



GEOENVIRONMENTAL DESK STUDY REPORT

Dakota Hotel Manchester Airport

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Author

EJS

5 John Charles Way
LEEDS
LS12 6QA

Tel: 0113 263 1155
admin@jpg.group
www.jpg.group





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CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

Evans Dakota Hotels Limited
Millshaw
LEEDS
LS10 1AB

This report has been prepared for the sole use and reliance of the above-named party. This report shall not be relied upon or transferred to any other parties without the express written authorisation of JPG (Leeds) Limited. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

DOCUMENT HISTORY

Revision	Date	Revision Details	Status	Author(s)	Approved
P01	13.02.2024	First Issue	Final	EJS	RJM
P02	26.04.2024	Second Issue	Final	EJS	RJM
P03	31.05.2024	Updated Site Plan	Final	EJS	RJM



EXECUTIVE SUMMARY

Site Address	Land off Enterprise Way – Dakota Hotel, Manchester
NGR	NGR 381961 386038
Current Site Use & Proposed Development	<p>The site has an area of approximately 1.22 hectares (ha) and comprises an irregular shaped relatively level parcel of land. It measures approximately 110m along its north to south axis and 140m along its east to west axis. Vehicular access to the site is off Bailey Lane from the north west. Most of the site is covered with crushed stone, with smaller areas of concrete hardstanding. A shallow embankment, approximately 2m high, runs along the southeastern, southwestern and northwestern boundaries of the site.</p> <p>The proposed development comprises a seven-story hotel building with associated car parking, electrical charging points, service yard and landscaping.</p>
Site History	<p>The site comprised open fields up until the 1980s, after which the site and surrounding area were developed as car parking for Manchester Airport to the south west. Enterprise Way was constructed in 2017 adjacent to the south western boundary, connecting the site to the M56 to the east and Manchester Airport. Site compound buildings associated with the construction of the highway remain on site to the present day. Adjacent land use includes housing to the north and east and infrastructure associated with the airport to the south and south west.</p>
Site Setting	<p>Geology - No made ground is indicated on the BGS maps or in the GS Report. However, made ground is anticipated due to the historical use of the site. The underlying superficial geology is shown to comprise glacial till. The bedrock geology is shown to comprise a laminated reddish-brown and greenish-grey mudstone of the Bollin Mudstone Member (formerly the Mercia Mudstone).</p> <p>Mining - The site does not lie within a coal mining reporting area. However, the site lies within the Cheshire Brine Subsidence Compensation District. Consequently, a Cheshire Salt Search was obtained from GS. This stated that the site is not within a consultation area and therefore not within the influence zone of any extraction, shafts/wells or points of weakness.</p> <p>Hydrogeology The superficial geology is classified as a Secondary Undifferentiated aquifer. The underlying bedrock is classified as a Secondary B aquifer. The site does not lie within 500m of an Environment Agency Source Protection Zone. There are no active groundwater abstraction licenses within 2km of the site.</p> <p>Hydrology - The nearest surface water feature is an inland river not influenced by normal tidal action located on the eastern boundary of the site.</p> <p>Flooding - The site lies in Flood Zone 1, indicating a less than 0.1% annual probability of flooding.</p> <p>Landfills and Waste - There are no active or historical landfill sites located within 500m of the site.</p> <p>Radon - No radon protection measures are required.</p>
Environmental Risk Assessment	<p>Based on the proposed commercial end use and known history of the site, the following potential pollutant linkages may be present:</p> <ul style="list-style-type: none"> • Development and maintenance workers and site end users (e.g. staff and customers) could come into contact with soils and groundwater containing elevated concentrations of potential contaminants and hazardous ground gases/soil vapours. • The inland river and underlying Secondary Undifferentiated and Secondary B Aquifers could become contaminated due to leaching and migration of potential contaminants from the made ground. • Buildings and services could be affected by potential contaminants in any made ground; and, • Plants in landscaped areas could be affected by phytotoxic elements in any made ground. <p>These are based on current site conditions and do not consider exposure pathways following any remediation of the site.</p> <p>Based on the conceptual site model, the site is considered to be a low to moderate risk with respect to contamination in soils and hazardous ground gases. This designation will be largely dependent on the nature of any made ground and hazardous ground gases present on or adjacent to the site.</p>
Preliminary Engineering Assessment	<p>Foundations - The selection of foundation type will be governed by the nature of the proposed development, i.e. seven-storey hotel building, and the thickness, strength and settlement characteristics of the underlying natural strata. At this stage it is anticipated that a piled foundation solution will be required, with piles founding in the underlying Bollin Mudstone. Foundation design will be confirmed through information obtained during the ground investigation.</p> <p>Ground Floor Construction - The properties of the underlying natural soils will need to be investigated to determine if ground-bearing floor slabs can be used. The requirements of any ground gas protection measures will also need to be taken into consideration in relation to ground floor design and construction.</p> <p>Obstructions - The presence of obstructions, i.e. hardstanding and old roads, is likely due to the previous use of the site. There is also a live water service on the site. The presence of other live</p>



	<p>services crossing the site cannot be discounted. Their presence should be confirmed prior to carrying out a ground investigation.</p> <p>Earthworks - Based on the generally level topography and development proposals, it is anticipated that only minor cut and fill earthworks will be required in order to create a level development platform. Testing of materials on site will be carried out as part of the ground investigation in order to assess their suitability for use in earthworks. Any earthworks should be carried out in accordance with the Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks.</p> <p>Roads, Pavements and Hardstanding Surfaces - It is recommended that, at this stage, a conservative bearing value for the subgrade is assumed until the nature of the subgrade can be physically assessed. The works should then be designed to achieve a suitable CBR value for the proposed development.</p> <p>Chemical Attack on Buried Ground - Samples of made and natural ground should be obtained and submitted to the laboratory for testing in order to assess the sulphate content and acidity and hence the concrete class required for buried concrete.</p>
Further Work Required	<p>In order to further assess the potential geotechnical and environmental constraints to the proposed development, it is recommended that the following investigative works be carried out:</p> <ul style="list-style-type: none"> • Trial pitting in order to assess the shallow ground conditions at the site and confirm the composition, extent, depth and nature of any made ground and underlying natural strata. These provide general coverage and will allow soil samples to be obtained submitted for chemical analysis and geotechnical testing. • Cable percussive boreholes with in-situ SPT tests to provide geotechnical information from greater depth and inform foundation design. These will then be followed-on by rotary core drilling. Selected boreholes will be installed with deep groundwater monitoring wells. • Window sample boreholes with in-situ SPTs to assess the nature of the subsurface and to confirm the depth and distribution of any made ground and shallow natural ground. Selected boreholes will be installed with shallow hazardous ground gas and groundwater monitoring wells. • Chemical analysis of soil and leachate samples in order to determine the concentrations of potential contamination on the site and classify selected materials for disposal off-site (not including WAC testing). • Geotechnical testing to classify materials and inform foundation design and geochemical testing to assess the Aggressive Chemical Environment for Concrete classification. • Monitoring of gas and groundwater wells for hazardous ground gases, methane, carbon dioxide, oxygen, flow rate and groundwater level. <p>The investigation outlined above could be carried out in a phased approach. On completion a Phase 2 geoenvironmental ground investigation report, to include a Tier 2 Generic Quantitative Risk Assessment, will be prepared.</p>
<p>This sheet is intended as a summary only of the assessment of the site in relation to ground condition. It does not provide a definitive engineering analysis.</p>	



1.0 INTRODUCTION

1.1 Instruction

JPG (Leeds) Limited (JPG) has been instructed by Evans Dakota Hotels Limited to provide a geoenvironmental desk study report for a proposed hotel development off Enterprise Way immediately north east of Manchester Airport.

