Metropolis Planning and Design LLP

Land at Northaw Road East, Cuffley: Primary Distribution District Heat Network

Phase 1 Environmental Study

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RSK GENERAL NOTES

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1 INTRODUCTION

1.1 Instructions

On the instructions of Metropolis Planning and Design LLP (the 'Client'), RSK Environment Ltd (RSK) has carried out a Phase 1 Environmental Study of land adjacent to Northaw Road East, Cuffley.

The project was commissioned to obtain and collate information on the environmental characteristics of the site, with the purpose of identifying the existing potential geoenvironmental hazards and liabilities associated with the proposed construction of a primary distribution district heat network.

This report is subject to RSK's service constraints given in **Appendix A**.

1.2 Proposed development

It is proposed to construct a primary distribution district heat network running from a recently constructed anaerobic digestion plant to the south of Sopers Viaduct, to a proposed residential development to the north of Northaw Road East.

The heat pipe network will comprise of two pipes (ranging between 110mm and 180mm diameter) laid parallel within a shallow trench within an imported sand backfill. A 200mm soil layer will be laced over the sand backfill.

1.3 Project brief

The project was carried out to an agreed brief as set out in RSK's proposal letter of 11th August 2014 and included the following tasks:

- A site walk-over reconnaissance survey;
- Liaison where possible with current/previous owners/occupiers of the site;
- A study of the history of development and industry on the site, including reference to archival Ordnance Survey mapping;
- A search of statutory registers for potentially contaminative land uses and licences in the vicinity of the site, in the form of an environmental database report, and a search of the Environment Agency website;
- Direct enquiries made to statutory authorities to obtain relevant data/records;
- A study of the local geology, hydrology and hydrogeology of the site, including the identification of geological hazards and historic mining activities;
- Preparation of a preliminary conceptual site model (CSM) of contamination, identifying possible pollutant linkages; and

- An assessment of the environmental risks and liabilities associated with redevelopment of the site.

1.4 Standards and limitations

The study aims principally to identify and assess the potential risks and liabilities associated with contamination of the ground, on and in the vicinity of the site. While this includes consideration of current operations and housekeeping on the site, the report does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

The study was designed generally to meet the objectives of a preliminary (phase 1) investigation, as defined by BS 10175:2011 "Code of Practice for the Investigation of Potentially Contaminated Sites.

This report should be considered in the light of any changes in legislation, statutory requirement or industry practices that have occurred subsequent to the date of issue.

The "vicinity" of the site for the purposes of this report is defined as locations situated within an approximate 250m radius of the site, although certain sources and/or sensitive targets further than 250m may also have been considered.

The opinions expressed in this report, and the comments and recommendations given, are based on the information obtained from the desk assessment and the site reconnaissance survey. No intrusive investigations have been undertaken to confirm the actual ground conditions and hence the environmental status of the site.

2 SITE DETAILS

2.1 Description and geographic setting

The site is located at National Grid reference 53 0374 202 045, as shown on **Figure 1** leading from a recently constructed anaerobic digestion plant at the south-eastern end of the pipe network to a proposed residential development site at the northern end of the network.

From the anaerobic digestion plant, the pipe network initially runs in a north to south orientation along the base of an existing railway embankment, before crossing the route of the railway line (which bisects the southern end of the pipe network in a north to south orientation) at Sopers Viaduct.

From this point, the pipe network runs in a broadly east to west orientation, to the immediate south of Northaw Brook and Hemp shill Brook, until meeting Northaw Road East where the pipe network turns ninety-degrees to run along the southern edge of the road.

To the immediate west of the Cuffley Sports Ground, the pipe network again turns ninety-degrees, to cross Northaw Road East (which bisects the northern end of the route corridor in a north-east to south-west orientation) and then runs around the perimeter of Wells Farm to the south-western corer of the development site.

Allowing for a nominal constriction corridor along the length of the pipe network, the site covers an area of approximately 5.0 hectares, which generally comprises of low-grade agricultural farmland, as shown on **Figure 2**.

The area around the site predominantly comprises agricultural land together with a mixture of residential properties and occasional recreational land as detailed in Table 1.

Table 1: Site setting

To the north:	Cuffley Sports ground is present to the north of central sections of the route corridor with high density residential housing associated with Cuffley village beyond. A railway line bisects the southern end of the pipe network and rubs along an embankment to the immediate north of the southern end of the pipe network.
To the east:	Open fields bisected by occasional farm tracks and Nursery Plantation are present to the immediate east of the site with Cuffley Brook beyond. At the northern end of the pipe network high density residential housing associated with Cuffley village is present to the east.
To the south:	Open fields bisected by occasional farm tracks are present to the immediate south with Cattlegate farm located 400m south and the M25-motorway located 450m south.

	A railway line bisects the southern end of the pipe network and rubs along an embankment to the immediate north of the southern end of the pipe network.
To the west:	Open fields are present to the west of the majority of the pipe network. At the northern end of the pipe network, Wells Farm is present to the immediate west with Colesdale Farm present approximately 250m distant.

2.2 Reconnaissance survey

The site was visited on 9th October 2014. The aim of the survey was to identify the range of potentially contamina tive activities carried ou t on the site and in th e immediate vicinity, and any obvious potential sources of ground contamination.

The characteristics of the site observe d durin g the site r econnaissance visit and obtained from current Ordnance Survey maps are summarised in Table 2.

A plan showing the curre nt site layout is included as **Figure 2** and shows the location of the main features identified below.

Table 2: Site description

Feature	Description
Physical characteristics	
Area of site	Approximately 5.0 hectares
Ground levels	The south-eastern section of the pipe network trends north to south along the edge of shallow valley which drops towards Soppers Viaduct. Ground levels in this area range between 56.0mAOD adjacent to the anaerobic digestion plant to approximately 47.0mAOD in the base of the valley adjacent to Sopprs Viaduct. Central sections of the pipe network run parallel to Northaw Brook and Hempshill Brook (broadly orientated east to west) on flat ground at the base of a shallow, gently sloping valley. Ground levels in this area range between 47.0mAOD adjacent to Soppers Viaduct and 52.0mAOD to the immediate south of Northaw Road East. Northern sections of the pipe network run along the east of Northaw road East and around the perimeter of Wells Farm on an area of sloping ground which drops away towards the west. Ground levels in this area range between 52.0mAOD to the immediate south of Northaw Road East and 72.0mAOD to the north of Wells Farm.
Depressions in the ground surface	None observed
Waterlogged or marshy ground	An area of slightly waterlogged ground was observed at the base of the slope to the immediate south of Northaw Book located to the west of Sopers Viaduct.
Surface water	Hempsill Brook flows in a south-easterly direction generally running parallel to northern sections of the pipe network. The brook merges with Northaw Brook approximately 200m south of Northaw Road East (which flows in a north-easterly direction and bisects the pipe network) before

Feature	Description
	the combined watercourse flows parallel to the northern edge of the pipe network. Two small drainage channels drain farmland to the west of Sopers Viaduct (one of which bisects the pipe network) and flows into the Northaw Brook.
Trees and hedges	The banks of Northaw Brook and Hempsill Brook, the northern boundary of Wells Farm and the roadside of Northaw Road East are lined with shrubbery and mature trees of a variety of species, including several Oak, Sycamore and Birch trees. A copse of mature trees is present at the southwestern end of the pipe network, to the immediate north of the anaerobic digestion plant.
Existing buildings on site	Currently the site office for the construction of the anaerobic digestion plant and an associated compost processing plant is situated at the south-eastern end of the pipe network.
External hardstanding	The northern end of the pipe network is bisected by Northaw Road East. The south-eastern end of the pipe networks is bisected by a hardcore track to the immediate east of Sopers Viaduct.
Retaining walls and adjacent buildings on or close to site boundary	Sopers Viaduct passes over the pipe network at the south-eastern end of the site.
Made ground, earthworks and quarrying	Made ground is anticipated to b present where a farm track and Northaw road East bisect the pipe network. Several large stockpiles of soil are also present at the south-eastern end of the route corridor associated with the constriction of the anaerobic digestion plant.
Potentially unstable slopes on or close to site	A railway embankment runs parallel to the south-eastern end of the pipe network. The embankment appears to be in a good state of repair and unlikely to become unstable in the short term.
Buried services present	A number of land drains are present beneath the site draining into Northaw brook. Services are also anticipated to be present beneath Northaw Road East.
Environmental characteristics	
Tank storage and dispensing facilities	None observed
Potentially hazardous materials storage and use	None observed
Asbestos-containing materials	None observed
Waste storage	None observed
Electricity sub-stations	A small electrical substation/transformer is present at the south-eastern end of the pipe network adjacent to the railway line.

Feature	Description
Evidence of possible land contamination on site	None observed
Potential off-site sources of ground contamination	Whilst a compost plant and anaerobic digestion plant are present at the south-eastern end of the pipe network, these are not anticipated to represent a significant source of potential contamination under normal operating conditions.

With the exception of a small electrical substation/transformer and the possible presence of made ground beneath Northaw Road East and an access track, no other potentially significant ground contamination issues were identified during the site reconnaissance survey.

2.3 Information from environmental searches

2.3.1 Environmental database report and Environment Agency (EA) information

Details on the presence of industries with pollution-related licences, landfill sites and pollution incidents have been obtained via an environmental database report and from a search of information publicly available on the EA website.

A copy of the environmental database report is included in **Appendix B** with salient information from these sources described below:

Agency and Hydrological

There is one record of a pollution incident to controlled waters on site. This relates to the release of unknown sewage material s in 1991 to an unspecified watercourse. The indecent was categorised as a Category 3 (minor incident) and therefore is not considered to represent an ongoing risk.

Within a 500m radius of the site there are no records of the following:

- Contaminated land register entries and notices;
- Discharge consents;
- Enforcements and prohibition notices;
- Integrated pollution and pollution prevention controls;
- Local Authority pollution prevention and control enforcements;
- Prosecutions relating to controlled water or authorised processes;
- Registered radioactive substances;
- Substantiated pollution incident register; or
- Water industry act referrals.

Waste Sites

There is one licensed waste management facility within 250m of the site. This is located 104m south-east of the site at Cattlegate Farm and operated by Willen Biogas Ltd for composting in open systems.

There are no records of landfill sites (former or current) operating within a 500m radius of the site. Furthermore, there are no records of waste transfer or disposal sites within the same radius.

Hazardous Substances

There are no records of COMAH or NIHHS or explosive sites within a 500m radius of the site. Furthermore, there are no records of planning hazardous substance consents or enforcements within a 500m radius of the site.

Industrial Land-use

There are five records of contemporary trade directory entries within a 250m radius of the site. These entries are associated with pet food and animal feed producer, car repair facilities and furniture manufactures with the closest feature located 205m west of the site. Given the nature and proximity of these entries, none are considered to represent an ongoing risk.

2.3.2 Local authority environmental health department information

The environmental health department (EHD) of Welwyn and Hatfield Borough Council has been contacted for information on contaminated land at the site. At the time of writing no response has been forthcoming.

A copy of the EHD's response will be included in **Appendix C**.

2.3.3 Local authority planning department information

Welwyn and Hatfield Borough Council hold records of three planning applications associated with the site. The only record of relevance relates to an application for change of land use Cattlegate Farm with a view to creating a composting facility for imported biodegradable waste.

3 DEVELOPMENT HISTORY

3.1 Sources of information

The history of the site's land-use and development from Victorian times onwards has been researched from:

- Early Ordnance Survey (OS) maps;
- Pre-Ordnance Survey (County Series) maps;
- Information from the local planning authority (see Section 2.3.3); and
- Aerial photography.

Copies of OS and County Series maps are included in the environmental database report in **Appendix B**. Reference to historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.

The development history of the site and surrounding area is summarised below.

3.2 Summary of development history

3.2.1 Site

The earliest available map records, dated 1882, show the site to comprise tree lined agricultural fields bisected by a track in the location of the present day Northaw Road East. A smaller track heading north east from Cattlegate Farm cuts across the south-eastern end of the site.

The first change of note on subsequent map editions were dated 1916 to 1920 when the Enfield Branch Railway and associated Sopers Viaduct were shown bisecting the south-eastern end of the site. At this time two drainage channels were also shown to be present to the west of the railway line draining into Northaw Brook.

Map editions dated 1960 show of electricity pylons to be present crossing central areas of the site. From this date onwards, the area has remedied essentially unchanged, albeit with an anaerobic digestion facility having been constructed at the south-eastern end of the site (not shown on the most recent map edition dated 2014).

3.2.2 Surrounding area

The earliest available map editions from the late 1800s show the surrounding area to comprises open fields with Wells Farm located adjacent to the northern edge of the site and Colesdale Farm present 250m west of the site. At the same time Sopers Farm was present 250m northeast of the site with a small gravel pit present 50m south/west of the south-eastern end of the site.

Mad records dated 1916 show the Enfield Branch Railway to bisect south-eastern areas of the site r unning alo ng larg e embankments to the immedi ate north a nd south of Sopers Viaduct.

By the late 1930's map records sho w ma jor residential d evelopment at to the no rth of the site associated with Cu ffley village, including a sc hool, 300m nort h and sewage works 600m north. To the north west of the site Northaw Pumping Station was shown to be present resulting in the ba ckfilling of the small quarry/pit which was located in the same area. Around the same time, a small cluster of houses wa s shown 300m south-west on Cattlegate Road.

By the 1960's a recreation ground and associated buildings were shown to be present to the north of central areas of the suite.

Map editions from the 1 970's show fu rther residential develo pment to ha ve taken pl ace in Cuffley village approximately 200m north of the site whilst Sopers Farm was no longer present 250m northeast.

The records from the 1980's show the sites surroundings to be much as the present day setting with the onl y ma jor de velopment sinc e the 197 0's bei ng the construction of th e M25 motorway approximately 450m south.

4 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

4.1 Geology

4.1.1 General characteristics

The published 1:50,000-scale geological map of the area (Sheet No 239 'Hertford') indicates that eastern sections of the site (extending approximately 170m west of Sopers Viaduct) are underlain the London Clay Formation Bedrock, whilst the underlying Lambeth Group (more specifically the Reading Beds) outcrop at the surface across western/northern areas of the site. The only exception to this relates to a small area of topographically elevated land to the immediate north of Wells Farm, where the London Clay Formation Is present overlying the Lambeth Group.

Through central areas of the site, the identified bedrock deposits are overlain by superficial Alluvium which follows the course of the Hempshill Brook and Northaw Brook. At the south-eastern end of the site a small area of River Terrace Deposits (Dollis Hill Gravel Member) is present to the immediate north of the anaerobic digestion plant.

On the basis of the published geological maps of the area, the likely composition of natural strata in the vicinity of the site is described in Table 3.

Table 3: Conjectural geological succession beneath the site

Geological unit	Brief description	Anticipated thickness
Superficial soils/drift		
Alluvium	Soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel	Approximately 2m
Dollis Hill Gravel Member	Sand and gravel, locally with lenses of silt, clay or peat and organic material	Approximately 2-3m
Solid geology deposits		
London Clay Formation	Fine, sandy, silty clay/silty clay. Glauconitic at base	Approximately 10m in eastern areas. Absent in western areas
Lambeth Group	Interleaved red and variegated clays and sands	Approximately 15m
White Chalk Sub-Group	Chalk with flints. With discrete marl seams, nodular chalk, sponge-rich and flint seams throughout.	>100m

Given th e site setting, and the g eneral abs ence of historical de velopment, it is considered unlikely that made ground deposits will exist across the majority of site. However, made ground is anticipated to be present where Northaw Road East and an access track bisect the site and also in eastern areas associated with the construction of Sopers Viaduct and associated embankments.

4.1.2 Radon

The en vironmental data base re port (Envirocheck Rep ort, 8th October 20 14) indicates that parts of the site come under an 'i ntermediate probability radon area' meaning that between 1% and 3% of homes ar e above the action level. As this development is not of a residential nature, this is not considered to represent a significant risk.

4.2 Hy drogeology

4.2.1 General characteristics

Based on the published geological map referred to above, and the existing topography, the hydrogeology of the site is likely to be highly variable owing to the sloping natur e of the site.

In central and eastern areas of the site, the hydrogeology of the site is likely to be characterised by the p resence of an unconfine d shallow a quifer associated with the superficial Alluvium a nd River Terr ace De posits overlyi ng th e London Clay Formation, an aquitard.

In western/n orthern ar eas of the site, the u nconfined aquifer within superficial Alluvial deposits is likely to be in continuity with the under lying Lambeth Group w hich, where it subsequently exte nds b eneath th e London Cl ay Formation, is likely to comprise a second, semi–confined dee p aquifer. This de ep aq uifer within the Lam beth Gr oup is anticipated to be in hydraulic continuity with the underlying White Chalk Sub-Group.

The shallow aquifer (superficial strata) has been classified by the En vironment Agency (EA) as a Secondary A aquifer whilst the de eper aquifer in the Lambeth Ground is also classified as a Secondary A aquifer. The underlying White Chalk Sub-Group is classified as a Principal aquifer.

The anticipated de pth to the wa ter ta ble in the sha llow aquifer i .e. the thickness of the unsaturated zone, is antic ipated to b e in the o rder of 1-2m b elow ground l evel. Shallow groundwater in the area is anticipated to flow in a south-easterly and locally direction (i.e. towards and in the direction of flow of the Hempshill Brook and Northaw Brook) although this will be locally complicated by the existing topography. Groundwater within the deep aquifer is also anticipated to flow in a south-easterly direction.

4.2.2 Groundw ater sensitivity

The envir onmental database repo rt indica tes that there a re no curre nt licensed groundwater abstractions within a 1.0km radius of the site.

Information available on the EA website indicates that the site does not lie within a designated groundwater source protection zone.

4.3 Hydrology

4.3.1 Nearest watercourse

The nearest identified surface watercourse comprised the Hempshill Brook and Northaw Brook which either bisect of flow immediately adjacent to the site.

Hempsill Brook flows in a south-easterly direction generally running parallel to northern sections of the pipe network. The brook merges with Northaw Brook approximately 200m south of Northaw Road East (which flows in a north-easterly direction and bisects the pipe network). The combined watercourse flows parallel to the northern edge of the pipe network and flows into Cuffley Brook approximately 300m east of the site.

Two small drainage channels drain farmland to the west of Sopers Viaduct (one of which bisects the pipe network) and flows into the Northaw Brook.

Both Hempshill Brook and Northaw Brook are approximately 0.5m to 1.0m wide and approximately 0.1m deep. Both watercourses are contained within partially canalised ditches/channels approximately 1.0m below surrounding levels) with steeply sloping grass banks. Both watercourses maintain a moderate, clear flow throughout.

The base flow of the Hempshill Brook and Northaw Brook are likely to be recharged by groundwater in the adjacent shallow aquifer and, in western/northern areas, from the deep aquifer in the Lambeth Group. A linkage between the stream and any ground or groundwater contamination beneath the site may therefore exist

There are no EA compliance points in the stretch of the Hempshill Brook or Northaw Brook on or adjacent to the site.

4.3.2 Site drainage

Surface draining is via infiltration into the ground which will ultimately discharge to Hempshill Brook or Northaw Brook and via groundwater flow or via one of the drainage channels that feed into Northaw Brook from the surrounding farmland.

4.3.3 Preliminary flood risk assessment

The indicative floodplain map for the area, published by the EA, shows that the majority of the site falls within the designated floodplains (Flood Zone 3) of both the Hempshill Brook and Northaw Brook.

4.4 Mining, quarrying, landfilling and land reclamation

Evidence has been sought to identify any mining, quarrying and landfilling operations, past and present, which have taken place in the vicinity of the site. The sources of information referenced in this element of the desk study include:

- Environmental database report;
- Records held by local authority/Environment Agency;
- Old Ordnance Survey maps and plans (see Section 3); and
- Geological maps (see Section 4.1).

Historical map records from the late 1800's show a small gravel pit to be present 50m south/west of the south-eastern end of the site. The pit was backfilled during the construction of the large railway embankment in the same area during the early 1900's.

There are no records of landfill sites (former or current) operating within a 500m radius of the site.

5 PRELIMINARY CONCEPTUAL SITE MODEL

5.1 Introduction

A conceptual site model (CSM) is a simplified written and/or visual/schematic description of the environmental conditions on a site and the surrounding area. It is developed from the individual components of the desk-based assessment to provide a depiction of likely contaminants, pathways and receptors, and highlights the key areas of uncertainty.

Fundamental to the CSM is the principle of pollutant linkages, an overview of which is presented in **Appendix D**. This approach is now accepted best practice in the industry but it does not take into account less scientific factors such as perceived risk, which frequently has a significant influence on land values, particularly when dealing with brownfield sites with a history of contamination.

The site is considered for the proposed future end use which will comprise open landscaped areas, locally associated with residential properties (i.e. at the northern end of the site) overlying an underground pipe network.

The preliminary CSM presented below is based on the findings of the Phase 1 assessment and therefore contains elements of conjecture and hypothesis.

In the following sections, the individual components of all identified possible pollutant linkages are identified and the risks of potentially complete pollutant linkages are assessed qualitatively in the preliminary CSM.

5.2 Sources of contamination

The study has identified a number of potentially contaminative land uses on and in the vicinity of the site. These are summarised in Table 4 below, together with the identified contaminants of concern typically associated with those land uses.

Table 4: Potential sources and types of contamination

Potential sources	Contaminants of concern
On-site present day	
Small electrical substation/transformer in south-eastern areas.	Mineral oils and Polychlorinated Biphenyls (PCB's).
Made ground deposits potentially associated with Northaw Road East, access tack and land adjacent to Sopers Viaduct.	Unknown fill material (but potentially including heavy metals, ash, clinker, sulphates, polycyclic aromatic hydrocarbons (PAHs), asbestos etc.).
Potential for organic rich deposits in Alluvium.	Potential ground gas generation (Methane and Carbon Dioxide).

Potential sources	Contaminants of concern
Off-site	
Railway land and embankments to the immediate north and south of south-eastern areas of the site (1920's to present day) locally overlying an infilled gravel pit.	Fuel oils, lubricating oils, heavy metals, PAHs, PCBs, ethylene glycol, ash, sulphate, herbicides and asbestos and unknown fill material (but potentially including heavy metals, ash, clinker, sulphates, polycyclic aromatic hydrocarbons (PAHs), asbestos etc.).

On site sources of potential contamination are limited to the presence of a small electrical substation/transformer and the potential for made ground to be present in discrete areas. In addition, the presence of organic Alluvium may also represent a source of ground gas generation.

Off-site sources of potential contamination are limited to the presence of railway and unknown fill materials within the associated embankments which locally overlie a small backfilled gravel pit.

5.3 Receptors at risk

The risk assessment identifies four categories of potential receptors:

- End users of the site who may have acute exposure to sources of contamination on a regular and predictable basis;
- Controlled waters, being defined as all surface water, ground water or perched water;
- Building structures and services placed in or on the ground; and
- Other targets such as the "environment", including any flora and fauna (including agricultural crops) on or near the site.

The main sensitive targets within these categories are listed below in Table 5.

Table 5: Receptors at risk

Category	Details of receptor
Current/End users (human health)	Based upon the proposed development, site workers/occupants may be at risk from any ground contamination on site and any ground gases/vapours migrating from off-site sources of contamination.
Controlled waters	From the desk study/walkover information, these comprise shallow groundwater within the superficial Secondary (A) Aquifers, deeper Lambeth group Secondary (A) aquifer and the underling Principal Aquifer comprising the White Chalk Sub-group, (which are anticipated to be in hydraulic continuity). Surface watercourses at Northaw Brook and Hempshill Brook and the smaller drains which feed into them.
Buildings/services	Buried concrete and other construction materials within the ground.

Category	Details of receptor
Other targets	Short term occupation by construction workers and long term but intermittent visits by maintenance workers. Vegetation and other ecological receptors are present in the form of trees and shrubs lining the identified brooks and agricultural crops in fields

Please note that construction workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures including CDM regulations.

5.4 Pathways for migration

Based on the proposed end use of the site and the anticipated ground conditions at and in the vicinity of the site, the contaminant pathways identified within Table 6 are considered potentially to be present.

