



New Waitrose Store, Southam Road, Banbury

**Phase 1 Ground Condition
(Geotechnical and Contamination) Assessment**

On behalf of **Barwood Capital and Mondelez International**

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International

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Executive Summary

This report presents the findings of a Phase 1 Ground Condition (Geotechnical and Contamination) Assessment for land at Mondelez International on Southam Road, Banbury, Oxfordshire.

The study site lies on the northern outskirts of Banbury and is currently the south-eastern section of the Mondelez International (formerly Kraft Foods) site. The study site comprises mainly open ground. A watercourse, the Birds Brook, flows through the northern half of the study site and is culverted along the eastern site boundary. The culverted section of watercourse is recorded on Thames Water records as a 1275mm diameter trunk surface water sewer. In general topographical terms, the site is situated on the low western flank of the valley feature associated with the River Cherwell; the river lies to the east of the site, approximately 500m from the Southam Road boundary. The anticipated general site geology comprises the Jurassic aged Charmouth Mudstone Formation, although there is evidence of Made Ground and Superficial Deposits (of alluvium) being present on the study site overlying and masking the bedrock strata.

In terms of recent land use history, the study site has formed part of the food manufacturing complex since the 1960s, although has remained largely undeveloped. It is possible that during the cut and fill operation for the construction of a neighbouring warehouse unit, fill was also placed on this area.

The Phase 1 qualitative geoenvironmental risk assessment carried out to assess the potential hazards and constraints posed by existing site conditions and past land use activities are summarised as follows:

Potential Receptor	Risk Assessment	Description
Human Health – Future Site Users	Low	The risk to future site users may arise from potential localised hotspots of contamination associated with areas of Made Ground and the general potential for spillages associated with the former and existing uses of the site. However, as the site will be used for commercial purposes, there is considered to be limited exposure routes to future site users.
Human Health – Off-site Users	Low	It is considered unlikely that significant migration of potential contaminants away from any potential localised hotspot areas would have occurred due to the anticipated low permeability clay soils present beneath the site. Hence the risk estimation for off site users is low.
Human Health – Construction Workers	Very Low	The (low) risk to site workers is expected to be mitigated by provision of appropriate protective clothing and equipment, and adoption of good standards of hygiene to prevent prolonged skin contact, inhalation and ingestion of soils.
Groundwater	Low	The potential for any existing contamination of the ground to migrate into the Secondary groundwater aquifer present to the east of the study site boundary is not expected to be affected by the development
Surface Water	Moderate/Low	Existing surface water discharges into the Birds Brook heighten the risk of potential surface contaminants entering the watercourse.

Potential Receptor	Risk Assessment	Description
Buildings and Property	Very Low	There is no identified risk to existing buildings and neighbouring property.

With respect to the preliminary geotechnical assessment the study has identified:

Geotechnical Consideration	Description
Artificial and natural cavities	No hazard
Foundations and floor slabs	There are potential hazards for conventional shallow foundations and ground bearing floor slabs associated with compressible ground in areas of deep Made Ground and Superficial Deposits (possible Alluvium). There is also the possibility of shrinking or swelling hazards associated with the anticipated predominant clay soil. The Lower Lias bedrock strata is known as a geological strata likely to have substantial sulphate concentrations. Earthworks materials derived from this strata can be subject to ground heave.
Excavations	They are unlikely to be any construction issues with shallow excavations at the site, although provision of side support to maintain stability will be required and groundwater may be encountered within 2-3m of ground level and as such, should be considered in planned excavations extending to and below these depths.
Roads and pavements	The properties of the near surface soils will require confirmation prior to the design of roads and pavements.
Infiltration drainage	Given the generally clayey nature of the underlying strata, it is unlikely that infiltration drainage will be feasible at the site.

Conclusion

The Phase 1 geoenvironmental risk assessment has identified that progression to a Phase 2 intrusive study will be required as part of the development process. The intrusive site investigation will confirm the conceptual model and quantify potential contamination on the site arising from past and current land activities including the existing on-site R&D building and gas infrastructure station, and the adjacent off-site electrical substation and gas governor station, as well as other identified potential sources of contamination. However, given the limited scale of the potential sources of contamination from both on-site and off-site sources, it is anticipated that any requirement to carry out intrusive investigation can be satisfactorily dealt with by incorporation of a suitable condition in any granted Planning Consent.

The executive summary contains an overview of the key findings and conclusions. This summary should not be treated independently but should be read in conjunction with the main report text including Section 8 and the accompanying tables, figures and appendices.

1 Introduction

1.1 Background Information

Peter Brett Associates LLP (PBA) has been instructed by db symmetry (the Client – formerly Barwood Developments Ltd) to undertake a Phase 1 Ground Condition (Geotechnical and Contamination) Assessment for proposed commercial development on land to the west of Southam Road, Banbury, Oxfordshire.

This report presents the findings of the desk study researches carried out, together with the observations from a site walkover. It includes a preliminary ground stability risk assessment together with consideration of other potential geotechnical considerations and constraints, and a Tier 1 (preliminary) geoenvironmental qualitative risk assessment.

1.2 Objective

The objective of this report is to identify the likely ground conditions at the site and to assess whether there are significant geotechnical or geoenvironmental risks associated with the ground conditions that require management (remediation or mitigation) during and after the development.

1.3 Scope of Work/Terms of Reference

Geotechnical Desk Study

The study follows the guidelines published by the Building Research Establishment (BRE, 1987 and 1989) as cited in The Building Regulations Approved Document C, 2010 (+ July 2013 Amendments). Available published geological information has been obtained and reviewed, together with data acquired from public databases. A site walkover with direct inspection of the site and surrounding land was also carried out in conjunction with the desk study. This report presents a review of the acquired information and gives comments with respect to potential constraints on foundation and general site infra-structure design and construction.

Ground Condition (Contamination) Assessment

The principal components of this assessment are generally as described in Section 6.2 of BS 10175 (2011+A1 2013) and CLR 11 Model Procedures for the Management of Contaminated Land (EA, 2004). CLR 11 sets out a risk management process based on a tiered risk assessment with an increasing level of detail required to progress through the tiers. Due regard is also paid to the National Planning Policy Framework (NPPF) Clauses 120, 121 and 122. Under the definition of "Site Investigation Information" given in the NPPF Glossary Page 56, the Phase 1 Desk Study and contamination risk assessment is the minimum requirement under the NPPF to support any planning application on a site that might be potentially affected by contamination. Similarly, a desk study and site reconnaissance is the minimum information that should be provided for a site potentially at risk from ground instability.

In order to identify the current conditions and land use on the site and in the surrounding area, readily available information in the public domain has been obtained and reviewed, and a site reconnaissance walkover has been carried out. This report presents a review of the acquired information, together with the development of a Preliminary Conceptual Site Model (CSM) and the associated Tier 1 risk assessment.

Attention is drawn to the Guidance Note in Section 7 which provides advice for readers of this report and PBA's Methodology for Assessing Land Contamination in England in **Appendix A**.

1.4 Site Location and Setting

The site lies on the northern outskirts of Banbury, Oxfordshire and currently forms the south-eastern part of an industrial complex operated by Mondelez International (formerly Kraft Foods). The site is bordered to the east by the A361 Southam Road, to the north and west by industrial buildings (Mondelez International) and to the south by open grass (part of the wider Mondelez International site) with a metal workshop and yard. The Banbury Town Council Southam Road Cemetery is located beyond the south-western boundary of the industrial complex.

The National Grid Reference of the site centre is approximately SP 452 414, and its general location is shown on **Figure 1**. Salient site and local features are shown on **Figure 2**.

In general topographic terms, the study site is situated on the higher ground to the west of the River Cherwell flood plain; the river lies to the east of the study site, approximately 500m from the Southam Road boundary. Survey plans for the study site supplied by Kraft indicate that site levels fall gradually from west to east and south-east from approximately 95.7mOD at the western study site boundary to approximately 95.0mOD on the eastern study site boundary.

1.5 Proposed Development

It is currently proposed to develop the study site for a commercial use (supermarket). The proposed development comprises one large commercial unit located in the southern area of the site, with a delivery yard to the rear (south) of this unit. The delivery yard will be served by a service road located beyond the southern site boundary which is accessed off Southam Road. The central area of the study site will be occupied by a car park, with an access road serving the car park off Southam Road located in the northern area of the study site.

The proposed development is presented as **Figure 3**.

1.6 Sources of Information

The following sources of information were used in the preparation of this report:-

- A walkover survey by a PBA geotechnical engineer to observe existing conditions both on the site and surrounding the land parcel.
- Landmark was commissioned to provide historical maps, geological and environmental setting data searches (Envirocheck report).
- Additional environmental information was obtained by review of the Environment Agency public registers accessed through the internet.
- The responses to environmental enquiries made to the Environment Agency and Cherwell District Council's Environmental Health Department.
- Output from the PBA Natural and (Non-coal) Mining Cavities Databases for a site centred search.
- Various historical documents, ground surveys and plans for the study site, and area to the west and north of the study site, were supplied by the former landowner, Kraft Foods Ltd, during a previous phase of work in 2011.
- Geological information for the study site was obtained from various reference materials published by (or sourced from) the British Geological Survey (BGS).
- Thames Water Surface Water Records.

2 Land Use Information

2.1 Introduction

This section presents a summary of current and historical land use activity on and immediately adjacent to the site. Land use is used to inform the hazard identification element of the Tier 1 risk assessment.

2.2 Current Land Use

The current land use information is based on a walkover inspection undertaken by a PBA geotechnical engineer on the 20th November 2014. Photographs taken during the site walkover (Photographs 1 - 16) are presented in **Appendix B** with their locations presented on **Figure 2**.

For the purposes of this report "on-site" is defined as within the site boundary line as shown on Figures 1 and 2.

On-Site

The study site area is mainly an area of open grassland within the Mondelez International complex [Photos 4, 14 & 16]. Isolated trees line the banks of the watercourse (the Birds Brook) flowing through the northern half of the study site including ash, apple and aspen (a form of poplar). Mature stands of trees are present in the north-east and south-east corners of the study site including poplar, maple, rowan and birch. The eastern study site boundary is lined by lime trees (TEP, 2010). A disused single storey office building (of temporary construction form) is located in the south west corner of the study site with pallets of materials, presumably stored prior to recycling, located in the small car park area to the south of the office building [Photos 1 & 2]. A small building associated with the main gas supply to the factory is located in the north western site area [Photo 5]; records from Scotia Gas Networks show this building to be fed by a medium pressure gas mains from Southam Road.

The Birds Brook is present mainly in open channel in the northern part of the site [Photos 6 & 13] and is culverted along the eastern site boundary, adjacent to the Southam Road [Photo 10]. The culverted section of the watercourse is shown on Thames Water records as one of their assets – a 1275mm diameter trunk surface water sewer. The approximate alignment of the culverted section is shown on Figure 2. Surface water outfalls, presumably from the factory site, into the brook were observed during the site walkover [Photo 15]. North of the Birds Brook, in the north-western area of the study site, is a pallet storage area located on concrete hardstanding [Photo 12].

Ground levels fall gently from west to east, although areas of steeper sloping ground are present on either side of the brook, and also along the eastern and southern site boundaries.

Off-Site

The study site is bordered to the north and west by the wider Mondelez International factory site. An area of truck parking and a disused truck wash borders the western site boundary with a large warehouse present beyond the parking area. The northern site boundary is partly bordered by a factory unit [Photo 11]. The rest of the northern site boundary is bordered by an area of open grass [Photo 8].

The eastern site boundary is bordered by Southam Road. A Scotia Gas Networks gas infrastructure / gas governor station protrudes into the study site area from the eastern site boundary [Photo 9]. The gas site has been constructed on a small square cut platform at a lower level than the study site.

The southern site boundary borders further open grass areas which are a continuation from the study site with a metal workshop and yard. The Banbury Town Council's Southam Road Cemetery lies beyond the factory site boundary to the south-west. An 11kv electricity substation and pump house (serving the factory fire system) is located beyond the south western corner of the study site boundary [Photo 3].

2.3 Historical Land Use

Introduction

This section presents a summary of the identified historical land uses on and immediately adjacent to the Site. Historical information has been gathered from the following sources:

- Available historical maps for the study site and its immediate surrounds acquired from Landmark Information Group as part of an Envirocheck® report (LIG, 2014). These historical maps cover the period 1882 to 2014 and map extracts are reproduced in **Appendix C**, together with a summary key and index of the individual editions. Care should be taken when using historical maps as they only represent a snapshot of the ground conditions at the time of printing. *[For presentation purposes the extracts have been reduced in size by a factor of x 0.707 – i.e. to reduce the plan size from A3 to A4 sized].*
- Various documents were been supplied to PBA by Kraft in 2011. This information includes old site layout drawings, topographical surveys and previous planning applications which provide an insight into the history and development of the former Kraft site (now operated by Mondelez) including the study site. Selected documents are presented in **Appendix E**.
- Internet searches for general information on the history of the study site and surrounding area have also been carried out.

Recent Historical Background

The identified recent (post late nineteenth century) history of the site and its immediate surrounds is briefly summarised in **Tables 2.1** and **2.2**, respectively:

Table 2.1 Historical On site Features

Year	Summary Detail
1882	The historical map shows that the study site is formed of open fields. A tree lined watercourse is shown flowing west-east through the northern half of the site. The watercourse flows along the eastern study site boundary before deviating at the south east corner of the study site beneath the track which borders the eastern study site boundary. The study site lies beyond the northern outskirts of Banbury. Spot heights indicate a fall in ground levels from west to east.
1900	Trees along the watercourse are no longer shown on the historical map. No other significant changes are evident.
1922 - 1994	No significant changes are evident. The 1965 map shows that the watercourse has been culverted along the eastern study site boundary which coincides with the industrial development to the west and north west of the site boundary (see off site table below). The study site area is labelled as "Meadow Grass" at this time on the construction drawings.
2006	A small rectangular building is present in the south west area of the study site. This building is named as "R&D Building" on the Kraft topographical survey.

Year	Summary Detail
2014	No significant changes are evident.

Table 2.2 Historical Off-site Features

Year	Summary Detail
1882	The historical maps show the study site to be surrounded by fields. A vineyard nursery is shown approximately 100m south west of the study site boundary. The on-site stream appears to be fed by springs located over 1km west of the site boundary.
1938	Residential expansion of the northern outskirts of Banbury is evident around the area of Ruscote, approximately 400m south west of the site boundary. A cemetery is shown to the south-west of the study site.
1955	Evidence of industrial development is shown by two buildings east of the study site boundary, on the opposite side of Southam Road to the site.
1964	Land to the west and north west of the study site boundary are developed for industrial purposes (food manufacturing). Copies of the original construction drawings supplied by Kraft indicate that the original development was for Alfred Bird & Sons Ltd. An internet search revealed that Alfred Bird & Sons were subsequently taken over by General Foods (a predecessor of Kraft Foods).
1965	<p>The historical maps indicate industrial development west and north west of the site boundary with a large "Food Processing Plant" labelled and associated tanks and a chimney. The study site boundary appears to be located within the larger site boundary of the food factory. Industrial premises are also indicated beyond the eastern and south-eastern site boundaries labelled "Works", "Depots" and "Garage". Allotment gardens are shown beyond the southern complex boundary.</p> <p>The construction drawings indicate that the square building located beyond the western site boundary was originally the "Finished Goods Warehouse". A filling station with underground fuel storage tanks is shown to the south of the warehouse. The main factory car park is indicated to the west of the warehouse.</p>
1970	The warehouse unit located beyond the western site boundary is labelled as "Food Processing Plant" on the historical maps.
1984	The warehouse unit located beyond the western site boundary has extended westward and is labelled "Factory" on the historical maps. Part of the unit links to the main factory complex north west of the study site. The area to the west of the warehouse extension is now labelled as a car park.
1994	<p>The site plan supplied by Kraft shows the unit located beyond the western site boundary to be divided into four areas. The western extension area is shown as "Western Warehouse (CEVA Logistics)", the central area is split between "(Kraft Foods)" and "(CEVA Logistics)", and the eastern area is shown as "Eastern Warehouse (On-Time Automotive)". The unit is connected to the main factory complex to the north by a thin rectangular unit labelled "Big Bag & MaxPax Storage". This unit lies over the watercourse, which subsequently flows through the study site, which is denoted as being culverted beneath.</p> <p>The area to the east of the unit, i.e. bordering the western site boundary, is labelled as a truck park, truck wash and trailer park. Loading bays are shown to the south of the unit.</p>

Year	Summary Detail
1994 [Cont'd]	The historical map shows an additional industrial unit located beyond the northern site boundary (the "Max Pax Building").
2006-2014	No significant changes are evident, and this is supported by observations during the site walkover.

3 Environmental Setting

3.1 Introduction

Information on the geological setting of the site is used in the general geotechnical assessment.

Information on the environmental setting is used in the Hazard Assessment section of the Tier 1 (geoenvironmental) risk assessment to identify potential pathways and receptors.

3.2 Geological Setting

Introduction

This section presents a summary of geological information obtained for the site and the surrounding area from the following sources:

- Published geological maps from the British Geological Survey (BGS).
- Borehole and trial pit records for the site and surrounding area available via a search of the BGS's GeoRecords database. The database held records of four boreholes in the study site dating to February 1989 (presumably part of an earlier planning application for the site) and three trial pit records located north of the study site boundary for a proposed new computer room dating to February 1987. Borehole and trial pit records are included in **Appendix E**.
- Ground investigation data supplied to PBA by Kraft Foods in 2011. Kraft supplied an interpretative ground investigation report carried out by Geotechnical Engineering Limited (GEL) in March 2011 for a proposed pair of evaporate towers located within the Kraft manufacturing area north of the study site boundary. The ground investigation comprised one borehole. The GEL report also makes reference to an earlier ground investigation carried out by Ground Sense Limited in 2006 for a separate evaporate tower. The Ground Sense investigation comprised two boreholes, the details of which are described in the GEL report. The GEL report is included in **Appendix E**.

Bedrock Geology

The geological maps show that the entire site is underlain by the Jurassic aged Charmouth Mudstone Formation (formerly known as the Lower Lias Clay). The younger Marlstone Rock and Dyrham Formations outcrop on the east facing slopes of the Cherwell Valley approximately 500m west of the study site boundary.

The Charmouth Mudstone Formation (Lower Lias) is described on the geological map as comprising dark bluish grey clays between 75m and 110m thick (BGS, 1982).

The borehole and trial pit records from the study site area and site vicinity describe the stratum as generally stiff to hard blue grey silty clay with occasional mudstone gravel and shell debris. The GEL borehole encountered a medium strong dark grey argillaceous limestone band at 8.4m below ground level (bgl). A limestone band was also encountered during the Ground Sense investigation at a depth of 10.5m bgl. The base of the limestone band was not proven during either investigation, but it was at least 0.7m thick.

Superficial Geology

The geological maps show a narrow tract of Alluvium following the course of the River Cherwell which flows in a north-south direction beyond the eastern study site boundary. An area of this Alluvium is mapped adjacent to the eastern study site boundary.

Although Superficial Deposits are not mapped on the study site, the BGS borehole records from the study site indicate up to 4.7m of Superficial Deposits overlying the bedrock, thinning in a westerly direction. These deposits are described as soft to firm orange and brown silty clay with gravel near surface, intermittently described as green grey and orange brown with depth and becoming increasingly gravelly towards the base in the thickest areas. The presence of black organic material and wood are also noted on some of the borehole logs.

The GEL borehole records Head Deposits between 0.9m and 1.9m bgl. The Head Deposits are described as firm to stiff dark grey, locally orange and brown, slightly gravelly clay. The gravel is recorded as medium mudstone. Similar deposits (though termed glacially disturbed Lias Clay) are recorded on one of the BGS trial pit records between 0.3m and 0.7m bgl.

Made Ground

A generally thin cover layer of Made Ground (typically less than 1m thick), has been recorded on the BGS trial pit records, GEL borehole record and was also encountered during the Ground Sense investigation.

From the site visit in 2011, it was understood that some cut and fill operations were carried out as part of the original construction of the warehouse located beyond the western site boundary, and as such areas of Made Ground associated with the filling operations would be expected on the study site. It is possible that the upper part of the Superficial Deposits indicated beneath the study site is in fact Made Ground which was placed as fill during the original development of the larger factory site. This is supported by the apparent changes in ground profile in the site area pre and post development.

3.3 Naturally Occurring Geohazards

An assessment of potential geological hazards that may give rise to instability or adverse foundation or construction conditions as supplied by the British Geological Survey (BGS) from their National Geoscience Information Service (NGIS) are presented in the Envirocheck Report reproduced in **Appendix D**. The generic assessment is generated automatically based on digital geological maps and the scope and the accuracy is limited by the methods used to create the dataset and is therefore only indicative for the search area.

The information contained in the Envirocheck Report has been reviewed and where considered necessary reassessed considering the specific information available for the site. The modified assessment of the potential for geological hazards to be present on the site is summarised in **Table 3.1** overleaf.

Table 3.1 Summary of Geological Hazards from third party report.

Description	On-Site	PBA Comment
Coal Mining Affected Areas	In an area that might not be affected by coal mining.	PBA concur with this assessment.
Collapsible Ground Stability Hazards	Very Low	On the basis of the available data, PBA concur with this designation. There is a culverted watercourse in the eastern area of the site which should be considered as part of any new development.
Compressible Ground Stability Hazards	No Hazard	PBA do not currently concur with this assessment. PBA consider the hazard to be moderate. Areas of Superficial Deposits have been indicated on the study site during previous ground investigations. It is possible that these soils are a combination of Made Ground associated with cut and fill operations carried out as part of the original development of the factory site, overlying possible alluvial soils. The combined thickness of these soils has been encountered up to 4.7m. Localised areas of alluvial deposits may be present elsewhere associated with the on-site watercourse. Other areas of Made Ground may also be present on the site associated with the industrial use of part of the site. Where Made Ground and/or alluvial deposits are present, some potential hazard will exist. The extent of this hazard however will be dependent on the depth and nature of the alluvial deposits and Made Ground and further investigation is required to establish/ evaluate this.
Dissolution Hazard	No Hazard	On the basis of the available data, PBA concur with this designation.
Landslide Ground Stability	Very Low	On the basis of the available data, PBA concur with this designation.

Description	On-Site	PBA Comment
Running Sand	No Hazard	<p>PBA do not concur with this assessment. PBA consider the hazard to be low.</p> <p>It is known that to the north of the study site, running sand type conditions have been encountered locally where alluvial deposits associated with minor tributaries of the River Cherwell have been inferred. Similar conditions may potentially locally occur within any alluvial tract associated with the Birds Brook.</p>
Shrinking or Swelling Clay	Low	<p>PBA do not concur with this assessment. PBA consider the hazard to be moderate.</p> <p>The Charmouth Mudstone Formation known to underlie the site will classify the site as a 'clay soil' site for foundation purposes.</p> <p>The removal of existing trees during the redevelopment may result in the presence of a desiccated clay subsoil and thus potential risk of swelling ground. Retained or new areas of tree planting may lead to continued or initiate new potential shrinkage of the clay subsoil.</p>

Natural and Non-Coal Mining Cavity Records – Cavity Searches

A search of the PBA Natural and Non-Coal Mining Cavities Databases indicates that there are no known cavity locations within 5km of the site centre.

The Review of Mining Instability in Great Britain, regional atlas for Berkshire and Oxfordshire, indicates that the study site is located in an area where there is no evidence of mining (Arup, 1990). The Coal Authority's Online Gazetteer indicates that Banbury is not an area which requires a coal and brine mining search (Coal Authority, 2014).

Radon

Guidance on the measurement and mitigation of radon for commercial and industrial developments is discussed in *Radon in the workplace* (BRE, 1995). From the Envirocheck report, the study site is situated in a low radon potential area and therefore mitigation measures for the proposed development are unlikely to be required.

Arsenic

The Marlstone Rock Formation located west of the study site boundary is known to give rise to locally elevated concentrations of arsenic. The potential for naturally occurring arsenic to be present on the study site is considered to be low given the distance of the Marlstone Rock Formation from the site, and the anticipated geological conditions beneath the study site.

3.4 Controlled Waters - Groundwater

Table 3.2 summarises information recorded in the Envirocheck report regarding hydrogeology and groundwater vulnerability.

Table 3.2 Summary of Hydrogeology and Groundwater Vulnerability information

Item	Details
Aquifer Classification	<p>The Alluvium present beyond the eastern study site boundary is classified by the Environment Agency (EA) as a 'Secondary A Aquifer' (formerly known as a Minor Aquifer).</p> <p>From the BGS borehole records, Superficial Deposits were encountered beneath the area of the study site during an earlier ground investigation (possibly Made Ground overlying Alluvium). The Secondary A Aquifer is likely to extend below the site with the alluvium deposits associated with the onsite watercourse.</p> <p>The Charmouth Mudstone Formation is classified as 'Unproductive Strata'. Unproductive Strata are rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.</p>
Soil Vulnerability	HU High – soils in urban areas where a worst case vulnerability classification (H) is assumed until proven otherwise.
Depth to Groundwater	Groundwater strikes were recorded in three of the four boreholes carried out within the area of the study site in 1989. Strikes were recorded in the Superficial Deposits at depths between 2.7m and 3.2m bgl. Standing water levels were recorded at 2.4m and 2.8m bgl.
Groundwater Flow Direction	Probably to the east, south-east towards the River Cherwell which flows towards the south.
Source Protection Zone (SPZ)	The study site does not currently lie within a groundwater Source Protection Zones (SPZ) or Zone of Special Interest with respect to groundwater according to the Environment Agency.
Groundwater Abstraction	The nearest groundwater abstraction record is located approximately 1km north west of the site boundary and relates to a now revoked domestic supply borehole.

3.5 Controlled Waters - Surface Water

Table 3.3 overleaf summarises information recorded in the Envirocheck® report regarding hydrology.

Table 3.3 Summary of Surface Water Related Information

Item	Details
Watercourse Name & Source	<p>The watercourse that flows through the study site is known as both the Birds Ditch and the Birds Brook. The watercourse is classified as a Secondary River. The watercourse is culverted along the Southam Road study site boundary and leaves the study site boundary via the south east corner.</p> <p>Thames Water records identify the culverted section of the watercourse as a 1275mm diameter trunk surface water sewer, with 2 No man-holes within the site. The watercourse remains culverted/ a Thames Water trunk surface water sewer for the rest of its length (but 1500mm diameter), discharging into the River Cherwell just to the north of Banbury town centre, approximately 600m from the study site boundary.</p> <p>From the historical maps it appears that the Birds Brook is fed via springs issuing from the valley side west of the study site boundary. However, from the site reconnaissance visit it is evident that any base flow in the brook is augmented by surface water discharges into the brook along its course.</p>
Quality	There is no river water quality designation for the Birds Brook.
Abstraction	The nearest surface water abstraction record is located 550m north east of the site boundary and relates to a potable water supply point from the River Cherwell (Grimsbury Mill Point 'A').
Discharge Consents	<p>The nearest recorded active discharge consents are located approximately 30m north west of the study site boundary and relate to the discharge of trade effluent, site drainage and surface water from the Mondelez International site to Birds Brook.</p> <p>Other discharge points into the watercourse were also observed within the study site boundary during the walkover.</p>
Flood Risk*	The Environment Agency Flood Map included with the Envirocheck Report indicates that the study site is not at risk from fluvial flooding.
* The scope of this report does not include a flood risk assessment.	

