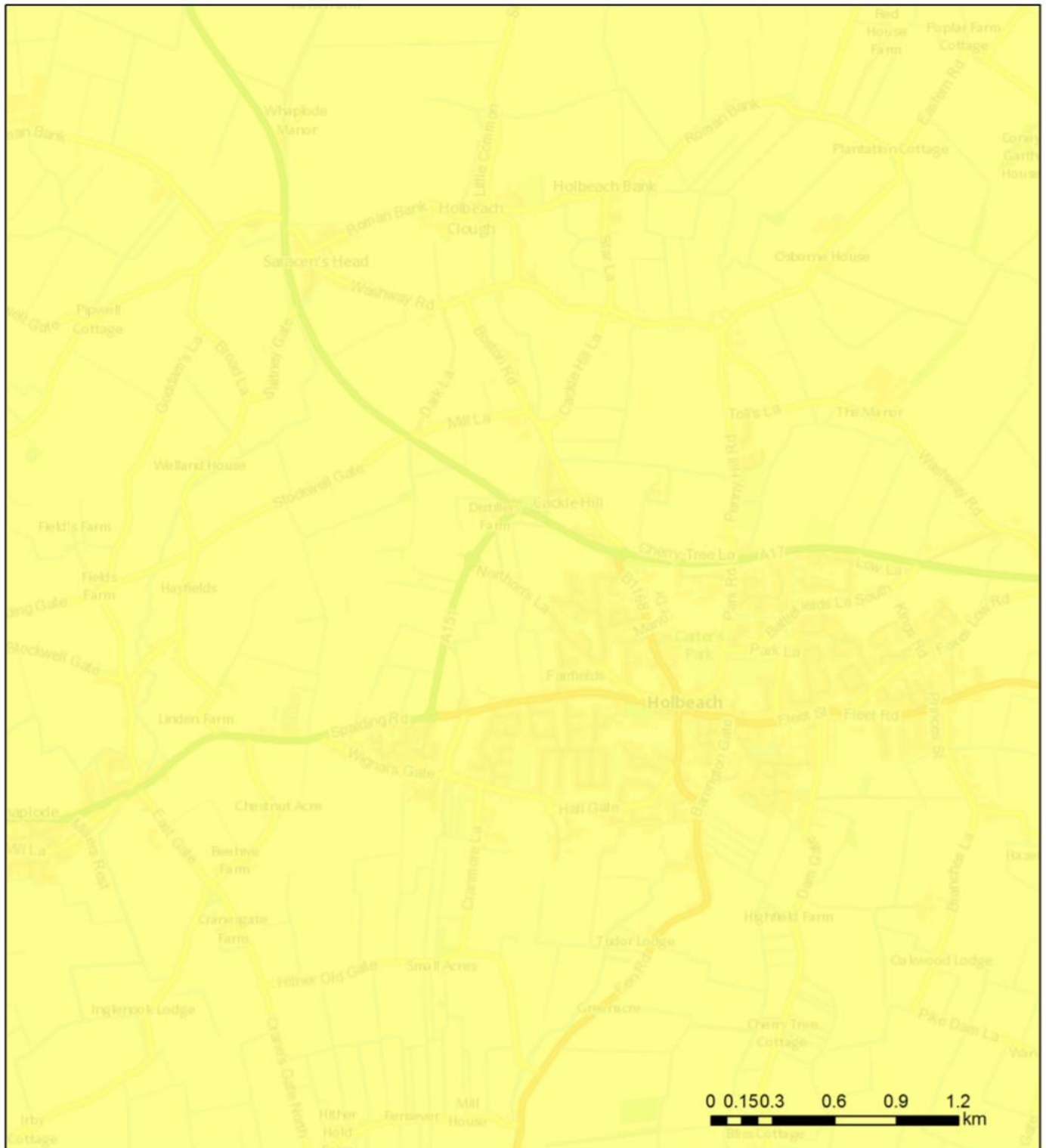
Bedrock Geology



Bedrock geology 1:50,000 scale

- WEST WALTON FORMATION - MUDSTONE AND SILTSTONE
- AMPHILL CLAY FORMATION - MUDSTONE
- OXFORD CLAY FORMATION - MUDSTONE

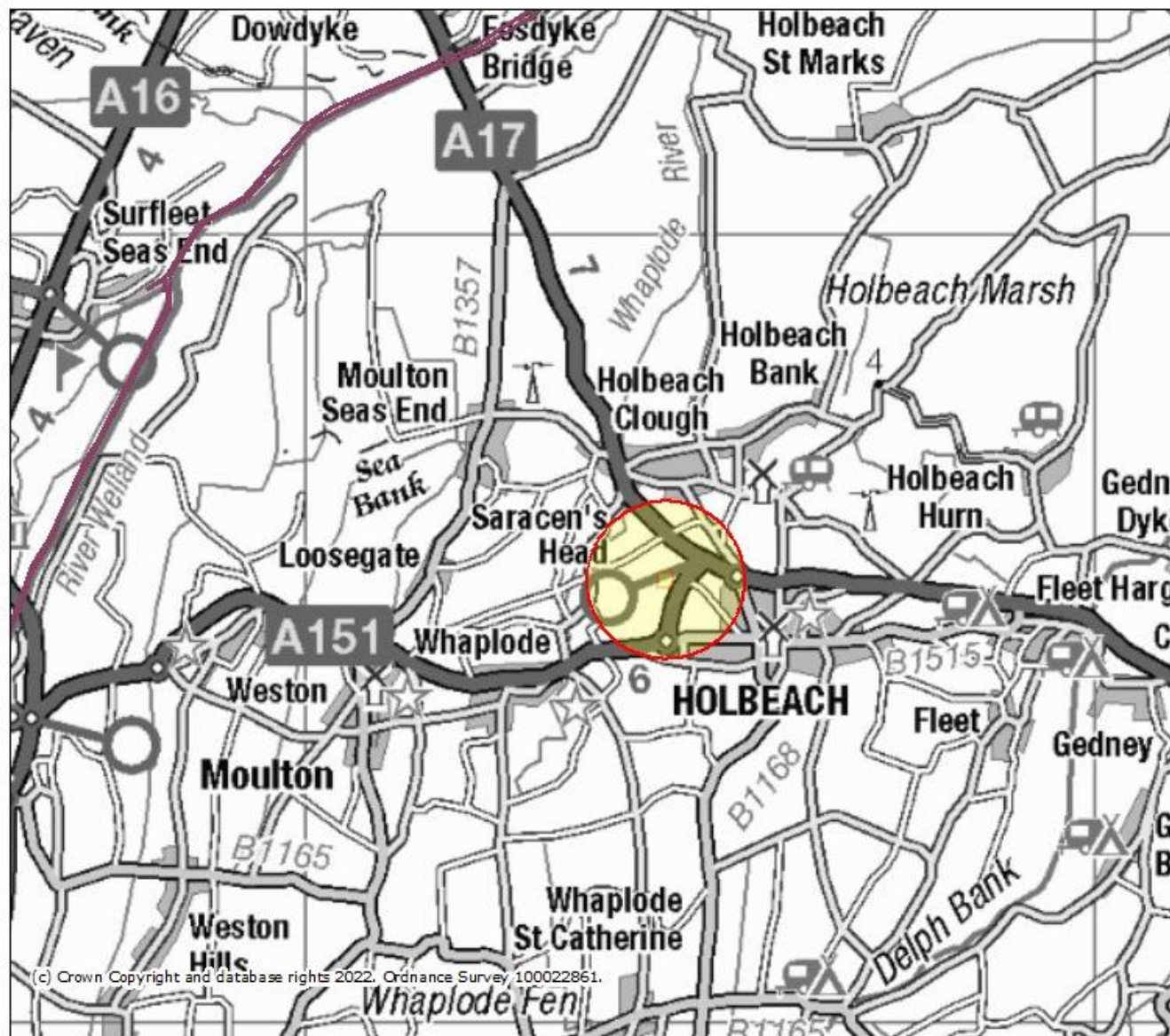
Superficial Geology



Superficial deposits 1:50,000 scale

 TIDAL FLAT DEPOSITS - CLAY AND SILT

Bedrock Aquifer



Legend

Aquifer Designation Map
(Bedrock) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unproductive

