Phase 1

Environmental Assessment Report

Howden-le-Wear

Durham

Date: 5th July 2022

Version 1

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Document Verification

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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 and the risks to the identified receptors (e.g. human health, controlled waters, buildings) following redevelopment is considered to be moderate.

This classification is due to previous site development and the potential for Made Ground to be present within the shallow soils at the site.

Additionally, several off-site land uses have been identified in the area that have the potential to contaminate the shallow soils. These include railway tracks, collieries and landfills. Associated contaminants include hydrocarbons, PCBs, PAHs, VOCs, herbicides, heavy metals, asbestos, ash, sulphates, ammoniacal liquors and ground gases (i.e. carbon dioxide and methane).

It is recommended a Phase 2 intrusive ground investigation is undertaken prior to site redevelopment to obtain additional information on the ground conditions and the contamination status. The investigation should be carried out by qualified and competent persons. The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the Phase 2 intrusive works.

The site intersects a Development High Risk Area for coal mining. It is therefore recommended that a detailed Coal Mining Risk Assessment is completed.

Disclaimer

This report has been prepared by EnviroSolution Ltd who has exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant experienced in preparing reports of a similar scope.

However, to the extent that the report is based on or relies upon information contained in records, reports or other materials provided to EnviroSolution Ltd, which have not been independently produced or verified, EnviroSolution Ltd, gives no warranty, representation or assurance as to the accuracy or completeness of such information.

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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 in Howden-le-Wear, Durham, DL15 8EP. This report was commissioned to provide information on the potential contamination status of 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 legalisation 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 1856 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 Howden-le-Wear, Durham. The British National Grid Reference for the approximate site centre is GR: 416591, 532888.

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

2.2 Site Description

The site description has been prepared following a walkover survey conducted by EnviroSolution Ltd on the 27th of June 2022. The site photographs are included in Appendix B.

The site is irregular in shape and covers and approximate area of 1,875 square meters.

The eastern side of the site is occupied by an existing vehicle parking area completely covered in tarmac which is in good condition. The remaining of the site is within an agricultural field. There is a path running along the northern boundary of the site, currently used by Northumbrian Water engineers to maintain the combined sewer overflow. The path can be accessed through a metal gate at the back of the carpark. The development site can be accessed from the east via the parking area and through the path. A dense woodland, including a public footpath, is located north and west of the site. A beck runs west of the site.

The site is gently sloping towards the west with an approximate mean elevation of 110m aOD.

Land use in the surrounding area is predominantly agricultural, and residential north of the site.

No petrol filling stations have been identified within a 250m radius of the site.

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

2.3 Development Proposals

No formal development plans have been submitted for the site. At this stage it is understood that future development plans include the erection of a stable building (including tack room, hay store and area for lambing) with associated hardstanding.

The proposed development plan is shown on Figure 3 which is included 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
1856-1882	1:2,500	The site forms a parcel of land within an agricultural field.	Surrounding land is undeveloped. Railway tracks 160m southwest of the site. Beck 20m northwest.
1861	1:10,560	No significant change.	The stretch of the beck north of the site has been diverted. The beck now is 60m west of the site.
1897	1:2,500	No significant change.	Residential development directly east of the site. Moderate residential development 180m southwest of the site. Howden Colliery 250m north of the site. Colliery spoil/embankment 75m northwest, 75m north, 100m southeast, 160m northwest of the site. Coke ovens 150m northwest and 250m southeast. Sand pit 175m southeast. Disused sand pit 75m east. Wagonway along the easternmost corner of the site, and 90m northwest.

Date	Scale	On Site	Off Site
1920-1921	1:2,500	Southern spoil heaps expanded north, now intersecting the western half of the site. Embankment of dismantled wagonway crossing the centre of the site.	Howden Colliery buildings no longer identified on the map. Coke ovens demolished. Sand pits disused. Wagonway dismantled. Spoil heap 170m southwest.
1939	1:2,500	No significant change.	No significant change.
1954	1:10,000	No significant change.	No significant change.
1973	1:2,500	No significant change.	North Bitchburn Colliery buildings demolished. Railway tracks dismantled. Southern spoil heaps disused. No longer identified on the map.
1984	1:2,500	No significant change.	Barns 60m northwest of the site.
1996	1:2,500	No significant change.	Sand pits partially infilled.
2000	1:10,000	No significant change.	No significant change.
2022	1:10,000	No significant change.	No significant change.

3 Environmental Setting

3.1 Geology

Geological maps of the area indicate that the site is directly underlain by superficial diamicton (till) deposits, sedimented during the Late Pleistocene. Diamicton is a type of sediment that is poorly sorted and contains a wide range of clast sizes.

The underlying bedrock is the Pennine Lower Coal Measures Formation, deposited during the Carboniferous. It consists of interbedded grey mudstone, siltstone and pale grey sandstone, commonly with numerous and thicker coal seams in the upper part.

The nearest geological fault (inferred) is located approximately 400m northwest 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 the properties are above the action level (low probability). Radon protective measures are not deemed necessary for the development.

3.3 Coal Mining Activity

The site falls within a coal mining reporting area described as having minable coal deposits, and the eastern half of the site lies within a 'Development High Risk Area' for coal mining, as defined by the Coal Authority. As such, it is considered that there are coal mining related hazards which could affect the site, and a coal mining risk assessment study is recommended.

A copy of the coal mining summary map is included in Appendix E.

3.4 Hydrogeology

The superficial till deposits are designated as a Secondary (Undifferentiated) Aquifer, defined as; cases where it has not been possible to attribute either category A or B to a rock type. In most cases this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

The Pennine Lower Coal Measures Formation is designated as a Secondary A Aquifer, defined as; 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.

There are no records of groundwater abstraction licences located within a 1km radius of the site and the site does not lie within a Source Protection Zone.

A copy of the hydrogeological maps is included in Appendix F.

3.5 Hydrology

There are no significant surface water features (rivers, lakes and reservoirs) located within a 1km radius of the site.

Beechburn Beck is located approximately 60m southeast of the site.

3.6 Flood Risk

The site lies within a Flood Zone 1 (low probability), land assessed as having less than a 1 in 1,000 annual probability of river flooding (0.01%) in any year (low risk). The completion of a detailed Flood Risk Assessment is not deemed necessary for this site.

A copy of the flood risk map is included in Appendix G.

3.7 Waste Management Facilities

There is a single record of historic landfill site located within a 1km radius of the site. The landfill information is summarised in Table 2 below:

Table 2 – Historic Landfill Summary

Landfill Site	Operation Dates	Waste Type	Distance from Site
Howden le Wear Colliery	No Information	No Information	200m S

A copy of the historic landfill map is included in Appendix H.

There is a single record of a site operating under an environmental permit for waste operations. The permit is held by W Marley Agricultural Contractors Ltd 850m northeast of the site for a Household, Commercial & Industrial Waste Transfer Station.

3.8 Environmental Permits, Incidents and Registers

There is a single record of site located within a 1km radius of the development site operating under an environmental permit for discharges to water and groundwater. The permit is held by Northumbrian Water Limited 640m north-northwest of the site.

There are 3 no. records of pollution incidents recorded by the Environment Agency having occurred within a 1km radius of the site. The incidents occurred 275m southeast, 345m northwest and 630m south of the site and were caused by sewage spillages.

3.9 Designated Environmentally Sensitive Sites

There are no records of designated environmentally sensitive sites located within a 1km radius of the site.

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 was used as agricultural land until the early 1900s, when spoil heaps and embankments for wagonways from the surrounding coal mining activity occupied the western half of the site. The site was progressively restored after the coal mining activity ceased. Currently, the eastern corner of the site is occupied by a parking area for the nearby residential properties. The remaining of the site is being used again as agricultural land.

Due to the history of the site, Made Ground consisting of colliery waste is expected beneath the site. Potential contaminants could include hydrocarbons, asbestos, PAHs, VOCs, heavy metals, ash and sulphates.

Several off-site land uses have been identified in the surrounding area that have the potential to contaminate the shallow soils at the site. The land uses and their associated contaminants are summarised in Table 3 below:

Table 3 – Off-Site Land Use Summary

Land Use	Potential Contaminants
Railway tracks /Wagonway	Hydrocarbons, PCBs, PAHs, VOCs, herbicides, heavy metals, ash and sulphates
Colliery /Colliery Spoil /Coke oven	Heavy metals, sulphates, ground gases (i.e. carbon dioxide and methane), ammoniacal liquors
Sand pit (infilled)	Heavy metals, hydrocarbons, asbestos, ground gases (i.e. carbon dioxide and methane)
Landfill/ Tip	Heavy metals, hydrocarbons, asbestos, ground gases (i.e. carbon dioxide and methane)

Due to the distance from the site (≥75m) and the presence of low permeability superficial deposits, the infilled sand pits and historic landfill can be discounted as a source of ground gases.

4.3 Receptors

The potential receptors considered to be at risk from soil and groundwater contamination associated with the site are summarised in Table 4 below:

Table 4 - Receptor Description

Receptor	Details
Human (On Site)	- Construction workers - Future site users - Site visitors
Human (Off Site)	- Adjacent site users
Controlled Waters	- Secondary (Undifferentiated) Aquifer - Secondary A Aquifer - Beck
Building/ construction materials	- Foundations - Buried services

4.4 Pathways

The potential exposure pathways linking contamination with the receptors identified above are summarised in Table 5 below:

Table 5 - 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

Future development plans include the erection of a stable building (including tack room, hay store and area for lambing) with associated hardstanding. This is considered to be a sensitive end use.

The presence of buildings and hardstanding in the development area 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 development in any areas not covered with hardstanding (i.e. path), to future site users, via all possible exposure pathways.

Any ground gases (i.e. methane and carbon dioxide) and vapours that are present within the soils beneath the site could potentially ingress into future buildings 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.

4.5.2 Controlled Waters

The site is immediately underlain by superficial till deposits, which are designated as a Secondary (Undifferentiated) Aquifer. It is considered that if Made Ground is present at the surface, it would be in direct contact with the underlying aquifer and could allow the migration of contaminants to the groundwater. Granular sediment lenses within the till could form preferential pathways to allow the migration of potential contaminants to off-site receptors or groundwater aquifers. The nearest sensitive surface water course is located approximately 60m from the development site. Migration pathways via direct surface water run-off are therefore considered feasible.

The site does not lie within a Source Protection Zone and there are no groundwater abstraction licences held within a 1km radius of the site.

Overall, the risk to controlled waters is deemed to be moderate.

4.5.3 Building/Construction Materials/Buried Services

The presence of any soil and groundwater contaminants beneath the site could potentially impact on construction materials for future new developments, 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 new properties which could present a risk of explosion.

4.6 Environmental Designations

There are no environmental receptors identified of being at risk by the proposed development.

4.7 Preliminary Hazard Assessment

A preliminary hazard assessment is presented in Table 6. 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 6 – Preliminary Hazard Assessment

Source	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	2	3	Moderate	Contamination source potential identified. Hardstanding and building footprint sever any exposure pathways. Path not covered with hardstanding allowing exposure.
Contaminated soil groundwater	Direct contact	Buildings/ services	3	3	Moderate	On-site contamination source identified. New buildings in direct contact with potentially contaminated soils. Sulphates likely present withing the shallow soils. The risk can be mitigated with the use of sulphate resistant foundations.
Contaminated groundwater	Downward or lateral migration Surface water run-off	Secondary (Undifferentiated) Aquifer Secondary A Aquifer	2	3	Moderate	Contamination source identified. The site does not lie within a Source Protection Zone and there are no groundwater abstraction licences held within a 1km radius of the site.

Source	Pathway	Receptor	Likelihood	Effect	Risk	Assessment
		Beck				Beck 60m west of potentially contaminated site.
Ground gas / vapours Radon	Inhalation, ingress into buildings	Buildings / services Future site users Adjacent site users Construction workers	2	4	Moderate	Ground gas source identified. Site located within a low probability area for radon.

Using Risk Matrix (Table 7) Degree of Risk (R) = Likelihood (L) x Effect (E)

Table 7 - 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 and the risks to the identified receptors (e.g. human health, controlled waters, buildings) following redevelopment is considered to be moderate.

This classification is due to previous site development and the potential for Made Ground to be present within the shallow soils at the site.

Additionally, several off-site land uses have been identified in the area that have the potential to contaminate the shallow soils. These include railway tracks, collieries and landfills. Associated contaminants include hydrocarbons, PCBs, PAHs, VOCs, herbicides, heavy metals, asbestos, ash, sulphates, ammoniacal liquors and ground gases (i.e. carbon dioxide and methane).

It is recommended a Phase 2 intrusive ground investigation is undertaken prior to site redevelopment to obtain additional information on the ground conditions and the contamination status. The investigation should be carried out by qualified and competent persons. The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the Phase 2 intrusive works.

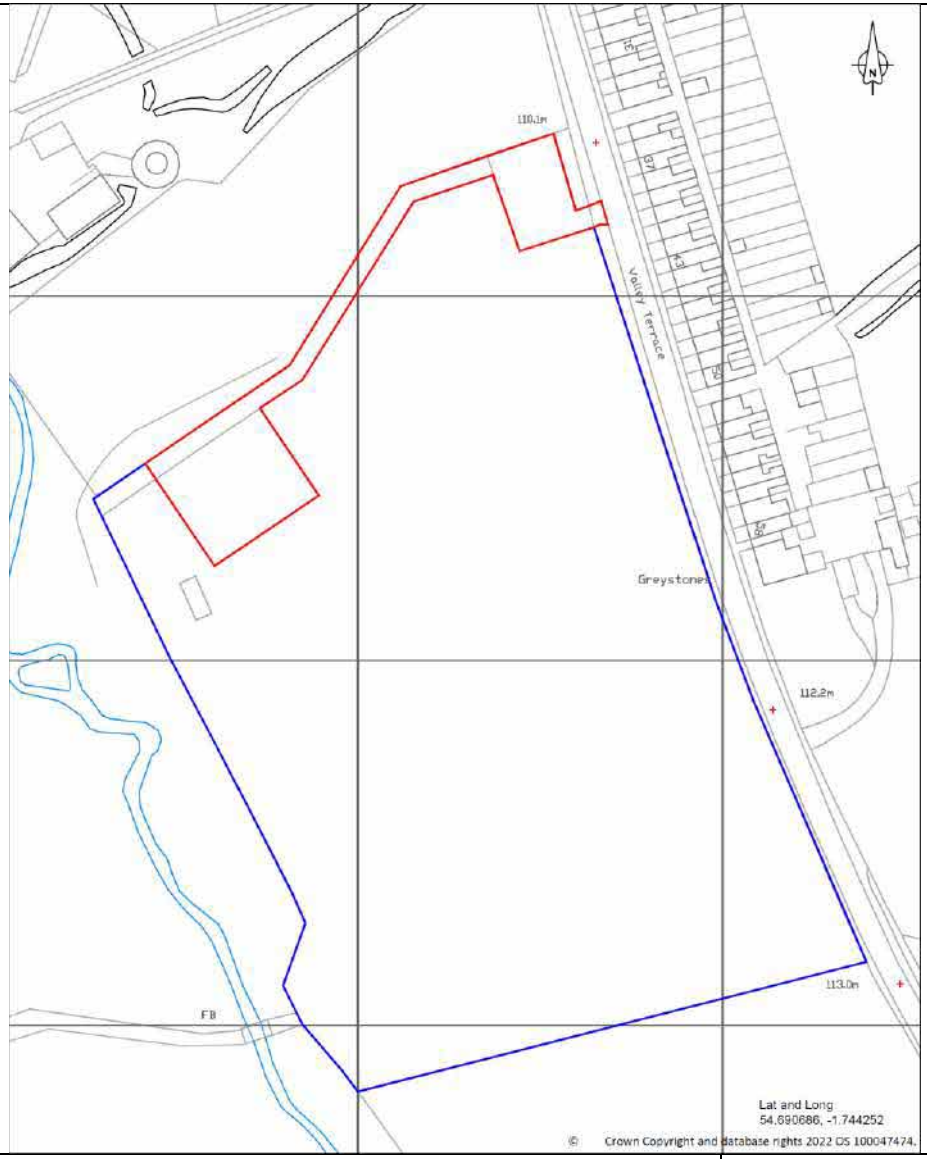
The site intersects a Development High Risk Area for coal mining. It is therefore recommended that a detailed Coal Mining Risk Assessment is completed.