3.6 Ecological Systems

The interactive map on the MAGIC website (www.magic.gov.uk) has been interrogated for information on local ecology. The MAGIC interactive map is managed by Natural England on behalf of Defra and involves Communities and Local Government, English Heritage, the Environment Agency and the Forestry Commission, as well as Defra and Natural England. All of these organisations are involved in the development and implementation of rural policies in England. This involves the collection and use of data on a wide range of land management schemes and countryside and environmental designations.

A study of the interactive ecological maps on the magic website indicates that the study site is not within 1 km of any of the following ecological sites:

- Local and national nature reserves,
- Site of Special Scientific Interest (SSSI),

- Special Areas of Conservation, or
- Ramsar (protected wetland) Sites.

3.7 Potentially Contaminative Current and Historic Land Uses

Information from Envirocheck® Report

Pertinent information from the Envirocheck® report is summarised below:

- There are no recorded landfill sites within 500m of the study site boundary.
- The nearest recorded waste facility is located approximately 480m north west of the study site boundary and relates to aggregate recovery processes.
- There are no contemporary trade directory entries recorded on the study site, although 64 no. are recorded within 500m of the study site boundary. This is expected given the close proximity of the study site to several industrial estates and retail parks.
- There are four pollution incidents to controlled water recorded within 20m of the site boundary. The severity of these incidents is detailed as Category 2-Significant for three of the incidents and Category 3-Minor for the other incident. The pollutant types are given as unknown-sewage and miscellaneous-unknown. A further five pollution incidents to controlled waters are recorded within 250m of the site boundary.
- The nearest integrated pollution prevention and control (IPPC) site is located 115m north west of the site boundary and relates to the combustion plant for the Kraft (now the Mondelez International) site.
- The nearest active Local Authority Pollution Prevention and Control site is located approximately 80m north-east of the site boundary and relates to respraying of motor vehicles.

Information from Environment Agency

The Environment Agency's 'What's in my backyard' website has been accessed to review information available for the study site. There is no pertinent information from the website relating to the site.

A request was made to the local Environment Agency office regarding any information that they may hold on the site. The e-mail response from the Environment Agency (dated 13 January 2015) is included in **Appendix F**.

The information supplied by the Customers and Engagement Officer for the Environment Agency's West Thames Area has confirmed:

- One PAS Active IPCC Authorisation (details as outlined above in data obtained from the Envirocheck® report).
- No Waste Management Licences currently in force, nor any historical landfill sites within 500m
- No category 1 or 2 pollution (high impact) incidents to air, land or water within 500m of the site
- Four active discharge consents.

Information from Cherwell District Council

An environmental information request was made to Cherwell District Council's Communities Services Department requesting information that they hold on the site. A copy of the response dated 7 January 2015 is included in **Appendix F** of this report.

Cherwell District Council has confirmed:

- No recorded landfill sites within 250m.
- No records of any prosecutions relating to permitted processes at the site.
- No records relating to explosives at this site.
- No enforcement or prohibition notices relating to this site.

The Council has also confirmed that the site is not currently registered as Contaminated land under Part 2A of the Environmental Protection Act 1990.

Information from the Banbury Town Council Website

Review of the Banbury Town Council website for information on the Banbury identifies that the first burial took place on 27th March 1858. Since then, thousands of burials have taken place, with more than 16,000 graves occupying an area of approximately 8.5 hectares (21 acres).

The cemetery no longer has space for new burials, however if space permits, families with existing graves can still proceed with burials or the interment of ashes.

4 Tier 1 Preliminary Geo-environmental Risk Assessment

4.1 Introduction

The methodology developed and adopted by PBA for assessing land contamination in England is included in **Appendix A**.

In accordance with guidance presented in CLR 11 (EA Model Procedures for the Management of Land Contamination) we adopt a staged approach to risk assessment and this report presents a Tier 1 assessment or first stage.

The underlying principle of the Phase 1 Ground Condition Assessment is the identification and evaluation of *pollutant linkages* in order to assess whether the presence of a source of contamination could potentially lead to harmful consequences. A pollutant linkage consists of the following three elements:-

- A source/hazard (chemical or geoenvironmental) which has the potential to cause harm or pollution;
- A pathway for the hazard to move along / generate exposure; and
- A receptor which is affected by the hazard.

For each potential pollutant linkage identified the risk is estimated through consideration of the magnitude of the potential consequence and the likelihood or probability of an event occurring. This assessment report is divided into sections identifying potential sources (hazard identification), potential pathway and receptor identification and risk estimation and assessment.

4.2 Conceptual Site Model

The Tier 1 Preliminary Risk Assessment includes the development of a conceptual site model (CSM). The CSM describes the types and locations of potential contamination sources, the identification of potential receptors and the identification of potential transport/migration pathways.

For a pollutant linkage to be identified a connection between all three elements (source-pathway-receptor) is required.

4.3 Geoenvironmental Hazard Identification

The study site forms part of the large food manufacturing complex, which was constructed in the mid-1960s, although has remained broadly undeveloped. The study area may have been used as a fill area during cut and fill operations for the original development of the food manufacturing complex during the 1960s. Birds Brook, a small watercourse, flows partly culverted through the northern half of the study site and also fully culverted along the eastern site boundary.

The study site is bordered to the north and west by industrial and warehouse buildings and areas of truck parking (within the wider Mondelez International site), to the east by Southam Road with industrial estates beyond, and to the south by open areas, a metal workshop and yard. To the south-west of the site is the Banbury Town Council Southam Road Cemetery.

Potential Sources of Contamination

The potential sources of contamination (PSC) identified are summarised below. Off site sources of contamination are only identified if they are located hydraulically up gradient or within 250m of the site boundary.

Table 4.1 Potential Sources of Contamination (PSC) based on Identified Land Use Activities

Item/Reference	Description	Comment
PSC 1 (On-site; Historical and current)	Made Ground and factory land-uses of isolated areas of the study site e.g. general material and pallet storage areas	Potential for localised hotspots associated with areas of Made Ground where the source of the material is unknown and former industrial land-uses.
PSC 2 (On-site and Off-site: Historical and current)	Scotia Gas Networks gas infrastructure building/ connection point on the western boundary. And the Gas Governor Station on the Southam Road boundary.	Potential for localised hotspots associated with the construction and maintenance of these gas infrastructure facilities.
PSC 3 (Off-site; Historical)	Former underground fuel storage tanks used when the fuel filling station was in operation. The tanks and pipework are understood to be decommissioned but this is unconfirmed.	Potential for localised hotspot associated with the tank locations.
PSC 4 (Off-site; Historical)	Former fuel filling station and bunded fuel tank location.	Potential for localised hotspot associated with fuel storage and use.
PSC 5 (Off-site; Historical and current)	Former truck wash and current truck park.	Potential for localised hotspots associated with truck wash equipment and long-standing use as truck park.
PSC 6 (Off-site: Historical and current)	Electrical sub-station located beyond south west corner of the site.	Potential for localised hotspot associated with site use
PSC 7 (Off-site: Historical and current)	Warehouse building and other industrial land-uses located off site.	The food factory to the north and north west of the site has been in operation for almost 50 years. Other industrial land-uses are also present in close proximity to the site boundary.

Item/Reference	Description	Comment
PSC 8 (Off-site: Historical and current)	The Southam Road Cemetery to the south-west	The cemetery extends to approximately 8.5 hectares (21 acres). The cemetery however no longer has space for new burials, but families with existing graves can still proceed with burials or the interment of ashes.

4.4 Pathways

Potential environmental hazards need a pathway connecting the source (if present) to potential receptors in order to be able to impact upon the receptors. These pathways are capable of conveying the contaminants. Pathways may be anthropogenic (artificial) or natural.

Anthropogenic pathways are artificial routes capable of conveying contaminants and include such routes as surface water drains, high permeability backfill materials, poorly consolidated Made Ground, foundations, and persons disturbing contamination sources in such a way as to liberate contaminants.

In the case of persons working with contaminated ground (e.g. to lay foundations or install services) direct contact with the source becomes possible, and pathways such as dermal contact, inhalation or ingestion require consideration.

The underlying geology at the study site and the surrounding area is likely to be largely cohesive (mapped as the Charmouth Mudstone Formation) and therefore the potential for contaminants to migrate from their on-site or off-site source is likely to be limited. However, any interconnecting zones of unconsolidated/loose and granular horizons within the Made Ground and Superficial Deposits may offer preferential pathways for contamination to migrate laterally. The Birds Brook will also act as a potential pathway for the transmission of contaminants.

4.5 Hazard Assessment

Identification of Potential Receptors

It is understood that it is intended to redevelop the site for a commercial end-use. Details of the potential receptors considered and whether or not the receptor is plausible are presented in the following table:-

Table 4.2 Identification of Potential Receptors

Receptor Type	Comment	Potential Receptor? (Yes /No)
Human	End User Current = Unused End User Future = Commercial Service Maintenance = Commercial Off Site = Industrial Construction Workers	No Yes Yes Yes Yes Yes
Surface Waters	Secondary watercourse present on the site	Yes

Receptor Type	Comment	Potential Receptor? (Yes /No)
Groundwater	Superficial Deposits bordering the site and potentially extending below the site within alluvium deposits associated with the onsite watercourse form part of a Secondary A Aquifer	Yes
Buildings/Materials	Structures are proposed	Yes
Property – including crops, livestock, buildings	The study site is located in an industrial area of Banbury	Yes
Ecological Systems	None in close proximity to the site boundary	No

Identification of Potential Pathways

Table 2 in the PBA methodology describes possible pathways for each receptor type. Each of these possible pathways is then considered when assessing the possible pollutant linkage (see below).

Potential Pollutant Linkages

Potential pollutant linkages have been identified using the information on potential sources (contaminant types), receptors and exposure pathways. **Table 1**, at the end of the report text, identifies which pollutant linkages are considered to potentially exist.

4.6 Risk Estimation

When there is a pollutant linkage (and therefore some measure of risk) it is necessary to determine whether the risk matters and therefore whether further action is required. PBA provide an estimation of the level of risk but do not comment on whether or not it is an unacceptable risk as the significance or acceptability of a risk depends on the individual stakeholder. Risk estimation involves predicting the likely consequence (what degree of harm might result) and the probability that the consequences will arise (how likely the outcome is).

Table 1 presents an assessment of consequence and probability for each potential pollutant linkage identified. Based on the information available, and assuming a worst case scenario, the estimated risks have been designated as follows:-

- **Human Health** (future users) – **Low**
- **Human Health** (off site) – **Low**
- **Human Health** (construction workers) – **Very Low**
- **Groundwater** – **Low**
- **Surface Water** – **Moderate/low**
- **Buildings** – **Very Low**
- **Property** – **Very Low**

Possible pollutant linkages are determined using professional judgement. If a linkage is considered possible, it is considered that this represents a potentially 'unacceptable risk' and therefore requires further consideration. This may be through remediation or mitigation or through further tiers of investigation and assessment.

Possible pollutant linkages have been identified for human health, groundwater, surface water, property and buildings.

4.7 Conclusions and Risk Evaluation

The results of the Ground Condition Assessment consider that the risk to on and off site receptors from potential on-site contamination is generally **Low**. This is generally due to the absence of significant sources of contamination and the clayey nature of the underlying soils which would limit the extent of contamination from a particular point source. The exception to this is the risk to surface water receptors being **Moderate/low**, mainly as a result of Birds Brook flowing through the study site area and the discharge of surface water into the watercourse.

Where a **Low** risk has been estimated, it is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Whilst the risk associated for the whole site is generally **Low**, a Phase 2 intrusive investigation will be required in due course to investigate on-site PSCs and generally confirm the conceptual site model developed by this study.

Given the limited scale of the PSCs, it is anticipated that any requirement to carry out intrusive investigation can be satisfactorily dealt with by incorporation of a suitable condition in any granted Outline Planning Consent.

This risk assessment and CSM should be reviewed and updated following the Phase 2 intrusive investigation.

5 Preliminary Geotechnical Appraisal

5.1 Introduction

This section provides a preliminary geotechnical assessment of the site, based on the anticipated ground conditions. The section addresses the risk of geohazards at the site and the possible implications of the anticipated ground conditions on the construction of the proposed development. National Planning Policy Framework (NPPF) Clause 121 requires an assessment for a site potentially at risk from ground instability.

Consideration is given below to the risk of potential causes of instability arising from existing ground conditions across the site, as identified by the data review. Comments are also provided on likely development requirements to mitigate ground conditions. As this geotechnical appraisal has been based on publically available information obtained as part of a desk based data collection the comments made herein should therefore be considered as preliminary.

5.2 Ground Stability

Natural and Artificial Cavities

From the geological setting of the site, the local topography and the known site history it is considered unlikely that the future development will have to consider subsidence risks associated with artificial and natural cavities. As such, these subsidence risks are not considered further in this assessment.

Compressible Ground

The presence of Superficial Deposits (possibly incorporating Made Ground and Alluvium) beneath the study site and the potential for Made Ground and Alluvium (along the tract of the Birds Brook) to exist in other areas of the study site give rise to potential adverse foundation conditions associated with the natural ground conditions and the past historical use of the site.

Soft natural soils and Made Ground have the potential for increased total and differential settlements to take place when loaded by foundations.

General presence of 'Clay soils'

The anticipated general presence of the Charmouth Mudstone (Lower Lias) will classify the site as a 'Clay Soil' site. All clay soils are to a varying degree susceptible to shrinkage and swelling due to both seasonal effects and due to the effect of trees and other vegetation. Standard geotechnical classification tests are likely to classify the Charmouth Mudstone (Lower Lias) as a clay soil of medium volume change potential (BRE, 1993).

Design and construction protocols to manage risk of shrinkage/ swelling movements on clay soil sites are well established with published guidelines produced by the Building Research Establishment. Adherence to these published guidelines, including guidelines on new proposed landscape plantings, should ensure no increased risk to development as result of the clay soil classification of the site.

Aggressive ground conditions

The desk study has identified the potential presence on the site of Made Ground derived from works on adjacent sites within the wider complex. There is therefore likelihood that the placed fill materials could contain material derived from the Charmouth Mudstone (Lower Lias) bedrock. The Lower Lias is known to be one of the principal sulphate and sulphide bearing

geological strata (BRE, 2005). There are thus potential geotechnical and engineering implications associated with potential sulphate reactions and pyrite oxidation. The oxidation of pyrite is a common cause of deterioration of the ground or construction materials. The resulting sulphate rich acidic conditions can give rise to chemical attack of construction materials and the precipitation of expansive minerals. Thus an assessment of the potential for sulphate attack on concrete materials and the potential for heave is required (GSL, 2006).

5.3 Excavations

It is considered unlikely that there will be significant constraints to shallow excavations at the site. Groundwater may be encountered at relatively shallow depth (2-3m below ground level), based on the historical exploratory hole records.

5.4 Pavement Design

It is anticipated that there will be areas of road pavement and hardstanding at the site related to the proposed development. The alignment of roads and position of car parks will require investigation prior to construction to determine the nature and thickness of the underlying materials and its properties, and any mitigating measures designed accordingly.

5.5 Infiltration Drainage

Given the clayey nature of the underlying soils, it is considered unlikely that the use of infiltration drainage systems at the study site will be feasible.

5.6 Geotechnical Investigation

An intrusive geotechnical investigation will be required in due course to provide site specific information to assist in the design of the proposed development. The investigation work will be required to confirm the extent and properties of the Superficial Deposits and to confirm the general near surface ground and groundwater conditions on the site.

The investigation will need to include testing for sulphate classification bearing in mind the preliminary structural design concept for the new build and the potential for sulphides (including pyrite) to be present in both the Made Ground and natural superficial and bedrock strata. Consideration of the potential risk of resultant ground heave occurring post placement as a result of the expansive precipitation of gypsum and other forms of sulphate minerals from pyrite oxidation and its potential to damage ground supported floor slabs and any basements should also be given.

6 References

(BGS, 1982) 1:50,000 Geological Survey of Great Britain (England and Wales), Sheet 201 Banbury Solid and Drift Edition. British Geological Survey.

(BRE, 1987) BRE Digest 318. Site investigation for low-rise building: desk studies. February 1987, Building Research Establishment.

(BRE, 1989) BRE Digest 348. Site investigation for low-rise building: the walk-over survey. December 1989. Building Research Establishment.

(BRE, 1993) BRE Digest 240. Low rise buildings on shrinkable clay soils: Part 1. 1993 Edition. Building Research Establishment.

(BRE, 1990). BRE Digest 241. Low rise buildings on shrinkable clay soils. Part 2. 1990. Building Research Establishment.

(BRE, 1999) BRE Digest 298. Low rise buildings: the influence of trees in clay soils. April 1999 Edition. Building Research Establishment.

(BRE, 2005) Concrete in aggressive ground. Special Digest 1:2005. Third edition. BRE publications.

(BSI, 2011). BS 10175: 2001. Investigation of potentially contaminated sites – Code of practice. British Standards Institution.

(DOE, 2004) CLR 11 Model procedures for the management of contaminated land. Department of the Environment Contaminated Land Report.

(DOT, 2002). Department for Transport, Local Government and the Regions. Planning Policy Guidance Note 14. Development on Unstable Land. Annex 2: Subsidence and Planning. February 2002.

(GSL, 2006). Czerewko M and Cripps J, C. Sulfate and sulphide minerals in the UK and their implications in the built environment. IAEG2006 Paper number 121. 2006. The Geological Society of London.

(LIG, 2014). Envirocheck report No 62251650_1_1, dated 19 November 2014. Landmark Information Group.

(Magic, 2014). <http://www.magic.gov.uk/website/magic/>, viewed 24th November 2014.

(TEP, 2010) Arboricultural Implications Assessment, Preliminary Arboricultural Method Statement Tree Protection Plan. Dated January 2010 and revised July 2010. Prepared for Whitbread Plc by Treework Environmental Practice. Supplied to PBA by Kraft Foods Ltd in 2011.

7 Essential Guidance for Report Readers

This report has been prepared within an agreed timeframe and to an agreed budget that will necessarily apply some constraints on its content and usage. The remarks below are presented to assist the reader in understanding the context of this report and any general limitations or constraints. If there are any specific limitations and constraints they are described in the report text.

The opinions and recommendations expressed in this report are based on statute, guidance, and best practise current at the time of its publication. Peter Brett Associates LLP (PBA) does not accept any liability whatsoever for the consequences of any future legislative changes or the release of subsequent guidance documentation, etc. Such changes may render some of the opinions and advice in this report inappropriate or incorrect and the report should be returned to us and reassessed if required for re-use after one year from date of publication. Following delivery of the report PBA has no obligation to advise the Client or any other party of such changes or their repercussions.

Some of the conclusions in this report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third party data used. Historical maps and aerial photographs provide a "snap shot" in time about conditions or activities at the site and cannot be relied upon as indicators of any events or activities that may have taken place at other times.

The conclusions and recommendations made in this report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be taken into account in any analysis and reporting.

It should be noted that groundwater levels, groundwater chemistry, surface water levels, surface water chemistry, soil gas concentrations and soil gas flow rates can vary due to seasonal, climatic, tidal and man-made effects.

This report has been written for the sole use of the Client stated at the front of the report in relation to a specific development or scheme. The conclusions and recommendations presented herein are only relevant to the scheme or the phase of project under consideration. This report shall not be relied upon or transferred to any other party without the express written authorisation of PBA. Any such party relies upon the report at its own risk.

The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not taken into account the perceptions of, for example, banks, insurers, other funders, lay people, etc, unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.

Public or legal consultations or enquiries, or consultation with any Regulatory Bodies (such as the Environment Agency, Natural England or Cherwell District Council) have taken place only as part of this work only where specifically stated.

Tables

New Waitrose Store, Southam Road, Banbury
Phase 1 Ground Condition Assessment
Table 1 Summary of Estimated Geoenvironmental Risk

Site potential for generating contamination - Moderates (3)

Receptor	Present (Y/N) & Sensitivity Value	Pathway	Present (Y/N)	EPH & Solvent	PAH	Metals	Inorganic	Biocides	Radioactivity	Ground Gas	Consequence (Hazard Classification x Sensitivity)	Probability	Estimated Risk		
Human Health - On-Site Current Users	N	Ingestion of fruit or vegetable leaf or roots													
		Ingestion of contaminated drinking water													
		Ingestion of water / sediments when swimming													
		Inhalation of individual indoors													
Human Health - On-Site Future User	Y - Moderate (3)	Ingestion of solid/soil outdoors	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low		
		Inhalation of particles (dust / soil) outdoor and outdoor	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low	
		Inhalation of vapours - outdoor	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low	
		Inhalation of vapours - indoor	Y	Y	Y	Y	Y	Y	Y	Y	Y	9 - Mild	Low likelihood	Low	
		Dermal absorption via direct contact with soil	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Dermal absorption via waters (swimming / showering)	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of fruit or vegetable leaf or roots	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of contaminated drinking water	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of water / sediments when swimming	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of solid/soil outdoors	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low
		Inhalation of particles (dust / soil) indoor and outdoor	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low
		Inhalation of vapours - outdoor	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low
Human Health - Off-Site	Y - Moderate (3)	Dermal absorption via direct contact with soil	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low	
		Dermal absorption via waters (swimming / showering)	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of fruit or vegetable leaf or roots	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of contaminated drinking water	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of water / sediments when swimming	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Ingestion of solid/soil outdoors	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low
		Inhalation of particles (dust / soil) indoor and outdoor	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low
		Inhalation of vapours - outdoor	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low
		Inhalation of vapours - indoor	Y	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low
		Dermal absorption via direct contact with soil	N	Y	Y	Y	Y	Y	Y	Y	Y	Y			
		Dermal absorption via waters (swimming / showering)	N	Y	Y	Y	Y	Y	Y	Y	Y				
		Human Health - Construction/ Maintenance Workers*	Y - Moderate (3)	Ingestion of solid/soil outdoors	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Unlikely
Inhalation of particles (dust / soil) outdoor	Y			Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Unlikely	Very Low	
Inhalation of vapours - outdoor	Y			Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Unlikely	Very Low	
Inhalation of vapours - indoor	Y			Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Unlikely	Very Low	
Groundwater	Y - Moderate (3)	Leaching	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Unlikely	Very Low	
		Dermal absorption via direct contact with soil	N	Y	Y	Y	Y	Y	Y	Y	Y				
Surface Water	Y - High (4)	Migration via natural or anthropogenic	Y	Y	Y	Y	Y	Y	Y	Y	X	9 - Mild	Low likelihood	Low	
		Direct runoff or discharges from pipes	Y	Y	Y	Y	Y	Y	Y	Y	X	12 - Medium	Low likelihood	Moderate/Low	
Buildings	Y - Very Low (1)	Indirect via recharge from groundwater (hydraulic flow)	Y	Y	Y	Y	Y	Y	Y	Y	X	12 - Medium	Low likelihood	Moderate/Low	
		Deposition of wind blown dust	N	Y	Y	Y	Y	Y	Y	Y	X	3 - Minor	Unlikely	Very Low	
Ecological Systems	N	Direct contact	Y	Y	Y	Y	Y	Y	Y	Y	X	3 - Minor	Unlikely	Very Low	
		Explosion due to gas migration via natural or anthropogenic	Y	Y	Y	Y	Y	Y	Y	Y	X	3 - Minor	Unlikely	Very Low	
Property	Y - Very Low (1)	Direct deposition of particles / dust - wind blown or flood	Y	Y	Y	Y	Y	Y	Y	Y	X	3 - Minor	Unlikely	Very Low	
		Indirect - through watering	Y	Y	Y	Y	Y	Y	Y	Y	X	3 - Minor	Unlikely	Very Low	
		Inhalation of gases/vapours or particulates/dust by animals	Y	Y	Y	Y	Y	Y	Y	Y	X	3 - Minor	Unlikely	Very Low	
		Ingestion of water / soil by animals	N	Y	Y	Y	Y	Y	Y	Y	X	3 - Minor	Unlikely	Very Low	

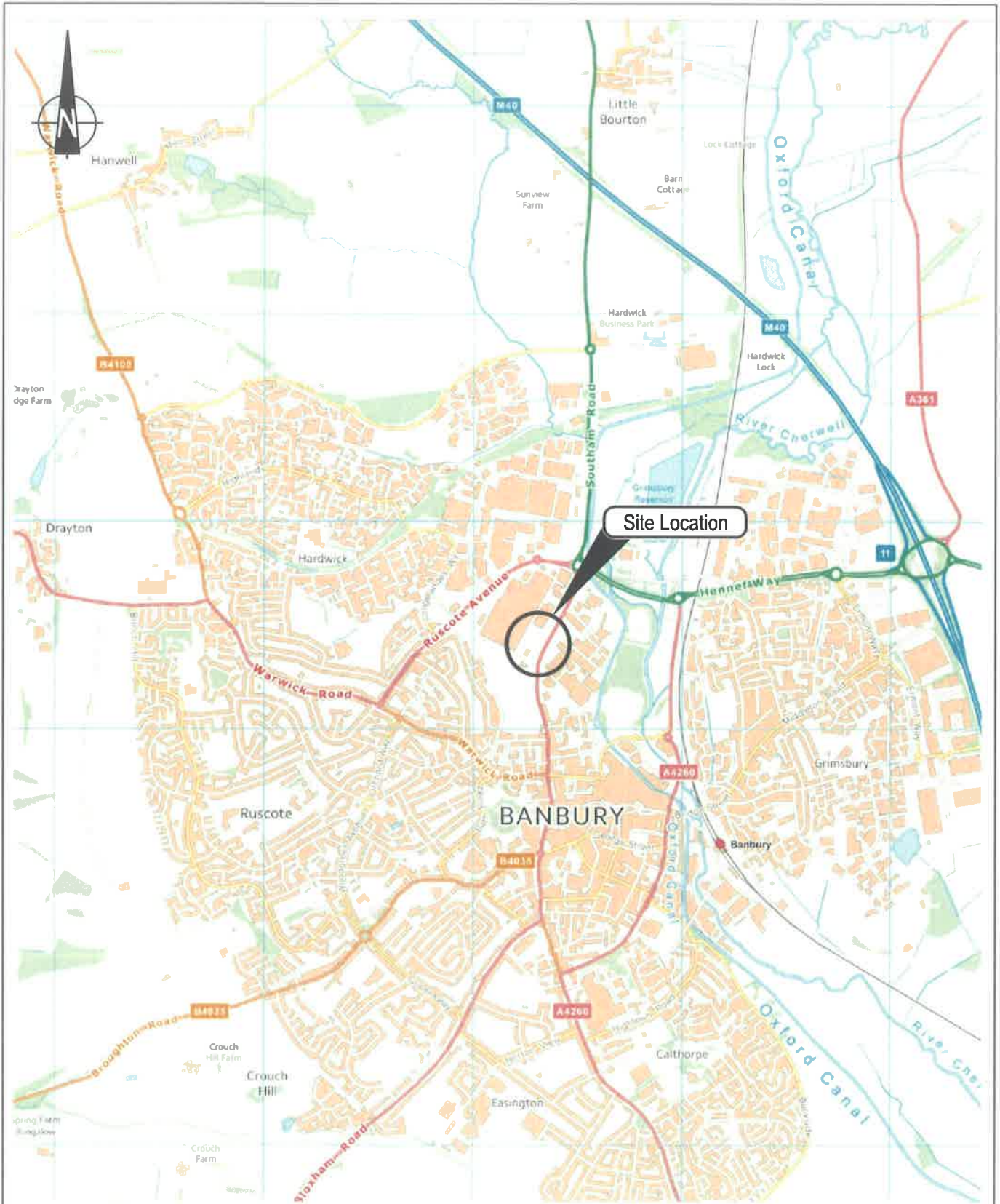
* It is assumed that construction workers will undergo appropriate health and safety training and wear personal protective equipment in conjunction with appropriate hygiene facilities.