Table 6: Pathways for migration

Category	Details of pathway
Current/End users (human health)	Pathways relevant to the end user are identified in the CLEA Model as ingestion, inhalation of soil / dust particulates or contaminant vapours, and dermal contact (absorption through skin).
Controlled waters	Mobile/leachable contaminants will generally migrate vertically downward through the superficial drift deposits (Alluvium and Dollis Hills Gravel Member) and underlying Secondary aquifer until meeting the water table, after which free/dissolved phases would expect to migrate generally in a southerly or easterly direction. Contaminants in surface waters would be expected to migrate in a south-easterly direction i.e. towards and in the direction of flow of Hempshill Brook and Cuffley Brook.
Buildings/services	Buried concrete and services will be susceptible to attack via contact with aggressive/contaminated ground, especially if mobile groundwater is present. Pathways for gas migration are considered to exist through the underlying geology and from off-site sources of gas generation. Gas migration could potentially occur directly via the unsaturated zone, albeit this is thin, and also occur via leachate migrating into the groundwater.
Other targets	Vegetation and other ecological targets may be affected by contact with contaminated soils via plant uptake routes.

5.5 Preliminary CSM

Based on the assumptions above, a preliminary CSM of pollutant linkages on the site has been developed from the above information and is presented as Table 7, overleaf.

The CSM includes a qualitative estimation of risk for each pollutant linkage, based on a comparison of the consequence of the event against the probability of its occurrence, in line with the risk classification methodology presented in CIRIA Report C552 (2001).

To summarise, the preliminary CSM has identified evidence of possible ground contamination on the site, probable pathways for contamination to migrate and sensitive receptors potentially at risk. Plausible pollutant linkages are therefore deemed to exist, both in the current form of development and future developments.

Table 7: Preliminary conceptual model of pollutant linkages

Sources potentially present	Pathways	Receptors	Qualitative assessment of risk
Small electrical substation/transformer in south-eastern areas.	Ingestion of contaminated soil, dust, liquid Inhalation of contaminated dust Dermal contact with contaminated soil/water/liquid Leakage into unsaturated zone and migration to shallow groundwater	Human health (current and future site users) Controlled waters Building materials/structures Vegetation and ecological receptors	**Negligible** (Given the likelihood of contaminants being present and size of the potentially impacted area)
Made ground deposits potentially associated with Northaw Road East, access tack and land adjacent to Sopers Viaduct.	Ingestion of contaminated soil, dust, liquid Inhalation of contaminated dust Dermal contact with contaminated soil/water/liquid Leakage into unsaturated zone and migration to shallow groundwater	Human health (current and future site users) Controlled waters Building materials/structures Vegetation and ecological receptors	**Negligible** (Given the likelihood of contaminants being present discrete areas involved)
Potential for organic rich deposits in Alluvium.	Inhalation of ground gases	Human health (current and future site users)	**Negligible** (Given the likelihood of gas generation and proximity to sensitive receptors)
Railway land and embankments to the immediate north and south of south-eastern areas of the site (1920's to present day) locally overlying an infilled gravel pit.	Ingestion of contaminated soil, dust, liquid Inhalation of contaminated dust Dermal contact with contaminated soil/water/liquid Leakage into unsaturated zone and migration to shallow groundwater	Human health (current and future site users) Controlled waters Building materials/structures Vegetation and ecological receptors	**Negligible** (Given the likelihood of contamination being present and proximity to sensitive receptors)

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The study has identified a number of marginal on-site sources of potential contamination comprising a small electrical substation /transformer, localised made ground deposits and the presence of Alluvial soils which may act as a source of ground gas generation. A single off-site source of contamination has been identified in the form of railway land and associated embankments in south-eastern areas of the site.

With respect to these potential sources of contamination, potential pollutant linkages, albeit of a negligible significance, have been identified with respect to the proposed end land use.

The preliminary findings suggest that the site is unlikely to be classified by the Local Authority as 'Contaminated Land' under the current contaminated land regime (Environmental Protection Act 1990: Part IIA).

Therefore, the overall environmental liability associated with the site and the risks associated with site ownership/usage are considered to be **Negligible**.

It is considered that intrusive investigation will need to be carried out in advance of the site redevelopment in order to identify the possible presence, nature and extent of any contamination within the ground/groundwater. The investigation should be conducted to clarify the geological/hydrogeological constraints on contamination migration to give a more detailed assessment of the potential environmental risks and liabilities.

Planning consent for residential development is likely to be subject to a number of land-quality conditions, specifying the stages of assessment and remediation of contamination, as detailed in CLR11 (Model Procedures for the Management of Contaminated Land. Contaminated Land Report Number 11, Environment Agency 2004).

FIGURES

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Web: www.rsk.co.uk

Client: METROPOLIS PLANNING AND DESIGN LLP

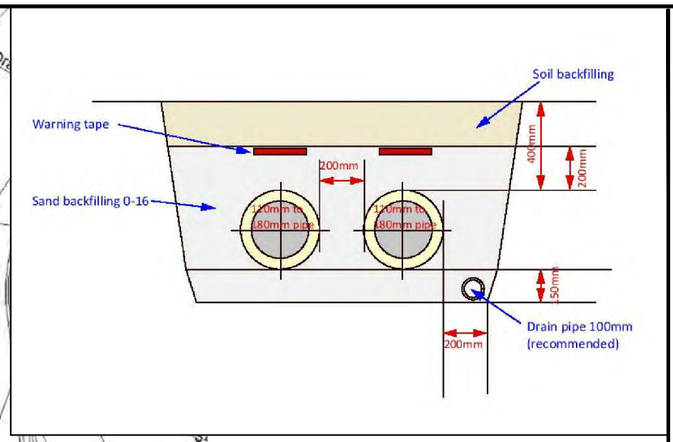
Project Title: LAND AT NORTHAW ROAD EAST, CUFFLEY, HERTFORDSHIRE
PRIMARY DISTRIBUTION DISTRICT HEAT NETWORK

Drawing Title: SITE LOCATION MAP

Rev	Drawn	Date	Checked	Date	Approved	Date
00	SAY	17.10.14	AK	17.10.14	AK	17.10.14

Dimensions	Scale	Original Size
m	1:50,000	A4

Project Number	Drawing File	Drawing Number
26435-4 (00)	26435 - SLP.dwg	FIGURE 1



LEGEND

Proposed Heat Pipe Network

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
P1	17.10.14	First Issue	SAY	AK	AK

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Client
METROPOLIS PLANNING AND DESIGN LLP

Project Title
LAND AT NORTHAW ROAD EAST, CUFFLEY, HERTFORDSHIRE PRIMARY DISTRIBUTION HEAT NETWORK

Drawing Title
SITE LAYOUT PLAN

Drawn	Date	Checked	Date	Approved	Date
SAY	17.10.14	AK	17.10.14	AK	17.10.14

Scale	Orig Size	Dimensions
1:2500	A3	m

Project No.	Drawing File
26435-04 (00)	26435 (R04-00).dwg

Drawing No.	Rev.
FIGURE 2	P1

Scale
0 50 100m

APPENDIX A
SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Metropolis Planning and Design LLP (the "client") in accordance with the terms of a contract between RSK and the "client", dated the 11th August 2014. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.

2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.

3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**

4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.

5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.

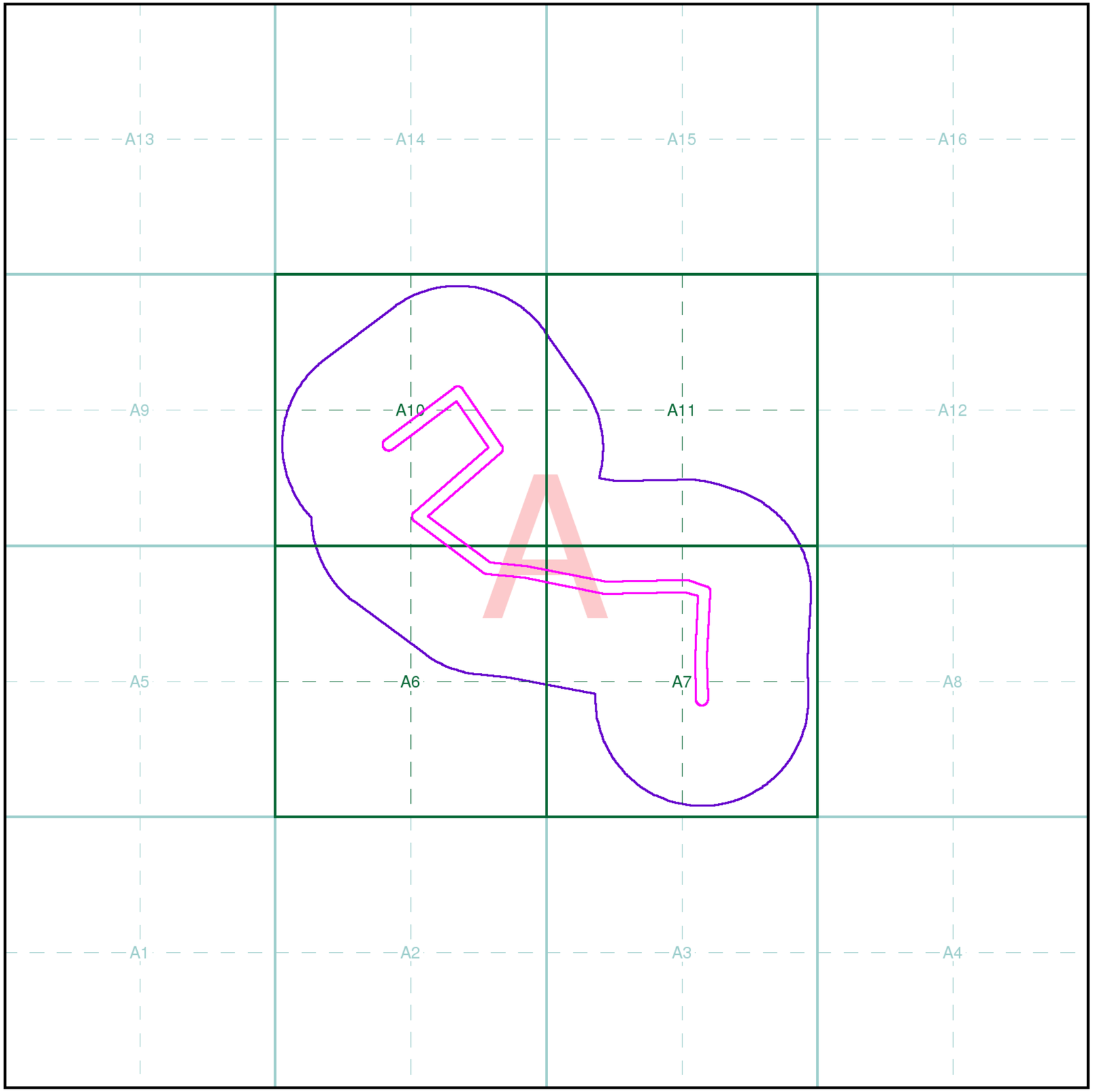
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.

7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B
ENVIRONMENTAL DATABASE REPORT (CD)



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Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Ordnance Survey Licensed Partner

British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

NATURAL ENGLAND

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr A Kent, RSK Environment Ltd, 18 Frogmore Road,
Hemel Hempstead, Herts, HP3 9RT

Order Details

Order Number:	60967330_1_1
Customer Ref:	26435
National Grid Reference:	530240, 201810
Site Area (Ha):	5.08
Search Buffer (m):	250

Site Details

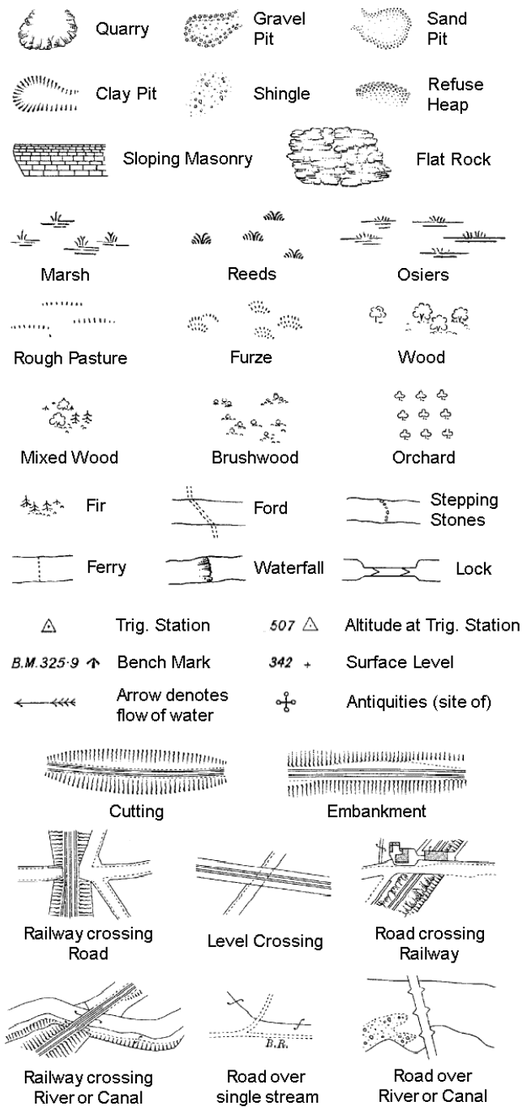
Site at, Cuffley Brook, Hertfordshire

Full Terms and Conditions can be found on the following link:
http://www.landmarkinfo.co.uk/Terms/Show/515

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

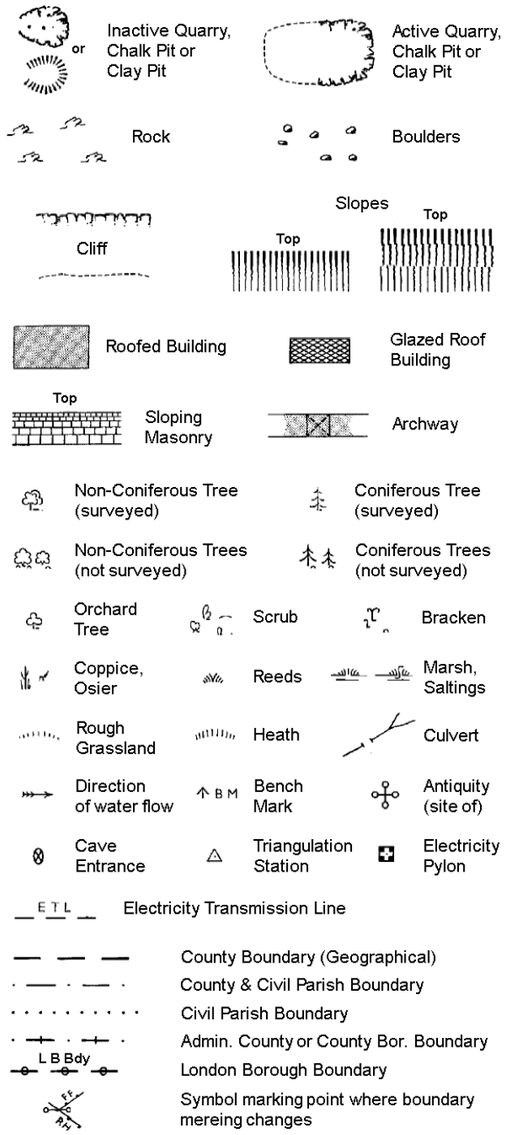
Historical Mapping Legends

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



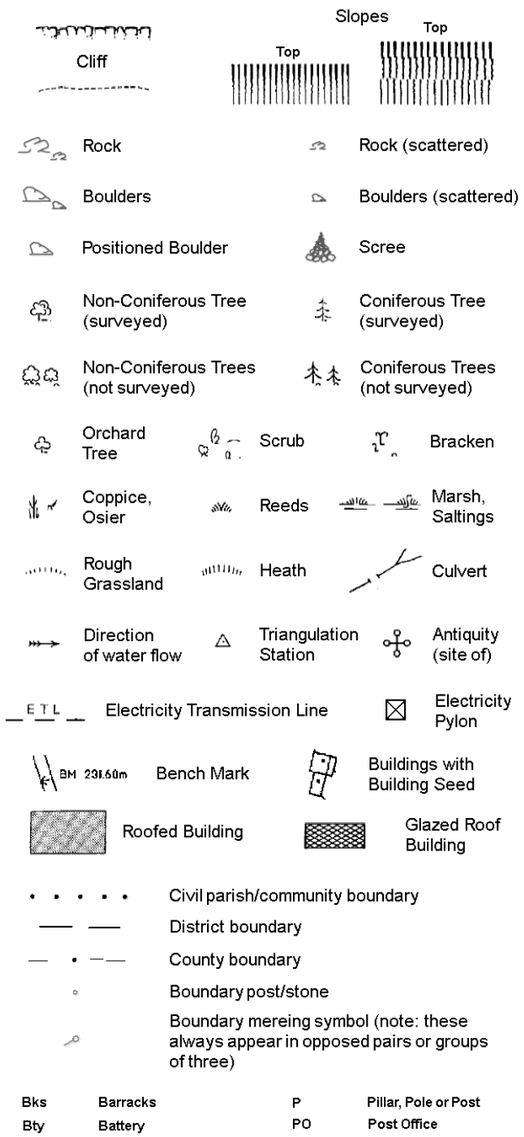
B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



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



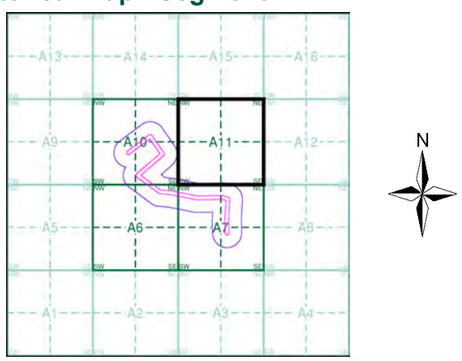
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity 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

RSK

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Hertfordshire	1:2,500	1874	2
Hertfordshire	1:2,500	1898	3
Hertfordshire	1:2,500	1914	4
Hertfordshire	1:2,500	1935	5
Ordnance Survey Plan	1:2,500	1971	6
Supply of Unpublished Survey Information	1:2,500	1973	7
Additional SIMs	1:2,500	1983	8
Large-Scale National Grid Data	1:2,500	1992	9
Large-Scale National Grid Data	1:2,500	1996	10

Historical Map - Segment A11



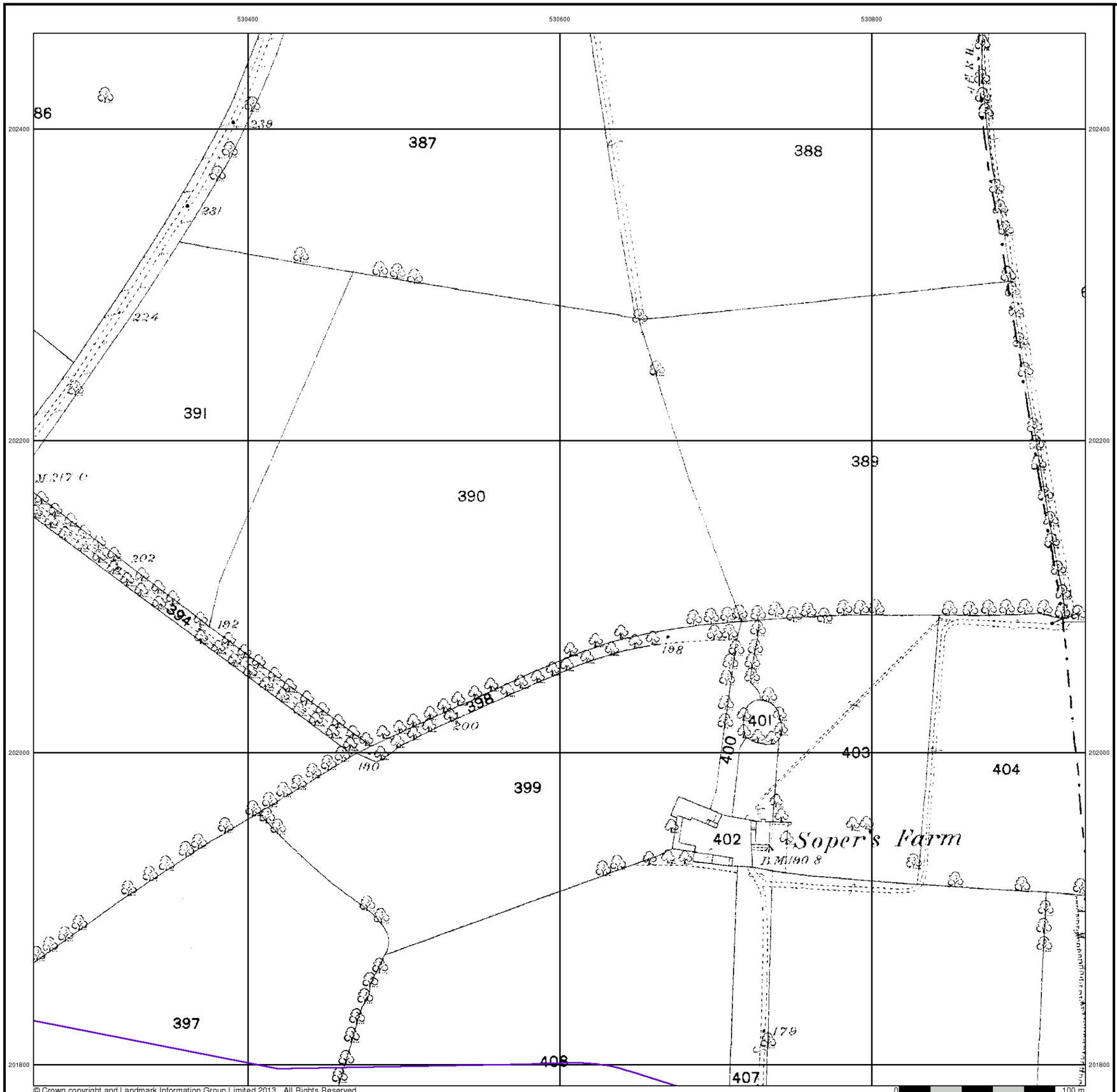
Order Details

Order Number: 60967330_1_1
Customer Ref: 26435
National Grid Reference: 530270, 201790
Slice: A
Site Area (Ha): 5.08
Search Buffer (m): 100

Site Details

Site at, Cuffley Brook, Hertfordshire

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



0 100 m

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Hertfordshire

Published 1874

Source map scale - 1:2,500

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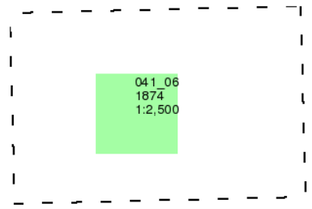
Map Name(s) and Date(s)



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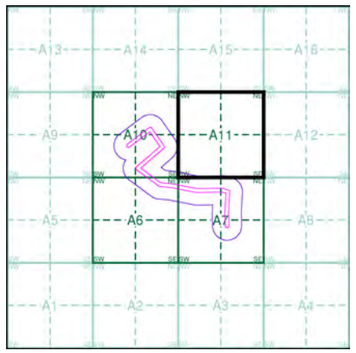

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Customer Ref:	26435
National Grid Reference:	530270, 201790
Slice:	A
Site Area (Ha):	5.08
Search Buffer (m):	100