Projection = OSGB36

xmin = 519000

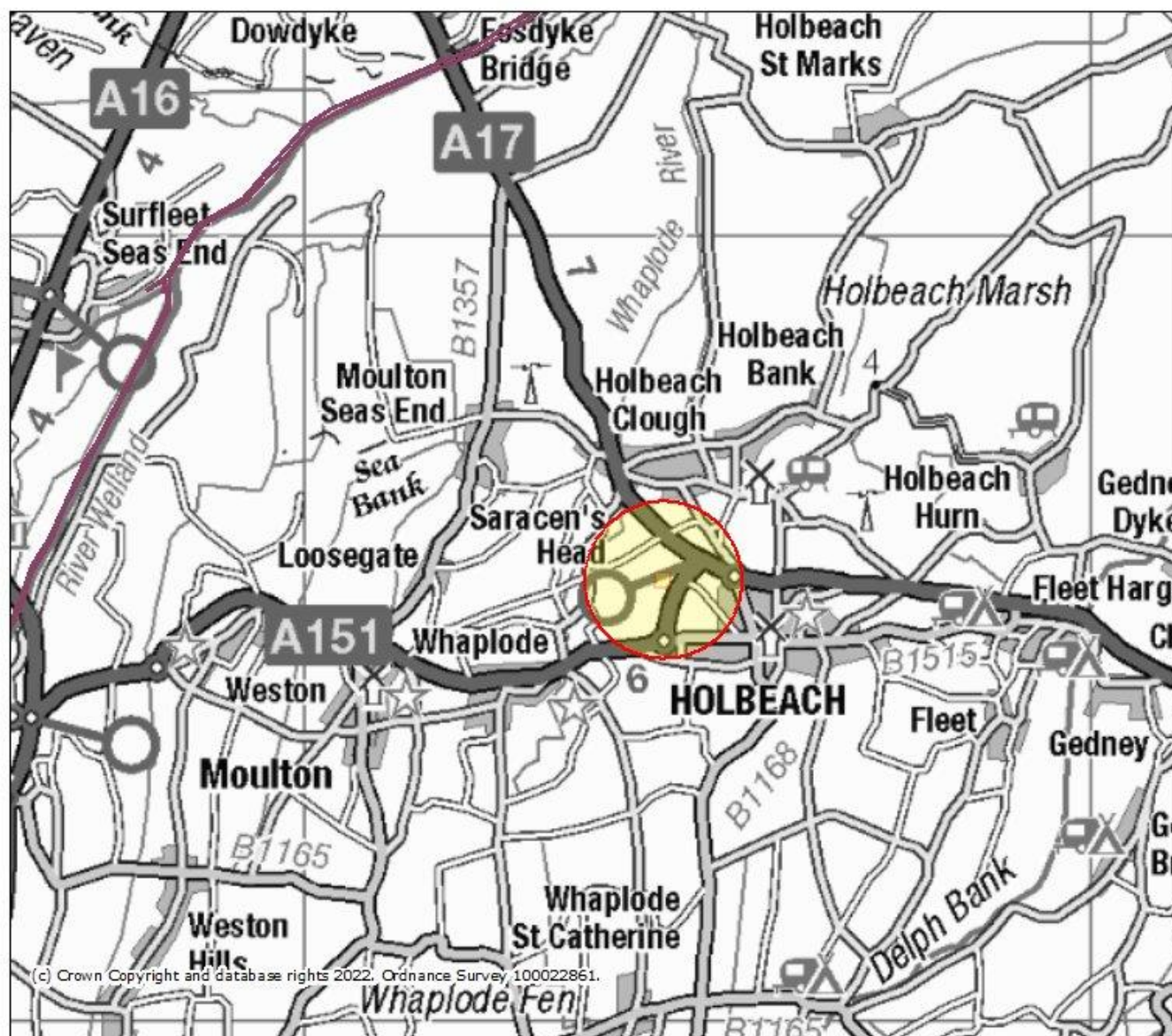
ymin = 317200

xmax = 548400

ymax = 335400

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**Legend****Aquifer Designation Map
(Superficial Drift) (England)**

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unknown (lakes+landslip)
- Unproductive