Risk estimation establishes the magnitude and probability of the possible consequences (what degree of harm might result and how likely).

The criteria for classifying probability and consequence are set out in Tables 3 and 4 of the PBA methodology.

Green text highlights one or more elements of the Pollutant Linkage are missing and therefore eliminated

Figures



Site Grid Ref: SP 452 414

Offices throughout the UK and continental Europe.

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Client
Barwood Capital and Mondelez International

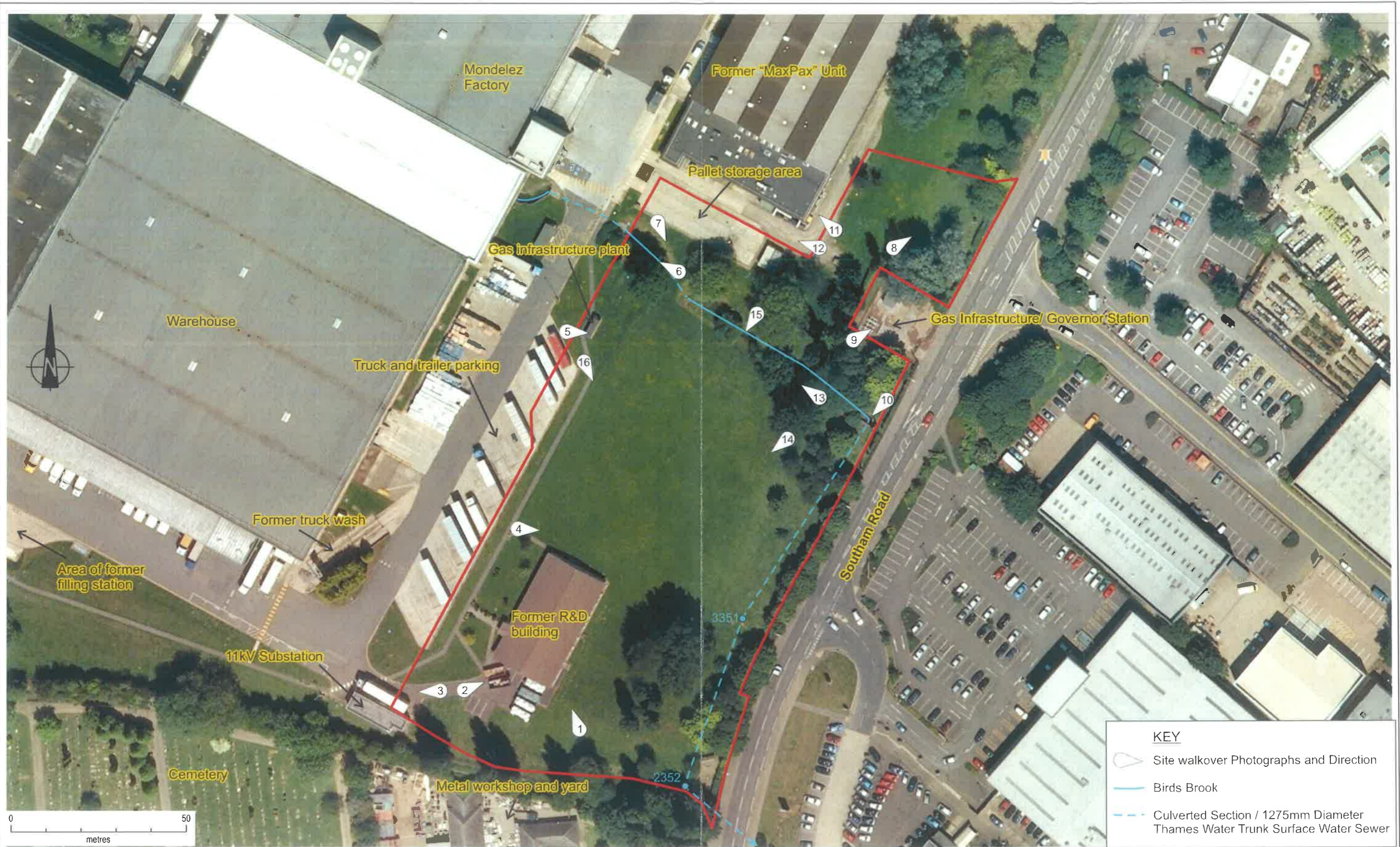
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**NEW WAITROSE STORE,
 SOUTHAM ROAD, BANBURY**

Date	24.11.2014
Scale	1:25 000
Drawn by	davco
Checked by	RF
Revision	0

SITE LOCATION PLAN

FIGURE 1



KEY	
	Site walkover Photographs and Direction
	Birds Brook
	Culverted Section / 1275mm Diameter Thames Water Trunk Surface Water Sewer



Client
Barwood Capital and
Mondelez International

Google Earth
© 2014 Infoterra Ltd & Bluesky
Image Date: May 2009

NEW WAITROSE STORE, SOUTHAM ROAD, BANBURY

SITE LAYOUT PLAN

Date	20.04.2014
Scale	1:1000
Drawn by	davco
Checked by	DBi
Revision	0

FIGURE 2

The accuracy of this drawing is limited only to the information provided to the architect. It is not to be used for any other purpose without the consent of the architect. All dimensions shall be to the center line of the building. An architect's seal and signature are required for this drawing to be valid. An architect's seal and signature are required for this drawing to be valid.



1. 06.85 to 06.80 from 06.80 level
 2. 06.85 to 06.80 from 06.80 level
 3. 06.85 to 06.80 from 06.80 level
 4. 06.85 to 06.80 from 06.80 level
 5. 06.85 to 06.80 from 06.80 level
 6. 06.85 to 06.80 from 06.80 level
 7. 06.85 to 06.80 from 06.80 level
 8. 06.85 to 06.80 from 06.80 level
 9. 06.85 to 06.80 from 06.80 level
 10. 06.85 to 06.80 from 06.80 level

BARWOOD CAPITAL and MONDELEZ INTERNATIONAL
 NEW WAITROSE STORE
 SOUTHAM ROAD
 BANBURY
 Proposed Site Plan

Rev	Issued	By	Date
01	01/01/2015	AD	23.01.2015
02	01/01/2015	AD	23.01.2015

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Client
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NEW WAITROSE STORE, SOUTHAM ROAD, BANBURY

PROPOSED SITE PLAN

Date	05.05.2015
Scale	not to scale
Drawn by	davco
Checked by	DBI
Revision	0

FIGURE 3

Appendix A PBA Methodology for Assessing Land Contamination in England

PBA Methodology for Assessing Land Contamination in England

1 Introduction

This document defines the approach adopted by PBA in relation to the assessment of land contamination in England. The aim is for the approach to (i) be systematic and objective, (ii) provide for the assessment of uncertainty and (iii) provide a rational, consistent, transparent framework.

When preparing our methodology we have made reference to various technical guidance documents and legislation referenced in Section 7 of which the principal documents are (i) Contaminated Land Statutory Guidance (Defra 2012), (ii) the Model Procedures for the Management of Contamination (CLR 11) (EA 2004), (iii) Contaminated land risk assessment: A guide to good practice (C552) (CIRIA 2001) and (iv) National Planning Policy Framework (DCLG 2012).

2 Dealing with Land Contamination

Government policy on land contamination aims to prevent new contaminated land from being created and promotes a risk based approach to addressing historical contamination. With regard to historical contamination, regulatory intervention is held in reserve for land that meets the legal definition and cannot be dealt with through any other means, including through planning. Land is only considered to be "contaminated land" in the legal sense if it poses an unacceptable risk.

UK legislation on contaminated land is principally contained in Part 2A of the Environmental Protection Act, 1990 (which was inserted into the 1990 Act by section 57 of the Environment Act 1995). Part 2A was introduced in England on 1 April 2000 and provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to human health or the environment. In 2004 the Model Procedures for the Management of Contamination (CLR 11) were published providing guidance on how the statutory requirements were to be delivered. The approach, concepts and principles for land contamination management promoted by CLR 11 are applied to the determination of planning applications.

Other legislative regimes may also provide a means of dealing with land contamination issues, such as the regimes for waste, water, environmental permitting, and environmental damage. Further, the law of statutory nuisance may result in contaminants being unacceptable to third parties whilst not attracting action under Part 2A or other environmental legislation.

2.1 Part 2A

The Regulations and Statutory Guidance that accompanied the Act, including the Contaminated Land (England) Regulations 2006, has been revised with the issue of The Contaminated Land (England) (Amendment) Regulations 2012 (SI 2012/263) and the Contaminated Land Statutory Guidance for England 2012.

Part 2A defines contaminated land as "*land which appears to the Local Authority in whose area it is situated to be in such a condition that, by reason of substances in, on or under the land that significant harm is being caused, or there is a significant*

possibility that such harm could be caused, or pollution of controlled waters is being, or likely to be, caused".

Harm is defined as "*harm to the health of living organisms or other interference with the ecological systems of which they form part, and in the case of man, includes harm to his property*".

For the purposes of Part 2A, land is contaminated if it poses a significant possibility of significant harm (SPOSH).

Part 2A provides a means of dealing with unacceptable risks posed by land contamination to human health and the environment, and under the guidance enforcing authorities should seek to find and deal with such land. It states that "*under Part 2A the starting point should be that land is not contaminated land unless there is reason to consider otherwise. Only land where unacceptable risks are clearly identified, after a risk assessment has been undertaken in accordance with the Guidance, should be considered as meeting the Part 2A definition of contaminated land*". Further the guidance makes it clear that "*regulatory decisions should be based on what is reasonably likely, not what is hypothetically possible*".

The overarching objectives of the Government's policy on contaminated land and the Part 2A regime are:

- "(a) To identify and remove unacceptable risks to human health and the environment.
- (a) To seek to ensure that contaminated land is made suitable for its current use.
- (b) To ensure that the burdens faced by individuals, companies and society as a whole are proportionate, manageable and compatible with the principles of sustainable development".

The enforcing authority may need to decide whether and how to act in situations where decisions are not straight forward, and where there is uncertainty. "*In so doing, the authority should use its judgement to strike a reasonable balance between: (a) dealing with risks raised by contaminants in land and the benefits of remediating land to remove or reduce those risks; and (b) the potential impacts of regulatory intervention including financial costs to whoever will pay for remediation, health and environmental impacts of taking action, property blight, and burdens on affected people*". The authority is required to "*take a precautionary approach to the risks raised by contamination, whilst avoiding a disproportionate approach given the circumstances of each case*". The aim is "*that the regime produces net benefits, taking account of local circumstances*".

The guidance recognises that "*normal levels of contaminants in soils should not be considered to cause land to qualify as contaminated land, unless there is a particular reason to consider otherwise*".

Normal levels are quoted as:

- "a) natural presence of contaminants' such as from underlying geology 'that have not been shown to pose an unacceptable risk to health and the environment
- b) ...low level diffuse pollution, and common human activity..."

PBA Methodology for Assessment of Potentially Contaminated Land

Similarly the guidance states that significant pollution of controlled waters is required for land to be considered contaminated and the *"fact that substances are merely entering water"* or *"where discharge from land is not discernible at a location immediately downstream"* does not constitute contaminated land.

To help achieve a more targeted approach to identifying and managing contaminated land in relation to the risk (or possibility) of harm to human health, the revised Statutory Guidance presented a new four category system for considering land under Part 2A, ranging from Category 4, where there is no risk that land poses a significant possibility of significant harm (SPOSH), or the level of risk is low, to Category 1, where the risk that land poses a significant possibility of significant harm (SPOSH) is unacceptably high.

For land that cannot be readily placed into Categories 1 or 4 further assessment is required. If there is a sufficiently strong case that the risks are of sufficient concern to cause significant harm/pollution or have the significant possibility of significant harm/pollution the land is to be placed into Category 2. If the concern is not met land is considered Category 3.

The technical guidance clearly states that the currently published SGV and GAC's represent *"cautious estimates of level of contaminants in soils"* which should be considered *"no risk to health or, at most, a minimal risk"*. These values do not represent the boundary between categories 3 and 4 and *"should be considered to be comfortably within Category 4"*.

At the end of 2013 technical guidance in support of Defra's revised Statutory Guidance (SG) was published (CL:AIRE 2013) which provided:

- A methodology for deriving C4SLs for four generic land-uses comprising residential, commercial, allotments and public open space; and
- A demonstration of the methodology, via the derivation of C4SLs for six substances – arsenic, benzene, benzo(a)pyrene, cadmium, chromium (VI) and lead.

2.2 Planning

The Local Planning Authority (LPA) is responsible for the control of development, and in doing so it has a duty to take account of all material considerations, including contamination.

Section 11, Paragraph 109 of the National Planning Policy Framework (NPPF) (DCLG 2012) states the planning system should contribute to and enhance the natural and local environment by *"preventing both new and existing developments from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water pollution"* and *"remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate"*. Paragraphs 120 and 121 describe the policy considerations the Government expects LPA to have in regard to land affected by contamination when preparing policies for development plans and in taking decisions on applications.

For planning purposes, the NPPF requires that the assessment of risks arising from contamination and remediation requirements should be considered on the

basis of the current environmental setting, the current land use, and the circumstances of its proposed new use. The NPPF stipulates that planning policies and decisions should ensure that "the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation"; and that "after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and adequate site investigation information, prepared by a competent person, is presented."

The level at which contamination is deemed to be unacceptable, or, gives rise to adverse effects under a planning context has not been identified but is envisaged to be more precautionary than the level required to determine land as contaminated under Part 2A.

In paragraph 121 the developer is required to ensure that land, after development, is not capable of being determined as contaminated land under Part 2A of the EPA 1990.

The principal planning objective is to ensure that any unacceptable risks to human health, buildings and other property and the natural and historical environment from the contaminated condition of the land are identified so that appropriate action can be considered and taken to address those risks. In order to grant a planning permission the Local Planning Authority (LPA) has to be satisfied that there is sufficient information about the condition of the land, its impacts and the availability of viable remedial options. NPPF Paragraph 21 states that *"planning policies and decisions should also ensure that adequate site investigation information, prepared by a competent person, is presented"*. Site investigation information is further defined in the NPPF Glossary page 56 and that also states that investigations should be carried out in accordance with established procedures, including BS10175 (BSI 2011) that in turn links procedure to the requirements of CLR11.

A key distinction between the Soil Guideline Values (SGVs) and the C4SLs is the level of risk that they describe. As described by the Environment Agency (2009a):

"SGVs are guidelines on the level of long-term human exposure to individual chemicals in soil that, unless stated otherwise, are tolerable or pose a minimal risk to human health."

A letter from Lord de Mauley dated 3rd September 2014 provides more explicit direction to local authorities on the use of the C4SL in a planning context. The letter identifies four key points:

- 1) that the screening values were developed expressly with the planning regime in mind
- 2) their use is recommended in DCLG's planning guidance
- 3) soil concentrations below a C4SL limit are considered to be 'definitely not contaminated' under Part IIA of the 1990 Environmental Protection Act and pose at most a 'low level of toxicological concern' and
- 4) exceedance of a C4SL screening value does not mean that land is definitely contaminated, just that further investigation may be warranted.

PBA Methodology for Assessment of Potentially Contaminated Land

2.3 Building Control

The building control department of the local authority or private sector approved inspectors are responsible for the operation and enforcement of the Building Regulations (DCLG 2010) to protect the health, safety and welfare of people in and around buildings. Approved Document C requires the protection of buildings and associated land from the effects of contamination, to be applied (non-exclusively) in all changes of use from commercial or industrial premises, to residential property.

3 Approach

CLR 11 recommends a phased or tiered approach to risk assessment with the three tiers being:-

- Tier 1 - preliminary – a qualitative assessment forming part of a Phase 1 report,
- Tier 2 - generic - a quantitative assessment using published criteria to screen site specific ground condition data forming part of a Phase 2 report
- Tier 3 - detailed – a quantitative assessment involving the generation of site specific assessment criteria

Each tier of risk assessment comprises the following four stages:-

1. Hazard Identification – identifying potential contaminant sources on and off site;
2. Hazard Assessment – assessing the potential for unacceptable risks by identifying what pathways and receptors could be present, and what pollutant linkages could result (forming the Conceptual Site Model (CSM));
3. Risk Estimation – estimating the magnitude and probability of the possible consequences (what degree of harm might result to a defined receptor and how likely); and
4. Risk Evaluation – evaluating whether the risk needs to be, and can be, managed.

A PBA Phase 1 report normally comprises a desk study, walkover and Tier 1 risk assessment (the project specific offer defines the actual scope of work). This is the minimum requirement as defined by the NPPF, pp56. At Tier 1 the PBA approach to risk estimation involves identifying the magnitude of the potential consequence (taking into account both the potential severity of the hazard and the sensitivity of the receptor) and the magnitude of the likelihood i.e. the probability (taking into account the presence of the hazard and the receptor and the integrity of the pathway). This approach is promoted in current guidance such as R&D 66 (NHBC 2008).

The PBA approach is that if a pollution linkage is identified then it represents a potential risk which requires further consideration and either (1) remediation / direct risk management or (2) further tiers of assessment.

A PBA preliminary Phase 2 report comprises an intrusive investigation to collect site specific information, a Tier 2 quantitative generic risk assessment and a refinement of the CSM using the site specific data. Depending on the findings further investigation and/or progression to Tier 3 risk assessment and the generation of site specific assessment criteria may be required.

The PBA methodology provides an estimate of the level of risk, it does not identify a risk level at which the risk is considered "significant" and/or "unacceptable" as this is dependant on the view of the individual / stakeholder. For example; to a risk adverse stakeholder even a risk level of "very low" may be considered unacceptable and as such this stakeholder may require risk management options to be implemented.

4 Identification of Pollutant Linkages and Conceptual Site Model (CSM)

For all Tiers the underlying principle to ground condition assessment is the identification of *pollutant linkages* in order to evaluate whether the presence of a source of contamination could potentially lead to harmful consequences. A pollutant linkage consists of the following three elements:-

- A source/hazard – a substance or situation which has the potential to cause harm or pollution;
- A pathway – a means by which the hazard moves along / generates exposure; and
- A receptor/target – an entity which is vulnerable to the potential adverse effects of the hazard.

The *Conceptual Site Model* identifies the types and locations of potential contaminant sources/hazards and potential receptors and potential migration/transportation pathway(s). The CSM is refined as the assessment progresses through the Tiers.

4.1 Hazard Identification

A hazard is a substance or situation that has the potential to cause harm. Hazards may be chemical, biological or physical (e.g. explosive gases).

At Tier 1 the potential for hazards to be present is determined from consideration of the previous or ongoing activities on or near to the site in accordance with the criteria presented in the **Table 1**.

Based on the land use information Potential Contaminants of Concern (PCOC) are identified. The PCOC direct the scope of the collection of site specific data and the analytical testing selected for subsequent Tiers.

At Tier 2 the site specific data is screened using published assessment criteria (refer to PBA document entitled Rationale for the Selection of Tier 2 Assessment Criteria). In general, published criteria have been developed using highly conservative assumptions and therefore if the screening criterion is not exceeded then the PCOC is eliminated as a potential Hazard. It should be noted that exceedance does not necessarily indicate that a site is contaminated and/or unsuitable for use only that the PCOC is retained as a potential Hazard. Published criteria are generated using models based on numerous and complex assumptions. Whether or not these assumptions are appropriate in a site-specific context requires confirmation on a project by project basis and would form part of a Tier 3 assessment.

When reviewing or assessing site specific data PBA utilise published guidance on comparing contamination

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data with a critical concentration (CL:AIRE/CIEH 2008) which presents a structured process for employing statistical techniques for data assessment purposes. The benefit of the statistical tool is uncertainty is quantified and decisions are made knowing the strength of the evidence. Correct decision probability is a function of sample size, difference in the mean and the critical concentration, variation in measured values and the significance level.

4.2 Receptor and Pathway Identification

For all Tiers the potential receptors (for both on site and adjoining land) that will be considered are:

- Human Health – including current and future occupiers, construction and future maintenance workers, and neighbouring properties/third parties;
- Ecological systems; ^{*1}
- Controlled waters ^{*2} – including surface water and groundwater;
- Property, Animal or Crop (existing or proposed) - including buildings, service lines and pipes, crops, livestock, pets, woodland; and
- Archaeological sites and ancient monuments.

^{*1} International or nationally designated sites (as defined in the statutory guidance (Defra Circular 04/12)) "in the local area" will be identified as potential ecological receptors. A search radius of 1, 2 or 5km will be utilised depending on the site specific circumstances (see also pathway identification). The Environment Agency has published an ecological risk assessment framework (EA 2008) which promotes (as opposed to statutorily enforces) consideration of additional receptors to include locally protected sites and protected or notable species. These additional potential receptors will only be considered if a Phase 1 habitat survey, undertaken in accordance with guidance (JNCC 1993), is commissioned and the data provided to PBA. It should be noted that without such a survey the Tier 1 risk assessment may conclude that the identification of potential ecological receptors is inconclusive (refer to PBA Specification for Phase 1).

^{*2} the definition of "pollution of controlled water" was amended by the introduction of Section 86 of the Water Act 2003. For the purposes of Part 2A groundwater does not include waters above the saturated zone and our assessment does not therefore address perched water other than where development causes a pathway to develop.

If a receptor is taken forward for further assessment it will be classified in terms of its sensitivity, the criteria for which are presented in **Table 2**. Table 2 has been generated using descriptions of environmental receptor importance/value given in various guidance documents including R&D 66 (NHBC 2008) and Transport Analysis Guidance (based on DETR 2000). Human health and buildings classifications have been generated by PBA using the attribute description for each class.

The exposure pathway and modes of transport that will be considered are presented in **Table 3**.

4.3 Note regarding Ecological Systems

The Environment Agency (EA) has developed an ecological risk assessment framework which aims to provide a structured approach for assessing the risks to ecology from chemical contaminants in soils (EA 2008). In circumstances where contaminants in water represent a potential risk to aquatic ecosystems then risk assessors will need to consider this separately.

The framework consists of a three tiered process:-

- Tier 1 is a screening step where the site soils chemical data is compared to a soil screening value (SSV)
- Tier 2 uses various tools (including surveys and biological testing) to gather evidence for any harm to the ecological receptors
- Tier 3 seeks to attribute the harm to the chemical contamination

Tier 1 is preceded by a desk study to collate information about the site and the nature of the contamination to assess whether pollutant linkages are feasible. The framework presents ten steps for ecological desk studies and development of a conceptual site model as follows.

- 1 Establish Regulatory Context
- 2 Collate and Assess Documentary Information
- 3 Summarise Documentary Information
- 4 Identify Potential Contaminants of Concern
- 5 Identify Likely Fate Transport of Contaminants
- 6 Identify Potential Receptors of Concern
- 7 Identify Potential Pathways of Concern
- 8 Create a Conceptual Site Model
- 9 Identify Assessment and Measurement Endpoints
- 10 Identify Gaps and Uncertainties

The information in a standard PBA Phase 1 report covers Steps 1 to 4 inclusive. Step 5 considers fate and transport of contaminants and it should be noted that our standard report adopts a simplified approach considering only transport mechanisms. A simplified approach has also been adopted in respect of Steps 6 and 7 receptors (a detailed review of the ecological attributes has not been undertaken) and pathways (a food chain assessment has not been undertaken). Step 9 is outside the scope of our standard Phase 1 report.

It should be noted that the Tier 1 assessment for ecological systems (i.e. where designated sites are identified) as part of a Phase 1 report will assess the viability of the mode of transport given the site specific circumstances not specific pathways.

The Tier 1 risk assessment may conclude that the risk to potential ecological receptors is inconclusive (see PBA Specification for Phase 1).

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4.4 Note regarding Controlled Waters

Controlled Waters are rivers, estuaries, coastal waters, lakes and groundwaters, but not perched waters.

The Water Framework Directive (WFD) (2000) aims to protect and enhance the quality of surface freshwater, groundwaters and dependent eco systems, estuaries and coastal waters. The WFD was transposed into UK law in 2003 (Statutory Instruments 2003). Member states must aim to reach good chemical and ecological status as defined in the Directive by 2015.

The Ground Water Daughter Directive (GWDD) was enacted by the Groundwater Regulations (2009), which were subsumed by the Environmental Permitting Regulations (2010) which provide essential clarification including on the four objectives specifically for groundwater quality in the WFD:-

- Achieve 'Good' groundwater chemical status by 2015, commonly referred to as 'status objective';
- Achieve Drinking Water Protected Area Objectives;
- Implement measures to reverse any significant and sustained upward trend in groundwater quality, referred to as 'trend objective'; and
- Prevent or limit the inputs of pollutants into groundwater, commonly referred to as 'prevent or limit' objectives

The Water Act 2003 (Commencement No.11) Order 2012 amends the test for 'contaminated land' which relates to water pollution so that pollution of controlled waters must now be "significant" to meet the definition of contaminated land.

River Basin Management Plans (RBMP) have been developed for the 11 River Basin Districts in England and Wales. These were released by Defra in 2009 (Defra 2009).

These RBMP's establish the current status of waters within the catchments of the respective Districts and the current status of adjoining waters identified. As part of a Tier 2 risk assessment water quality data is screened against the WFD assessment criteria. Compare to the RBMP's current status of waters for the catchment under consideration would form part of a Tier 3 assessment.

5 Risk Estimation

Risk estimation classifies what degree of harm might result to a receptor (defined as consequence) and how likely it is that such harm might arise (probability).

At Tier 1 the consequence classification is generated by multiplying the hazard classification score and the receptor sensitivity score. This approach follows that presented in the republished R&D 66 (NHBC 2008).

The criteria for classifying probability are set out in **Table 4** and have been taken directly from **Table 6.4** CIRIA C552 (CIRIA 2001). Probability considers the integrity of the exposure pathway.

The consequence classifications detailed in **Table 5**

have been adapted from **Table 6.3** presented in C552 and R&D 66 (Annex 4 **Table A4.3**).

The Tier 1 risk classification is estimated for each pollutant linkage using the matrix given in **Table 6** which is taken directly from C552 (**Table 6.5**). Subsequent Tiers refine the CSM through retention or elimination of potential hazards and pollutant linkages.

6 Risk Evaluation

In order to put the Tier 1 risk classification into context the likely actions are described in **Table 7** which is taken directly from C552 (**Table 6.6**). Subsequent Tiers identify potential risk management options through remediation and/or mitigation measures.

Unless the initial assessment clearly demonstrates that the risk from contamination can be satisfactorily reduced to an acceptable level, further site investigations and risk assessment will be needed before the application can be determined.

7 References

BSI 2007 BS 8485 Code of Practice for characterisation and remediation from ground gas in affected developments.

BSI 2011 BS 10175 (2011) Code of practice - Investigation of potentially contaminated sites

CIRIA 2001: Contaminated land risk assessment – a guide to good practice C552.

CIRIA 2008: Assessing risks posed by hazardous ground gases to buildings C655

CL:AIRE/EIH 2008 Guidance on Company Soil Contamination Data with a Critical Concentration. Published by Contaminated Land: Applications in Real Environments (CL:AIRE)

CL:AIRE 2013 SP1010 – Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report published by Contaminated Land: Applications in Real Environments (CL:AIRE) 20th December 2013

DCLG 2010 Building Regulations 2010 Approved Document C Site preparation and resistance to contaminants and moisture.