1.2 Objectives

The main objective of the geoenvironmental desk study is to identify potential geotechnical and environmental issues that may represent constraints to the proposed development of the site.

1.3 Scope of Works

The scope of works for the desk study includes the following:

- Site walkover.
- Review of previous reports provided.
- Review of contemporary and historical Ordnance Survey publications.
- Consultations with regulatory authorities, where appropriate.
- Review of geological publications (including hydrology, hydrogeology and soil survey publications where appropriate).
- Review of the radon status of the site.
- An environmental database search.
- Preliminary recommendations with respect to foundations, ground floor and pavement design.
- Recommendations for further work where appropriate; and
- Presentation of the findings in a tabular non-technical summary.

1.4 Location

The site is located to the east of Junction 5 of the M56, approximately 500m to the north east of Terminal 2, Manchester Airport. The approximate centre of the site is located at NGR 381961 386038.

A site location plan is provided as Figure 1 in Appendix A.

1.5 Site Description and Topography

A site inspection was carried out by a JPG engineer on the 2 February 2024.



The site has an area of approximately 1.22 hectares (ha) and comprises an irregular shaped relatively level parcel of land. It measures approximately 110m along its north to south axis and 140m along its east to west axis. Vehicular access to the site is off Bailey Lane from the north west.

Most of the site is covered with crushed stone, with smaller areas of concrete hardstanding.

A shallow embankment, approximately 2m high, runs along the south eastern, south western and north western boundaries of the site.

Mature and semi-mature trees are located along the north eastern boundary of the site.

Most of site is bound by a wooden fence, except for the entrance off Bailey Lane which comprises herras fencing secured with a combination lock. An additional fence/gate with a combination lock is located inside the site, close to the entrance off Bailey Lane.

A water house (wooden box) and water tap (live) were noted in the northern part of the site.

Bailey Lane is located immediately beyond the north western boundary beyond which are units occupied by the Razorblue Group and Etrop Grange Hotel. Woodland and houses are located beyond the site to the north east. A roundabout is located beyond the site to the south east and Enterprise Way is beyond the site to the south west.

Land beyond Enterprise Way to the south west and to the west beyond Bailey Lane are currently under construction.

An aerial photograph of the site is included as Figure 2 in Appendix A.

1.6 Development Proposals

The proposed development comprises a seven-story hotel building with associated car parking, electrical charging points, service yard and landscaping.

A plan of the proposed development has been provided by the client. This is referenced below, and a copy is provided in Appendix A.

- KPP Architects. Proposed Site Plan. Dakota Hotel, Land off Enterprise Way, Wythenshawe. Dated May 2024.

1.7 Limitations

The general limitations to the nature of the investigation are outlined in Appendix D.



2.0 SITE HISTORY

2.1 Ordnance Survey Mapping

Historical maps for the site were obtained from GroundSure (GS). These have been reviewed in order to establish the previous uses of the site and identify any potentially contaminative historical uses or potential geotechnical constraints to the proposed development.

A summary of the relevant map information is provided in Table 2.1 and copies of the Ordnance Survey (OS) maps are provided in Appendix B.

Table 2.1 – Summary of Relevant Historical Map Information

Date(s) & Scale	Description
1897-99 1:10,560 1877 1:2,500 1989 1:2,500	The site comprises open fields, several field boundaries/hedges cross the site. Adjacent land to the north, south and west of the site comprises open fields. Land to the east of the site comprises Woodhouse Park. A road shown as 'Bailey Lane' extends east to west parallel to the northern boundary of the site. A small building is shown approximately 20m to the north. Buildings annotated as 'Moss House' are shown approximately 80m to the north east of the site. Two ponds are shown 90m north of the site. A road shown as 'Outwood Lane' extends south east to north west approximately 100m to the west of the site. Buildings are shown approximately 200m to the south of the site (later annotated as Moss House Farm).
1907-10 1:10,560 1909 1:2,500	No significant changes are shown on the site. A pond is shown immediately to the east of the site.
1938 1:10,560	No significant changes are shown on the site. Multiple small buildings are shown to the north of Bailey Lane approximately 25m to the north of the site.
1954 1:10,560	No significant changes are shown on or adjacent to the site.
1959-64 1:2,500 1960-63 1:2,500 1967 1:10,560	No significant changes are shown on the site. A watercourse is shown extending south east to north west along the eastern boundary of the site. A residential development annotated as 'Woodhouse Park' is shown to the north east of the site and beyond.
1976-77 1:10,560 1989 1:10,000 1974 1:2,500	The site is shown to form part of a wider area extending to the south. No field boundaries are shown to cross the site. A boating lake associated with 'Painswick Park' is shown approximately 100m to the north of the site. The drainage channel on the eastern boundary extends to the boating lake and then trends towards the west and is culverted below Outwood Lane, approximately 150m to the west of the site. Approximately 900m to the south of the site, beyond the M56, Terminal 1 of Manchester Airport is now shown. Moss House Farm to the south is no longer shown.
1995 1:10,000 1986-1990 1:2,500 1987-1992 1:2,500 1989-1994 1:2,500	No significant changes are shown on the site. Approximately 450m to the south west of the site, to the south of the M56, Terminal 2 of Manchester Airport is now shown.
2001 1:10,000 2003 1:2,500	No significant changes are shown on the site. A stream is shown running along the eastern boundary of the site then trending towards the west, extending 50m parallel to the northern boundary.
2010 1:10,000	No significant changes are shown on or adjacent to the site.
2024 1:10,000	No significant changes are shown on the site. A road is now shown extending north west to south east adjacent to the south west boundary of the site. A roundabout is also shown adjacent to the south east boundary.



2.2 Historical Aerial Imagery

Available aerial imagery dating from December 2000 to June 2023 has been reviewed on Google Earth Pro, along with those provided in the GS report.

A summary of the aerial photography is provided in Table 2.2.

Table 2.2 – Summary of Aerial Photography Viewed on Google Earth Pro

Date(s)	Feature
December 2000	The site is shown to form part of a wider car parking area extending to the south associated with Manchester Airport.
March 2017	The site is being used as a site compound, car park and material storage area. Ongoing construction of the road and roundabout on 'Enterprise Way' extending north west to south east adjacent to the south west of the site is shown.
April 2018	A through road is shown extending north to south through the site from Bailey Lane in the north. A bund is shown around the perimeter of the site adjacent to Bailey Lane and Enterprise Way. Road construction is shown to have been completed. Enterprise Way now defines the site boundary to the south and west.
June 2023	No significant changes are shown on or adjacent to the site.

