



A2 Site Investigation

Harringay Warehouse District

Phase I Desk Study

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1. Introduction

A2 Site Investigation Ltd (A2SI) has been engaged by Provewell Ltd to prepare a phase I desk study report for the proposed development at Harringay Warehouse District, Tottenham, London, N15 6RD (herein called the 'site').

1.1. Study Aims and Objectives

The desk study develops an initial Conceptual Site Model (CSM) and provides a qualitative Preliminary Risk Assessment (PRA) for the proposed development in accordance with the principles set out in *Land Contamination Risk Management (LCRM)* guidance, published by the Environment Agency on the UK Government website. The desk study has also been prepared in the context of the *National Planning Policy Framework (NPPF)* and *The Building Regulations 2010, Approved Document C - Site preparation and resistance to contaminants and moisture (2004 Edition incorporating 2010 and 2013 amendments)*. The desk study includes an assessment of whether there are any unacceptable risks (ref. *LCRM* guidance) which require further geo-environmental investigation. This report forms part of a wider programme, to be complemented by Phase II Ground Investigation and assessments.

Potential historical and current sources of contamination have been identified based on information available in the public domain (including information sources referenced in Section 1.2).

The proposed development is described in more detail in Section 6 but can generally be described as redevelopment and expansion of live-work units on the site, as part of a wider plan for the entire Harringay Warehouse District. A new eight-storey block (with two basement levels) and a new four-storey block are proposed adjacent to Eade Road.

Preliminary geotechnical assessment is not included in this desk study.

The outcomes of this desk study have been developed based on information current at the time of writing.

1.2. Information Sources

The primary sources of information which have informed the assessments presented herein include the following:

- *Envirocheck Report* for Harringay Warehouse District prepared by Landmark Information Group, dated October 2022 (ref. 302471250_1_1), included in Appendix B.
- *Detailed Unexploded Ordnance (UXO) Risk Assessment* for Harringay Warehouse District prepared by Brimstone, dated 14th October 2022 (ref. PRA-22-1937), included in Appendix C.
- Site walkover undertaken by representatives of A2SI on 18th October 2022.
- British Geological Survey, GeoIndex Onshore GIS database (accessed 12th October 2022); <https://mapapps2.bgs.ac.uk/geoindex/>.
- Department for Environment, Food & Rural Affairs (DEFRA), Magic Map Application (accessed 13th October 2022); <http://magic.defra.gov.uk/MagicMap.aspx>.
- Historic England, online Aerial Photo Explorer (accessed 13th October 2022); <https://historicengland.org.uk/images-books/archive/collections/aerial-photos/>.
- Health Protection Agency and British Geological Survey document Indicative Atlas of Radon in England and Wales, 2007.
- *The Lost Rivers of London* by Nicholas Barton, 1962.
- Google Earth (ref. earth.google.com/web/), accessed 10th October 2022.
- Flood Maps for Planning (ref. <https://flood-map-for-planning.service.gov.uk/>), accessed 10th October 2022).



2. Site Setting

2.1. Development Location and Current Site Use

The development site is located at Harringay Warehouse District, Tottenham, London, N15 6RD, as shown in Figure 2.1. The approximate National Grid reference for the site is 532700, 187990 and the site footprint covers approximately 0.23 hectares. The approximate ground surface elevation at the south of the site is 26 m above Ordnance Datum and elevations fall steeply towards the Tewkesbury Road in the northern part of the site (approximately 20 m OD).

The development site falls within the administrative boundaries of the London Borough of Haringey and currently includes a vacant plot on the corner of Eade Road and Seven Sisters Road and associated land in front and behind Cara House (both currently used as carparking areas). The site also includes an electrical substation, southwestern end of Tewkesbury Road, breakers yard and a narrow passageway between Tewkesbury Road and Seven Sisters Road.

The current land uses within a 250 m radius surrounding the site are summarised in Table 2.1.



Figure 2.1 Location of the proposed development (red line reflects the site boundary used for this assessment)

Table 2.1 Surrounding land uses summary

Bearing from Site	Features directly adjacent to the site boundary	Other identified land uses and key structures
North	Warehouse living spaces along Tewkesbury Road	Tewksbury Road (extends north immediately from site boundary), Cotton Mill and various other industrial/manufacturing units/warehouses (18 m north of courtyard to approximately 100 m and intersected by Overbury Road 50 m north and northeast of the site boundary), Tewksbury Road Open Space (75 m north), Community Centre (approximately 110 m north), Tiverton Primary School and playground (140 m north), three auto repair shops along Tewkesbury Rd to 75 m north and London Scrap Metal Recycling place approximately 85 m to the north of the site.



Bearing from Site	Features directly adjacent to the site boundary	Other identified land uses and key structures
South	Eade Street – single carriageway	Beyond Eade Rd (immediately to the south of the site boundary) and Eade Rd/Seven Sisters Rd intersection (immediately south and south east) is a four-storey residential apartment block 'Vivian House' (22 m south) surrounded by soft-landscaping area (from 13 m south) and Thames Water Pumping Station facilities (40 m southwest) with surrounding grass land. The course of New River is located 59 m to the south of the site and residential properties on the other side of the river (75 m south). Seven Sisters Rd/A107 intersection is approximately 45 m to the south of the site).
East	Residential terraced properties with small gardens along Seven Sisters Road (single carriageway)	Immediately to the east is KB Classic Cut Hairdresser and Seven Sisters Road. Further along A107 there is a Synagogue (48 m east). A Baptist Church is located (75 m east) on the corner of Seven Sisters Road and Vartry Road, with Stamford Hill Primary School located 140 m east (Vartry Road). Beyond this point the area turns largely residential.
West	Cara House (six-storey block) and warehouse	To the West of the site is Cara House – of both residential and commercial use including various businesses: night club, games arcade and office spaces (the site boundary surrounds the building to the north, east and south). A large warehouse (commercial and shopping unit) is located immediately to the west and associated car parking areas (one immediately to the west, the other approximately 65 m west. Various commercial and shipping units stretch beyond this point further to the west.

2.2. Site Walkover

A site walkover was undertaken by A2SI on the 18th October 2022. A summary is presented in this Section 2.2. Walkover records are included as Appendix D and these should be reviewed alongside the summary details below.

Much of the site is occupied by a carpark accessible via Eade Road. The car park is approximately 25 x 20 m in size and surrounded by a brick wall at its westerly perimeter, a metal fence with electric double gates to the south, a wooden fence to the east and railings separating it from the Cara House to the north. There is a bin store approximately 8 x 5 m in size and located in the southeast corner of the carpark. Immediately east of the carpark is a concrete and gravel outdoor seating and standing area (approx. 30 x 10 m) associated with the permanently parked fish and chips van where occasional, small-scale public live music and food events are held. The north of the site is a courtyard with a central vegetated area, multiple informal seating areas and a small outdoor bar against the metal perimeter fence behind the Cara House. The only substantial building on site is the breakers yard to the northeast, surrounded by a breeze block wall and with a small single-storey unit to the rear. The sloped central part of the site is heavily vegetated apart from the electrical substation at the base of the verge.

One electrical substation was observed on-site, located within a centre of the site. The area is overgrown and bound by a wooden fence, accessible through a wooden door via the stepped alleyway and with a warning sign, partially obscured by graffiti.

Off-site land-uses are largely commercial (typically large warehouses containing multiple commercial units) to the north and west, with occasional residential properties also present. To the east of the site is Seven Sisters Road with a Transport for London and London Underground (TFL/LU) tunnel running beneath it; beyond this point, the area is largely residential with a synagogue (48 m east) and a church approximately 75 m east of the site. To the south of the site is Eade Road followed by an area of soft landscaping and then the New River approximately 59 m south of the site.

Ground levels across the southern site are generally flat before declining steeply towards the north and northwest. The local spot levels around the site indicate 26.3 m OD to the south of the site and 22.9 m OD northeast of the site. Ground levels across the northwest courtyard also appear generally flat.



Some surface water drainage infrastructure was observed where Tewkesbury Road meets the site boundary.

A site features plan is provided Figure 2.2.



Figure 2.2. Site features plan

2.3. Planning Records

The Haringey Council Planning Portal (HCPP) has been searched for relevant records. No planning applications have been identified with respect to the site.

A search of the site's surrounding 250 m radius was undertaken on the HCPP and returned five planning applications: HGY/2022/0044, HGY/2022/0282, HGY/2021/2889, HGY/2022/2423, HGY/2022/2433. The planning application referenced HGY/2022/0044 included geo-environmental reporting. The location of the off-site planning application can be observed in Figure 2.3.



Figure 2.3. Location of planning application HGY/2022/0044 in relation to the site.

2.3.1. Planning Application HGY/2022/0044

Planning reference HGY/2022/0044 is located 160 m northwest of the site and refers to the 'Application for full planning permission for a comprehensive redevelopment of the site to provide four buildings comprising flexible light industrial floorspace (Class E) and storage and distribution units (Class B8), together with car and cycle parking, plant and all highways, landscaping and other associated works - Site at 108 Vale Road, London, N4 1TD'.

The following report was identified on the portal:

- Proposed Development Florentia Clothing Village Extension, Vale Road, Phase II Ground Investigation Report (ref R-GI-23675-01-02) produced by JPP issued December 2021.

The 2021 report on Phase II Ground Investigation Report produced by JPP summarised a ground investigation completed by JPP undertaken on 6th and 7th October 2021. The field work consisted of two excavated trial pits TP02 and TP03 (to a maximum depth of 2.10 m bgl), eight windowless sampler boreholes WS01 - WS08 (to a maximum depth of 5.00m bgl) with five gas and groundwater monitoring installations and seven hand excavated trial pits HD01 - HD07 in order to determine foundation depths of the easternmost and southern walls.

Made Ground underlying the concrete was generally cohesive, consisting of brown to grey, slightly gravelly, slightly sandy to sandy, silty clay to depths of between 0.70 m and 1.50 m bgl. The gravels within the clay soils consisted of brick, sandstone, concrete and occasional blacktop, metal, clinker and glass. A band of fine to coarse brick gravel were found in WS04 from 0.25 m to 0.35 m bgl, and fine to medium blacktop gravel was found in WS05 from 0.40 m to 0.60 m bgl. Above the clay Made Ground in HD01 and HD02 from the surface was a dark grey, gravelly, slightly silty, fine to medium sand with ash content to 0.30 m and 0.35 m bgl respectively. The gravel within the sand was described as brick, concrete and wood with occasional cobble size brick fragments.

Groundwater was encountered only within the Made Ground in the eastern section of the Site from between 0.45 m (WS08) and 1.35 m bgl (TP03). It was noted that the groundwater had a hydrocarbon odour.

Two combined groundwater and gas monitoring visits were undertaken as part of these site investigation works.



Elevated levels of lead were encountered within Made Ground soils (TP03) with TPHs and asbestos recorded below the assessment criteria implemented or not detected above method detection limits. The report concluded that no likely sources of ground gases were identified and following the ground gas monitoring visits, no gas protection measures were required. Water levels within WS04 and WS07 varied by approximately 3.20 m between the first and second visits, with the water levels rising from 3.98 m and 3.72 m bgl to 0.72 m and 0.60 m bgl respectively. It was concluded that this occurrence was likely to result from water ingress from the Made Ground strata, and not as a result of a variation in natural groundwater levels.

Finding of the Ground Investigation Report concluded that a 'hotspot' of contamination encountered at TP03, where the lead exceedance was encountered, will require suitably capping.

The area of Planning reference HGY/2022/0044 is not considered further as a viable potential off-site source of contamination in this desk study given the nature of the ground conditions and types of contamination identified which should not impact the site.

The planning application HGY/2022/0044 is currently pending Haringey Council decision.

2.4. Regulatory Consultation

Requests for information have been made to the following bodies:

- Environment Agency (EA), contacted via email on the 11th October 2022 (see Appendix E). Response awaited.
- Haringey Council (HC), contacted via email on the 11th October 2022 (see Appendix E). Response awaited.

Copies of the regulatory consultation undertaken are included as Appendix E.

2.5. Unexploded Ordnance

London was the most heavily bombed city in Britain during WWII, as indicated by official wartime figures. Despite the site's location in a peripheral borough, it was still situated in relatively close proximity to central London. An identified target, Tottenham Water Treatment Works and Reservoir, was also present within 2.5km. As a result, the borough experienced a high bombing density.

15 bombing incidents were recorded within an approximate 300m radius of the site; the closest of these incidents was plotted approximately 100 m to the northwest of the site.

Although a section of the site comprised an open ground during WWII, within which a UXB strike is typically less likely to have left clear evidence of its descent, it is anticipated that access and monitoring will have remained frequent/high, given the structures to the north, and the roadways around the south and east. Due to this, a crater or entry hole left by a UXB is more likely to have been observed, than in a large open field, for example. No damage is recorded to adjacent structures.

In summary, due to the lack of evidence of bombing and/or related damage on site or in the immediate vicinity, coupled with the anticipated frequent access to the site, the risk from UXO is not considered to be elevated above the background level for Harringay.

A Stage 2 Detailed UXO Risk Assessment is not considered necessary prior to works commencing. However, the possibility of UXO remaining on site cannot be completely ruled out at desktop stage, therefore, a UXO Safety Awareness Briefing to all personnel conducting ground works would be considered prudent.

Details of risk management strategies are outlined in CIRIA C681.

The above provides a summary of the available UXO risk assessment. However, the full assessment provided in Appendix C must be referred to and takes precedence.