Projection = OSGB36

xmin = 519000

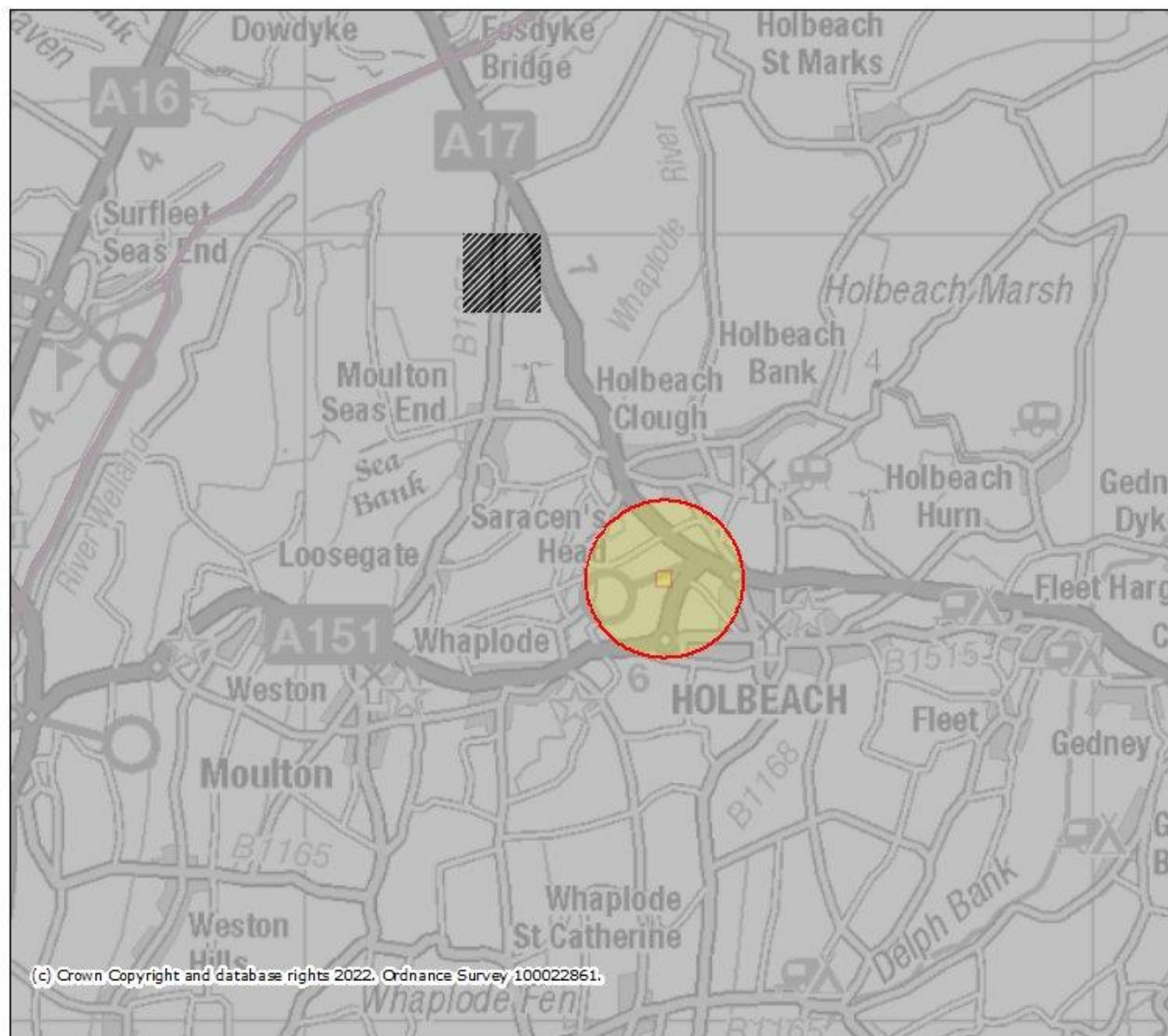
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ymax = 335400

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**Legend****Groundwater
Vulnerability Map
(England)**

-  Local Information
-  Soluble Rock Risk
-  High
-  Medium - High
-  Medium
-  Medium - Low
-  Low
-  Unproductive