Site Details

Site at, Cuffley Brook, Hertfordshire

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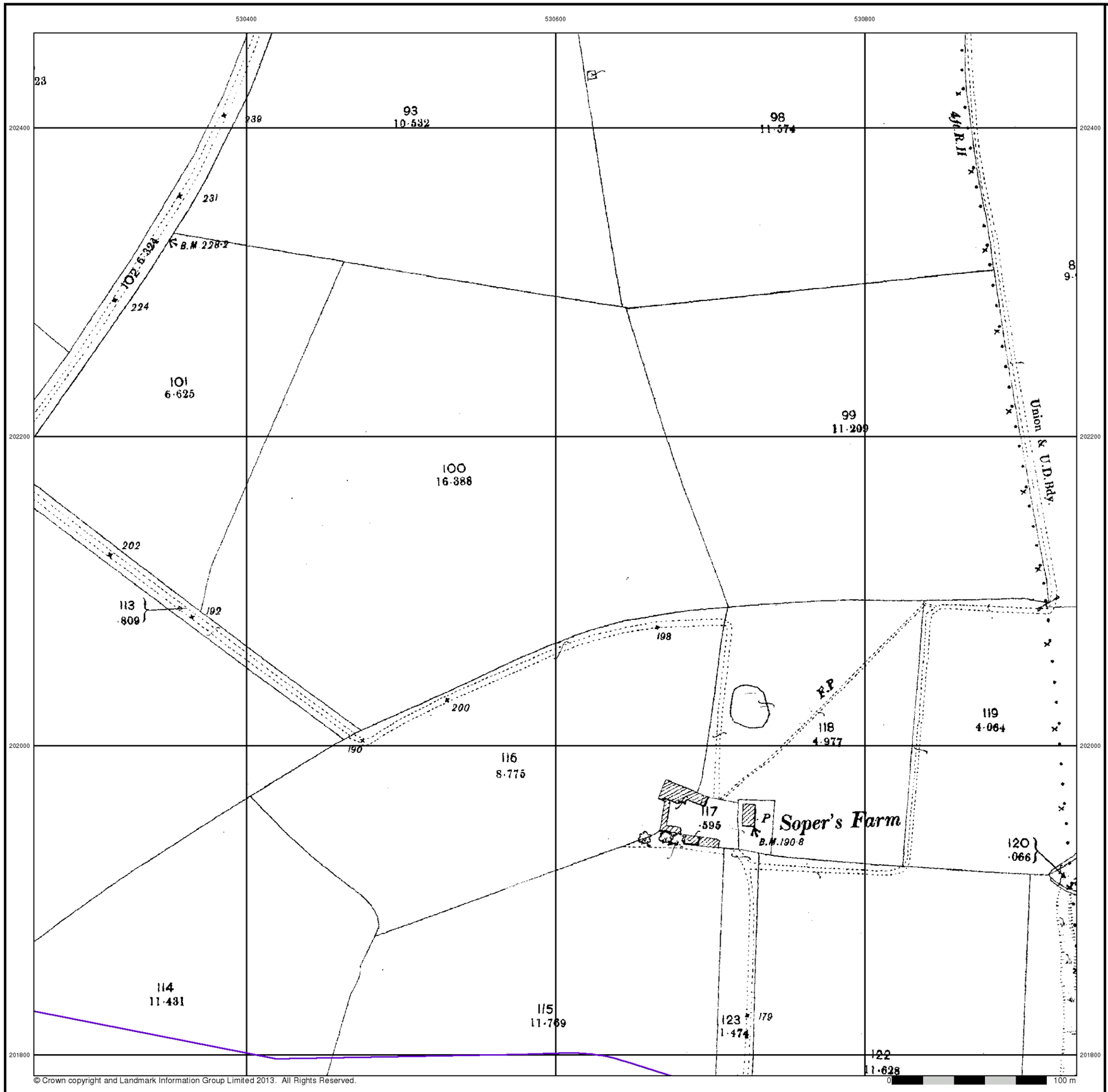

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Hertfordshire

Published 1898

Source map scale - 1:2,500

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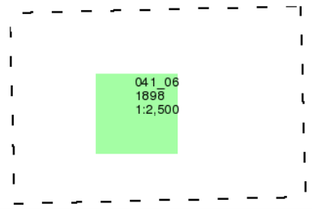
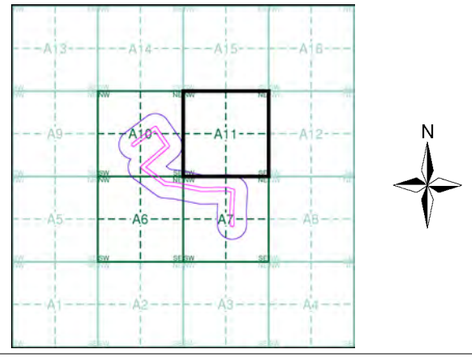
Map Name(s) and Date(s)



Historical Map - Segment A11



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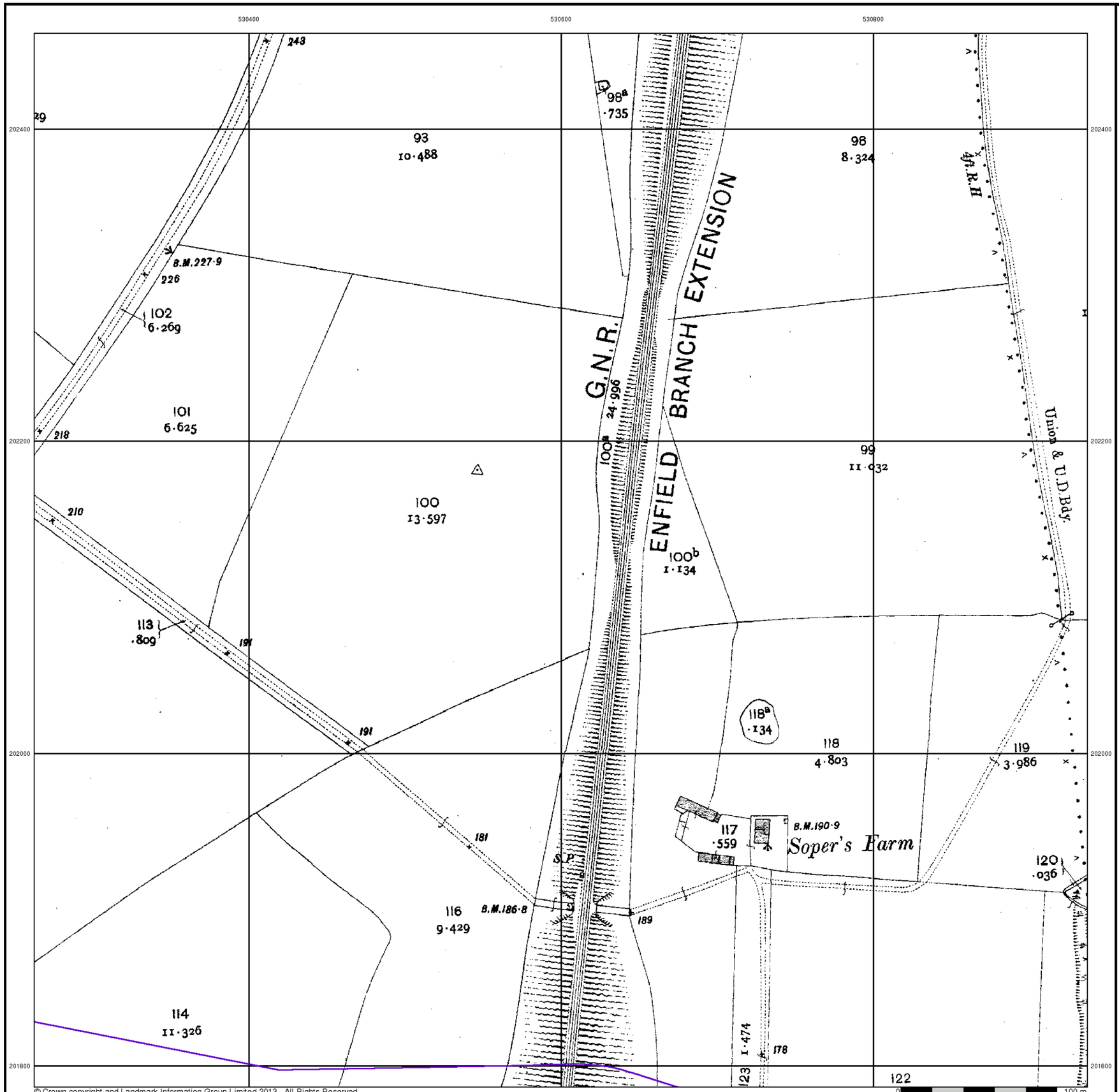
National Grid Reference:	530270, 201790
Slice:	A
Site Area (Ha):	5.08
Search Buffer (m):	100

Site Details

Site at, Cuffley Brook, Hertfordshire

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



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Hertfordshire

Published 1914

Source map scale - 1:2,500

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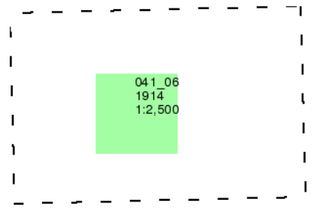
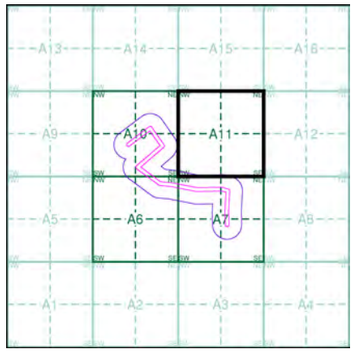
Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

Order Number:	60967330_1_1
Customer Ref:	26435
National Grid Reference:	530270, 201790
Slice:	A
Site Area (Ha):	5.08
Search Buffer (m):	100

Site Details

Site at, Cuffley Brook, Hertfordshire

Landmark Information Group
Tel: 0844 844 9952
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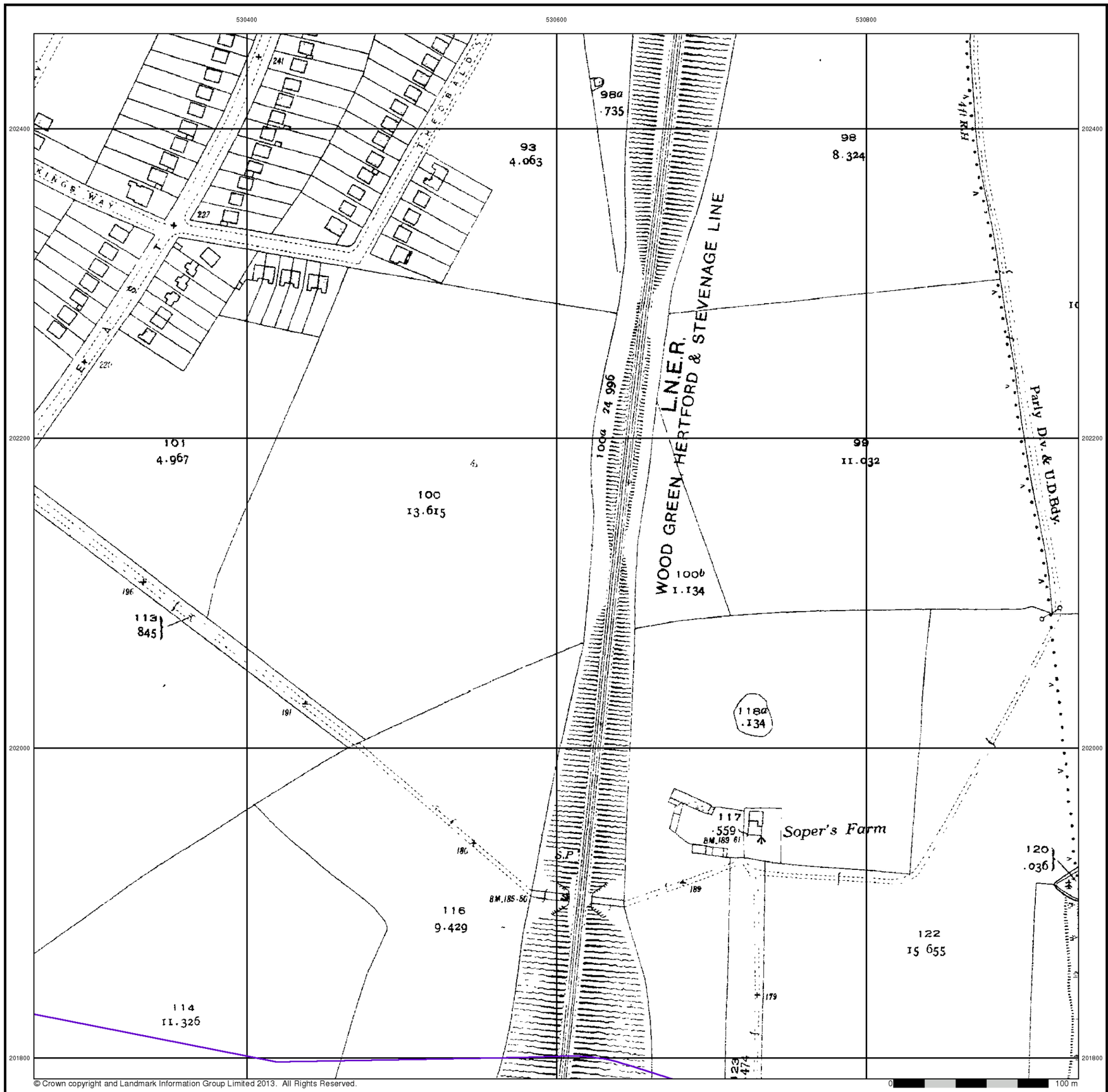
Web: www.envirocheck.co.uk



RSK

Hertfordshire

Published 1935

Source map scale - 1:2,500

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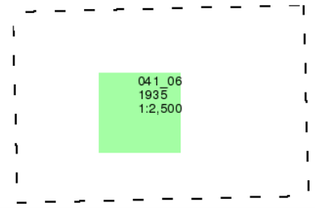
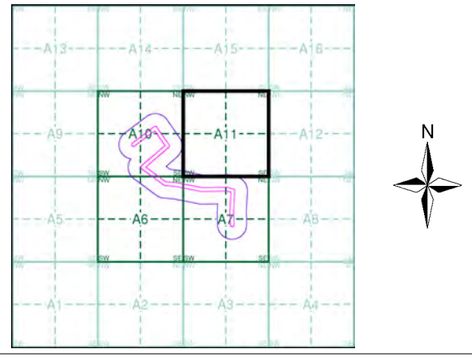
Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

Order Number:	60967330_1_1
Customer Ref:	26435
National Grid Reference:	530270, 201790
Slice:	A
Site Area (Ha):	5.08
Search Buffer (m):	100

Site Details

Site at, Cuffley Brook, Hertfordshire

Landmark Information Group
Tel: 0844 844 9952
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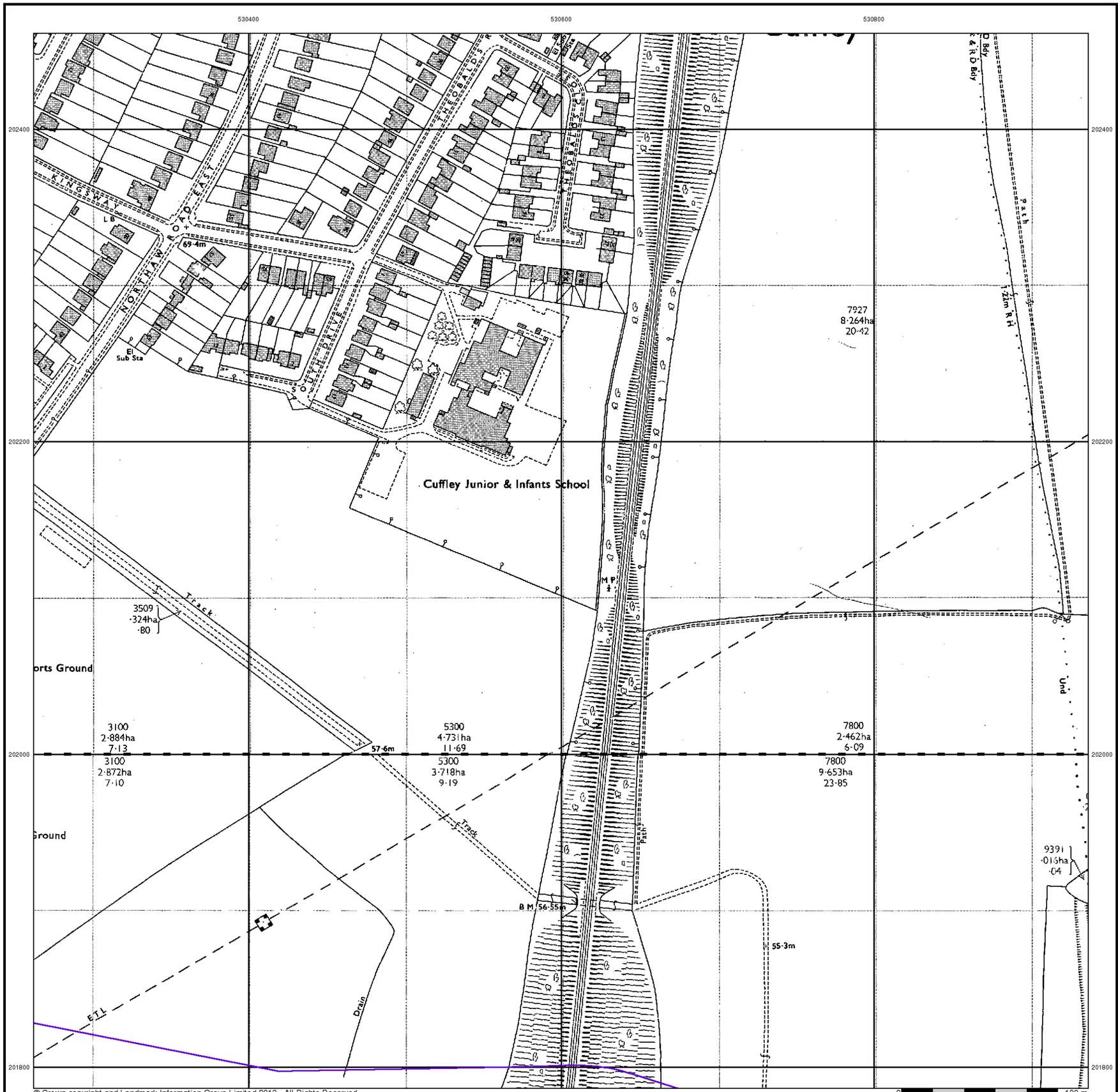

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Ordnance Survey Plan

Published 1971

Source map scale - 1:2,500

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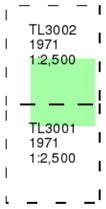
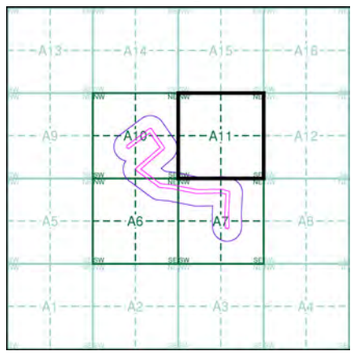
Map Name(s) and Date(s)



Historical Map - Segment A11



Order Details

Order Number:	60967330_1_1
Customer Ref:	26435
National Grid Reference:	530270, 201790
Slice:	A
Site Area (Ha):	5.08
Search Buffer (m):	100

Site Details

Site at, Cuffley Brook, Hertfordshire

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

RSK

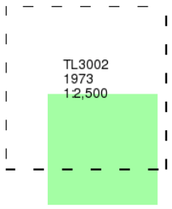
Supply of Unpublished Survey Information

Published 1973

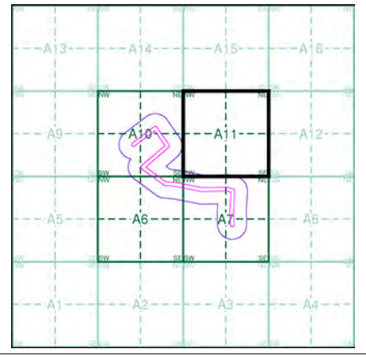
Source map scale - 1:2,500

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A11



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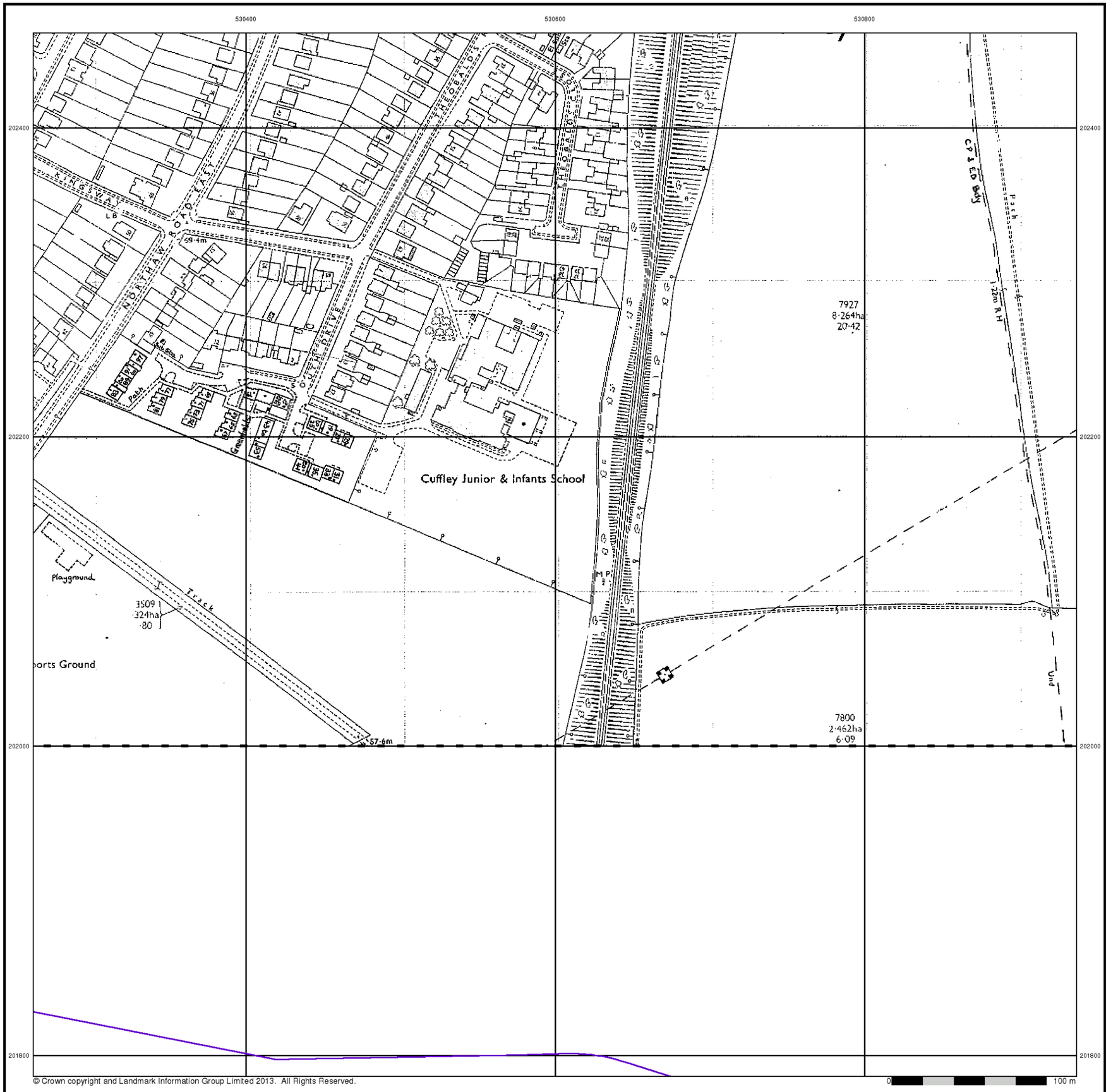