3. Geological Setting

3.1. Regional Geological Overview

The development site is located within the London Basin, which refers to an approximately triangular synclinal structure in which the sedimentary units underlying London and much of southeast England were deposited. The London Basin is comprised of the following formations, in order of decreasing depth:

- A deep (~200m thick) layer of Chalk, deposited throughout the Upper Cretaceous period, forms the base of the basin and is the principal aquifer of the region.
- The Thanet Formation, which comprise fine, locally silty glauconitic sands originating in shallow seas.
- The Lambeth Group, a depositionally and geographically complex sequence which comprises layers of sands and gravels, shelly and mottled clays, minor layers of cemented materials: limestones and lignites, and occasional sandstone and conglomerate.
- The London Clay Formation, a fine-grained deposit of silty locally sandy clay which is the dominant Thames Group deposit. Contains layers of weakly to strongly cemented claystones.
- Superficial (drift) deposits: River Terrace Deposits (comprising mainly gravels and sands) and Alluvium (fine, often organic soils) aggraded/deposited by the River Thames and its tributaries on top of the London Clay.

3.2. Site Geology and Anticipated Ground Conditions

Figure 3.1 illustrates the location of the development within the context of a regional geological map. The map illustrates the spatial distribution of superficial (drift) deposits and bedrock outcrops at the ground surface.

The Worked Ground is assumed to be present on site associated with historical site use, quarrying / brick works.

The geology map indicates that the site is located where natural superficial deposits are absent. However, Head Deposits have been marked on the BGS map adjacent to the south of the site boundary therefore a probability of encountering of this layer is likely. The London Clay Formation is present directly beneath the anthropogenic deposits and is underlain by the Lambeth Group over Thanet Formation overlying the Chalk.

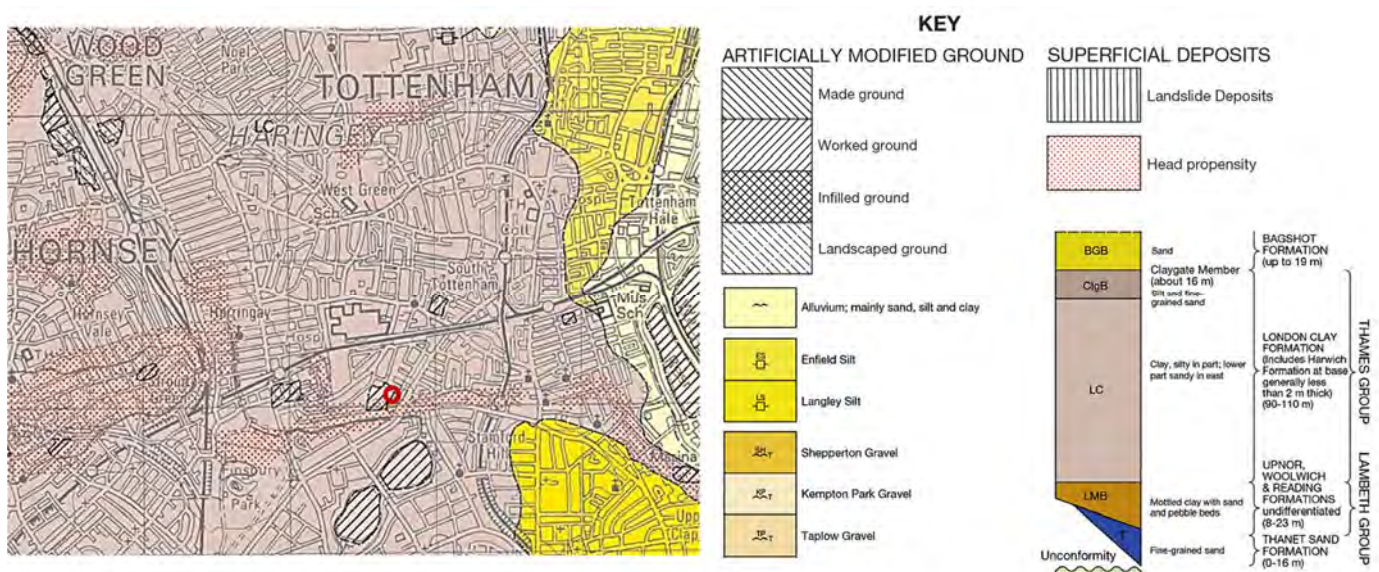


Figure 3.1. Geological context of the site. Approximate site location marked by red circle.



The British Geological Survey (BGS) Geology of Britain web map services provide access to the geographic locations and logs of historical borehole investigations and well installations. Historical boreholes surrounding the site are shown in Figure 3.2. The following historical records have been reviewed as part of this assessment; TQ38NW468, TQ38NW467, TQ38NW251 and TQ38NW95. Table 3.1 summarises the preliminary ground model adopted in this desk study, based on the information reviewed.



Figure 3.2. Locations of BGS boreholes in close proximity to the site boundary

Table 3.1. Preliminary ground model

Unit	Elevation ^[1] (mOD)	Depth ^[1] (m bgl)	Thickness (m)	Description
Made Ground	+26.25	0.0	12.0	Variable anthropogenic deposits
London Clay Formation	+14.25	12.0	30.5	Stiff brown/grey clay with partings of silt fine sand and occasional layers/beds of extremely weak to strong claystones
Lambeth Group	- 16.25	42.5	17.25	Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones, lignitic horizons, occasional sandstone and conglomerates
Thanet Formation	-33.50	59.75	6.25	Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate
Chalk	-39.75	66.0	Not proven	Generally very weak to weak, low to medium density white chalk

1. Elevation and depth refer to top of stratum.

3.3. Groundwater and Hydrogeology

Localised shallow perched water may be present associated with any Made Ground or Head deposits at the site.



The London Clay Formation is listed as Unproductive Strata. Unproductive Strata are low permeability strata which are not considered to retain significant quantities of groundwater. If groundwater is present within Unproductive Strata, for example within more permeable lenses or small fissures, it is typically discontinuous, of low value and very low sensitivity.

The underlying Lambeth Group and Thanet Formation are classed by the EA as a Secondary A Aquifer including permeable horizons capable of sustaining water supplies at a local rather than strategic scale, and in some cases significant enough to form the source of base flow to rivers.

The Chalk Group is classified as a Principal Aquifer as it contains layers of rock that have high permeability (due to fracturing, intergranular nature of the deposits and porosity) that provides high level of water storage capacity. They may support water supply and/or river base flow on a strategic scale.

It is anticipated that the pore water pressure distribution within the London Clay Formation is likely to be in hydrostatic equilibrium with an average or mean perched water table level. Whilst it is considered that the pore water pressure distribution within the London Clay and upper Lambeth Group clays is hydrostatic, it is likely that the lower portion of the Lambeth Group, Thanet Sand and Chalk Formations are underdrained. Due to historical dewatering from the Chalk aquifer at depth, underdrainage effects are frequently observed within the strata at depth within the London Basin.

The site is considered to be located in a setting of low sensitivity with regard to groundwater in relation to the underlying Unproductive Strata associated with the London Clay Formation. The mostly non-permeable London Clay deposits are considered to offer a level of protection to the underlying aquifers. Groundwater sensitivity is further reduced by the application site's urban setting and the absence of any nearby water abstractions at shallow depth. Groundwater within the deeper Chalk aquifer is confined by the London Clay and is anticipated to flow in a southerly direction towards the River Thames.

The site is identified as being located within a groundwater Source Protection Zone (SPZ) I. The SPZ is understood to be associated with the bedrock aquifers underlying the London Clay Formation.

According to the Landmark Envirocheck database, there are currently seven licensed groundwater abstractions (with multiple abstraction points) within 500m of the site as detailed below:

- Thames Water Utilities Ltd (one abstraction points located 37 m southwest from the site) – Eade Road East - Nlars Point 18, Public Water Supply: Potable Water Supply – Direct
- Thames Water Utilities Ltd (four abstraction points located 40 m southwest from the site) – Eade Road, Stamford Hill - Nlars Point 18, Public Water Supply: Potable Water Supply – Direct
- Thames Water Utilities Ltd (one abstraction points located 252 m southeast from the site) – Bethune Road - Nlars Point 19, Public Water Supply: Potable Water Supply – Direct
- Thames Water Utilities Ltd (four abstraction points located 261 m southeast from the site) – Bethune Road - Nlars Point 19, Public Water Supply: Potable Water Supply – Direct
- Thames Water Utilities Ltd (one abstraction points located 315 m southeast from the site) – Bethune Road, STOKE NEWINGTON, Public Water Supply
- Thames Water Utilities Ltd (one abstraction points located 490 m southeast from the site) – Lordship Road, STOKE NEWINGTON, Public Water Supply
- Thames Water Utilities Ltd (one abstraction points located 497 m southeast from the site) – Eade Road West - Nlars Point 39, Public Water Supply: Potable Water Supply – Direct



3.4. Hydrology

The nearest surface water feature (New River) is located approximately 59 m to the south.

The Lost Rivers of London (Barton, 1962) reveals that the New River was 'artificially' created following the attempt to increase the London's water supply at the start of XVII century by bringing the water from Hertfordshire. The New River followed a winding course of nearly 40 miles partially distributed in wooden pipes with much of its waters obtained from nearby streams incl. Hackney Brook. Given the nature of the preliminary ground model it is considered that a viable pathway to the above-mentioned surface water feature, is not present.

3.5. Geological Hazards

The British Geological Survey and Environment Agency (EA) hazard mapping have identified the following potential geotechnical hazards at the site:

- *Very Low* potential for collapsible ground stability hazards.
- *No Hazard* from compressible ground stability hazards.
- *No Hazard* from ground dissolution stability hazards.
- *Very Low* potential for landslide ground stability hazards.
- *Moderate* potential for shrinking or swelling clay ground stability hazards.
- *Very Low* from running sand ground stability hazards.

3.6. Mining and Mineral Extraction

The site is not listed within the Envirocheck Report as within an area affected by coal mining.

There are no BGS Mineral Site entries listed within the Envirocheck Report within 500m of the site.

No record of mining instability, man-made mining cavities or natural cavities have been recorded within 500m.

3.7. Radon

The Envirocheck Report indicates that the site is within a Lower Probability Radon Area (with less than 1% of homes estimated to be at or above the Action Level). Radon risk mapping included in *BRE 211: Radon – Guidance on Protective Measures for New Buildings (2015)* indicates that without a site-specific Radon Risk Report the maximum requirement for radon protection is 'None'.

A new basement is to be incorporated into the proposed development. As indicated in *BRE211 (2015)*, all basements are at increased risk of elevated levels of radon, regardless of geographic location. Therefore, despite the radon risk mapping, it is recommended that appropriate radon protection is provided for the new basement. An appropriate radon protection strategy which is compatible with the building waterproofing should be developed by a suitable waterproofing and radon specialist. 'Basic radon protection' (ref. *BRE211 (2015)*) is appropriate.



4. Site History

Detailed historical maps, fire insurance plans and aerial photographs of the site and surrounding area dated between 1863 and 2022 (at scales of 1:1,250, 1:2,500, 1:5,280, 1:10,000, 1:10,560 and 1:25,000), provided as part of the Envirocheck Report (Appendix B), have been reviewed as part of the study. This process has been undertaken to identify any former land uses at the site and within the surrounding area that may have geo-environmental implications for the proposed redevelopment.

The findings are summarised in Table 4.1. Only features considered to have a potential geo-environmental impact on the site and usually within a notional 250m radius of the site boundaries are presented and discussed, with the exception of any potentially infilled land which is identified within 500m of the site. Any distances quoted for features remote from the site have been scaled from the maps and are approximate. Other information sources available in the public domain have also been reviewed to support this assessment, including the Historic England online Aerial Photo Explorer and historical aerial photographs available on Google Earth.

Table 4.1. History of the site and surrounding areas

Historical Feature	Distance and Bearing from Site	Date of First Map Appearance	Date of Last Map Appearance	Potential to Impact the Site
<i>On-Site</i>				
Field with Boundary Posts forming the south boundary of the site	-	1863	1879	No (unlikely source of contamination)
Brick Works and residential terraced properties with outside space (currently Seven Sisters Road No 341 and 343) appearing in the northeast side of the site	-	1896	1896	Yes
Non-coniferous tree area associated with the new Blouse Factory appears in the north side of the site; central part of the site appears steep sloped (possibly post-Brick Works excavation)	-	1915	1920	Yes
The tree area is now occupied by part of the Store Fittings Manufactory building; an outbuilding/structure appears within the outside space of No 341 Seven Sisters Road.	-	1936	1966	Yes
A large rectangular building visible in the south side of the site	-	1946	1991	Yes
The site remains largely unchanged	-	1999	2022	-
<i>Off-Site</i>				
Factory (incl. blouse, hosiery, hand bag)	0 m W	1915	1920	Yes
	200 m N	1952	1992	No
	185 m NW	1952	1992	(Due to distance and nature of the ground model, migration of contamination onto site is unlikely)



Historical Feature	Distance and Bearing from Site	Date of First Map Appearance	Date of Last Map Appearance	Potential to Impact the Site
Store Fittings Manufactory	0 m W	1936	1978	Yes
Works (incl. confectionery, metal, furniture, engineering)	140 m W	1915	1977	No (Due to nature of the ground model, distance, anticipated groundwater flow direction, migration of contamination onto site is unlikely)
	15 m N	1936	1992	Yes
	25 m N		1992	Yes
	185 m NW		1936	No (Due to distance and nature of the ground model, migration of contamination onto site is unlikely)
	170 m NW	1952	2022	Yes
	0 m NE		1952	
	55 m NE		1952	
	60 m NE		2022	
	25 m N		1992	
	30 m N		1992	
	50 m N		2022	
Tanks	175 m W	1936	1992	No (Due to nature of the ground model, distance, anticipated groundwater flow direction, migration of contamination onto site is unlikely)
Electrical Wire Works	225 m W	1936	1936	Yes
Manufactory (incl. furniture, bedstead, lace paper)	55 m N	1936	1936	
	125 m NW		1936	
	250 m W		1954	No (Due to distance and nature of the ground model, migration of contamination onto site is unlikely)
Laundry	50 m NE	1936	1954	Yes
Telephone Exchange	210 m NE	1936	2022	No



Historical Feature	Distance and Bearing from Site	Date of First Map Appearance	Date of Last Map Appearance	Potential to Impact the Site
				(Due to distance and nature of the ground model, migration of contamination onto site is unlikely)
Tramway	10 m SE	1936	1936	Yes
	135 m S		2022	No (Due to nature of the ground model, distance, anticipated groundwater flow direction, migration of contamination onto site is unlikely)
Electrical Substation	195 m NW	1952	2022	No (Due to distance and nature of the ground model, migration of contamination onto site is unlikely)
	235 m SW		1954	No (Due to nature of the ground model, distance, anticipated groundwater flow direction, migration of contamination onto site is unlikely)
	85 m NE	1975	2022	Yes
Builder's Yard	210 m N	1952	1952	No (Due to distance and nature of the ground model, migration of contamination onto site is unlikely)
Warehouse	70 m NW	1954	2022	Yes
Air shaft	105 m NE	1960	2022	No
Ruin	90 m E	1952	1952	(Due to distance and nature of the ground model, migration of contamination onto site is unlikely)



5. Environmental Setting

5.1. Regulatory Data

Regulatory data from the Envirocheck Report in close proximity to the development site (generally within 250 m of the site boundary, with the exception of landfill and infilled ground which is identified within 500 m of the site) has been summarised in Table 5.1. The information provided for each item in Table 5.1 has been summarised from the Envirocheck Report for risk assessment purposes. For a full breakdown of the regulatory data refer to the Envirocheck Report in Appendix B.