APPENDICES

Appendix A – Site Location and Site Plan

enviro | solution	Site Location Map

Figure 1



enviro | solution

Existing Site Plan

Figure 2

enviro | solution

Proposed Development Plan

Figure 3

Appendix B – Site Photographs

enviro | solution	Access to car park looking west

enviro | solution	Gate between car park and access path

enviro | solution	Fence along northern boundary

enviro | solution	View of western boundary looking north

enviro | solution	Combined sewer overflow southwest of the site

enviro | solution	View of access path along the northern side of the site, and additional path for maintenance of the CSO looking southwest

enviro | solution	Open land to the south

enviro | solution	Gate between car park and access path

enviro | solution	Beechburn beck

enviro | solution	Detail of public footpath around the site showing bricks and concrete blocks

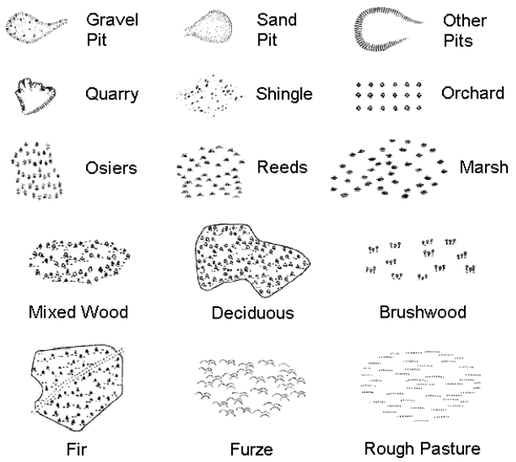
enviro | solution	Northern boundary and dense woodland north of the site

enviro | solution	Public footpath north of the site

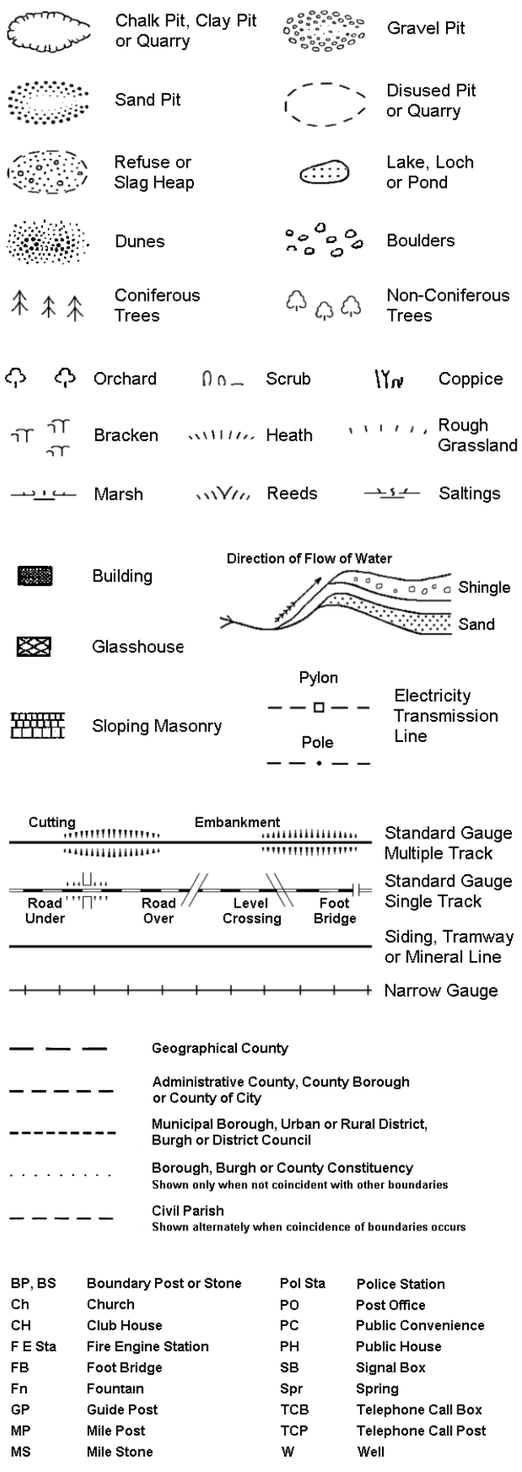
Appendix C - Historical Maps

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

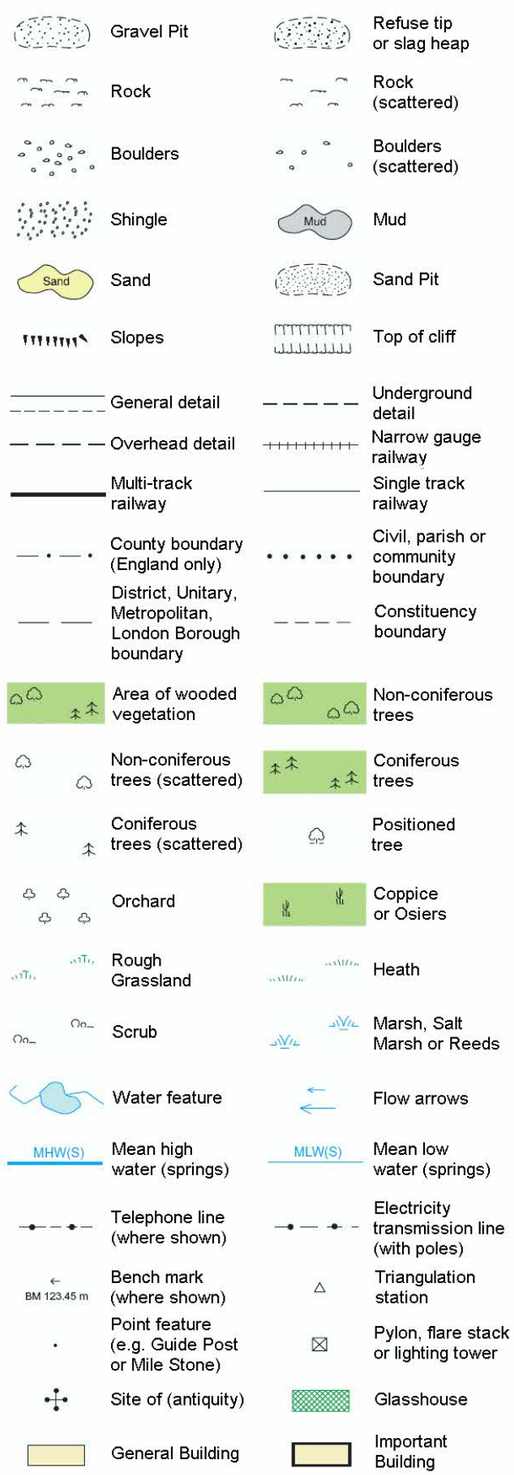


Ordnance Survey Plan 1:10,000



BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping



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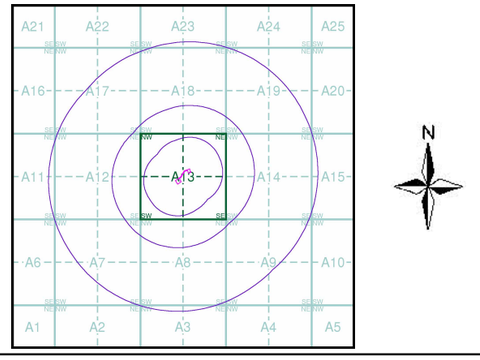
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Durham	1:10,560	1861	2
Durham	1:10,560	1898	3
Durham	1:10,560	1924	4
Durham	1:10,560	1938 - 1939	5
Ordnance Survey Plan	1:10,000	1954	6
Ordnance Survey Plan	1:10,000	1977	7
10K Raster Mapping	1:10,000	2000	8
Street View	Variable		9

Historical Map - Slice A



Order Details

Order Number:	297191831_1_1
Customer Ref:	ES200622
National Grid Reference:	416600, 532890
Slice:	A
Site Area (Ha):	0.22
Search Buffer (m):	1000

Site Details

36, Valley Terrace, Howden Le Wear, CROOK, DL15 8EP

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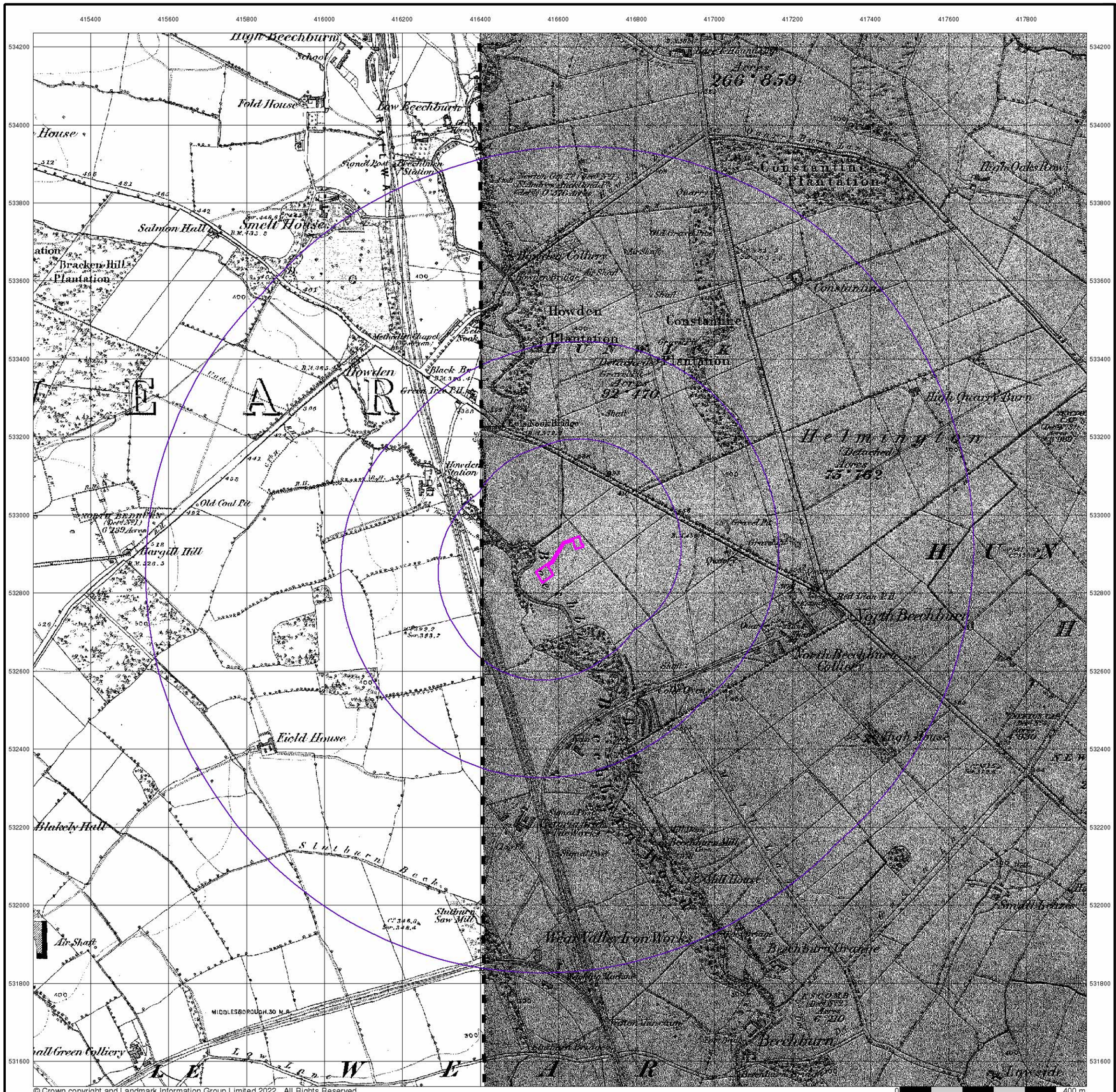
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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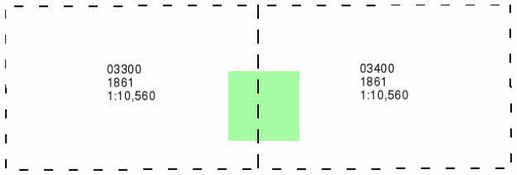
Durham

Published 1861

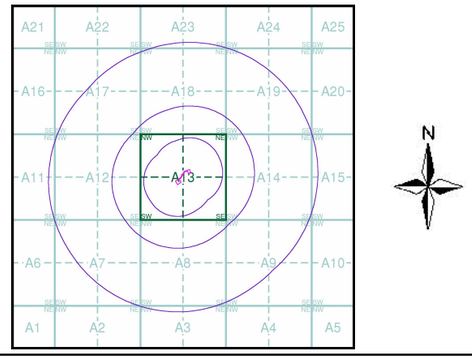
Source map scale - 1:10,560

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

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Customer Ref:	ES200622
National Grid Reference:	416600, 532890
Slice:	A
Site Area (Ha):	0.22
Search Buffer (m):	1000

Site Details

36, Valley Terrace, Howden Le Wear, CROOK, DL15 8EP

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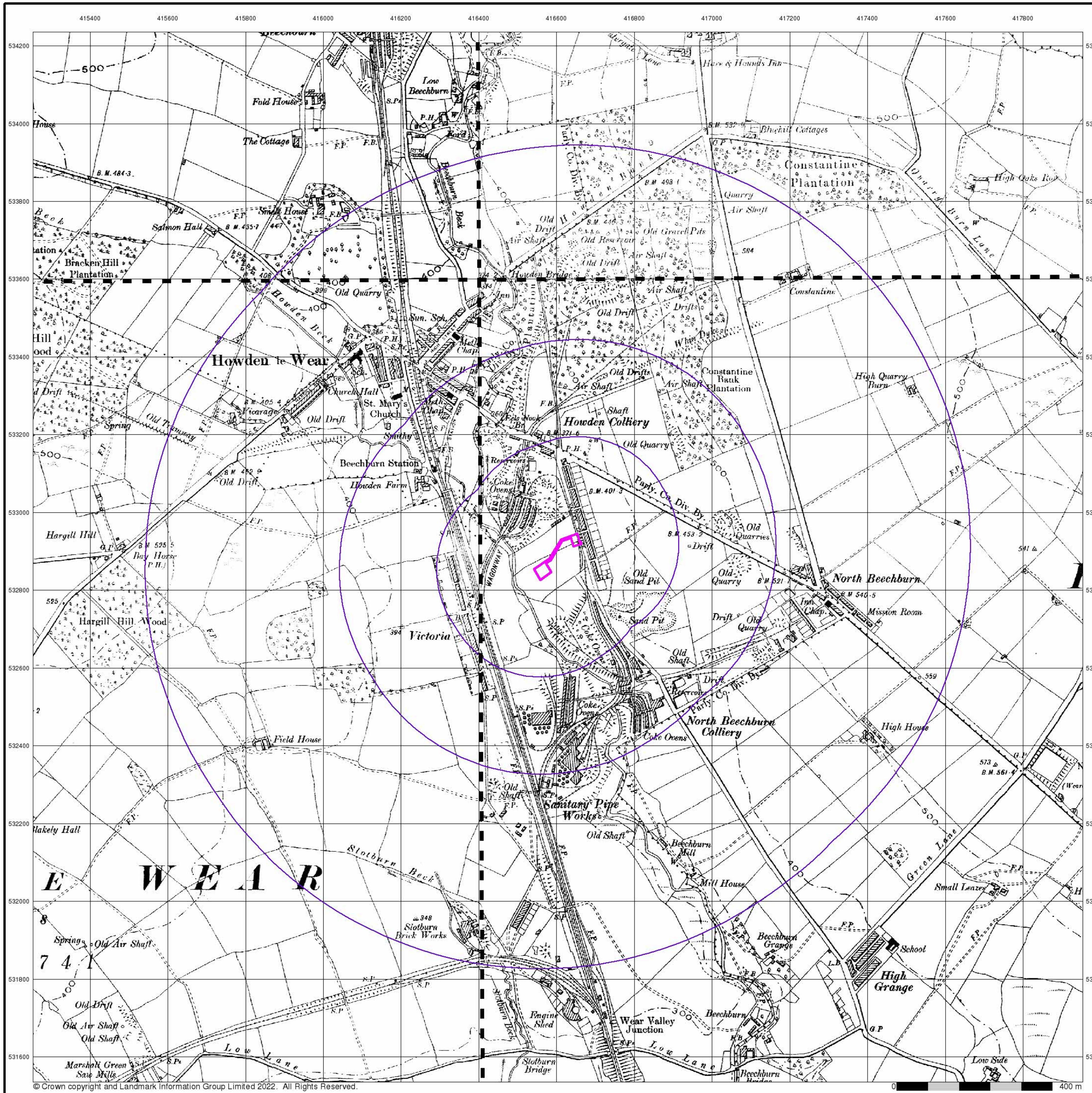