RSK

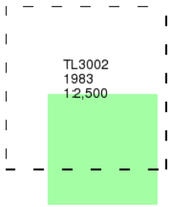
Additional SIMs

Published 1983

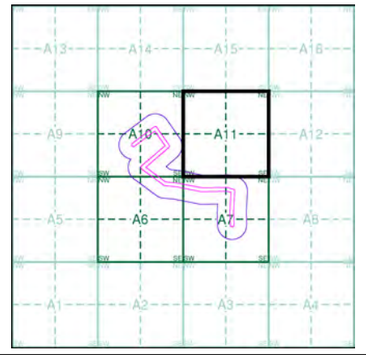
Source map scale - 1:2,500

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 A11



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RSK

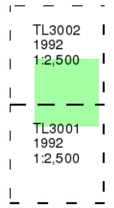
Large-Scale National Grid Data

Published 1992

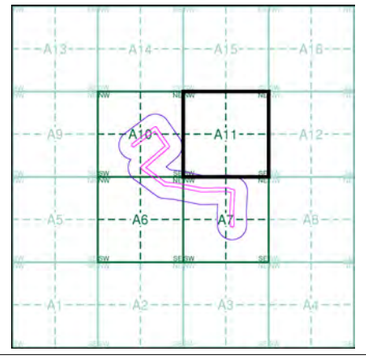
Source map scale - 1:2,500

'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 A11



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RSK

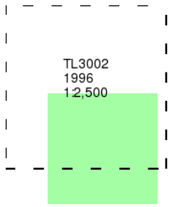
Large-Scale National Grid Data

Published 1996

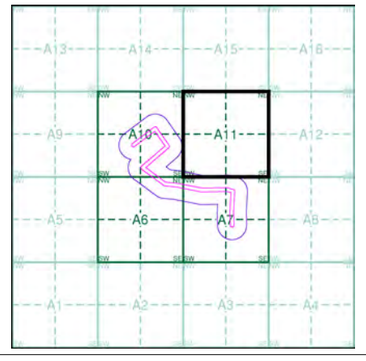
Source map scale - 1:2,500

'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 A11



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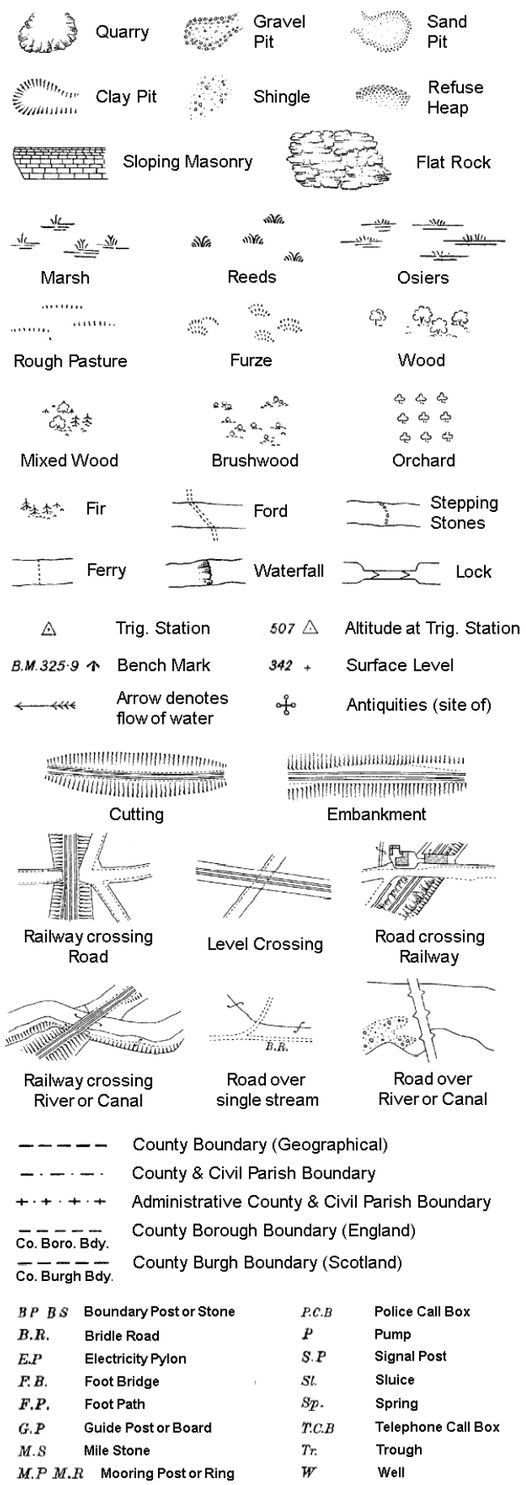
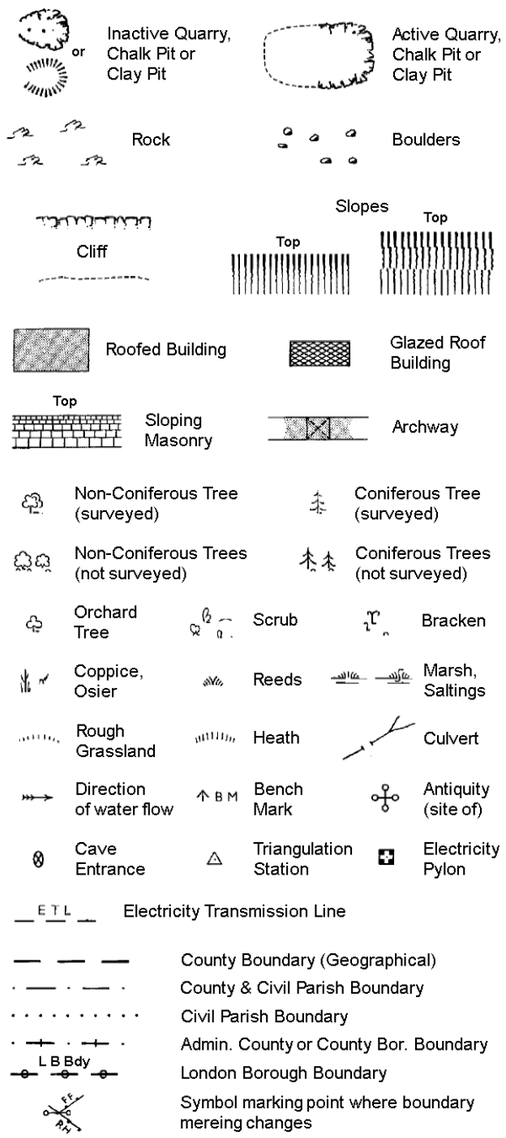
Historical Mapping Legends

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



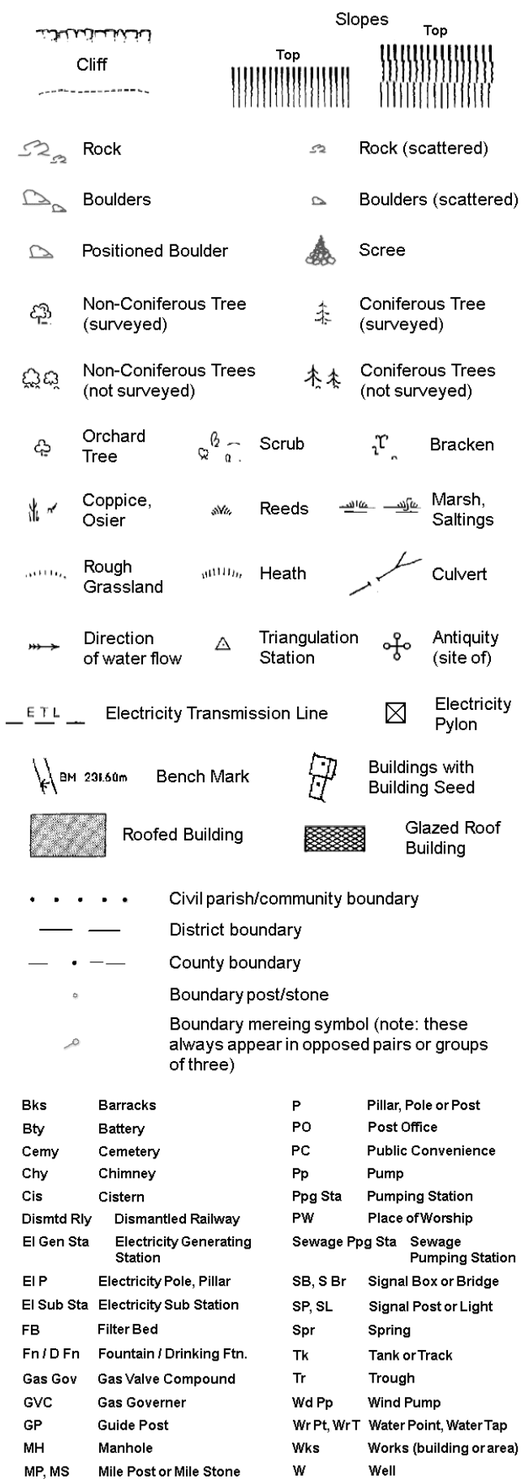
B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



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



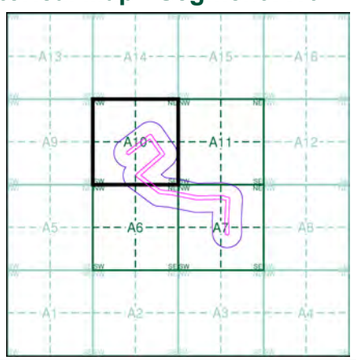
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity 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

RSK

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Hertfordshire	1:2,500	1874	2
Hertfordshire	1:2,500	1898	3
Hertfordshire	1:2,500	1914	4
Hertfordshire	1:2,500	1935	5
Ordnance Survey Plan	1:2,500	1970 - 1971	6
Supply of Unpublished Survey Information	1:2,500	1973	7
Additional SIMs	1:2,500	1983	8
Large-Scale National Grid Data	1:2,500	1992	9
Large-Scale National Grid Data	1:2,500	1996	10

Historical Map - Segment A10



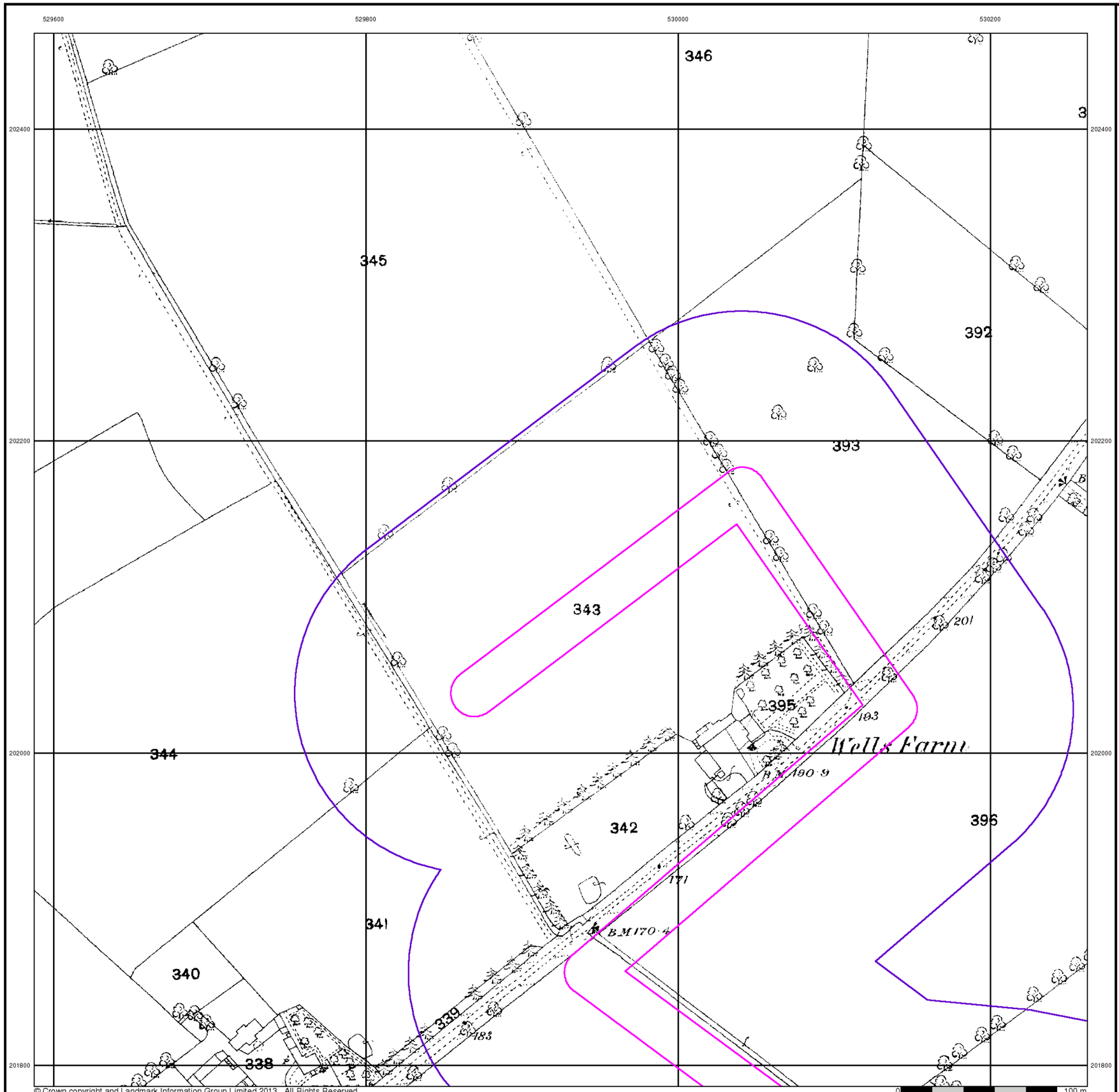
Order Details

Order Number: 60967330_1_1
Customer Ref: 26435
National Grid Reference: 530270, 201790
Slice: A
Site Area (Ha): 5.08
Search Buffer (m): 100

Site Details

Site at, Cuffley Brook, Hertfordshire

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



RSK

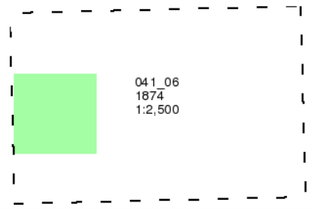
Hertfordshire

Published 1874

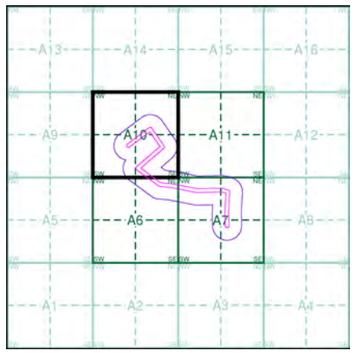
Source map scale - 1:2,500

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 A10



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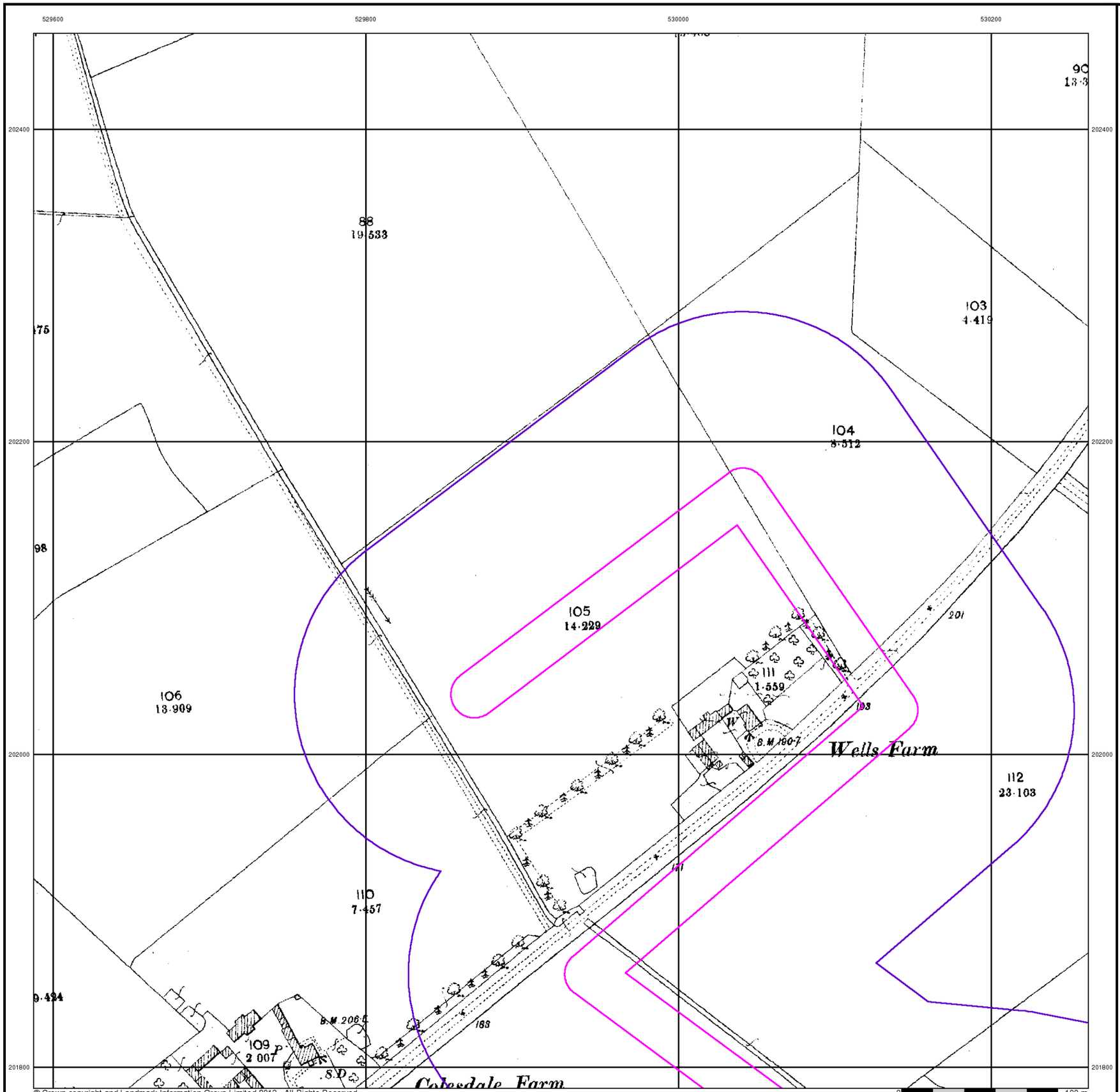

RSK

Hertfordshire

Published 1898

Source map scale - 1:2,500

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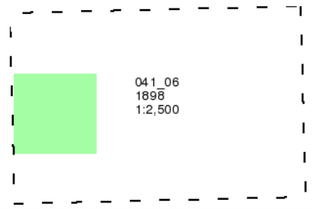
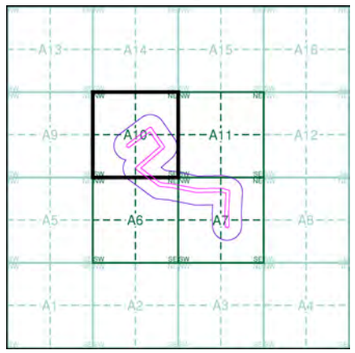


Historical Map - Segment A10



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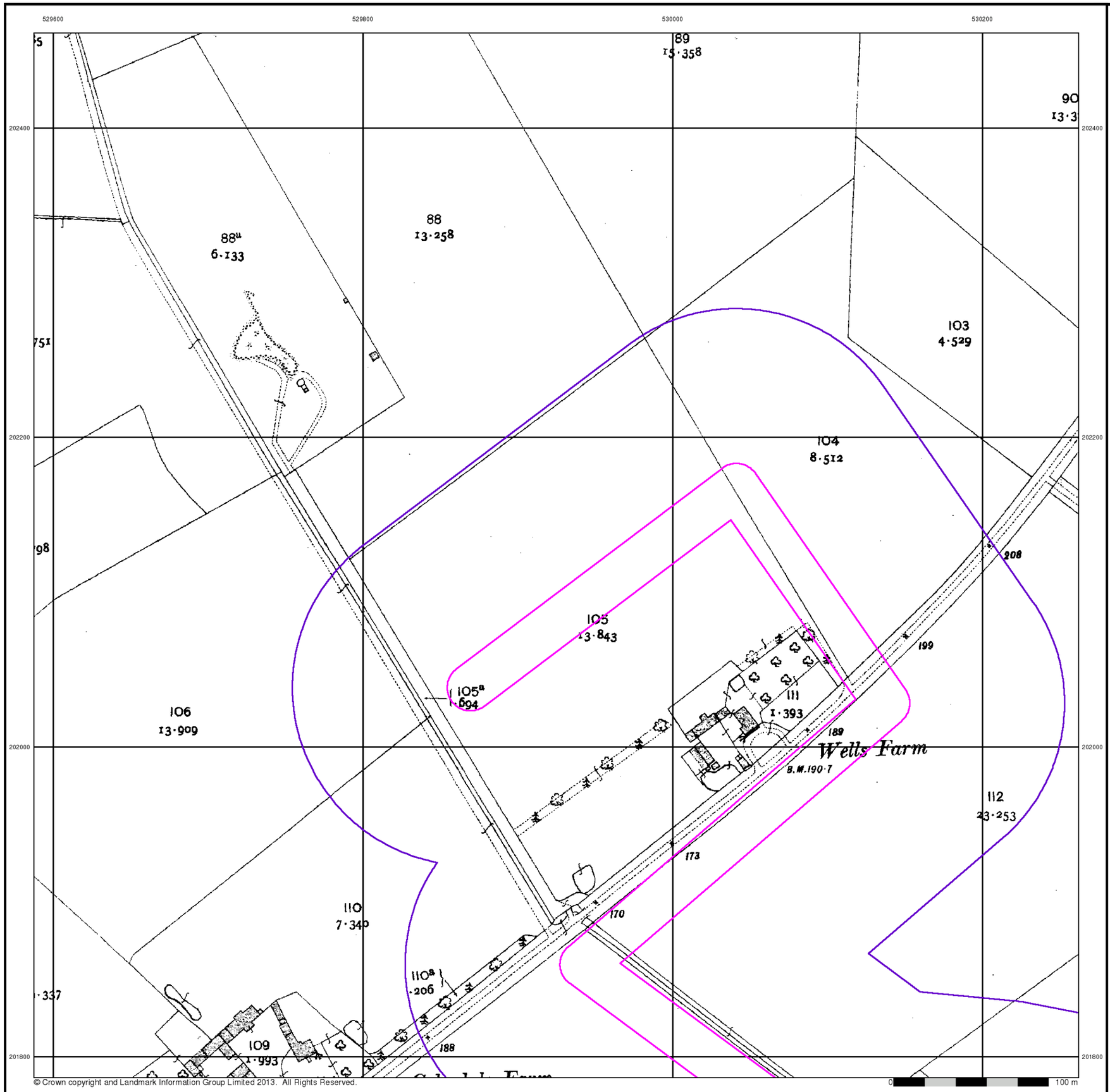

RSK

Hertfordshire

Published 1914

Source map scale - 1:2,500

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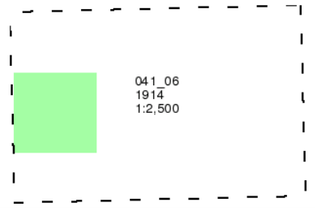
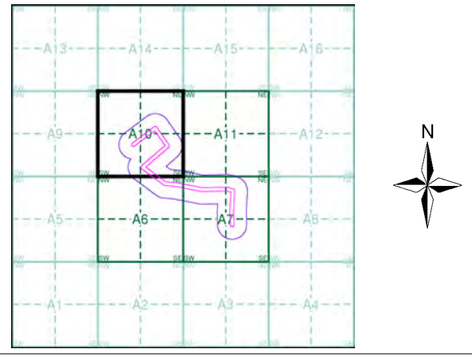
Map Name(s) and Date(s)



Historical Map - Segment A10



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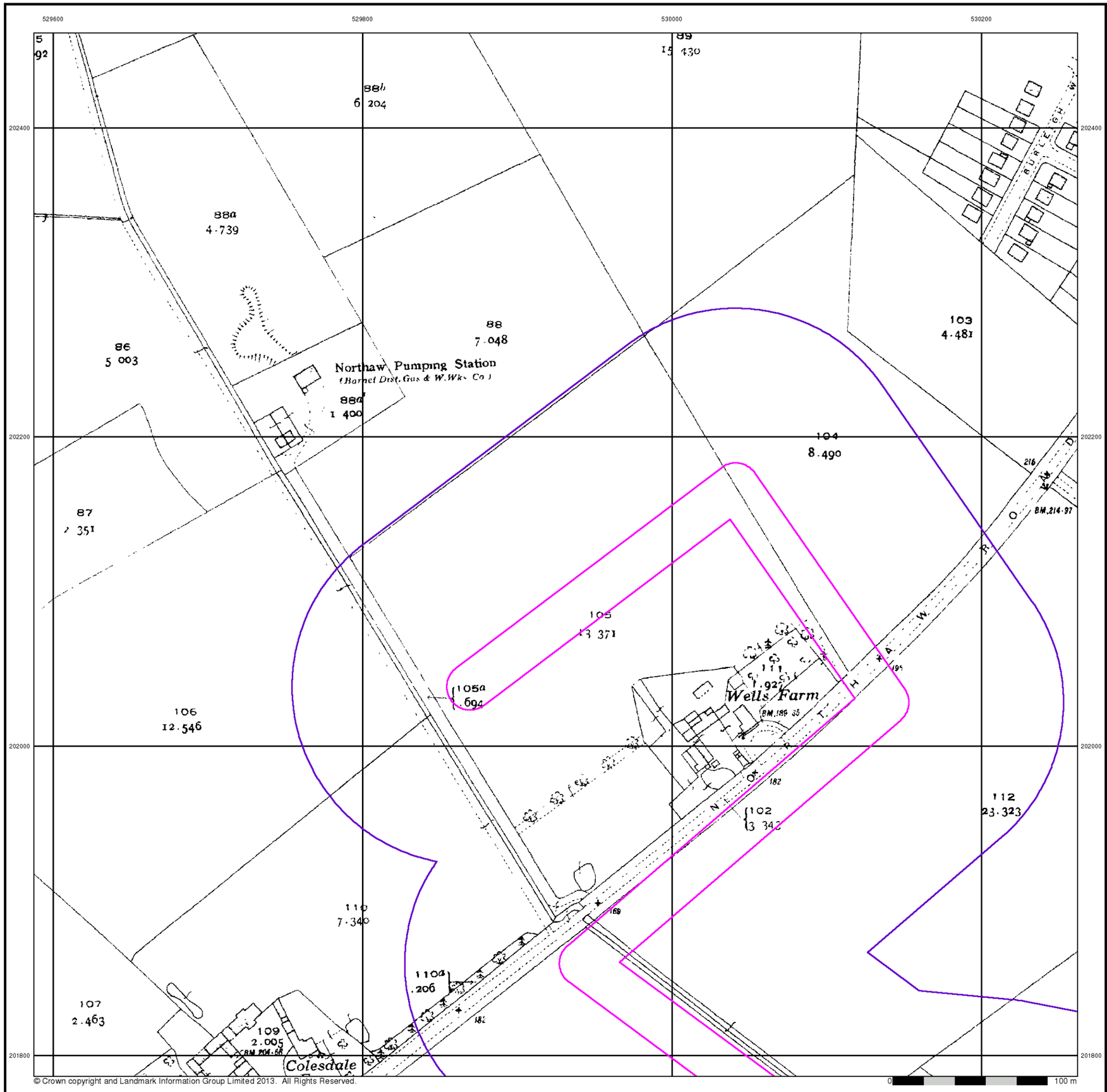