DCLG 2012 National Planning Policy Framework.

DETR 2000 Methodology for Multi Modal Studies. Volume 2 Section 4. The Environmental Objective.

Defra Circular 01/2006

Defra Circular 04/2012 Environmental Protection Act 1990: Part 2A. Contaminated Land Statutory Guidance.

DEFRA, 2006 The Contaminated Land (England) Regulations 2006.

DEFRA, 2012 The Contaminated Land (England) (Amendment) Regulations 2012 (SI2012/263).

DEFRA, 2012 Environmental Protection Act 1990: Part 2A. Contaminated Land Statutory Guidance. April 2012.

DEFRA, 2013 Environmental Damage (Prevention and Remediation) Regulations 2009: Guidance for England and Wales

Defra '2009 Water for Life and Livelihoods. River Basin Management Plan. (11 Districts: Anglia, Dee, Humber, Northumbria, Northwest, Severn, Solway and Tweed, Southeast, Thames, Western Wales) December 2009

EA 2004: The Model Procedures for the Management of Land Contamination CRL 11 published by the Environment Agency (EA).

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EA 2008 Ecological Risk Assessment Science Report Series SC070009 published by the Environment Agency (EA).

European Community 2000 Water Framework Directive (2000/60/EC)

JNCC 1993 Handbook for Phase 1 Habitat Survey – A Technical for Environmental Audit prepared by the Joint Nature Conservancy Council (JNCC)

NHBC/EA/CIEH 2008: R&D Publication 66 Guidance for the safe development of housing on land affected by

contamination.

Statutory Instrument 2003 No. 3242 Water Resources, England and Wales. The Water Environment (Water Framework Directive) Regulations 2003.

Table 1: Criteria for Classifying Hazards / Potential for Generating Contamination

Classification/Score	Potential for generating contamination/gas based on land use
Very Low 1	Land Use: greenfield Contamination: None. Gas generation potential : Inert Made Ground
Low 2	Land Use: residential, retail or office use, recent small scale industrial. Contamination: None or locally slightly elevated concentrations. Gas generation potential : Shallow thickness of Alluvium
Moderate 3	Land Use: railway yards, collieries, scrap yards, light industry, engineering works. Contamination: Locally elevated concentrations. Gas generation potential : Dock silt and substantial thickness of organic alluvium/peat
High 4	Land Use: gas works, chemical works, heavy industry, non-hazardous landfills. Contamination: Possible widespread elevated concentrations. Gas generation potential : Shallow mine workings Pre 1960's landfill
Very High 5	Land Use: hazardous waste landfills. Contamination: Likely widespread elevated concentrations. Gas generation potential : Domestic landfill post 1960

"Greenfield" is land which has not been developed including not used for crop production or animal husbandry and no contamination source therefore no pollutant linkages.

Table 2: Criteria for Classifying Receptor Sensitivity/Value

Classification/Score	Definition
Very Low 1	Receptor of limited importance Groundwater: Non aquifer Surface water: GQA Grade F Ecology: No local designation Buildings: Replaceable Human health: Unoccupied/limited access
Low 2	Receptor of local or county importance with potential for replacement Groundwater: Secondary aquifer Surface water: GQA Grade D/E Ecology: local habitat resources Buildings: Local value Human health: Minimum score 4 where human health identified as potential receptor
Moderate 3	Receptor of local or county importance with potential for replacement Groundwater: Principal aquifer Surface water: GQA Grade B/C Ecology: County wildlife sites, Areas of Outstanding Natural Beauty (AONB) Buildings: Area of Historic Character Human health: Minimum score 4 where human health identified as potential receptor
High 4	Receptor of county or regional importance with limited potential for replacement Groundwater: Source Protection Zone 2 Surface water: GQA Grade A Ecology: SSSI, National or Marine Nature Reserve (NNR or MNR) Buildings: Conservation Area Human health: Minimum score 4 where human health identified as potential receptor
Very High 5	Receptor of national or international importance Groundwater: Source Protection Zone 1 Surface water: GQA Grade A Ecology: Special Areas of Conservation (SAC and candidates), Special Protection Areas (SPA and potentials) or wetlands of international importance (RAMSAR) Buildings: World Heritage site Human health: Residential, open spaces and uses where children are present

PBA Methodology for Assessment of Potentially Contaminated Land

Table 3: Exposure Pathway and Modes of Transport

Receptor	Pathway	Mode of transport
Human health	Ingestion	Fruit or vegetable leaf or roots
		Contaminated water
		Soil/dust indoors
		Soil/dust outdoors
	Inhalation	Particles (dust / soil) – outdoor
		Particles (dust / soil) - indoor
		Vapours – outdoor - migration via natural or anthropogenic pathways
		Vapours - indoor - migration via natural or anthropogenic pathways
	Dermal absorption	Direct contact with soil
		Direct contact with waters (swimming / showering)
Irradiation		
Groundwater	Leaching	Gravity / permeation
	Migration	Natural – groundwater as pathway Anthropogenic (e.g. boreholes, culverts, pipelines etc.)
Surface Water	Direct	Runoff or discharges from pipes
	Indirect	Recharge from groundwater
	Indirect	Deposition of wind blown dust
Buildings	Direct contact	Sulphate attack on concrete, hydrocarbon corrosion of plastics
	Gas ingress	Migration via natural or anthropogenic paths
Ecological systems	See Notes	Runoff/discharge to surface water body
	See Notes	Windblown dust
	See Notes	Groundwater migration
	See Notes	At point of contaminant source
Animal and crop	Direct	Wind blown or flood deposited particles / dust / sediments
	Indirect	Plants via root up take or irrigation. Animals through watering
	Inhalation	By livestock / fish - gas / vapour / particulates / dust
	Ingestion	Consumption of vegetation / water / soil by animals

Table 4: Classification of Probability

Classification	Definition
High likelihood	There is a pollution linkage and an event either appears very likely in the short-term and almost inevitable over the long-term, or there is already evidence at the receptor of harm / pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter-term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.

PBA Methodology for Assessment of Potentially Contaminated Land

Table 5: Classification of Consequence (score = magnitude of hazard Table 1 and sensitivity of receptor Table 2)

Classification / Score	Examples
Severe 20-25	<p>Human health effect - exposure likely to result in "significant harm". Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive function.</p> <p>Controlled water effect - short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Equivalent to EA Category 1 incident (persistent and/or extensive effects on water quality leading to closure of potable abstraction point or loss of amenity, agriculture or commercial value. Major fish kill.</p> <p>Ecological effect - short-term exposure likely to result in a substantial adverse effect.</p> <p>Catastrophic damage to crops, buildings or property</p>
Medium 13-19	<p>Human health effect - exposure could result in "significant harm". Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive function.</p> <p>Controlled water effect - equivalent to EA Category 2 incident requiring notification of abstractor</p> <p>Ecological effect - short-term exposure may result in a substantial adverse effect.</p> <p>Damage to crops, buildings or property</p>
Mild 6-12	<p>Human health effect - exposure may result in "significant harm". Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive function.</p> <p>Controlled water effect - equivalent to EA Category 3 incident (short lived and/or minimal effects on water quality).</p> <p>Ecological effect - unlikely to result in a substantial adverse effect.</p> <p>Minor damage to crops, buildings or property. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).</p>
Minor 1-5	<p>No measurable effect on humans. Protective equipment is not required during site works.</p> <p>Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.</p> <p>Repairable effects to crops, buildings or property. The loss of plants in a landscaping scheme. Discolouration of concrete.</p>

Table 6: Classification of Risk (Combination of Consequence Table 5 and Probability Table 4)

Probability	Consequence			
	Severe	Medium	Mild	Minor
High likelihood	Very high	High	Moderate	Low
Likely	High	Moderate	Moderate/low	Low
Low likelihood	Moderate	Moderate/low	Low	Very low
Unlikely	Moderate/low	Low	Very low	Very low

Table 7: Description of Risks and Likely Action Required

Risk Classification	Description
Very high risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation is likely to be required in the short term.
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term.
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Appendix B Site Photographs



Photo 1: View of vacant office building located in the south-western area of the study site, looking north-west from southern site boundary. This building is labelled as "R&D Building" on the Kraft topographical survey.



Photo 2: View of southern end of vacant office building and car park looking north-east from southern site boundary. The materials on the pallets were packaged and bound, probably awaiting off-site recycling.


	Client	Site Photographs New Waitrose Store, Southam Road, Banbury	Date	NOV 2014
	Barwood Capital and Mondelez International		A4 Scale	nts
Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN Tel 0118 959 7498 Fax 0118 959 7498			Drawn	rf
			Checked	dbi
			Appendix	B



Photo 3: View of electrical sub-station located beyond the south west corner of the study site boundary, looking south west from the southern site boundary.



Photo 4: General view of open grass area which forms the main portion of the study site, looking north east from western site boundary.


	Client	Site Photographs New Waitrose Store, Southam Road, Banbury	Date	NOV 2014
	Barwood Capital and Mondelez International		A4 Scale	nts
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			Checked	dbi
			Appendix	B



Photo 5: View of gas infrastructure installation located on the western site boundary, looking north-east.



Photo 6: View of Birds Brook as it emerges from a culvert looking west. There are two booms across the brook channel at this location, presumably to contain any accident discharges of pollution to the watercourse.


 Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN Tel 0118 959 7498 Fax 0118 959 7498	Client	Site Photographs New Waitrose Store Southam Road, Banbury	Date	NOV 2014
	Barwood Capital and Mondelez International		A4 Scale	nts
			Drawn	rf
			Checked	dbi
			Appendix	B



Photo 7: View towards earth "bridge" over Birds Brook in the north-western corner of the study site. The watercourse flows through two circular concrete pipes over this short section.



Photo 8: View of open grassed area in the north-eastern corner of the study site looking north.


	Client	Site Photographs New Waitrose Store Southam Road, Banbury	Date	NOV 2014
	Barwood Capital and Mondelez International		A4 Scale	nts
			Drawn	rf
			Checked	dbi
			Appendix	B
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Photo 9: View towards gas infrastructure station located outside the eastern site boundary, looking north-east from eastern site boundary. The station is located on a small, square cut platform at a lower level than the study site in this area.



Photo 10: View of Birds Brook as it diverts in a southerly direction into a culvert which runs down the eastern site boundary, looking south from the eastern site boundary.


	Client	Site Photographs New Waitrose Store Southam Road, Banbury	Date	NOV 2014
	Barwood Capital and Mondelez International		A4 Scale	nts
Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN Tel 0118 959 7498 Fax 0118 959 7498			Drawn	rf
			Checked	dbi
			Appendix	B



Photo 11: View towards factory building located beyond the northern site boundary, looking north-west. This building is labelled as "Max Pax Building" on the Kraft topographical survey.



Photo 12: View of pallet storage area located in the north-west corner of the site, looking west.


	Client	<p align="center">Site Photographs New Waitrose Store Southam Road, Banbury</p>	Date	NOV 2014
	<p align="center">Barwood Capital and Mondelez International</p>		A4 Scale	nts
			Drawn	rf
			Checked	dbi
			Appendix	B
<p>Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN Tel 0118 959 7498 Fax 0118 959 7498</p>				



Photo 13: View of Birds Brook looking west from north-eastern area of the site.



Photo 14: General view of the central portion of the site, looking south-west from northern area.



	Client	Site Photographs New Waitrose Store Southam Road, Banbury	Date	NOV 2014
	Barwood Capital and Mondelez International		A4 Scale	nts
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			Checked	dbi
			Appendix	B



Photo 15: View of one of the surface water outfalls into Birds Brook. This outfall is located on the northern bank of the brook, looking north.



Photo 16: General view of the central portion of the site, looking south-east from western site boundary adjacent to truck park.

	Client	Site Photographs New Waitrose Store Southam Road, Banbury	Date	NOV 2014
	Barwood Capital and Mondelez International		A4 Scale	nts
<small>Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN Tel 0118 959 7498 Fax 0118 959 7498</small>			Drawn	rf
			Checked	dbi
			Appendix	B

Appendix C Historical Ordnance Survey Map Extracts

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 110,000 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 12,500 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 by letters of the alphabet to show features to be fully included or excluded. Features that are not included are those that have segment references of A7NW will be in Slices A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

Ms K Riley, Brett Consulting Ltd, Caversham Bridge House, Waleman Piece, Reading, Berkshire, RG1 8DN

Order Details

Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 445300, 241410
Site Area (Ha): 1.43
Search Buffer (m): 1000

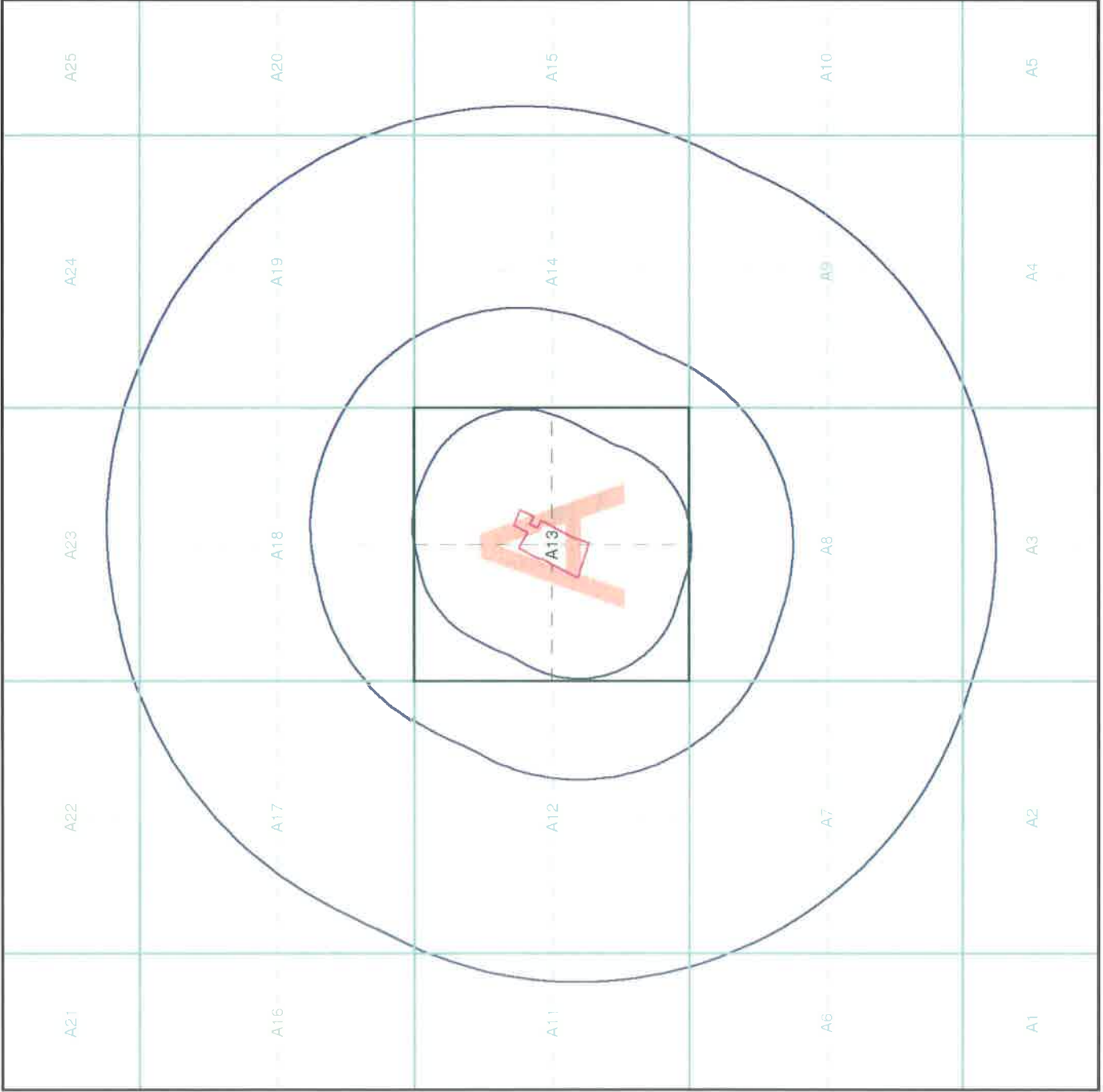
Site Details

Site at, Banbury, Oxfordshire

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



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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit	Quarry	Osiers	Mixed Wood	Fir	Deciduous	Brushwood	Marsh	Orchard	Other Pits
Sand Pit	Shingle	Reeds	Trigonometrical Station	Arrow denotes flow of water	Site of Antiquities	Pump, Guide Post, Signal Post	Surface Level	Sketched Contour	Main Roads
Gravel Pit, Clay Pit or Quarry	Sand Pit	Refuse or Slag Heap	Dunes	Coniferous Trees	Orchard	Bracken	Marsh	Building	Glasshouse
Gravel Pit	Rock	Boulders	Shingle	Sand	Slopes	General detail	Overhead detail	Multi-track railway	County boundary (England only)
Refuse tip or slag heap	Rock (scattered)	Boulders (scattered)	Mud	Sand Pit	Top of cliff	Underground detail	Narrow gauge railway	Single track railway	Civil, parish or community boundary
Refuse tip or slag heap	Rock (scattered)	Boulders (scattered)	Mud	Sand Pit	Top of cliff	Underground detail	Narrow gauge railway	Single track railway	Civil, parish or community boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry	Sand Pit	Refuse or Slag Heap	Dunes	Coniferous Trees	Orchard	Bracken	Marsh	Building	Glasshouse
Gravel Pit	Disused Pit or Quarry	Lake, Loch or Pond	Boulders	Non-Coniferous Trees	Coppice	Rough Grassland	Saltings	Direction of Flow of Water	Single Sand
Gravel Pit	Disused Pit or Quarry	Lake, Loch or Pond	Boulders	Non-Coniferous Trees	Coppice	Rough Grassland	Saltings	Direction of Flow of Water	Single Sand

1:10,000 Raster Mapping

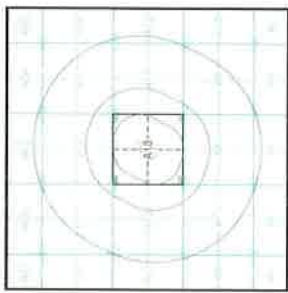
Gravel Pit	Rock	Boulders	Shingle	Sand	Slopes	General detail	Overhead detail	Multi-track railway	County boundary (England only)
Refuse tip or slag heap	Rock (scattered)	Boulders (scattered)	Mud	Sand Pit	Top of cliff	Underground detail	Narrow gauge railway	Single track railway	Civil, parish or community boundary
Refuse tip or slag heap	Rock (scattered)	Boulders (scattered)	Mud	Sand Pit	Top of cliff	Underground detail	Narrow gauge railway	Single track railway	Civil, parish or community boundary



Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pt
Northamptonshire	1:10,560	1883 - 1884	2
Oxfordshire	1:10,560	1885 - 1887	3
Wiltshire	1:10,560	1888	4
Oxfordshire	1:10,560	1900	5
Oxfordshire	1:10,560	1923	6
Northamptonshire	1:10,560	1923	7
Northamptonshire	1:10,560	1938	8
Oxfordshire	1:10,560	1938	9
Oxfordshire	1:10,560	1948	10
Oxfordshire	1:10,560	1948	11
Ordnance Survey Plan	1:10,000	1955	12
Ordnance Survey Plan	1:10,000	1965	13
Ordnance Survey Plan	1:10,000	1978	14
Ordnance Survey Plan	1:10,000	1980	15
Ordnance Survey Plan	1:10,000	1984 - 1985	16
10K Raster Mapping	1:10,000	2008	17
VectorMap Local	1:10,000	2014	18

Historical Map - Slice A



Order Details
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 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



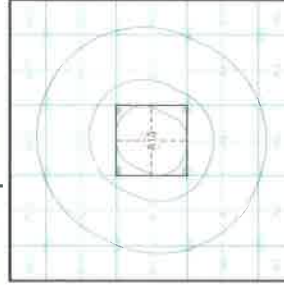
Tel: 0844 844 9502
 Fax: 0844 844 9551
 Web: www.entrack.co.uk

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

Map Name(s) and Date(s)

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1:10,560	
056SW	1883
1:10,560	

Historical Map - Slice A

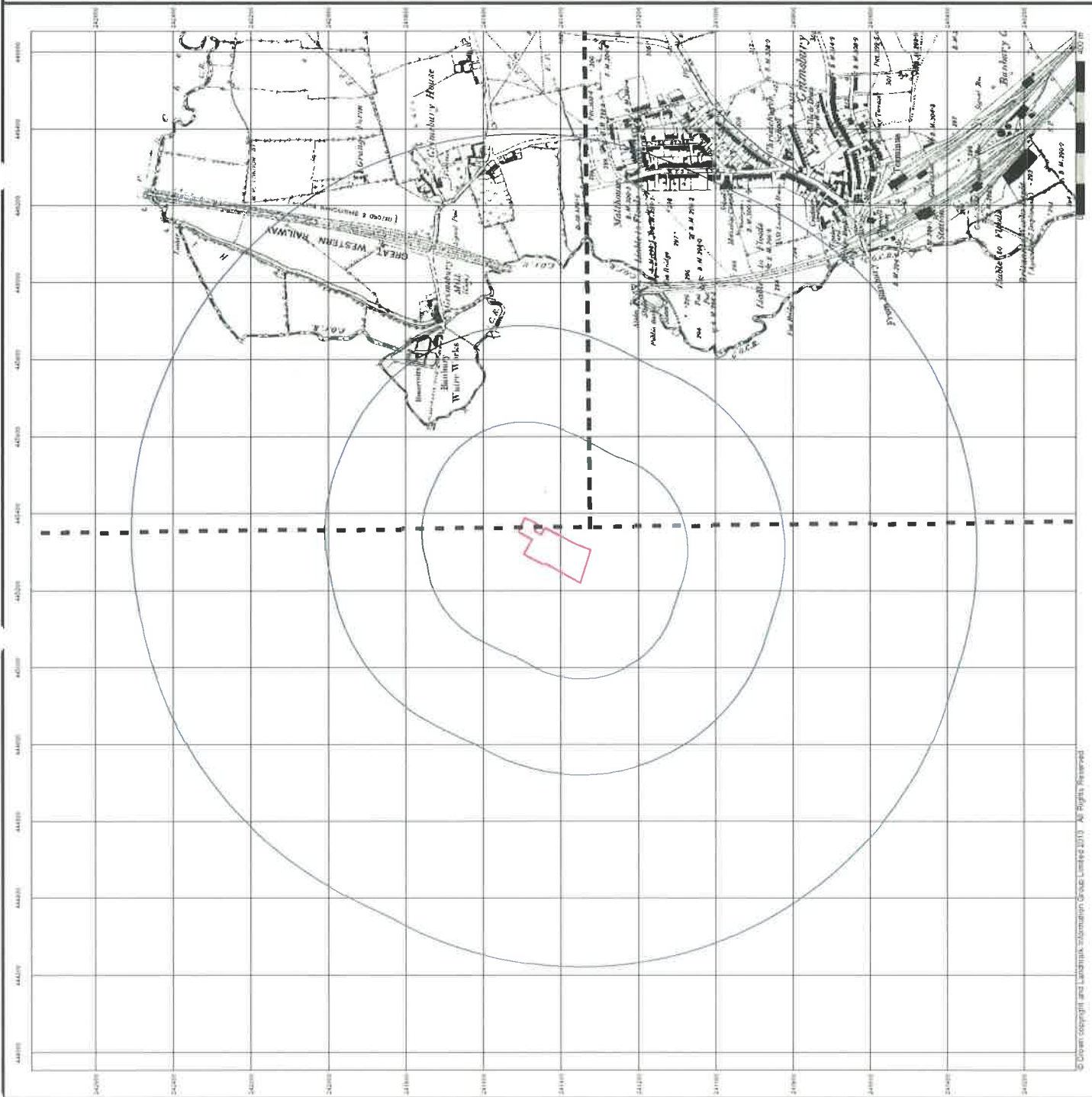


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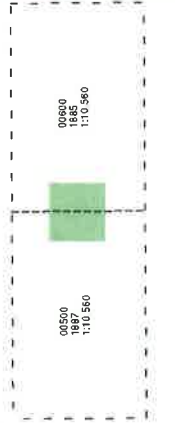
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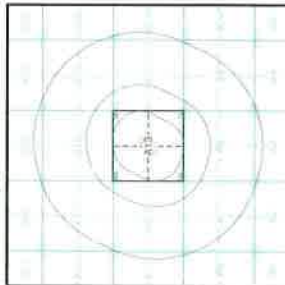


The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some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

Map Name(s) and Date(s)



Historical Map - Slice A



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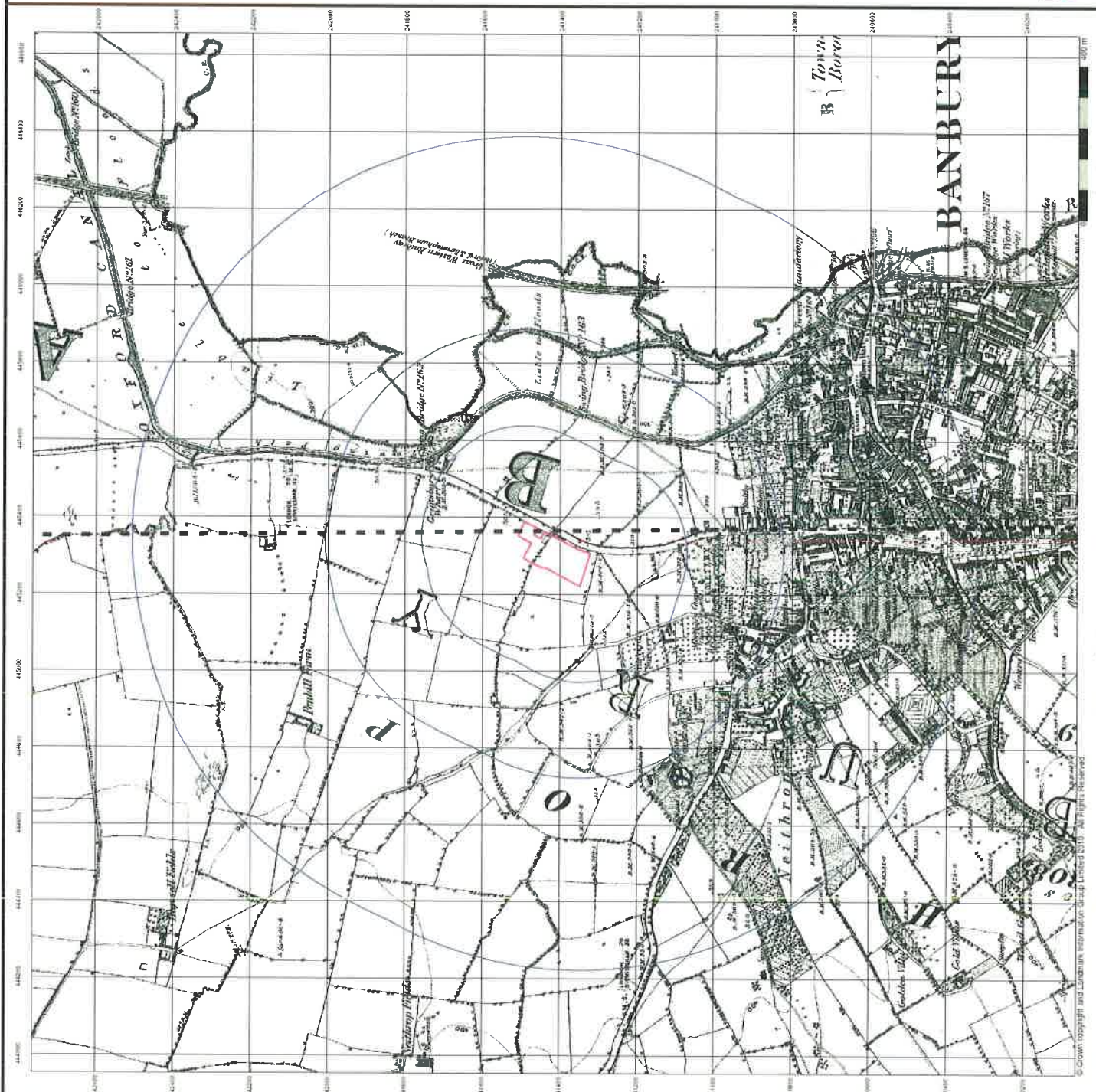
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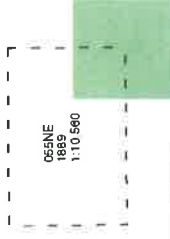


