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Appendices

Appendix – Historical Map Index – Ordnance Survey



1 Introduction

- 1.1 Brookbanks is appointed by Barwood Development Securities Ltd to complete a Phase 1 Geo-Environmental Desk Study for a proposed residential development at Land at Gosford.
- 1.2 The objective of the study is to research the likely geotechnical and chemical characteristics of the soil and ground water environment.
- 1.3 This application is only for the allocation shown as a red line boundary in the report. However, for completeness and a robust assessment, searches for land contamination were completed for a wider allocation. Therefore, the purple boundary shown from the Envirocheck, is the search area and the redline is the area considered in detail within this report. This occurs on figures 5-1, 6-1, 7-1 through 3 and also the historically mapping appendices.
- 1.4 This Report also considers the *PR7a Land South East of Kidlington Development Brief Draft for Consultation documentation* of October 2021 and *The Cherwell Local Plan 2011-2031 (Part I) Partial Review* of September 2020.



2 Background Information

Location and Details

- 2.1 The proposed development lies to the south east of the village of Kidlington and is approximately 27.75ha.
- 2.2 The Site is bound to the north by existing agricultural land/fields and to the east by agricultural fields, Water Eaton Lane and the A34. The south of the Site is bound by Oxford Road and the west to Bicester Road. A cemetery is situated adjacent to the north-west of the Site, off Bicester Road.
- 2.3 The site is currently undeveloped agricultural land and the land is not thought to have been historically subject to any significant built development. The Site location and boundary is shown indicatively on **Figure 2-1**, below:

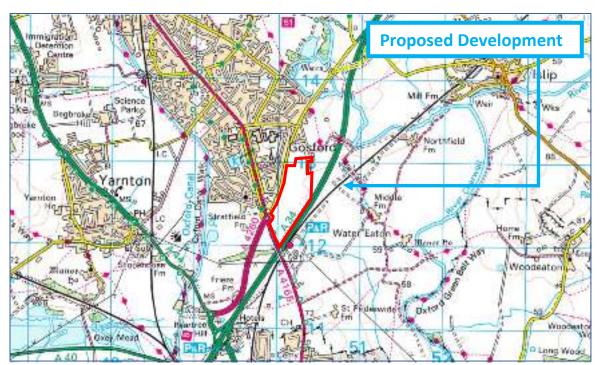


Figure 2-1: Site Location

Development Criteria

2.4 The following development is proposed at the site:

'Outline planning application for the development of up to 370 homes, public open space (including play areas and woodland planting), sports pitches and pavilion, drainage and engineering works, with all matters reserved (appearance, landscaping, layout and scale) except for vehicular and emergency accesses to Bicester Road'.



Sources of Information

2.5 The following bodies were consulted during the study:

Environmental Matters - Environment Agency

2.6 The following information has been gathered during the study:

• Environmental Search - Landmark Envirocheck Report, November 2020

Published Geology
 British Geological Survey (BGS), National

Geoscience Information Service (NGIS)

• UXO Pre-desk Study Assessment - Zetica UXO, November 2020



3 Historical Site Uses

- 3.1 In appraising the Site history, published Ordnance Survey maps have been reviewed dating from 1884 up to the present day. A selection of large scale maps used in this report, are contained within the Appendix
- 3.2 Inspection of the Ordnance Survey maps has revealed that since 1884, the Site has largely remained undeveloped.
- 3.3 The surrounding area is shown to include a few potentially contaminative land uses. Since 1960, the A43 has been built, along with the A34 in 1992. The expansion of Gosford was shown from 1969, along with associated amenities.
- 3.4 The historical activities described above, and further activities shown within the surrounding area are presented in **Table 3-1**.
- 3.5 The following potentially significant contaminative land uses are on or within close proximity of the site and will be further assessed within Section 10: **Agricultural**, **Roads** (**A34 and A43**) and a **Railway Line**.

Site Use / Activity	Date First Shown	Date Last Shown	Approximate Distance (m)	Direction
A43	1960	Still Present	Bounds	West
A34	1992	Still Present	Bounds	East
Railway Line	1884	Still Present	25	South East
Gosford Expansion	1969	Still Present	25	West
Golf Course	1947	Still Present	250	South

Table 3-1: Onsite and Offsite Historical Site Uses



4 Recent & Current Site Usage

4.1 The Site are shown as currently undeveloped. The historical map search suggests that the land has previously been set as agricultural land.



5 Ground Conditions

Geology

5.1 With reference to the BGS map, the entire Site is shown to be underlain by mudstone of the Oxford Clay Formation and West Walton Formation (Undifferentiated). The north-eastern corner of the Site includes for superficial Alluvium deposits, comprising clay, silt, sand and gravel. This is illustrated in **Figure 5-1**:



Figure 5-1: BGS Published Combined Geology

- 5.2 There are no areas of Artificial Ground/ Made Ground or Landslip areas reported on Site.
- 5.3 BGS records include the following ratings for a number of potential ground stability hazards on or within 250m of the Site boundary:

Collapsible ground stability:

Compressible ground:

No Hazard* / Very Low*

No Hazard* / Moderate*

Ground Dissolution: No Hazard*

Landslide: Very Low*

Running Sand: No Hazard* / Low*

Shrinking & Swelling Clay: Moderate*

*stability hazard reported on Site

Mining

- 5.4 The Site is reported to be in an area that might not be affected by **Coal Mining**.
- 5.5 The Site is not reported to be in an area situated within a **Non-Coal Mining Area of Great Britain**.



- 5.6 The Site is not reported to be in an area affected by **Natural Cavities**, **Man-Made Mining Cavities** or **Mining Instability**.
- 5.7 There is one **BGS Recorded Mineral Site** recorded within 1,000m of the Site boundary. Hanson Aggregates operates the process of quarrying of hard rock into crushed rock at Banbury Road Rail Depot, approximately 117m east of the Site.

Radon

- 5.8 The Site is shown to be situated within a lower probability area affected by radon, where less than 1% of homes are above the action level.
- 5.9 It is reported that no radon protection measures are necessary for the construction of new developments within the Site.

Estimated Soil Chemistry

5.10 The Envirocheck report provides the following estimated soil chemistry* on Site, whereby the soil is described as 'rural'.

Potentially Harmful Elements	BGS Estimated Soil Chemistry Concentration (mg/kg)
Arsenic	15 – 35
Cadmium	< 1.8
Chromium	90 – 120
Lead	<100 – 200
Nickel	30 – 45

Table 5-1: BGS Estimated Soil Chemistry

5.11 If required at the detailed design stage, confirmation of the existing site specific soil chemistry can be established via a Phase II ground investigation.

^{*} The British Geological Survey (BGS) Estimated Soil Chemistry dataset provides modelled estimates of ambient background concentrations of Potentially Harmful Elements (PHE) in topsoil: Arsenic (As), Cadmium (Cd), Chromium (Cr), Nickel (Ni) and Lead (Pb). The data has been created by combining high resolution geochemical data (from the BGS G-BASE and Imperial College Wolfson geochemical survey database) and the soil parent material maps derived from the BGS DiGMapGB geological data and covers the whole of Great Britain (excluding London).



6 Hydrology

Flooding

- 6.1 The Environment Agency's (EA) National Generalised Modelling (NGM) Flood Zones Plan indicates predicted flood envelopes of Main Rivers across the UK. In many circumstances, the NGM is based on basic catchment characteristic data and modelling techniques. Where appropriate, more accurate Section 105 / SFRM models are produced using more robust analysis techniques.
- 6.2 There are no documented (named) watercourses shown on Site, however the surrounding areas includes a network of land drains/ unnamed watercourses/ditches. A small section of one is shown in the eastern boundary, between the A34 and the end of Water Eaton Lane.
- 6.3 The River Cherwell is located approximately 550m north-east of the Site and the Oxford Canal is situated approximately 800m west of the Site.
- The site is shown to have limited development on site but located on the outskirts of the currently developed Kidlington. **Figure 6-1** illustrates the watercourse and feature described above.

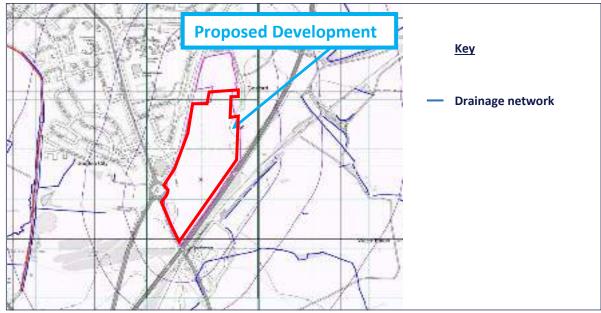


Figure 6-1: FEH web service - Urban Extent 2000 and BGS Hydrology and Drainage Network

6.5 The EA mapping shows that almost the entire Site lies within Flood Zone (FZ) 1; being an area of Low Probability of flooding and outside both the 1 in 100 (1% AEP) and 1 in 1,000 (0.1% AEP) year flood events. However, a small area in the north-eastern corner of the Site potentially lies within FZ2 and FZ3. These are areas assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%) and a 1 in 100 or greater annual probability of river flooding (>1%). This is illustrated on **Figure 6-2**.



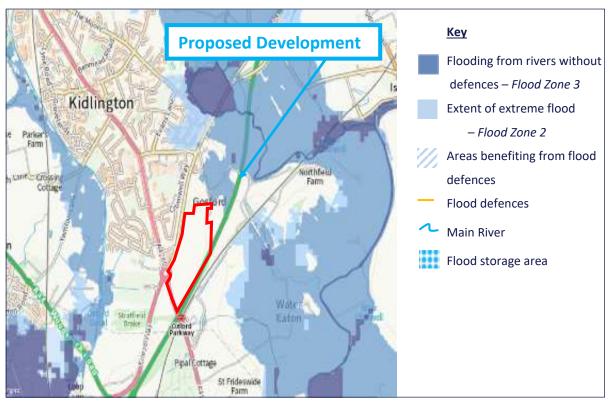


Figure 6-2: EA Flood Zone Plan showing 1 in 100 & 1 in 1,000 year floodplains

6.6 **Figure 6-3** illustrates areas the Site has a very low risk of surface water flooding. However, a small area in the east is shown to have a medium to high risk from surface water flooding.

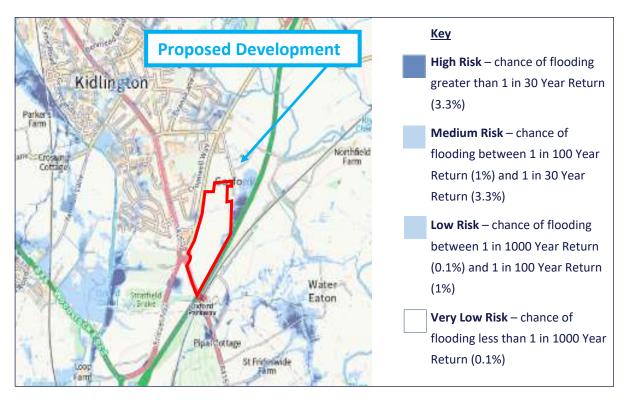


Figure 6-3: EA Long Term Flood Risk Maps – Flood risk from Surface Water (Gov.Uk website)



Discharge Consents

6.7 There are fourteen Discharge Consents reported within 1,000m of the proposed Site, of which ten permits are reported as surrendered/ lapsed or revoked. The discharge consents reported on Site and the remaining active permits are detailed in **Table 6-1**:

Operator – Location	Permit Status & Effective Date	Discharge Type	Receiving Water	Distance (m)	Direction
The Chief Executive – Oxfordshire County Council – North Oxford Park & Ride A4165, Kidlington	New Consent* – 30 th May 2002	Sewage discharges – Pumping Station	Tributary of the River Cherwell	237	South
Ms Suzanne Wilson- Higgins – Pipal Cottage, Water Eaton	New Consent* – 23 rd July 2003	Sewage discharges – Tributary of the Pumping River Cherwell Station		535	South
Collexoncotoo Ltd – Frieze Farm, Woodstock Road, Wolvercote.	Varied under EPR 2010 – 21 st December 2012	Sewage discharges – Final/treated effluent	Groundwater	718	South West
Trustees for the time being of North Oxford Golf Club Store – Oxford Road, Wolvercote.	New Consent* – 10 th February 1992	Sewage discharges – Final/treated effluent	Onto Land (alluvium)	758	South

Table 6-1: Discharge Consents

Water Quality

- 6.8 The Environment Agency monitor 40,000km of rivers across England. To help protect these areas each stretch of river was monitored between 1990 and 2009 and given a river quality grade. The General Quality Assessment (GQA) scheme was based upon the chemical quality of the water and graded from A to E, with A representing a river with very good water quality and E, a river with very poor water quality.
- 6.9 The Envirocheck has reported the following **River Quality Data** with 1,000m of the Site boundary:
 - River Cherwell (reach: Oxford Canal (Middle) to Ray (Oxon)), approximately 505m north-east of the Site to have a River Quality B.
 - Oxford Canal (Lower) (reach: Kidlington STW to Castle Mill STW), approximately 888m west of the Site to have a River Quality D.
 - Oxford Canal (Lower) (reach: Shiptonweir Lock to Kidlington STW), approximately 904m west of the Site to have a River Quality C.

^{*}Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995



- 6.10 There is one **River Quality Chemistry Sampling Points** within 1,000m of the Site boundary. This is further detailed below:
 - Cherwell (Oxford Canal (Middle) to Ray (Oxon)), has a River Quality Chemistry Grade in 2009 of A (Very Good).
- 6.11 There are no **River Quality Biology Sampling Points** recorded within 1,000m of the Site boundary.

Surface Water Abstraction

6.12 There are two **Surface Water Abstraction** permits recorded within 2,000m of the Site boundary, these are outlined below in **Table 6-2**:

Operator - Location	Abstraction Type	Permit Start Date	Permit End Date	Distance (m)	Direction
J E Henman & Son, Mill Farm Islip – River Cherwell & River Ray	General agriculture – spray irrigation	October 2004	Not Supplied	785	East
J E Henman & Son, Mill Farm Islip – River Cherwell & River Ray	General agriculture – spray irrigation	April 1967	Not Supplied	785	East

Table 6-2: Surface Water Abstractions (between 0 – 1,000m of the Site boundary)



7 Hydrogeology

Bedrock and Superficial Aquifer Designations

7.1 The underlying mudstone bedrock is shown to form an Unproductive Strata, whilst the superficial Alluvium deposits on and off Site are shown to form a Secondary A Aquifer, as illustrated below in **Figure 7-1** and **Figure 7-2**:

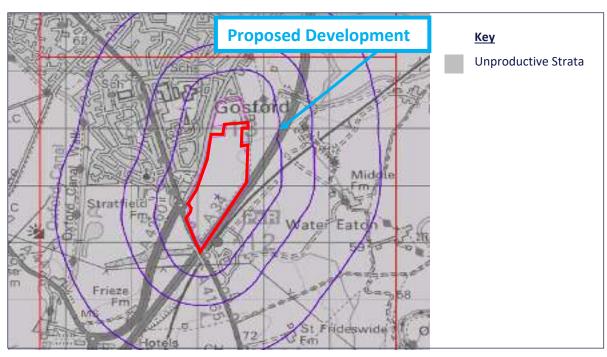


Figure 7-1: BGS Bedrock Geology Aquifer Designation

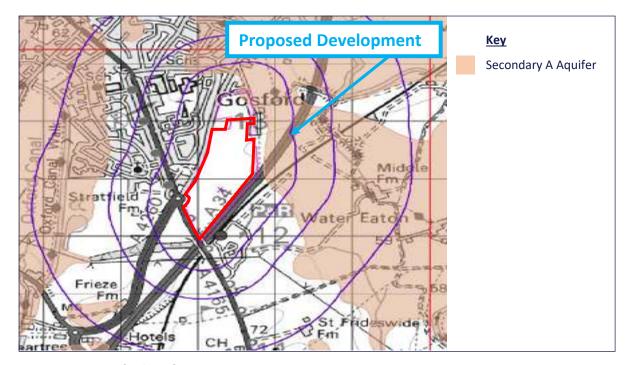


Figure 7-2: BGS Superficial Aquifer Designation



7.2 The EA provides the following definitions for Principal Aquifers, Secondary Aquifers and Unproductive Strata:

Secondary Aquifers - These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers."

Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

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

Unproductive: These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow."

Groundwater Vulnerability

- 7.3 The EA has recently updated their Groundwater Vulnerability Zones (GVZ) Map, this now includes 5 risk categories (High, Medium High, Medium Low and Low). The Map summarises the overall risk to groundwater, taking into account groundwater vulnerability, the types of aquifer present (superficial and/or bedrock) and their designation status.
- 7.4 **Figure 7-3** is an extract of their simplified GVZ map from the Envirocheck, which assesses the groundwater vulnerability risk for both Bedrock Geology and Superficial Deposits. The risk to the Site. The indicative risk on Site is shown to be 'Unproductive'. Areas to the east adjacent to the Site are shown to be of high vulnerability, from the Superficial Deposits.

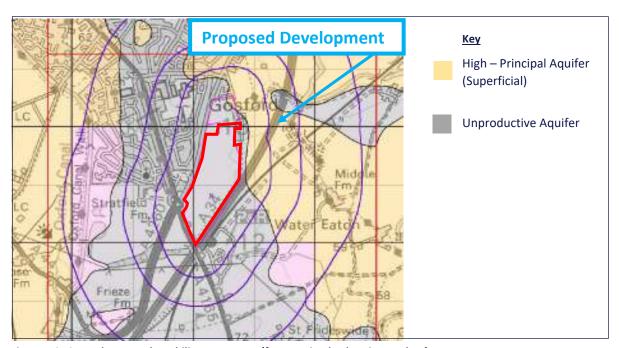


Figure 7-3: Groundwater Vulnerability Zones Map (from Envirocheck, using EA data)



- 7.5 It should therefore be noted, that the EA maps provide an overall groundwater vulnerability. The area identified as "high" risk, is shown in EA mapping, incorporating the Bedrock Geology and Superficial Deposits as "medium-low" vulnerability.
- 7.6 The EA provides the following definitions for the five GVZs:

High – These are high priority groundwater resources that have very limited natural protection. This results in a high overall pollution risk to groundwater from surface activities. Operations or activities in these areas are likely to require additional measures over and above good practice pollution prevention requirements to ensure that groundwater isn't impacted.