RSK

Hertfordshire

Published 1935

Source map scale - 1:2,500

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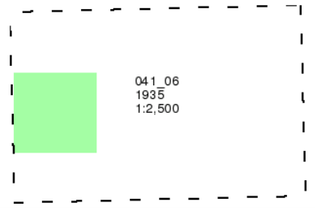
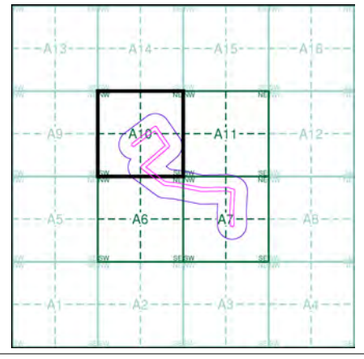


Historical Map - Segment A10



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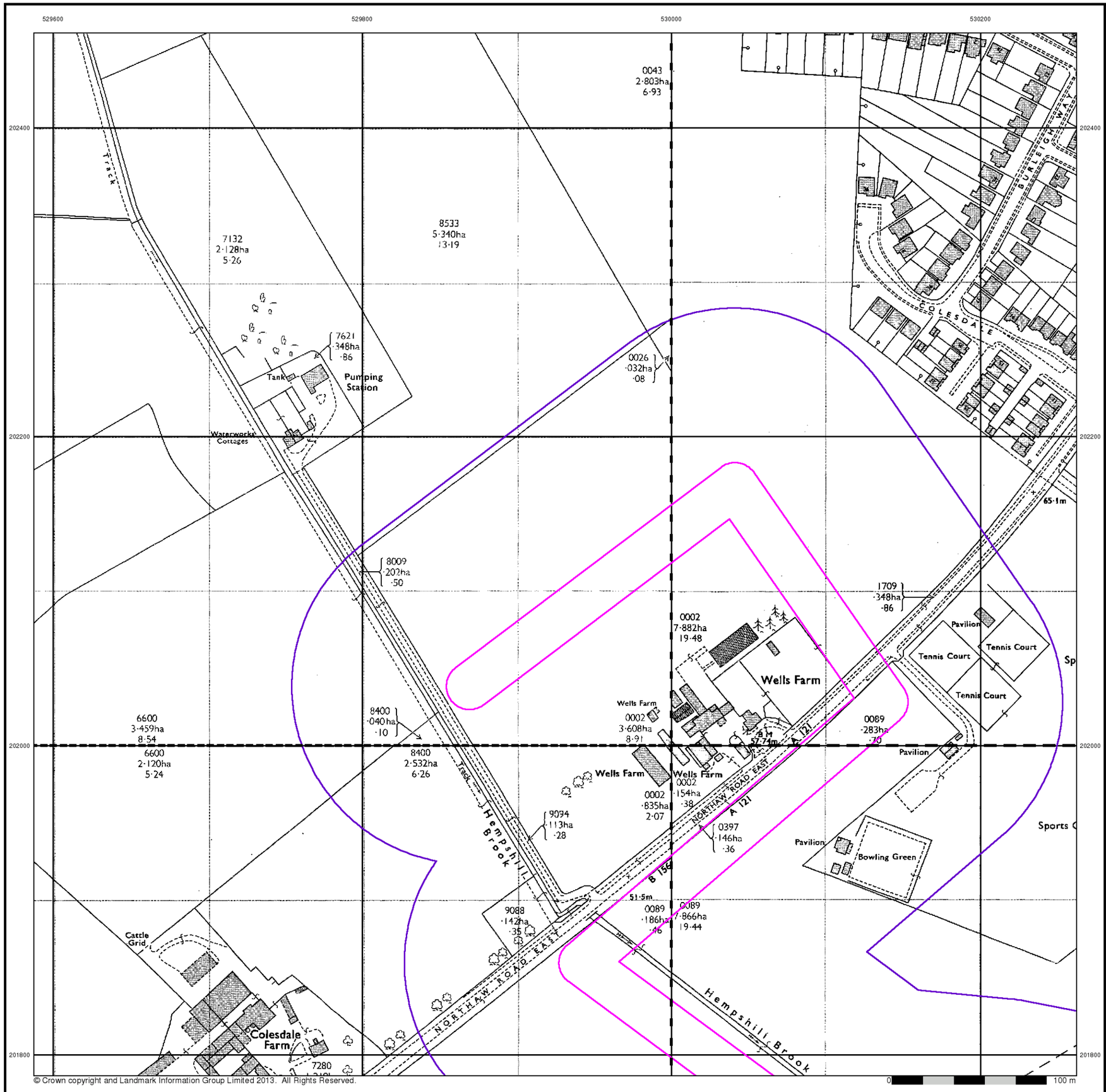

RSK

Ordnance Survey Plan

Published 1970 - 1971

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.

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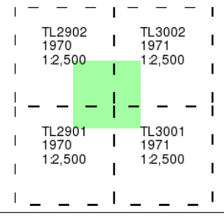
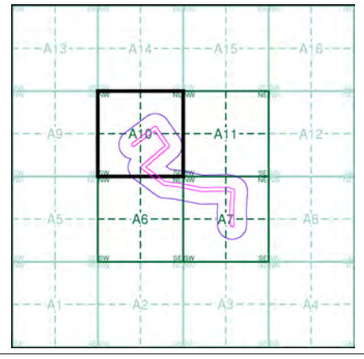


Historical Map - Segment A10



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RSK

Supply of Unpublished Survey Information

Published 1973

Source map scale - 1:2,500

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

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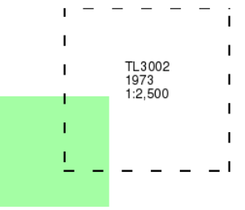
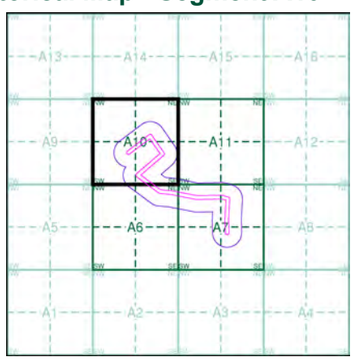


Historical Map - Segment A10



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RSK

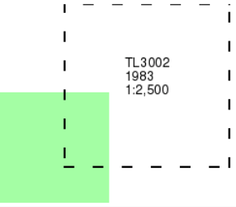
Additional SIMs

Published 1983

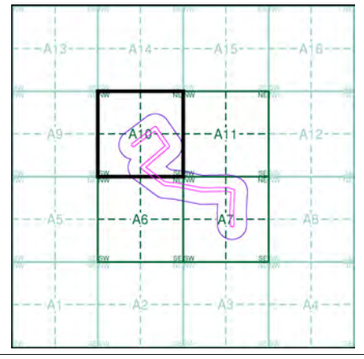
Source map scale - 1:2,500

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 A10



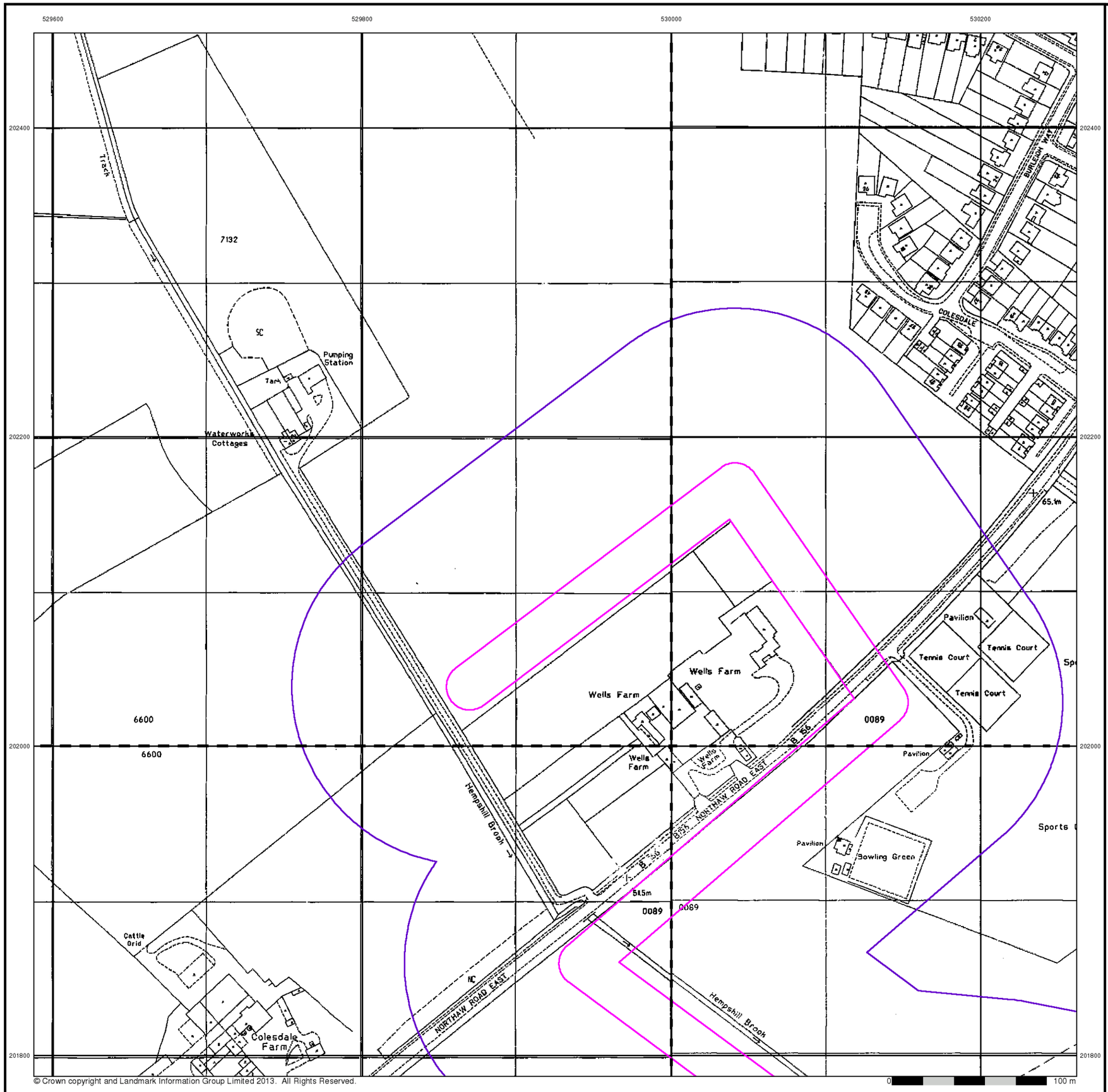
Order Details

Order Number:	60967330_1_1
Customer Ref:	26435
National Grid Reference:	530270, 201790
Slice:	A
Site Area (Ha):	5.08
Search Buffer (m):	100

Site Details

Site at, Cuffley Brook, Hertfordshire

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



RSK

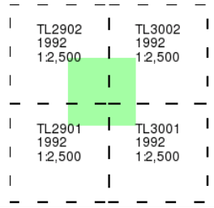
Large-Scale National Grid Data

Published 1992

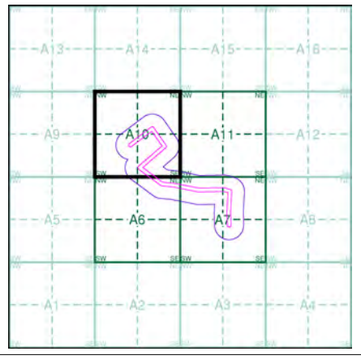
Source map scale - 1:2,500

'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 A10



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RSK

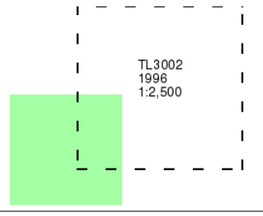
Large-Scale National Grid Data

Published 1996

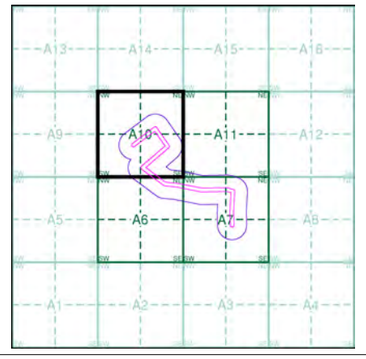
Source map scale - 1:2,500

'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 A10



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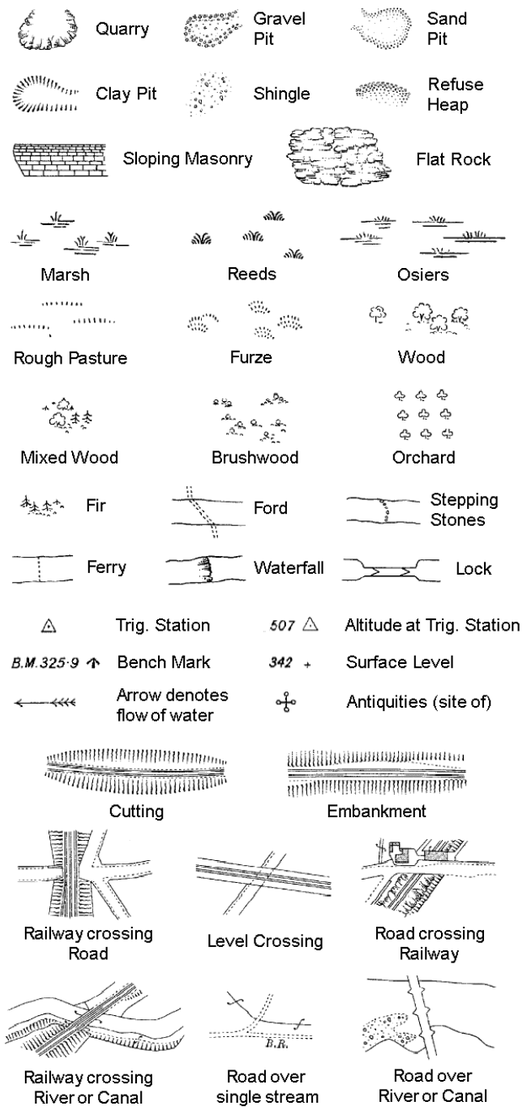
Historical Mapping Legends

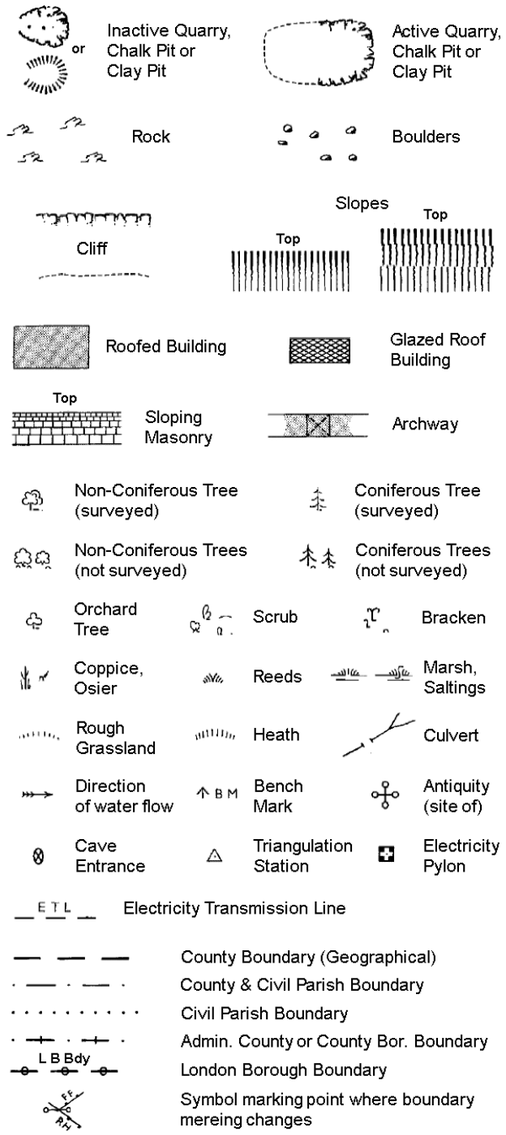
Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



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

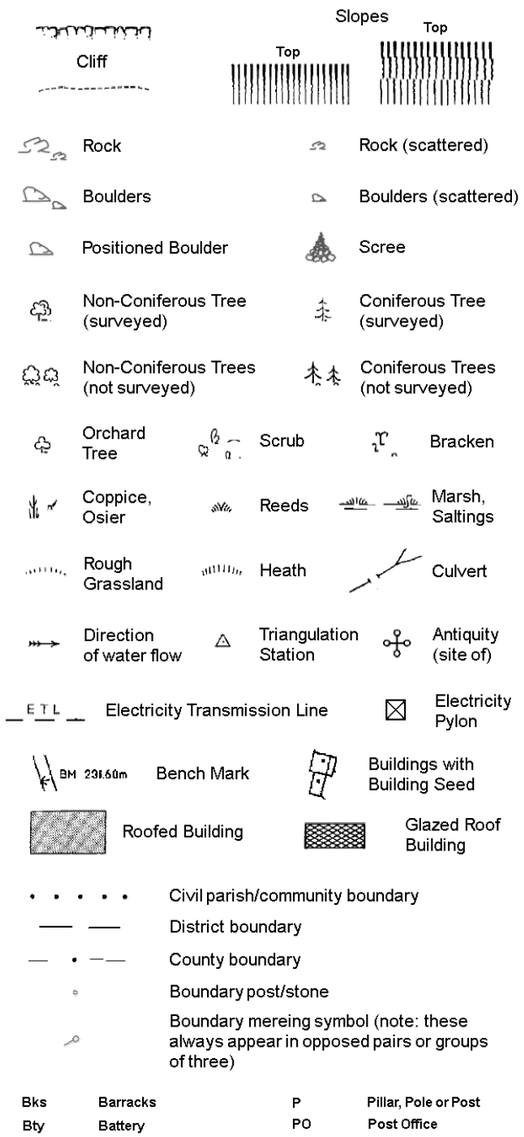
Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



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)

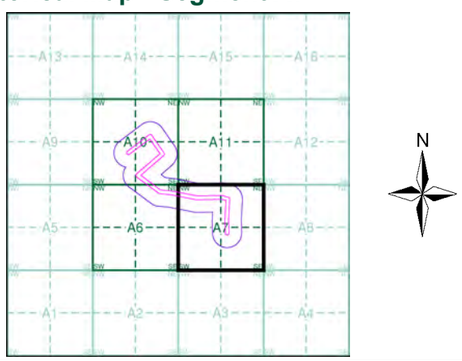
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity 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

RSK

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Hertfordshire	1:2,500	1873 - 1874	2
Hertfordshire	1:2,500	1873	3
Middlesex	1:2,500	1884	4
Middlesex	1:2,500	1896	5
Hertfordshire	1:2,500	1898	6
Hertfordshire	1:2,500	1914	7
Hertfordshire	1:2,500	1935	8
Ordnance Survey Plan	1:2,500	1971	9
Large-Scale National Grid Data	1:2,500	1992	10

Historical Map - Segment A7



Order Details

Order Number: 60967330_1_1
Customer Ref: 26435
National Grid Reference: 530270, 201790
Slice: A
Site Area (Ha): 5.08
Search Buffer (m): 100

Site Details

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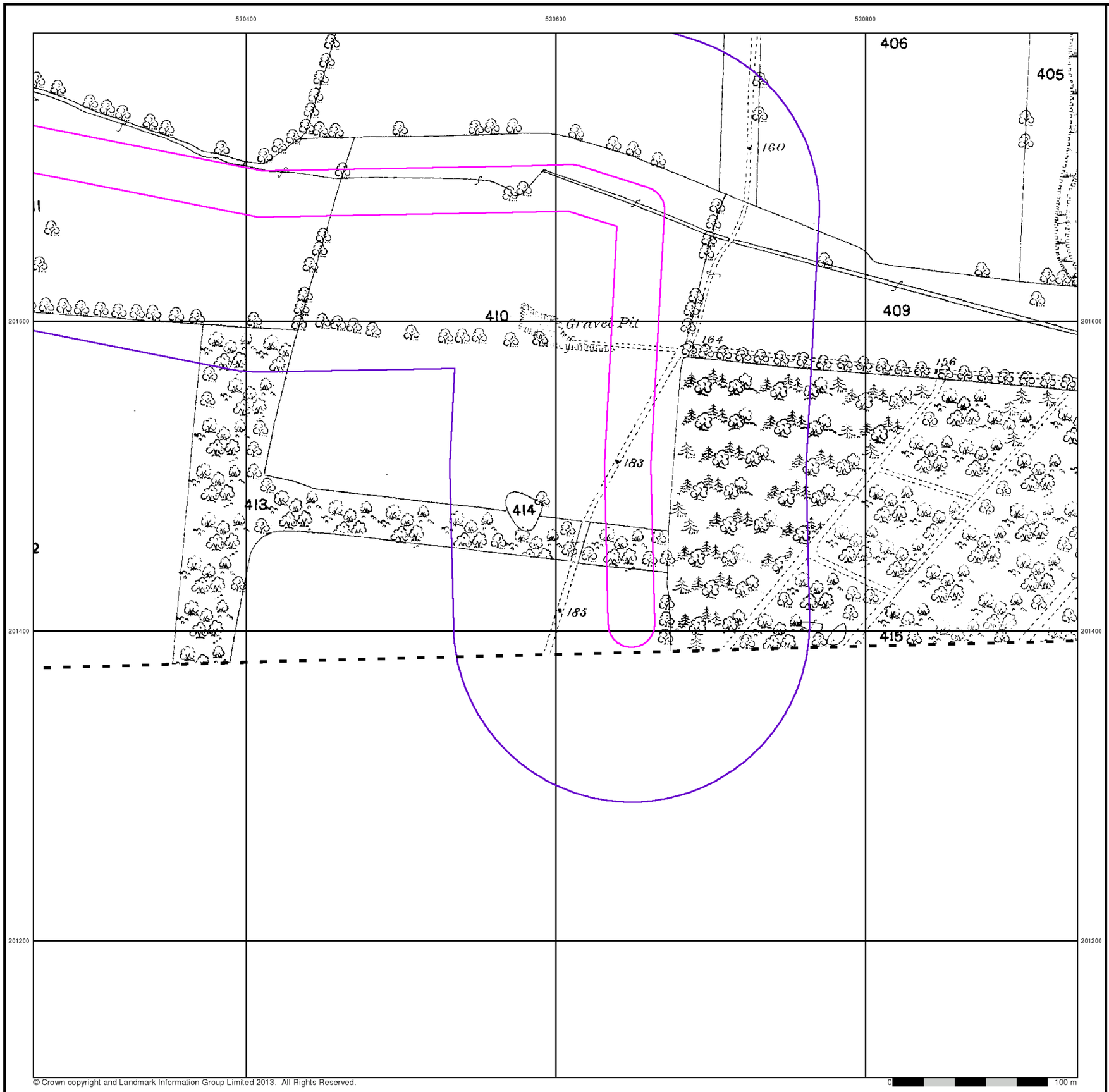