Warwickshire
Published 1889

Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



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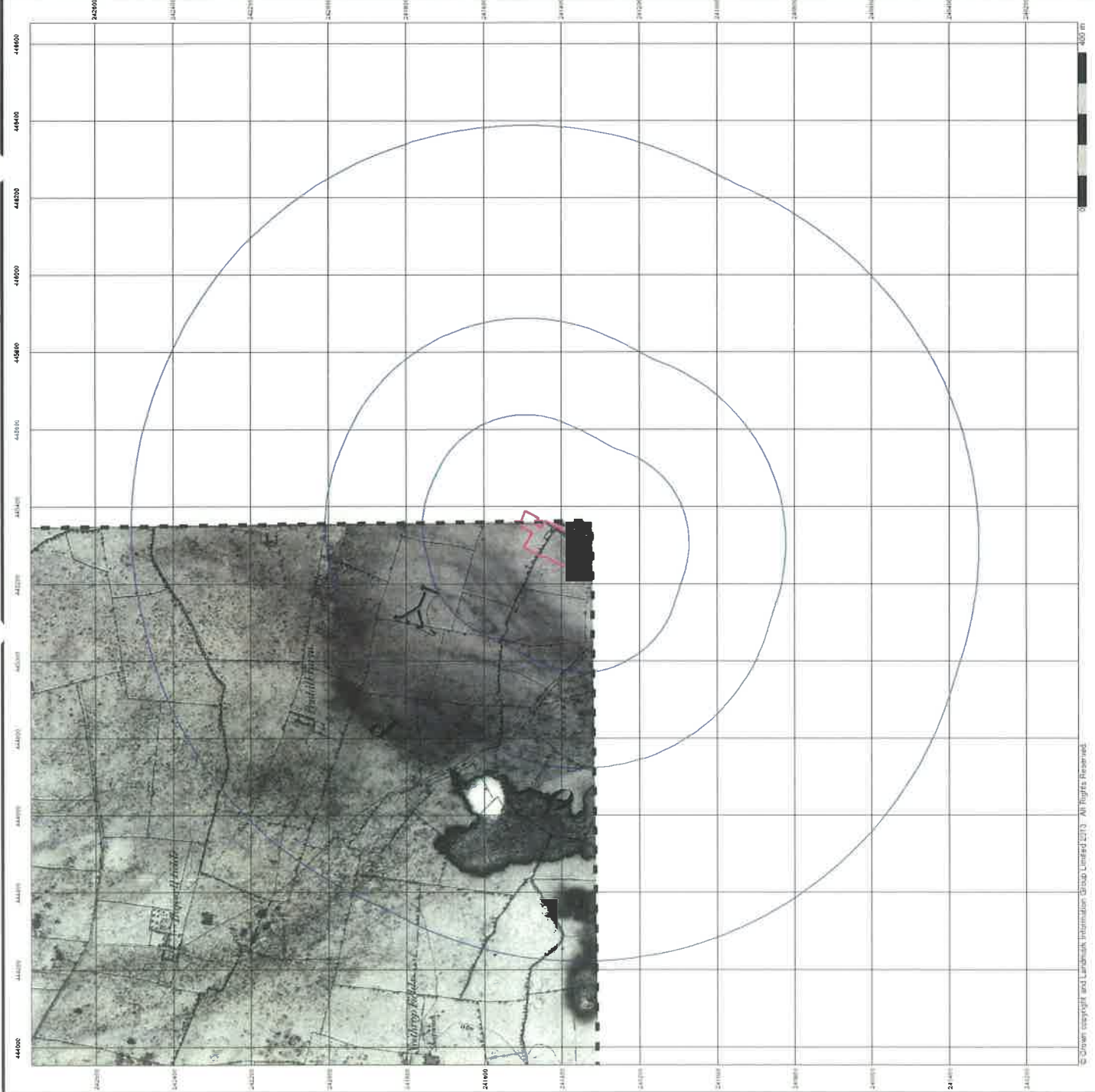
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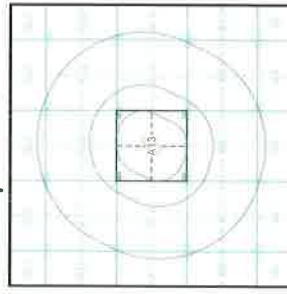
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Map Name(s) and Date(s)

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1:10,560	1:10,560
006SE 1900	006SW 1900
1:10,560	1:10,560

Historical Map - Slice A

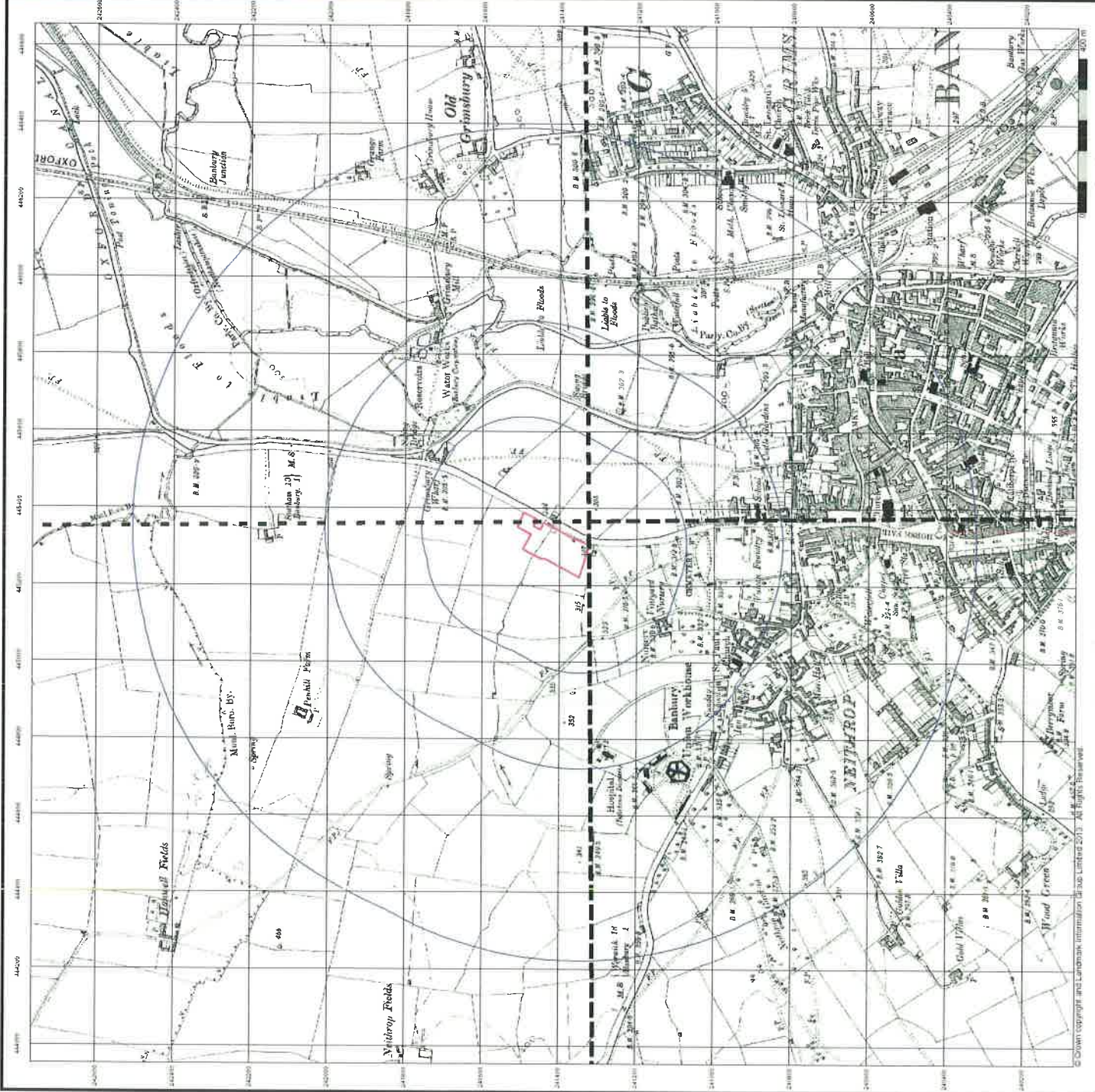


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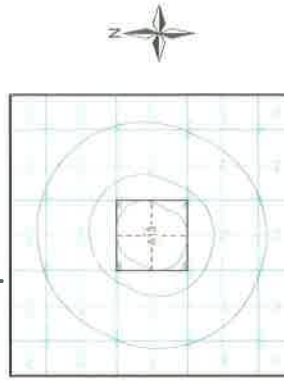
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Map Name(s) and Date(s)

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005SE	1930	1:10,560

Historical Map - Slice A

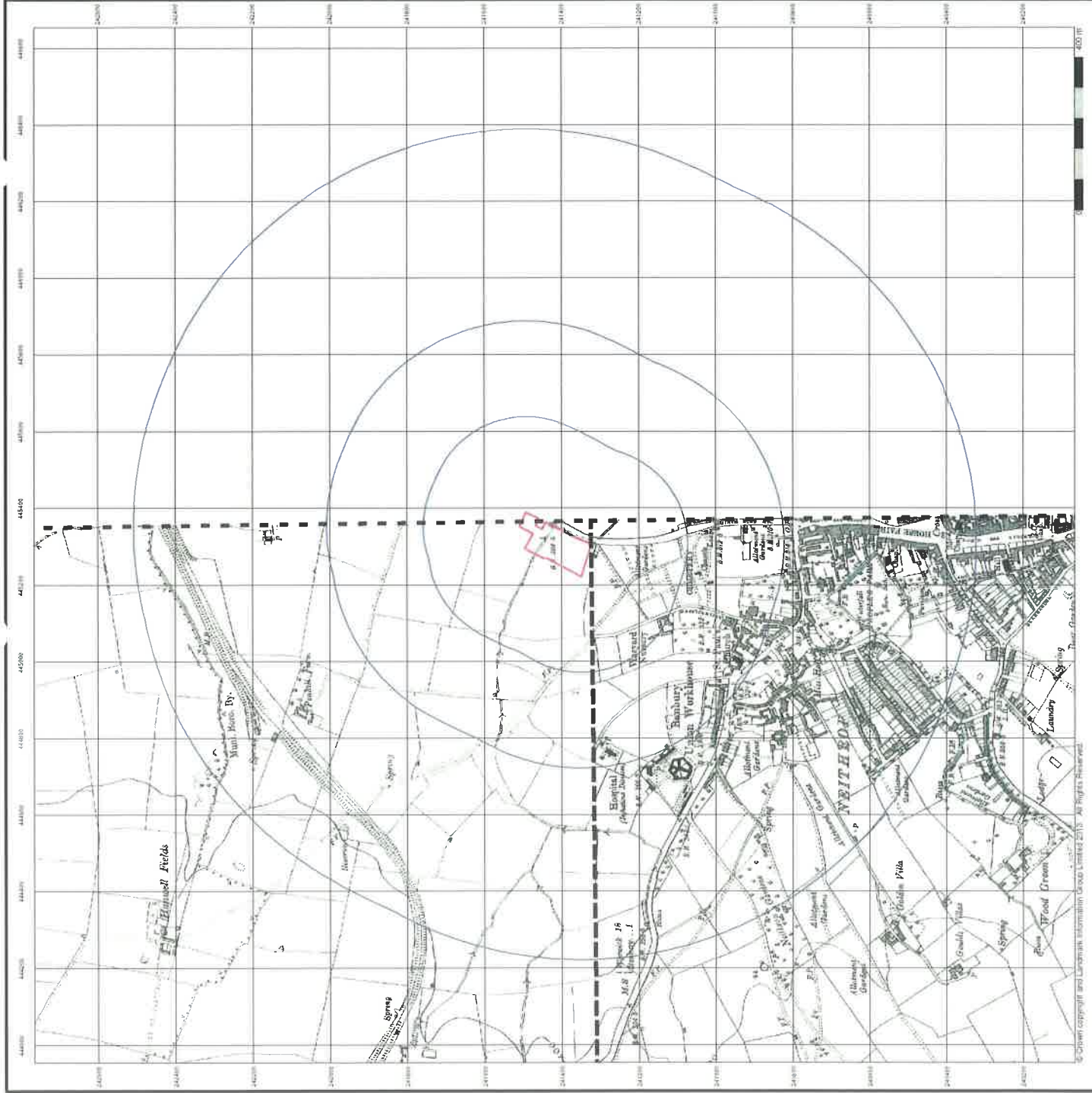


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Site Details

Site at, Banbury, Oxfordshire



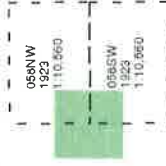


Northamptonshire Published 1923

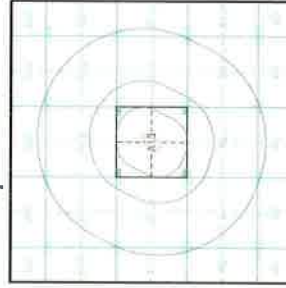
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Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

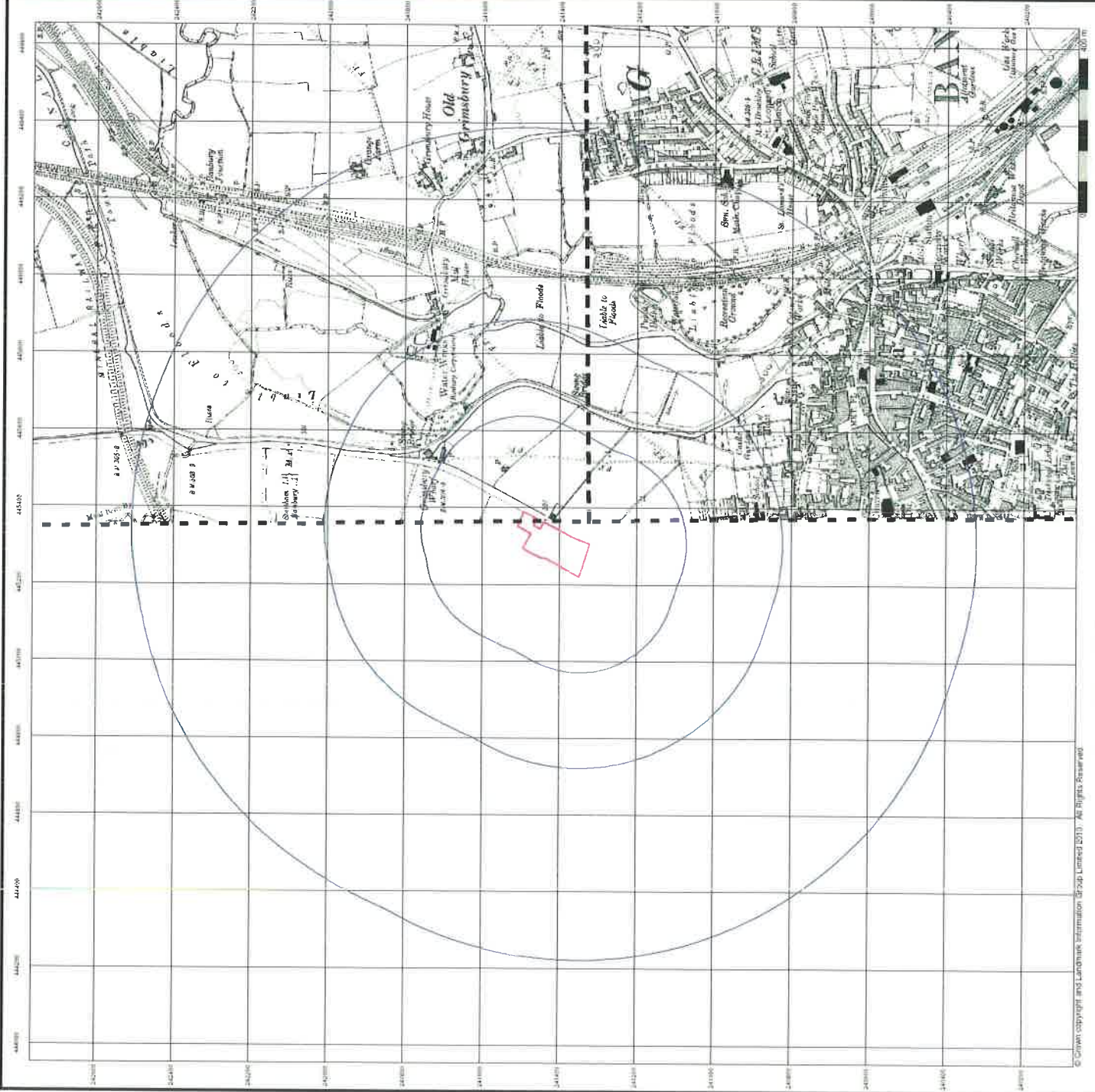
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Site Details

Site at, Banbury, Oxfordshire

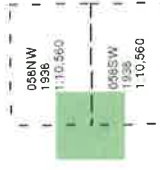


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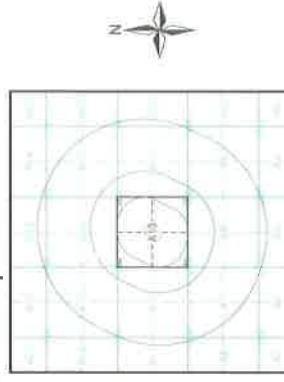


The historical maps shown were reproduced from maps painstakingly held at the Public Record Office, Warminster, Wiltshire, England, in 1940. In 1954 the 1:10,560 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in adjoining areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A

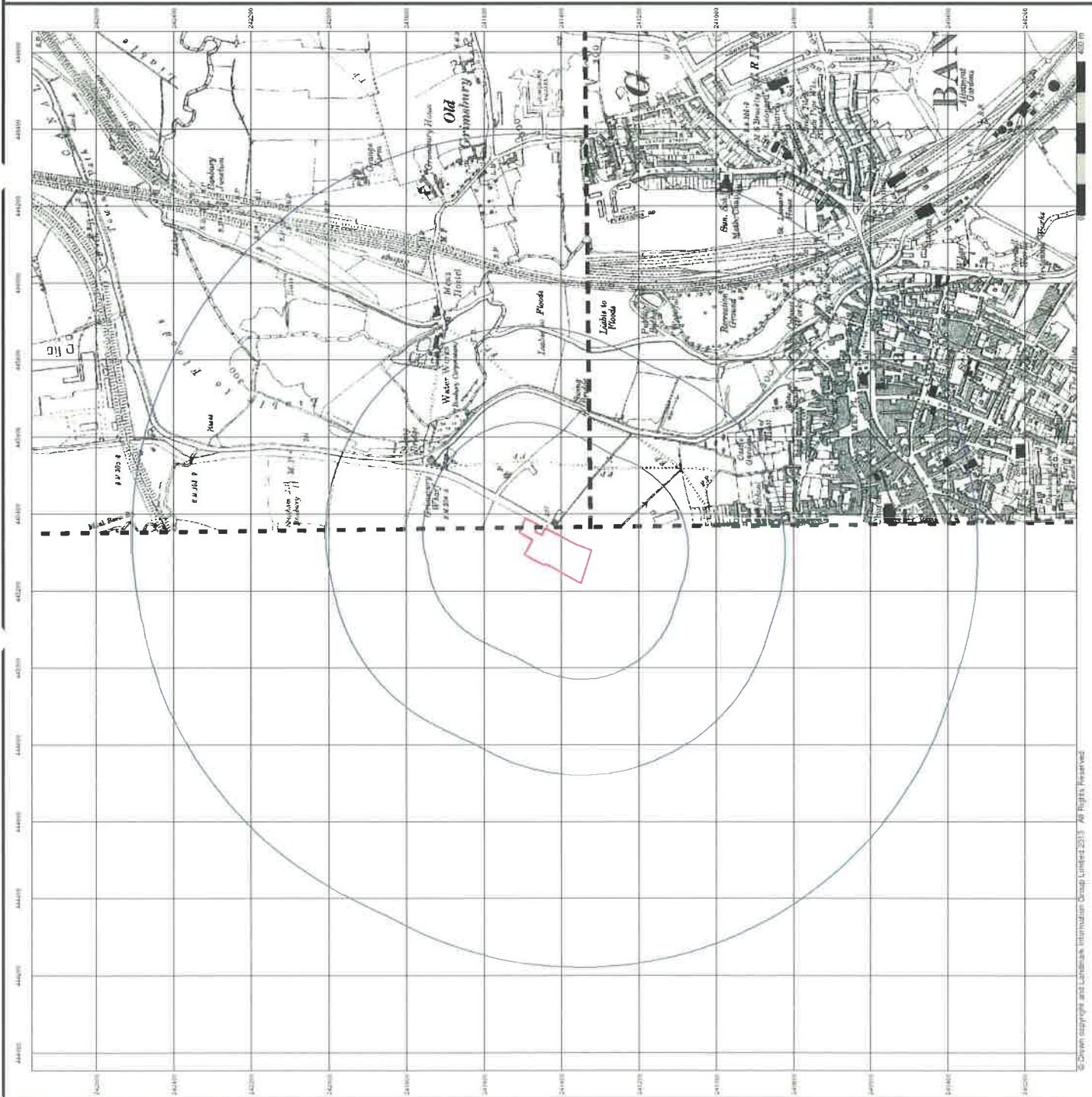


Order Details

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Site Details

Site at: Banbury, Oxfordshire



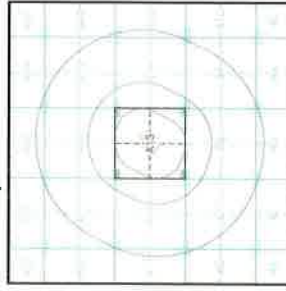
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Map Name(s) and Date(s)

OSNE	1938
1:10,560	
OSSE	1938
1:10,560	

Historical Map - Slice A

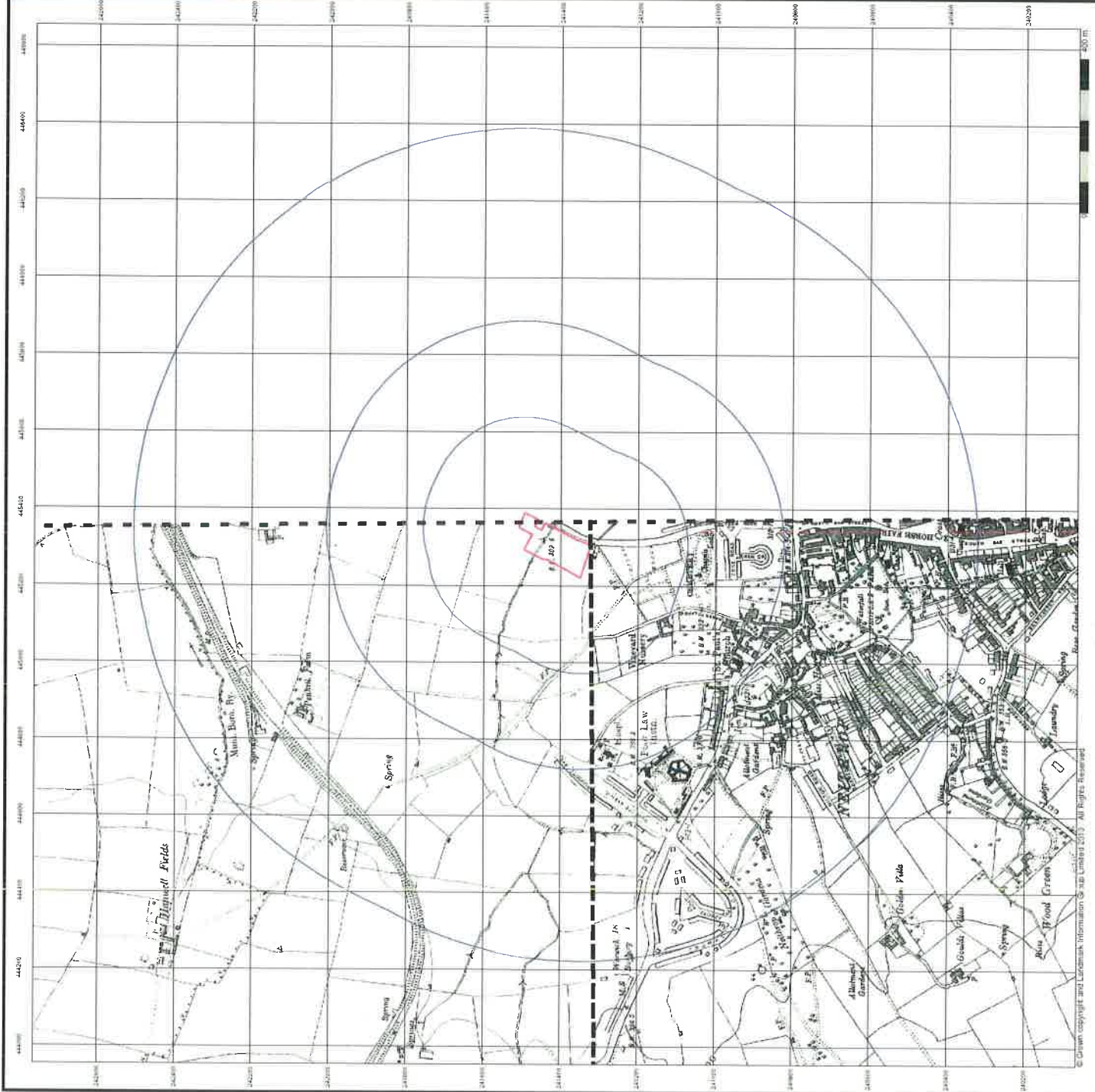


Order Details

Order Number: 62251650_1_1
 Customer Ref: 26004/3501
 National Grid Reference: 445310, 241420
 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 1000

Site Details

Site at, Banbury, Oxfordshire



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Historical Aerial Photography Published 1948

Source map scale - 1:10,560

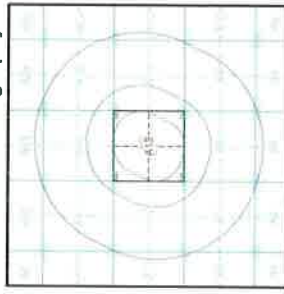
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photographs. These were produced between 1944 and 1951 as an interim measure pending preparation of conventional mapping, due to post war resource shortages. New security measures in the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

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Map Name(s) and Date(s)