Table 5.1. Summary of regulatory data

Item	Distance and Bearing from Site	Information	Potential to Impact the Site
<i>Agency & Hydrogeological</i>			
No relevant records			
<i>Waste and Landfill</i>			
Potentially Infilled Land (Non-Water)			
<i>Records on site: 1</i>	On-site	Use: Unknown Filled Ground (Pit, quarry etc)	Yes
<i>Records within 0-250m: 0</i>		Date of Mapping: 1990	
<i>Records within 250-500m: 0</i>			
Potentially Infilled Land (Water)			
	210 m SE	Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	No
		Date of Mapping: 1876	
<i>Records on site: 0</i>	333 m N	Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	(Due to distance and nature of the ground model, migration of contamination onto site is unlikely)
<i>Records within 0-250m: 1</i>		Date of Mapping: 1876	
<i>Records within 250-500m: X</i>	497 m NE	Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)	
		Date of Mapping: 1876	
<i>Facilities Registered as using Hazardous Substances</i>			
No relevant records			
<i>Industrial Land Uses and Points of Interest</i>			
<i>(potential sources of contamination are identified within 100 m of the site boundary only based on the preliminary ground model)</i>			
Contemporary Trade Directories and Points of Interest	9 m NE	Type: Unspecified Works Or Factories (x2) Status: N/A	Yes
<i>Records on site: 0</i>	16m N	Type: Clothing & Fabrics - Manufacturers Status: Inactive	Yes



Item	Distance and Bearing from Site	Information	Potential to Impact the Site
<i>Records within 0-100m: 52</i>			No
<i>Records within 0-250m: 143</i>			(non-industrial - unlikely source of contamination)
(only records based on the criteria in the section heading are shown opposite for risk assessment purposes. See Appendix B for all records)	17 m N	Type: Transport, Storage and Delivery Status: N/A	
	22 m N	Type: Unspecified Works Or Factories Status: N/A	Yes
	23 m N		
	36 m NE	Type: Metal Workers Status: Inactive	Yes
	40 m NW		
	38 m N	Type: Unspecified Works Or Factories (x5) Status: N/A	Yes
	47 m N		
	95 m W	Type: Clothing & Fabrics – Manufacturers (x4) Status: Inactive	Yes
	95 m W	Type: Wallpapers & Wall Coverings (x4) Status: Active	No (non-industrial - unlikely source of contamination)
	95 m W	Type: Textile Manufacturing Status: Inactive	Yes
	62 m NW		
	67 m NW	Type: Unspecified Works Or Factories (x4) Status: N/A	Yes
	59 m NW		
	72 m NW	Type: Clothing & Fabrics – Manufacturers (x4) Status: Inactive	Yes
	80 m NW		
	84 m NW	Type: Garage Services Status: Active	Yes
	59 m N	Type: Clothing Accessory Manufacturers Status: Inactive	Yes
	68 m N		
	69 m N	Type: Clothing & Fabrics – Manufacturers (x6) Status: Inactive	Yes
	70 m N		
	83 m N	Type: Unspecified Works Or Factories (x2) Status: N/A	Yes
	84 m N		



Item	Distance and Bearing from Site	Information	Potential to Impact the Site
	91 m N	Type: Clothing & Fabrics – Manufacturers	Yes
	92 m N	Status: Inactive	

5.2. Flood Risk

The Envirocheck report indicates that the site is located outside flood zones therefore it is further classified as at no risk of flooding from surface waters.

Flood Maps for Planning (ref. <https://flood-map-for-planning.service.gov.uk/>, accessed 17th October 2022) indicates that the site is located in a Flood Zone 1 i.e. there is a low probability of flooding.

No further consideration of flood risk is given in this report. Specialist flood risk advice should be sought with regards to drainage and flooding.

5.3. Ecology, Flora and Fauna

No records of potentially sensitive ecological receptors as defined by the *Environmental Protection Act (1990) Part 2a (as amended)* have been identified.

An assessment of potential invasive species is not included in this report. Given that some of the site areas are overgrown it would be prudent for an invasive weeds survey to be undertaken.



6. Proposed Development

The proposed development scheme involves the redevelopment and expansion of live-work units on the site, as part of a wider plan for the entire Harringay Warehouse District. A new eight-storey block (with addition of two-level basement) and a new four-storey block are proposed adjacent to Eade Road. In addition the scheme incorporates limited soft-landscaped areas at ground level and green roof-top terrace for the communal use.



7. Conceptual Site Model (CSM) and Preliminary Risk Assessment (PRA)

A means to qualitatively assess the risk posed by potential land contamination to a proposed development is to prepare an initial CSM and carry out a PRA. An initial CSM represents the characteristics of the site which influence the possible relationships between identified potential contaminant sources, pathways and receptors. A PRA is undertaken for each potentially complete source-pathway-receptor linkage (potential contaminant linkage). The PRA assessment matrix used in this report is included as Appendix A. The risk assessment approach is in accordance with the principles set-out in the *Land Contamination Risk Management* (LCRM) guidance, published by the Environment Agency on the UK Government website.

An initial CSM and PRA for the proposed development is set-out below in consideration of all the information detailed in the earlier sections of this report. Should any changes be made to the proposed development compared to the details presented herein, or should any new information become available, then the PRA must be updated.

7.1. Potential Contaminants of Concern

The potential contamination sources identified as part of this assessment are summarised in this section. Off-site potential sources of contamination within 100 m of the site boundary are identified and considered further, based on the preliminary ground model. Relevant potential ground gas sources within 500 m of the site are also identified.

Current and former residential land-uses, retail units, offices and other general commercial uses (non-industrial) are not considered potential sources of contamination unless stated otherwise.

Naturally occurring radon risks are discussed in Section 3.

Please be aware that the nature of historical records mean that every potential source of contamination may not be detailed in the available documents. Therefore, there is potential for additional sources of contamination to be present.

7.1.1. On-Site Sources

- Made Ground – heavy metals and metalloids, acids / alkalis, PAHs, asbestos, sulphate and ground gases.
- Historical site use as a Brick Works including Worked Ground (pit possibly since infilled) – heavy metals and metalloids, acids / alkalis, PAHs and TPHs associated with the Brick Works. Various contaminants may be present depending on the nature of the possible infill, such as heavy metals and metalloids, acids / alkalis, PAHs, TPHs, VOCs, SVOCs, MTBE, phenolics, asbestos, sulphate, cyanide, ammoniacal nitrogen, nitrate, phosphate and ground gases.
- Current electrical substation - PAHs, TPHs, and PCBs.
- Current breakers yard - heavy metals and metalloids, acids / alkalis, PAHs, MTBE, VOCs and TPHs.
- Current and former carparking areas – heavy metals and metalloids, acids / alkalis, PAHs, MTBE and TPHs.
- Current bin storage area and general littering of the site - heavy metals and metalloids, acids / alkalis, asbestos, PAHs and TPHs.
- Former blouse factory and store fittings manufactory - heavy metals and metalloids, acids / alkalis, PAHs, TPHs, VOCs and SVOCs.
- Former large rectangular building in the south - heavy metals and metalloids, acids / alkalis, PAHs, TPHs, VOCs and SVOCs.

Asbestos containing materials (ACMs) may be present in the current building fabric. Mitigation measures are described below separate to Table 7.1.

A potential source location plan for on-site areas is included as Figure 7.1.



Figure 7.1. Potential on-site contamination sources

7.1.2. Off-Site Sources

- Former Works and Factories 15 m, 25 m, 30 m, 50 m, 55 m north; 0 m west; 0 m, 55 m, 60 m northeast – heavy metals and metalloids, acid/alkalis, PAHs, TPHs, SVOCs and VOCs.
- Former Laundry 50 m northeast – heavy metals and metalloids, acids / alkalis and VOCs.
- Former Tramway 10 m southeast – heavy metals and metalloids, acids / alkalis, TPHs, PAHs and VOCs.
- Electrical Substation 85 m northeast – PAHs, TPHs and PCBs.
- Former Warehouse 70 m northwest – heavy metals and metalloids, acids / alkalis, PAHs, TPHs, SVOCs and VOCs.
- Industrial land uses and points of interest identified in Table 5.1 – works and factories 9 m northeast; 40 m, 59 m, 62 m, 67 m northwest; 22m, 23 m, 38 m, 47 m, 83 m and 84 m north – heavy metals and metalloids, acids / alkalis, PAHs, TPHs, SVOCs and VOCs
- Clothing and Fabrics Manufacturers 16 m, 59 m, 68 m, 69 m, 70 m, 91 m, 92 m north; 72 m, 80 m northwest; 95 m west - heavy metals and metalloids, acids / alkalis and VOCs.
- Metal Works 36 m northeast – heavy metals and metalloids, acids / alkalis, PAHs, VOCs, SVOCs and TPHs.
- Garage services 84 m northwest – heavy metals and metalloids, acid/alkalis, PAHs, TPHs, MTBE and VOCs.

The above bullet-points are a summary list of the most pertinent potential off-site sources. Other potential off-site sources are identified in the earlier sections of this desk study and are associated with contaminants including: heavy metals and metalloids, acids / alkalis, PAHs, MTBE, VOCs, SVOCs, TPHs, ground gases, ammoniacal nitrogen and sulphates.

Asbestos has not been indicated for potential off-site sources as there is no relevant pathway for asbestos to migrate through the ground towards the site.

Notes -

TPH – total petroleum hydrocarbons (inc. BTEX)



PAH – polycyclic aromatic hydrocarbons

LPG – liquefied petroleum gas

VOC – volatile organic compounds

SVOC – semi-volatile organic compounds

BTEX – benzene, toluene, ethylbenzene, xylenes

PCBs – polychlorinated biphenyls

Asbestos – potential free fibres, debris and / or fragments of asbestos containing material (ACM).

Ground gas – methane, carbon dioxide, carbon monoxide and / or hydrogen sulphide (excludes soil vapour)

7.2. Potential Pathways

The potential pathways identified as part of this assessment include:

7.2.1. On-Site Human Health

- Dermal contact or ingestion of soils at the site.
- Inhalation of ground gas, soil vapour or soils at the site.
- Consumption of water from impacted water supply pipes installed as part of the proposed redevelopment.

7.2.2. Off-Site Human Health

- Inhalation of wind-blown soil derived from the site.
- Migration off-site at shallow depth via preferential pathways and / or shallow perched groundwater followed by direct contact / inhalation / ingestion of contaminated soils.
- Off-site migration of ground gas or soil vapour followed by accumulation and inhalation within neighbouring properties.
- Migration off-site at shallow depth via preferential pathways and / or shallow perched groundwater followed by impact to water supply pipes and ingestion.

7.2.3. On-Site Buildings and Below Ground Structures

- Direct contact of 'aggressive' ground and / or grossly impacted soils with building structures / foundations.
- Accumulation of ground gas or soil vapour within buildings followed by ignition.

7.2.4. Off-Site Buildings and Below Ground Structures

- Migration off-site via preferential pathways, shallow groundwater and / or shallow perched groundwater followed by direct contact with building structures / foundations.
- Off-site migration of ground gas or soil vapour followed by accumulation within buildings and ignition.

7.2.5. Controlled Waters

- Leaching from the unsaturated zone.
- Perched water percolation and / or lateral migration.
- Migration via advection and diffusion in the saturated zone.
- Vertical and lateral migration of free-phase product in the unsaturated and saturated zones.

7.2.6. Sensitive Ecology, Flora and Fauna

- On-site ingestion / dermal contact / inhalation / root uptake.
- Off-site migration at shallow depth via preferential pathways and / or shallow perched groundwater followed by ingestion / dermal contact / inhalation / root uptake.
- Off-site migration via controlled waters pathways followed by ingestion / dermal contact / inhalation / root uptake.



7.3. Potential Receptors

The potential receptors identified as part of this assessment include:

- Human health of proposed site end users (residential users, commercial users and occasional maintenance workers).
- Human health of off-site commercial end users (closest 0 m and 15 m from site in west and north directions respectively) and residential end users (closest directly east of the site along Seven Sisters Road) in the vicinity of the site (including garden use).
- Property including on-site (proposed) and off-site buildings and below ground structures (buried concrete and underground services).
- Flora and fauna in proposed soft-landscaped areas and off-site.