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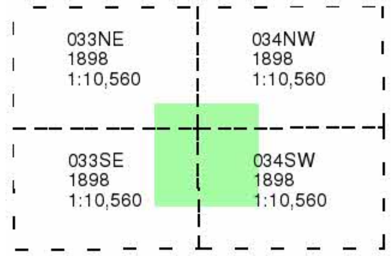
Published 1898

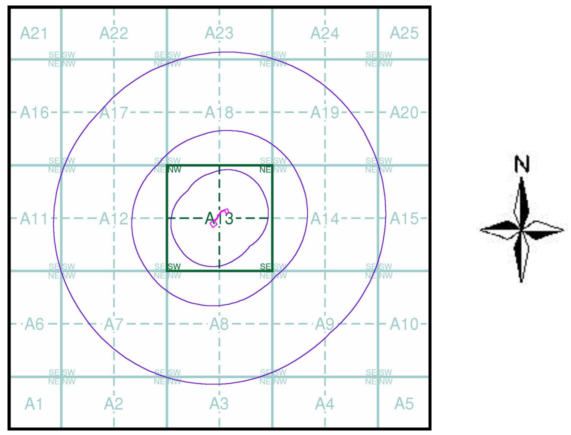
Source map scale - 1:10,560

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: 297191831_1_1
Customer Ref: ES200622
National Grid Reference: 416600, 532890
Slice: A
Site Area (Ha): 0.22
Search Buffer (m): 1000

Site Details

36, Valley Terrace, Howden Le Wear, CROOK, DL15 8EP

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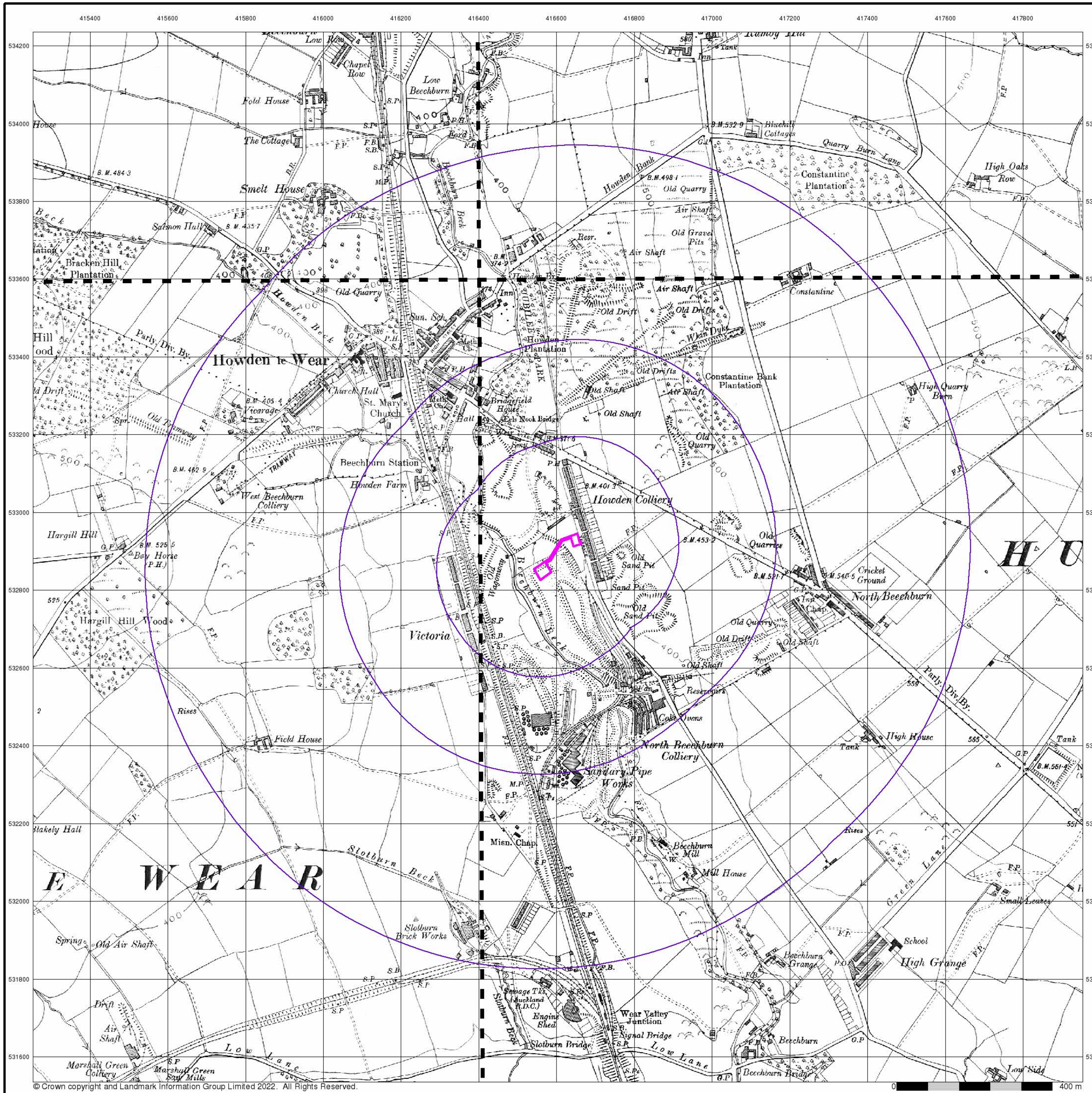

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Durham

Published 1924

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.

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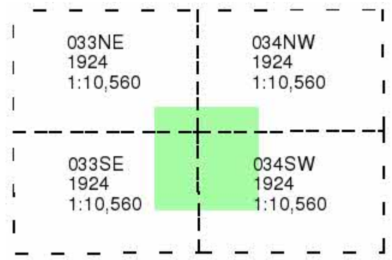
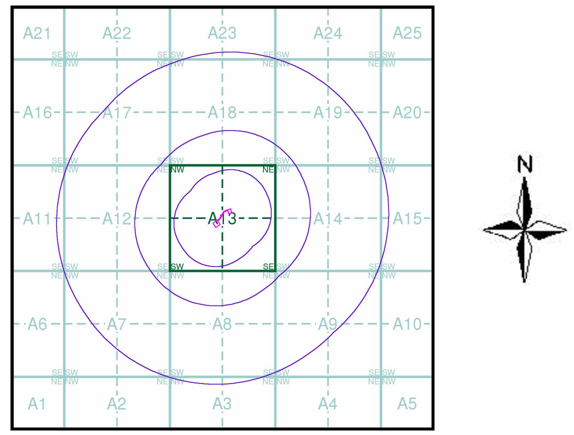


Historical Map - Slice A



Order Details

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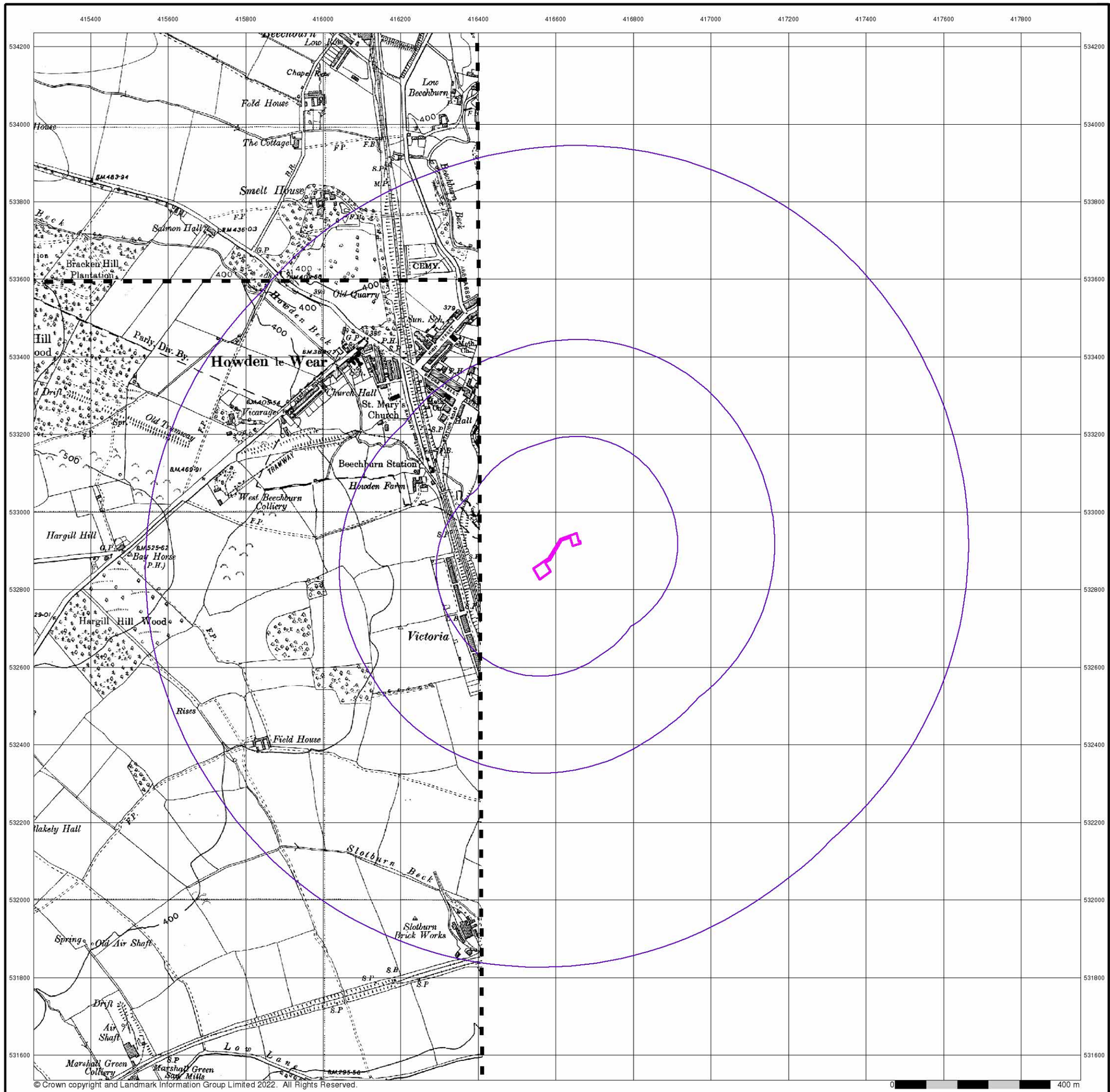

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Durham

Published 1938 - 1939

Source map scale - 1:10,560

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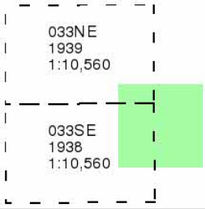
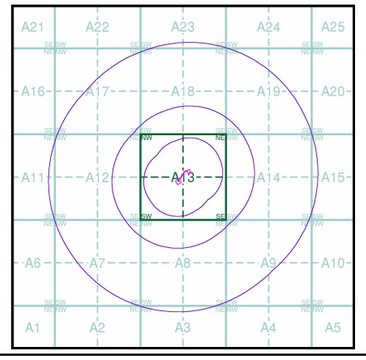


Historical Map - Slice A



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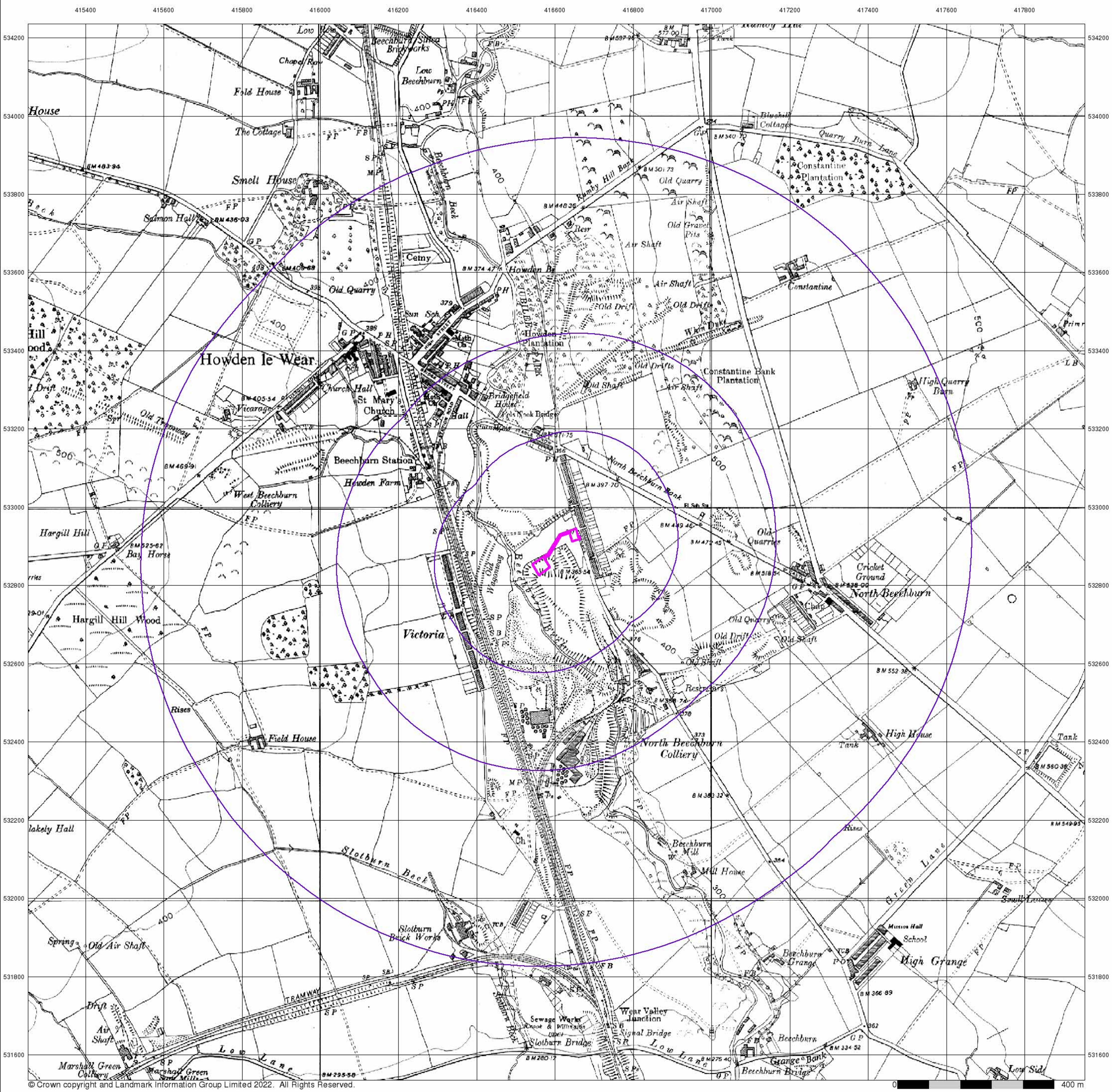