SP44SW	SP44SE
1948	1948
1:10,560	1:10,560

Historical Aerial Photography - Slice A



Order Details

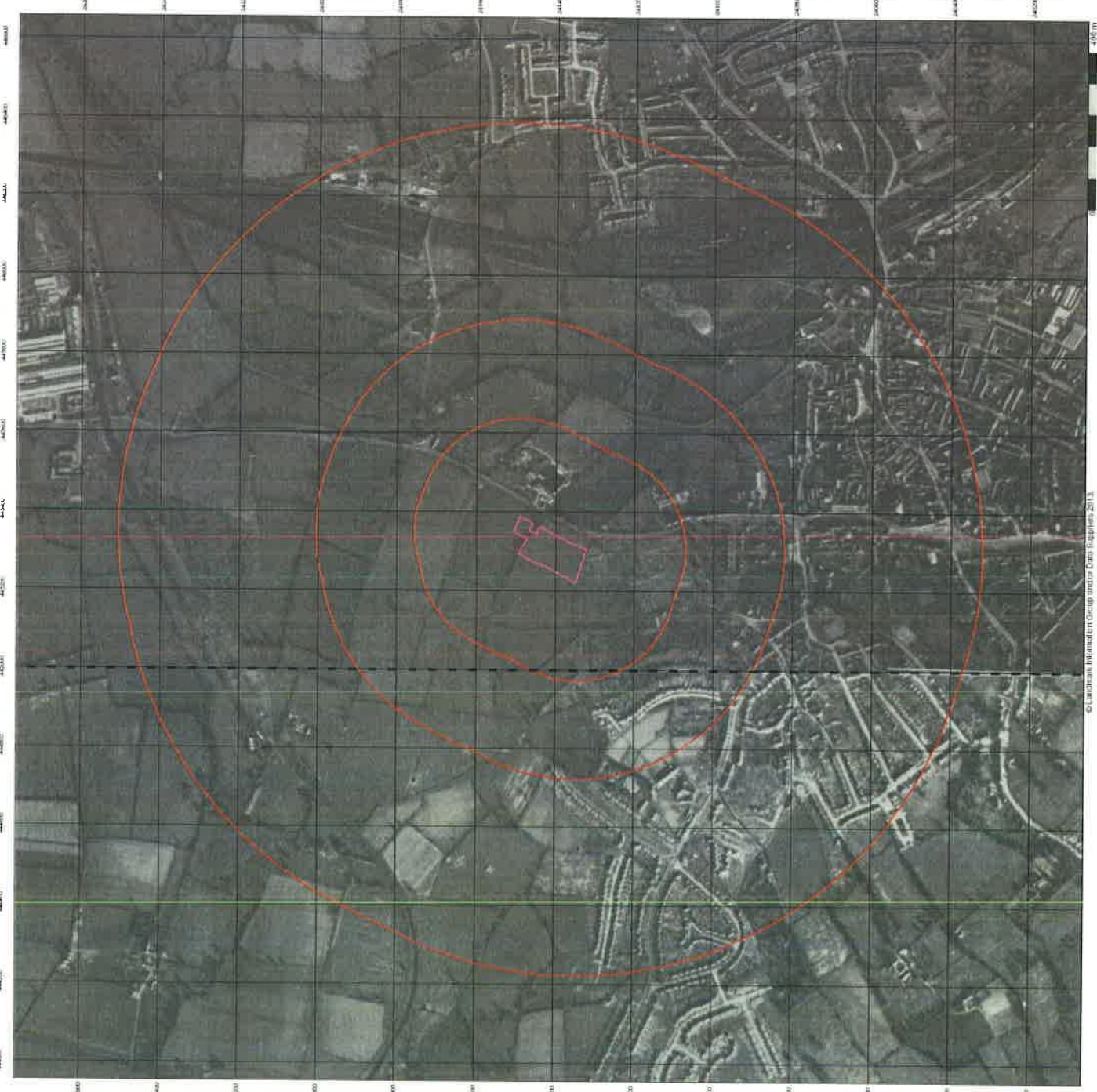
Order Number: 62251650_1_1
 Customer Ref: 260043501
 National Grid Reference: 446310, 241420
 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



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 Web: www.enrrocheck.co.uk

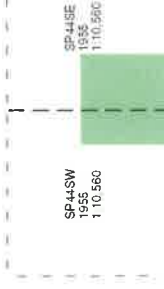


**Ordnance Survey Plan
Published 1955**

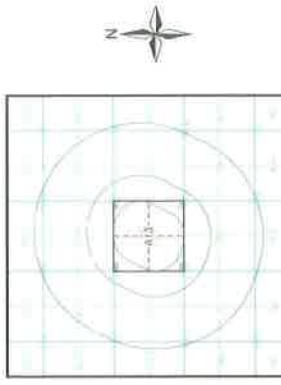
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A

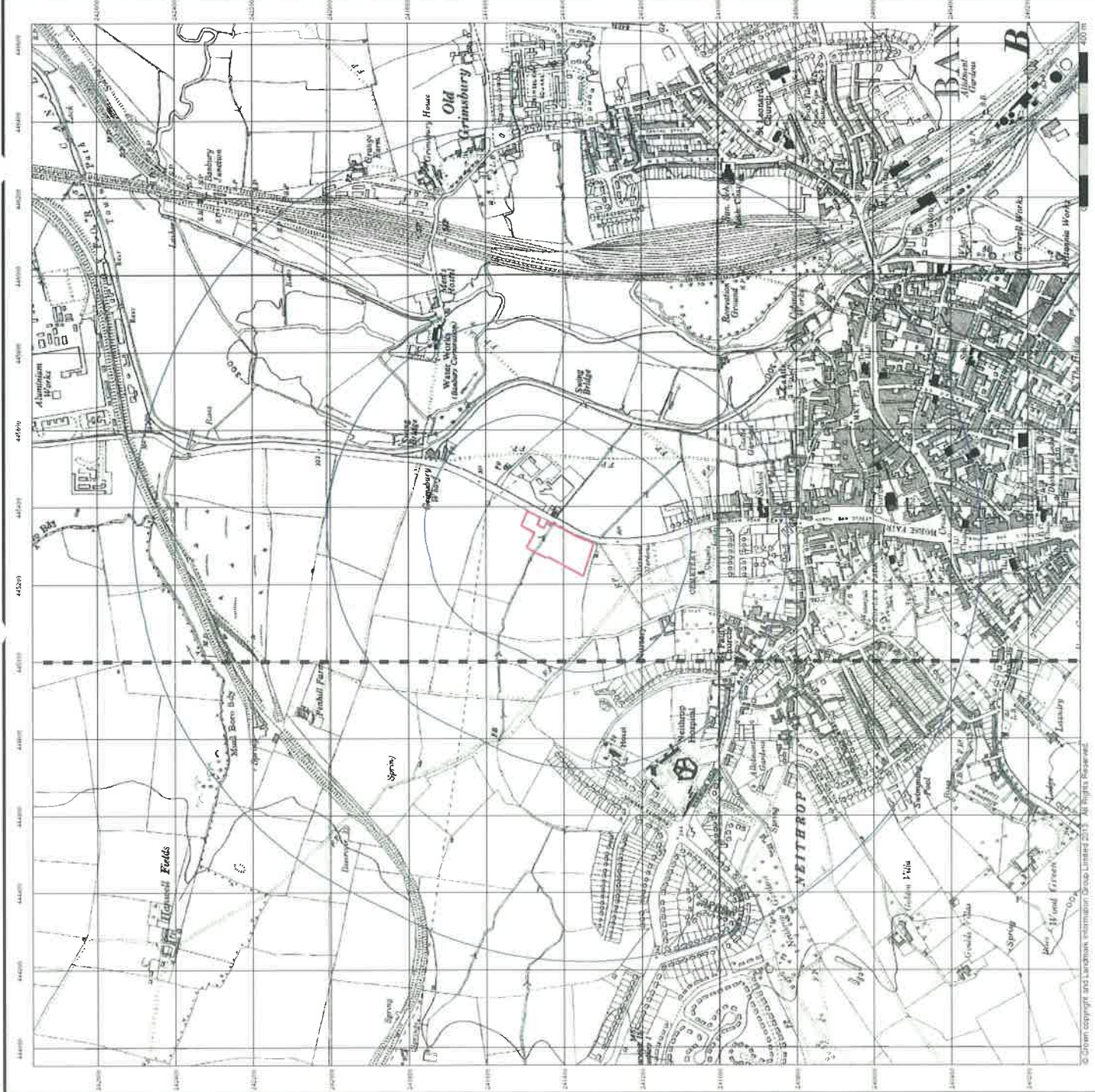


Order Details

Order Number: 62251650_1_1
 Customer Ref: 26004/3501
 National Grid Reference: 445310, 241420
 Slice: A
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 Search Buffer (m): 1000

Site Details

Site at, Banbury, Oxfordshire



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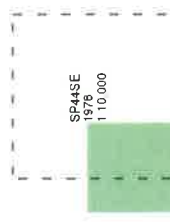


Ordnance Survey Plan Published 1978

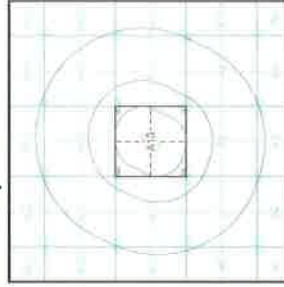
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940's. In 1824 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The maps were updated in 1978, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid References: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 1000

Site Details

Site at, Banbury, Oxfordshire



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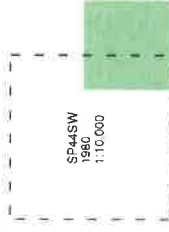


Ordnance Survey Plan Published 1980

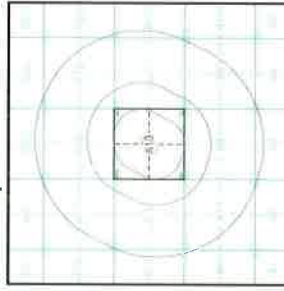
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

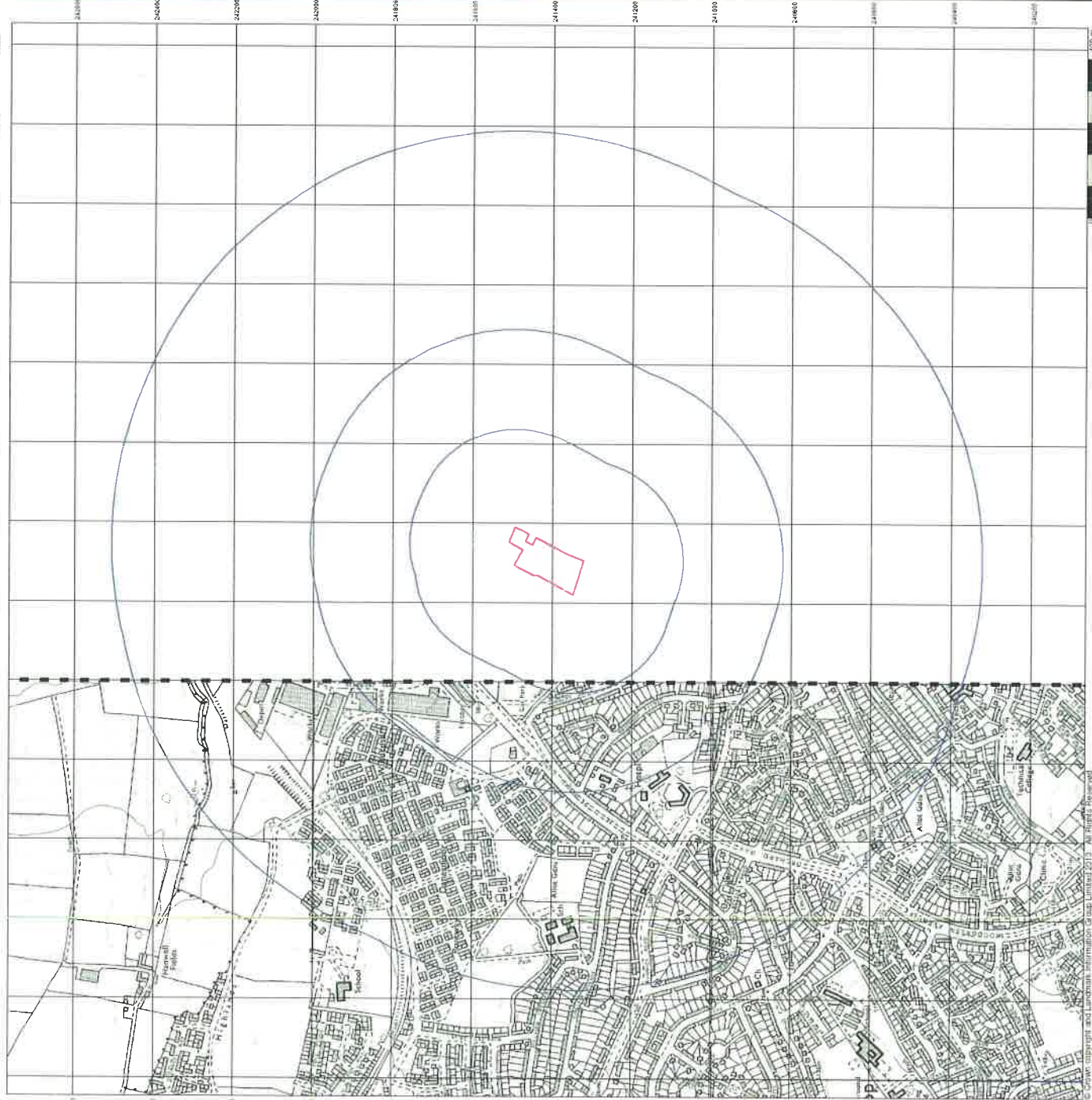
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National Grid Reference: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



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Ordnance Survey Plan Published 1994 - 1995

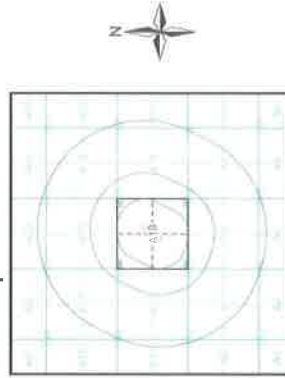
Source map scale - 1:10,000

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

Map Name(s) and Date(s)

SP44SW	1995	1:10,000
SP44SE	1994	1:10,000

Historical Map - Slice A



Order Details

Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 446310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



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Web: www.ornsurvey.co.uk

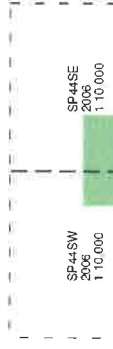


10k Raster Mapping Published 2006

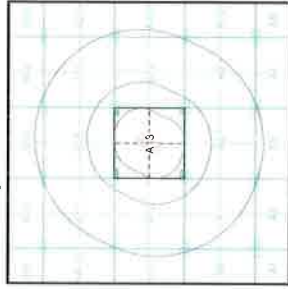
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

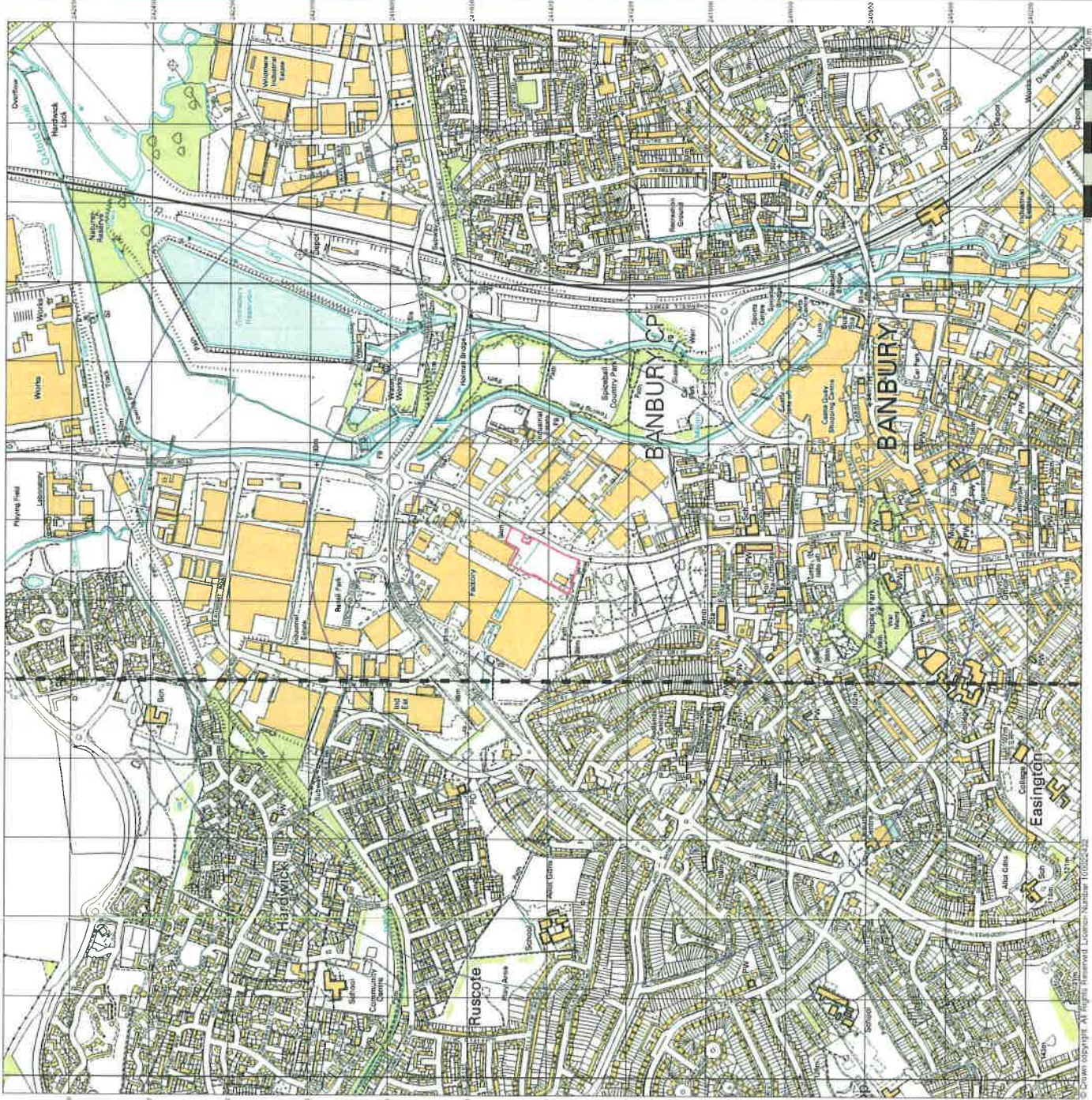
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Customer Ref: 26004/3501
National Grid Reference: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



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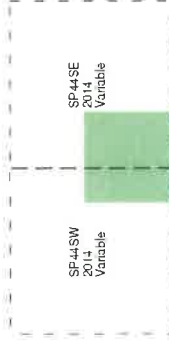


VectorMap Local Published 2014

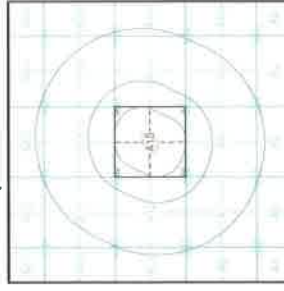
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10,000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

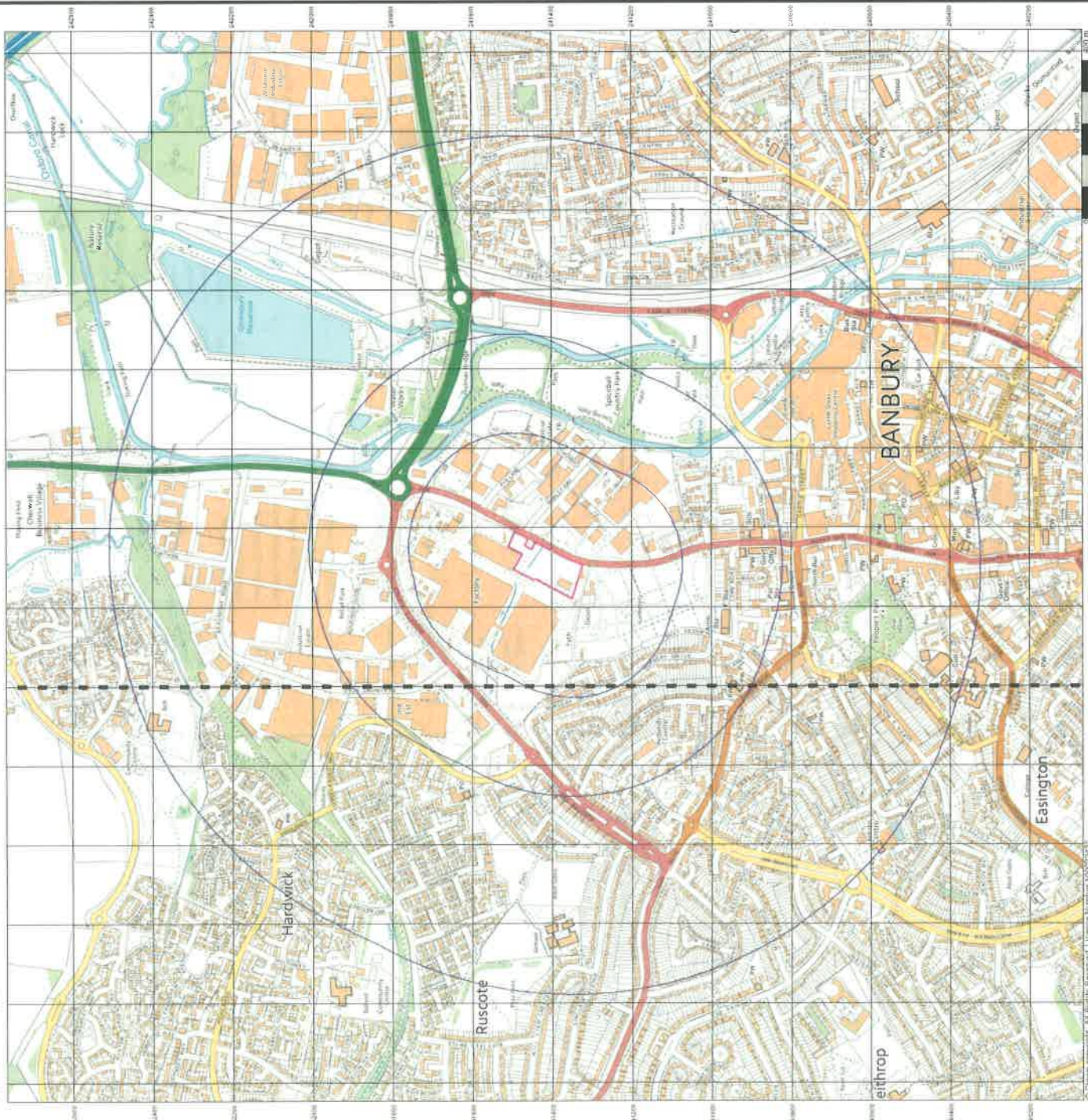
Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



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Historical Mapping Legends

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

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

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

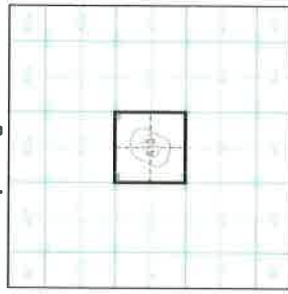
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	PA
Orfordshire	1:2,500	1882 - 1885	2
Northamptonshire	1:2,500	1885	3
Northamptonshire	1:2,500	1900	4
Oxfordshire	1:2,500	1900	5
Northamptonshire	1:2,500	1922	6
Oxfordshire	1:2,500	1922	7
Ordnance Survey Plan	1:1,250	1965 - 1973	8
Ordnance Survey Plan	1:1,250	1970 - 1979	9
Additional SIMs	1:1,250	1978 - 1988	10
Ordnance Survey Plan	1:1,250	1989 - 1990	11
Large-Scale National Grid Data	1:1,250	1991	12
Large-Scale National Grid Data	1:1,250	1993	13
Large-Scale National Grid Data	1:1,250	1994	14
Large-Scale National Grid Data	1:1,250	1995	15

Historical Map - Segment A13



Order Details
 Order Number: 62251650_1_1
 Customer Ref: 2600473501
 National Grid Reference: 445310, 241420
 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 100

Site Details
 Site at: Banbury, Oxfordshire



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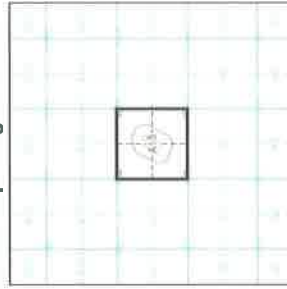
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1939, 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)

005 08	006 05
1882	1882
1:2,500	1:2,500

005 12	006 06
1882	1885
1:2,500	1:2,500

Historical Map - Segment A13



Order Details

Order Number: 62251650_1_1
 Customer Ref: 26004/3501
 National Grid Reference: 445310, 241420

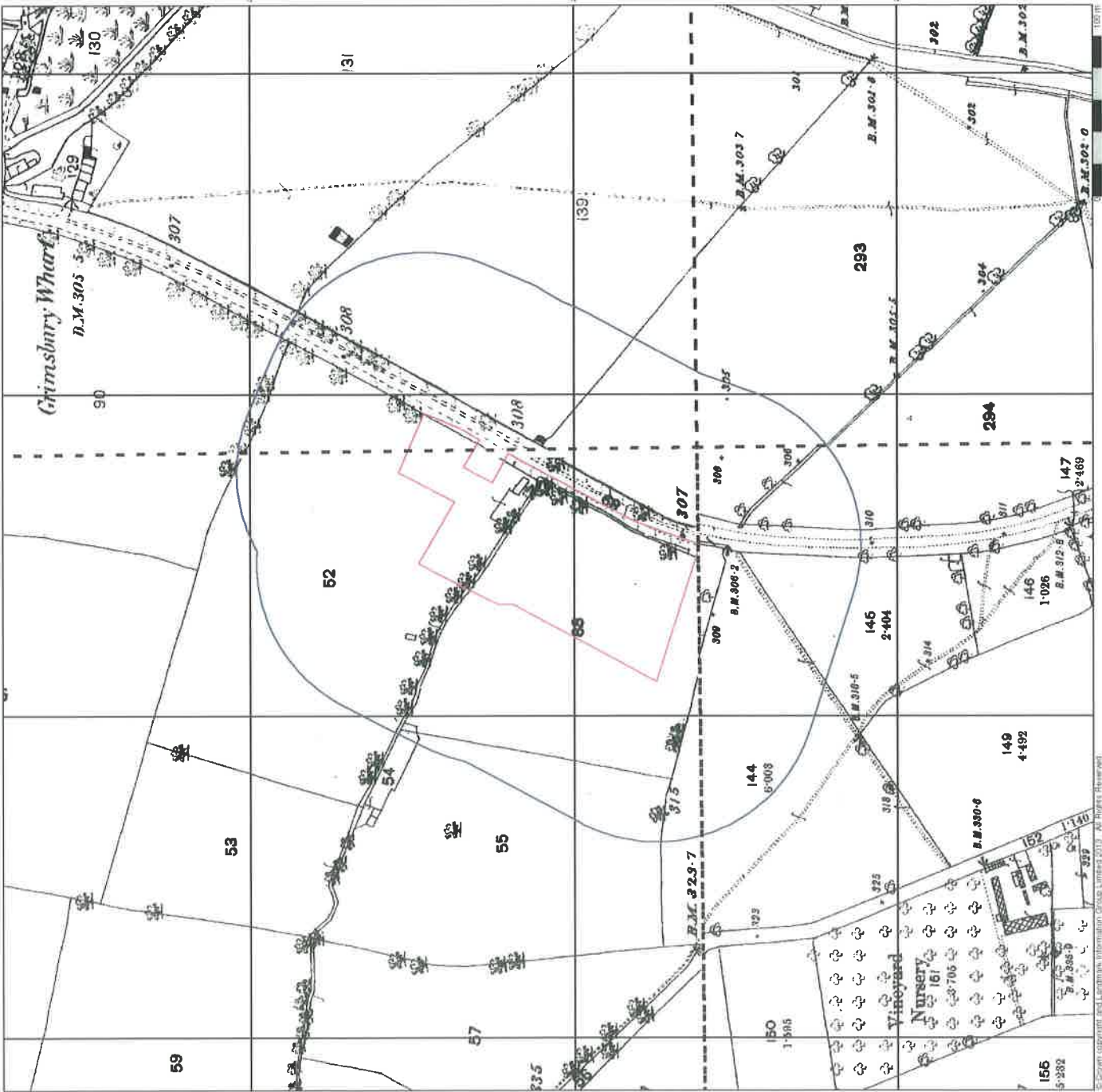
Site: A
 Site Area (Ha): 1.43
 Search Buffer (m): 100