Medium-high – These are high priority groundwater resources that have limited natural protection. This results in a medium-high overall pollution risk to groundwater from surface activities. Activities in these areas may require additional measures over and above good practice to ensure they do not cause groundwater pollution.

Medium – these are medium priority groundwater resources that have some natural protection resulting in a moderate overall groundwater risk. Activities in these areas should as a minimum follow good practice to ensure they do not cause groundwater pollution.

Medium-low - these are lower priority groundwater resources that have some natural protection resulting in a moderate to low overall groundwater pollution risk. Activities in these areas should follow good practice to ensure they do not cause groundwater pollution.

Low – these are low priority groundwater resources that have a high degree of natural protection. This reduces their overall risk of pollution from surface activities. However, activities in these areas may be a risk to surface water due to increased run-off from lower permeability soils and near-surface deposits. Activities in these areas should be adequately managed to ensure they do not cause either surface or groundwater pollution.

Groundwater Abstractions

7.7 There are two **Groundwater Abstraction** permits recorded within 2,000m of the Site boundary, and these are further detailed in **Table 7-1**

Operator - Location	Abstraction Type	Permit Start Date	Permit End Date	Distance (m)	Direction
Mr W H Smith – Northfield Farm, Water Eaton	General Farming and Domestic	February 1966	Not Supplied	1219	East
W H Drinkwater & Sons – Loop Farm, Woodstock Road – Borehole A	General Farming and Domestic	November 1997	Not Supplied	1467	South West

Table 7-1: Groundwater Abstractions (between 0 – 1,000m of the Site boundary)

Source Protection Zones

7.8 There are no **Source Protection Zones** identified on or within 1,000m of the Site boundary.



8 Potential Contaminative Uses & Statutory Registers

There are two **Local Authority Pollution Prevention and Controls** issued by Cherwell District Council within 1,000m of the Site Boundary, as detailed in **Table 8-1**.

Name - Location	Dated	Description	Distance (m)	Direction
Sainsbury's Supermarket – Oxford Road, Kidlington	27/11/98	Petrol Filling Station	74	West
Save Service Stations Ltd – Bicester Road, Kidlington	27/10/98	Petrol Filling Station	627	North West

Table 8-1: Local Authority Pollution Prevention and Controls

8.2 One **Substantiated Pollution Incident Register** has recorded within 1,000m of the Site boundary, this is further detailed in **Table 8-2**:

Pollutant	Incident Date	Water Impact	Air Impact	Land Impact	Distance (m)	Direction
Not Identified 1	16/09/03	Category 1 – Major Incident	Category 4 – No Impact	Category 4 – No Impact	871	North West

Table 8-2: Substantiated Pollution Incident Register

8.3 There are thirteen **Pollution Incidents to Controlled Waters** reported within 1,000m of the Site Boundary, as detailed in **Table 8-3**.

Property Type - Location	Incident Date	Pollutant	Incident Severity	Receiving Water	Distance (m)	Direction
Not Given – Kidlington	02/11/94	Oils – Unknown	Category 3 – Minor Incident	Not Given	484	West
Not Given – Kidlington	Not Supplied	Oils – Unknown	Category 3 – Minor Incident	Not Given	526	North West
Not Given – Kidlington	18/02/99	Miscellaneous – Other	Category 3 – Minor Incident	Not Given	562	East
Not Given – Northfield Farm	27/02/94	Miscellaneous – Unknown	Category 3 – Minor Incident	Not Given	634	North East
Not Given – Gosford	16/07/97	General	Category 3 – Minor Incident	Not Given	669	North East
Not Given – Kidlington	28/02/91	Unknown Sewage	Category 2 – Significant	Not Given	746	West



Not Given – Kidlington	06/08/97	General	Category 2 – Significant	Not Given	749	North West
Not Given – Wolvercote	27/07/97	Unknown	Category 3 – Minor Incident	Not Given	824	West
Not Given – Oxford	22/07/97	Unknown	Category 3 – Minor Incident	Not Given	824	West
Not Given – Kidlington Stw	01/08/90	Unknown Sewage	Category 3 – Minor Incident	Not Given	834	West
Not Given – Kidlington	04/02/90	Unknown Sewage	Category 3 – Minor Incident	Not Given	856	West
Not Given – Kidlington	15/11/94	Miscellaneous – Unknown	Category 3 – Minor Incident	Not Given	875	North West
Not Given – Kidlington	Not Supplied	Oils – Unknown	Category 3 – Minor Incident	Not Given	914	North West

Table 8-3: Pollution Incidents to Controlled Waters

- 8.4 None of the following have been recorded within 1,000m of the Site boundary:
 - Contaminated Land Register Entries and Notices
 - Enforcement and Prohibition Notices
 - Integrated Pollution Controls
 - Integrated Pollution Prevention and Control
 - Local Authority Integrated Pollution Prevention and Control
 - Local Authority Pollution Prevention and Control Enforcements
 - Prosecutions Relating to Authorised Processes
 - Prosecutions Relating to Controlled Waters
 - Registered Radioactive Substance
 - Water Industry Act Referrals

Hazardous Substances

- 8.5 There are no records of the following on or within a 1,000m radius of the Site boundary:
 - Control of Major Accident Hazards Sites (COMAH)
 - Explosive Sites
 - Notification of Installations Handling Hazardous Substances (NIHHS)
 - Planning Hazardous Substance Consents
 - Planning Hazardous Substance Enforcements



There are twenty-five **Contemporary Trade Directory Entries** recorded within 1,000m of the Site boundary. Ten of these are situated within 500m of the Site boundary. These are further detailed in **Table 8-4.**

Name – Location	Classification	Status	Distance (m)	Direction
Sainsbury's Petrol Station – Oxford Road, Kidlington	Petrol Filling Station	Active	146	North West
S R Barrett Horticultural Engineers Ltd – The Parade, Kidlington	Lawnmowers & Garden Machinery	Inactive	249	North West
Sunray Blinds & Shutters – The Parade, Kidlington	Blinds, Awnings & Canopies	Active	297	North West
Homegoods – Fairfax Centre, Kidlington	Electrical Goods Sales, Manufacturers & Wholesalers	Inactive	318	North West
Premier Oxford Cleaning Services – Bicester Road, Kidlington	Cleaning Services - domestic	Inactive	370	North
Digital One – Waverley Avenue, Kidlington	Electrical Goods – Servicing & Repairs	Inactive	388	South
Oxford Designer Blinds – Oxford Road, Kidlington	Blinds, Awnings & Canopies	Inactive	464	North West
Oxford Designer Blinds – Oxford Road, Kidlington	Blinds, Awnings & Canopies	Inactive	465	North West
Fast Track – Oxford Road, Kidlington	Breakdown & Recovery	Inactive	465	North West
Walton Driveways – Edinburgh Drive, Kidlington	Asphalt & Coated Macadam Laying Contractors	Inactive	485	South West

Table 8-4: Contemporary Trade Directory Entries located between 0 and 500m

8.7 A further fifteen Contemporary Trade Directories are situated between 501m and 1,000m from the Site boundary. These are further provided in **Table 8-5**:

Active	Inactive
Car Breakdown & Recovery Services x2	Boilers – Servicing, Replacements & Repairs x2
Domestic Appliances – Servicing, Repairs & Parts	Car Dealers x2
Boilers – Servicing, Replacements & Repairs	Car Dealers – Used
Car Dealers – Used	Motorcycle Repairs
Garage Services	Garage Services
	Commercial Cleaning Services
	Catering Equipment

Table 8-5: Contemporary Trade Directory Entries located between 501 and 1,000m



8.8 There are two **Fuel Station Entries** recorded within 1,000m of the Site boundary, as detailed below:

Name – Location	Premise Type	Status	Distance (m)	Direction
Sainsbury's Kidlington – Oxford Road, Kidlington	Hypermarket Petrol Station	Open	131	West
Cherwell Service Station – Bicester Road, Kidlington	Not Applicable	Obsolete	627	North West

Table 8-6: Fuel Station Entries

Waste

- 8.9 The Site is located within the **Local Authority Landfill Coverage** of Oxfordshire County Council, who has supplied Landfill data and Oxford City Council, who has no landfill data to supply.
- 8.10 There is one **BGS Recorded Landfill Site** within 1,000m of the Site boundary. Gosford Tip is located approximately 511m south of the Site off Woodstock Road in Yarnton. No further details are available for the site.
- 8.11 There is one **Historical Landfill Site** within 1,000m of the Site boundary. Pear Tree Railway Cutting is located approximately 517m south of the Site. Specified deposited waste included inert, industrial, commercial and household waste. The first input date of waste has not been supplied, however the last input into the landfill site is reported to be the 31st December 1973.
- 8.12 There are three recorded **Local Authority Recorded Landfill Sites** within 1,00m of the Site boundary and this is further detailed in b.

Location – Authority	Type of Waste	Last Reported Status	Date of Closure	Distance (m)	Direction
Pear Tree Hill Railway Cutting - Cherwell District Council	Domestic	Unknown	Not Supplied	511	South
Pear Tree Hill Railway Cutting - Cherwell District Council	Domestic	Unknown	Not Supplied	858	South West
Pear Tree Hill Railway Cutting - Oxfordshire County Council	Domestic	Unknown	Not Supplied	929	South West
	1				

Table 8-7: Local Authority Recorded Landfill Sites

8.13 There are six recorded areas of **Potentially Infilled Land (Water)** within 1,000m of the Site boundary, as detailed below:



Date of Mapping	Distance (m) Type	Direction
1955	107	North West
1955	332	East
1955	633	South East
1955	765	North West
1955	800	South West
1955	941	South East
	Mapping 1955 1955 1955 1955 1955	Mapping (m) Type 1955 107 1955 332 1955 633 1955 765 1955 800

Table 8-6: Potentially Infilled Land (Water)

- 8.14 There are no provided reports of the following within 1,000m of the Site boundary:
 - Integrated Pollution Control Registered Waste Sites
 - Licensed Waste Management Facilities (Landfill Boundaries)
 - Licensed Waste Management Facilities (Locations)
 - Potentially Infilled Land (Non-Water)
 - Registered Landfill Sites
 - Registered Waste Transfer Sites
 - Registered Waste Treatment or Disposal Sites

Unexploded Ordnance (UXO)

- 8.15 The Zetica Regional Unexploded Bomb Risk Map for the Site has outlined the proposed development is potentially located within a Low Bomb Risk area affected by UXO activity.
- 8.16 A 'Pre-Desk Study Assessment' (PDSA) Bomb Search was carried out by Zetica UXO Site, in which the risk of encountered items of UXO during intrusive works on Site was assessed.
- 8.17 The potential sources of explosive ordnance on Site are detailed in **Table 8-9**.



Threat Source	Details
Pre-WWI Military Activity on or Affecting the Site	None identified
WWI Military Activity on or Affecting the Site	None identified
WWI Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: - Transport infrastructure and public utilities - Royal Flying Corps (RFC) Port Meadow
WWI Bombing	None identified on the Site
Interwar Military Activity on or Affecting the Site	None identified
WWII Military Activity on or Affecting the Site	None Identified on the Site
WWII Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: - Transport infrastructure and public utilities. - Royal Air Force (RAF) Kidlington - Anti-Aircraft (AA) and anti-invasion defences.
WWII Bombing Decoys (within 5km of Site)	None
WWII Bombing	During WWII the Site was located in the Rural District (RD) of Ploughley, which officially recorded 278No. High Explosive (HE) bombs with a bombing density of 3.5 bombs per 405 hectares (ha). No readily available records have been found to indicate that the Site
	was bombed.
Post-WWII Military Activity on or Affecting the Site	None identified on Site

Table 8-9: Zetica UXO Pre-Desk Study Assessment

8.18 Given this, Zetica PDSA has recommended that, whilst always prudent, a detailed desk study is not considered essential at this site.



9 Environmental Setting

- 9.1 There is one **Environmentally Sensitive Area** recorded with Natural England, within 1,000m of the Site. The Upper Thames Tributaries (decommissioned) are located approximately 290m south and south-west of the Site.
- 9.2 There are two surface water **Nitrate Vulnerable Zones** within 1,000m of the Site:
 - The Site is included within the Cherwell (Ray to Thames) and Woodeaton Brook Nitrate Vulnerable
 Zone
 - The second is the Thames (Leach to Evenlode) Nitrate Vulnerable Zone situated approximately 512m south of the Site.
- 9.3 None of the following are reported within 1,000m of the Site boundary:
 - Ancient Woodland
 - Area of Outstanding Natural Beauty
 - Forest Parks
 - Local Nature Reserves
 - Marine Nature Reserves
 - National Nature Reserves
 - National Parks
 - Nitrate Sensitive Areas
 - Ramsar Sites
 - Sites of Special Scientific Interest
 - Special Areas of Conservation
 - Special Protection Areas
 - World Heritage Sites



10 Site Conceptual Model

- 10.1 Guidance has been published by the Department of the Environment, Transport and the Regions (DETR Circular 02/2000) 'Environmental Protection Act 1990: Part 11A Contaminated Land (20th March 2000) which promotes the 'suitable for use approach'. This has since been replaced by the DEFRA: Contaminated Land Statutory Guidance (April 2012). The DEFRA note 'The "suitable for use" approach focuses on the risks caused by land contamination. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Risks therefore need to be assessed on a site-by-site basis.
- 10.2 The "suitable for use" approach consists of three elements:
 - Ensuring that land is suitable for its current use in other words, identifying land where contamination
 is causing unacceptable risks to human health and the environment, assessed on the basis of the
 current use and circumstances of the land, and returning such land to a condition where such risks no
 longer arise ("remediating" the land): the new contaminated land regime provides general machinery
 to achieve same.
 - Ensuring that land is made suitable for any new use, as planning permission is given for that new use
 - in other words, assessing the potential risks from contamination, on the basis of the proposed future
 use and circumstances, before official permission is given) for the development and, where necessary
 to avoid unacceptable risk to human health and the environment, remediating the land before the
 new use commences; this is the role of the town and country planning and building control regimes.
 - Limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought in other words, recognising that the risks from contaminated land can be satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby risking distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).
- 10.3 Also addressed within the DEFRA guidance is the issue of 'contaminated land'. 'Before the Local Authority can make the judgement that any land appears to be Contaminated Land on the basis that Significant Harm is being caused, or that there is a Significant Possibility of such harm being caused, the authority must therefore identify a Significant Pollutant Linkage.
- 10.4 This means that each of the following has been identified:
 - A Contaminant Source
 - A Pathway
 - A Receptor

and that:

• The Contaminant is causing Significant Harm to that Receptor.

Or

There is a Significant Possibility of such harm being caused by the Contaminant to the Receptor.



- 10.5 Where any of the three elements of the Source-Pathway-Receptor (SPR) are not present, there is no risk and therefore land cannot be classified as statutory 'contaminated land'.
- 10.6 In terms of controlled waters, DEFRA: Contaminated Land Statutory Guidance (April 2012) notes the following:
 - "A.35 Section 78A (9) defines the pollution of controlled waters as: 'The entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter'.
 - A.36 Before determining that pollution of controlled waters is being, or is likely to be, caused, the local authority should be satisfied that a substance is continuing to enter controlled waters or is likely to enter controlled waters. For this purpose, the local authority should regard something as being "likely" when they judge it more likely than not to occur.
 - A.37 Land should not be designated as contaminated land where:
 - (a) A substance is already present in controlled waters;
 - (b) Entry into controlled waters of that substance from land has ceased; and
 - (c) It is not likely that further entry will take place.
 - A.38 Substances should be regarded as having entered controlled waters where:
 - (a) They are dissolved or suspended in those waters; or
 - (b) If they are immiscible with water they have direct contact with those waters on or beneath the surface of the water.
 - A.39 The term "continuing to enter" should be taken to mean any entry additional to any which has already occurred."
- 10.7 In 2004 the Environment Agency published the 'Model Procedures for the Management of Land Contamination', CLR11, which provides the technical framework for applying a risk management process, based on the 'suitable for use' approach, when dealing with land affected by contamination.
- 10.8 In 2008, to enable the practical application of good practice of the EA's Model Procedures CLR11, R&D Publication 66 'Guidance for the Safe Development of Housing on Land Affected by Contamination' was published by the National House Builders Council (NHBC), the EA and the Chartered Institute of Environmental Health. Whilst written to be relevant to housing development it is also applicable to other forms of development where sites are land affected by contamination. The guidance describes in detail the process and activities involved for the identification and assessment of hazards for a Phase 1 assessment.
- 10.9 At Phase 1 stage, it is necessary to develop an initial conceptual site model to understand the possible relationships between contaminants, pathways and receptors. If a hazardous source, via an exposure pathway to a potential receptor can be established then there is a 'pollutant linkage', which is preliminarily risk assessed using parameters summarised in Table 10a, below. At this stage, the conceptual model is prepared without site specific soils, groundwater or gas testing and as such, the findings should be treated only as first and general indications of possible SPR linkages.



10.10 The primary potential sources of contamination are indicated below:

Agricultural Use-Soil and Water ContaminationRoads (A34 and A43)-Soil and Water ContaminationRailway Line-Soil and Water Contamination

- 10.11 The potential receptors at the site are:
 - End users / site occupiers
 - Adjacent users / occupiers
 - Controlled waters
 - Flora and fauna
 - Buildings & construction materials
- 10.12 The potential pathways at the site are primarily:
 - Direct ingestion of soil / water / fruit or vegetable
 - Inhalation of dust / vapours
 - Direct skin contact with the ground / water
 - Regression of plant growth due to phytotoxic contamination
 - Vertical and lateral migration of contamination
- 10.13 While limited information is available at this stage methodology has been developed to help identify the potential contamination risk and linkages. The severity of damaging effects and the likelihood of any linkage have been considered.
- 10.14 Given the potential consequence and likelihood, a risk rating is given, based on the following matrix:

		Consequence			
		Severe	Moderate	Mild	Minor
	Highly Likely	Very High	High	Medium	Low
ility ood)	Likely	High	Medium	Medium/Low	Low
Probability (Likelihood)	Possible	Medium	Medium/Low	Low	Very Low
Pre (Lil	Unlikely	Medium/Low	Low	Very Low	Very Low

Table 10-1: Risk Ratings

10.15 The risk ratings are described on the next page.



Very High: There is a high probability that severe harm could arise to a designated receptor from an

identified hazard at the site without appropriate remediation action.

High: Harm is likely to arise to a designated receptor from an identified hazard at the site without

appropriate remediation action.