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Ordnance Survey Plan
Published 1954
Source map scale - 1:10,000

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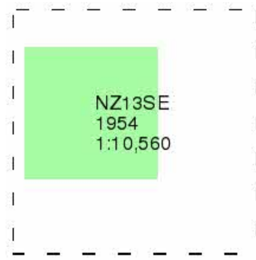
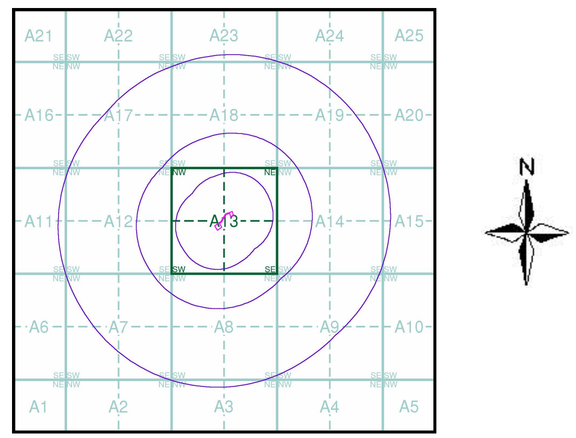


Historical Map - Slice A



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Site Details

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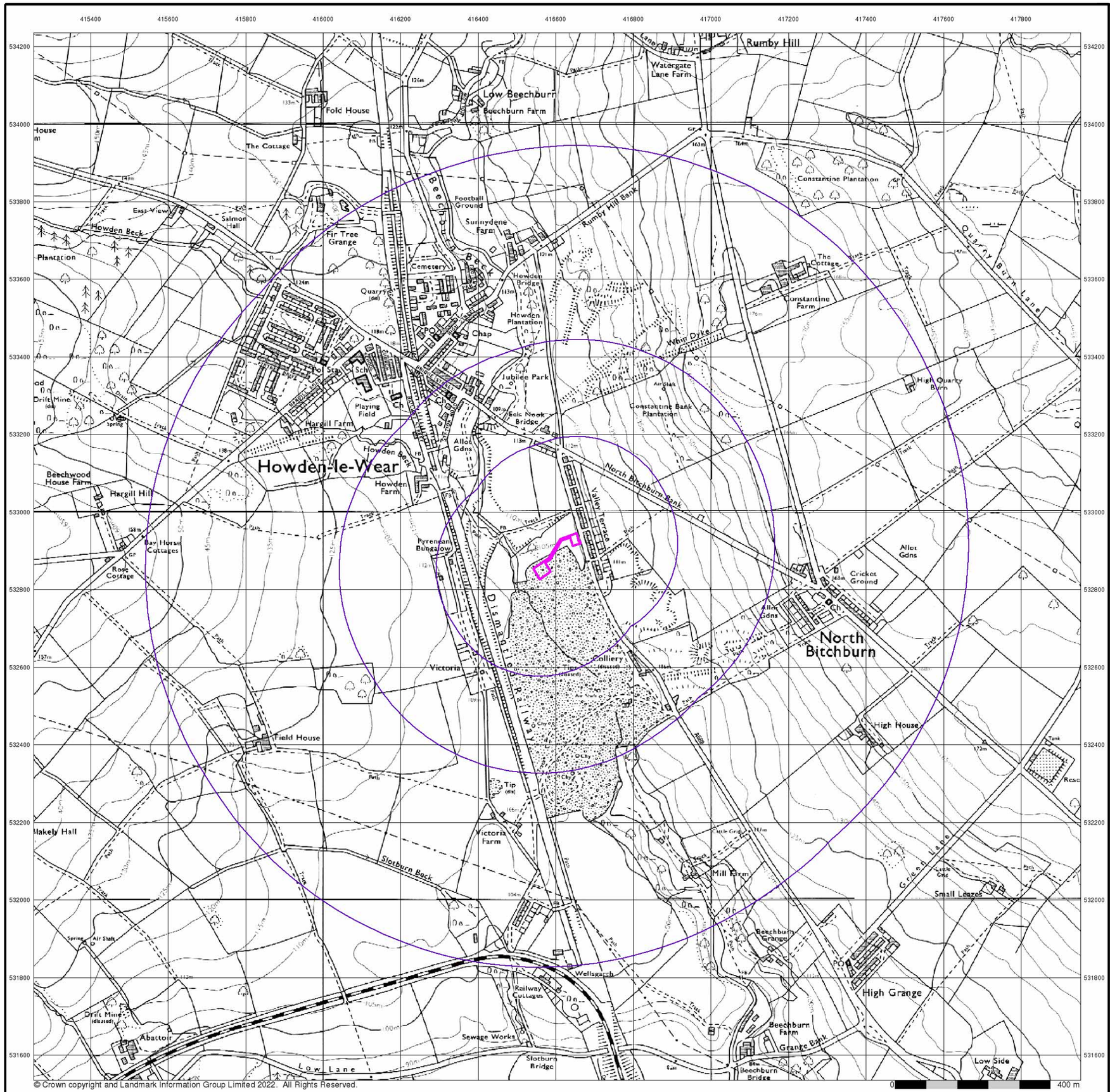

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Ordnance Survey Plan

Published 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.

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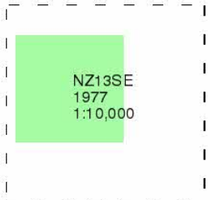
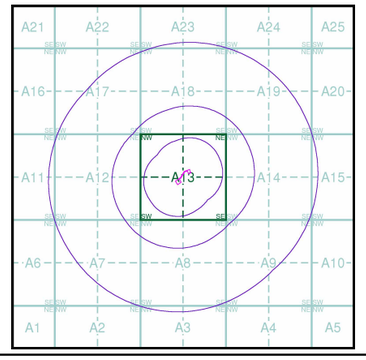


Historical Map - Slice A



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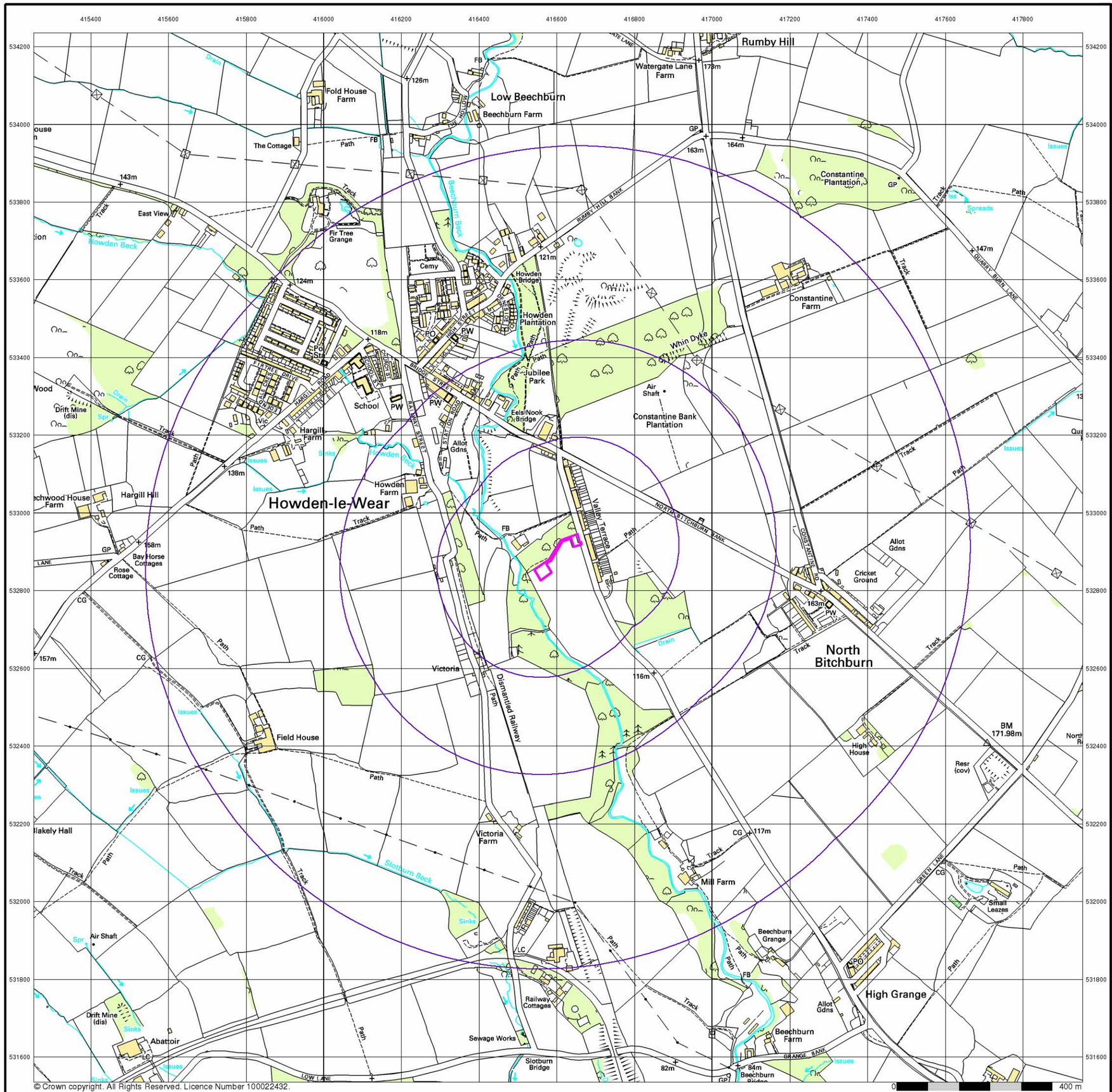

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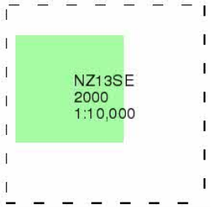
10k Raster Mapping

Published 2000

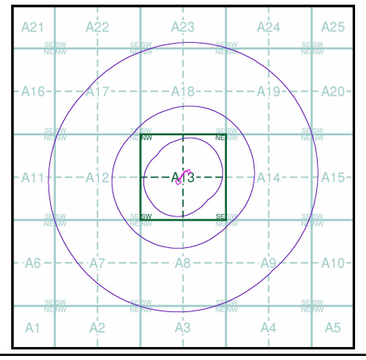
Source map scale - 1:10,000

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)



Historical Map - Slice A



Order Details

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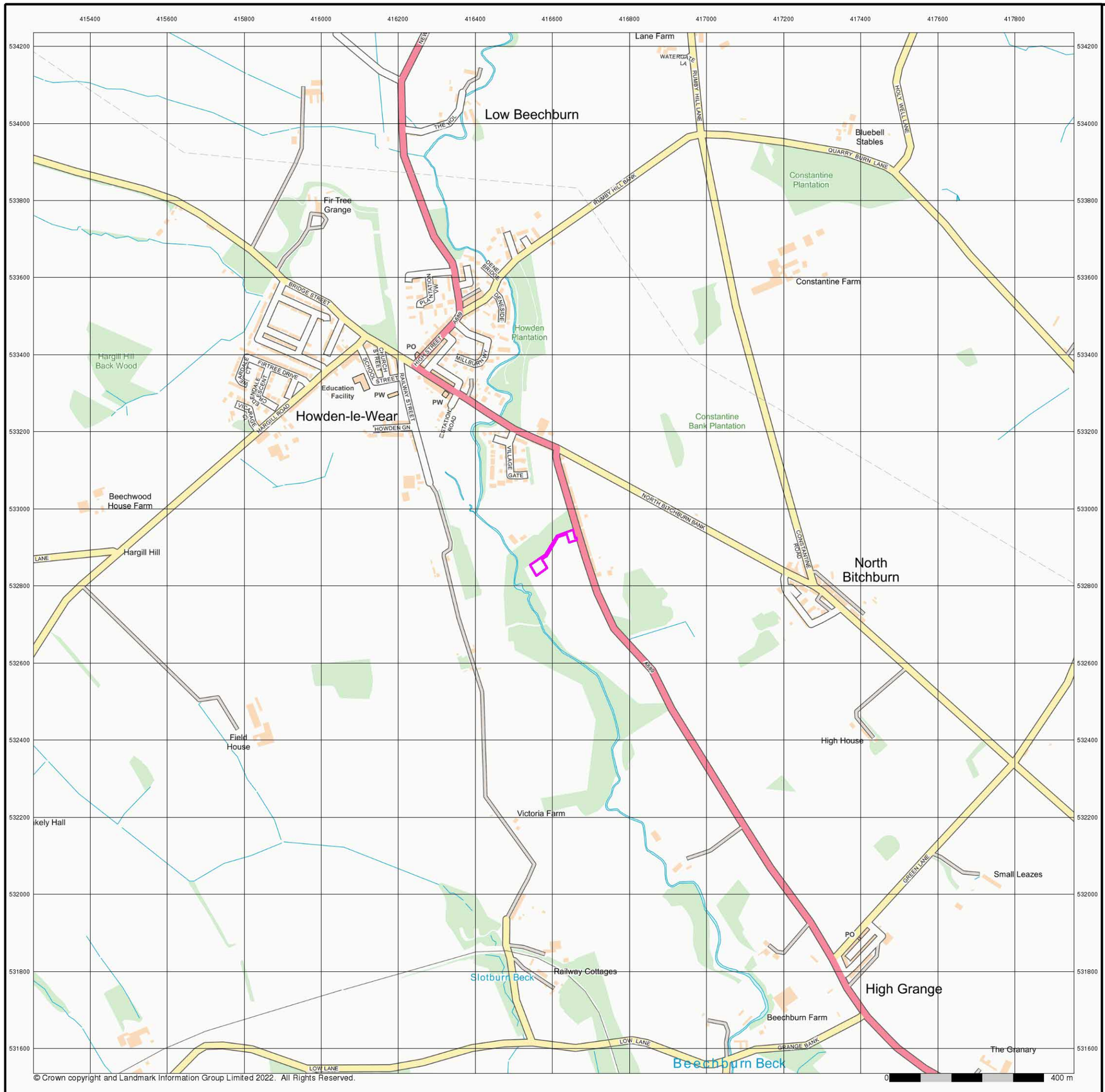

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Street View

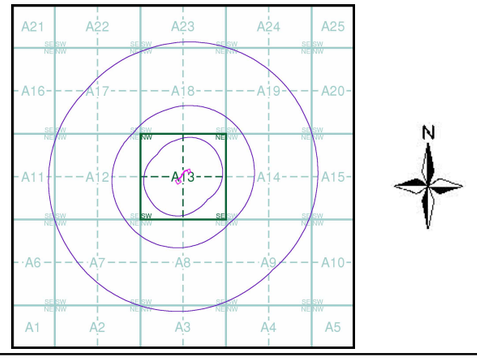
Published 2022

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



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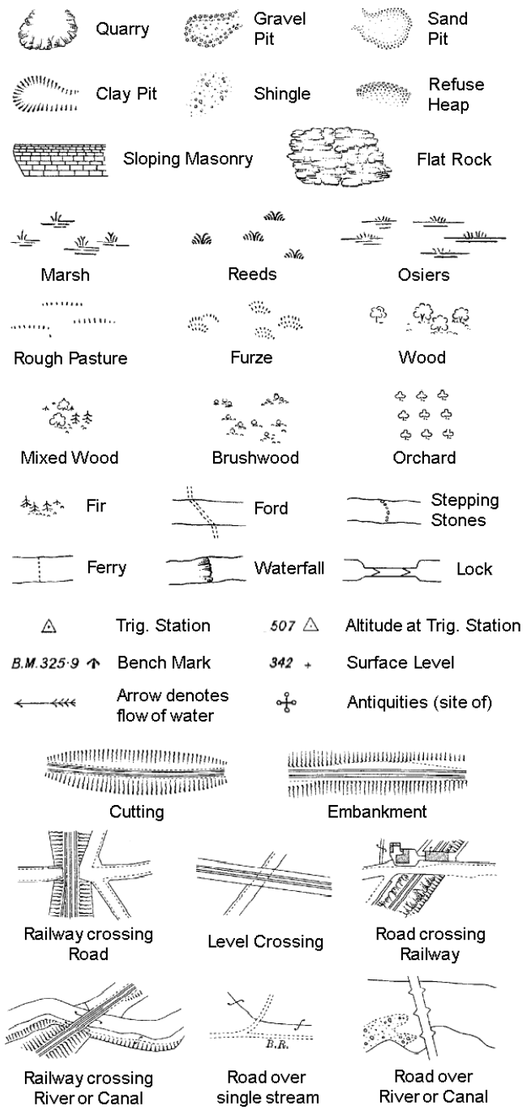
Historical Mapping Legends