2.3 Summary of Site History

The site comprised open fields up until the 1980s, after which the site and surrounding area were developed as car parking for Manchester Airport to the south west. Enterprise Way was constructed in 2017 adjacent to the south western boundary, connecting the site to the M56 to the east and Manchester Airport. Site compound buildings associated with the construction of the highway remain on site to the present day. Adjacent land use includes housing to the north and east and infrastructure associated with the airport to the south and south west.

3.0 SITE SETTING

3.1 Geology

The GS Report and the following geological publications have been consulted:

- BGS Sheet 98, Stockport, Solid, 1:50,000. Published 1977.
- BGS Onshore GeoIndex (<http://mapapps2.bgs.ac.uk/geoindex/home.html>).

No made ground is shown on the BGS maps or in the GS Report. However, made ground is anticipated due to the historical use of the site.

The underlying superficial geology is shown to comprise glacial till, a heterogenous mixture of clay, sand, gravel and boulders.

The bedrock geology is shown to comprise a laminated reddish-brown and greenish-grey mudstone of the Bollin Mudstone Member. This was formerly called the Mercia Mudstone (Lower Division).



Historical borehole information has been obtained from the BGS. There are 11 BGS borehole records within 250m of the site with the closest located 18m to the north, this is summarised below. The remaining ten borehole records are confidential.

Table 3.1 – SJ88NW14, Boreholes No. 2, NGR 381951, 386131.

Depth (m)	Strata
0 – 0.53	Soil (topsoil)
0.53 – 1.22	Brown CLAY
1.22 – 7.92	Variegated CLAY (multicoloured)

A copy of the borehole log is provided in Appendix C.

3.2 Coal Mining

The site does not lie within a coal mining reporting area.

3.3 Quarrying/Mineral Extraction

The GS Report provides information from the British Pits (BritPits) database, which indicates one closed surface mineral working within 500m of this site. This was located 468m south east and was for the extraction of clay and shale.

The site lies within the Cheshire Brine Subsidence Compensation District. Consequently, a Cheshire Salt Search was obtained from GS. This stated that the site is not within a consultation area and therefore not within the influence zone of any extraction, shafts/wells or points of weakness.

A copy of the report is provided in Appendix D.

3.4 Hydrogeology

The superficial geology is classified as a Secondary Undifferentiated aquifer. These are described as layers which have “previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type”.

The underlying bedrock is classified as a Secondary B aquifer. These are described as “predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features”.

The GS report indicates that the risk of groundwater flooding occurring on the site is low. The risk of groundwater flooding occurring at the site should be assessed based on site specific information.

The site does not lie within 500m of an Environment Agency Groundwater Source Protection Zone (SPZ).

There are no active licenced groundwater abstractions within 2km of the site.



There are no active licenced potable water abstractions within 2km of the site.

There are no records of active discharge consents (of treated or untreated effluent) to groundwater within 500m of the site.

3.5 Hydrology

The GS report indicates the nearest surface water feature is an inland river not influenced by normal tidal action which is located on the eastern boundary of the site.

There are no records of active Red List pollutant releases to surface waters within 500m of the site.

There are no records of active discharge consents (of treated or untreated effluent) to groundwater within 500m of the site.

There are no active licenced surface water abstractions within 2km of the site.

The site lies in Flood Zone 1, indicating a less than 0.1%-annual probability of flooding.

The nearest Water Framework Directory (WFD) surface water body is the River Sinderland Brook, located approximately 205m North-West of the site.

There are no recorded historical flood events, records of flood defences or flood storage areas within 250m of the site.

The GS report indicates that the highest risk of surface water flooding on the site is 1 in 30-year, 0.3m to 1.0m.

The GS report states that the risk of groundwater flooding on the site is low.

3.6 Pollution Incidents

There is one Environment Agency Recorded Pollution Incident within 500m of the site. This is summarised in Table 3.6.1 below.

Table 3.6.1 – Summary of Environment Agency Recorded Pollution Incidents

Distance & Direction	Incident Date	Incident Identification	Pollutant	Impacts
436m NE	20/04/2001	2847	Biodegradable Materials and Wastes	Land Impact: Category 3 (Minor)

3.7 Environmental Permits and Registers

There are no recorded active Control of Major Accidents Hazard (COMAH) sites within 500m of the site.

There are no historical records of Integrated Pollution Control (IPC) authorisations within 500m of the site.



There are no recorded active Part A (1) licensed industrial activities within 500m of the site.

There are no recorded active Part A (2) or Part B licensed pollutant releases within 500m of the site.

There are no recorded active radioactive substance authorisations within 500m of the site.

There are no records of discharges of special category effluents to the public sewer within 500m of the site.

There are no records of active List 1 or List 2 Dangerous Substances within 500m of the site.

There are no pollution inventory substances, waste transfers or radioactive waste records within 500m of the site.

There are no records of sites determined as Contaminated Land under Part 2A of the Environmental Protection Act (EPA) 1990 within 500m of the site.

3.8 Landfills and Waste

The GS report includes information on active and former landfill sites supplied by the EA, Local Authority and the BGS.

There are no recorded active or historical landfill sites located within 500m of the site.

There are no recorded historical or licenced waste sites based on Local Authority planning records or EA regulations respectively, within 500m of the site.

There is one recorded waste exemptions within 500m, this is for the manual treatment of waste and is located 443m to the north east of the site.

3.9 Radon Risks

The site is in a radon affected area as defined by Public Health England with less than 1% of properties above the action level. In accordance with the Building Research Establishment (BRE) publication BR211, no radon protective measures are required for new properties constructed on the site.

3.10 Previous Reports

No previous reports have been provided for review.



4.0 ENVIRONMENTAL RISK ASSESSMENT

4.1 Introduction

The statutory definition of contaminated land is given in the Environmental Protection Act, Part 2A, Section 78, 1990, which was introduced by the Environment Act, Section 57, Department of Environment, 1995 and is defined as:

Land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused (where harm is defined as harm to health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property); and/or
- Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused (by the land).

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists. The potential for harm to occur requires three conditions to be satisfied:

- **Sources** – The presence of substances (potential contaminants/pollutants), in or under the ground, that may cause harm or pollution.
- **Receptors** - The presence of a receptor which may be harmed, e.g. the water environment or humans, buildings, fauna and flora; and,
- **Pathway** - The existence of a linkage between the Source and the Receptor.

In summary, the presence of measurable concentrations of contaminants within the ground and subsurface environment does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and an unacceptable risk of harm to available receptors.

The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the sensitivity of the intended end use of the site and the site's characteristics and environmental setting.

Legislation and guidance on the assessment of contaminated sites acknowledges the need for a tiered risk-based approach. This is set out in the Environment Agency's manual Land contamination: risk management (LCRM), published on 8 October 2020 and last updated on 20 July 2023.