Medium: It is possible that without appropriate remediation action harm could arise to a designated

receptor. It is relatively unlikely that any such harm would be severe, and if any harm were

to occur it is more likely that such harm would be relatively mild.

Low: It is possible that harm could arise to a designated receptor from an identified hazard. It is

likely that, at worst if any harm was realised any effects would be mild.

Very Low: The presence of an identified hazard does not give rise to the potential to cause harm to a

designated receptor.

10.16 A summary of the potential SPR linkages on site and within close proximity of the site are detailed in **Table 10-2.**

Source	Pathway	Receptor	Risk Rating	Potential Mitigation
Contaminated soils	Direct Ingestion & contact (1)	Site workers &	Low	-
On-site: • Agricultural	Inhalation of dust ⁽²⁾	occupiers	Low	-
Off-site:	Direct skin contact (3)		Low	-
Existing Roads	Vertical & lateral migration (4)	Controlled waters	Low	-
Railway Line	Direct uptake (5)	Flora	Low	-
	Direct contact (6)	Building materials	Low	-
Contaminated groundwater	Direct Ingestion & contact (7)	Site workers &	Low	-
On-site: • Agricultural	Direct skin contact (8)	occupiers	Low	-
Off-site:	Vertical & lateral migration ⁽⁹⁾	Controlled waters	Low	-
AgriculturalExisting Roads	Direct uptake ⁽¹⁰⁾	Flora	Low	-
Railway Line	Direct contact (11)	Building materials	Low	
Elevated gas On-site: None	Vertical & Lateral Mitigation	Site workers & occupiers	Low	-
Off-site: None		Adjacent occupiers	Low	-

Table 10-2: Site SPR Summary

- 10.17 The following paragraphs outline the comments from the pathways identified in Table 10-2 above.
- 10.18 **(1) Direct Ingestion & Contact** Historically undeveloped Site and is currently in agricultural use. Agricultural use may have included the use of pesticides and fertilizers which may pose minor potential contamination. An assessment of the soils may be required at the detailed design stage.



- 10.19 **(2) Inhalation of Dust** Historically undeveloped Site and is currently in agricultural use. Agricultural use may have included the use of pesticides and fertilizers which may pose minor potential contamination. An assessment of the soils may be required at the detailed design stage.
- 10.20 **(3) Direct Skin Contact** Historically undeveloped Site and is currently in agricultural use. Agricultural use may have included the use of pesticides and fertilizers which may pose minor potential contamination. An assessment of the soils may be required at the detailed design stage.
- 10.21 **(4) Vertical and Lateral Migration** The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site.
- 10.22 (5) Direct Uptake Historically undeveloped Site and is currently in agricultural use
- 10.23 **(6) Direct Contact** Historically undeveloped Site and is currently in agricultural use. Agricultural use may have included the use of pesticides and fertilizers which may pose minor potential contamination. An assessment of the soils may be required at the detailed design stage.
- 10.24 **(7) Direct Ingestion & Contact** The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site.
- 10.25 **(8) Direct Skin Contact** The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site.
- 10.26 **(9) Vertical & Lateral Migration** The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site.
- 10.27 **(10) Direct Uptake** The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site.
- 10.28 **(11) Direct Contact** The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site.
- 10.29 **(12) Vertical and Lateral Migration: Site Workers & Occupiers** Historically undeveloped Site and is currently in agricultural use. The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site. No potential sources for gassing have been identified within an influencing distance of the proposed development.
- 10.30 **(12) Vertical and Lateral Migration: Adjacent Occupiers** Historically undeveloped Site and is currently in agricultural use. The bedrock geology for the Site is situated on Unproductive Strata. The Superficial deposits shown on the Site form Secondary A Aquifers. Groundwater flow into site is possible however none of the surrounding off-site sources have the potential to detrimentally impact the proposed site. No potential sources for gassing have been identified within an influencing distance of the proposed development.



11 Discussion & Summary

Discussion

11.1 A review of readily available Site environmental data, including historical mapping and statutory registers and consultation with appropriate authorities has identified the following:

On-Site and Offsite

11.2 The Site comprises **Agricultural Land** which may include the following typical contaminants: Nitrogen, potassium and phosphorous contained within fertilisers; chemicals from pesticides and herbicides; coliform and non-coliform bacteria from livestock waste and manure application; and hydrocarbons from oil and fuel leakages from machinery. Taking into consideration the existing underlying geology and groundwater vulnerability, this feature generally provides a **low** rating for risk. However, this may vary depending on persistence of the chemicals used and further assessment of the Site's soils may be required at the detailed design stage to establish baseline ground conditions.

Off-Site

- 11.3 Potential contaminants from leakages and spillages from vehicles on the **A34** and **A43**, may include: heavy metals, oils, fuels and Polycyclic Aromatic Hydrocarbons. Further assessment of the site's soils will be required at the detailed design stage to establish baseline conditions. The risk rating is considered to be Low, despite these being major roads, the Sites are separated by highway ditches which would intercept any potential contaminated runoff.
- 11.4 An **existing Railway Line** is shown, approximately 25m south-east of the Site. Potential contaminants may include: degreasing solvents, PCBs from engines and electrical equipment, heavy metals, oils, fuels, waste ash and clinker. Taking into consideration the existing underlying geology and groundwater vulnerability, this feature generally provides a **low** rating for risk.

Summary

- 11.5 After reviewing the historical mapping, geological data, hydrological data, sensitive land uses, industrial land uses, waste and hazardous substances, there are no uses identified on or within close proximity of the Site that are potentially contaminative and are likely to be prohibitive to the planned development.
- 11.6 The underlying ground conditions are not considered to be sensitive, with the Sites situated on a Unproductive bedrock strata.
- 11.7 The overall contaminative risk at the site is considered to be Low, due to the limited potential contamination risks and underlying bedrock. In order to confirm the baseline ground conditions, it is recommended that a Phase II ground investigation is carried out across the Site.



12 Limitations

- 12.1 The benefits of this report are provided solely to Barwood Development Securities Ltd. The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the Site. Brookbanks do not confer any third party rights for the information contained in the report.
- 12.2 All distances referred to in this report are measured from the boundary of the planned development Site unless otherwise advised.
- 12.3 Third party information has been used in the preparation of this report, which Brookbanks, by necessity assume is correct at the time of writing.

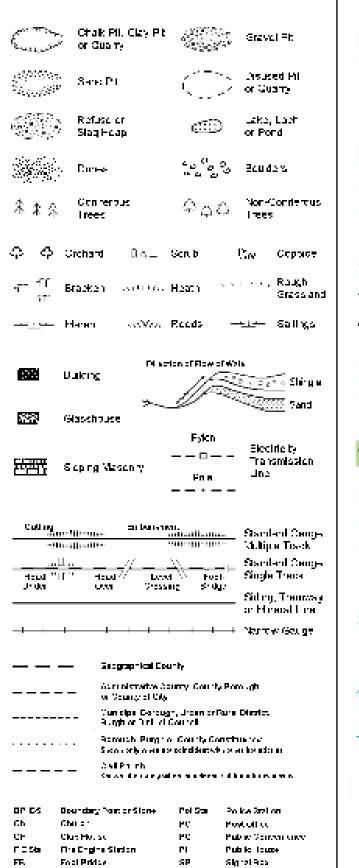


Appendix – Historical Map Index – Ordnance Survey

Historical Mapping Legends

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	Site of (artiquity)		Gle-c-liousea
	General Building		Important Ridelio

Bulking

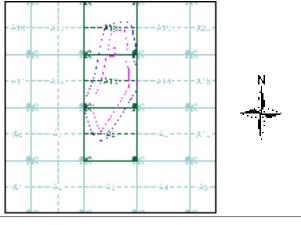
Brookbanks

Consulting

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Oxfordshire	1:10,560	1884 - 1887	2
Oxfordshire	1:10,560	1900	3
Berkshire	1:10,560	1914	4
Oxfordshire	1:10,560	1922 - 1923	5
Berkshire	1:10,560	1922	6
Berkshire	1:10,560	1938	7
Oxfordshire	1:10,560	1938 - 1947	8
Historical Aerial Photography	1:10,560	1947	9
Ordnance Survey Plan	1:10,000	1955	10
Ordnance Survey Plan	1:10,000	1960	11
Ordnance Survey Plan	1:10,000	1967	12
Ordnance Survey Plan	1:10,000	1969	13
Ordnance Survey Plan	1:10,000	1970	14
Ordnance Survey Plan	1:10,000	1981	15
Ordnance Survey Plan	1:10,000	1992 - 1993	16
10K Raster Mapping	1:10,000	1999	17
10K Raster Mapping	1:10,000	2006	18
VectorMap Local	1:10,000	2020	19

Historical Map - Slice A



Order Details

Order Number: 267226906_1_1
Customer Ref: 000115
National Grid Reference: 450150, 212400
Slice: A

Site Area (Ha): 32.65 Search Buffer (m): 1000

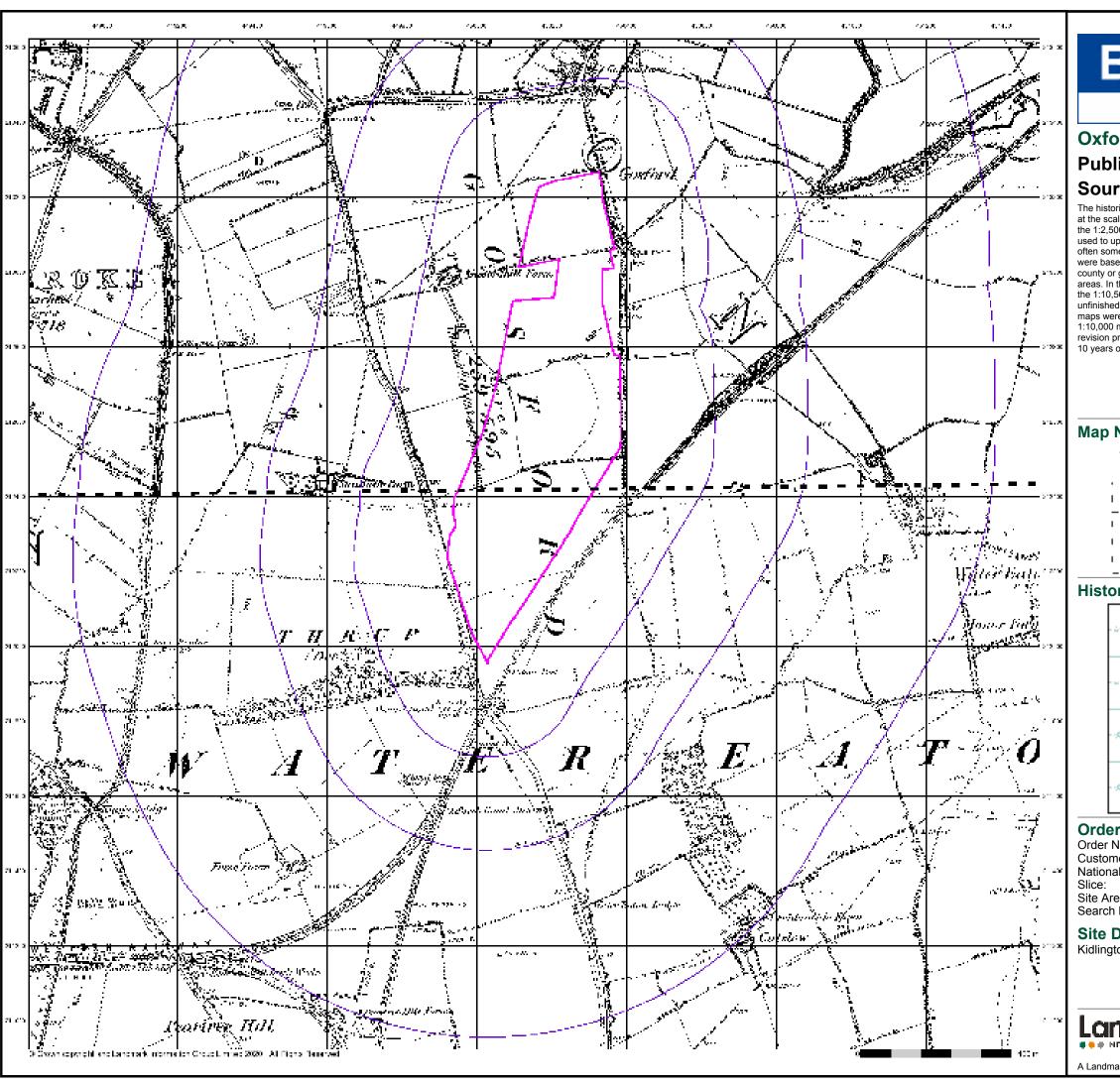
Site Details

Kidlington, Oxfordshire



el: 0844 844 9952 ax: 0844 844 9951 (eb: www.envirocheck.co.uk

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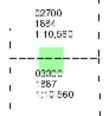
Consulting

Oxfordshire

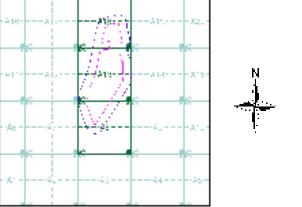
Published 1884 - 1887 Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 267226906_1_1
Customer Ref: 000115
National Grid Reference: 450150, 212400

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Site Area (Ha): 32.65 Search Buffer (m): 1000

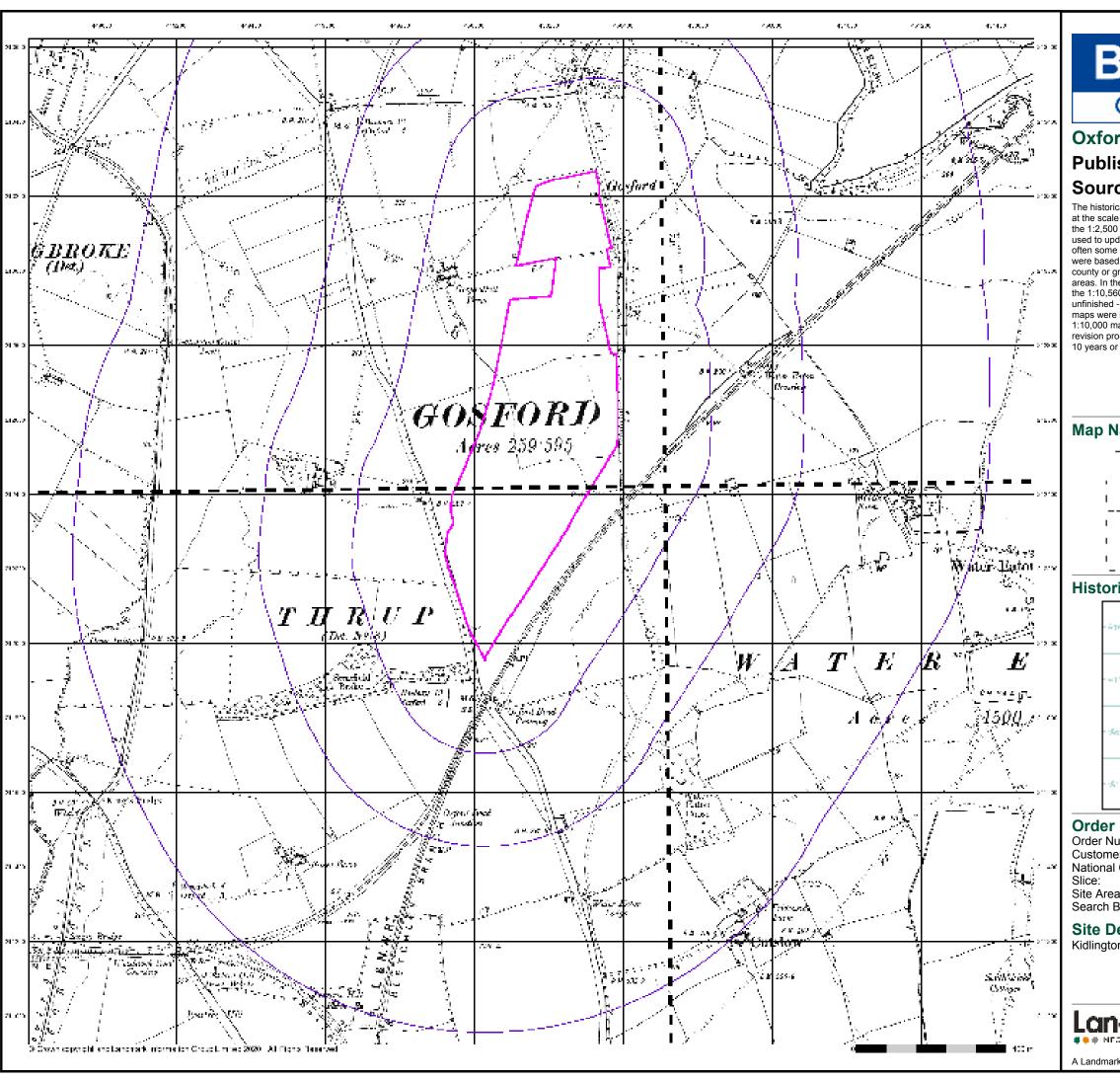
Site Details

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Consulting

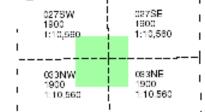
Oxfordshire

Published 1900

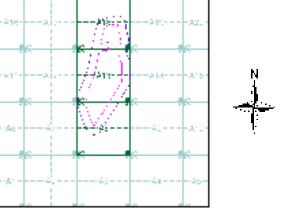
Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 267226906_1_1 Customer Ref: 000115 National Grid Reference: 450150, 212400