0 100 m

RSK

Hertfordshire

Published 1873 - 1874

Source map scale - 1:2,500

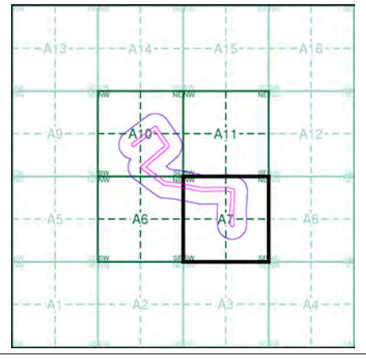
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain.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

041_06
1874
1:2,500

041_10
1873
1:2,500

Historical Map - Segment A7



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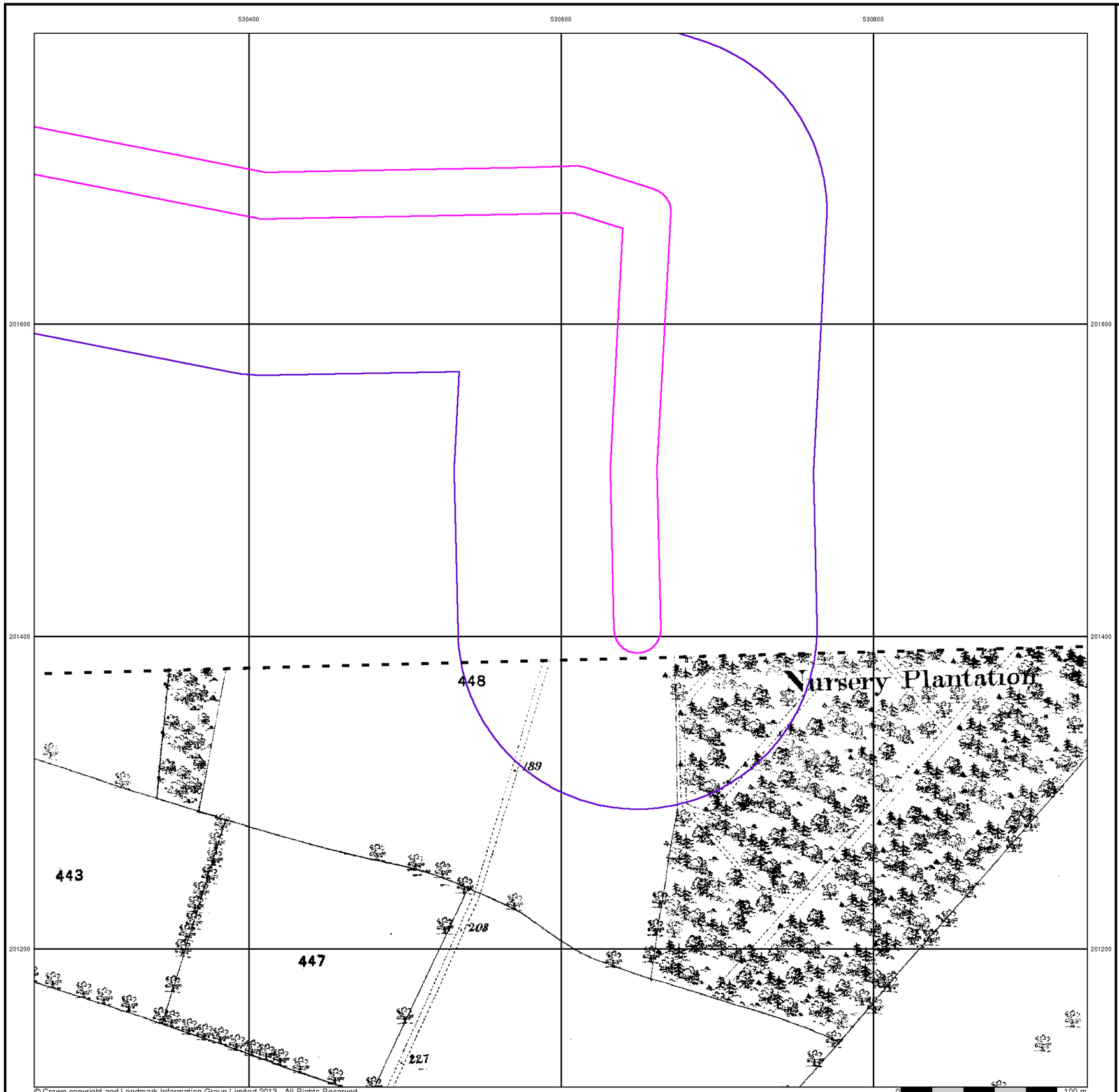

RSK

Hertfordshire

Published 1873

Source map scale - 1:2,500

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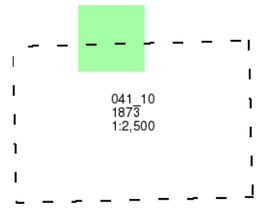
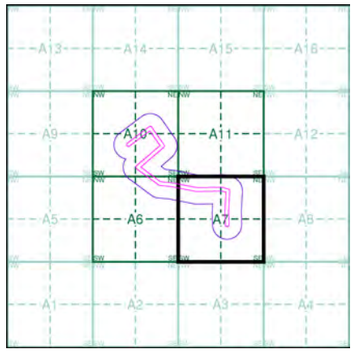


Historical Map - Segment A7



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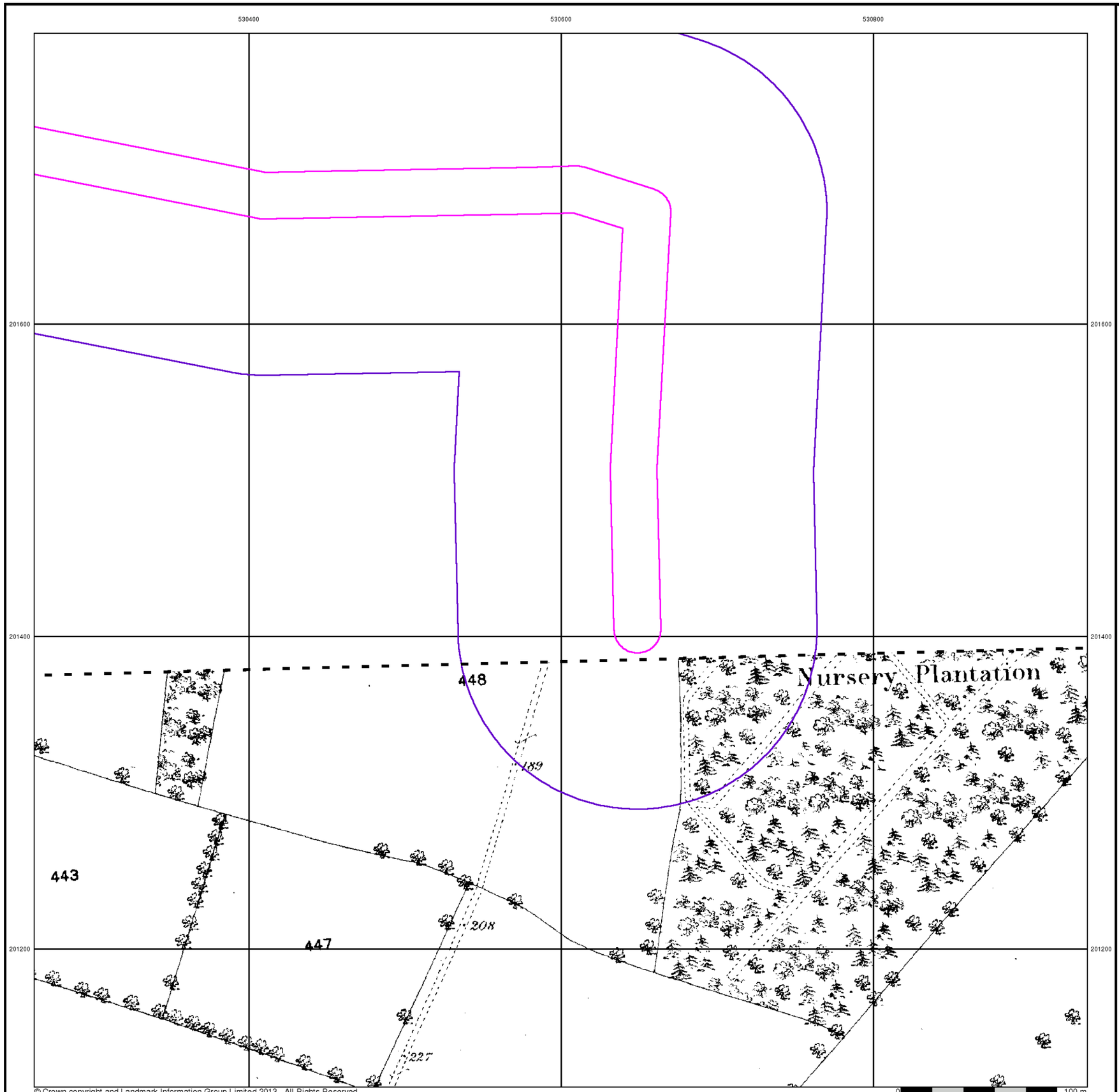

RSK

Middlesex

Published 1884

Source map scale - 1:2,500

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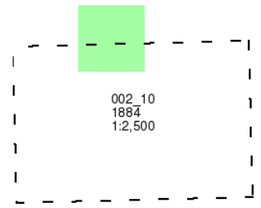
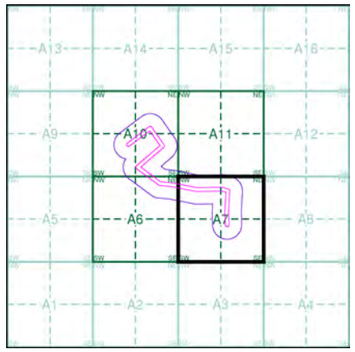


Historical Map - Segment A7



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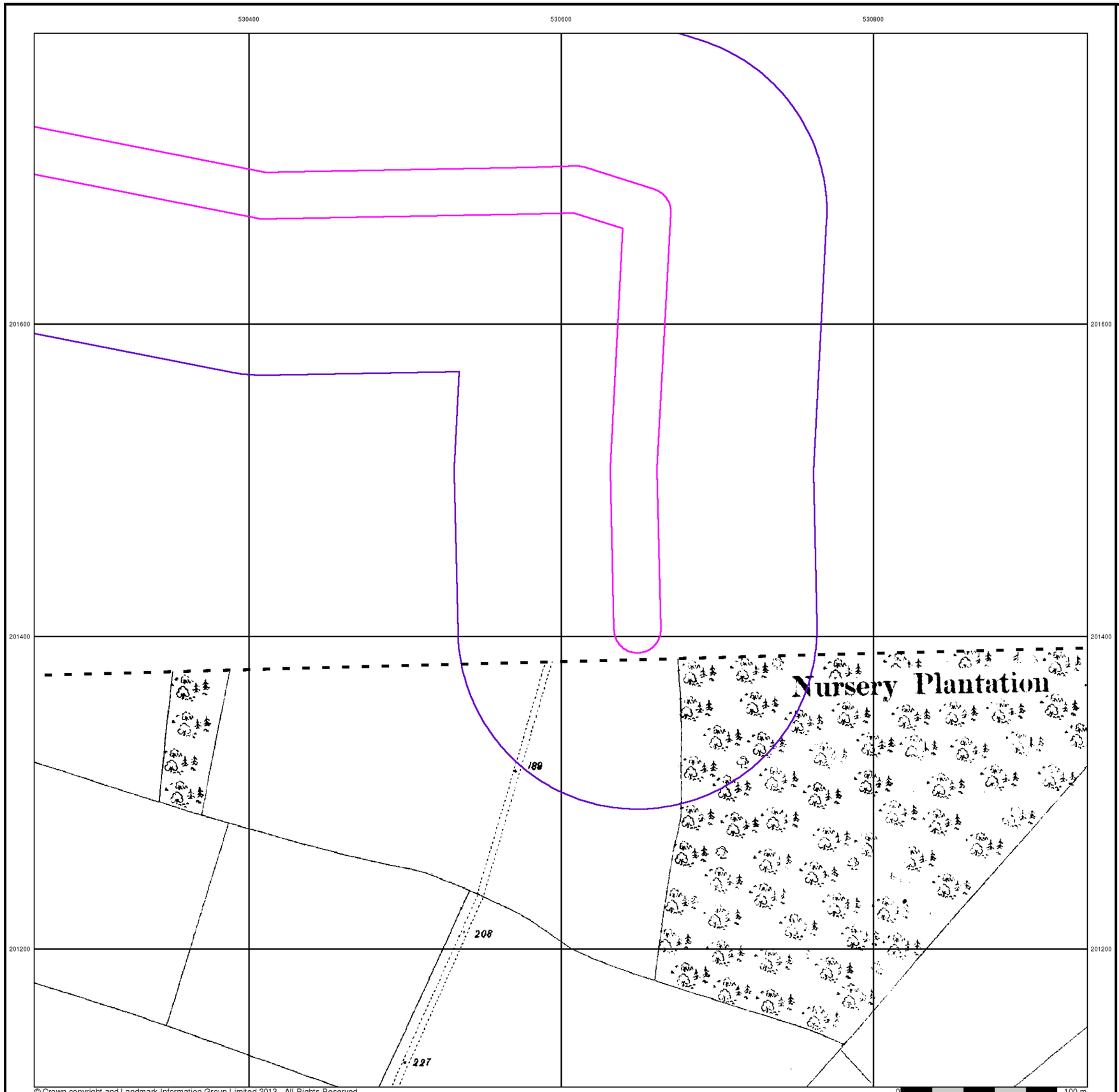

RSK

Middlesex

Published 1896

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.

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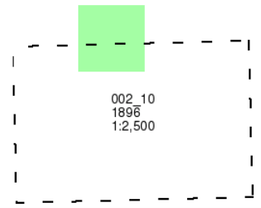
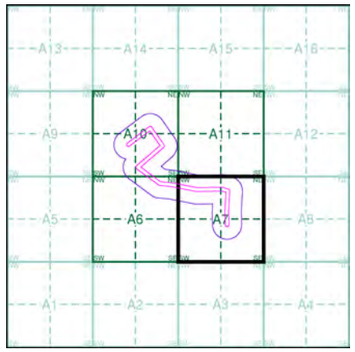


Historical Map - Segment A7



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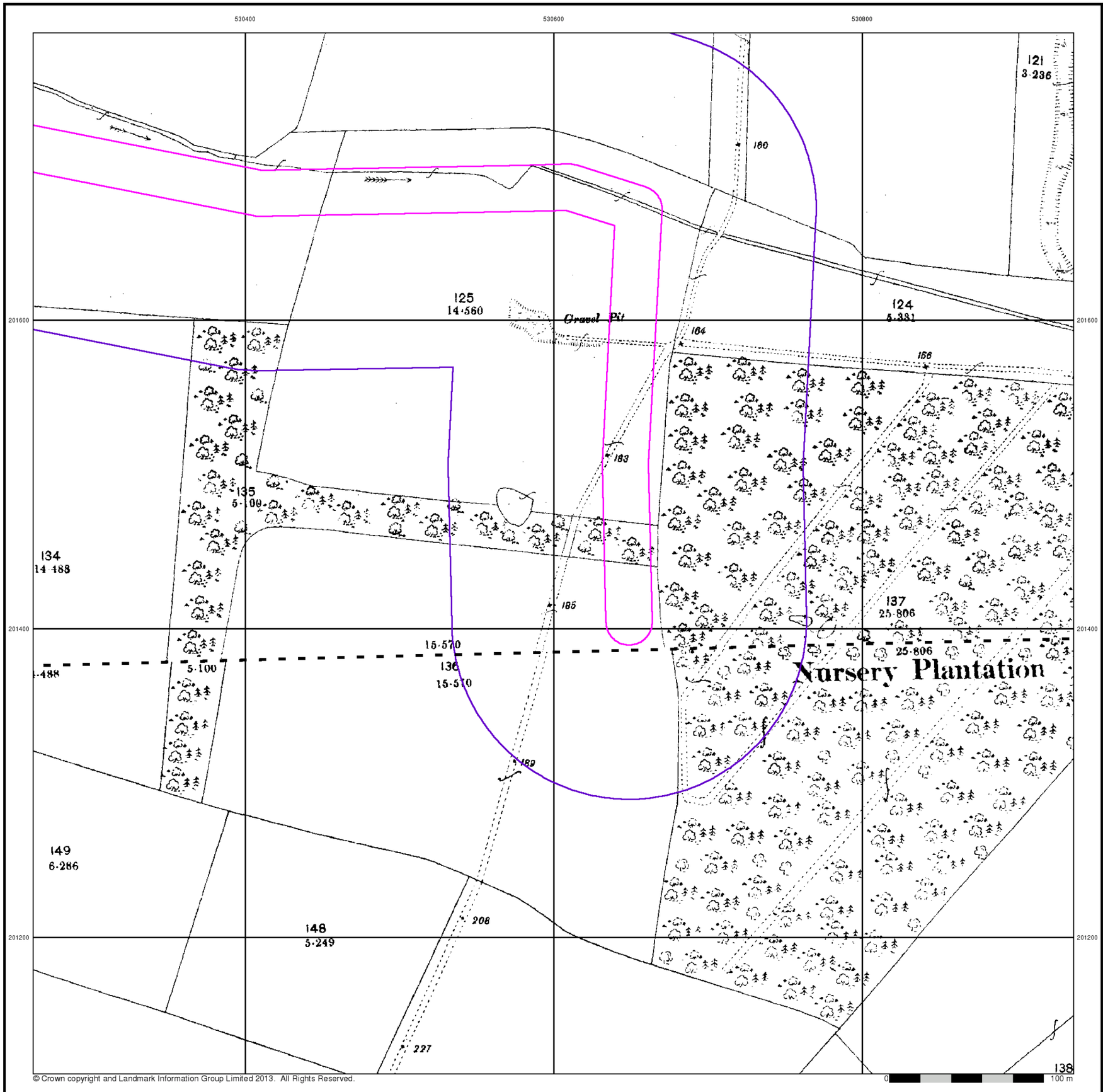

RSK

Hertfordshire

Published 1898

Source map scale - 1:2,500

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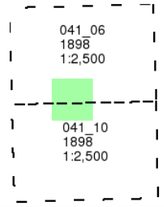
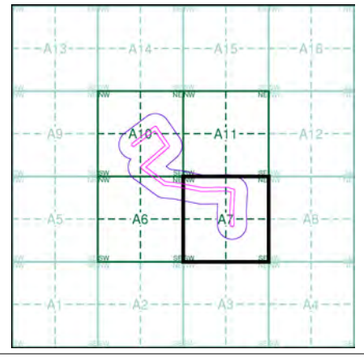


Historical Map - Segment A7



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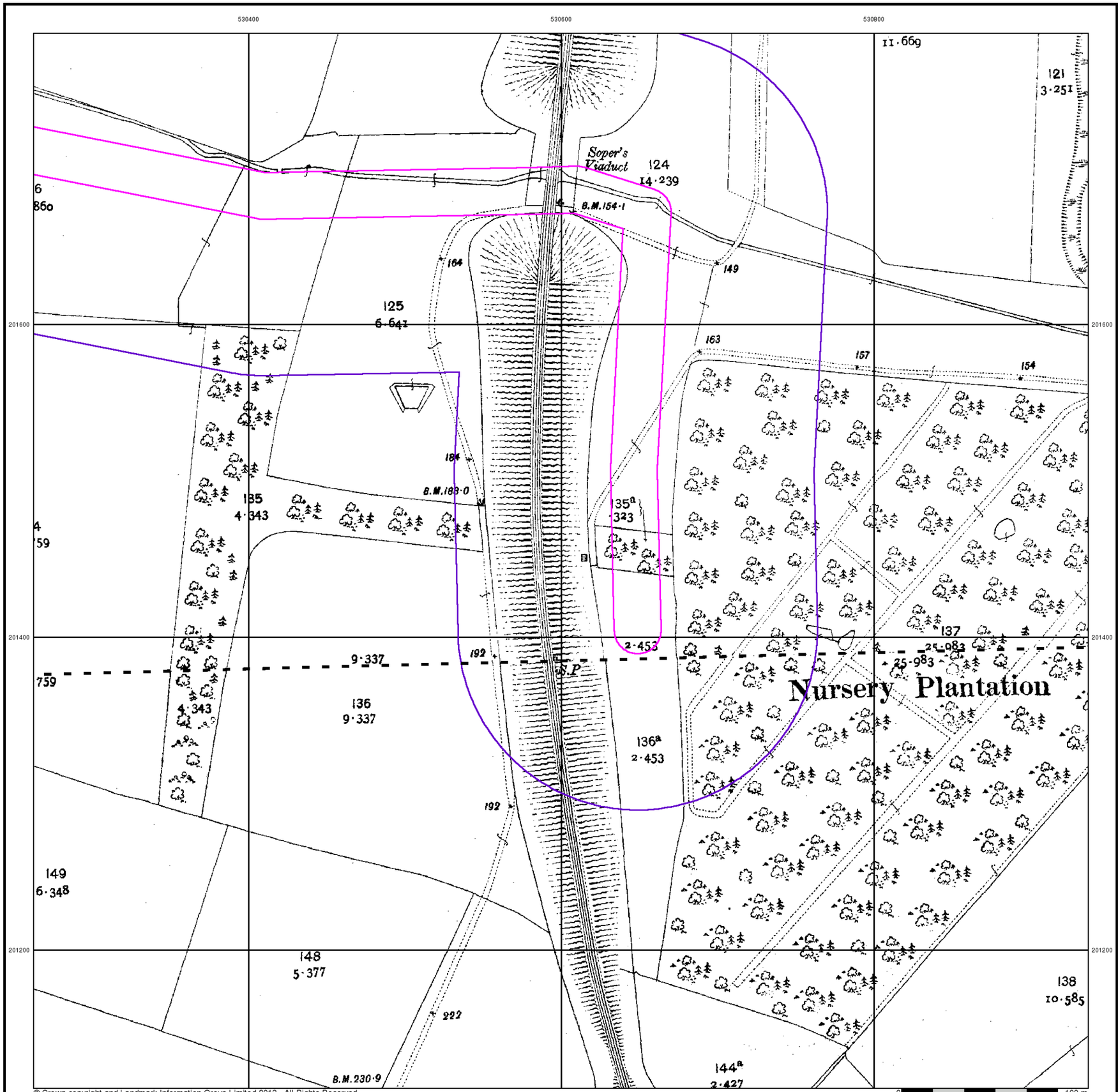

RSK

Hertfordshire

Published 1914

Source map scale - 1:2,500

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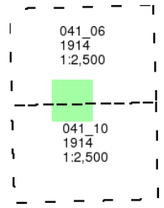
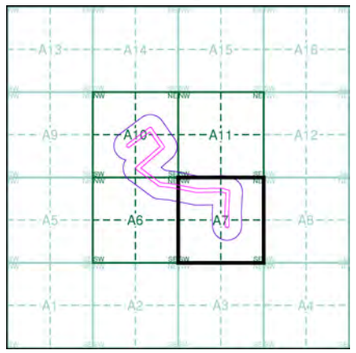