The LCRM outlines the following stages of risk assessment:

Tier 1: Preliminary risk assessment (PRA)	As part of this assessment, the overall site objectives are defined. Current and historical information about the site and the potential contaminants expected to be present are assessed and an outline conceptual model (CM) is developed. The risks are assessed qualitatively, and the findings reported in the PRA (or desk study). The report recommends what further works would be required in order to assess whether the site is suitable for its proposed use.
Tier 2: Generic quantitative risk assessment (GQRA)	The GQRA uses Generic Assessment Criteria and a standard set of generic assumptions based on specific end uses in order to assess the risks to receptors. It includes the collection of more detailed information including laboratory analysis of soil and water samples in order to inform and assess the risks.
Tier 3: Detailed quantitative risk assessment (DQRA)	If pollutant linkages are confirmed as part of the GQRA, these are known as relevant pollutant linkages (RPLs) and further detailed assessment is required. At this tier, detailed site-specific information is collected to estimate the risk or to develop site-specific assessment criteria (SSAC). This may include collecting information about the receptor.

This desk study report represents a Tier 1 Preliminary Risk Assessment.

4.2 Potential Sources

The following potentially contaminative sources may be present on or adjacent to the site:

- Made ground associated with former land use, i.e. car park and site compound, and earth bund surrounding the site.
- Potential leaks from fuel storage tanks and vehicles associated with former uses.
- Made ground associated with off-site sources, e.g. construction of highway to the south west.

Potential contaminants which could be present on the site are listed below:

- Metals, metalloids, and their compounds.
- Inorganic compounds, e.g. arsenic.
- Asbestos fibres/asbestos containing materials.
- Organic compounds including polycyclic aromatic hydrocarbons (PAH) and petroleum hydrocarbons (TPH); and
- Hazardous ground gases/soil vapours.



4.3 Potential Pathways

Based on the available information and the proposed redevelopment of the site for commercial end use, the following potential exposure pathways will require consideration, both during the redevelopment works and on completion of construction:

- Ingestion, inhalation and/or dermal contact with contaminated soil and groundwater.
- Inhalation of hazardous ground gases/soil vapours/asbestos fibres.
- Leaching/migration of potential contaminants from soil into groundwater and surface water via surface infiltration, drainage and/or groundwater flow.
- Permeation of water supply pipes and other services by organic and aggressive contaminants; and,
- Uptake of contaminants by planting in landscape areas.

4.4 Potential Receptors

The potential receptors considered are:

- Development workers and future maintenance workers involved in excavations, e.g. foundations or where services are being installed or repaired following development.
- Future end users of the site, i.e. staff and customers.
- Adjacent site users, i.e. employees and customers.
- Controlled waters, i.e. inland river and underlying aquifers (superficial deposits, Secondary Undifferentiated and bedrock, Secondary B).
- Buildings and infrastructure; and
- Planting in landscaped areas.

4.5 Pollutant Linkage Assessment

A potential pollutant linkage assessment has been completed and is summarised in the Conceptual Site Model, which is provided in Section 4.6. This is based on the proposed development of the site for a commercial end use.

Based on the proposed commercial end use and history of the site, the following potential pollutant linkages may be present:

- Development and maintenance workers and site end users (e.g. staff and customers) could come into contact with soils and groundwater containing elevated concentrations of potential contaminants and hazardous ground gases/soil vapours.



-
- The inland river and underlying Secondary Undifferentiated and Secondary B Aquifers could become contaminated due to leaching and migration of potential contaminants from the made ground.
 - Buildings and services could be affected by potential contaminants in any made ground; and,
 - Plants in landscaped areas could be affected by phytotoxic elements in any made ground.

These are based on current site conditions and do not consider exposure pathways following any remediation of the site.



4.6 Conceptual Site Model & Risk Rating

The conceptual model is summarised in Table 4.6 below.

Table 4.6 Preliminary Conceptual Model

Source	Pathway	Receptor	Risk Rating	Comments
<p>Based on the history of the site and the findings of the desk study, the following potentially contaminative sources may be present on and adjacent to the site.</p> <p>On site</p> <p>Made ground associated with former land use, i.e. car park and site compound, and earth bund surrounding the site.</p> <p>Potential leaks from fuel storage tanks and vehicles associated with former uses.</p> <p>Adjacent to the site</p> <p>Made ground associated with off-site sources, e.g. construction of highway to the south west.</p>	<p>Inhalation. Ingestion. Dermal contact.</p>	<p>Users During Development Development workers.</p>	Low/ Moderate	Ground investigation to confirm the thicknesses and nature of the made ground and establish the concentrations of potential contamination present. Gas monitoring to be undertaken as part of ground investigation. Appropriate health and safety procedures to be in place during the construction phase of the development.
		<p>Future End Users Staff and customers. Maintenance workers.</p>	Low/ Moderate	Ground investigation to confirm the thicknesses and nature of the made ground and establish the concentrations of potential contamination present. Gas monitoring to be undertaken as part of ground investigation.
		<p>Adjacent Site Users Employees and Customers.</p>	Low	Ground investigation to confirm the thicknesses and nature of the made ground and establish the concentrations of potential contamination present. Appropriate health and safety procedures to be in place during the construction phase of the development.
	Leaching of mobilised contaminants	<p>Controlled Waters</p> <p>Groundwater Secondary Undifferentiated and Secondary B Aquifers.</p> <p>Surface Water Inland River</p>	Low	<p>Groundwater There are no active licenced groundwater abstractions within 2km of the site. There are no recorded active discharge consents to groundwater within 500m of the site. Site is not located in a Groundwater Source Protection Zone.</p> <p>Surface Water There are no active licenced discharge consents to surface water within 500m of the site. There are no active licenced surface water abstractions within 2km of the site.</p>
Potential Phytotoxic Contamination	Root uptake.	<p>Vegetation Proposed landscaping.</p>	Low	Ground investigation and sampling to establish levels of any phytotoxic contamination present.
Aggressive Contaminants in Soil and Groundwater	Direct contact.	<p>Construction Materials Concrete.</p>	Low/ Moderate	Samples of made and natural ground should be obtained and submitted to the laboratory for testing in order to assess the sulphate content and acidity.
		<p>Construction Materials Services.</p>	Low/ Moderate	



4.7 Risk Classification

Based on the conceptual site model, the site is considered to be **low to moderate risk** with respect to contamination in soils and hazardous ground gases. This designation will be largely dependent on the nature of any made ground and hazardous ground gases present on or adjacent to the site.

In order to assess further and classify the risks to human health, groundwater, surface water and buildings/services, a Phase 2 geoenvironmental ground investigation, to include a Tier 2 Generic Quantitative Risk Assessment, will be required. The Phase 2 geoenvironmental ground investigation will include chemical testing of soils, leachate and groundwater, as well as hazardous ground gas monitoring.

5.0 PRELIMINARY ENGINEERING ASSESSMENT

5.1 Development Proposals

The proposed development comprises a seven-story hotel building with associated car parking, electrical charging points, service yard and landscaping.

A plan of the proposed development has been provided by the client. This is referenced below, and a copy is provided in Appendix A.

- KPP Architects. Ground Floor & Car Park Plan, Option F. Dakota Manchester Airport. Dated January 2024.

5.2 Foundations

Based on the information provided in the GS report, geological maps and historical borehole data, ground conditions below the site are likely to comprise made ground (associated with site's historical and current land use), underlain by superficial deposits of glacial till which is in turn underlain by mudstone of the Bollin Mudstone Formation.

The selection of foundation type will be governed by the nature of the proposed development, i.e. seven-storey hotel building, and the thickness, strength and settlement characteristics of the underlying natural strata.