Site Area (Ha): Search Buffer (m): 32.65

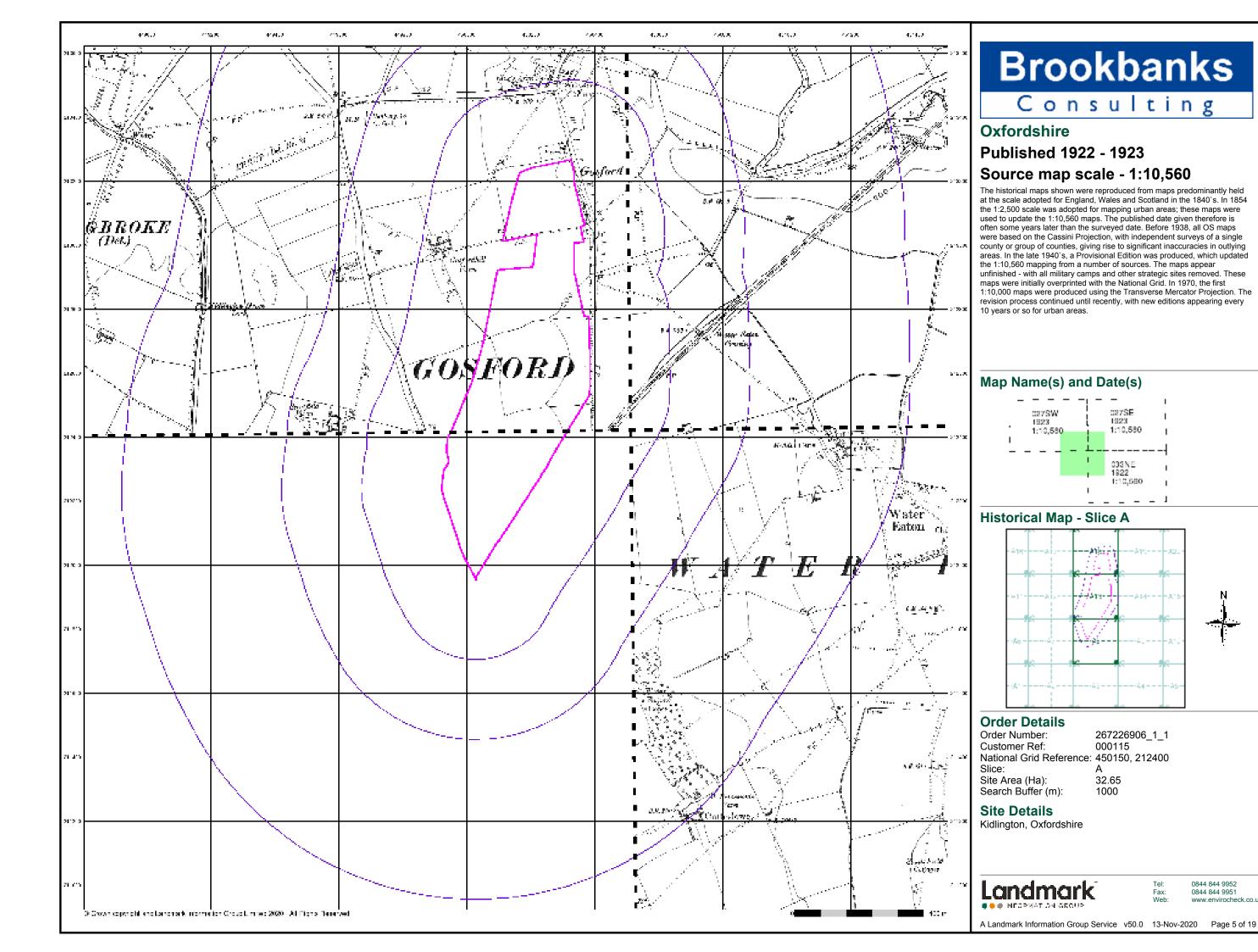
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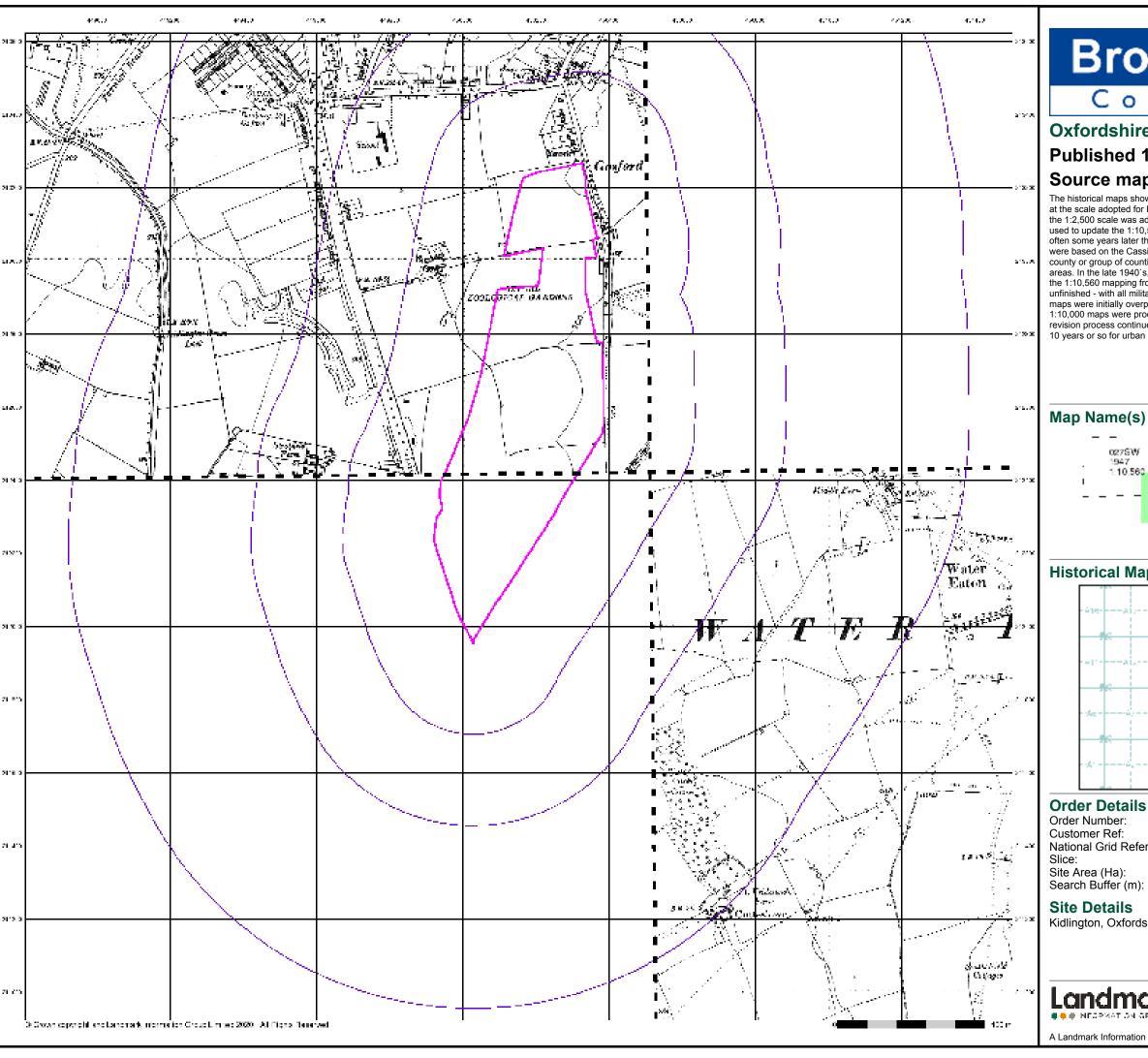
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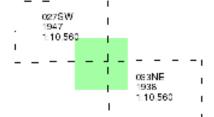
Consulting

Oxfordshire

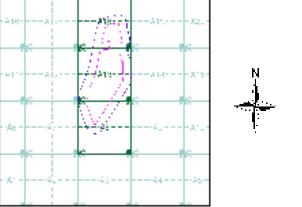
Published 1938 - 1947 Source map scale - 1:10,560

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

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

267226906_1_1 Customer Ref: 000115 National Grid Reference: 450150, 212400

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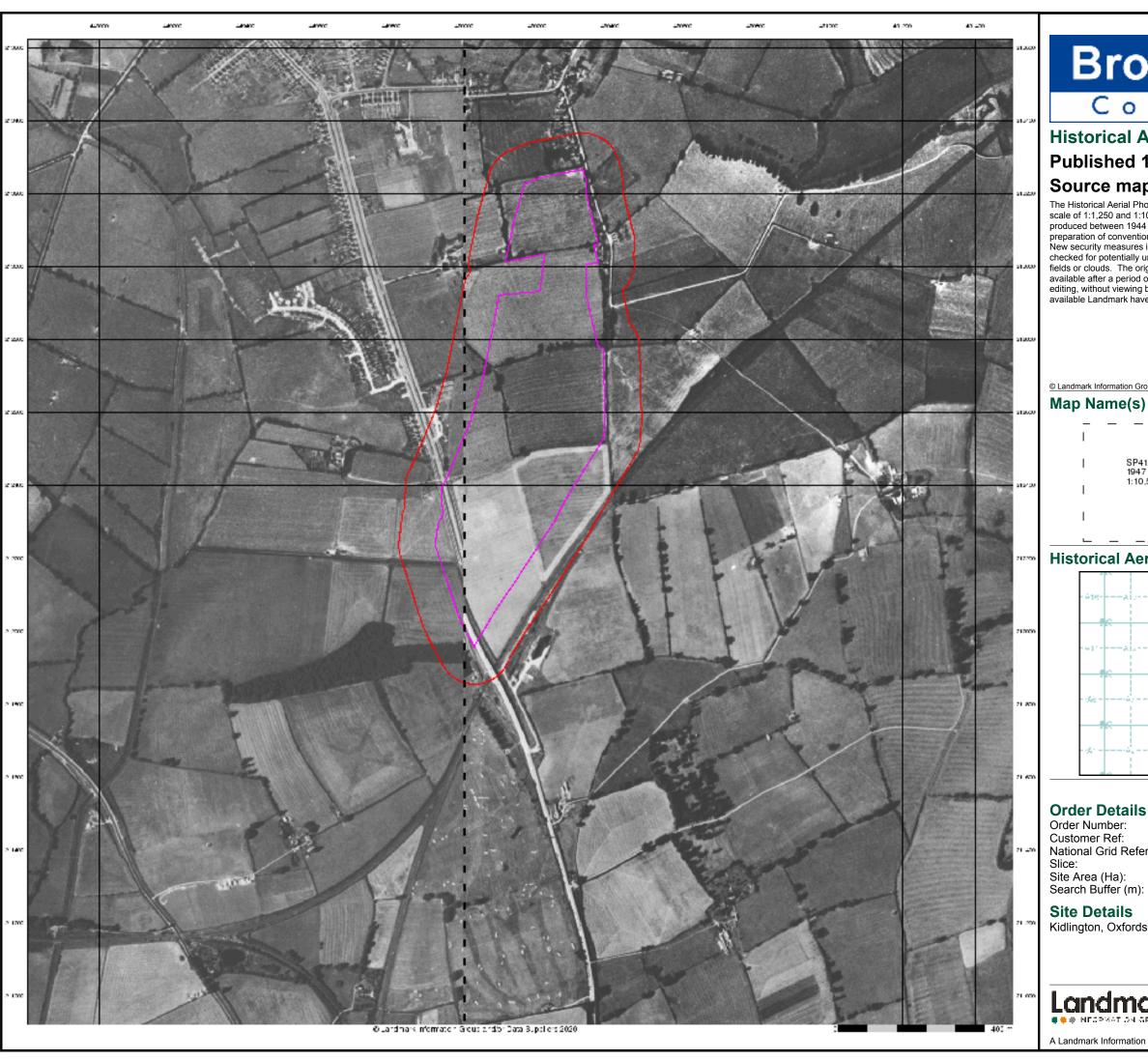
Site Details

Kidlington, Oxfordshire



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A Landmark Information Group Service v50.0 13-Nov-2020 Page 8 of 19



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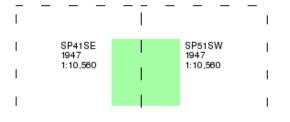
Consulting

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

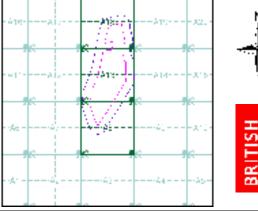
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending produced between 1944 and 1951 as an Interim measure, pending preparation of conventional mapping, due 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)



Historical Aerial Photography - Slice A



Order Details

267226906_1_1 000115 Order Number: Customer Ref: National Grid Reference: 450150, 212400 32.65

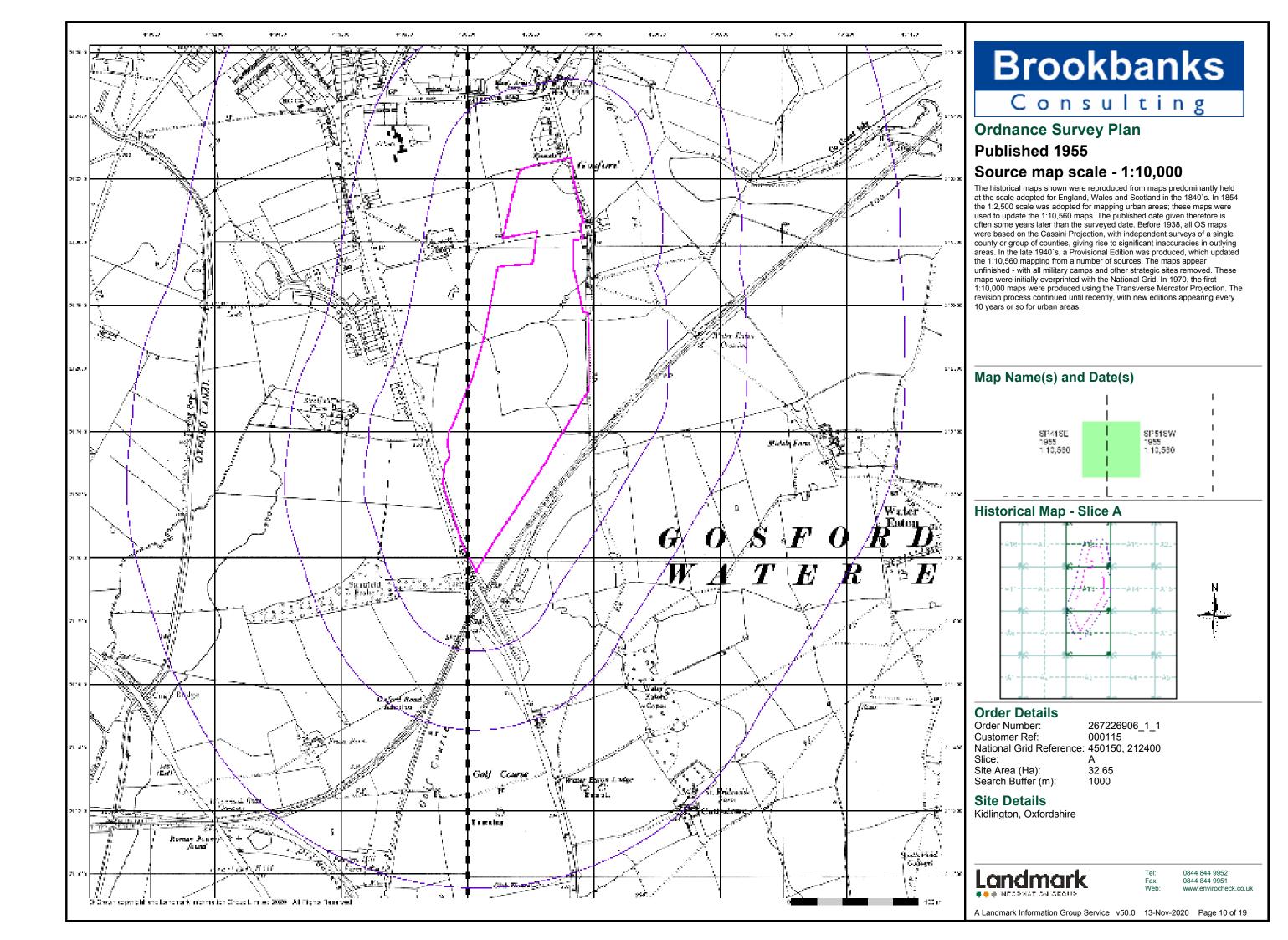
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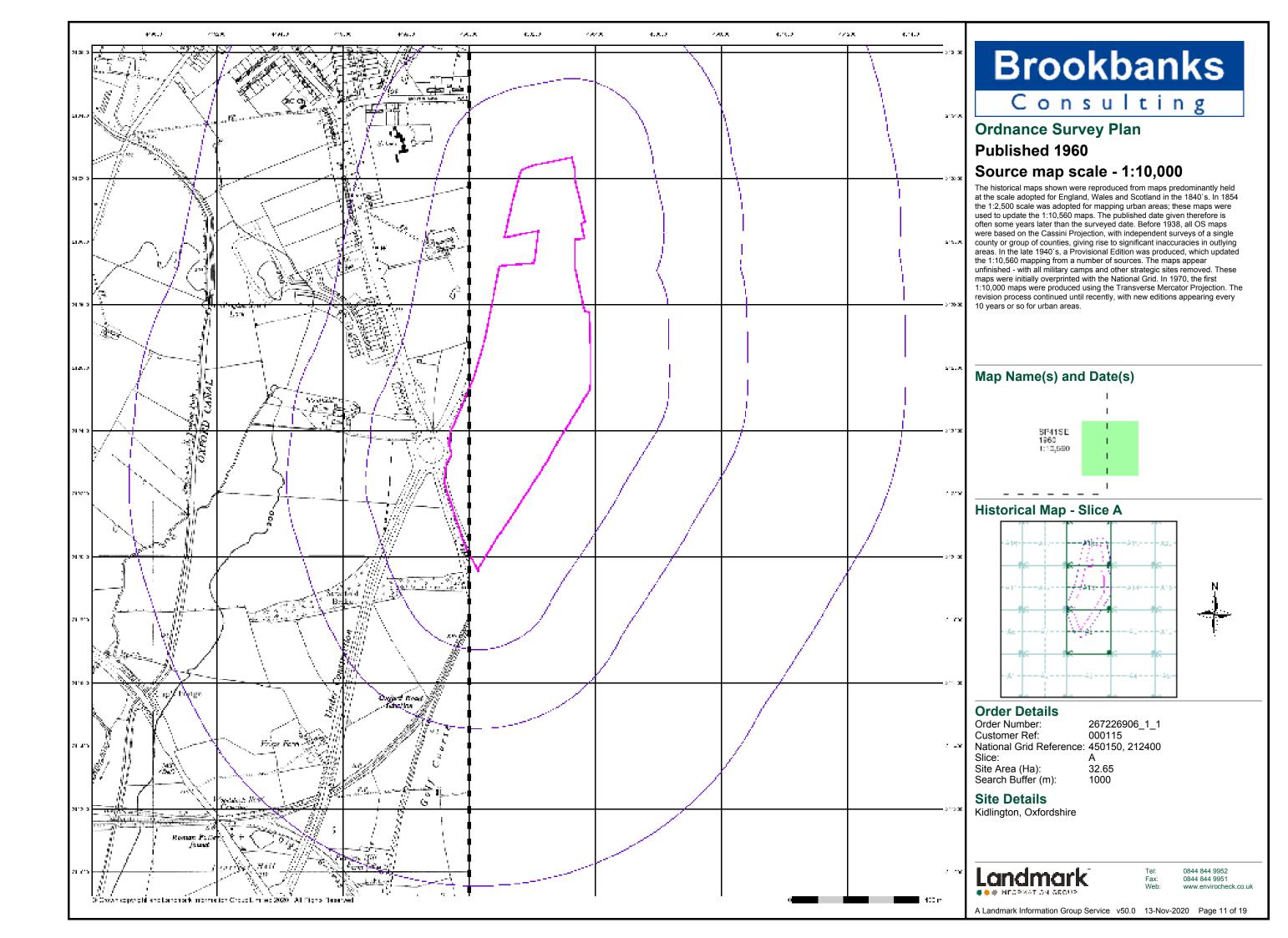
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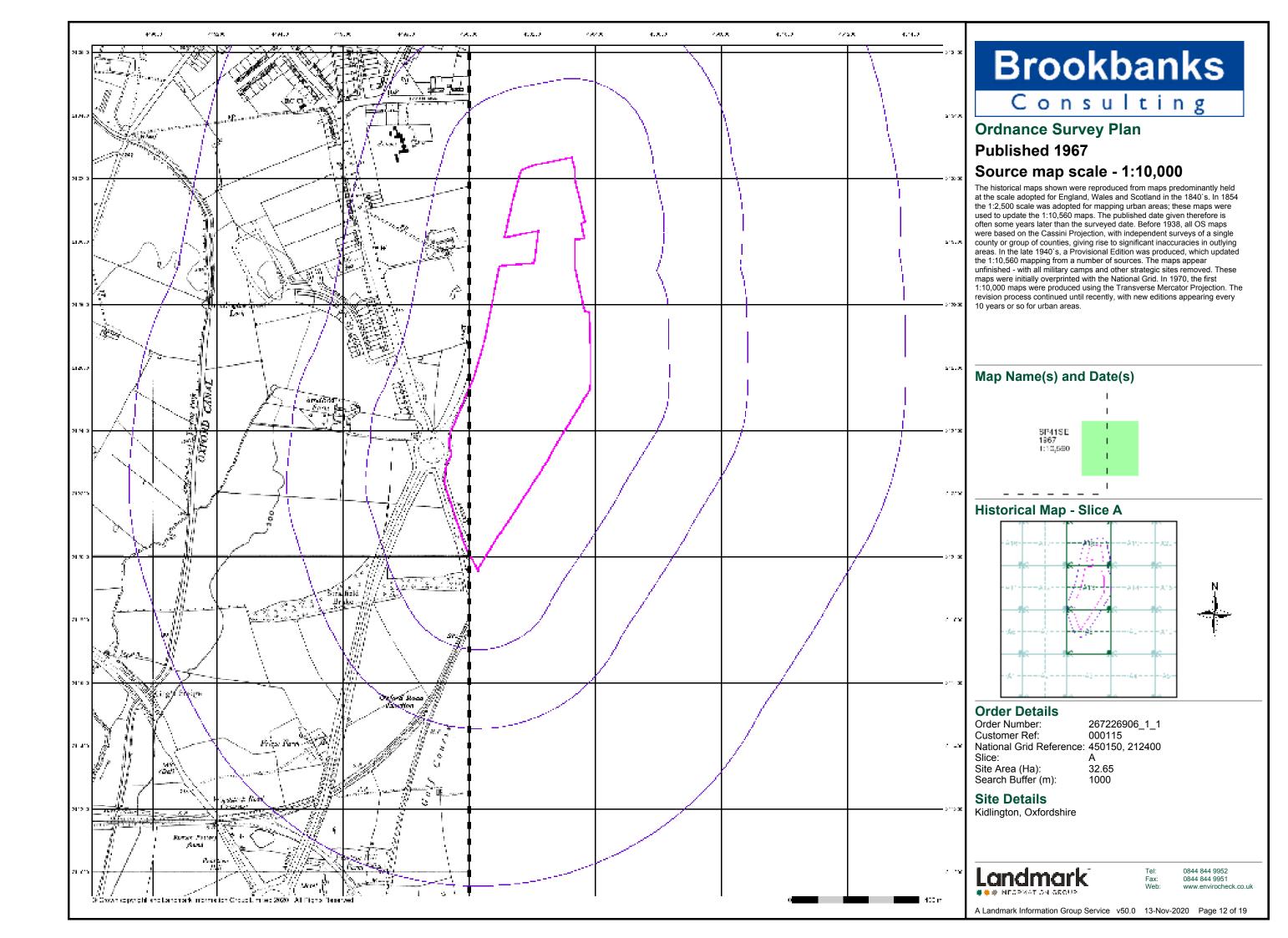