New foundation systems associated with the proposed redevelopment are not anticipated to penetrate the base of the London Clay Formation. Therefore, bedrock aquifers and SPZ1 beneath the London Clay Formation are not considered further in this assessment as there is no risk of preferential pathways being created via piling. The Client should inform A2SI of the foundation termination depths once final designs have been prepared so that no requirement for a foundation works risk assessment can be confirmed.

Given the localised perched water anticipated at shallow depth and likely thickness of the London Clay Formation, shallow groundwater is not considered a sensitive controlled waters receptor and not considered further in the PRA. Shallow groundwater is unlikely to provide a viable pathway to identified off-site surface water receptors, so risks to controlled surface waters are also not considered further in the PRA.

No records of potentially sensitive ecological receptors as defined by the *Environmental Protection Act (1990) Part 2a (as amended)* have been identified.

Risks to site workers and the environment (from potential land contamination) during the construction phase of the proposed redevelopment can be appropriately managed by successful implementation of construction phase risk assessments and method statements (RAMS). The associated construction phase risks from potential contamination are not considered further in this document but should be appropriately considered and mitigated by the Principal Contractor in their preparation and implementation of construction phase RAMS and Construction Phase Plan (CPP).

7.4. Summary of Potential Contaminant Linkages

The information presented in this assessment has been compiled to produce a summary of the identified potential contaminant linkages, based on the initial CSM presented herein. Table 7.1 presents a PRA for the proposed redevelopment based on the identified potential contaminant linkages. This assessment has been performed considering the details of the proposed development presented in this report. Qualitative risk classifications are provided in accordance with *CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001)* (see summary in Appendix A). Where no potentially complete contaminant linkage is identified then no risk classification is provided.

Table 7.1. Preliminary Risk Assessment (PRA)

Potential Contaminant Source	Potential Pathway	Potential Receptor	Potential Contaminant Linkage	Risk Level Classification
On-site See Section 7.1.1	Direct contact with soil	Human health of proposed site end users	Yes	Moderate [†]
	Inhalation of windblown soil	(see Section 7.3)	(Multiple historical and current site uses represent potential	Moderate [†]



Potential Contaminant Source	Potential Pathway	Potential Receptor	Potential Contaminant Linkage	Risk Level Classification
	Ingestion of soil		sources of contamination, and soft landscaping is proposed where exposure is possible)	Moderate †
	Impact to water supply pipes followed by ingestion of contaminated water supply		Yes (New pipes may be laid in impacted soils)	Low to moderate †
	Ground gas generation and inhalation		Yes (Worked Ground/Brick Works/infill and other Made Ground represents a potential source of ground gas)	Moderate †
	Soil vapour generation and inhalation		Yes (Volatile contaminants are potentially present)	Moderate †
	Inhalation of windblown soil from the site	Off-site human health (see Section 7.3)	Yes (Proposed development includes limited soft landscaping so generation of significant windblown dust is unlikely)	Low
	Off-site migration and direct contact with impacted soil		Yes (Domestic gardens with open ground are present immediately east of the site)	Low to moderate †
	Off-site migration and ingestion of impacted soil			Low to moderate †
	Impact to water supply pipes followed by ingestion of contaminated water supply		Yes (Pipes may be present in nearby soils impacted by potential contamination from the site)	Low to moderate †
	Ground gas generation, off-site migration and inhalation		Yes (Worked Ground/Brick Works/infill and other Made Ground represents a potential source of ground gas)	Moderate †
	Soil vapour generation, off-site migration and inhalation		Yes (Volatile contaminants are potentially present)	Moderate †



Potential Contaminant Source	Potential Pathway	Potential Receptor	Potential Contaminant Linkage	Risk Level Classification
	Direct contact	On-site below ground structures (proposed)	Yes (Structures may be constructed in sulphate bearing soils, increasing the potential for 'sulphate attack' of concrete)	Low to moderate †
	Migration followed by ignition of ground gas		Yes (Worked Ground/Brick Works/infill and other Made Ground represents a potential source of ground gas)	Moderate †
	Migration followed by ignition of soil vapour		Yes (Volatile contaminants are potentially present)	Moderate †
	Off-site migration followed by direct contact	Off-site below ground structures	Yes (It is unlikely that gross contamination is migrating off-site with the potential to cause off-site structural damage)	Very low
	Off-site migration followed by ignition of ground gas		Yes (Worked Ground/Brick Works/infill and other Made Ground represents a potential source of ground gas)	Moderate †
	Off-site migration followed by ignition of soil vapour		Yes (Volatile contaminants are potentially present)	Moderate †
	On-site ingestion / dermal contact / inhalation / root uptake	Flora and fauna in proposed soft-landscaped areas at the site	Yes (Limited soft landscaping is proposed and it is of low ecological sensitivity)	Low
	Off-site migration at shallow depth followed by ingestion / dermal contact / inhalation / root uptake	Off-site flora and fauna in soft-landscaped areas nearby	Yes (Limited soft landscaping is in the immediately surrounding area and it is of low ecological sensitivity)	Very low
Off-site See Section 7.1.2	On-site migration followed by direct contact or ingestion of soil	Human health of proposed site end users (see Section 7.3)	Yes (Limited soft landscaping is proposed and it is of low ecological sensitivity)	Low to moderate †



Potential Contaminant Source	Potential Pathway	Potential Receptor	Potential Contaminant Linkage	Risk Level Classification
	Inhalation of windblown soil from off-site		Yes (No viable sources of significant windblown dust have been identified in the surrounding area)	Very Low
	On-site migration followed by impact to water supply pipes and ingestion of the water supply		Yes (Pipes may be laid in soils impacted by potential off-site sources)	Low to moderate †
	Ground gas generation, on-site migration and inhalation		Yes (Potential sources of ground gas have been identified in the vicinity of the site)	Low to moderate †
	Soil vapour generation, on-site migration and inhalation		Yes (Former industrial works in close vicinity to site could source vapours)	Low to moderate †
	On-site migration followed by direct contact		Yes (It is unlikely that gross contamination with potential to damage structures is migrating onto site)	Very low
	On-site migration followed by ignition of ground gas	On-site below ground structures (proposed)	Yes (Potential sources of ground gas have been identified in the vicinity of the site)	Low to moderate †
	On-site migration followed by ignition of soil vapour		Yes (Former industrial works in close vicinity to site could source vapours)	Low to moderate †
	On-site ingestion / dermal contact / inhalation / root uptake	Flora and fauna in proposed soft-landscaped areas at the site	Yes (Potential soft landscaping may be incorporated and it is of low ecological sensitivity)	Very low

† - unacceptable risk (ref. *LCRM* guidance)

The PRA has identified potential contaminant linkages with a maximum 'moderate' risk classification.

Based on the results of the PRA, it is considered that there are no unacceptable risks (ref. *LCRM* guidance) to controlled waters, sensitive ecology, flora and fauna.



Unacceptable risks (ref. *LCRM* guidance) have been identified with respect to human health and buildings / structures (property). Therefore, it is recommended that appropriately targeted ground investigation is undertaken for geo-environmental purposes to enable a refinement of the CSM and geo-environmental assessments for the specifically identified unacceptable risks. The next stage of geo-environmental assessment should include a generic quantitative risk assessment (GQRA) for human health purposes. Appropriate assessments should also be made with respect to the proposed on-site buildings and structures, including an assessment of the risk from sulphate 'attack' to foundations. Ground gas and vapour monitoring should be included as part of the ground investigation.

The recommended ground investigation and assessments should be undertaken and presented in a 'Phase II' type geo-environmental interpretive report in accordance with *BS10175:2011 Investigation of Potentially Contaminated Sites – Code of Practice* and *LCRM* guidance.

The risk represented by potential ACMs can be addressed by commissioning an asbestos Demolition and Refurbishment Survey for the relevant areas of the current buildings/structures to be demolished and / or renovated. If ACMs are identified then their onward management should be informed by an asbestos specialist, but it is considered that appropriate ACM removal will be required prior to any phases of demolition.

Design of a future geo-environmental site investigation is outside the scope of this document.



8. Closing Remarks

A2SI was appointed by Provewell Ltd to prepare a phase I desk study for the proposed development at Harringay Warehouse District, London, N15 6RD. The desk study provides an initial CSM and qualitative PRA for the proposed development in accordance with the principles set out in *LCRM* guidance, published by the Environment Agency on the UK Government website. The desk study has also been prepared in the context of the *NPPF* and *The Building Regulations 2010, Approved Document C - Site preparation and resistance to contaminants and moisture (2004 Edition incorporating 2010 and 2013 amendments)*.

The site forms a part of the Harringay Warehouse District and currently includes a vacant plot on the corner of Eade Road and Seven Sisters Road and associated land in front and behind Cara House (both currently used as carparking areas), southwestern end of Tewkesbury Road, passageway between Tewkesbury Road and Seven Sisters Road. The scheme comprises redevelopment and expansion of live-work units on site with innovative communal living and working space aimed for creative industries and small businesses. The proposed development will include a new eight-storey block (with a new two-level basement) and a new four-storey block adjacent to Eade Road.

Due to the lack of evidence of bombing and/or related damage on Site or in the immediate vicinity, the risk from UXO is not considered to be elevated above the background level for Harringay. A Stage 2 Detailed UXO Risk Assessment is not considered necessary prior to works commencing. However, the possibility of UXO remaining on Site cannot be completely ruled out at desktop stage, therefore, a UXO Safety Awareness Briefing to all personnel conducting ground works would be considered prudent.

Based on the results of the PRA, it is considered that there are no unacceptable risks (ref. *LCRM* guidance) to controlled waters, sensitive ecology, flora and fauna.

Unacceptable risks (ref. *LCRM* guidance) have been identified with respect to human health and buildings / structures (property). Therefore, it is recommended that appropriately targeted ground investigation is undertaken for geo-environmental purposes to enable a refinement of the CSM and geo-environmental assessments for the specifically identified unacceptable risks. The next stage of geo-environmental assessment should include a generic quantitative risk assessment (GQRA) for human health purposes. Appropriate assessments should also be made with respect to the proposed on-site buildings and structures, including an assessment of the risk from sulphate 'attack' to foundations. Ground gas and vapour monitoring should be included as part of the ground investigation.

The recommended ground investigation and assessments will be undertaken and presented in a 'Phase II' type geo-environmental interpretive report in accordance with *BS10175:2011 Investigation of Potentially Contaminated Sites – Code of Practice* and *LCRM* guidance.

The risk represented by potential ACMs can be addressed by commissioning an asbestos Demolition and Refurbishment Survey for the relevant areas of the current buildings/structures to be demolished and / or renovated. If ACMs are identified then their onward management should be informed by an asbestos specialist, but it is considered that appropriate ACM removal will be required prior to any phases of demolition.

A new basement is to be incorporated into the proposed development. As indicated in *BRE211 (2015)*, all basements are at increased risk of elevated levels of radon, regardless of geographic location. It is recommended that appropriate radon protection is provided for the new basement. An appropriate radon protection strategy which is compatible with the building waterproofing should be developed by a suitable waterproofing and radon specialist. 'Basic radon protection' (ref. *BRE211 (2015)*) is appropriate.

Given that some of the site areas are overgrown it would be prudent for an invasive weeds survey to be undertaken.

Risks to site workers and the environment (from potential land contamination) during the construction phase of the proposed redevelopment can be appropriately managed by successful implementation of construction phase RAMS. The associated



construction phase risks from potential contamination should be appropriately considered and mitigated by the Principal Contractor in their preparation and implementation of construction phase RAMS and CPP.

This desk study should be made available to those preparing the operational site Health & Safety File for the proposed development.

The final specification for newly installed water supply pipes should be based on the risk assessments and recommendations presented herein and also agreed with the utility provider. Based on the PRA, upgraded water supply pipe materials may be required but this should be assessed further by ground investigation.

Should any changes be made to the proposed development compared to the details presented herein, or should any new information become available, then the assessments included in this desk study must be updated.

The Client should inform A2SI of the foundation termination depths once final designs have been prepared so that no requirement for a foundation works risk assessment can be confirmed.



Appendix A: Qualitative Risk Assessment Matrix

A2SI qualitative risk assessment for geo-environmental purposes is undertaken in accordance with *CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001)*. The CIRIA C552 risk categories and the assessment methodology are summarised below in Table A.1, Table A.2 and Table A.3. Potential magnitude and potential likelihood are both classified to enable a risk rating to be assessed.

Potential magnitude takes into account the potential consequences should a complete source–pathway–receptor linkage be present. Potential magnitude is classified as per Table A.1.

Table A.1 Definition of potential magnitude of consequence

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings / property, major pollution to controlled waters.
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures.
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures.
Minor	Damage to non-sensitive ecosystems or species.

Potential likelihood takes into account the presence of the hazard and receptor as well as the integrity of the pathway for exposure, i.e., whether a source–pathway–receptor linkage is present or not. Potential likelihood is classified as per Table A.2.

Table A.2 Definition of potential likelihood of exposure

Category	Definition
High Likelihood	Pollutant linkage may be present and is almost certain to occur in the long-term. Or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that it will occur over the long-term.
Low Likelihood	Pollutant linkage may be present, and there is a possibility that it will occur, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but it is improbable that it will occur.

The potential magnitude of consequence and the potential likelihood of exposure are assessed in accordance with the risk matrix presented in Table A.3.