At this stage it is anticipated that a piled foundation solution will be required, with piles founding in the underlying Bollin Mudstone.

Foundation design will be confirmed through information obtained during the ground investigation.

5.3 Ground Floor Construction

Properties of the underlying natural soils will need to be investigated to determine if a ground-bearing floor slab can be used.



The requirements of any ground gas protection measures will also need to be taken into consideration in relation to ground floor design and construction.

5.4 Groundwater

The presence of groundwater will need to be assessed as part of any ground investigation.

5.5 Obstructions

The presence of obstructions, i.e. hardstanding and old roads, is likely due to the previous use of the site.

There is also a live water service on the site. The presence of other live services crossing the site cannot be discounted. Their presence should be confirmed prior to carrying out a ground investigation.

5.6 Earthworks

Based on the generally level topography and development proposals, it is anticipated that only minor cut and fill earthworks will be required in order to create a level development platform.

Testing of materials on site will be carried out as part of the ground investigation in order to assess their suitability for use in earthworks.

Any earthworks should be carried out in accordance with the Manual of Contract Documents for Highway Works, Volume 1 Specification for Highway Works, Series 600 Earthworks.

5.7 Roads, Pavements and Hardstanding Surfaces

It is recommended that, at this stage, a conservative bearing value for the subgrade is assumed until the nature of the sub-grade can be physically assessed.

An earthworks should be designed to achieve a suitable CBR value for the proposed development.

5.8 Chemical Attack on Buried Ground

Samples of made and natural ground should be obtained and submitted to the laboratory for testing in order to assess the sulphate content and acidity and hence the concrete class required for buried concrete to the latest standard.



5.9 Further investigations

In order to further assess the potential geotechnical and environmental constraints to the proposed development, it is recommended that the following investigative works be carried out:

Trial pitting in order to assess the shallow ground conditions at the site and confirm the composition, extent, depth and nature of any made ground and underlying natural strata. These provide general coverage and will allow soil samples to be obtained submitted for chemical analysis and geotechnical testing.

Cable percussive boreholes with in-situ SPT tests to provide geotechnical information from greater depth and inform foundation design. These will then be followed-on by rotary core drilling. Selected boreholes will be installed with deep groundwater monitoring wells.

Window sample boreholes with in-situ SPTs to assess the nature of the subsurface and to confirm the depth and distribution of any made ground and shallow natural ground. Selected boreholes will be installed with shallow hazardous ground gas and groundwater monitoring wells.

Chemical analysis of soil and leachate samples in order to determine the concentrations of potential contamination on the site and classify selected materials for disposal off-site (not including WAC testing).

Geotechnical testing to classify materials and inform foundation design and geochemical testing to assess the Aggressive Chemical Environment for Concrete classification.

Monitoring of gas and groundwater wells for hazardous ground gases, methane, carbon dioxide, oxygen, flow rate and groundwater level.

On completion, a Phase 2 geoenvironmental ground investigation report, to include a Tier 2 Generic Quantitative Risk Assessment, will be prepared.



Appendix A Figures and Drawing



Figure 1 – Site Location Plan

Site	Dakota Hotel, Manchester Airport
Client	Evans Dakota Hotels Limited
Job Number	6338
Scale	NTS