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



County Boundary (Geographical)

County & Civil Parish Boundary

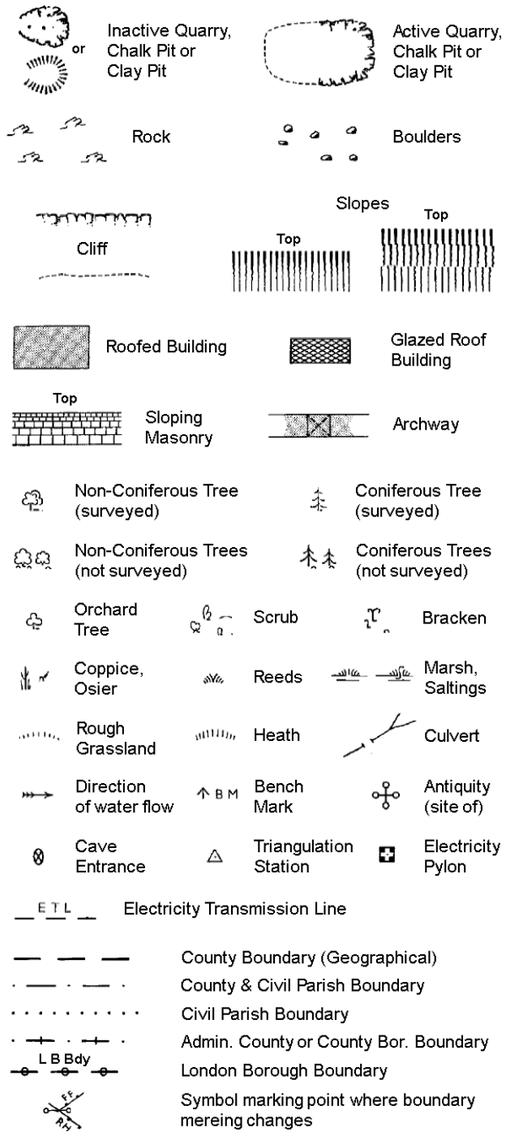
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

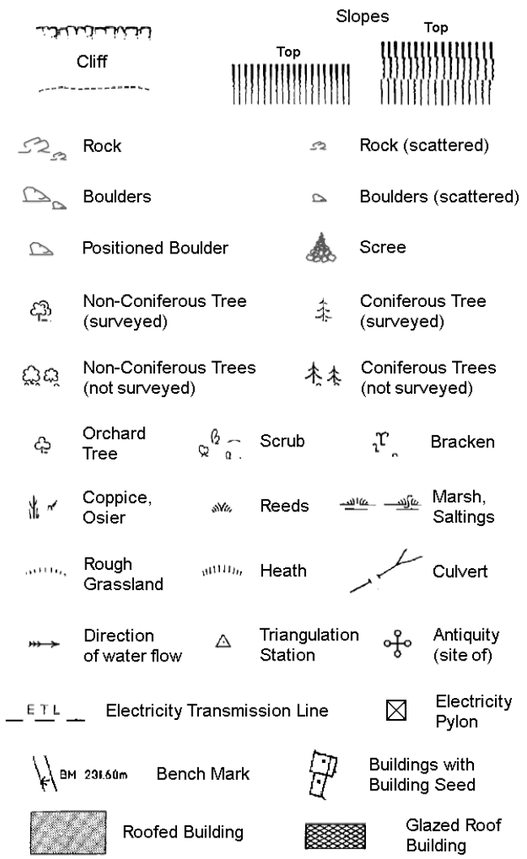
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

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



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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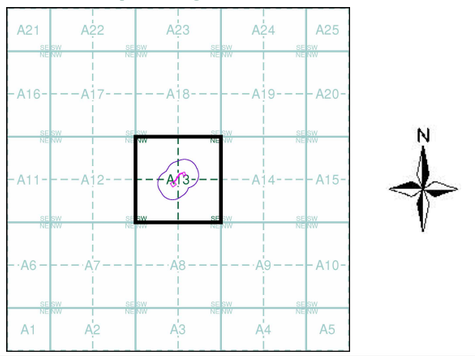
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Durham	1:2,500	1856 - 1882	2
Durham	1:2,500	1897	3
Durham	1:2,500	1920 - 1921	4
Durham	1:2,500	1939	5
Ordnance Survey Plan	1:2,500	1973	6
Additional SIMs	1:2,500	1984	7
Large-Scale National Grid Data	1:2,500	1993	8
Large-Scale National Grid Data	1:2,500	1996	9

Historical Map - Segment A13



Order Details

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Site Details

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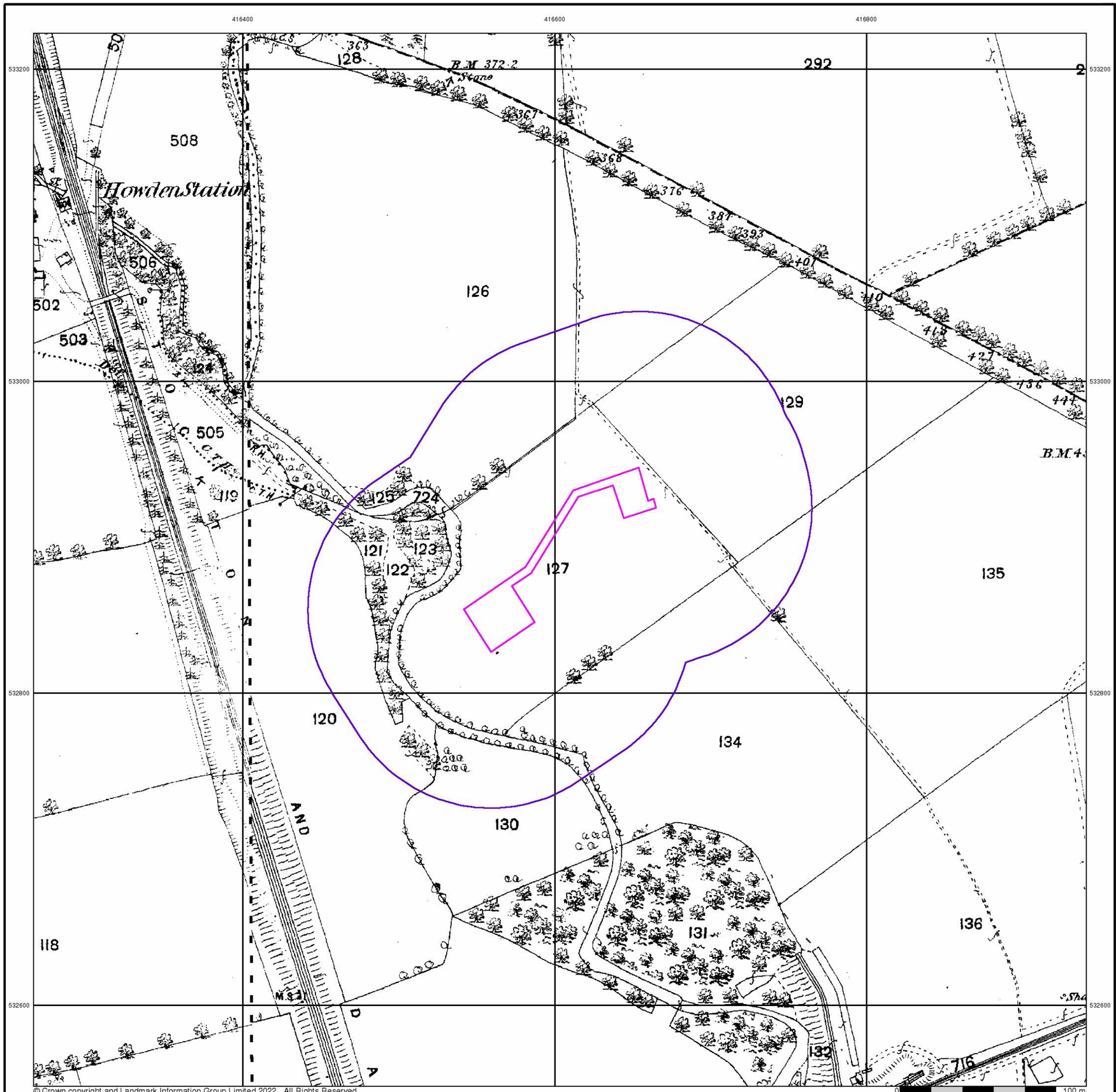

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Durham

Published 1856 - 1882

Source map scale - 1:2,500

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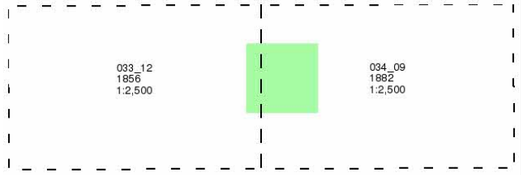
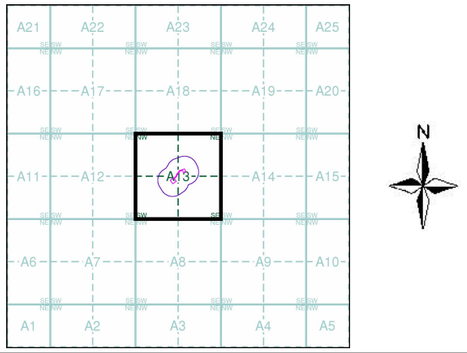


Historical Map - Segment A13



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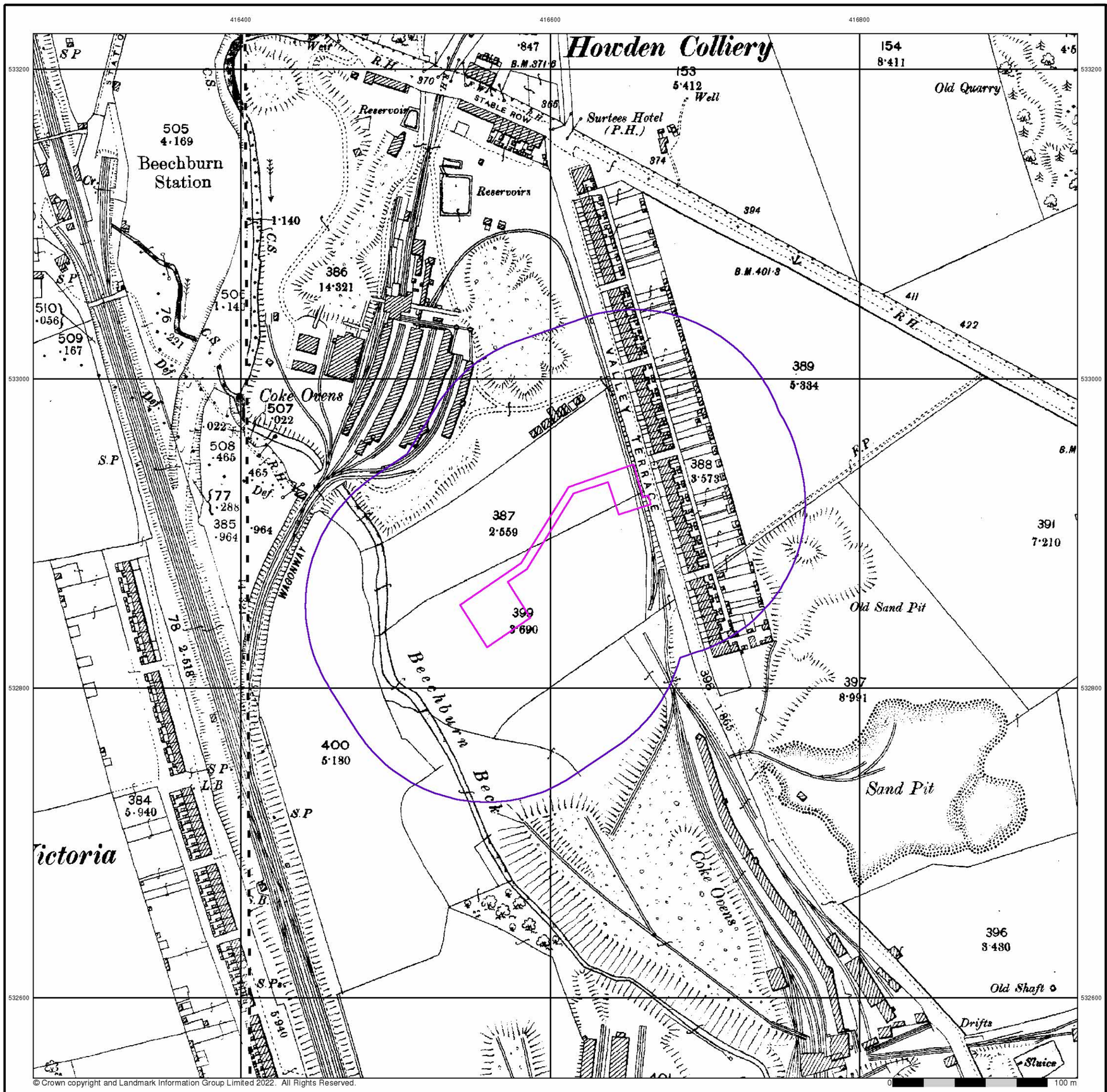

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Durham

Published 1897

Source map scale - 1:2,500

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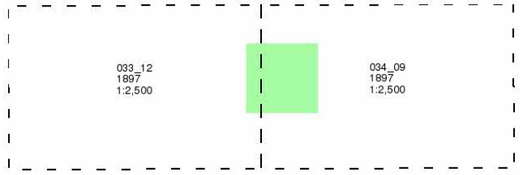
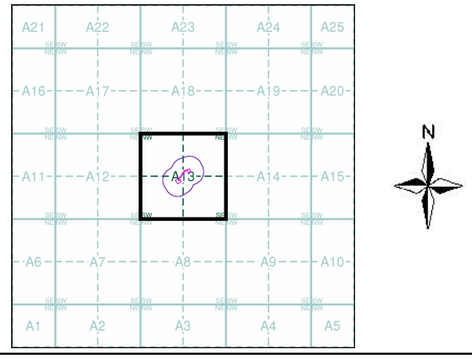


Historical Map - Segment A13



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Durham

Published 1920 - 1921

Source map scale - 1:2,500

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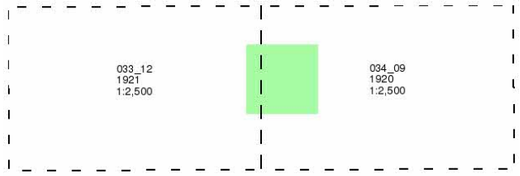
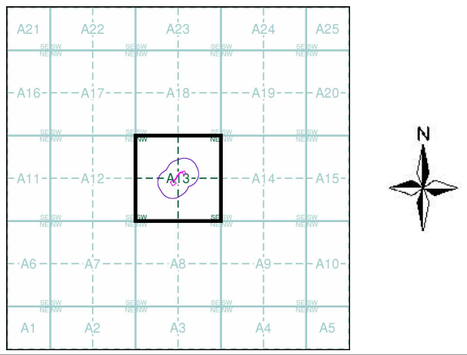


Historical Map - Segment A13



Order Details

Order Number:	297191831_1_1
Customer Ref:	ES200622
National Grid Reference:	416600, 532890
Slice:	A
Site Area (Ha):	0.22
Search Buffer (m):	100