Table A.3 Geo-environmental risk assessment matrix

		Potential Magnitude of Consequence			
		Severe	Medium	Mild	Minor
Potential Likelihood of Exposure	High Likelihood	Very High	High	Moderate	Low to Moderate
	Likely	High	Moderate	Low to Moderate	Low
	Low Likelihood	Moderate	Low to Moderate	Low	Very Low
	Unlikely	Low to Moderate	Low	Very Low	Very Low



Appendix B: Envirocheck Report

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	WGR	Worked Ground (Undivided)	Void	Not Supplied - Holocene
	LSGR	Landscaped Ground (Undivided)	Artificially Modified Ground	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand And Peat	Not Supplied - Holocene
	LASI	Langley Silt Member	Clay and Silt	Not Supplied - Devensian
	ESI	Enfield Silt Member	Clay and Silt	Not Supplied - Devensian
	KPGR	KEMPTON PARK GRAVEL MEMBER	Sand and Gravel	Not Supplied - Devensian
	HAGR	Hackney Gravel Member	Sand and Gravel	Not Supplied - Wolstonian

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LC	London Clay Formation	Clay, Silt and Sand	Not Supplied - Ypresian

Geology 1:50,000 Maps

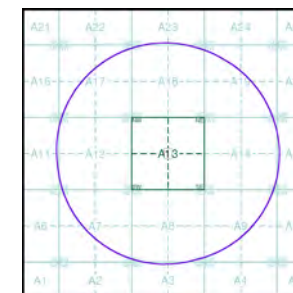
This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	1
Map Sheet No:	256
Map Name:	North London
Map Date:	2006
Bedrock Geology:	Available
Superficial Geology:	Available
Artificial Geology:	Available
Faults:	Not Supplied
Landslip:	Available
Rock Segments:	Not Supplied

Geology 1:50,000 Maps - Slice A

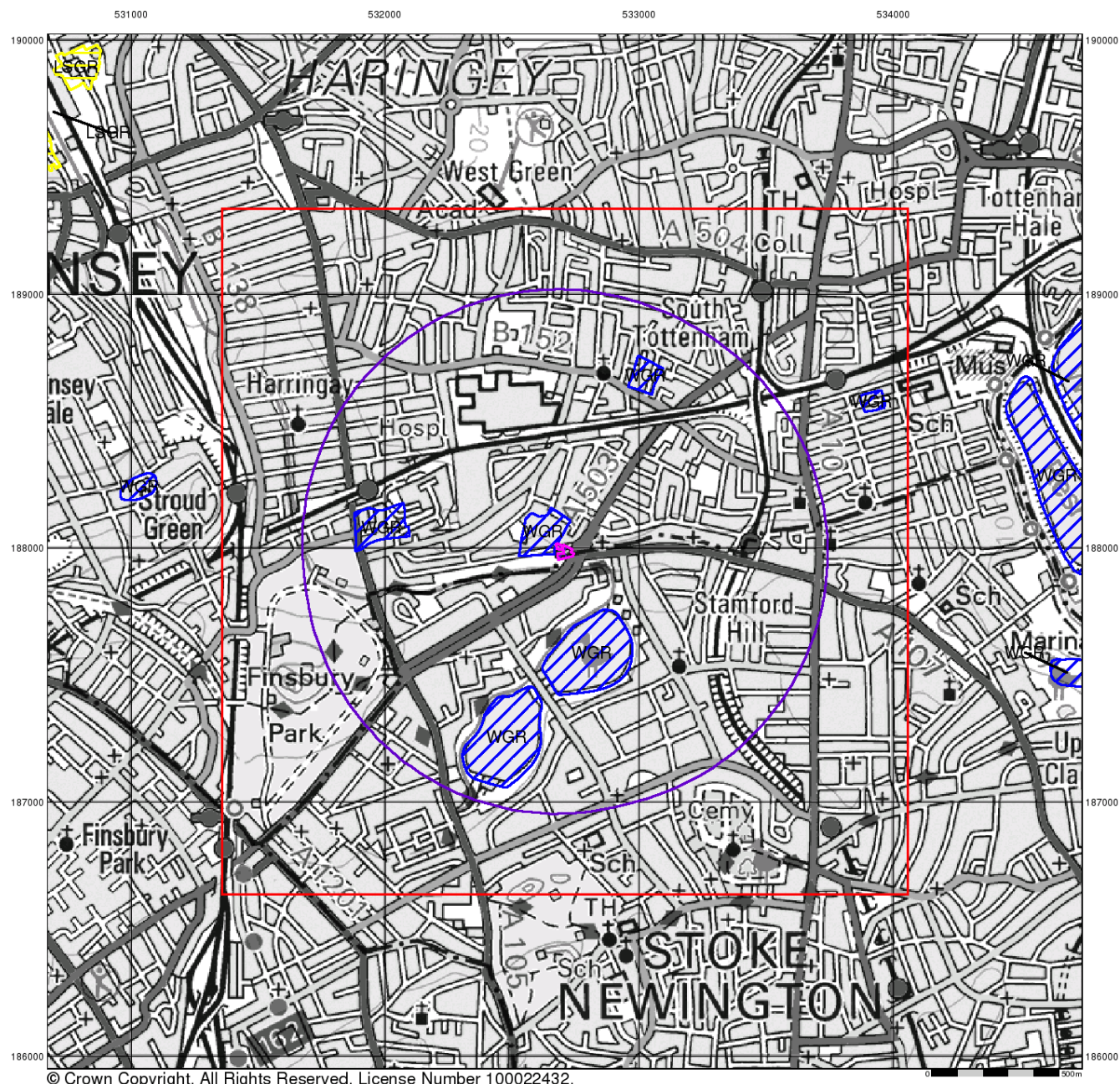


Order Details:

Order Number:	302471250_1_1
Customer Reference:	24822
National Grid Reference:	532700, 187990
Slice:	A
Site Area (Ha):	0.23
Search Buffer (m):	1000

Site Details:

Harringay Warehouse District, Seven Sisters Road, Tottenham, London, N15 6RD



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Artificial Ground and Landslip

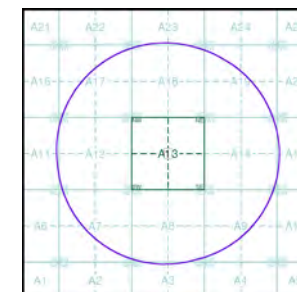
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



Order Details:

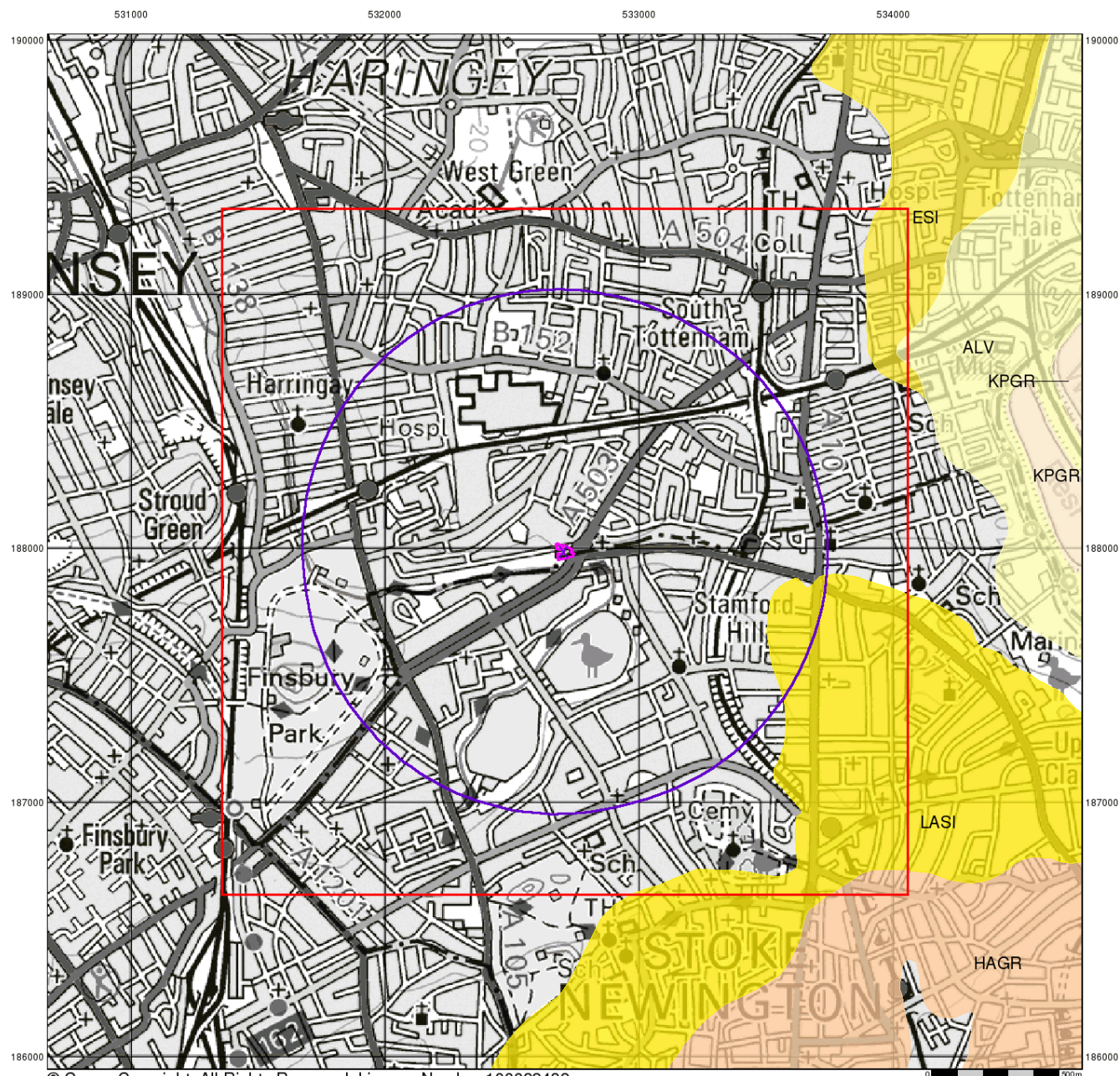
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 Customer Reference: 24822
 National Grid Reference: 532700, 187990
 Slice: A
 Site Area (Ha): 0.23
 Search Buffer (m): 1000

Site Details:

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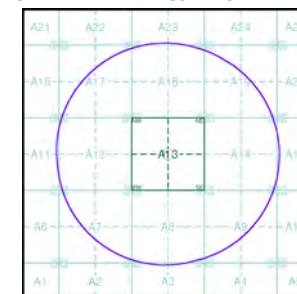
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



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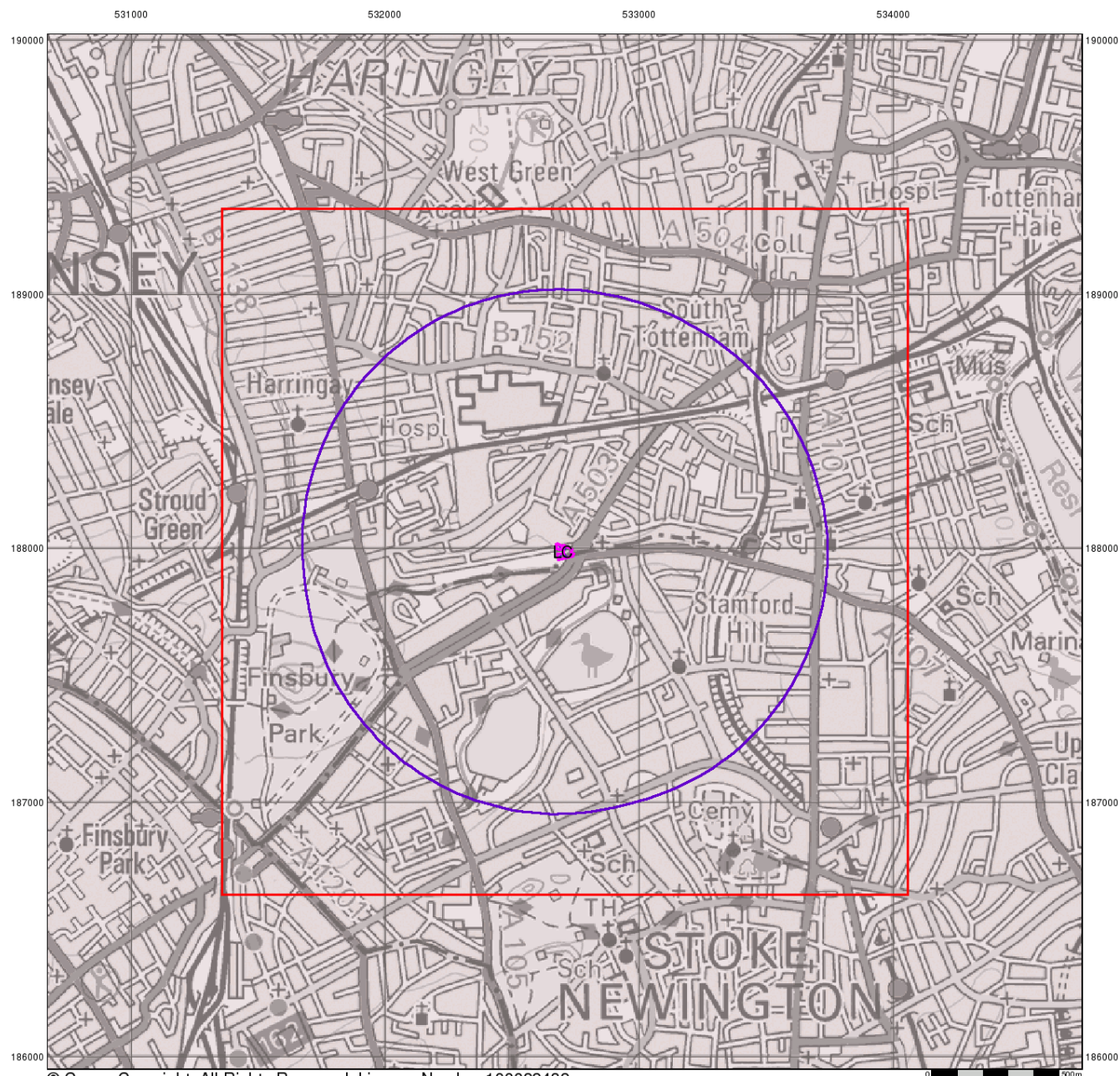
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Bedrock and Faults