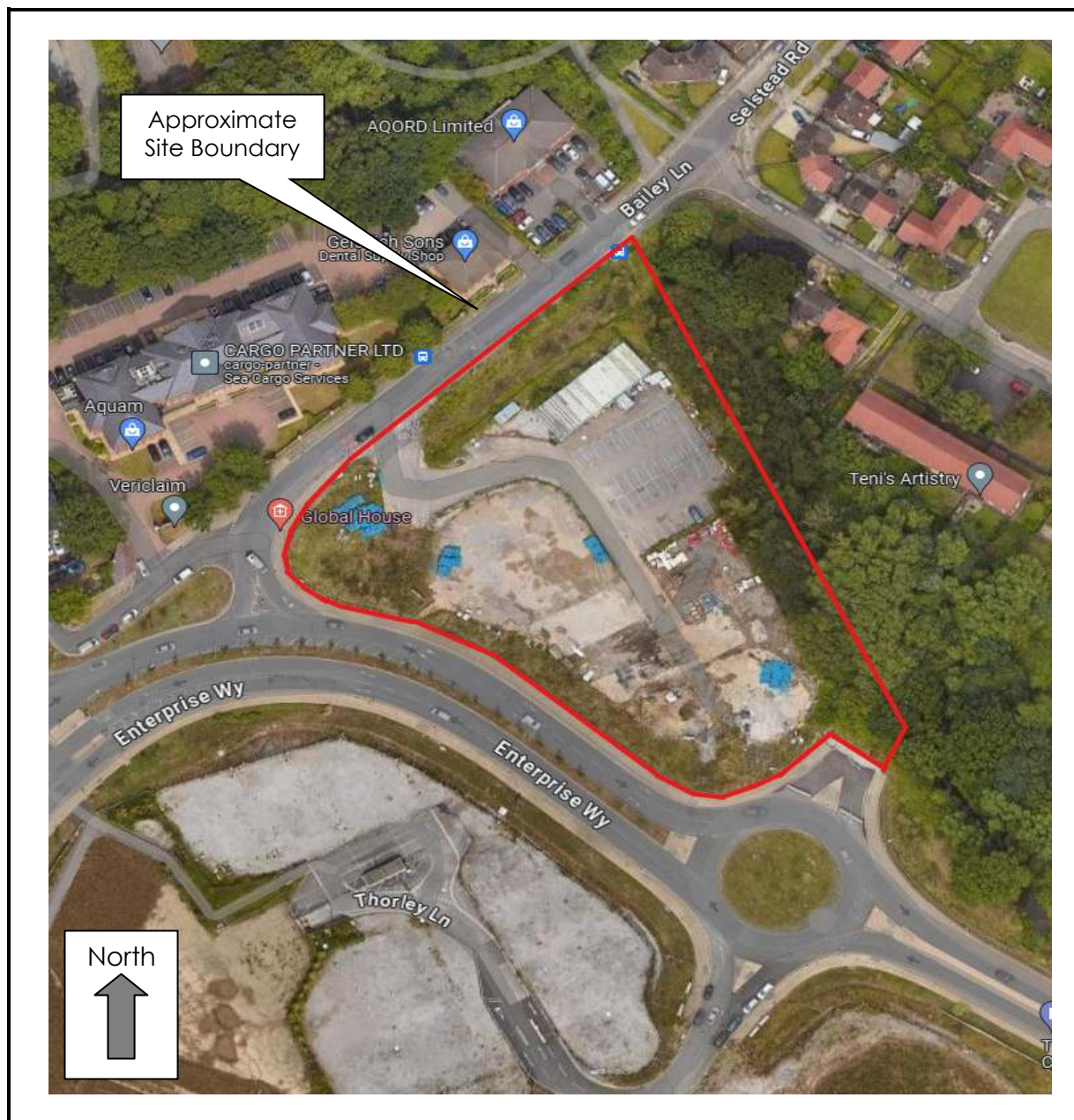
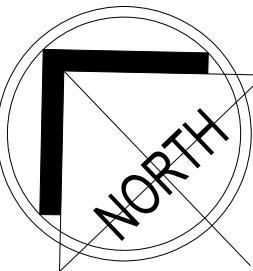
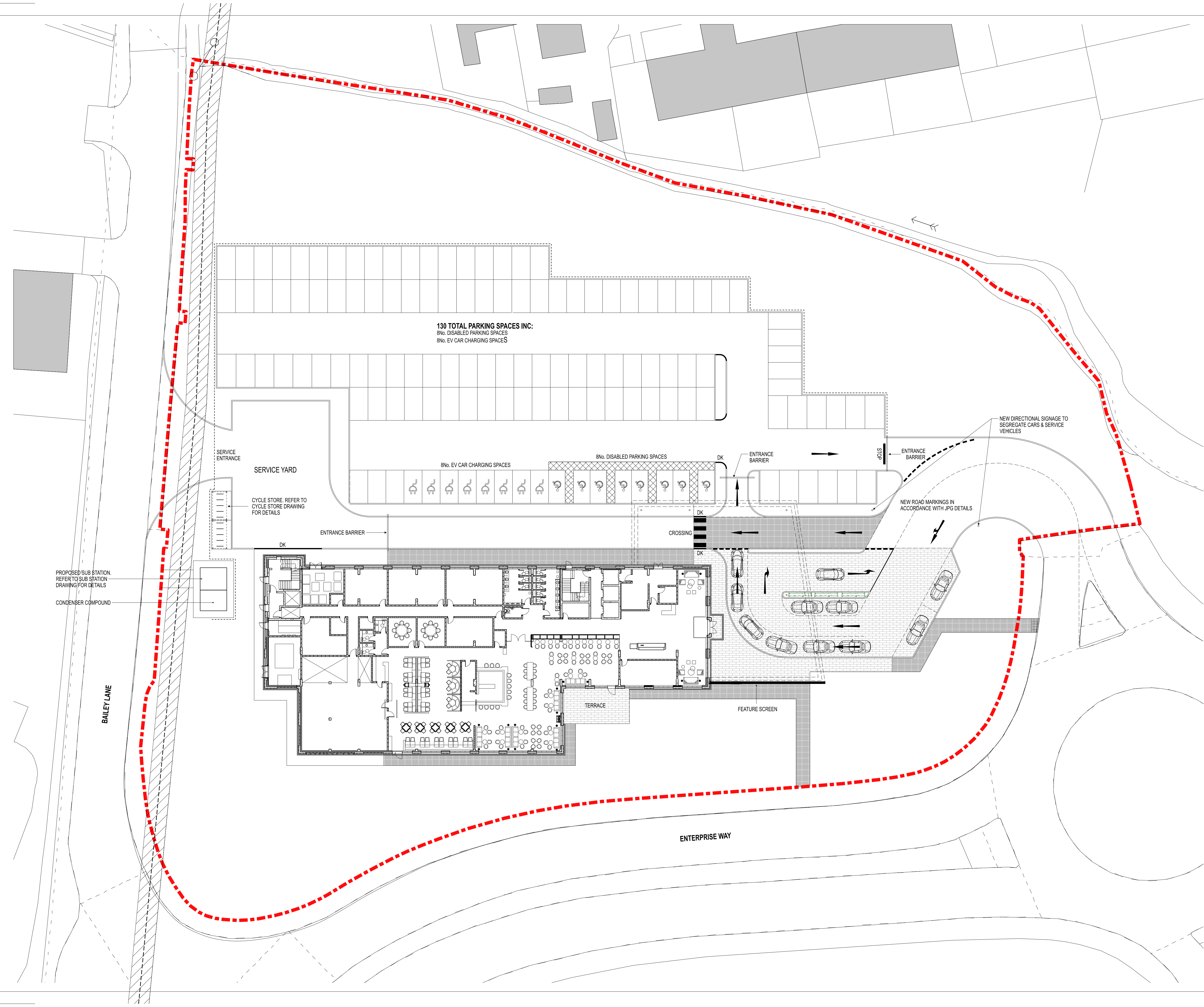


Figure 2 – Aerial Photograph

Site	Dakota Hotel, Manchester Airport
Client	Evans Dakota Hotels Limited
Job Number	6338
Scale	NTS

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Do not scale from this drawing. Any discrepancies on site should be brought to the attention of KPP Architects Ltd.
Work and materials must comply with the current building regulations and codes of practice and be read in conjunction with building specifications and other sub-contractors information. All materials are to be installed in strict accordance with the recommendations of the manufacturers.



Rev	Description	By	Chkd	Date

Client

EVANS DAKOTA HOTELS LTD.

Product Title
DAKOTA HOTEL
LAND OFF ENTERPRISE WAY
WYTHENSHAW

Drawing Title
PROPOSED SITE PLAN

KPP
ARCHITECTS
Lodge House
12 Town Street
Horsforth, Leeds LS184RJ
T : +44 (0) 113 2390460
E : architects@kpp-leeds.co.uk
W : www.kpp-leeds.co.uk

Scale	Size	Date	Drawn	Checked
1:250	A1	MAY '24	JH	.
Status	PRELIMINARY			
KPP Job No	2019-08			Rev
Number	3001			P1



Appendix B Historical Maps

**Site Details:**

Bailey Lane, Manchester, M90
4AB

Client Ref: CMAPS-JPG-1145816-65579-240124
Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: County Series