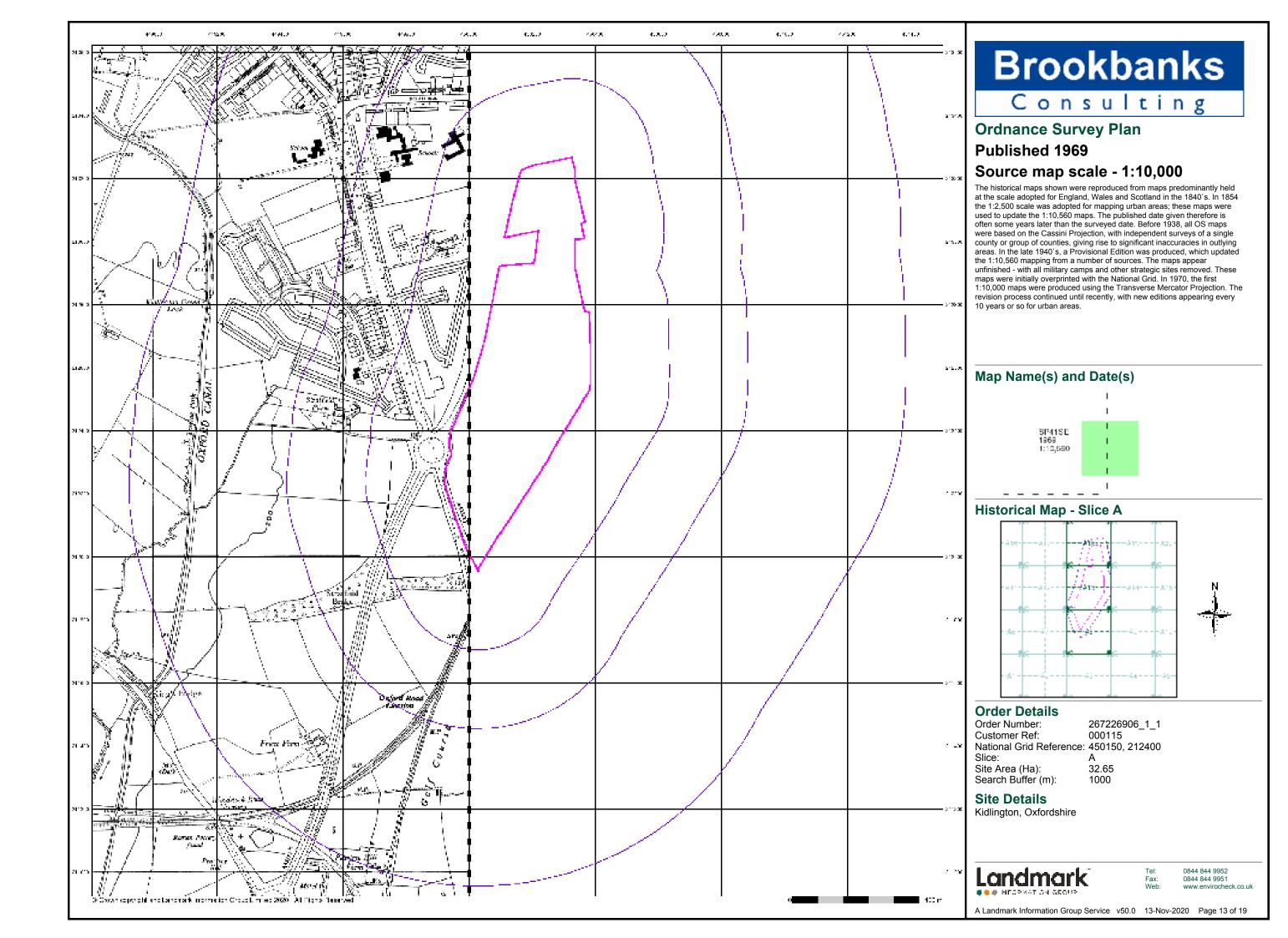
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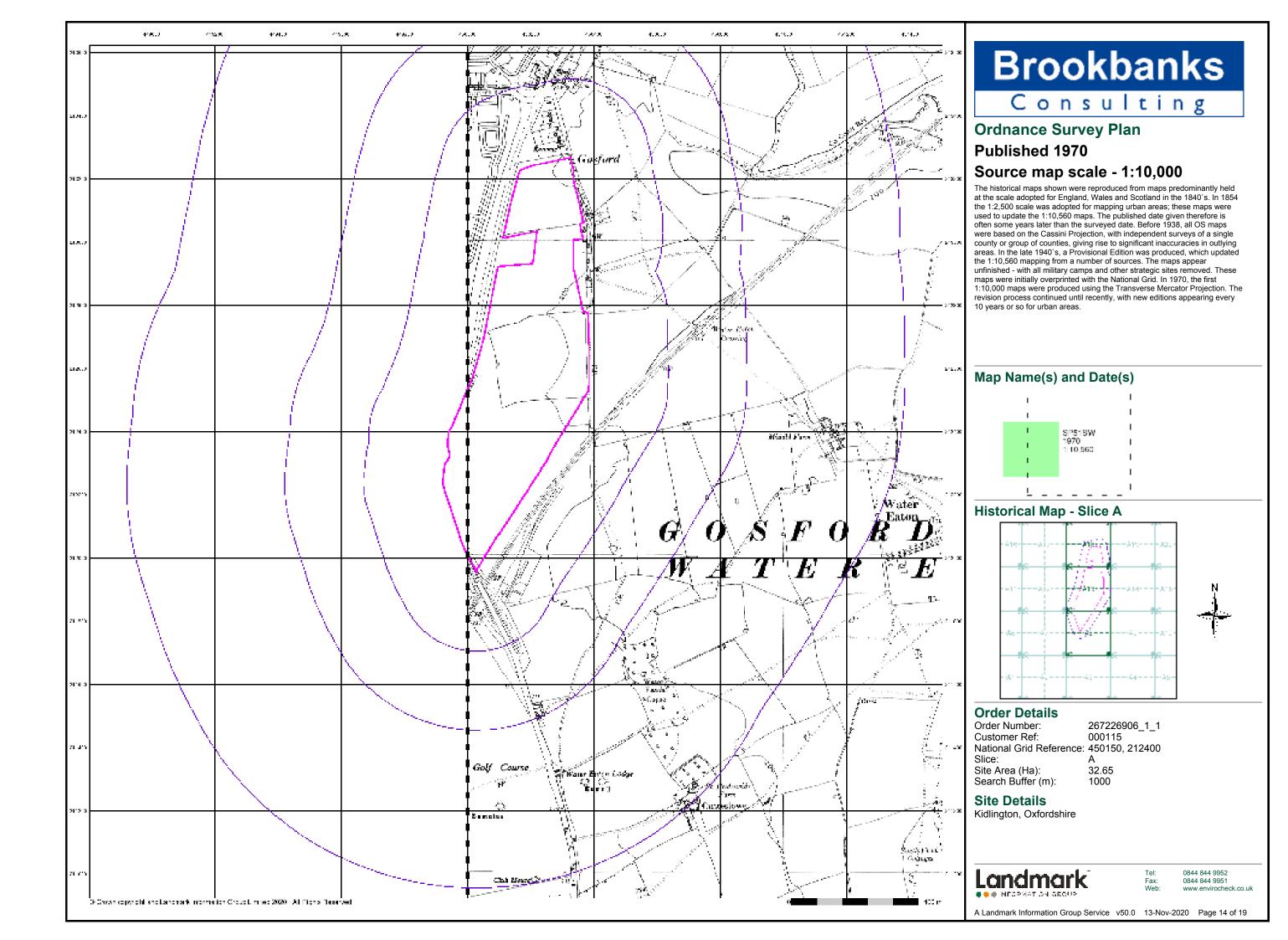
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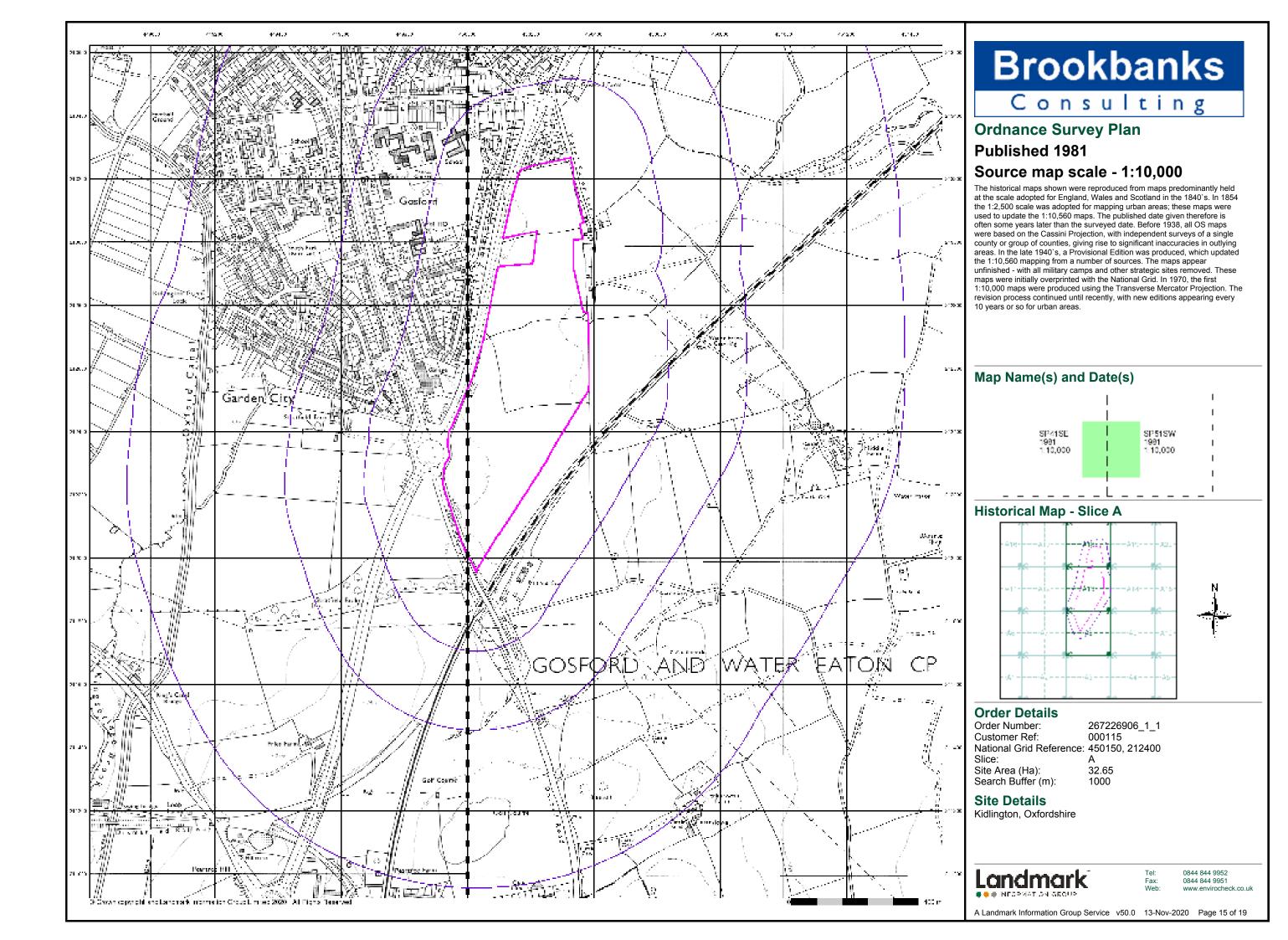