Historical Map - Segment A7



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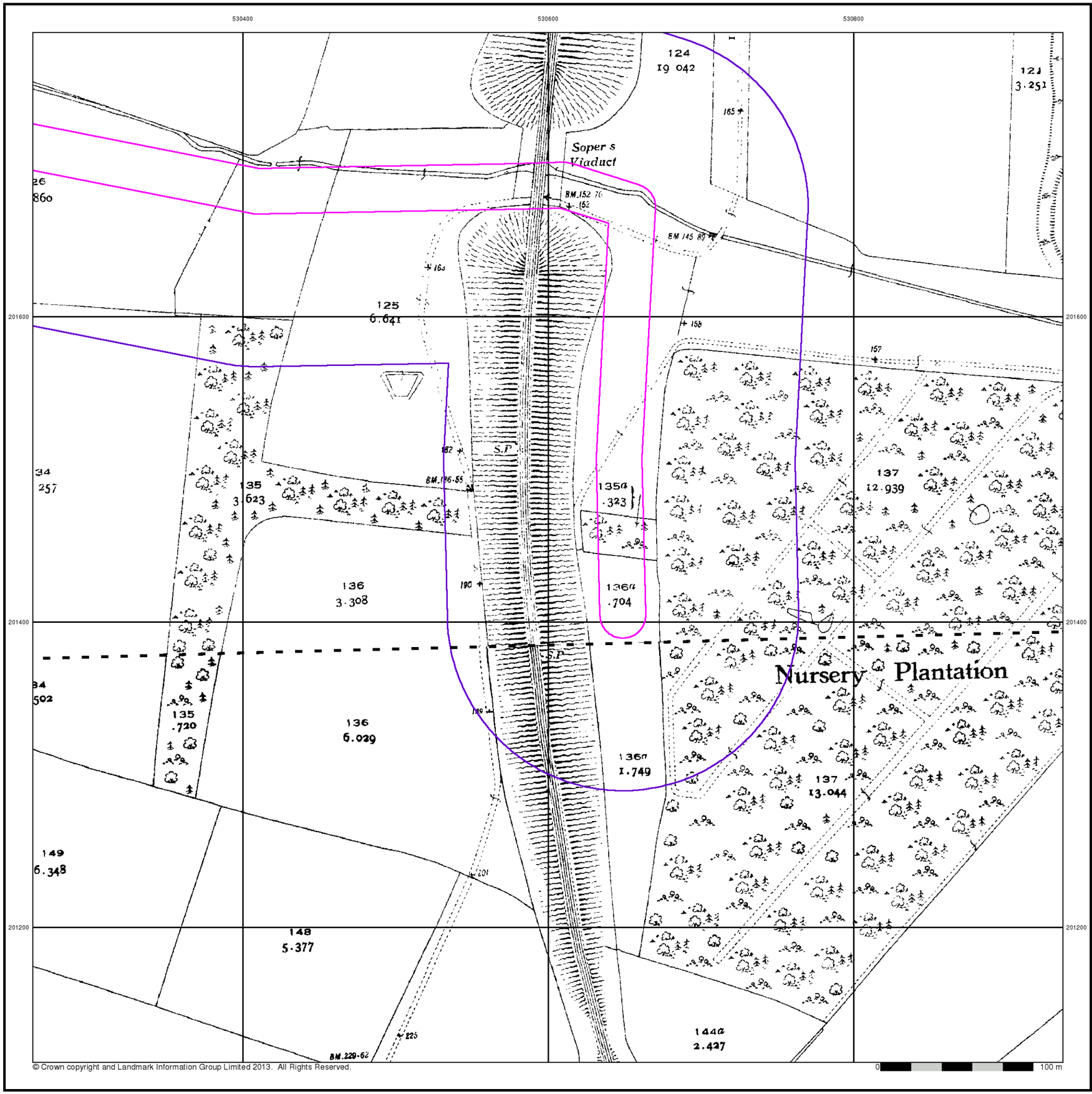

RSK

Hertfordshire

Published 1935

Source map scale - 1:2,500

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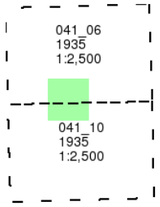
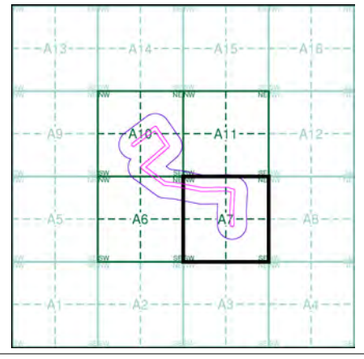
Map Name(s) and Date(s)



Historical Map - Segment A7



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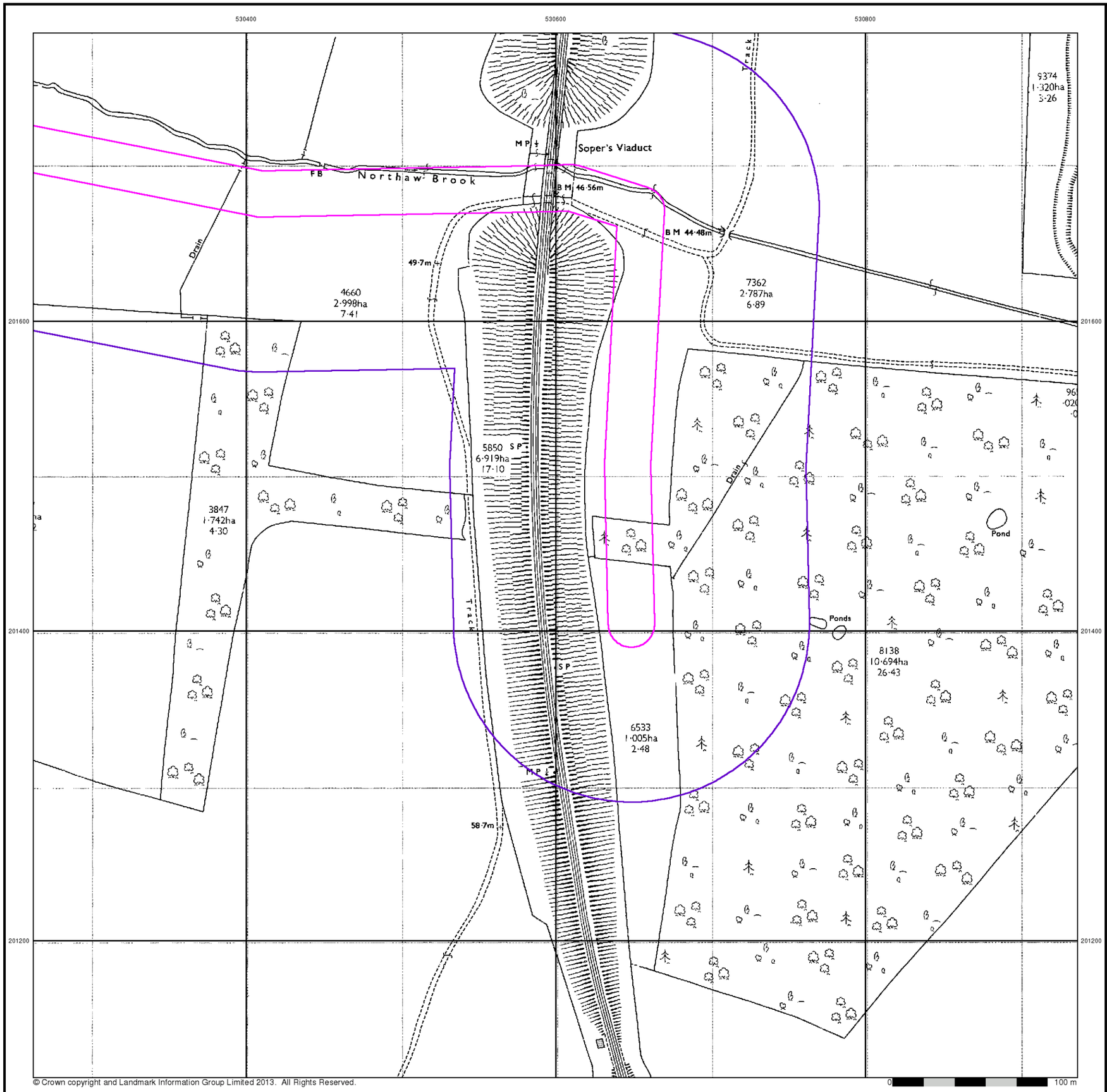

RSK

Ordnance Survey Plan

Published 1971

Source map scale - 1:2,500

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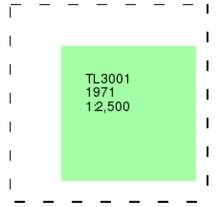
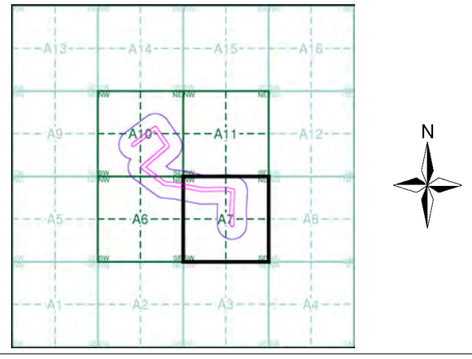
Map Name(s) and Date(s)



Historical Map - Segment A7



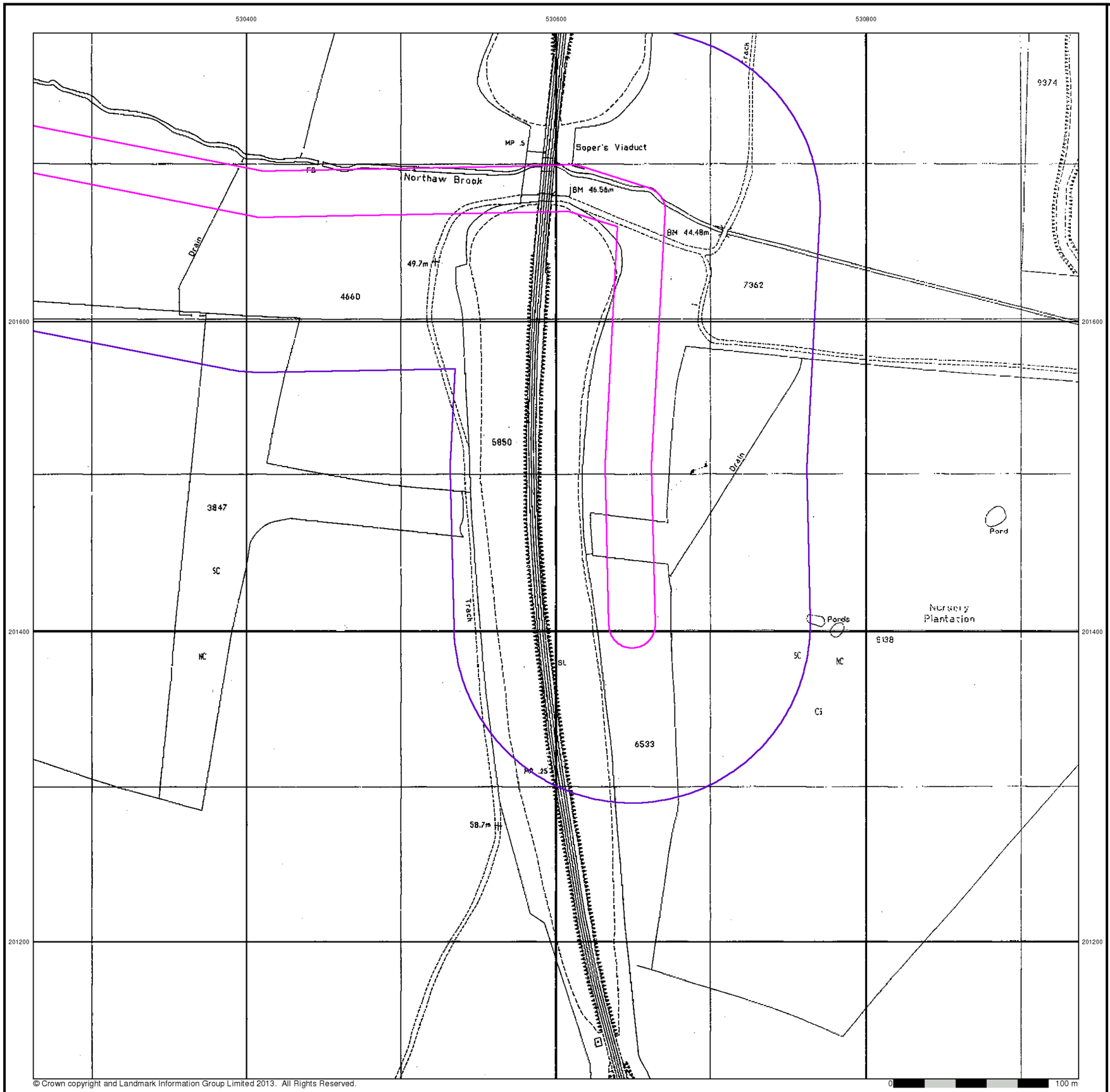
Order Details

Order Number:	60967330_1_1
Customer Ref:	26435
National Grid Reference:	530270, 201790
Slice:	A
Site Area (Ha):	5.08
Search Buffer (m):	100

Site Details

Site at, Cuffley Brook, Hertfordshire

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



RSK

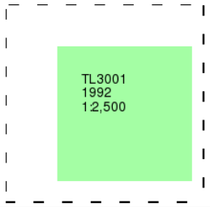
Large-Scale National Grid Data

Published 1992

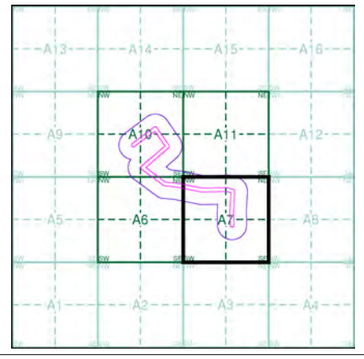
Source map scale - 1:2,500

'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 A7



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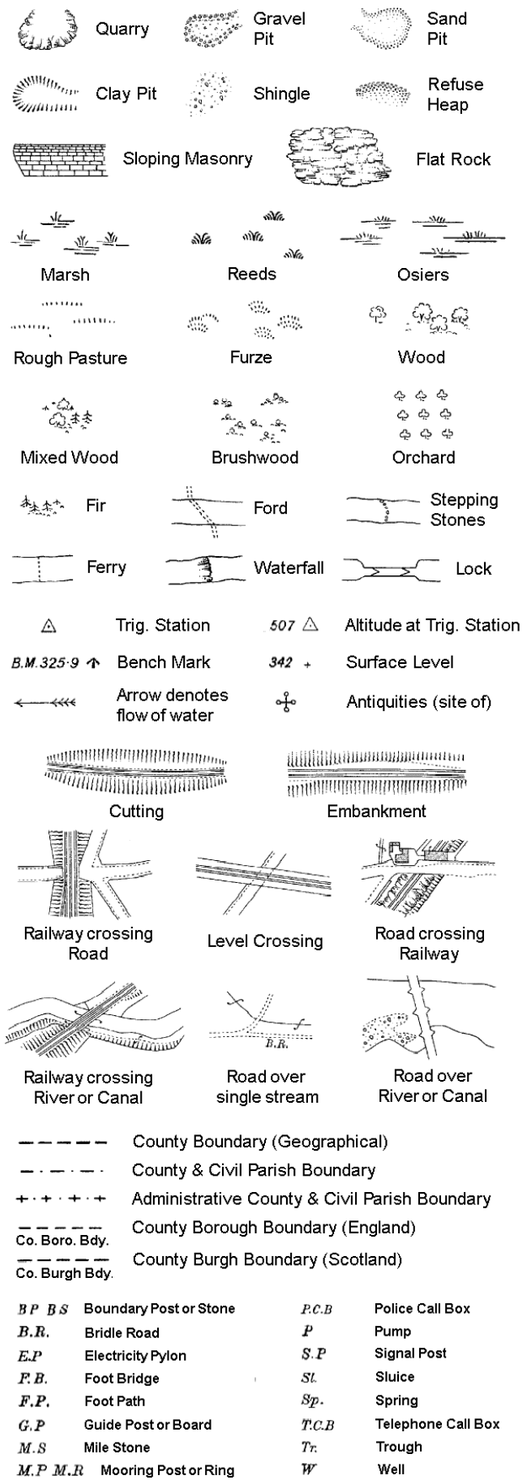
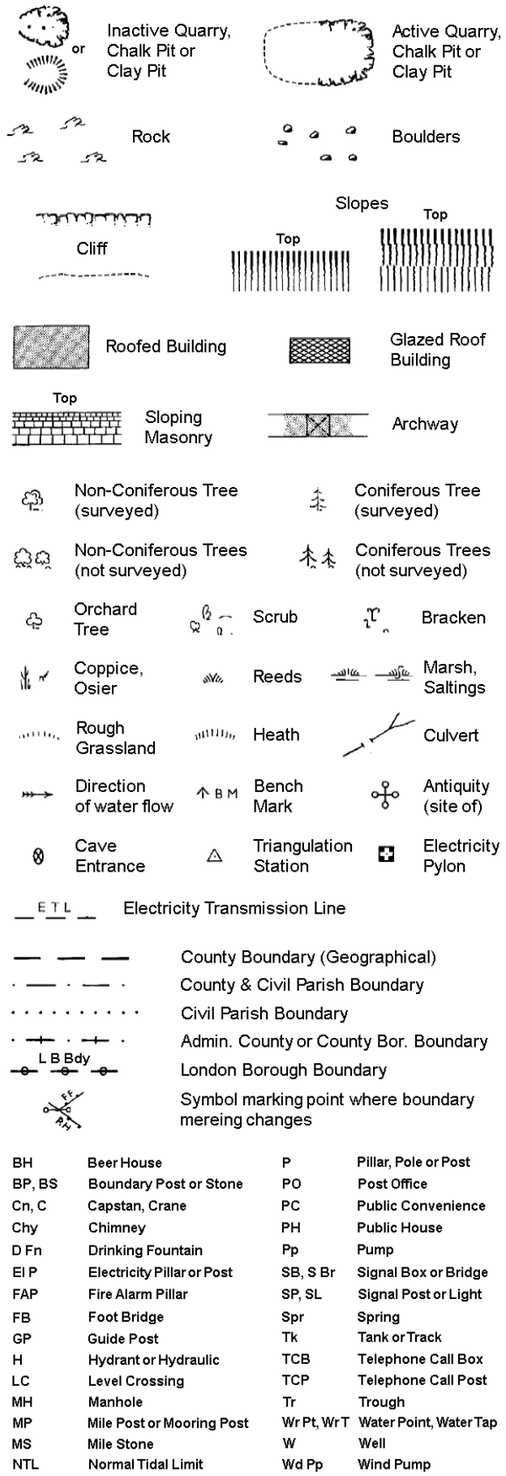
Historical Mapping Legends

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



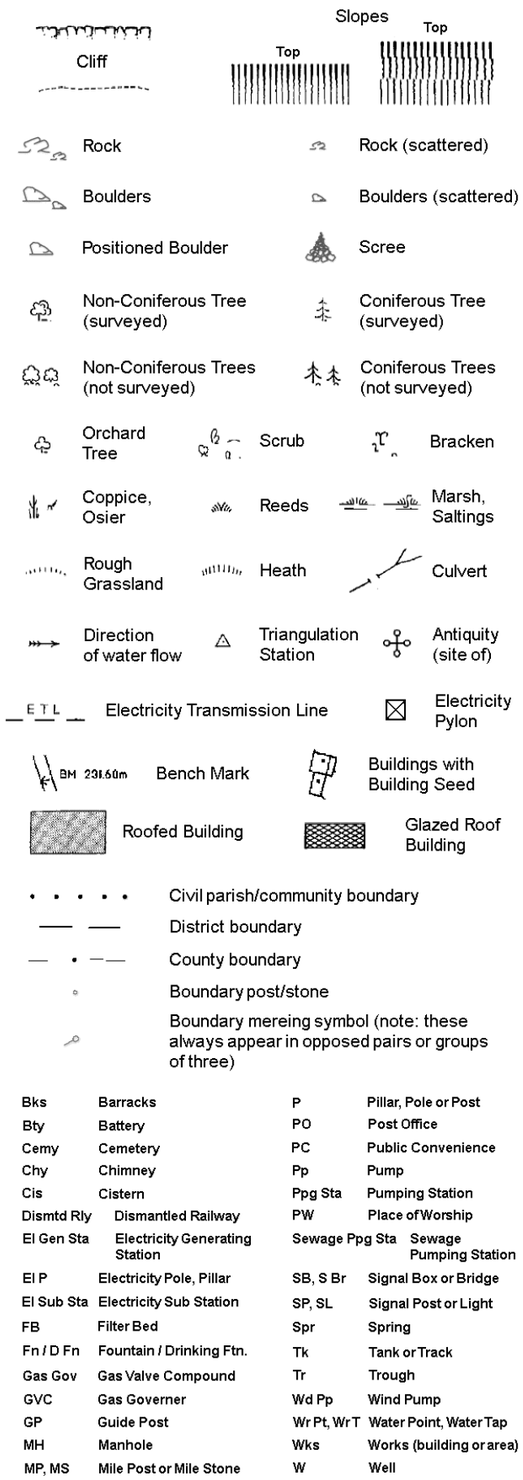
B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



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



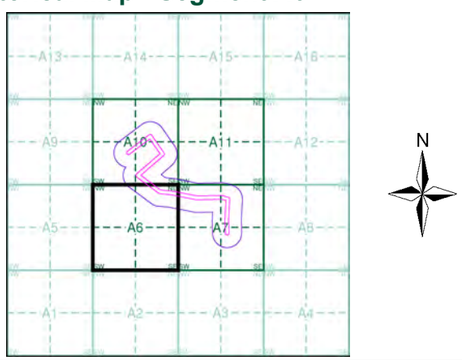
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity 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

RSK

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:2,500	1864 - 1884	2
Hertfordshire	1:2,500	1873 - 1880	3
Hertfordshire	1:2,500	1873	4
Middlesex	1:2,500	1896	5
Hertfordshire	1:2,500	1898	6
Hertfordshire	1:2,500	1913 - 1914	7
Hertfordshire	1:2,500	1935	8
Ordnance Survey Plan	1:2,500	1970 - 1971	9
Large-Scale National Grid Data	1:2,500	1992	10

Historical Map - Segment A6



Order Details

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Customer Ref: 26435
National Grid Reference: 530270, 201790
Slice: A
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Search Buffer (m): 100

Site Details

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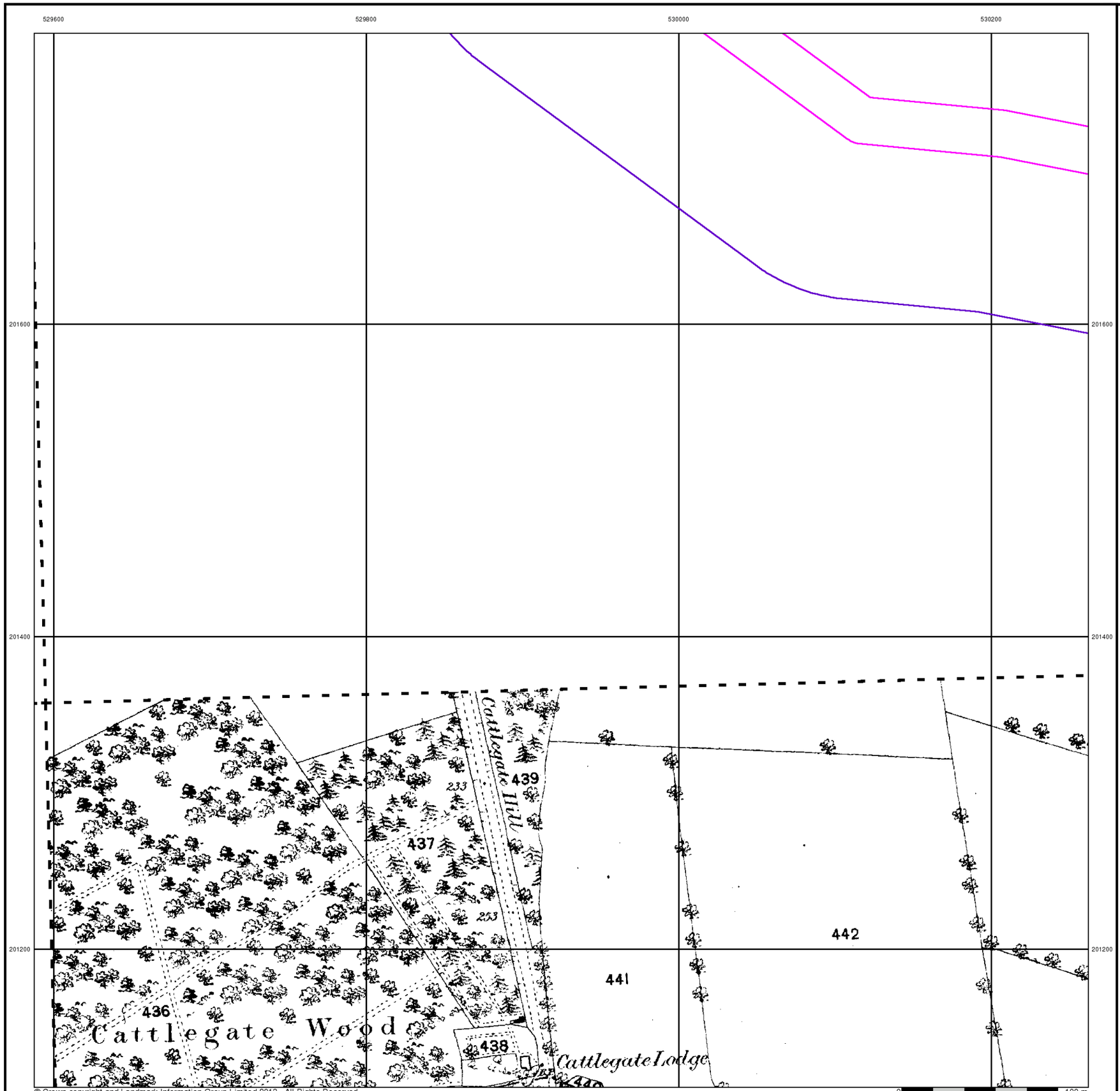