Site Details

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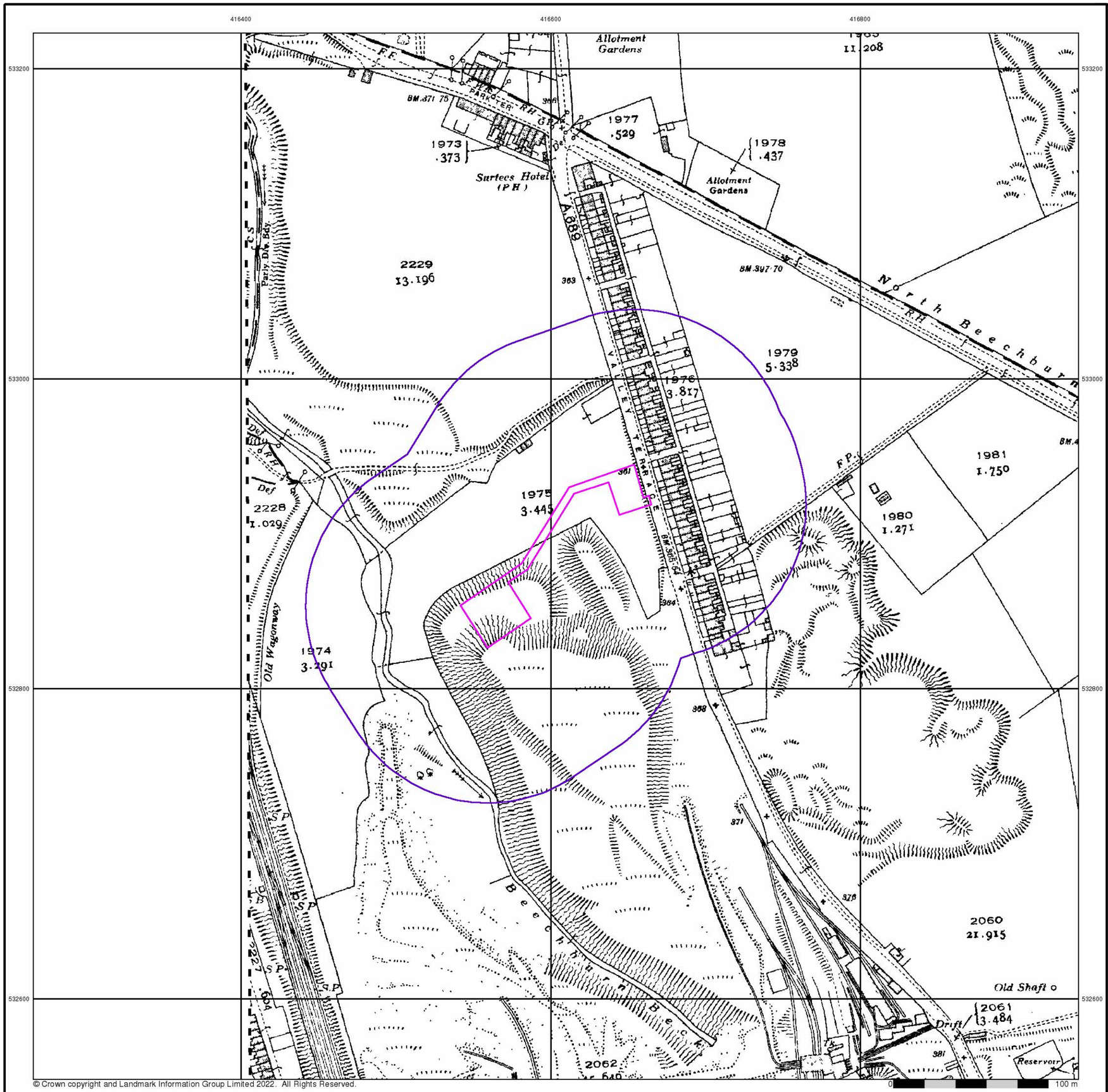

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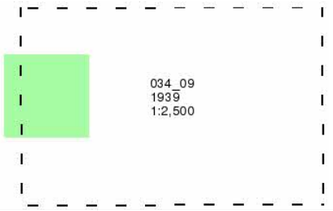
Durham

Published 1939

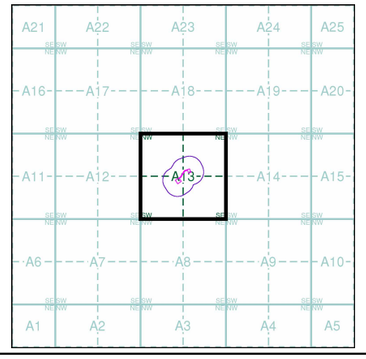
Source map scale - 1:2,500

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



Order Details

Order Number:	297191831_1_1
Customer Ref:	ES200622
National Grid Reference:	416600, 532890
Slice:	A
Site Area (Ha):	0.22
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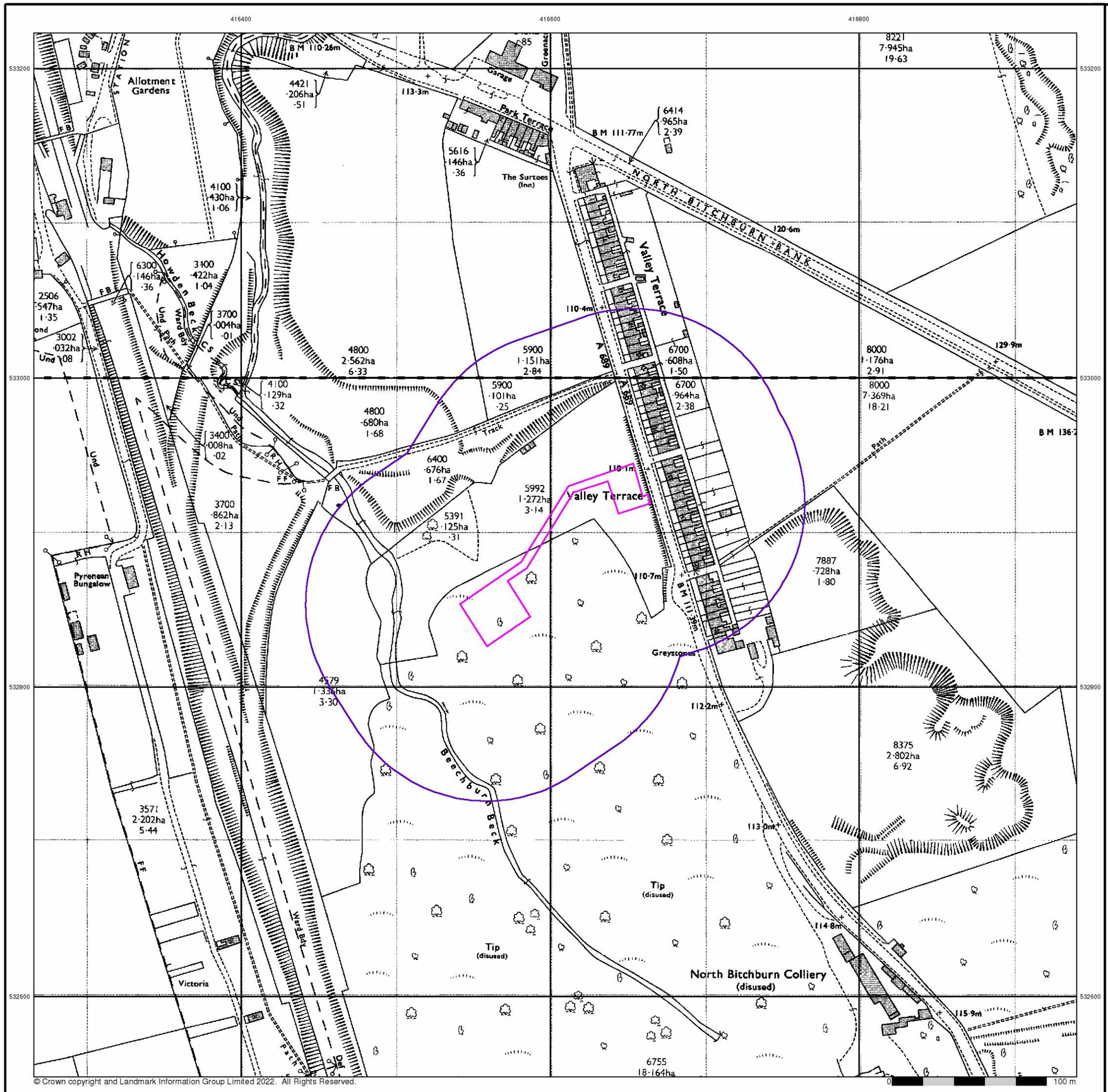

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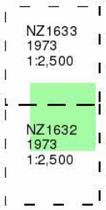
Ordnance Survey Plan

Published 1973

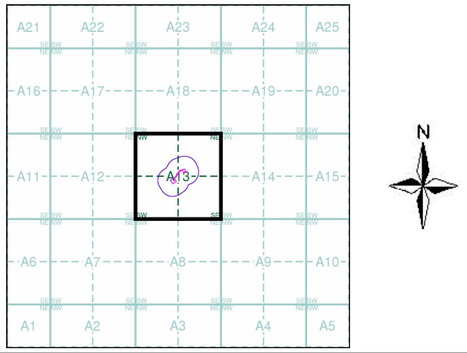
Source map scale - 1:2,500

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



Order Details

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Customer Ref:	ES200622
National Grid Reference:	416600, 532890
Slice:	A
Site Area (Ha):	0.22
Search Buffer (m):	100

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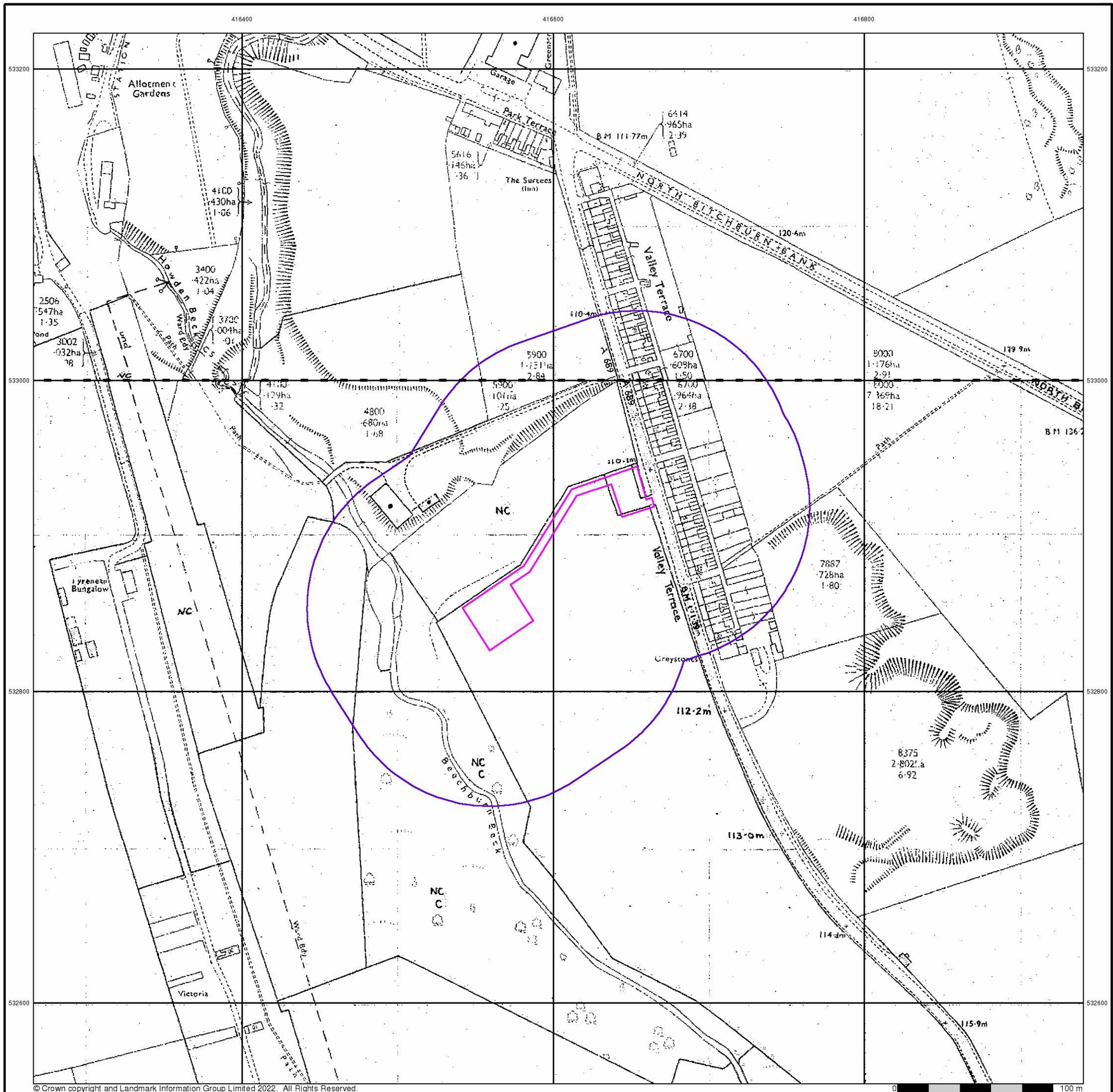

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Additional SIMs

Published 1984

Source map scale - 1:2,500

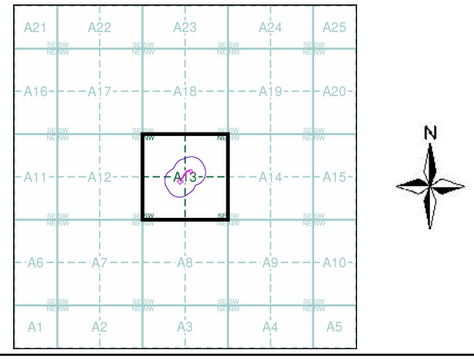
The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps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

Map Name(s) and Date(s)

NZ1633
1984
1:2,500

NZ1632
1984
1:2,500

Historical Map - Segment A13



Order Details

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National Grid Reference:	416600, 532890
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Site Area (Ha):	0.22
Search Buffer (m):	100

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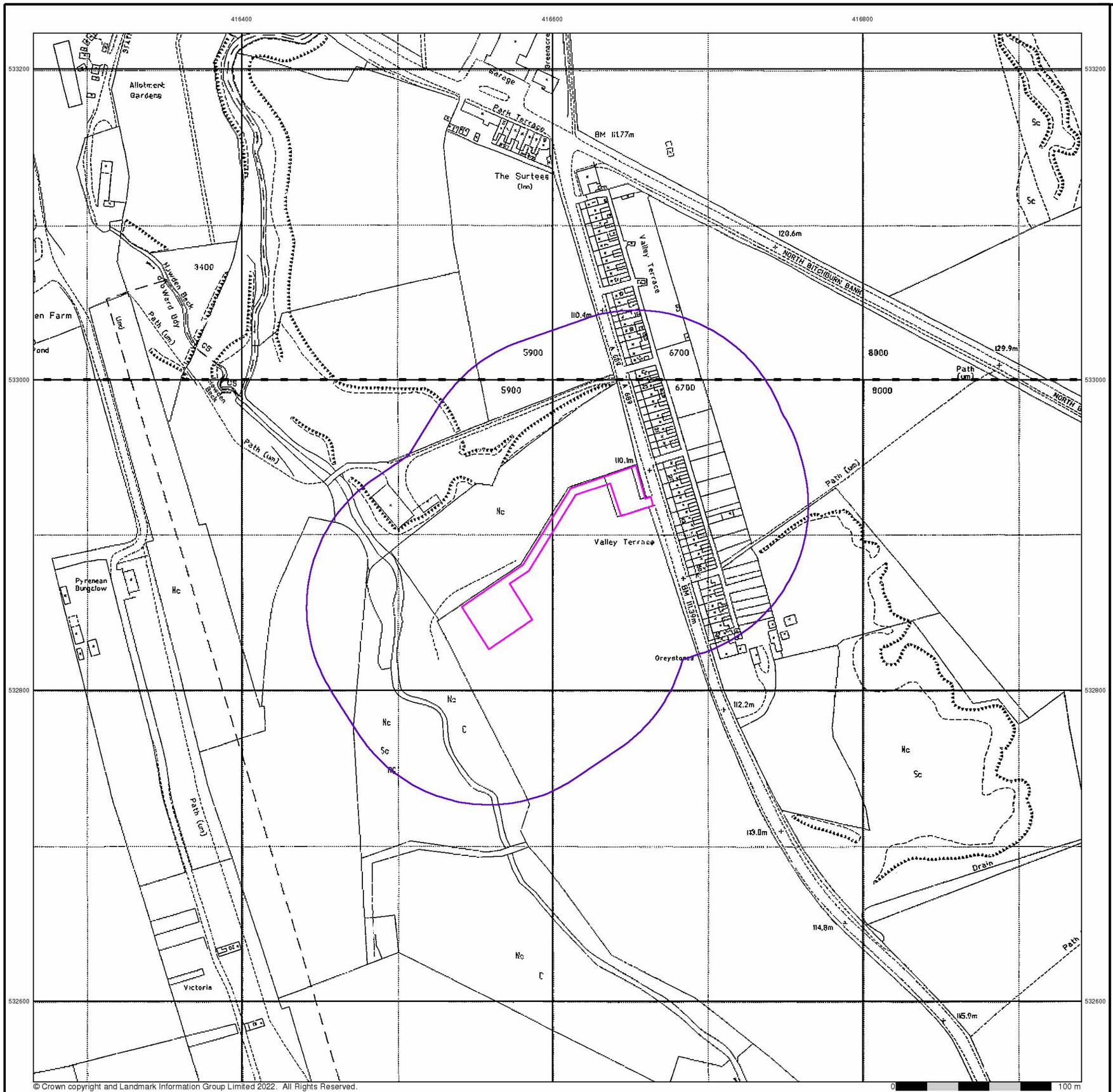