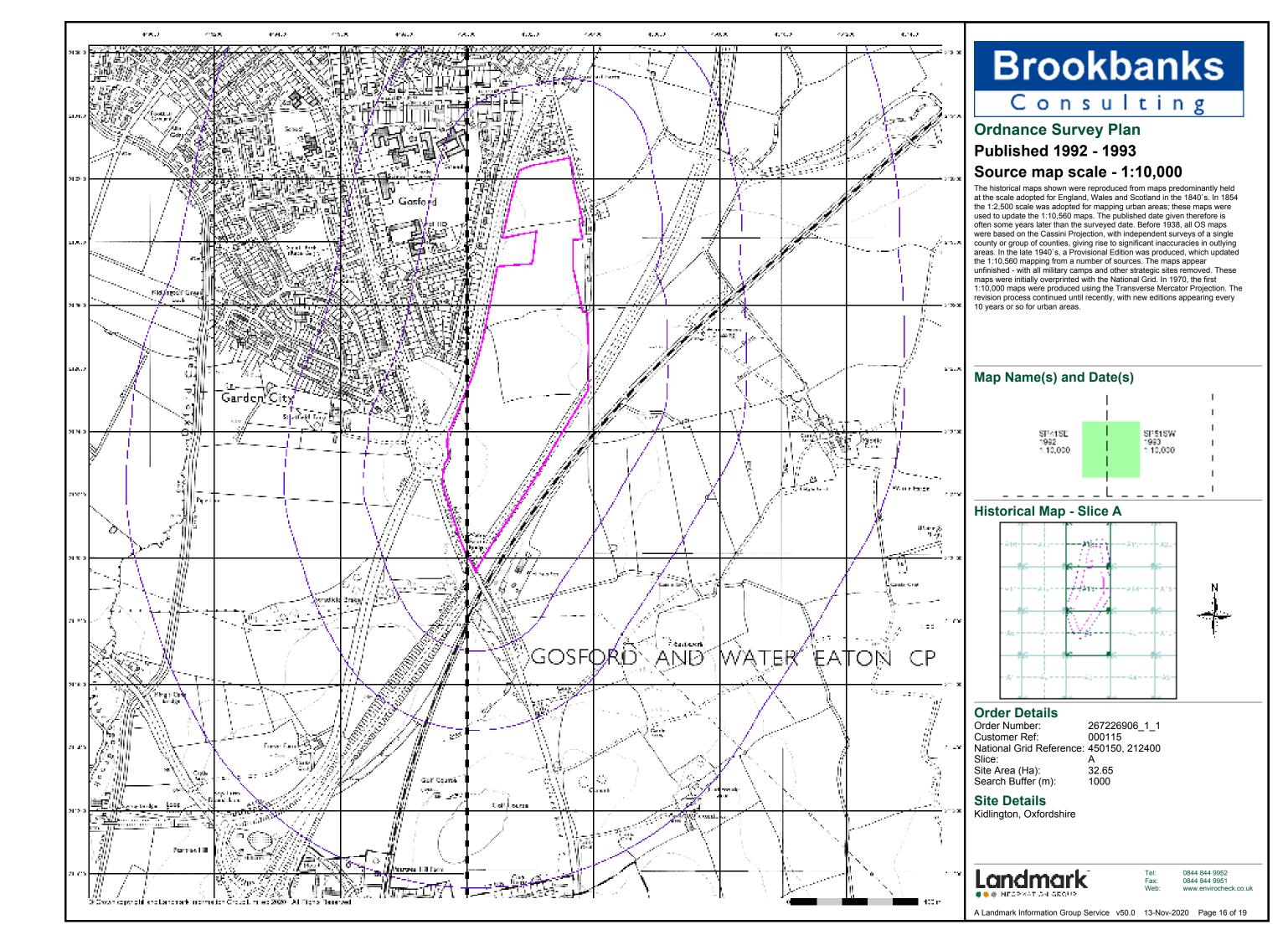


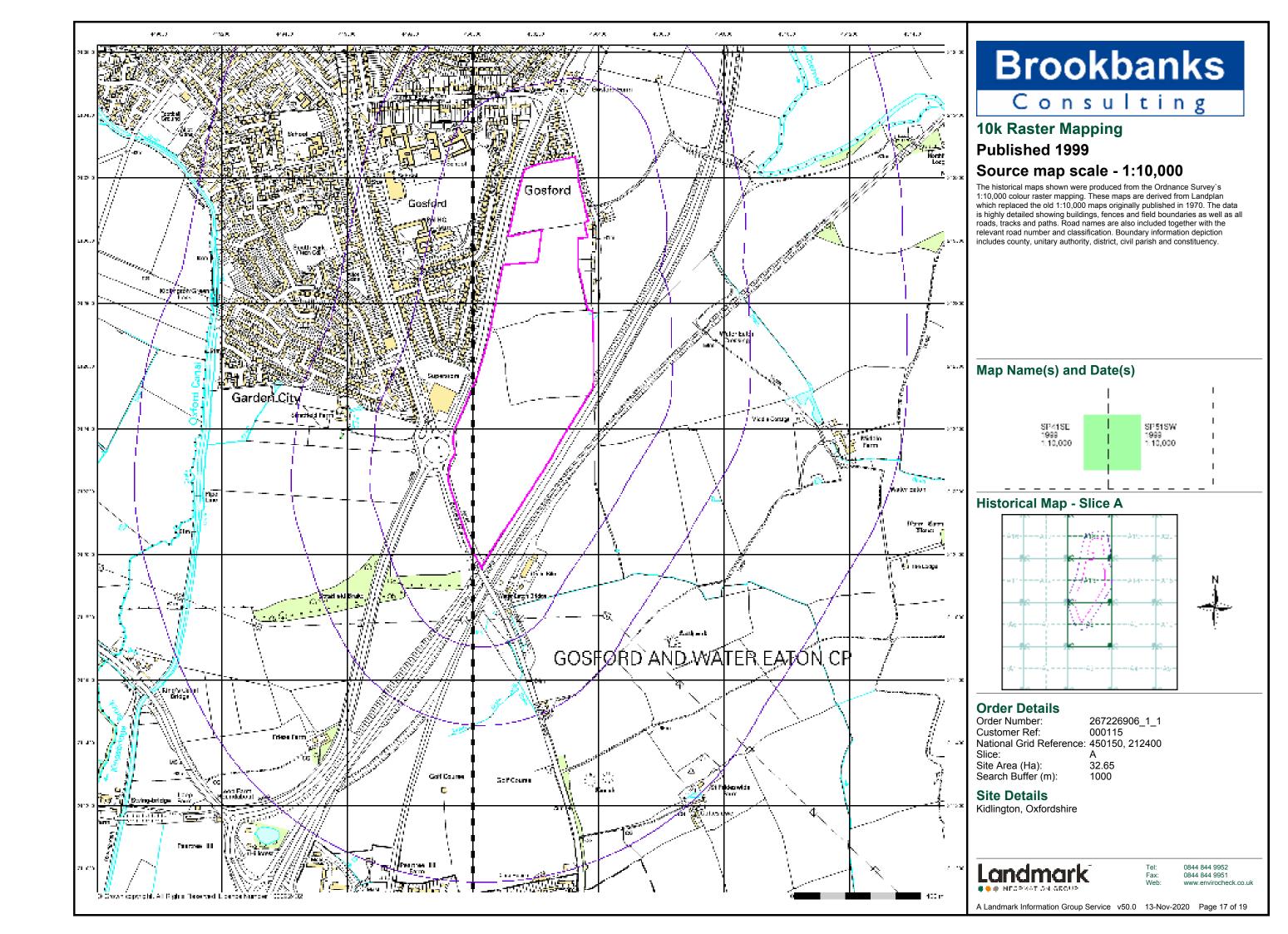


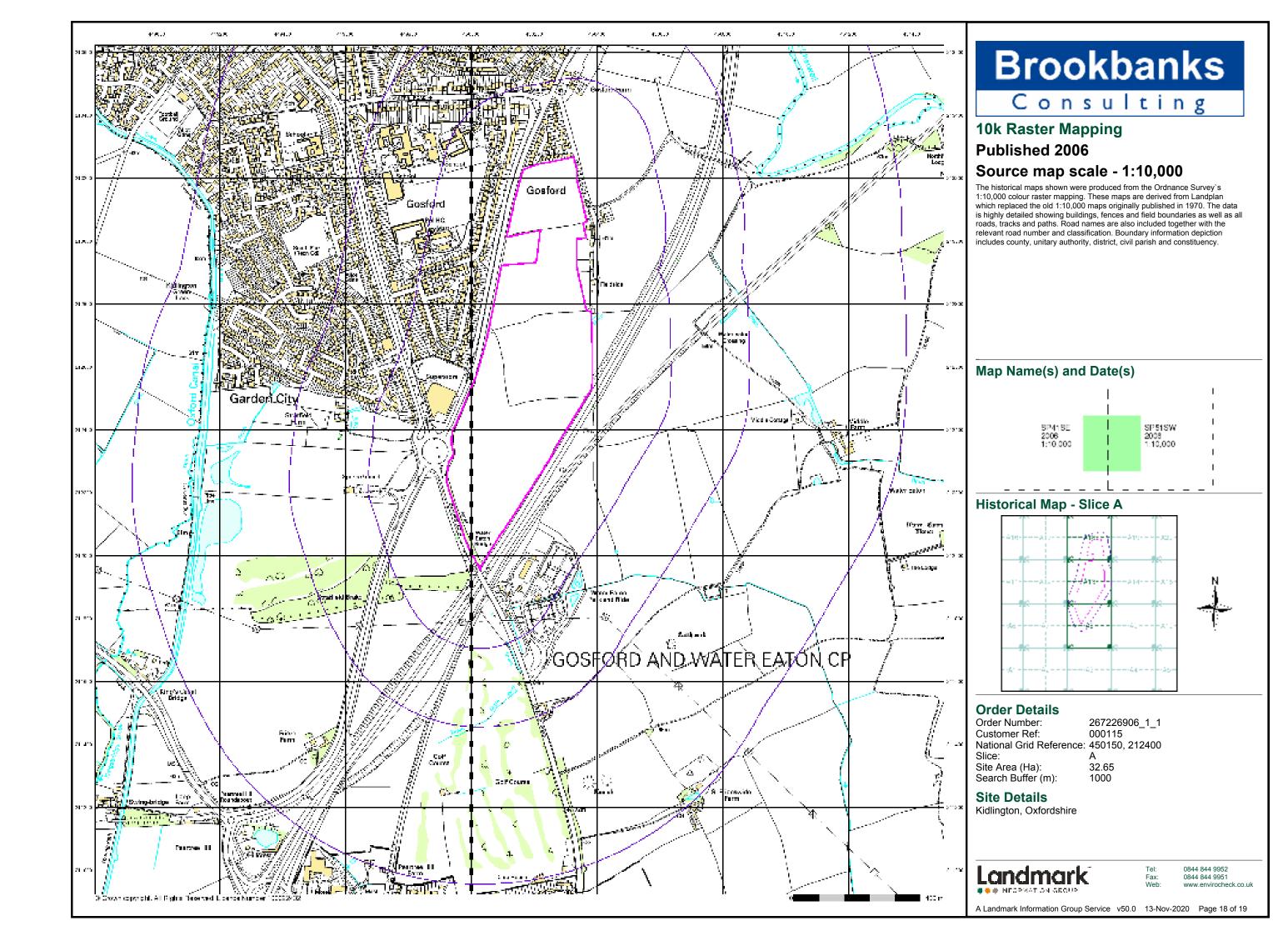


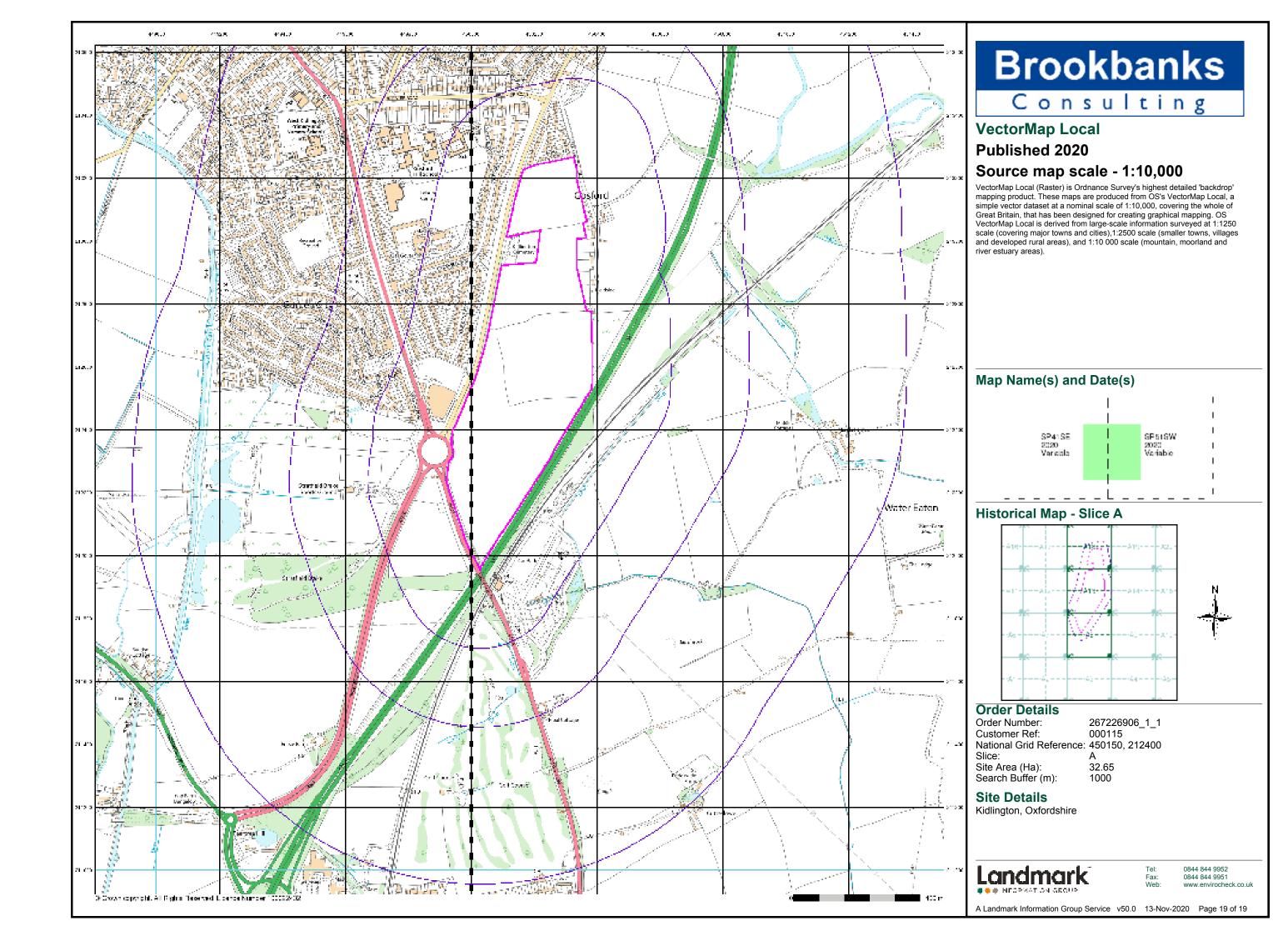


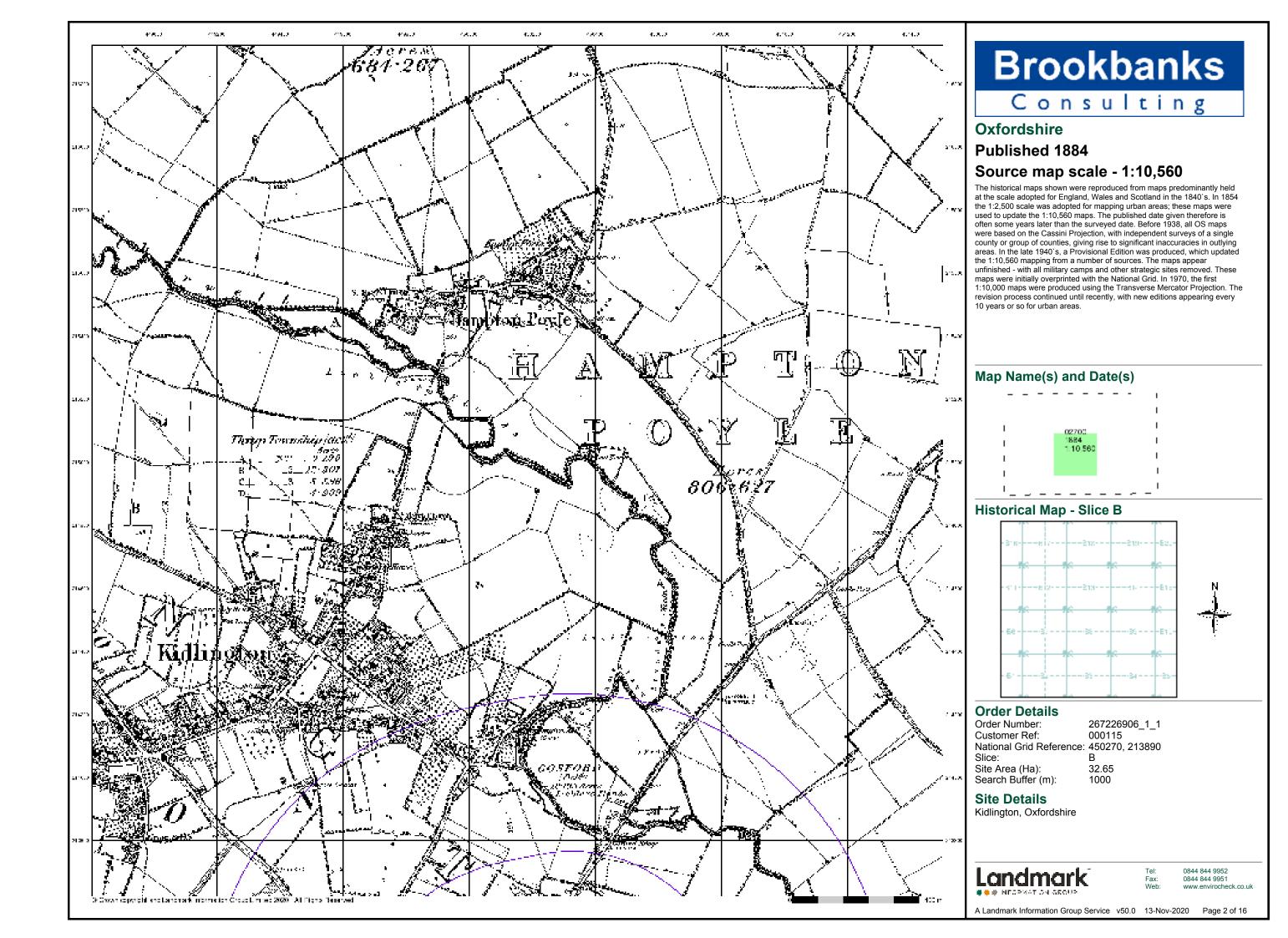


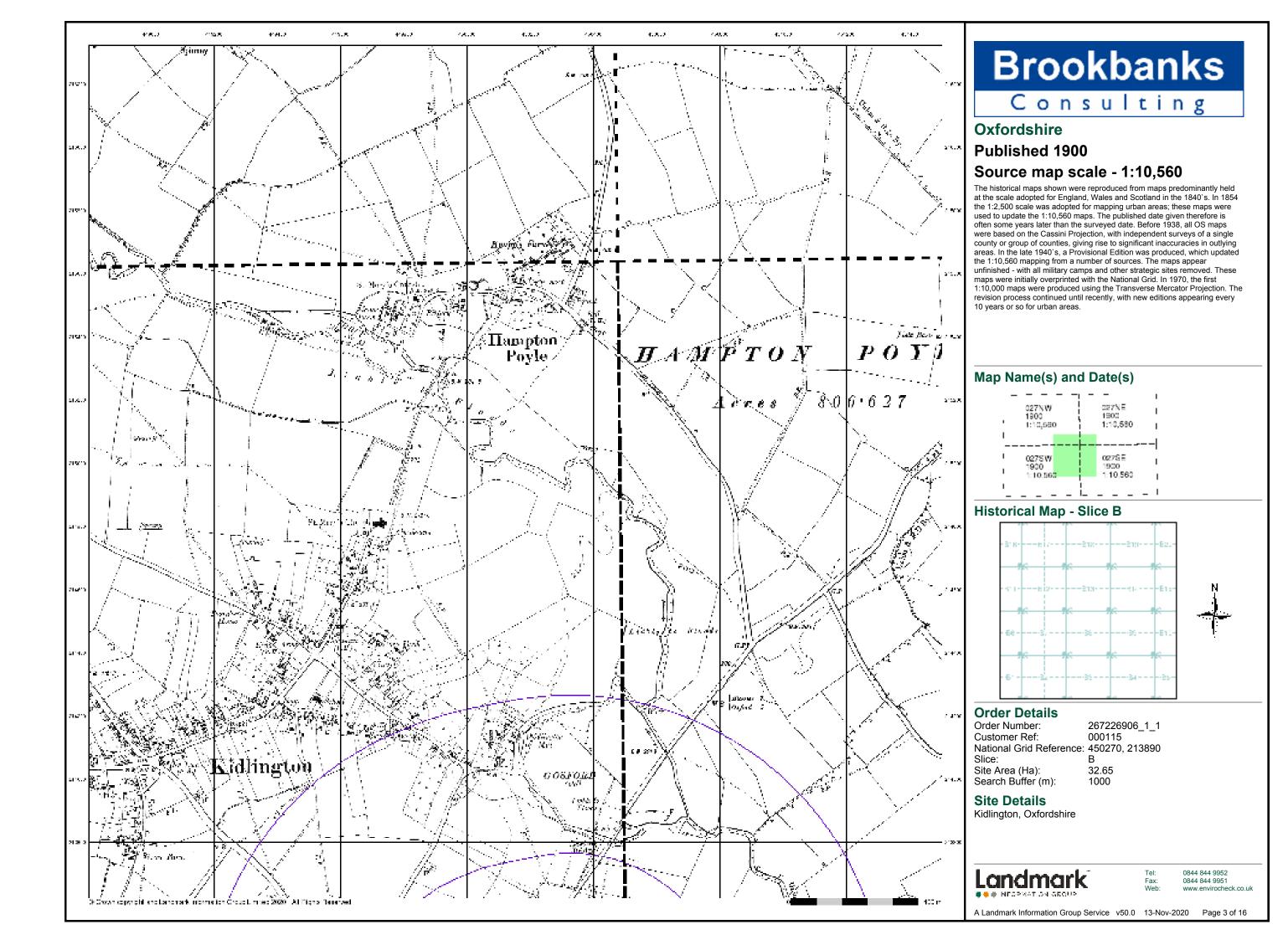