0 100 m

RSK

Middlesex

Published 1864 - 1884

Source map scale - 1:2,500

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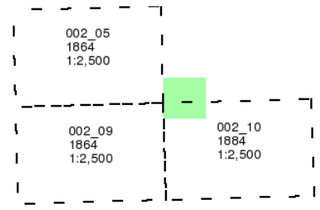
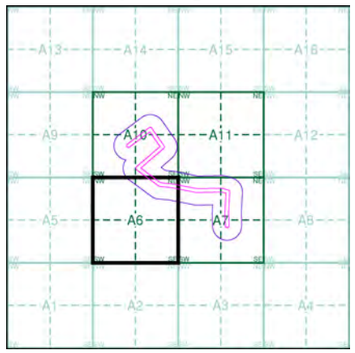


Historical Map - Segment A6



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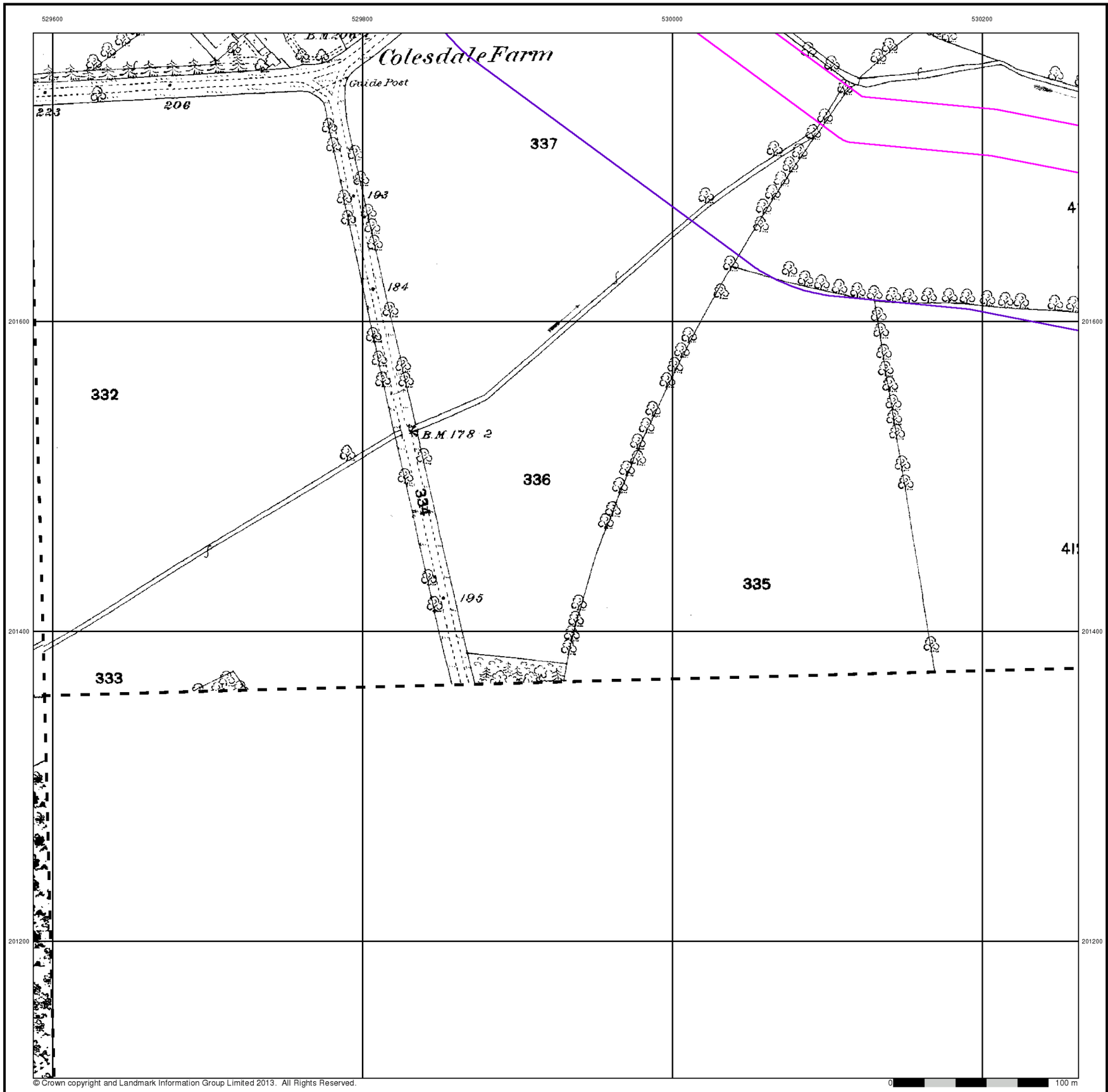

RSK

Hertfordshire

Published 1873 - 1880

Source map scale - 1:2,500

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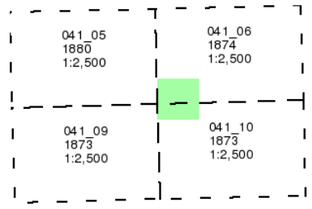
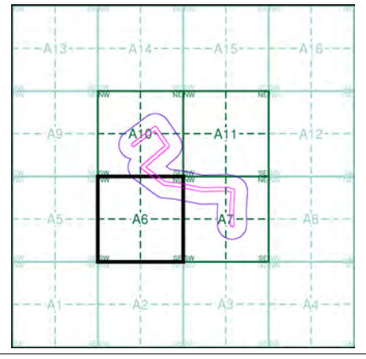


Historical Map - Segment A6



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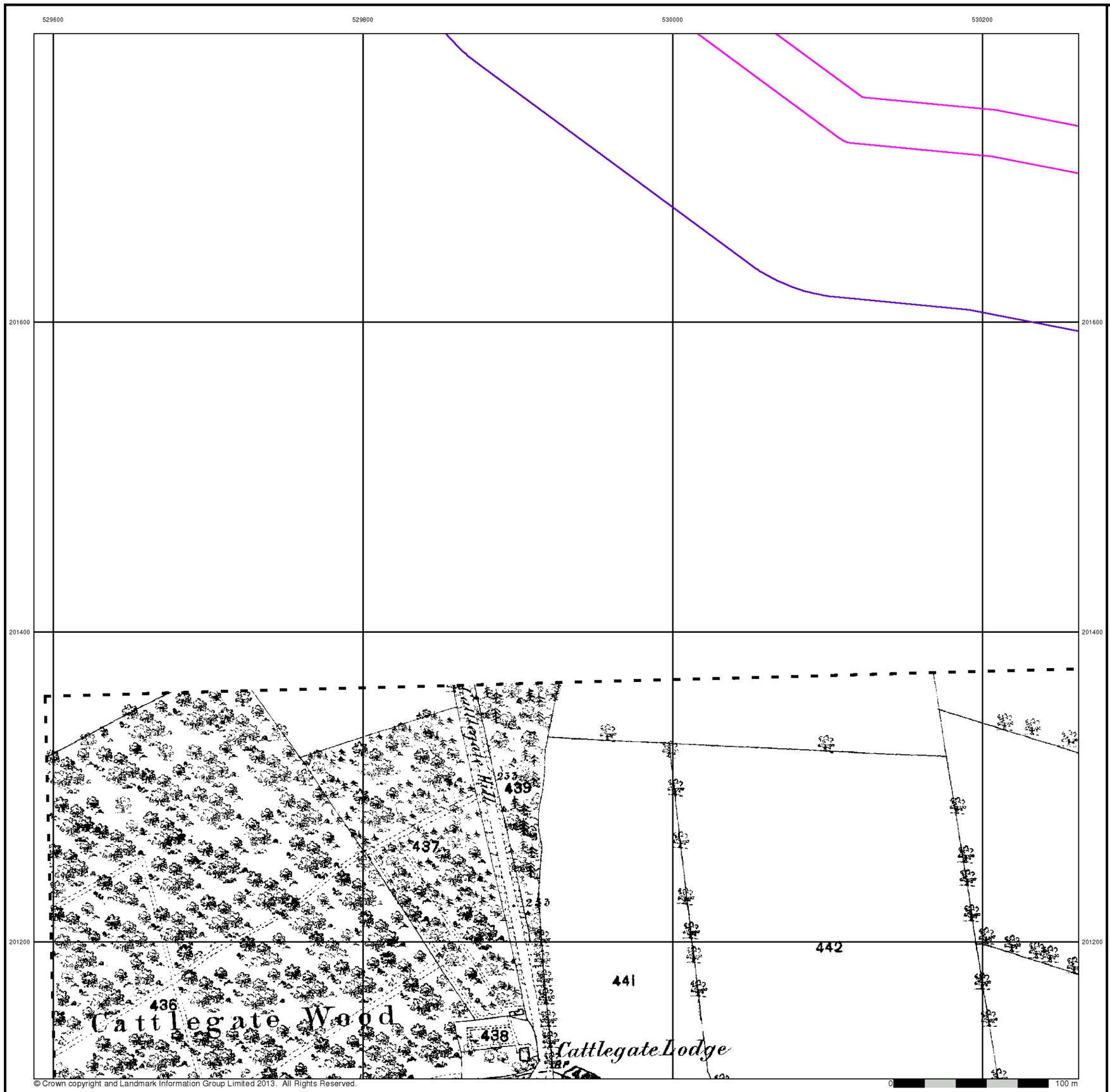

RSK

Hertfordshire

Published 1873

Source map scale - 1:2,500

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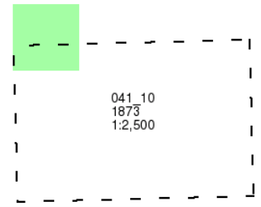
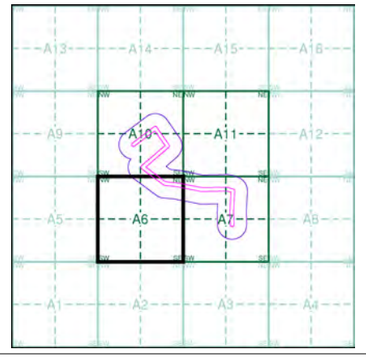


Historical Map - Segment A6



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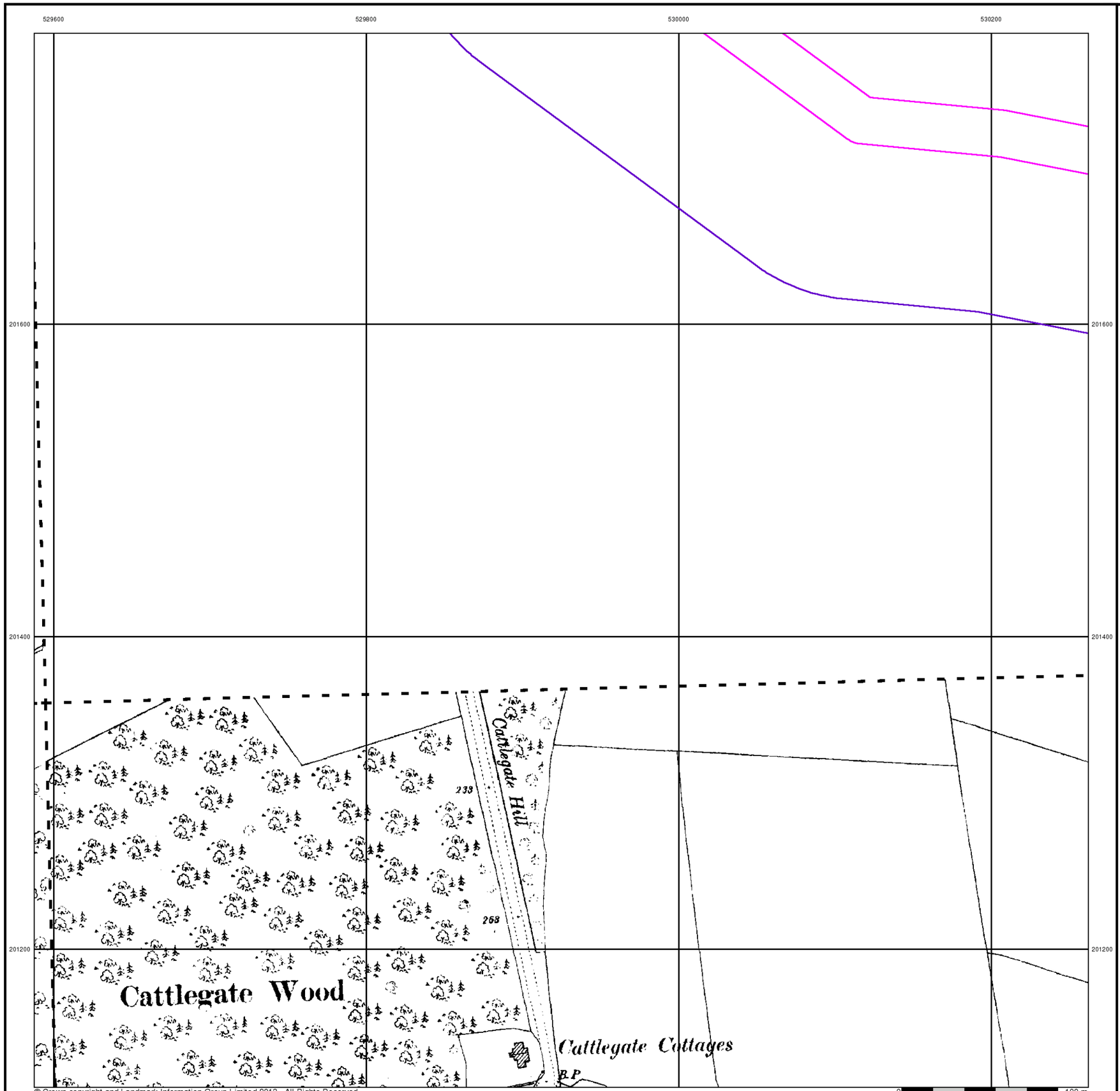

RSK

Middlesex

Published 1896

Source map scale - 1:2,500

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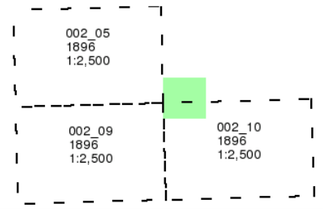
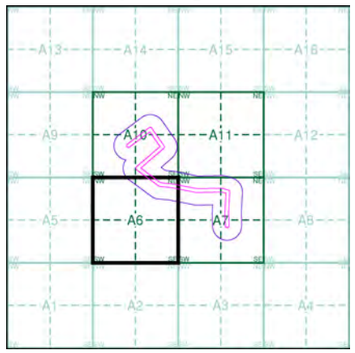


Historical Map - Segment A6



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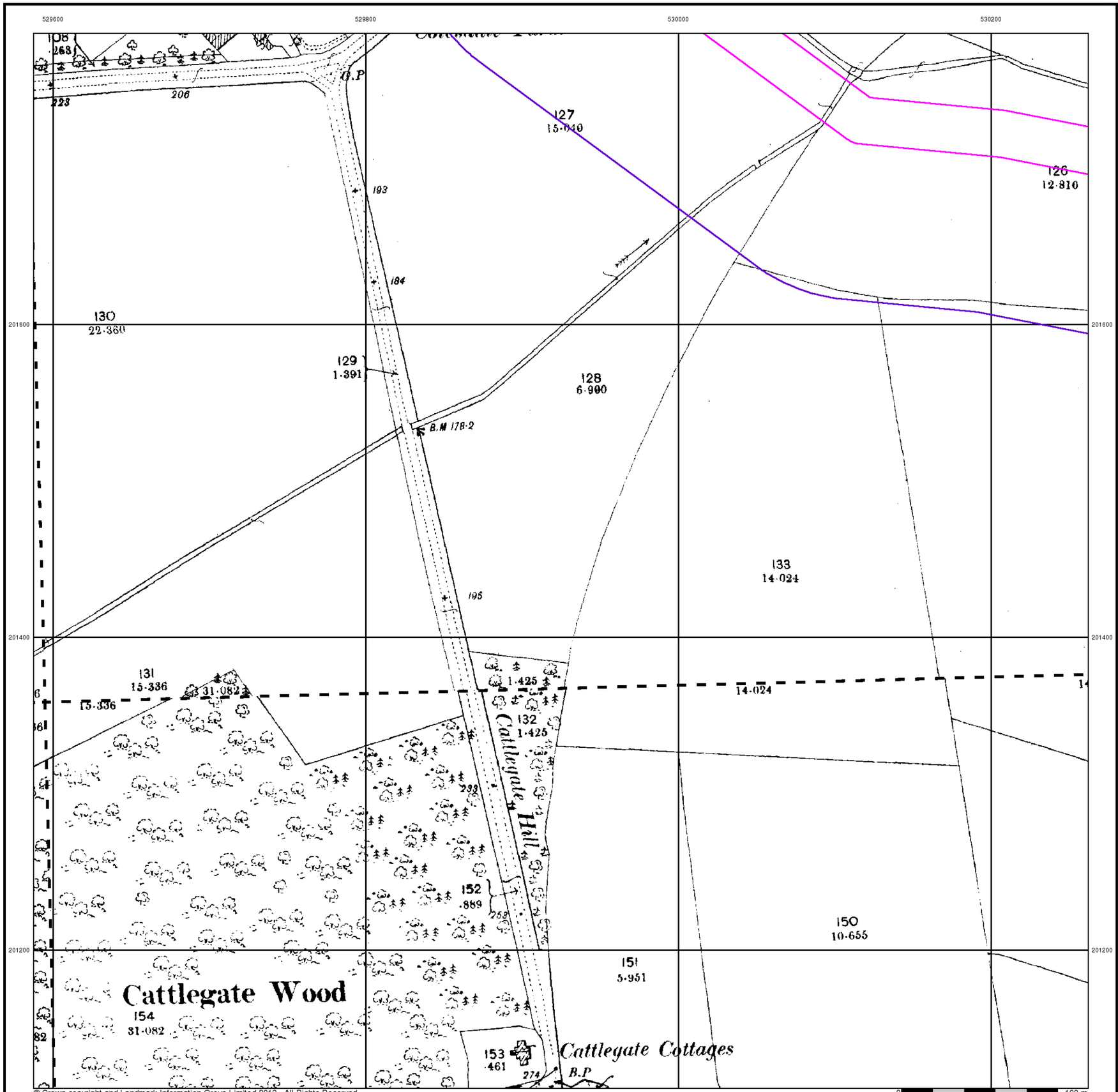

RSK

Hertfordshire

Published 1898

Source map scale - 1:2,500

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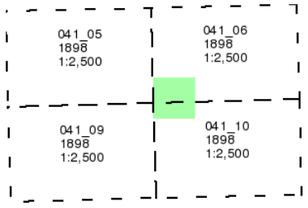
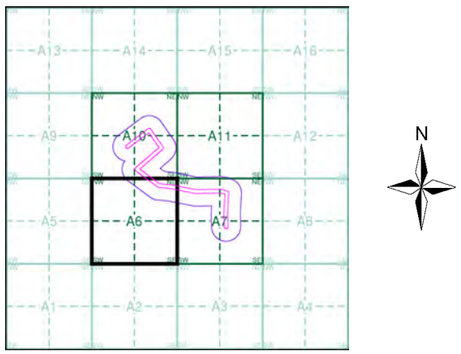


Historical Map - Segment A6



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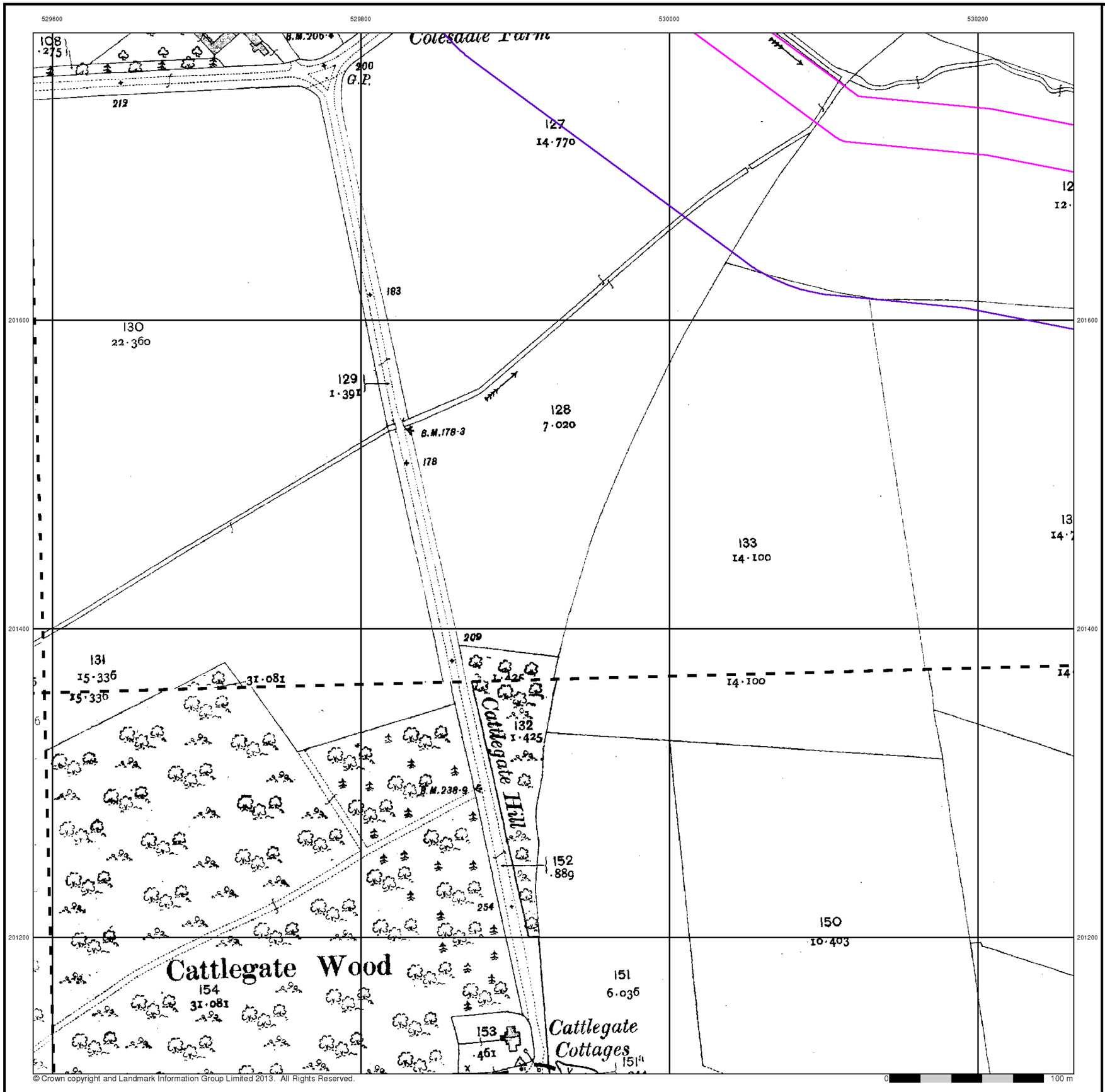

RSK

Hertfordshire

Published 1913 - 1914

Source map scale - 1:2,500

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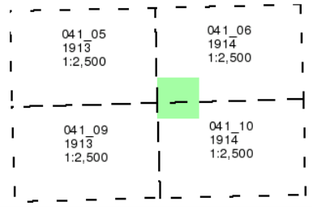
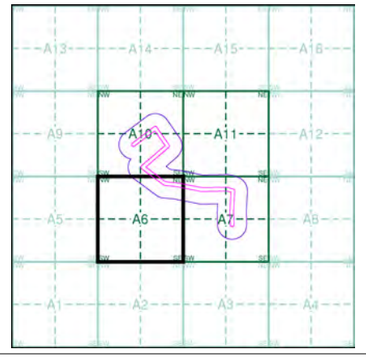


Historical Map - Segment A6



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