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Large-Scale National Grid Data

Published 1993

Source map scale - 1:2,500

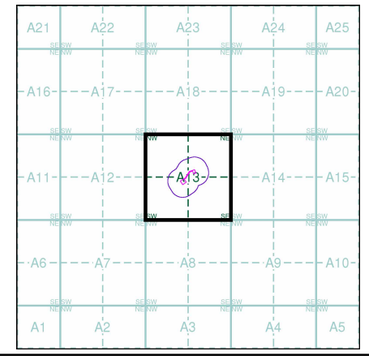
'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic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

Map Name(s) and Date(s)

NZ1633
1993
1:2,500

NZ1632
1993
1:2,500

Historical Map - Segment A13



Order Details

Order Number:	297191831_1_1
Customer Ref:	ES200622
National Grid Reference:	416600, 532890
Slice:	A
Site Area (Ha):	0.22
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LANDMARK INFORMATION GROUP®

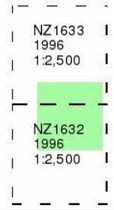
Large-Scale National Grid Data

Published 1996

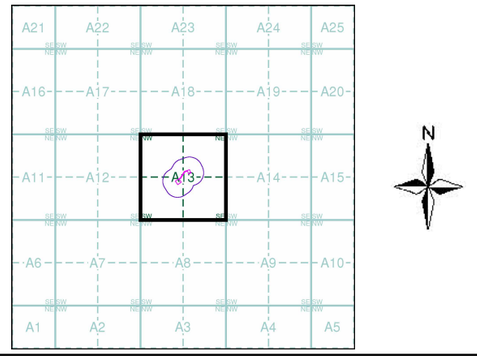
Source map scale - 1:2,500

'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:	297191831_1_1
Customer Ref:	ES200622
National Grid Reference:	416600, 532890
Slice:	A
Site Area (Ha):	0.22
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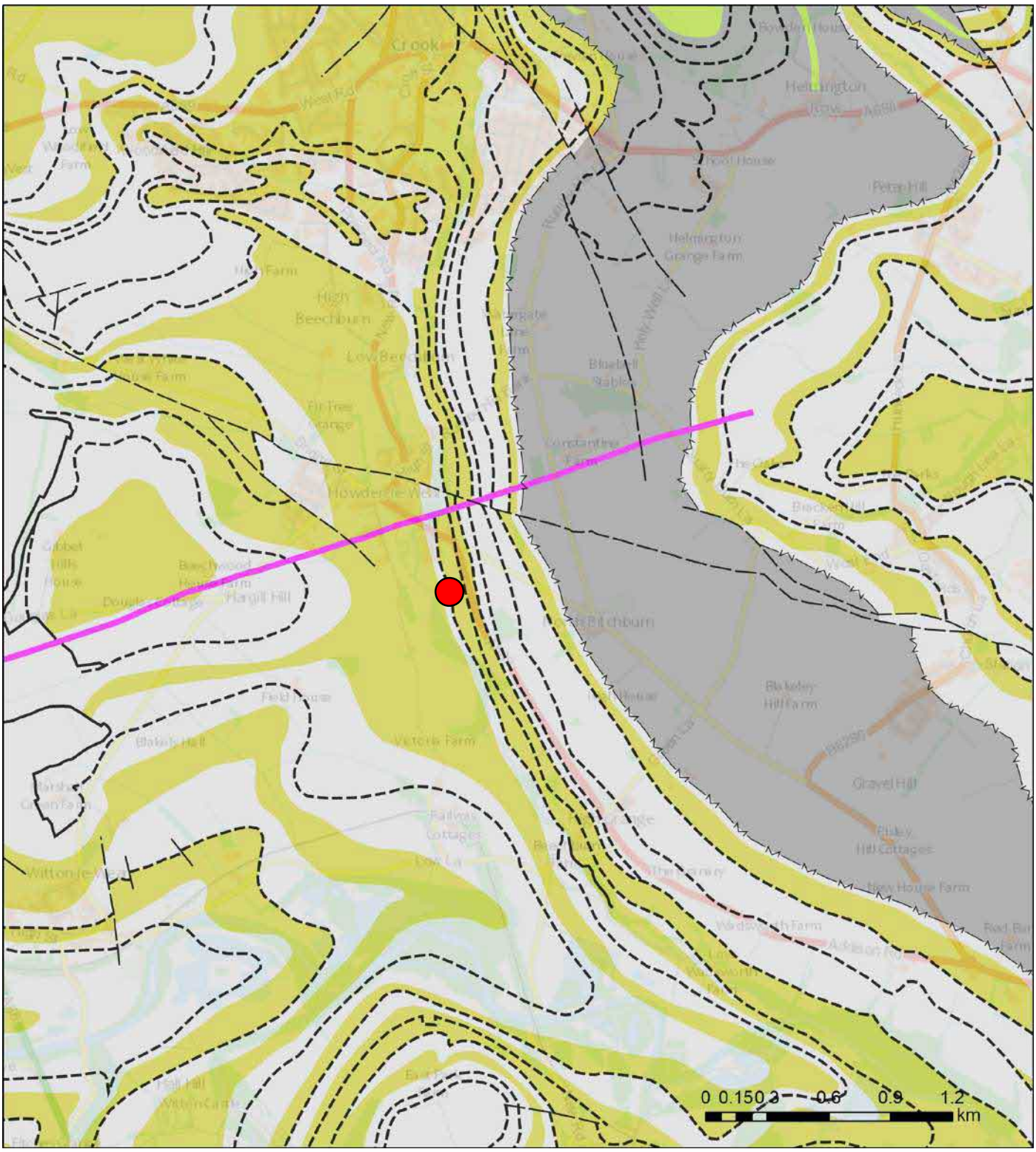
Appendix D – Geological Maps

Superficial Geology

Superficial deposits 1:50,000 scale

- GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL
- TILL, DEVENSIAN - DIAMICTON
- ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
- RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - GRAVEL, SAND AND SILT

Bedrock Geology



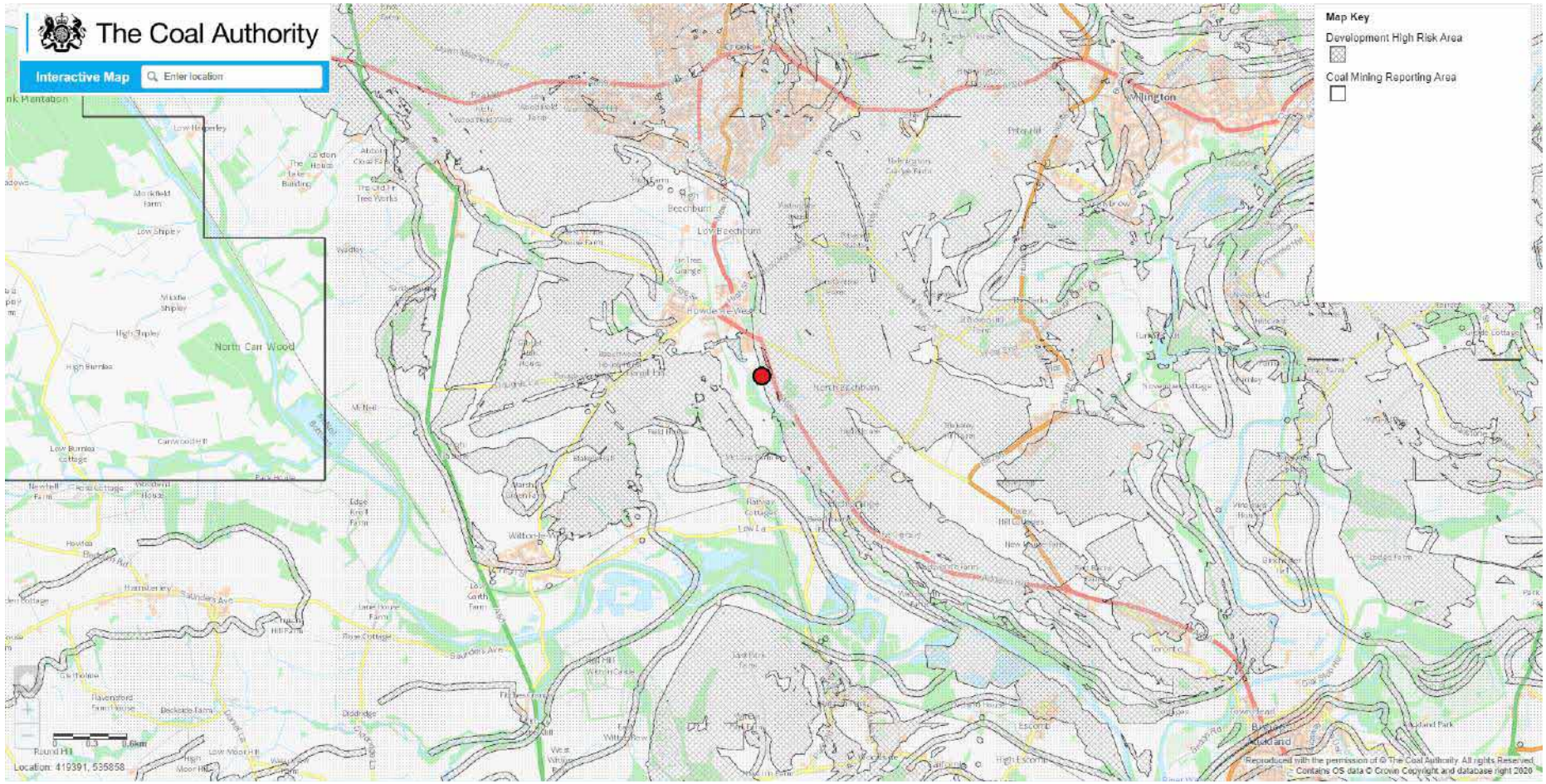
Bedrock geology 1:50,000 scale

- NORTHERN ENGLAND LATE CARBONIFEROUS THOLEIITIC DYKE-SWARM - QUARTZ-MICROGABBRO
- PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- STAINMORE FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- STAINMORE FORMATION - SANDSTONE
- PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE
- PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE

Linear features 1:50,000 scale

- Coal_seam_Inf
- Coal_seam_Obs
- Marine_band

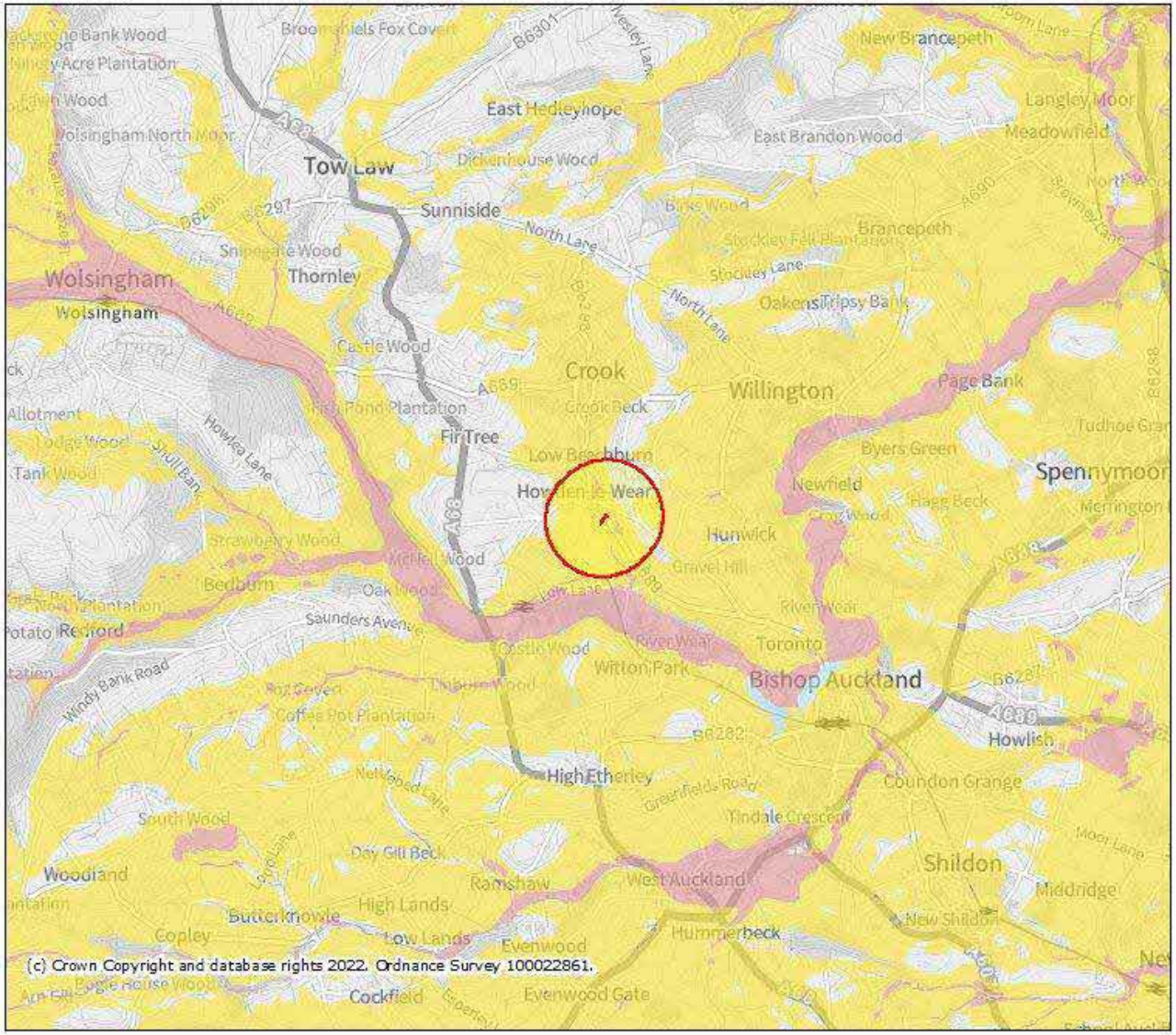
Appendix E – Coal Mining Summary Map



enviro | solution	Historic Landfill Map

MAGIC

Superficial Aquifer



Legend

Aquifer Designation Map (Superficial Drift) (England)