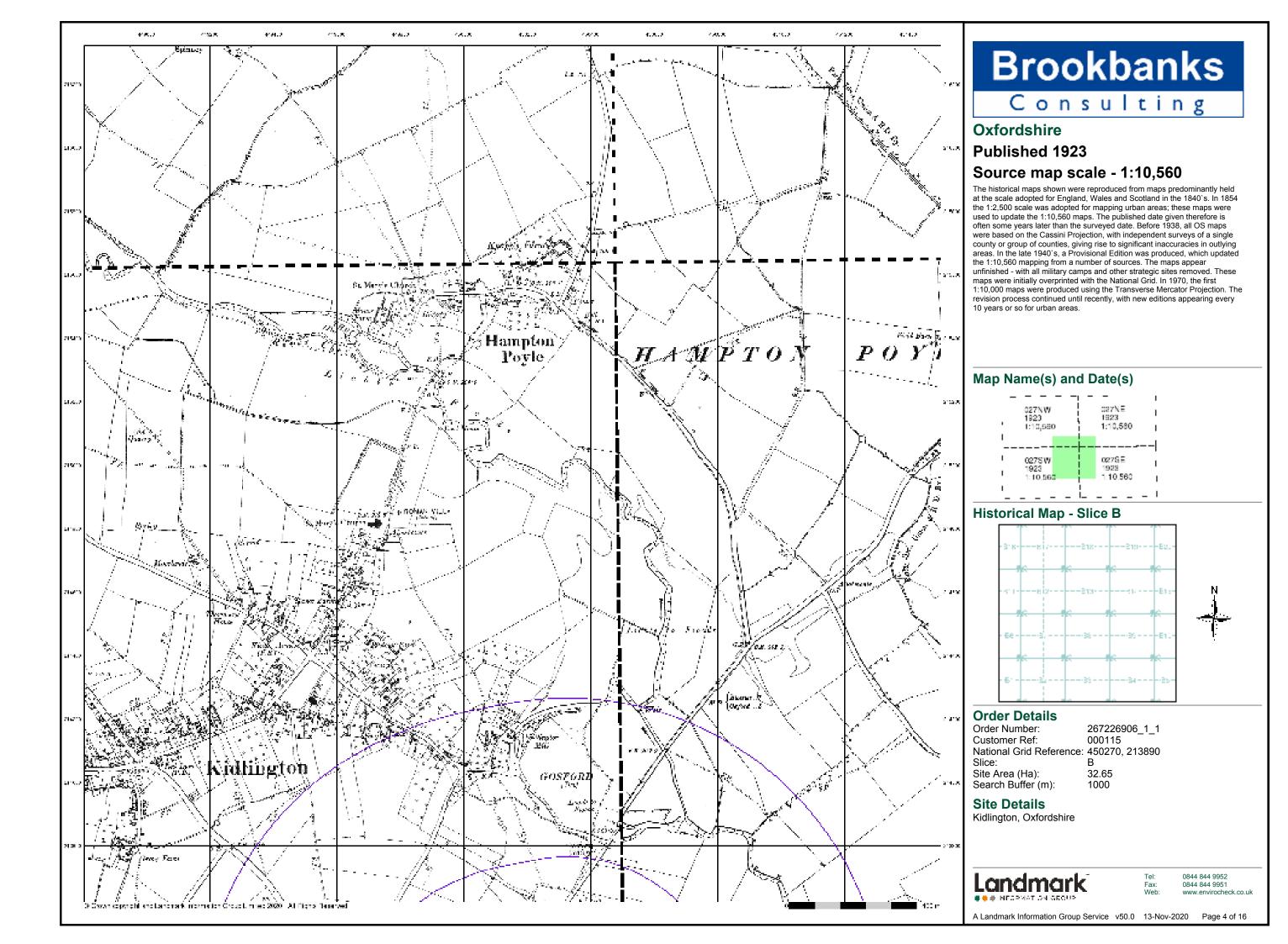


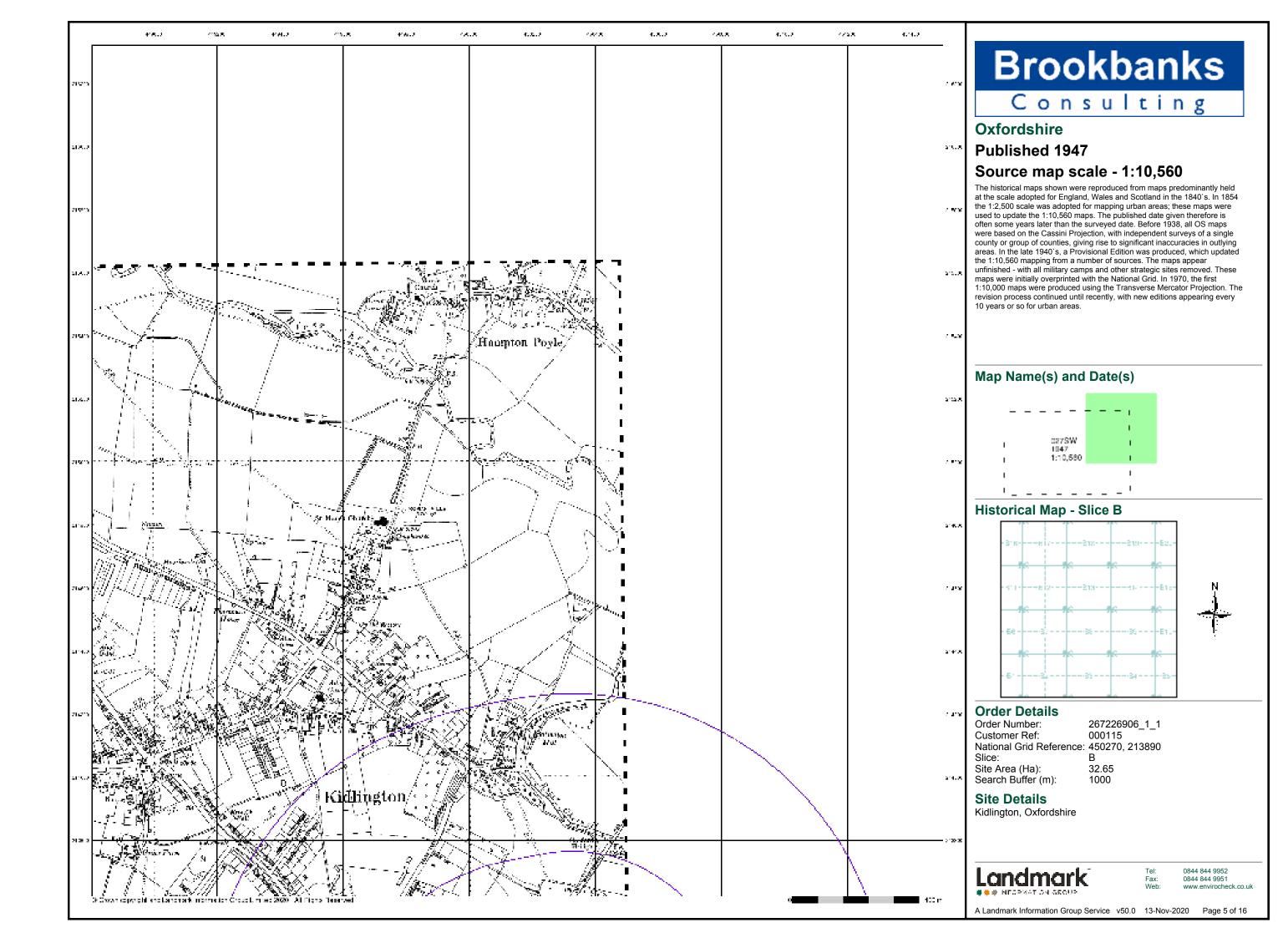


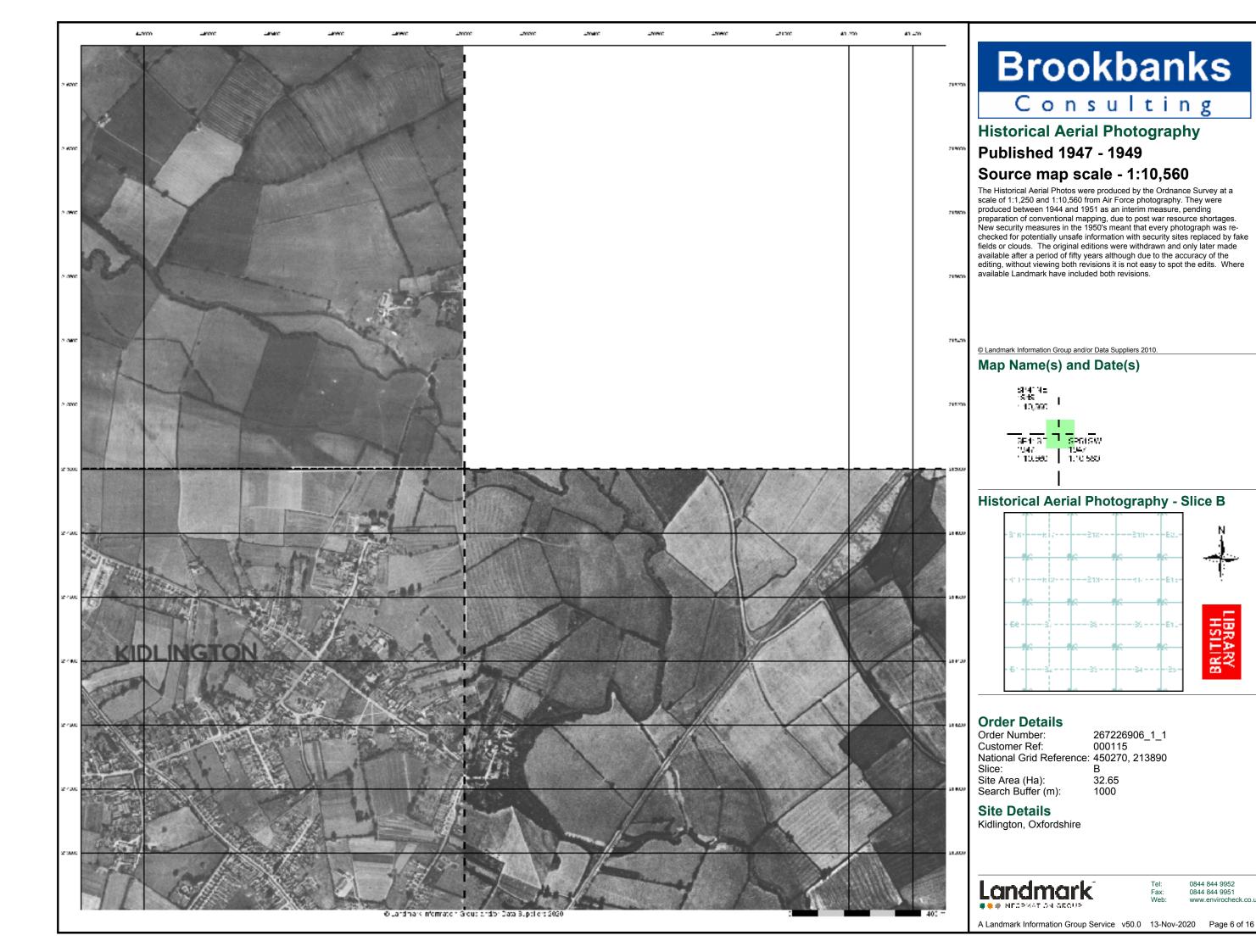


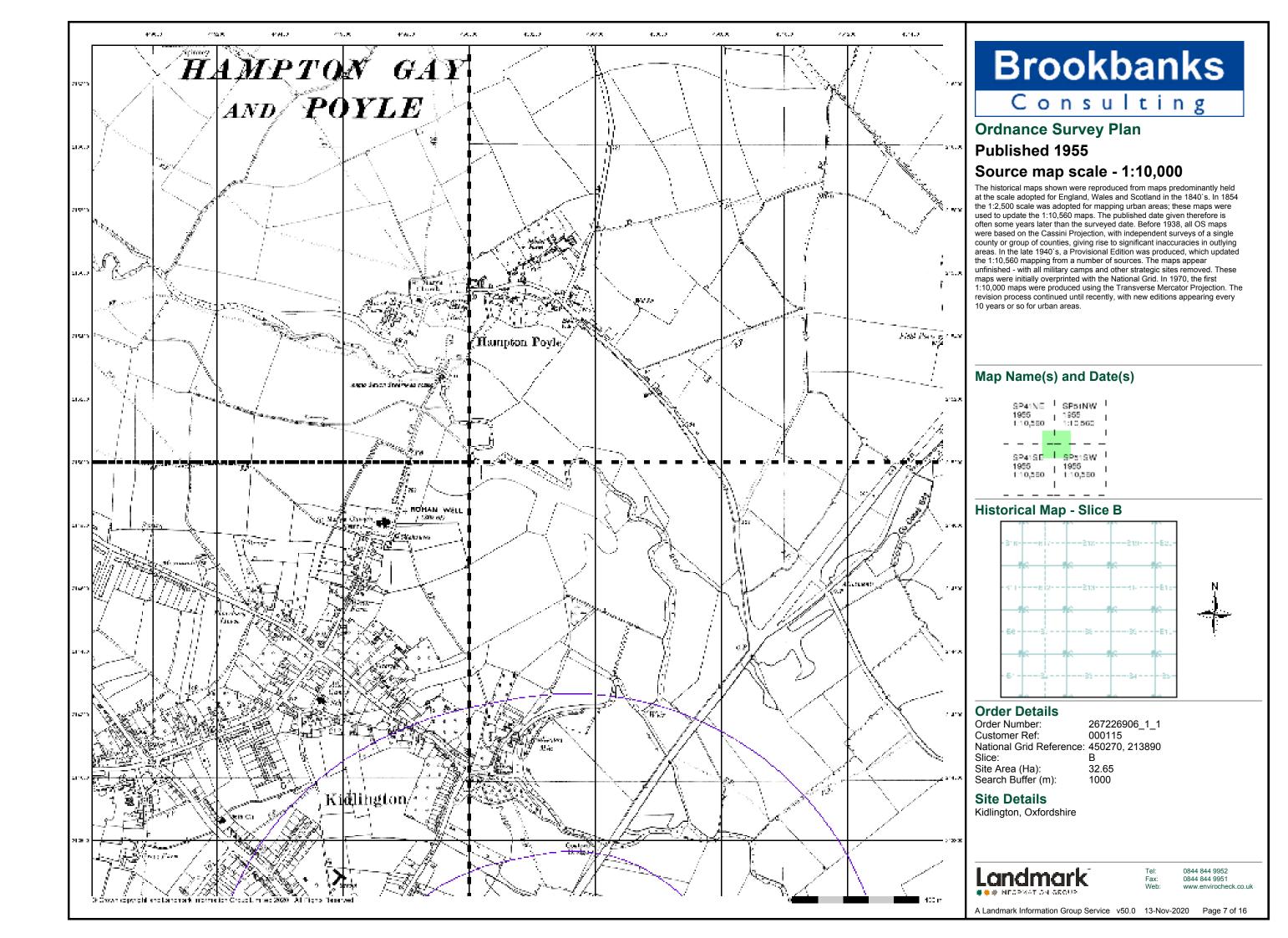


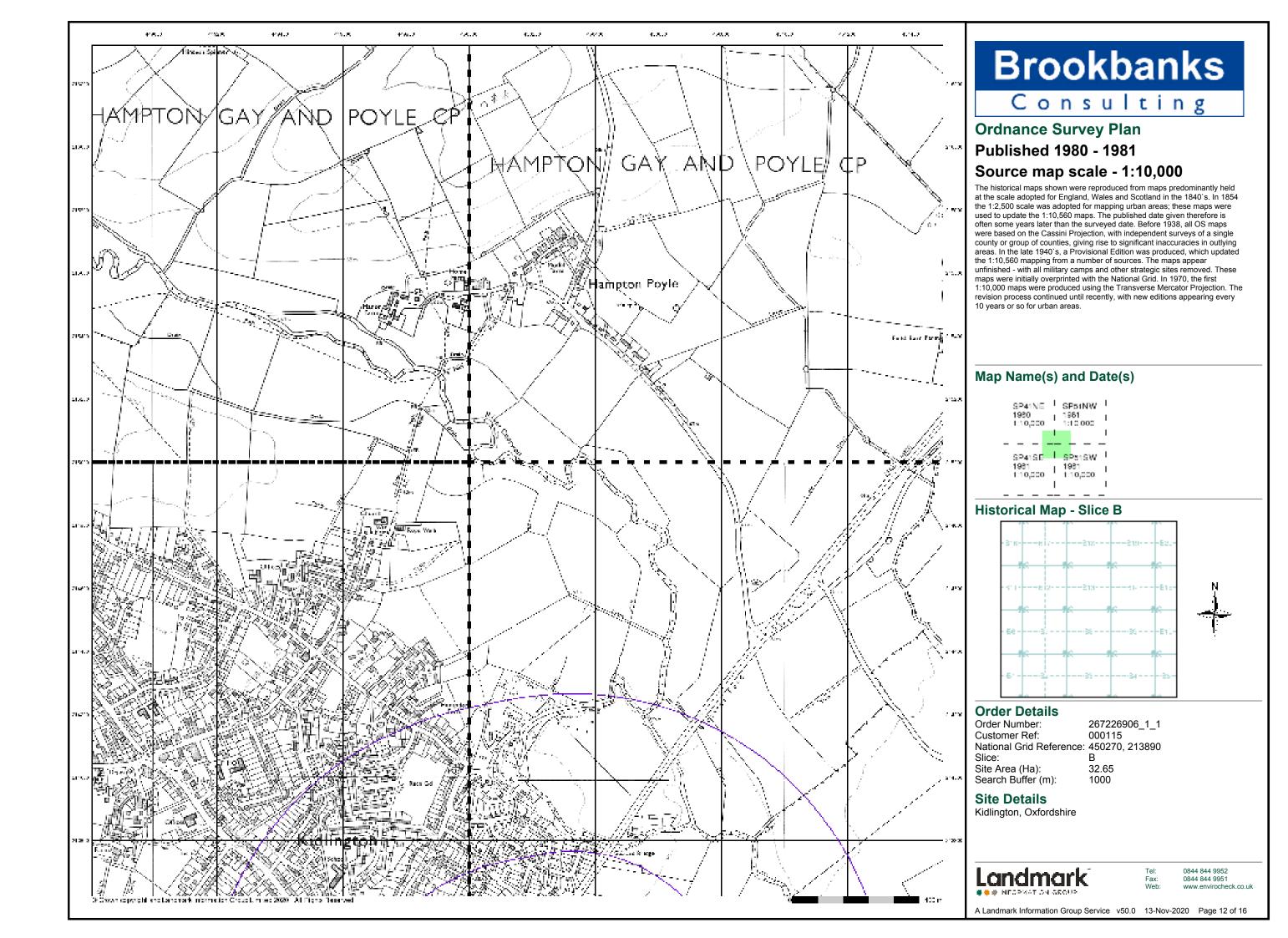