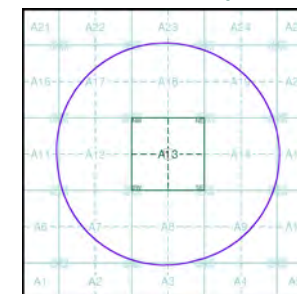
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



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Site Details:

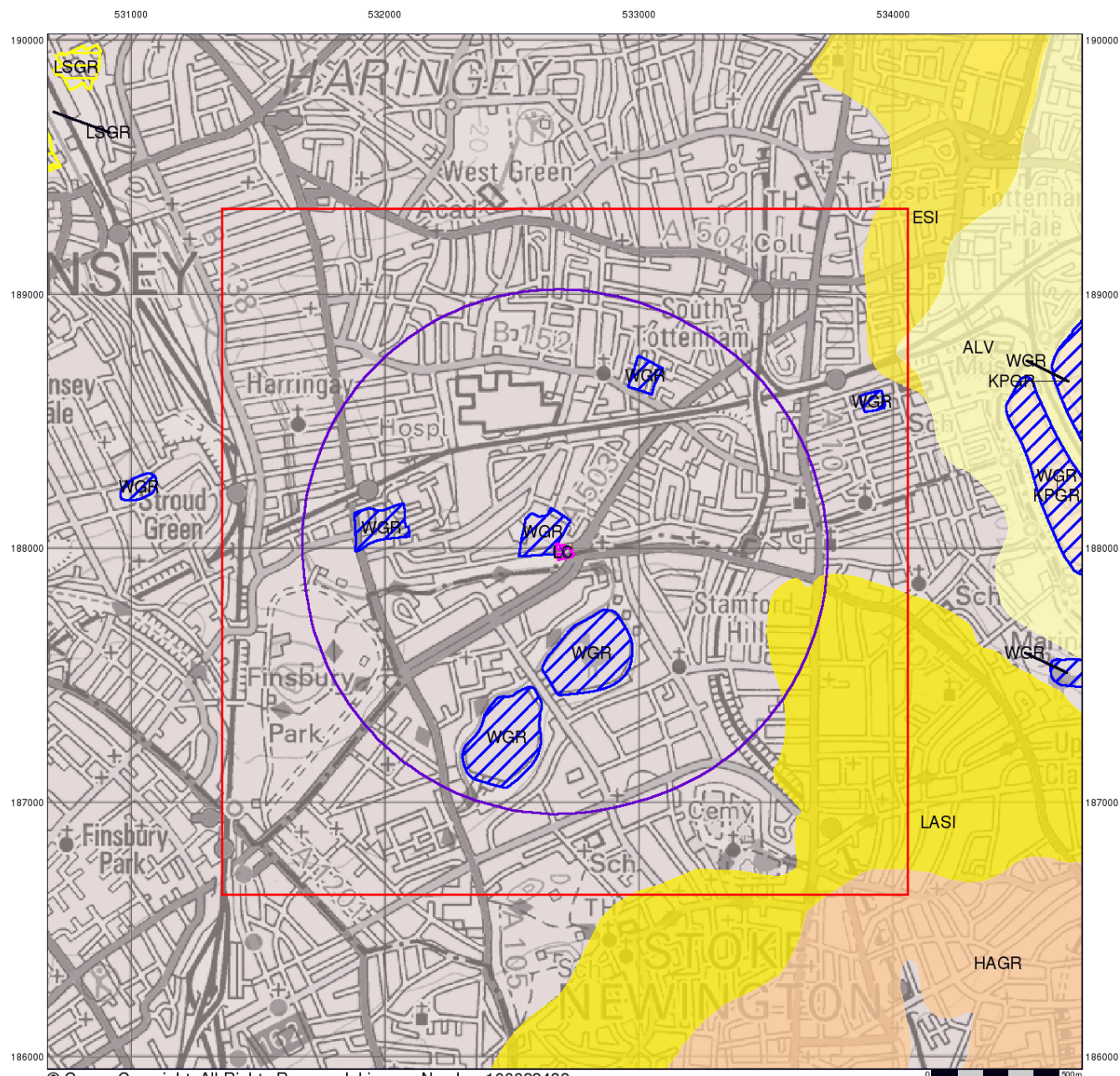
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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

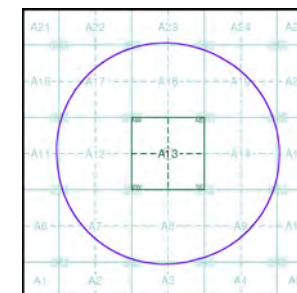
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Bracken		Heath
	Marsh		Reeds
	Building		Glasshouse
	Sloping Masonry		Pylon
	Cutting		Embankment
	Road Under		Road Over
	Level Crossing		Foot Bridge
	Standard Gauge Multiple Track		Standard Gauge Single Track
	Siding, Tramway or Mineral Line		Narrow Gauge
	Geographical County		Administrative County, County Borough or County of City
	Municipal Borough, Urban or Rural District, Burgh or District Council		Borough, Burgh or County Constituency
	Civil Parish		
	BP, BS		Ch
	CH		F E Sta
	FB		Fn
	GP		MP
	MS		Pol Sta
	PO		PC
	PH		SB
	Spr		TCB
	TCP		W
	Police Station		Post Office
	Public Convenience		Public House
	Signal Box		Spring
	Telephone Call Box		Telephone Call Post
	Well		

1:10,000 Raster Mapping

	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	Mean high water (springs)		Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building

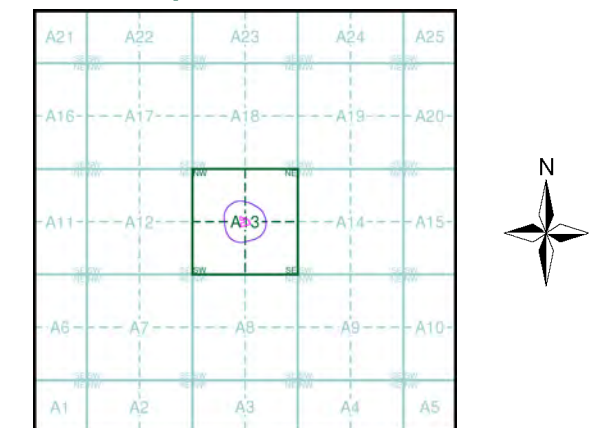
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:10,560	1873	3
Middlesex	1:10,560	1879	4
London	1:10,560	1896	5
Essex	1:10,560	1920	6
Essex	1:10,560	1938	7
Historical Aerial Photography	1:10,560	1950	8
Ordnance Survey Plan	1:10,000	1962	9
Ordnance Survey Plan	1:10,000	1967	10
Ordnance Survey Plan	1:10,000	1975	11
Ordnance Survey Plan	1:10,000	1984	12
London	1:25,000	1985	13
Ordnance Survey Plan	1:10,000	1990	14
10K Raster Mapping	1:10,000	1999	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2021	17

Historical Map - Slice A



Order Details

Order Number: 302471250_1_1
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Slice: A
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Russian Military Mapping Legends

1:5,000 and 1:10,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings Military and Industrial Buildings

Military and Communication Areas Subway Entrance

Fireproof Building Prominent Fireproof Building

Non-fireproof Building Non-fireproof Building (non-dwelling)

Factory, mill, and flour mill, with chimneys Factory, mill, and flour mill, without chimneys

Power Station, drawn to scale Hydroelectric Power Station

Radio Station, drawn to scale Telephone Station, drawn to scale

Abandoned Open-pit Mine or Quarry Open-pit Salt Mine

Pit Oil Deposit or Well Oil Seepage

Tailings Pile Fuel Storage Tanks Natural Gas Tank

Bench Mark Drill Hole Burial Mound Triangulation Point on Burial Mound

Single-track Railroad Double-track Railroad and Station Building

Coniferous Forest Deciduous Forest Mixed Forest

Lawns Citrus Orchard Wet Ground Scattered Vegetation

243.8 Values for prominent elevations

186.0 Numbers for spot elevations, depth soundings, contour lines, etc.

0.2 Velocity of the current, width of river bed, depth of river

180/12 Fractional terms: length and capacity of bridges; depth of fords and condition of the river bottom; height of forest and the diameter of trees

Russian Alphabet (For reference and phonetic interpretation of map text)

А а (A)	З з (Z)	П п (P)	Ч ч (CH)
Б б (B)	И и (I)	Р р (R)	Ш ш (SH)
В в (V)	Й й (Y)	С с (S)	Щ щ (SHCH)
Г г (G)	К к (K)	Т т (T)	Ъ (-)
Д д (D)	Л л (L)	У у (U)	Ы (Y)
Е е (E)	М м (M)	Ф ф (F)	Ь (')
Ё ё (YO)	Н н (N)	Х х (KH)	Э э (E)
Ж ж (ZH)	О о (O)	Ц ц (TS)	Ю ю (YU or IU)
			Я я (YA or IA)

1:25,000 mapping

a. Not drawn to scale b. Drawn to scale

Government and Administrative Buildings Military and Industrial Buildings

Military and Communication Areas Subway Entrance

Partly Demolished Buildings Demolished Buildings

Built-Up Area with Fireproof Buildings Predominant Built-Up Area with Non-Fireproof Buildings Predominant

Individual Fireproof Building Prominent Industrial Building

Individual Dwelling, Fireproof Ruins of an Individual Dwelling

Factory or Mill Chimney Factory or Mill with Chimney Factory or Mill without Chimney Mine or Open Pit Mine

Operating Shaft or Mine Non-Operating Shaft or Mine Salt Mine Tailings Pile

Pit Stone Quarry Gas Pump or Service Station Fuel Storage or Natural Gas Tank

Oil or Natural Gas Derrick Small Hydroelectric Power Station Power Station Transformer Station

Cemetery Burial Mound (height in metres) Triangulation Point on Burial Mound Triangulation Point

Bench Mark Bench Mark (monumented) Telegraph Office Telephone Station

Radio Station Radio Tower Airfield or Seaplane Base Landing Strip

Telegraph/Telephone Lines Main Highway Highway under Construction Improved Dirt Road (former truck road)

Double-track Railroad with First Class Station Dismantled Railroad Railroad Under Construction

Shore Embankment River or Ditch with Embankment Direction and velocity of current Water Gauge Water Level Mark

Well Water Reservoir or Rain Water Pit Spring Isobath with value

Heavy (Index) Contour Line Contour Line and Value Half Contour Line Spot Elevation Value

Coniferous Deciduous Mixed Scrub

Key to Numbers on Mapping

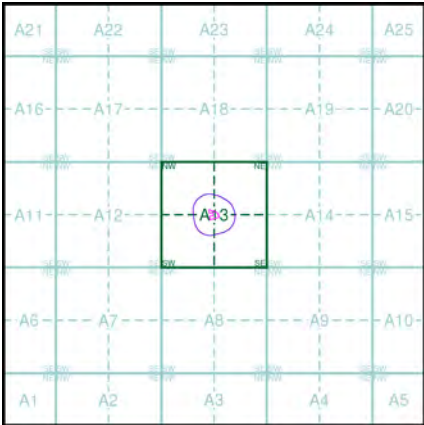
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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Middlesex	1:10,560	1873	3
Middlesex	1:10,560	1879	4
London	1:10,560	1896	5
Essex	1:10,560	1920	6
Essex	1:10,560	1938	7
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London	1:25,000	1985	13
Ordnance Survey Plan	1:10,000	1990	14
10K Raster Mapping	1:10,000	1999	15
10K Raster Mapping	1:10,000	2006	16
VectorMap Local	1:10,000	2021	17