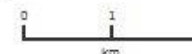
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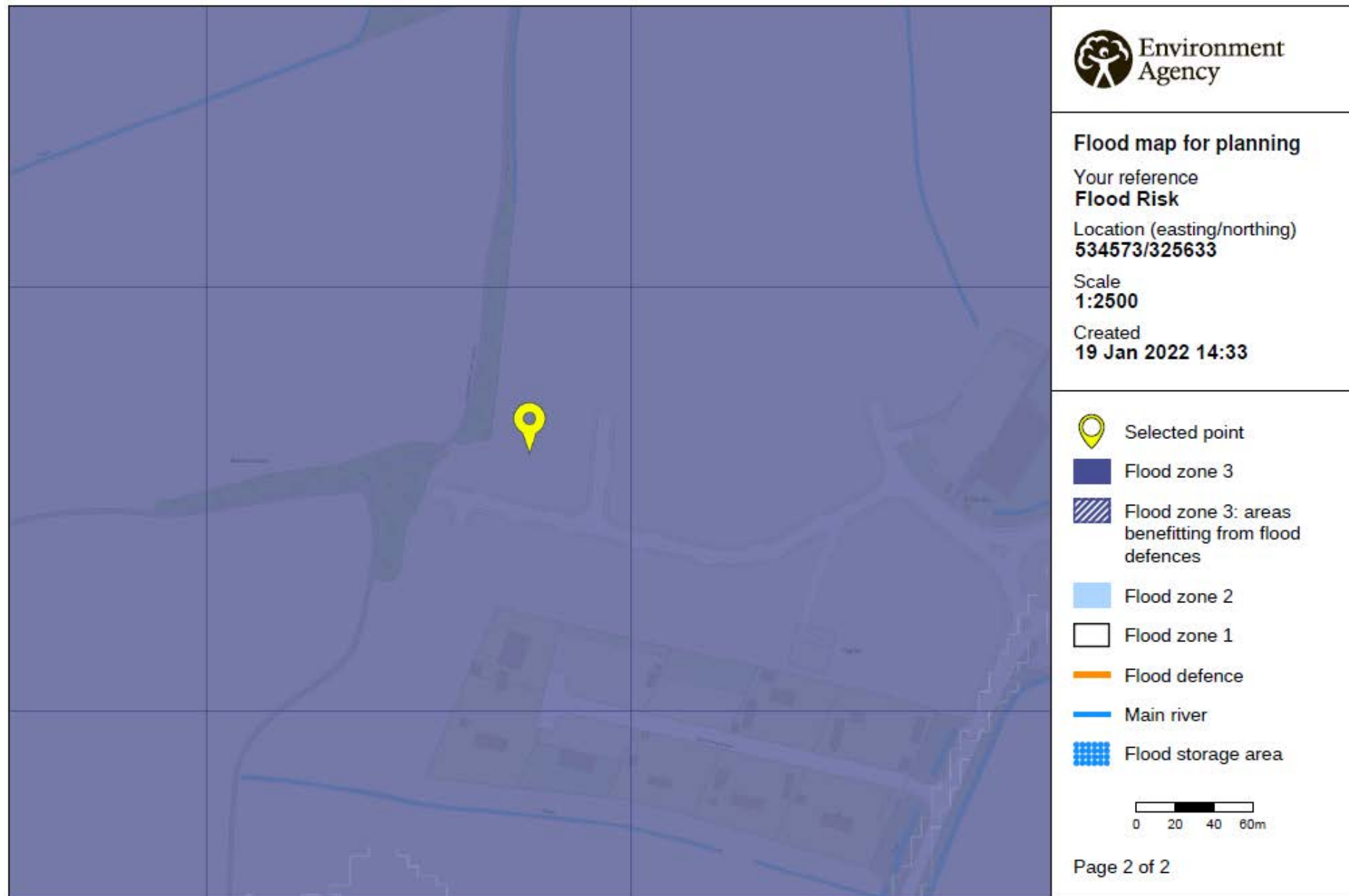
ymax = 335400



Map produced by MAGIC on 19 January, 2022.