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

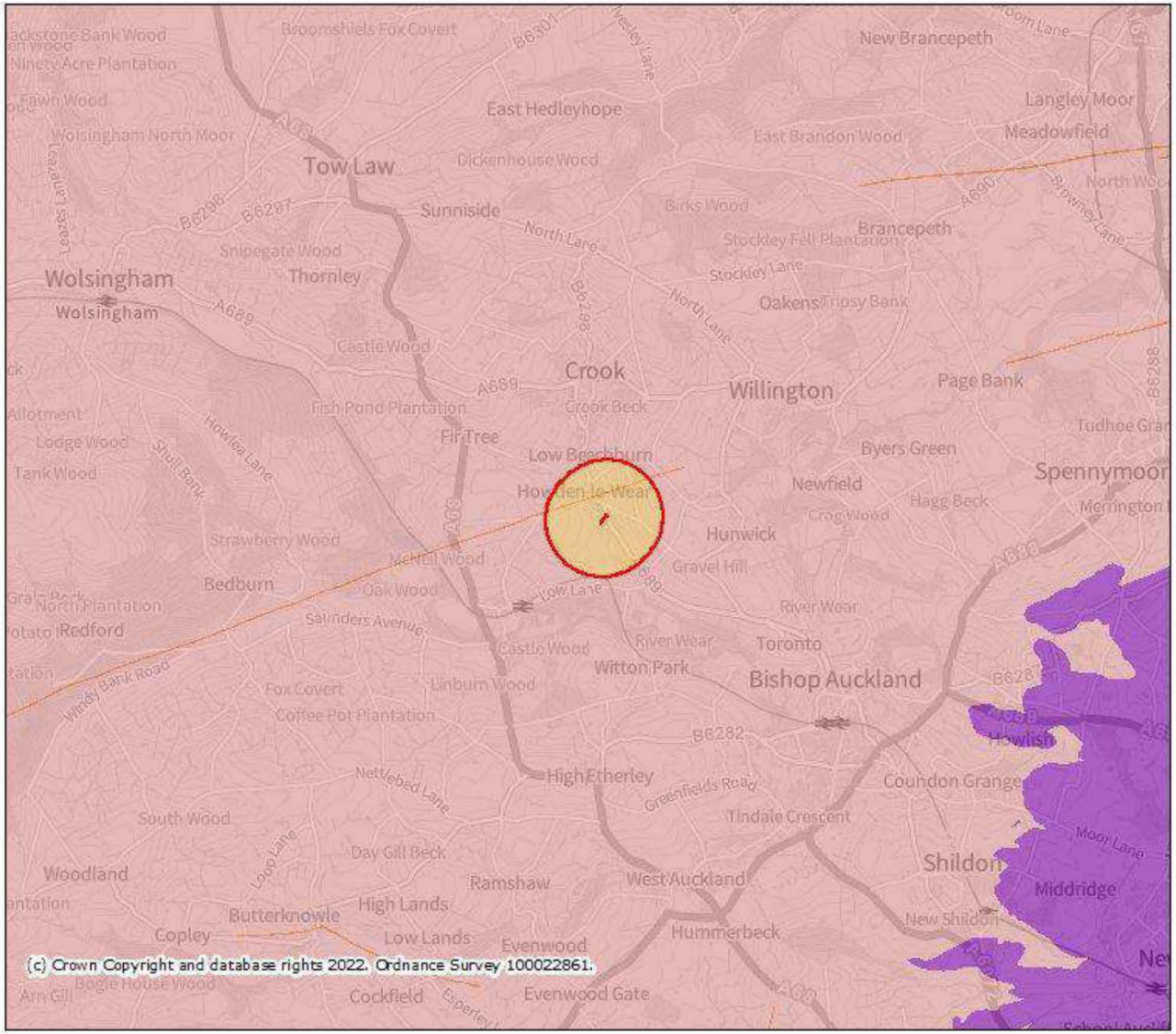
Projection = OSGB36
xmin = 389700
ymin = 519300
xmax = 442900
ymax = 546500

0 2 4
km

Map produced by MAGIC on 20 June, 2022.

MAGiC

Bedrock Aquifer



Legend

Aquifer Designation Map (Bedrock) (England)

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

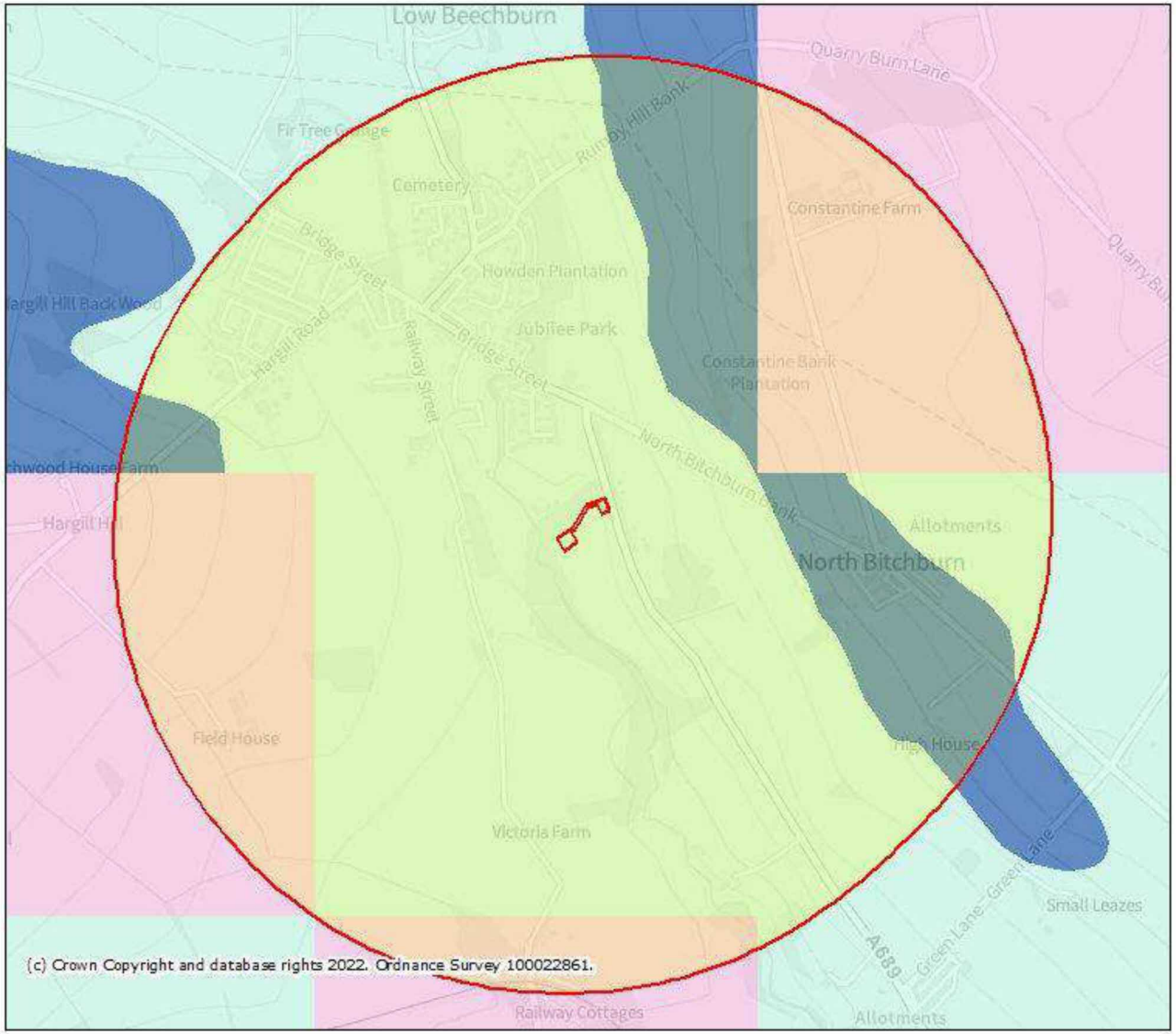
Projection = OSGB36
xmin = 389700
ymin = 519300
xmax = 442900
ymax = 546500

0 2 4
km

Map produced by MAGIC on 20 June, 2022.

MAGiC

Groundwater Vulnerability



Legend

Groundwater Vulnerability Map (England)

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

Projection = OSGB36
xmin = 413300
ymin = 531300
xmax = 420000
ymax = 534500

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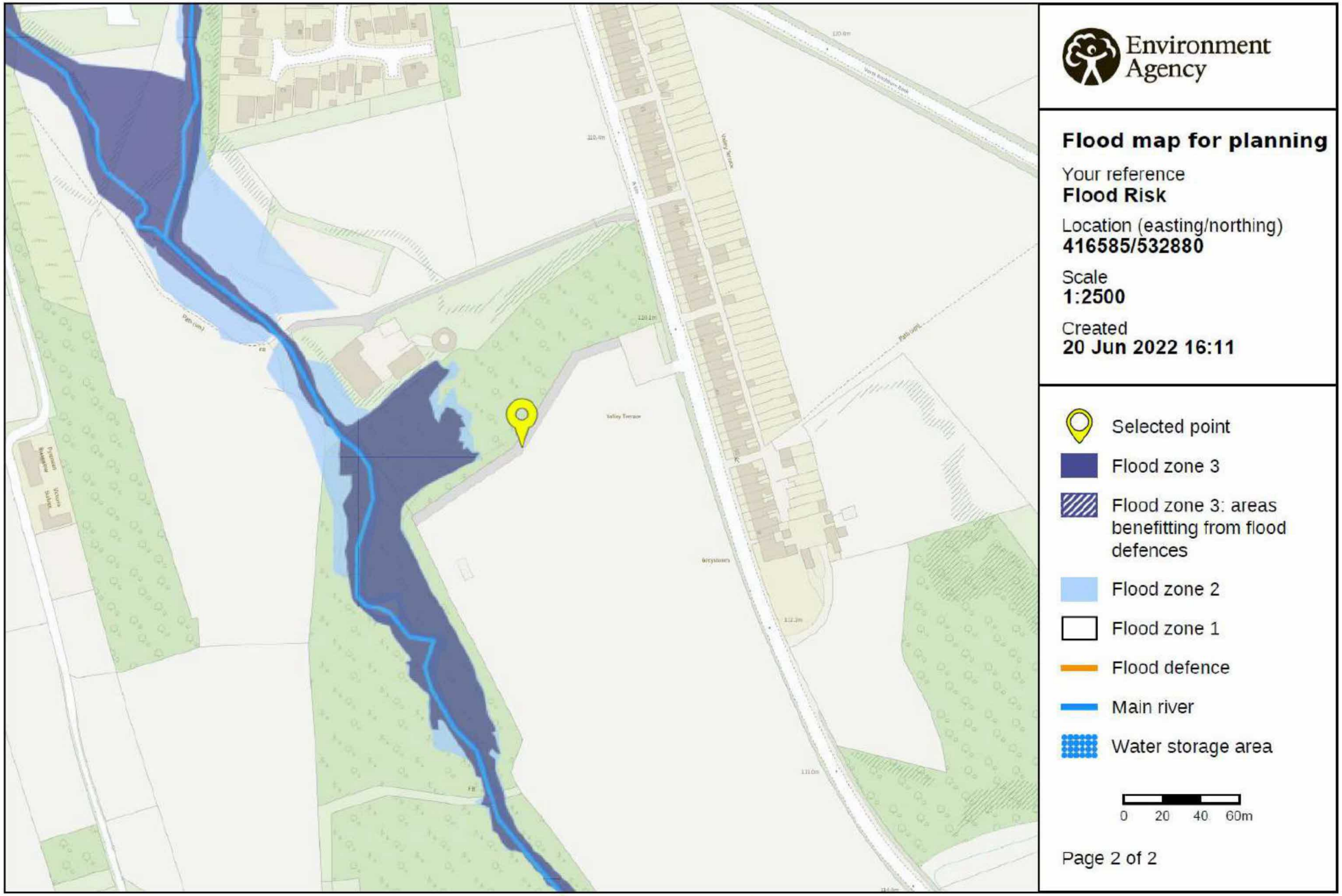
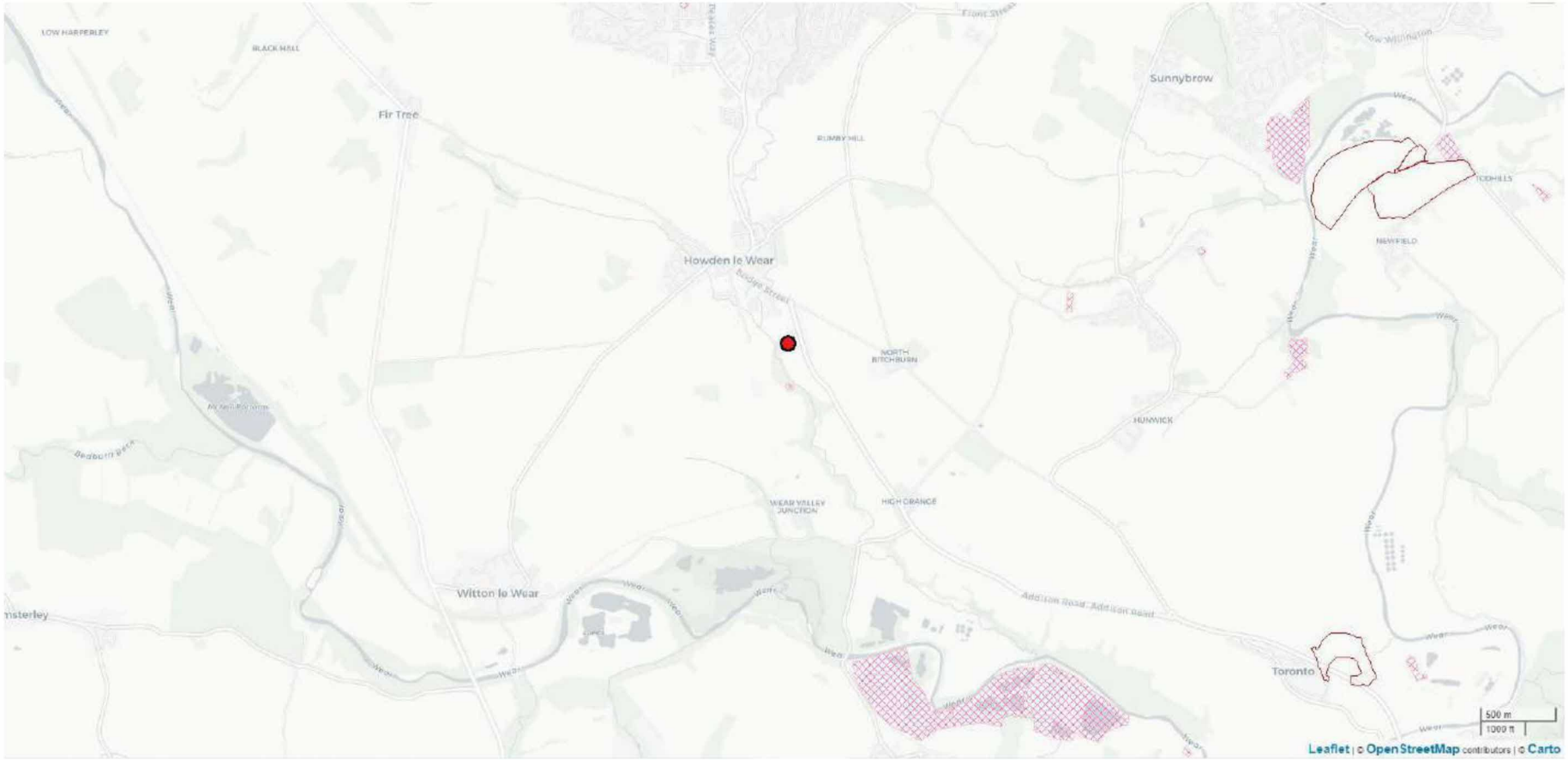
km

Map produced by MAGIC on 20 June, 2022.

Appendix G – Flood Risk Map



Appendix H – Historic Landfill Map



enviro | solution	**Historic Landfill Map**