Russian Map - Slice A



Order Details

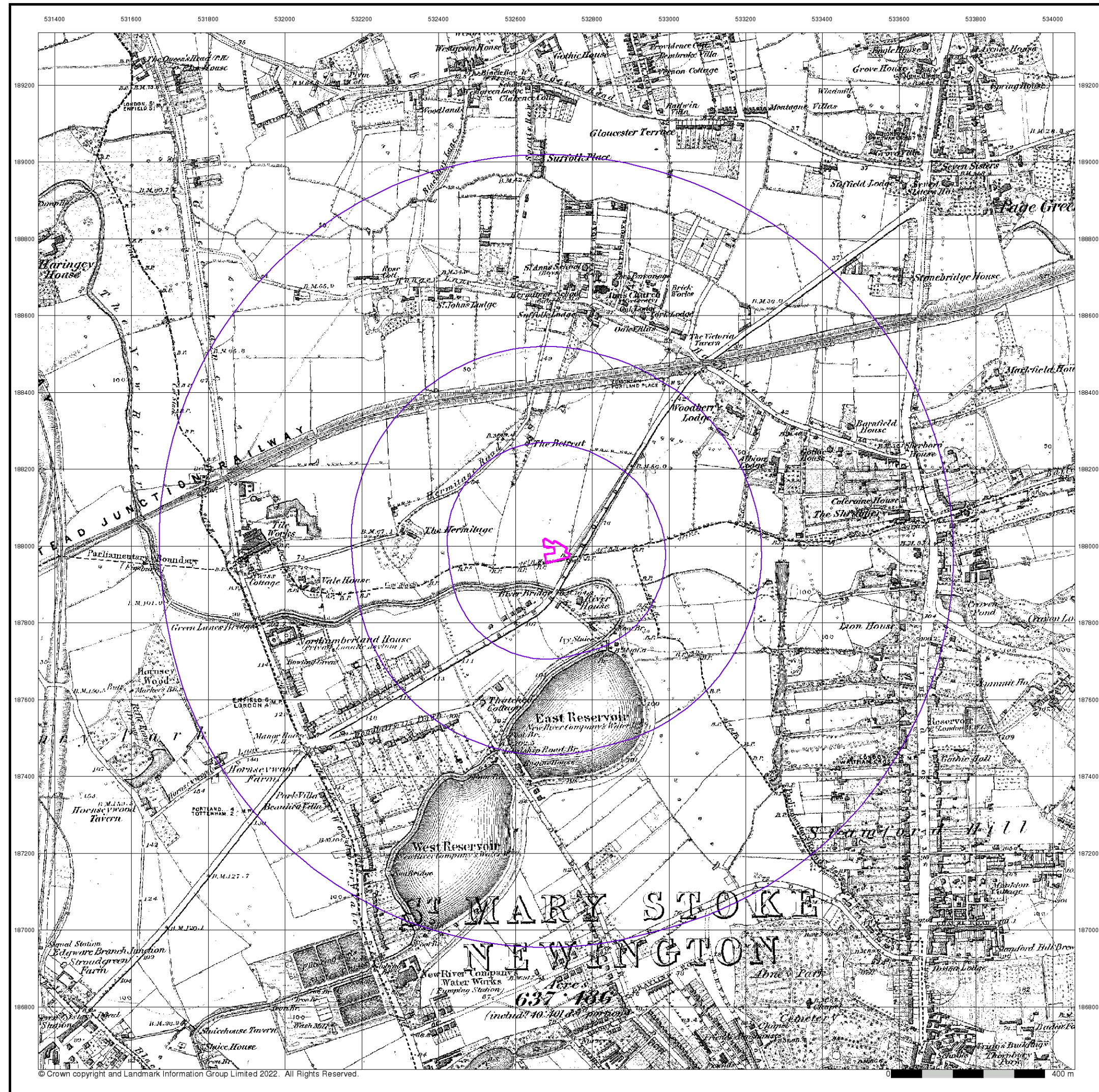
Order Number: 302471250_1_1
Customer Ref: 24822
National Grid Reference: 532700, 187990
Slice: A
Site Area (Ha): 0.23
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Middlesex

Published 1873

Source map scale - 1:10,560

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Map Name(s) and Date(s)

01200

1873

1:10,560

Historical Map - Slice A

A21A22A23A24A25

A16A17A18A19A20

A11A12A13A14A15

A6A7A8A9A10

A1A2A3A4A5

N

Order Details

Order Number:	302471250_1_1
Customer Ref:	24822
National Grid Reference:	532700, 187990
Slice:	A
Site Area (Ha):	0.23
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Site Details

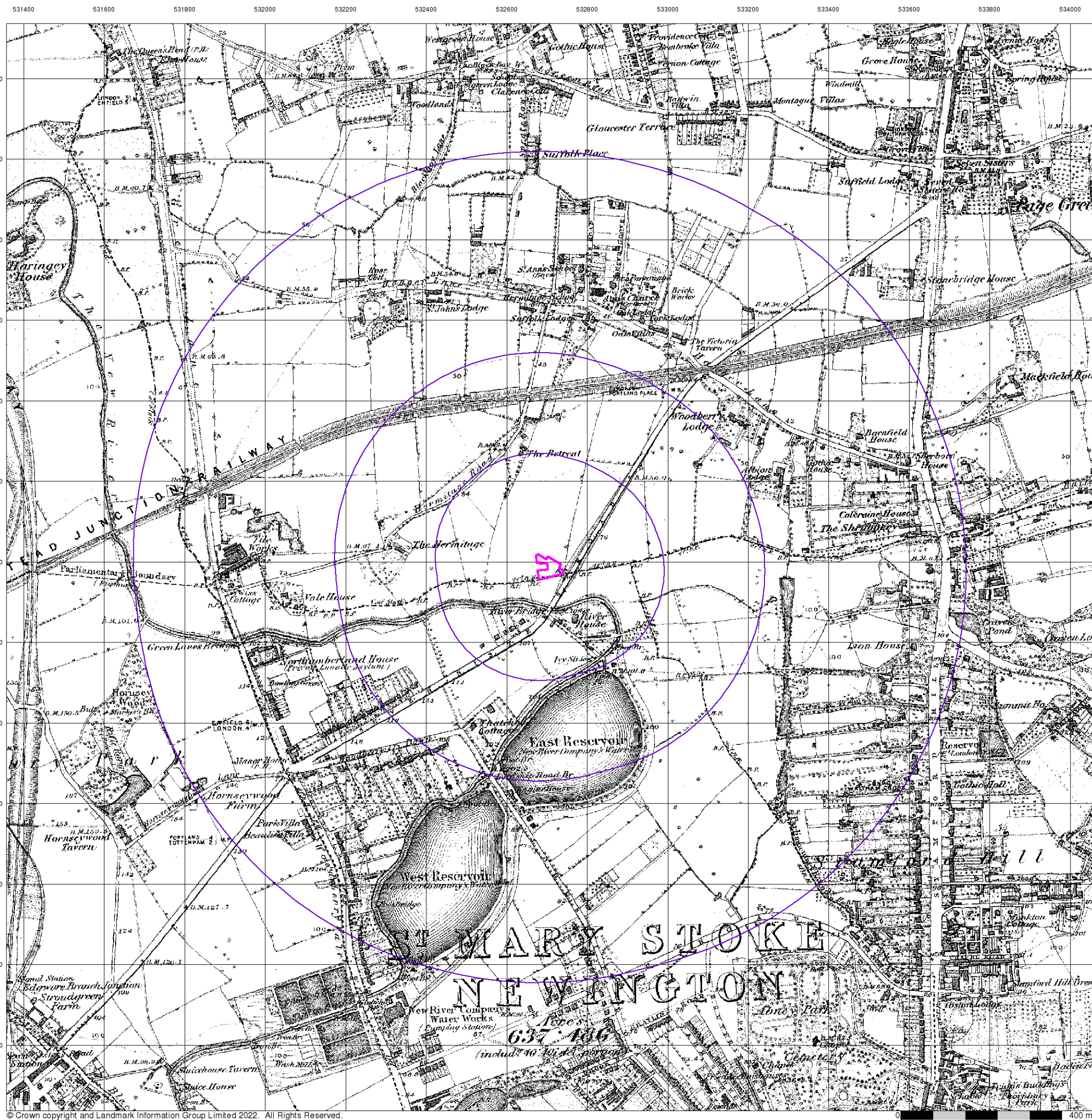
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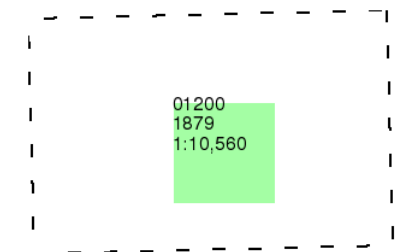
Middlesex

Published 1879

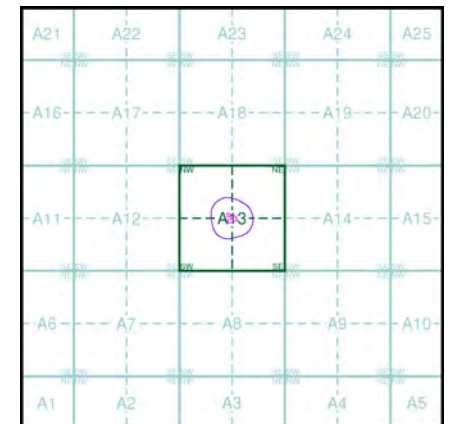
Source map scale - 1:10,560

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

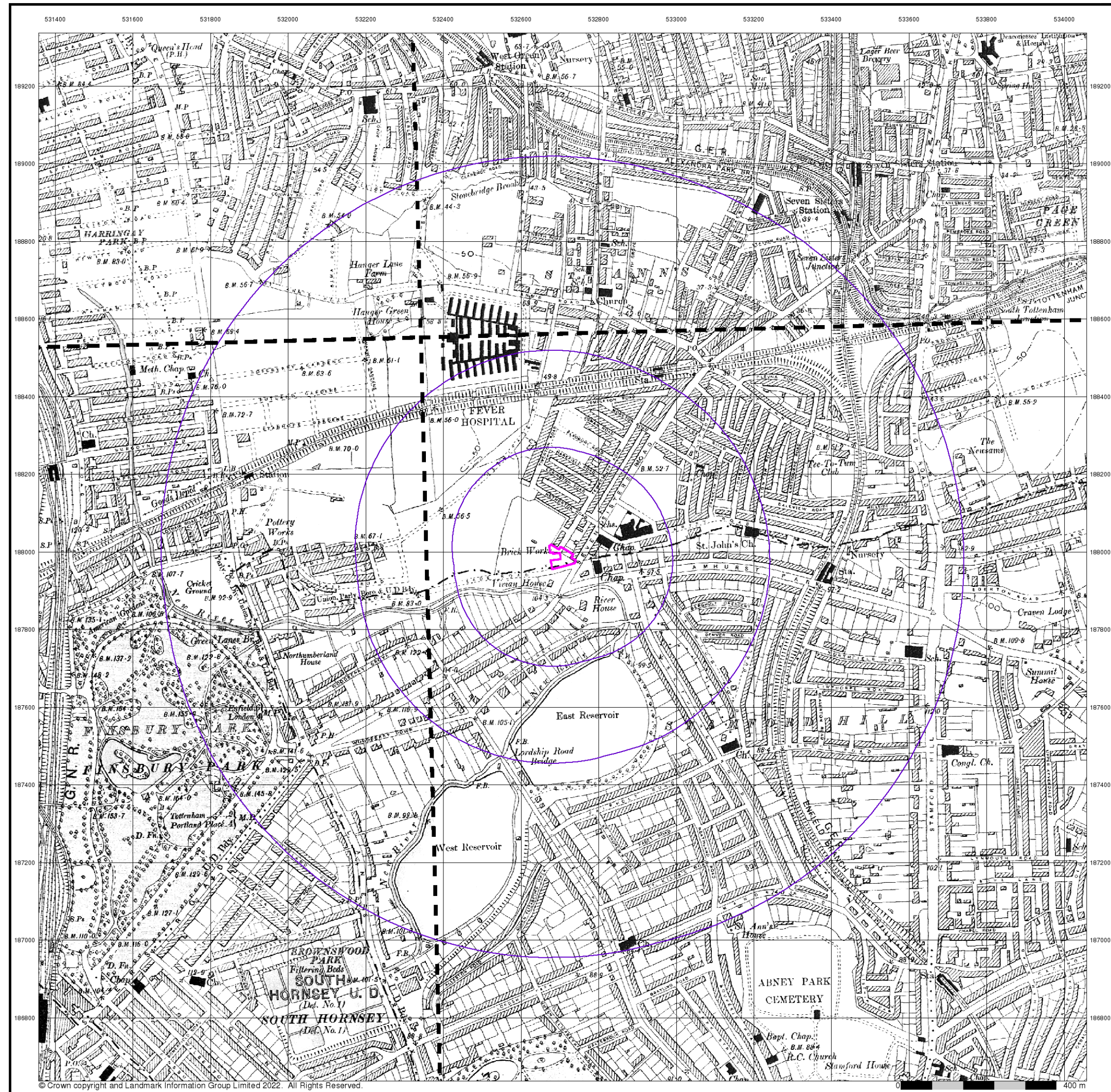
Order Number: 302471250_1_1
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London

Published 1896

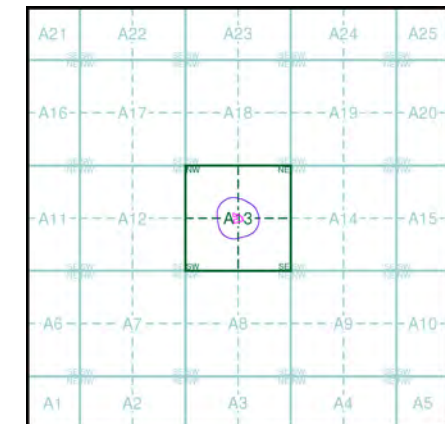
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Map Name(s) and Date(s)