Map date: 1872

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1872
Revised 1872
Edition N/A
Copyright N/A
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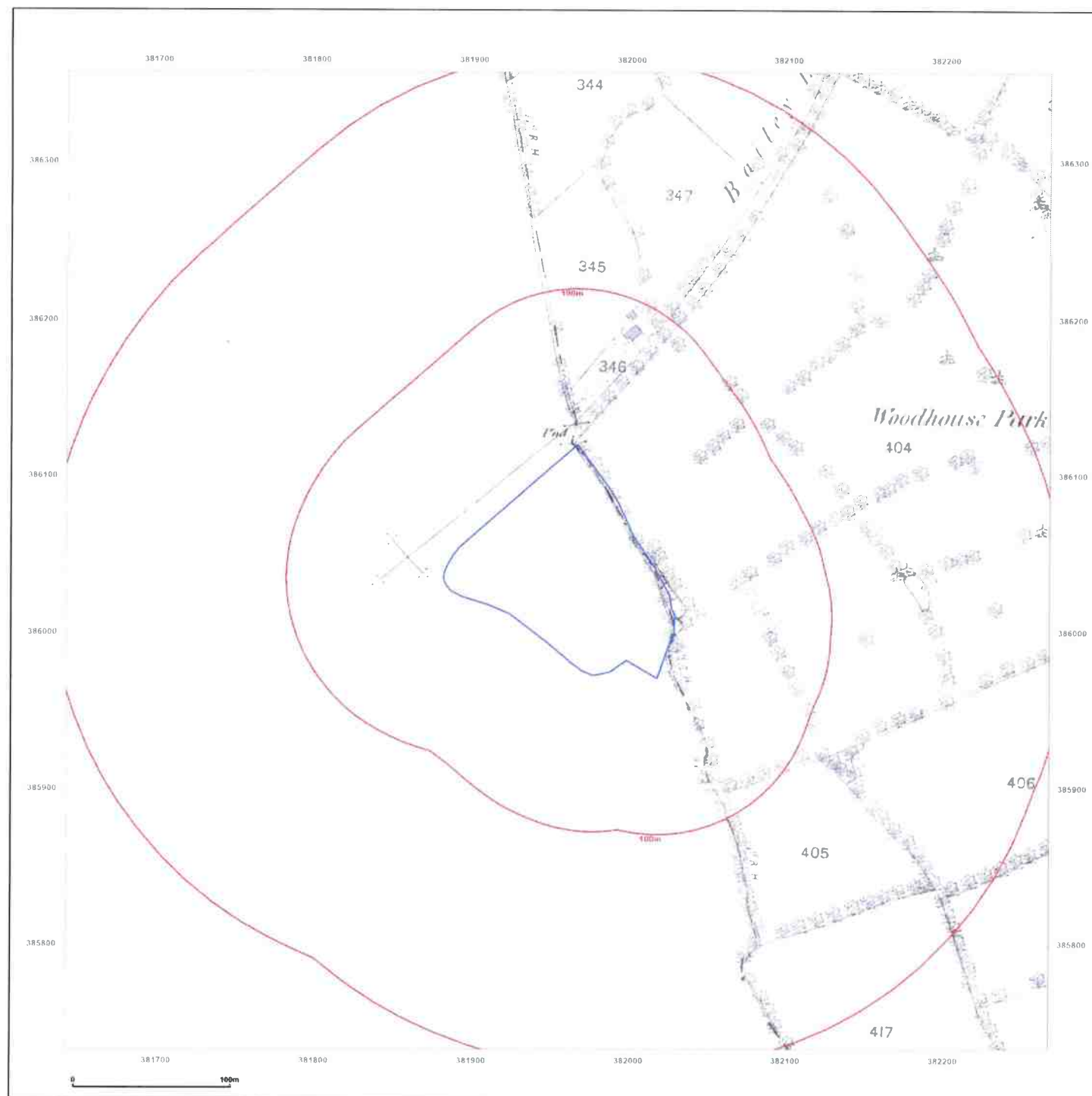


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Site Details:

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Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: County Series

Map date: 1877

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1877
Edition N/A
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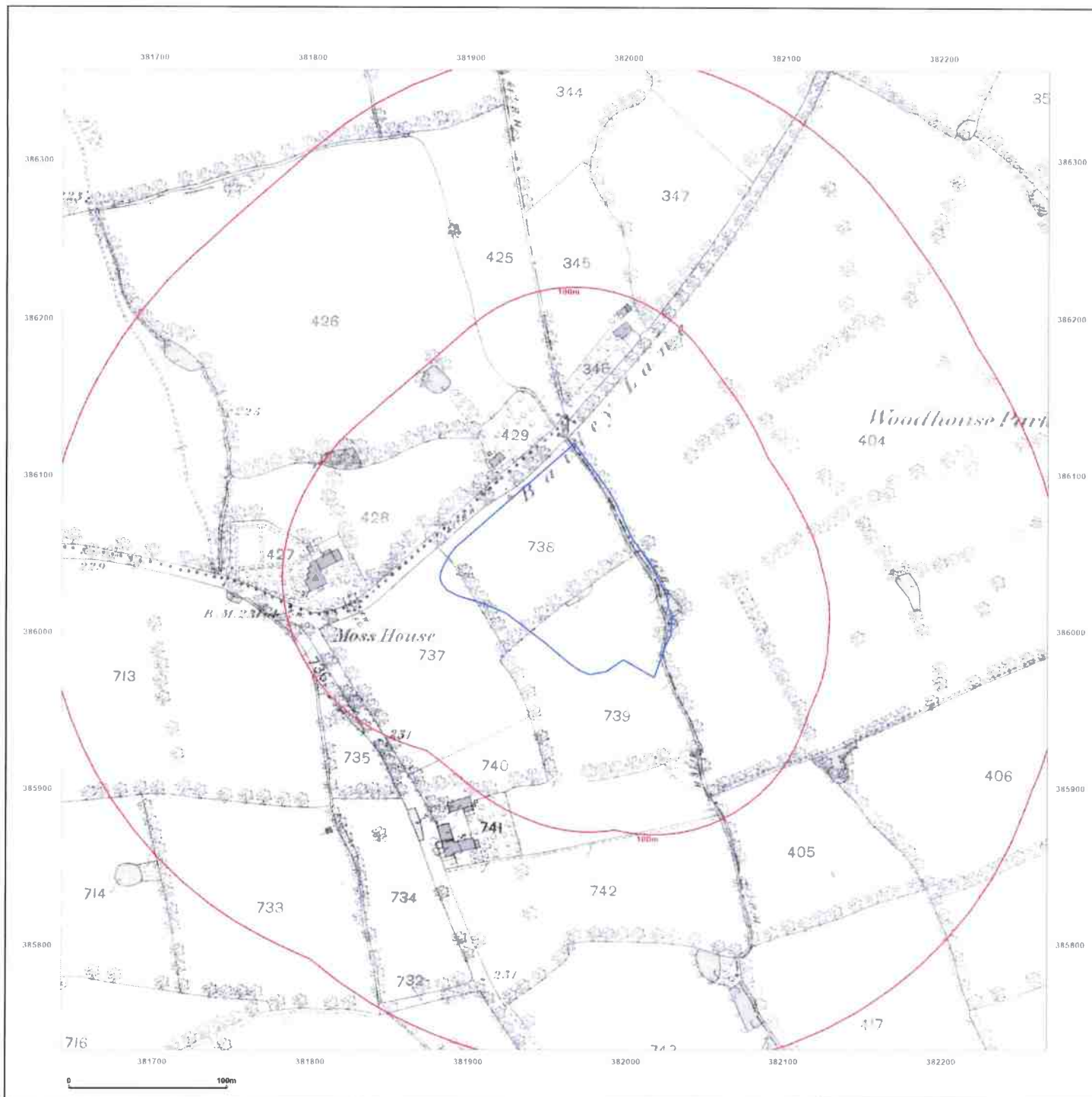
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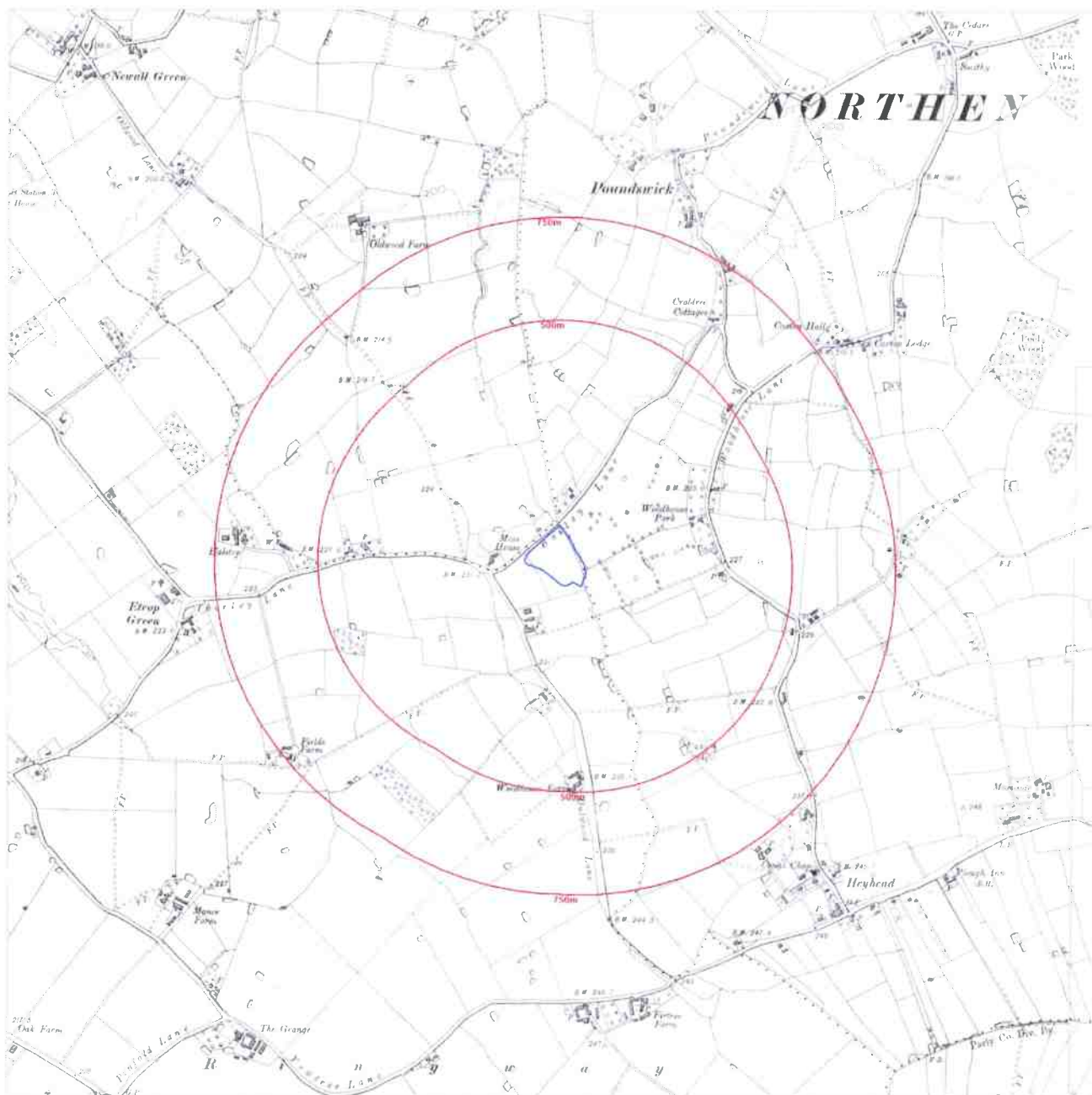