Site Details

Site at, Banbury, Oxfordshire



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Northamptonshire Published 1885

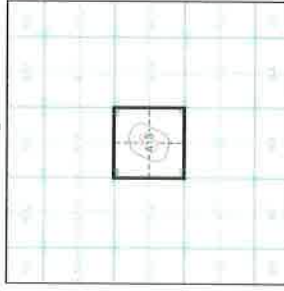
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

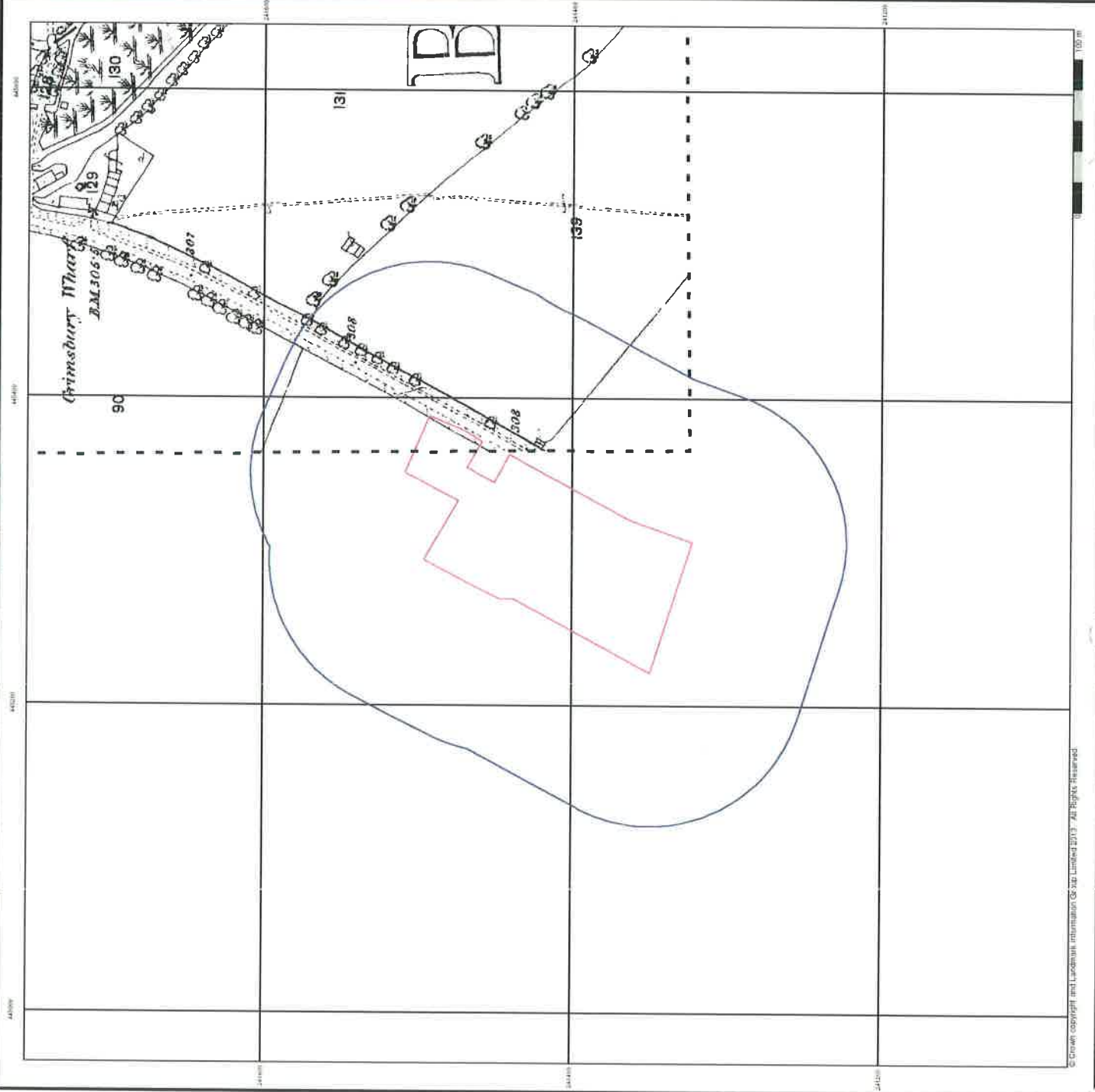
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National Grid Reference: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



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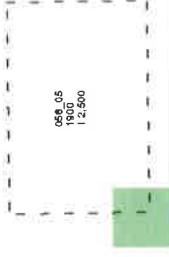


**Northamptonshire
Published 1900**

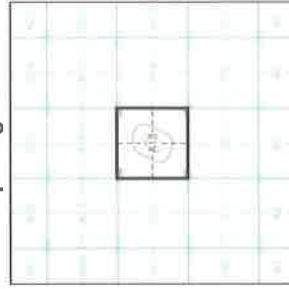
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13

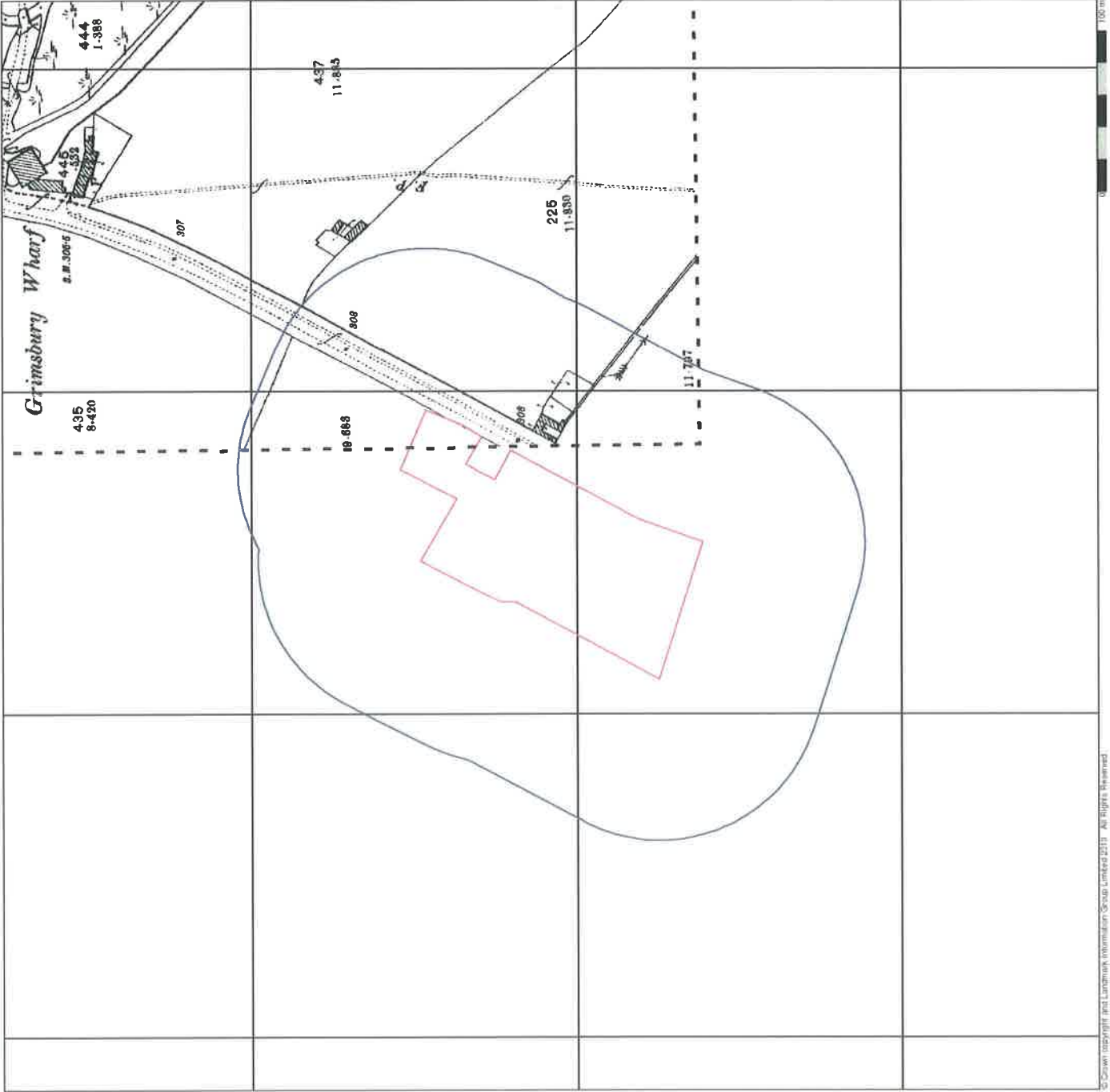


Order Details

Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid References: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at, Banbury, Oxfordshire





Oxfordshire

Published 1900

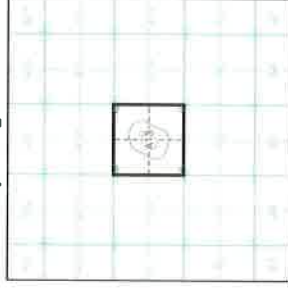
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1895 it covered the whole of what was 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)

005_04	1900	1:2,500
006_04	1900	1:2,500
005_12	1900	1:2,500
006_12	1900	1:2,500

Historical Map - Segment A13



Order Details

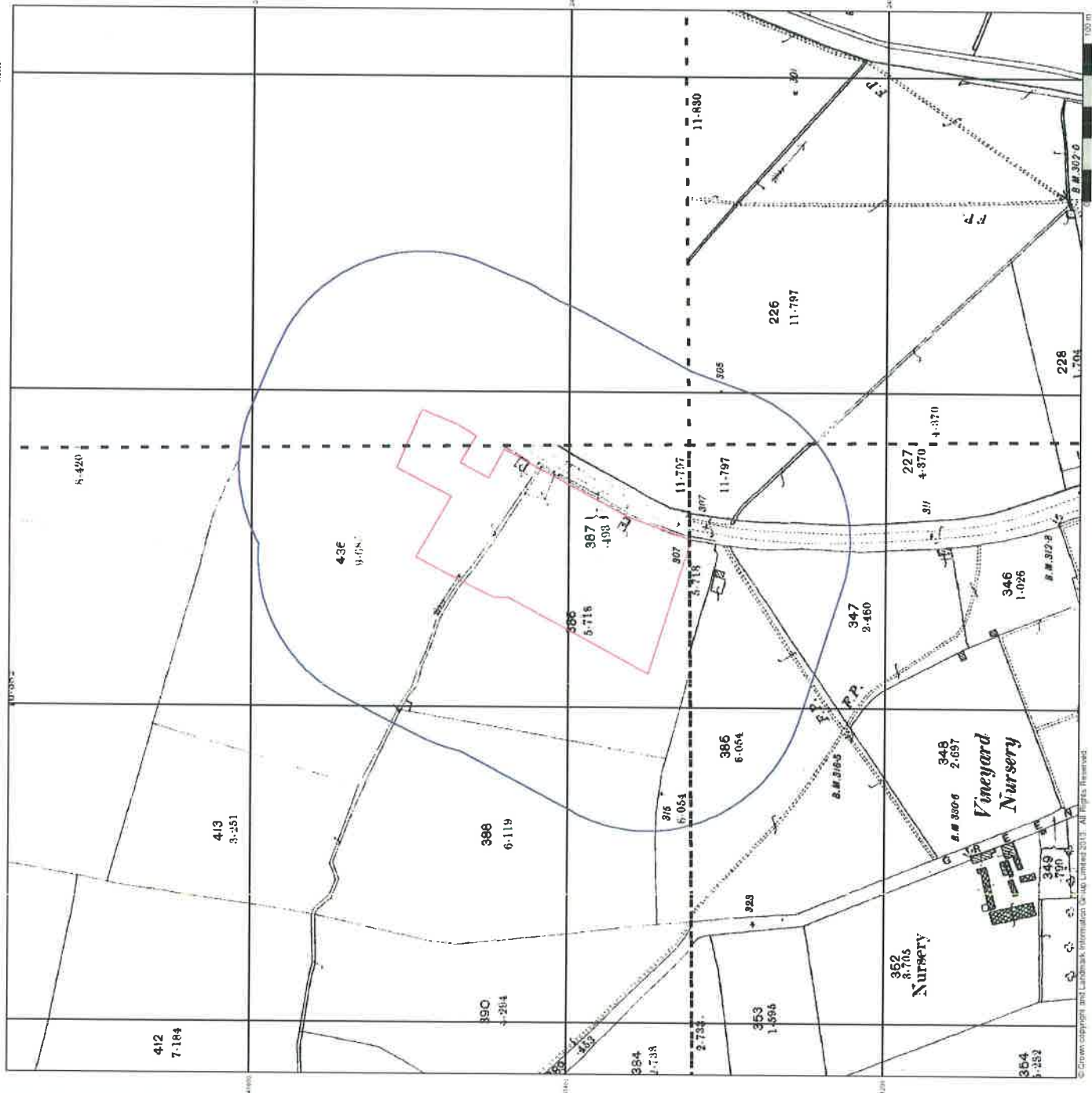
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 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 100

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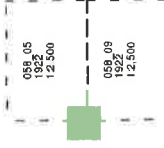
Northamptonshire

Published 1922

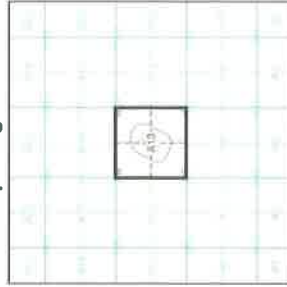
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1856 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



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Oxfordshire

Published 1922

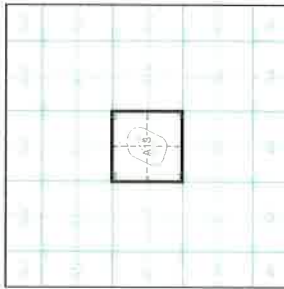
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The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

085.06	1892	1:2,500
085.12	1892	1:2,500

Historical Map - Segment A13



Order Details

Order Number: 62251650.1_1
Customer Ref: 26004/3501
National Grid Reference: 445310, 241420

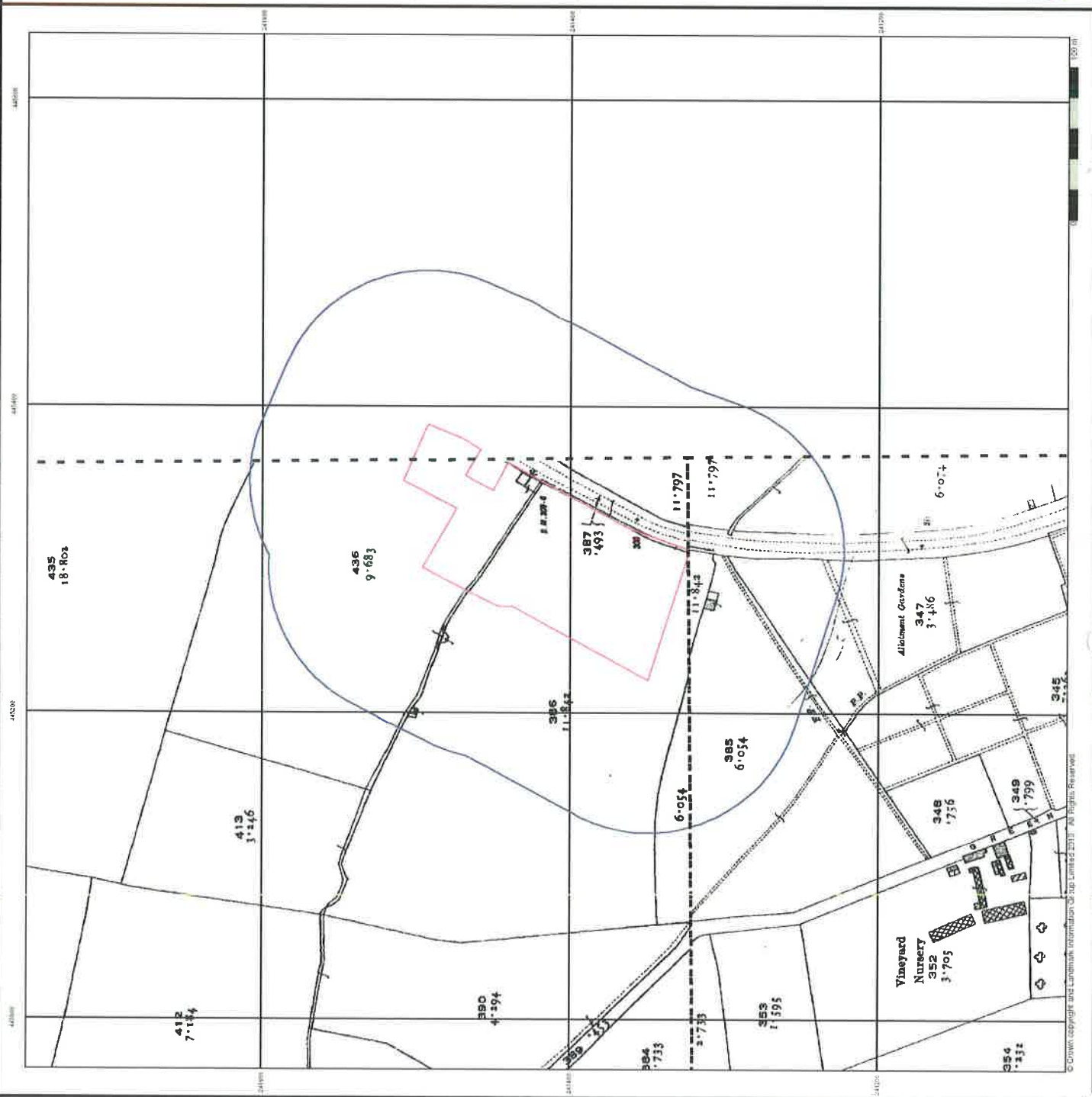
Site: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



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**Ordnance Survey Plan
Published 1965 - 1973**

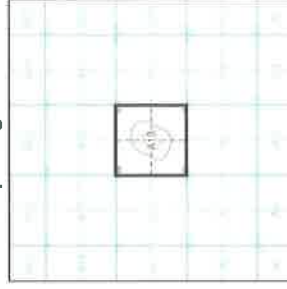
Source map scale - 1:1,250

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 was 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)

SP4441NE 1973 1:1,250	SP4541NW 1965 1:1,250	SP4541NE 1965 1:1,250
SP4441SE 1966 1:1,250	SP4541EW 1965 1:1,250	SP4541SE 1965 1:1,250

Historical Map - Segment A13



Order Details

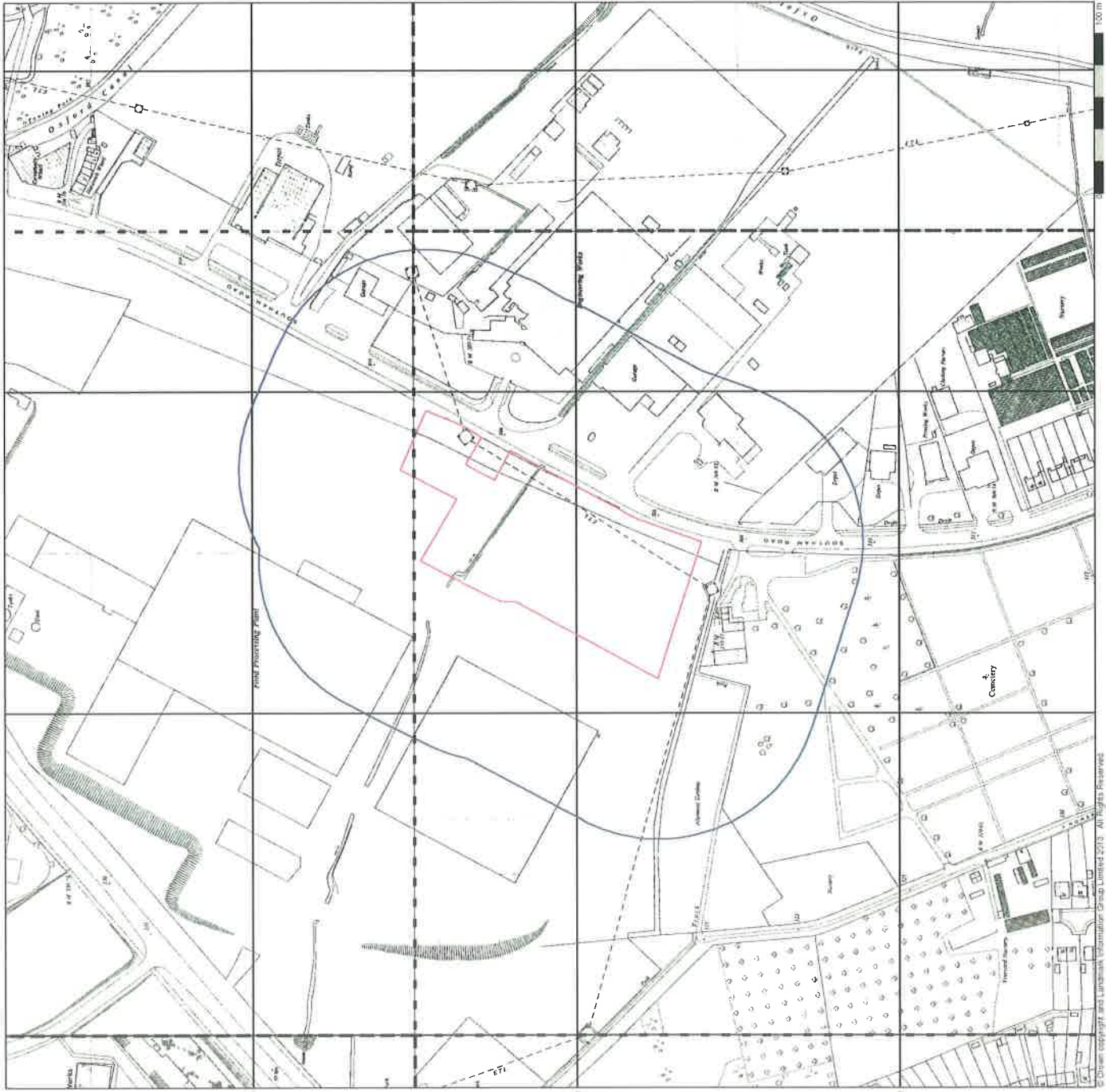
Order Number: 62251650_L1
 Customer Ref: 26004/3501
 National Grid Reference: 445310, 241420
 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 100

Site Details

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Ordnance Survey Plan Published 1970 - 1979

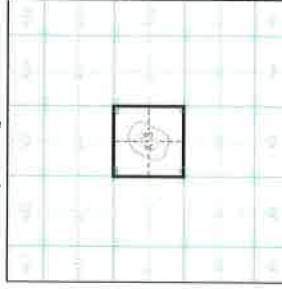
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1940'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)

SP441NE 1970 1:1,250	SP441NW 1970 1:1,250	SP441NE 1970 1:1,250
SP441SE 1970 1:1,250	SP441SW 1970 1:1,250	SP441E 1970 1:1,250

Historical Map - Segment A13



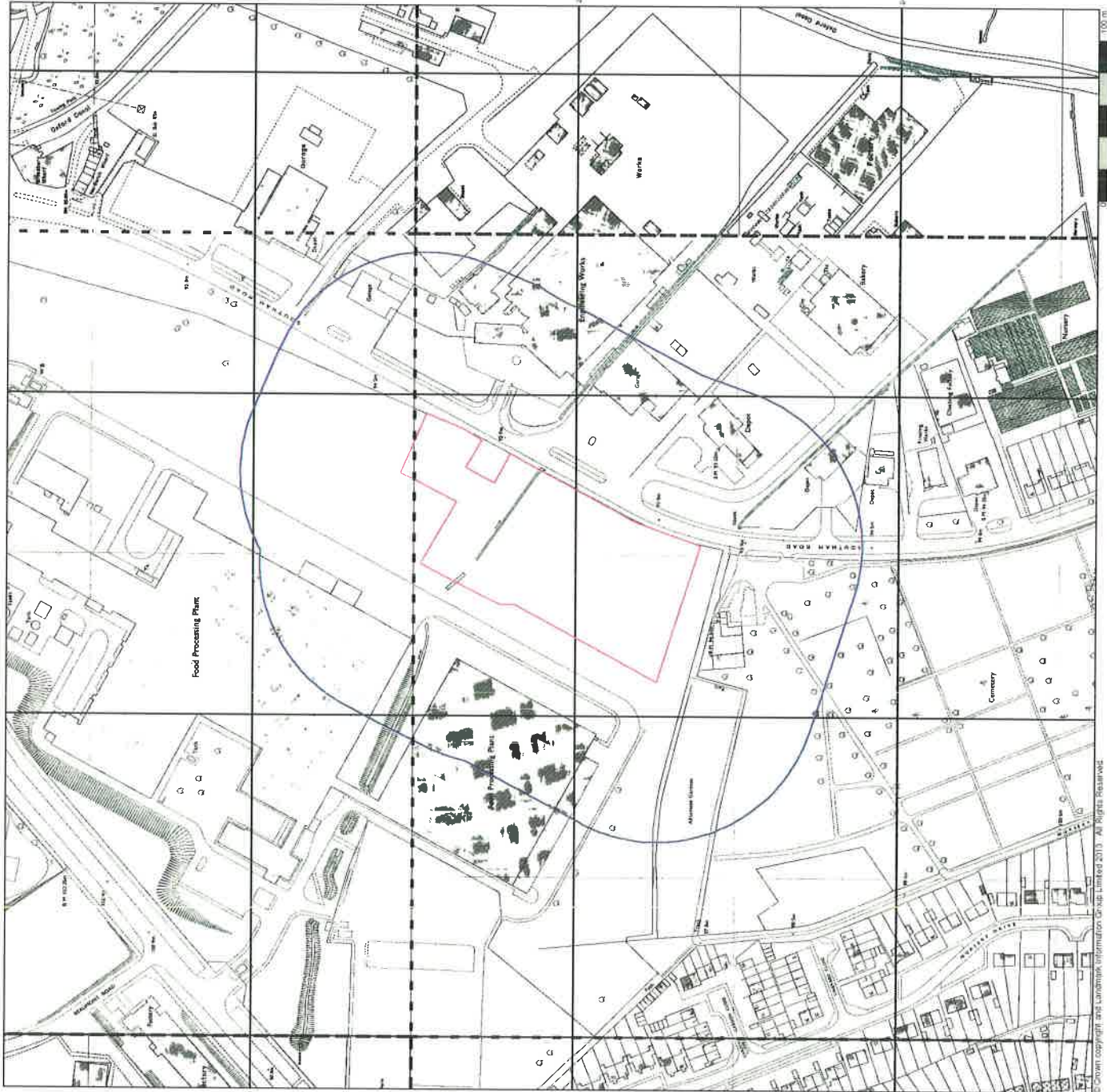
Order Details

Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 445310, 241420

Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



Tel: 0844 844 9952
Fax: 0844 844 9957
www.earthtrack.co.uk





Additional SIMS

Published 1978 - 1988

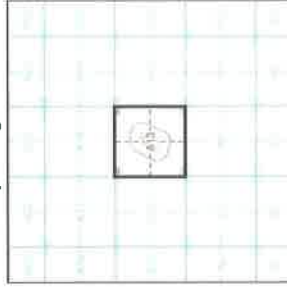
Source map scale - 1:1,250

The SIM cards (Ordinance 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)