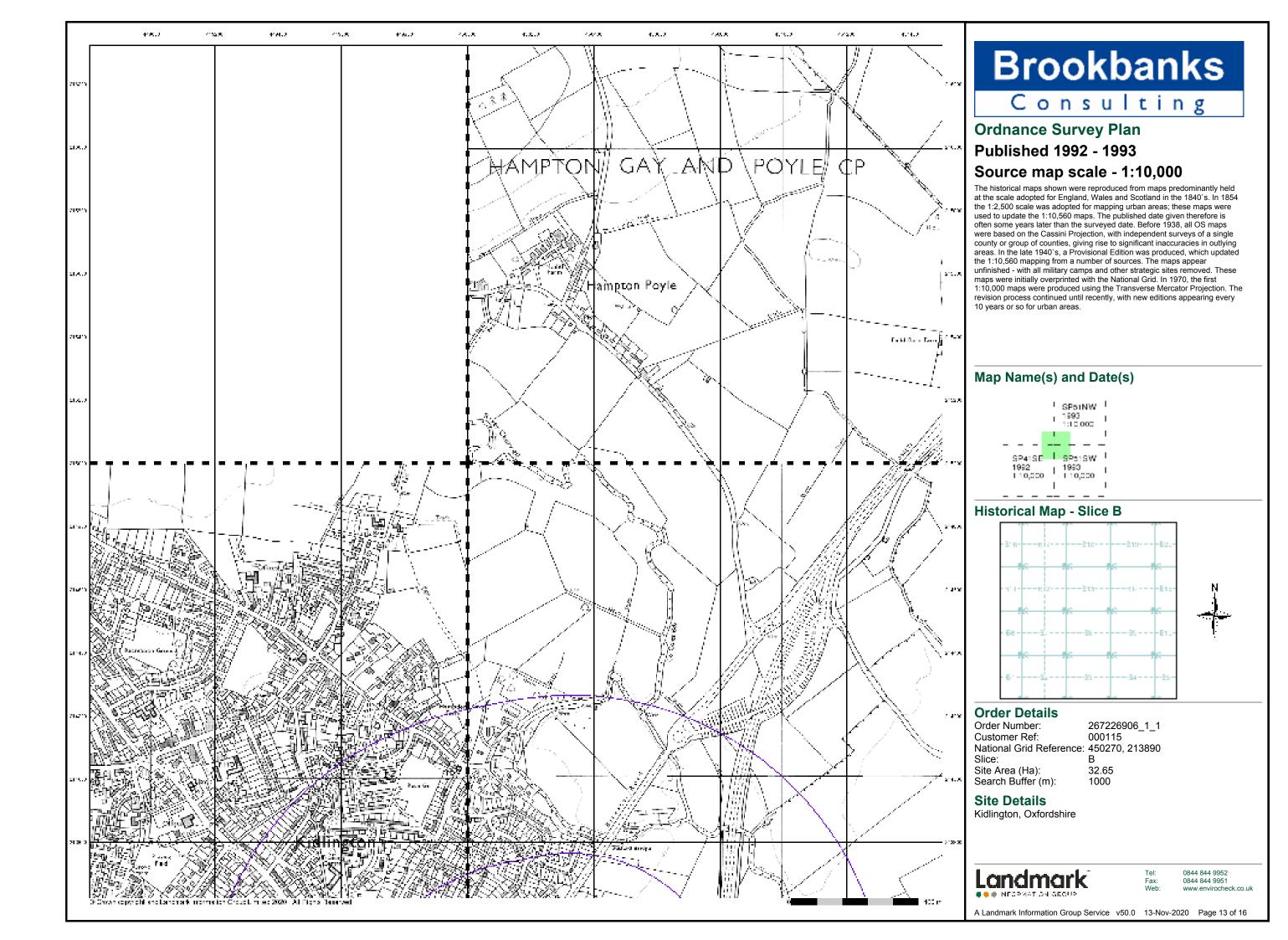


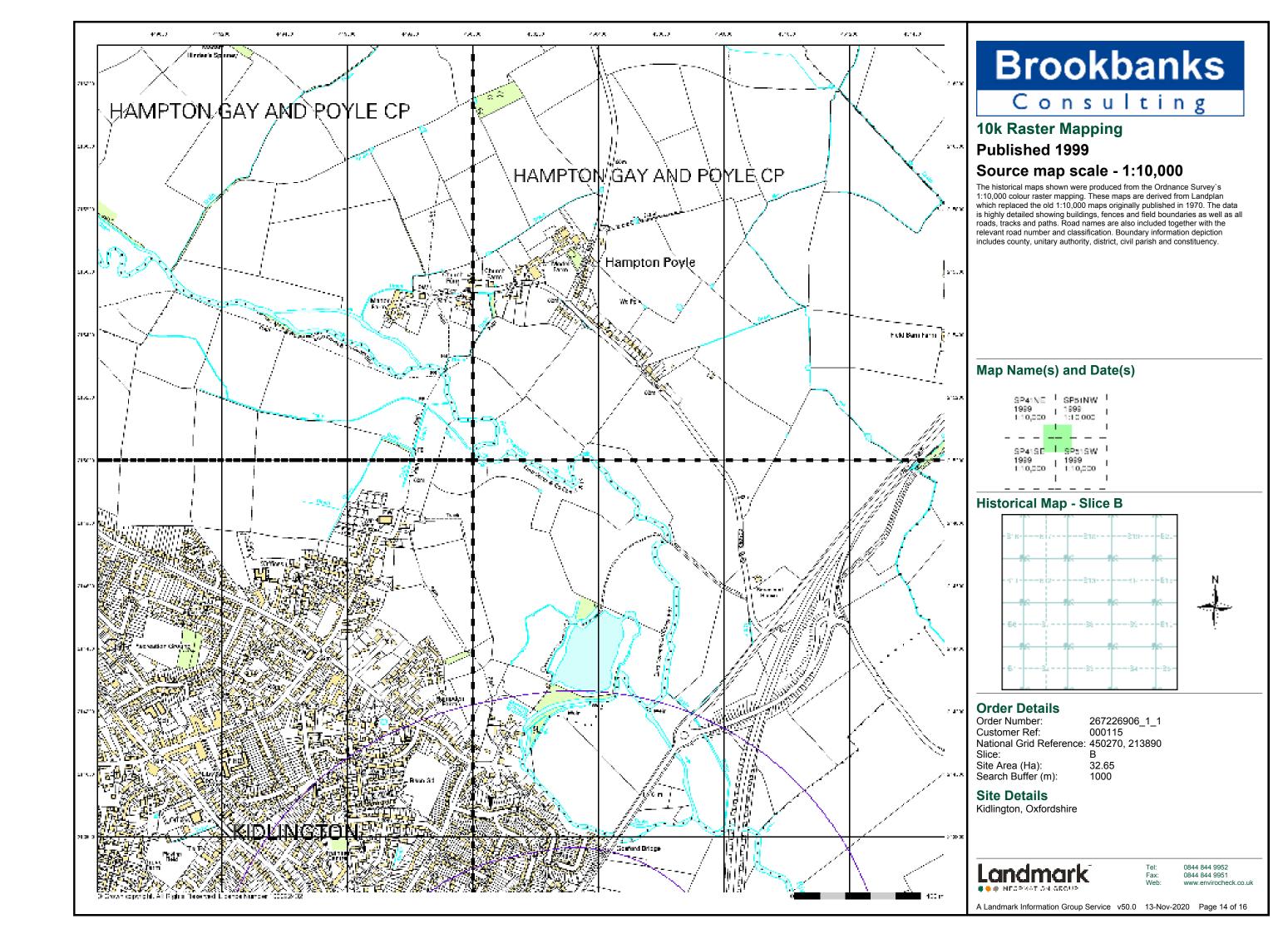


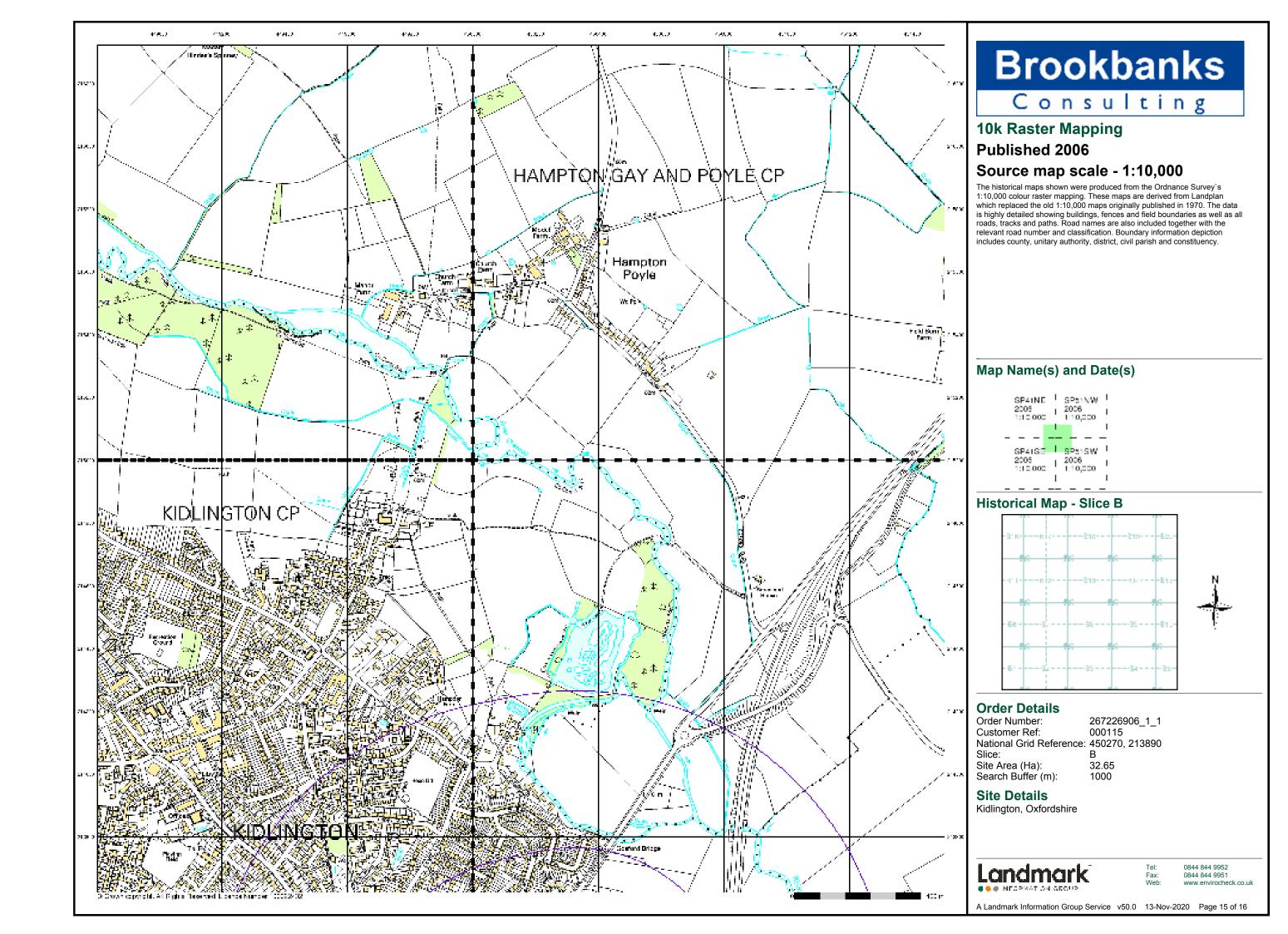


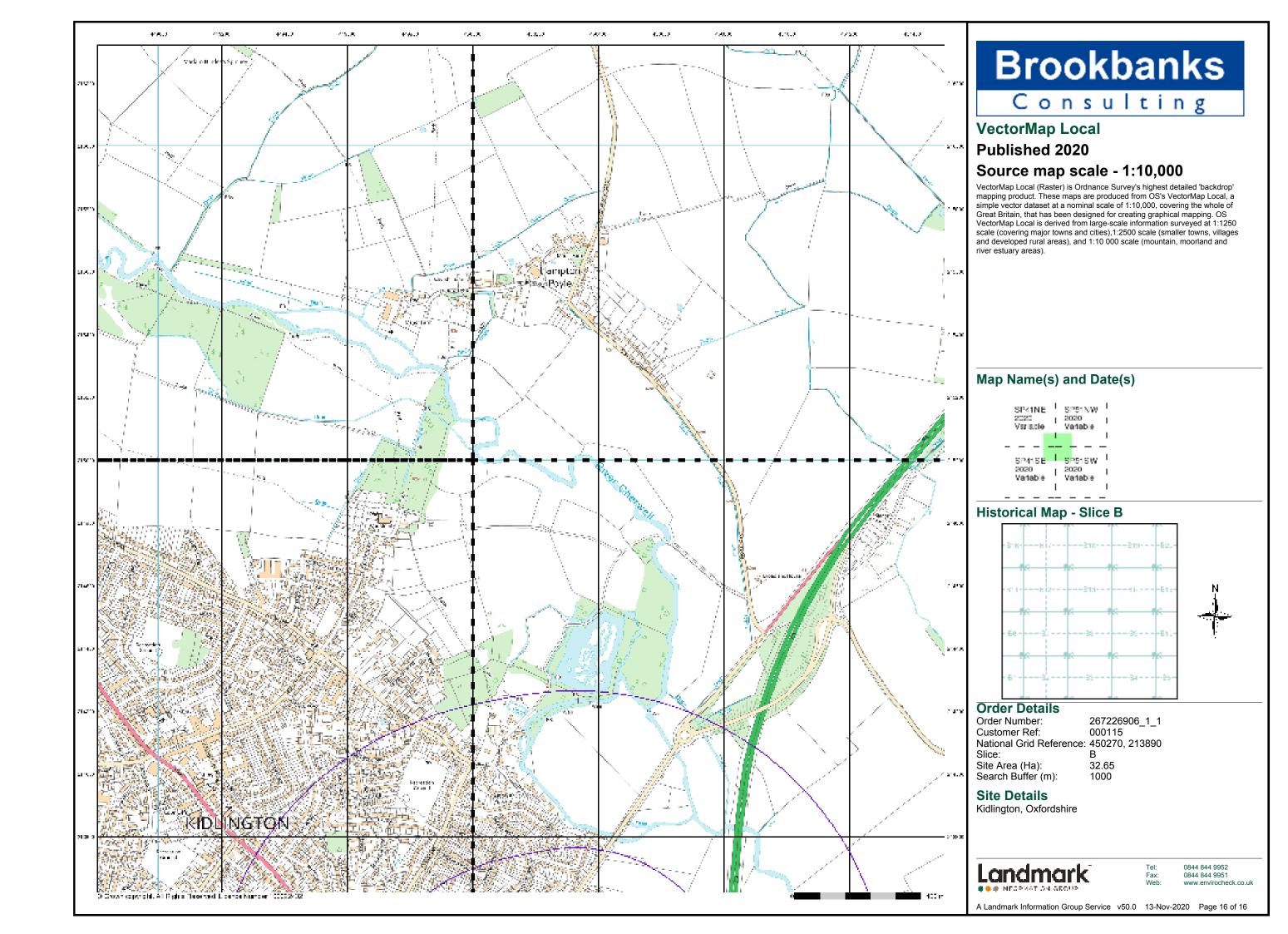














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