003NW 1896 1:10,560	003NE 1896 1:10,560
003SW 1896 1:10,560	003SE 1896 1:10,560

Historical Map - Slice A

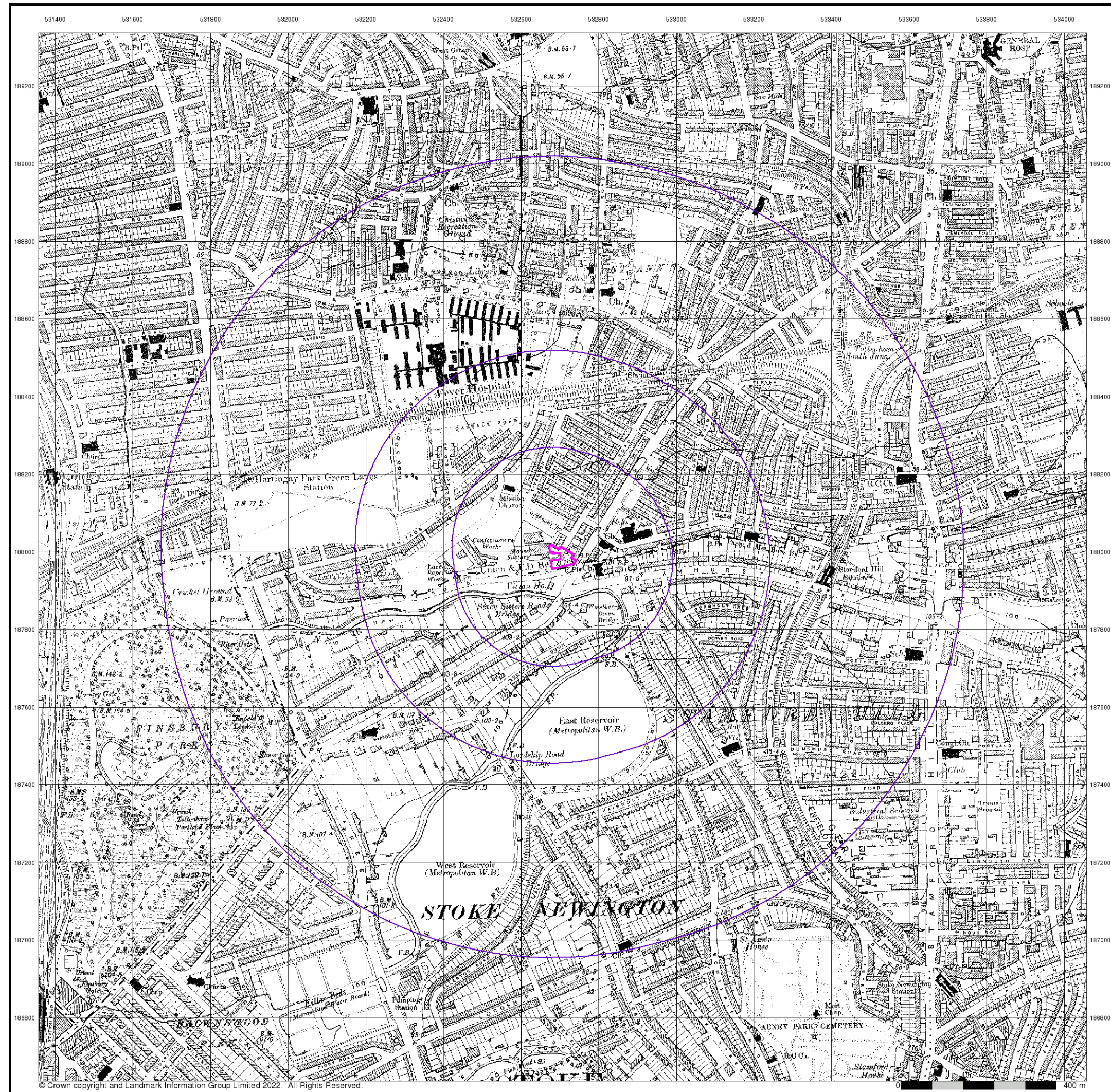


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Essex

Published 1920

Source map scale - 1:10,560

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Map Name(s) and Date(s)

07700

1920

1:10,560

Historical Map - Slice A

A21A22A23A24A25

A16A17A18A19A20

A11A12A13A14A15

A6A7A8A9A10

A1A2A3A4A5

N

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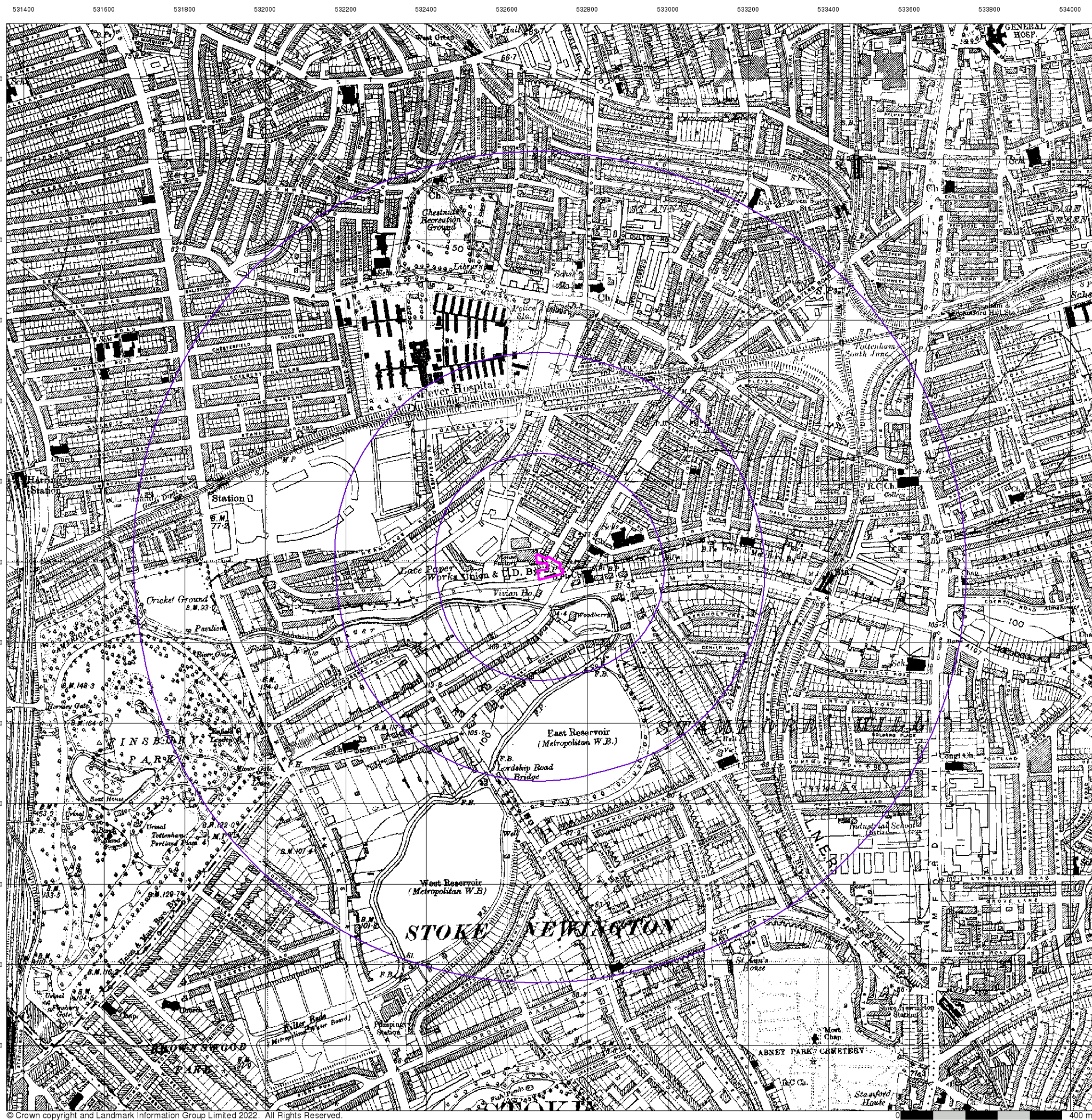
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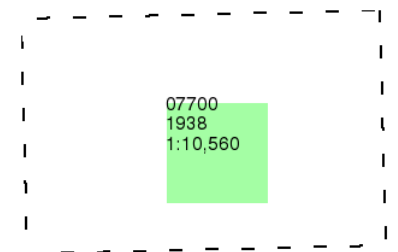
Essex

Published 1938

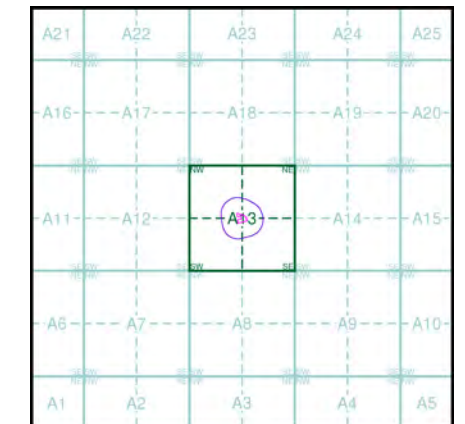
Source map scale - 1:10,560

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



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0 400 m

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Historical Aerial Photography

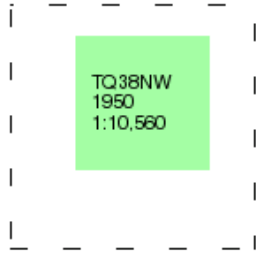
Published 1950

Source map scale - 1:10,560

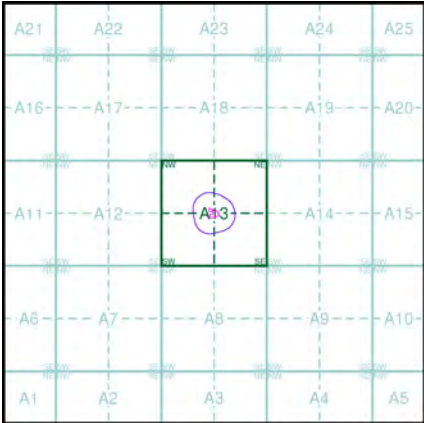
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked 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



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HSILIRB

Order Details

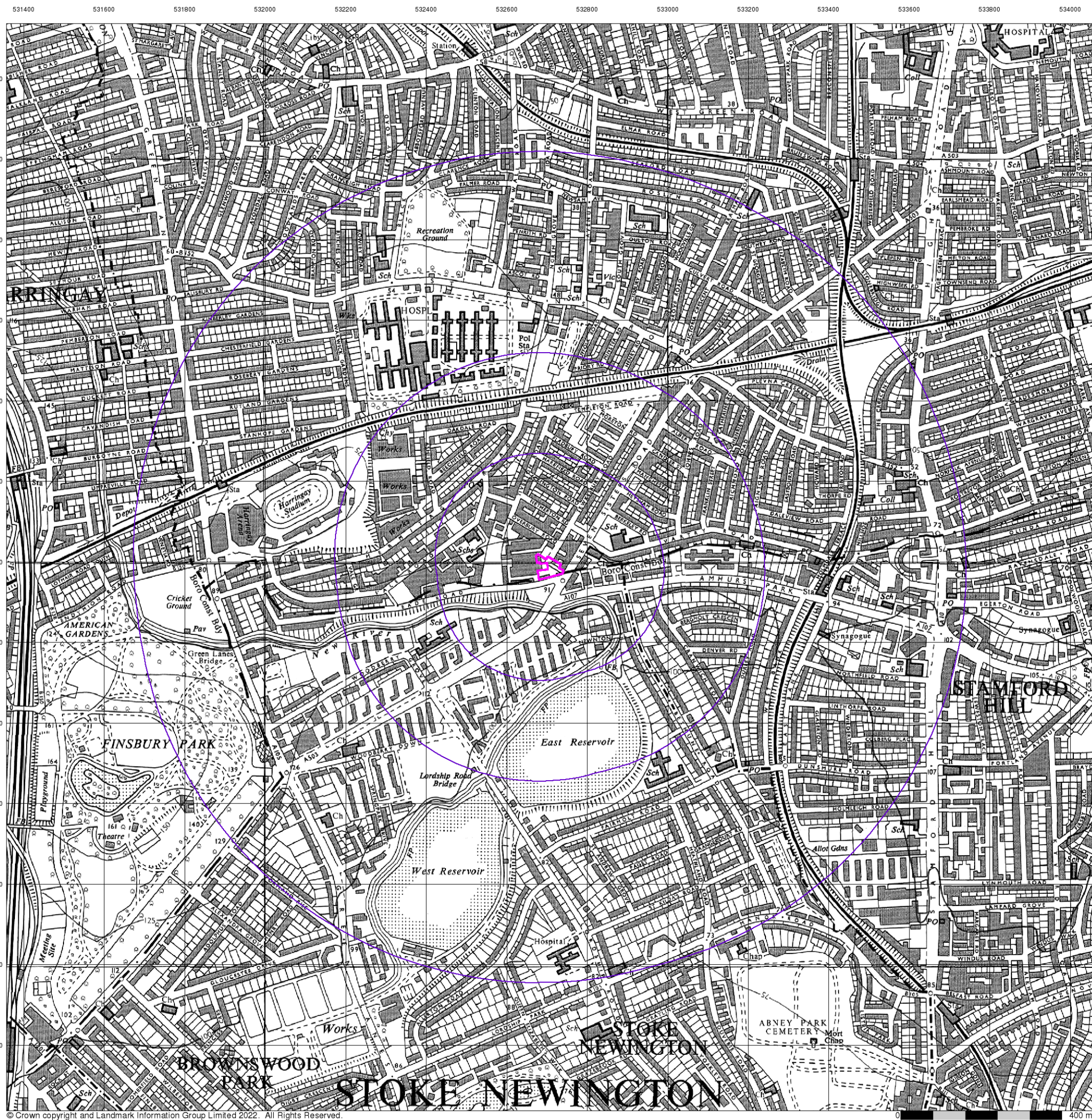
Order Number: 302471250_1_1
Customer Ref: 24822
National Grid Reference: 532700, 187990
Slice: A
Site Area (Ha): 0.23
Search Buffer (m): 1000

Site Details

Harringay Warehouse District, Seven Sisters Road, Tottenham, London, N15 6RD

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
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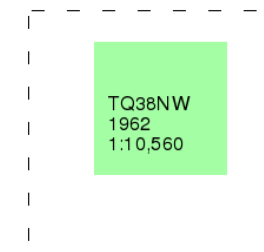
Ordnance Survey Plan

Published 1962

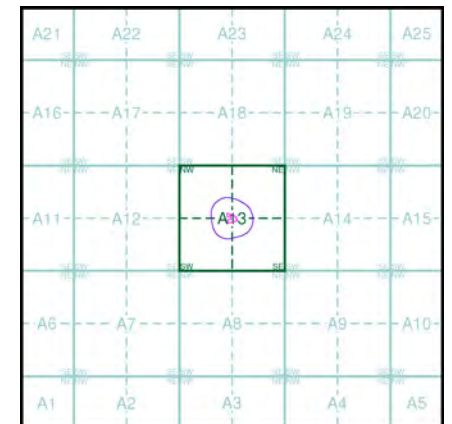
Source map scale - 1:10,000

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

Map Name(s) and Date(s)



Historical Map - Slice A



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