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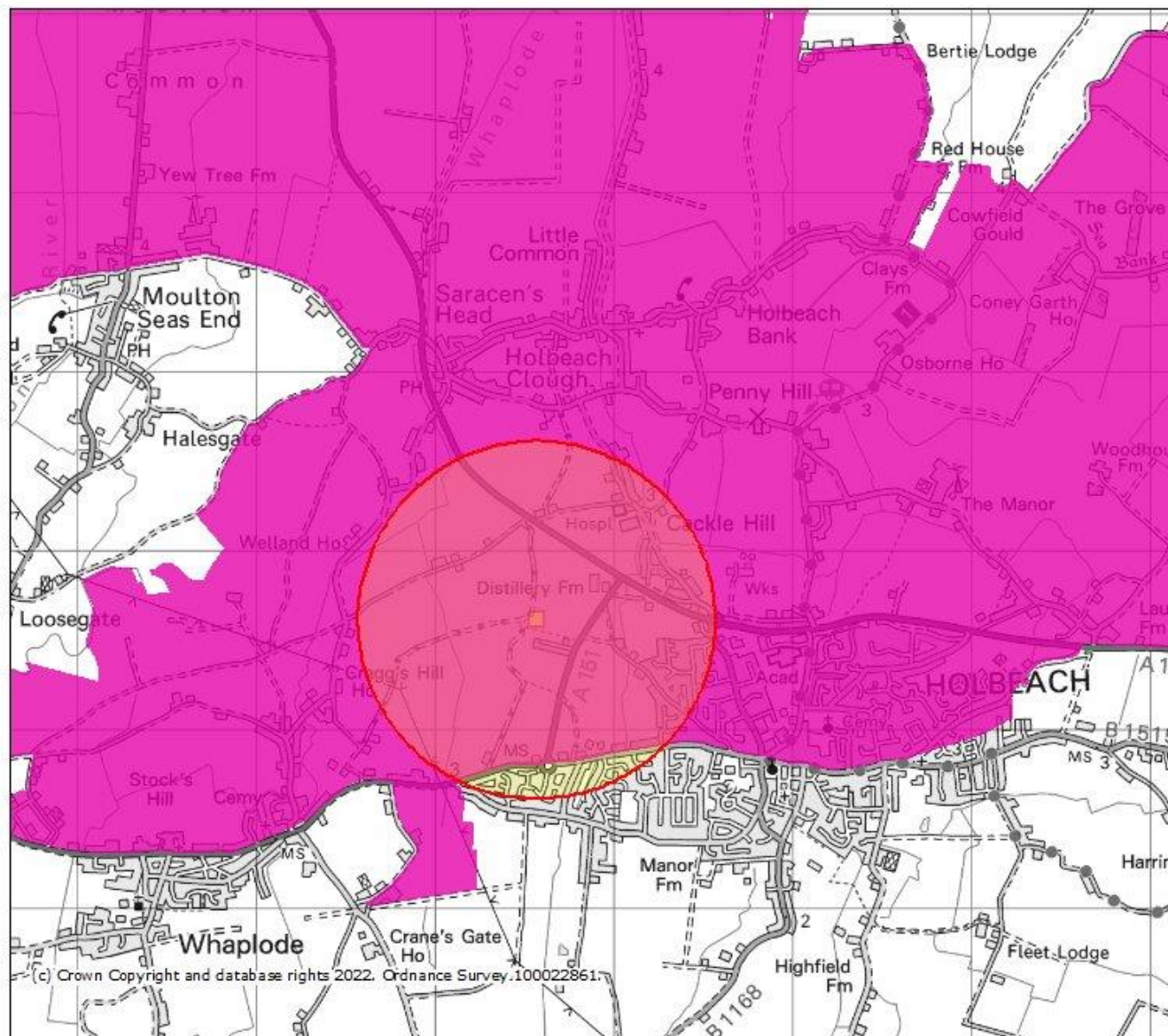
Appendix F – Flood Risk Map



Appendix G – Historic Landfill Map



Nitrate Vulnerable Zone



Legend

Nitrate Vulnerable Zones
 2017 Designations
 (England)

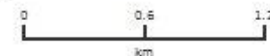
Projection = OSGB36

xmin = 527800

ymin = 322500

xmax = 542000

ymax = 329800



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