SP4441NE	1978	1:1,250
SP4541NW	1985	1:1,250
SP4541NE	1987	1:1,250
SP4441SE	1988	1:1,250
SP4441SW	1988	1:1,250
SP4541SE	1988	1:1,250

Historical Map - Segment A13



Order Details

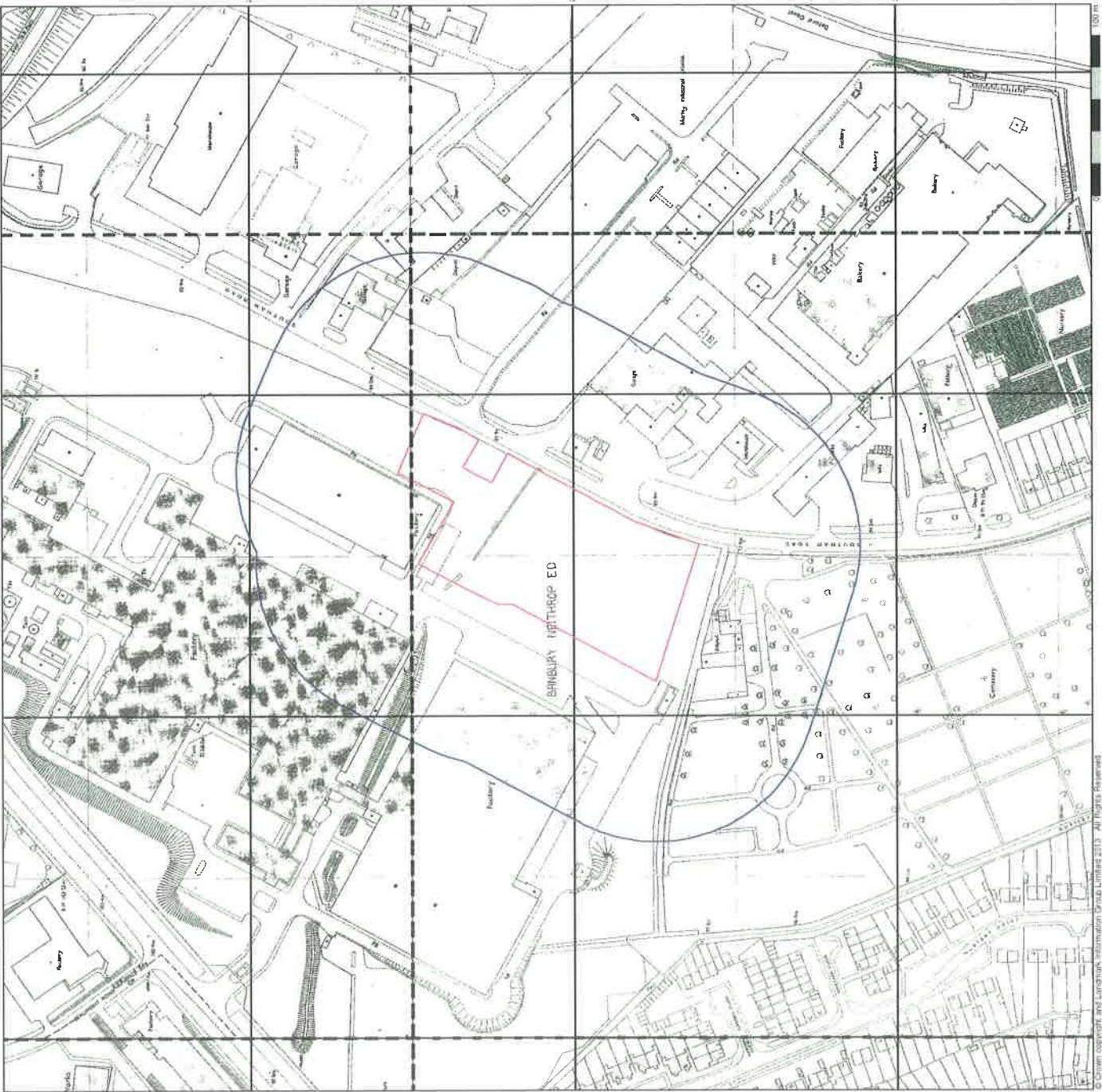
Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 446310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at, Banbury, Oxfordshire



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Fax 0844 844 8951
Web www.enhrocheck.co.uk





Additional SIMS

Published 1989 - 1990

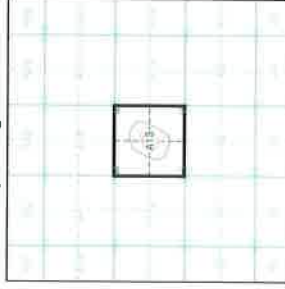
Source map scale - 1:1,250

The SIM cards (Chance 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 1984, 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)

SP441NE	SP441NW	SP441SE
1989	1989	1989
1:1,250	1:1,250	1:1,250

Historical Map - Segment A13

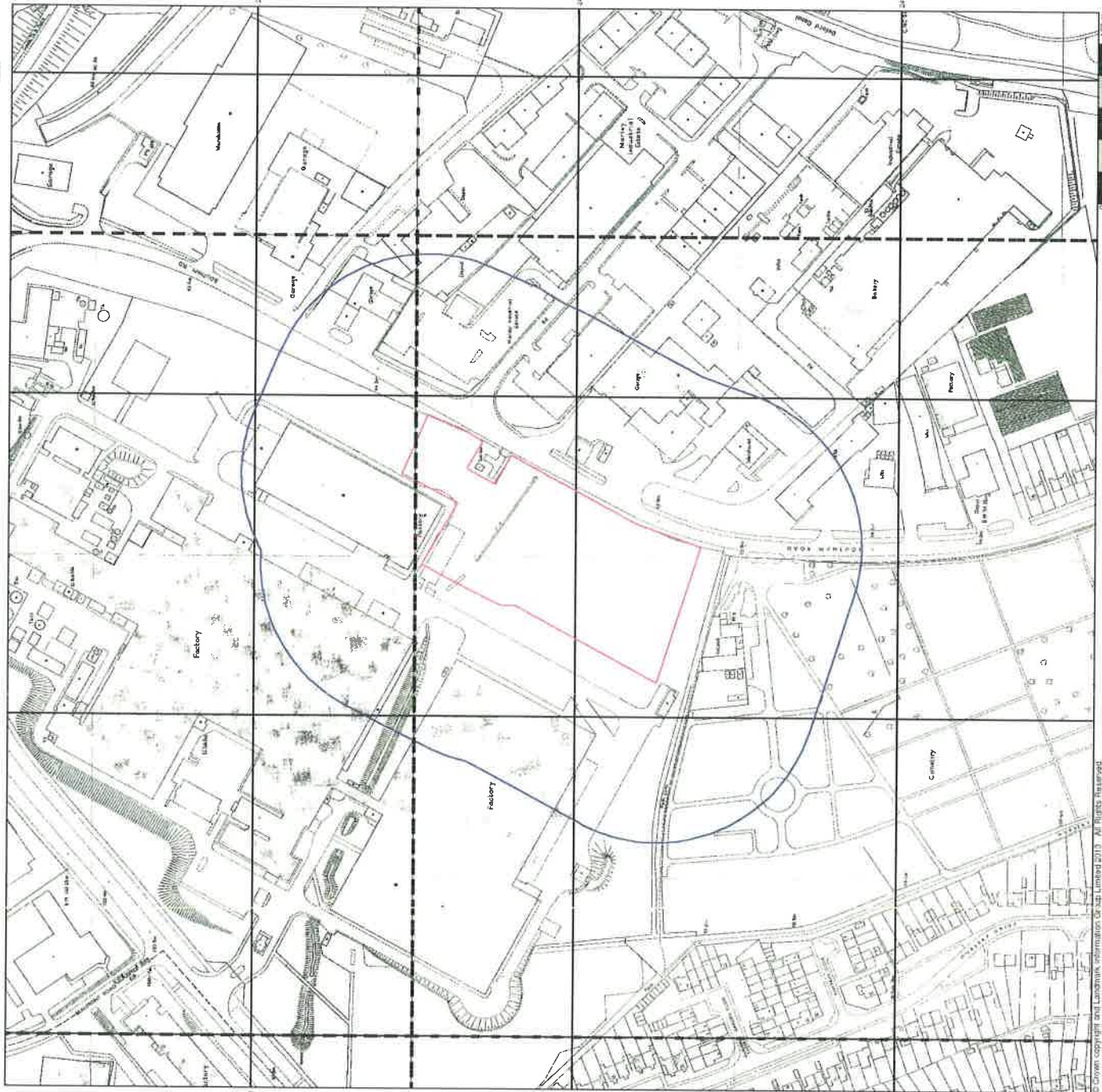


Order Details

Order Number: 62251650_1_1
Customer Ref: 260043501
National Grid Reference: 445310, 241420
Site: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



Tel: 0844 844 9552
Fax: 0844 844 9551
Web: www.enrichcheck.co.uk



Ordnance Survey Plan Published 1991

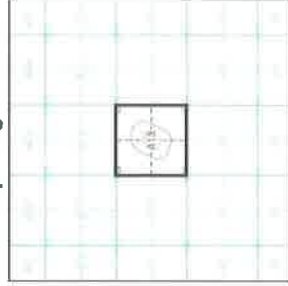
Source map scale - 1:1,250

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 1939, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

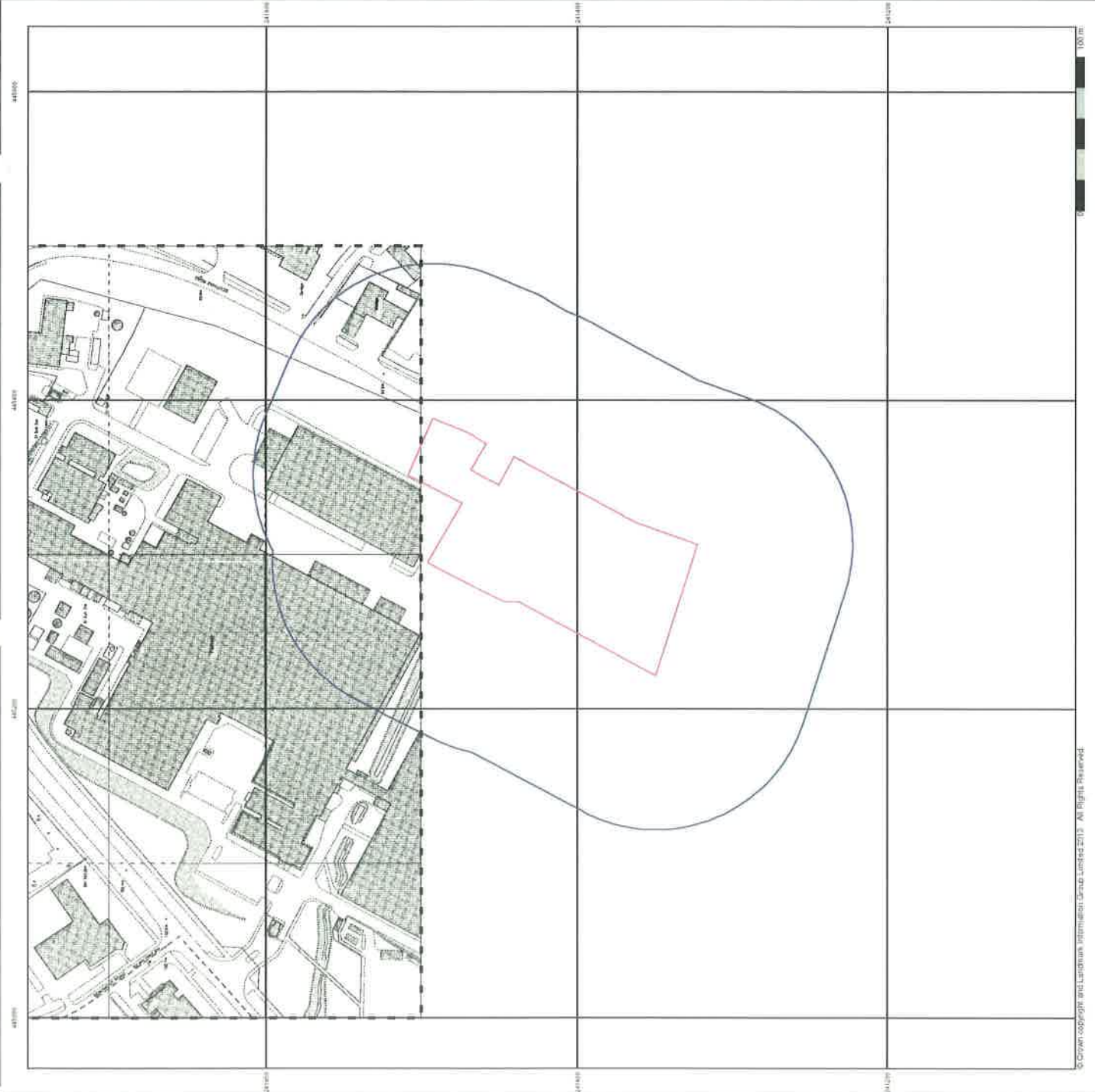
Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



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Fax: 01444 844 8851
Web: www.enrcheck.co.uk





Large-Scale National Grid Data Published 1993

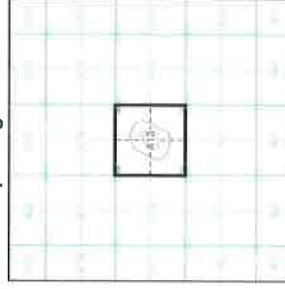
Source map scale - 1:1,250

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 forerunners 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)

SP4441 NE	1993	1:1,250	SP4541 NE	1993	1:1,250
SP4441 SE	1993	1:1,250	SP4541 SE	1993	1:1,250

Historical Map - Segment A13



Order Details

Order Number: 62251650_1_1
Customer Ref: 2600043501
National Grid Reference: 445310, 241420

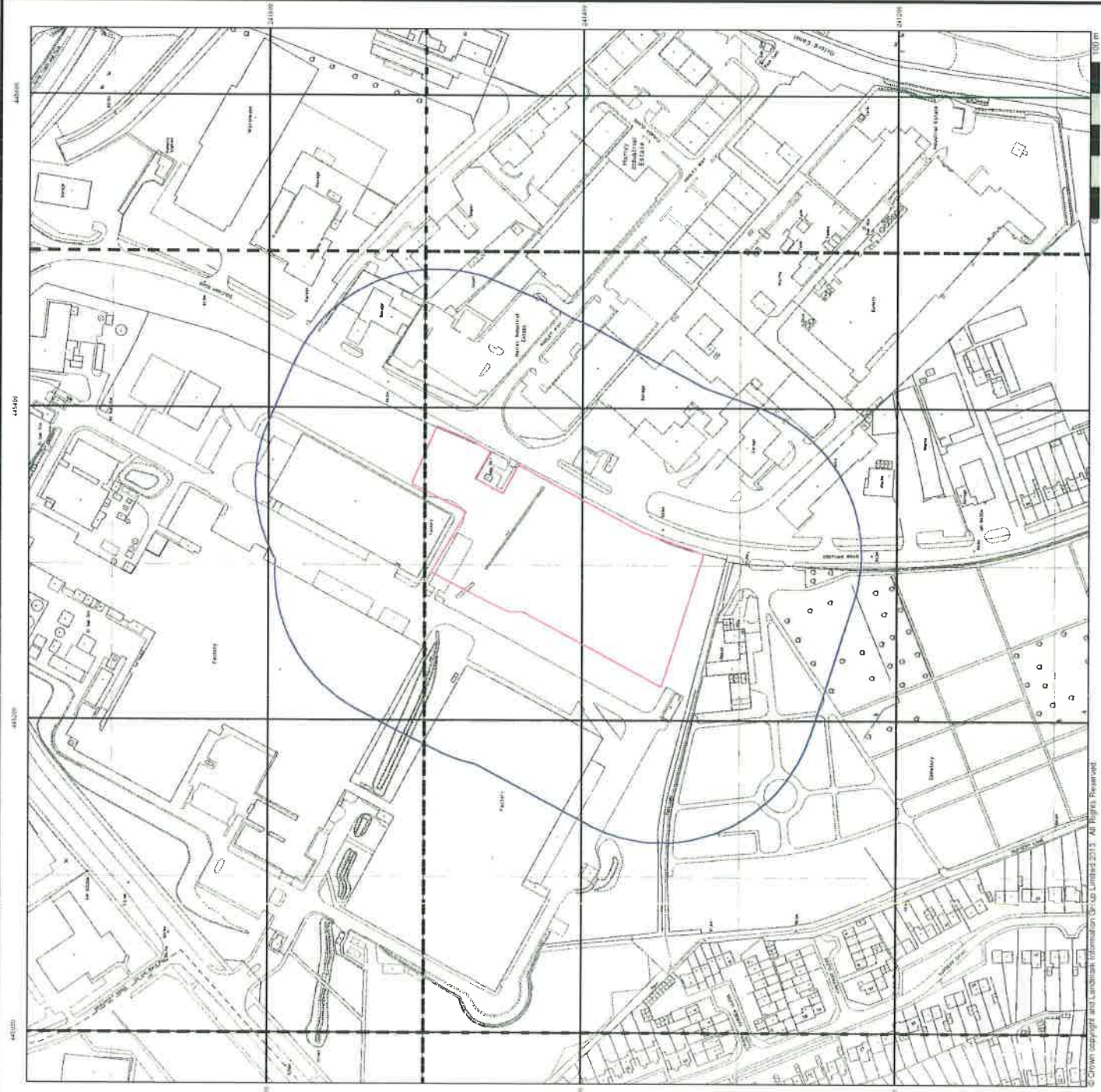
Site: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



Tel: 0844 844 9852
Fax: 0844 844 9851
Web: www.enrocheck.co.uk



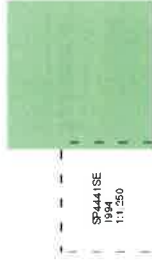


Large-Scale National Grid Data Published 1994

Source map scale - 1:1,250

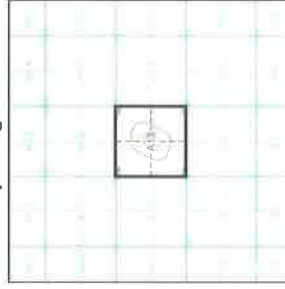
Large Scale National Grid Data, superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic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

Map Name(s) and Date(s)



SP4441SE
1994
1:1,250

Historical Map - Segment A13



Order Details

Order Number: 62251660_1_1
Customer Ref: 26004/3501
National Grid References: 446310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at: Banbury, Oxfordshire



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

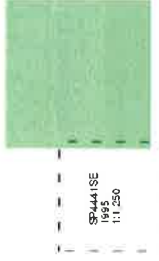


Large-Scale National Grid Data Published 1995

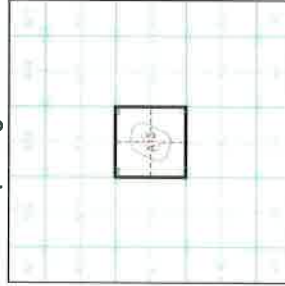
Source map scale - 1:1,250

'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 forerunners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 62251650_1_1
Customer Ref: 26004/3501
National Grid Reference: 445310, 241420
Slice: A
Site Area (Ha): 1.43
Search Buffer (m): 100

Site Details

Site at, Banbury, Oxfordshire



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Fax 0844 844 9851
Web www.enrrobeck.co.uk

Appendix D Landmark Envirocheck Report

Groundwater Vulnerability

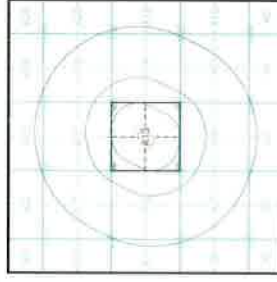
- General**
- Specified site
 - Specified Butler(s)
 - Map ID
 - Specified Reference Point
 - Slice

Agency and Hydrological

Soil Classes

- Major Aquifer (Highly Permeable)**
- High (H) 1, 2, 3, U
 - Intermediate (I) 1, 2
 - Low
- Minor Aquifer (Variably Permeable)**
- High (H) 1, 2, 3, U
 - Intermediate (I) 1, 2
 - Low
- Non Aquifer (Negligibly Permeable)**
- Water or Sea
 - Drift Deposit

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 92251650_1_1
 Customer Ref: 26004/3501
 National Grid Reference: 446310, 241420
 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



Tel: 0444 944 9221
 Fax: 0444 944 9051
 Email: sales@landmark.co.uk



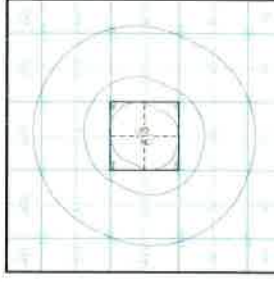
Superficial Aquifer Designation

- General**
- Specified Site
 - Specified Buffer(s)
 - Bearing Reference Point
 - Map ID

Agency and Hydrological Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown

Site Sensitivity Context Map - Slice A



Order Details

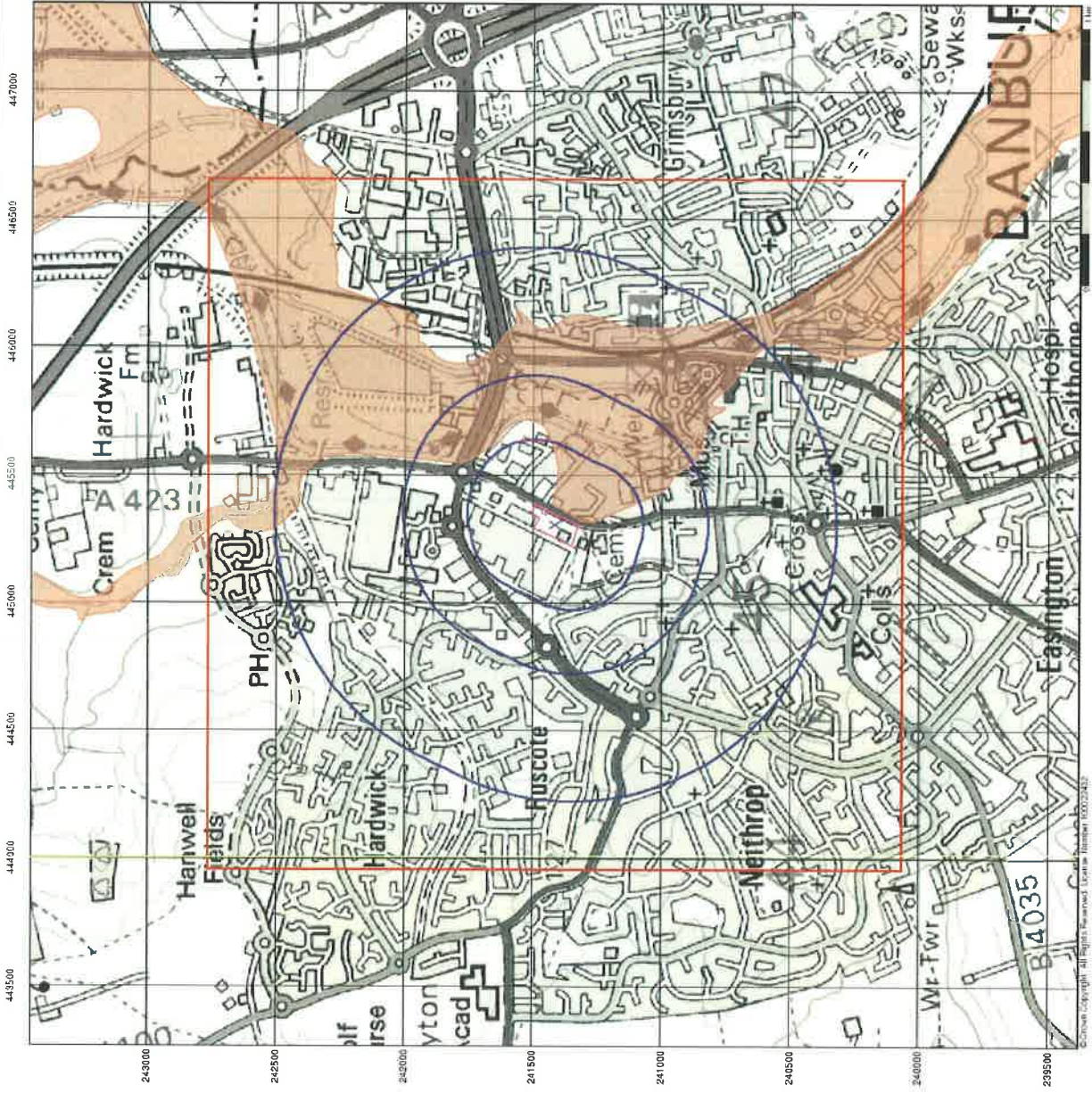
Order Number: 62251650_1-1
 Customer Ref: 26004/3501
 National Grid Reference: A 446310, 241420
 Slice: A
 Site Area (Ha): 1.43
 Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire



Tel: 0844 844 8552
 Fax: 0844 844 8551
 Web: www.envischeck.co.uk

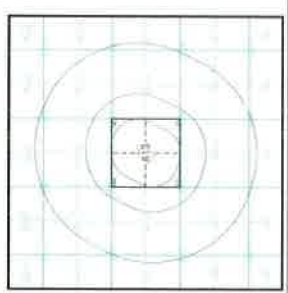


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Sensitive Land Uses

- General**
- Specified Site
 - Specified Buffer(s)
 - Map ID
 - Bearing Reference Point
- Sensitive Land Uses**
- Area of Adopted Green Belt
 - Area of Outstanding Natural Beauty
 - Environmentally Sensitive Area
 - Forest Park
 - Local Nature Reserve
 - Marine Nature Reserve
 - National Nature Reserve
 - National Park
 - Nitrate Sensitive Area
 - Nitrate Vulnerable Zone
 - Ramsar Site
 - Site of Special Scientific Interest
 - Special Area of Conservation
 - Special Protection Area

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 62251650_L1
 Customer Ref: 26004/3501
 National Grid Reference: 445310, 241420
 Slice: A
 Site Area (-he): 1.43
 Search Buffer (m): 1000

Site Details

Site at: Banbury, Oxfordshire