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Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: County Series

Map date: 1897-1899

Scale: 1:10,560

Printed at: 1:10,560



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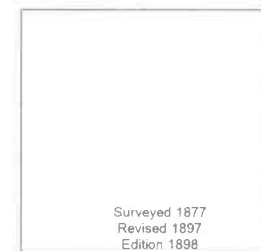
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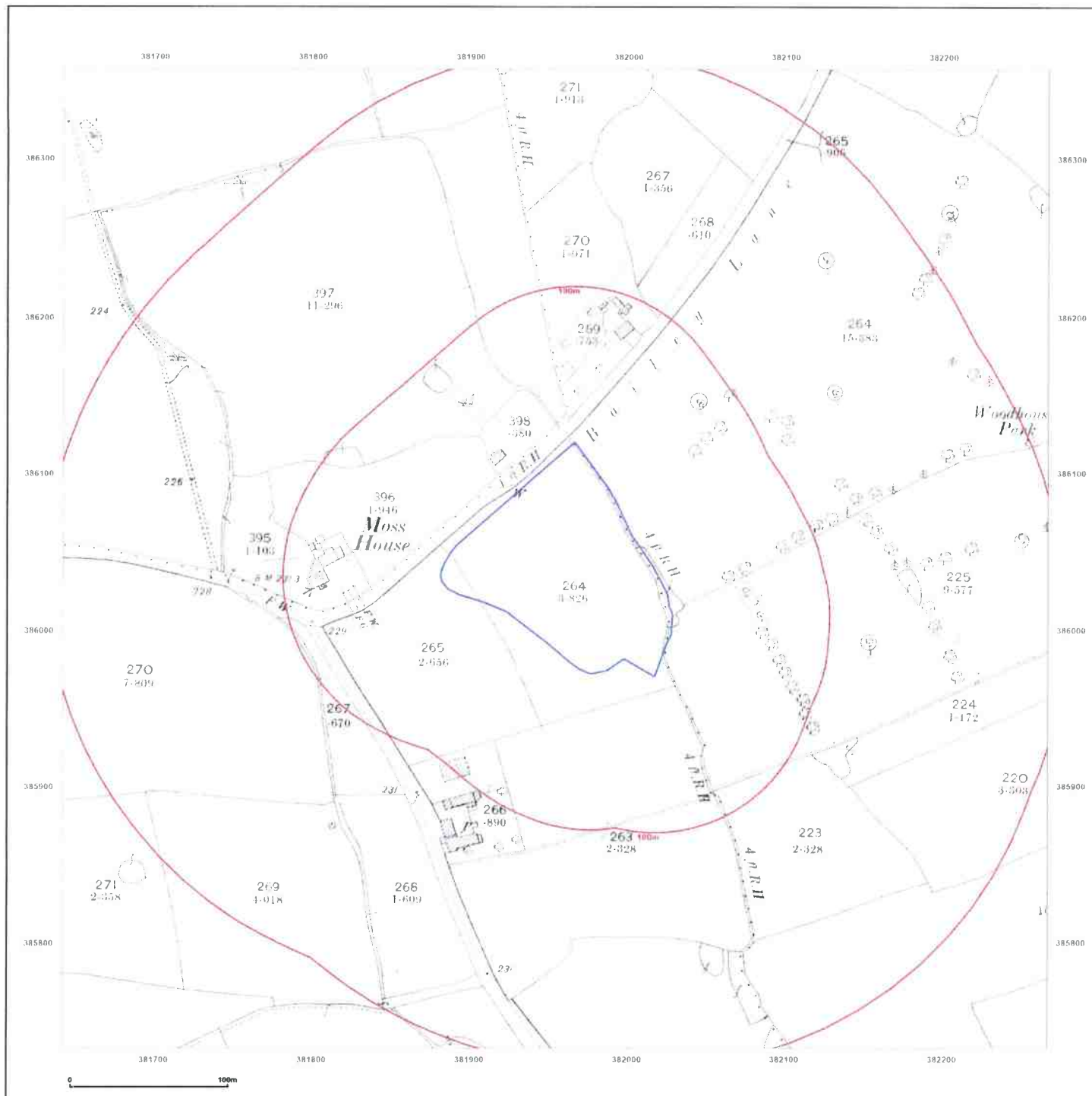
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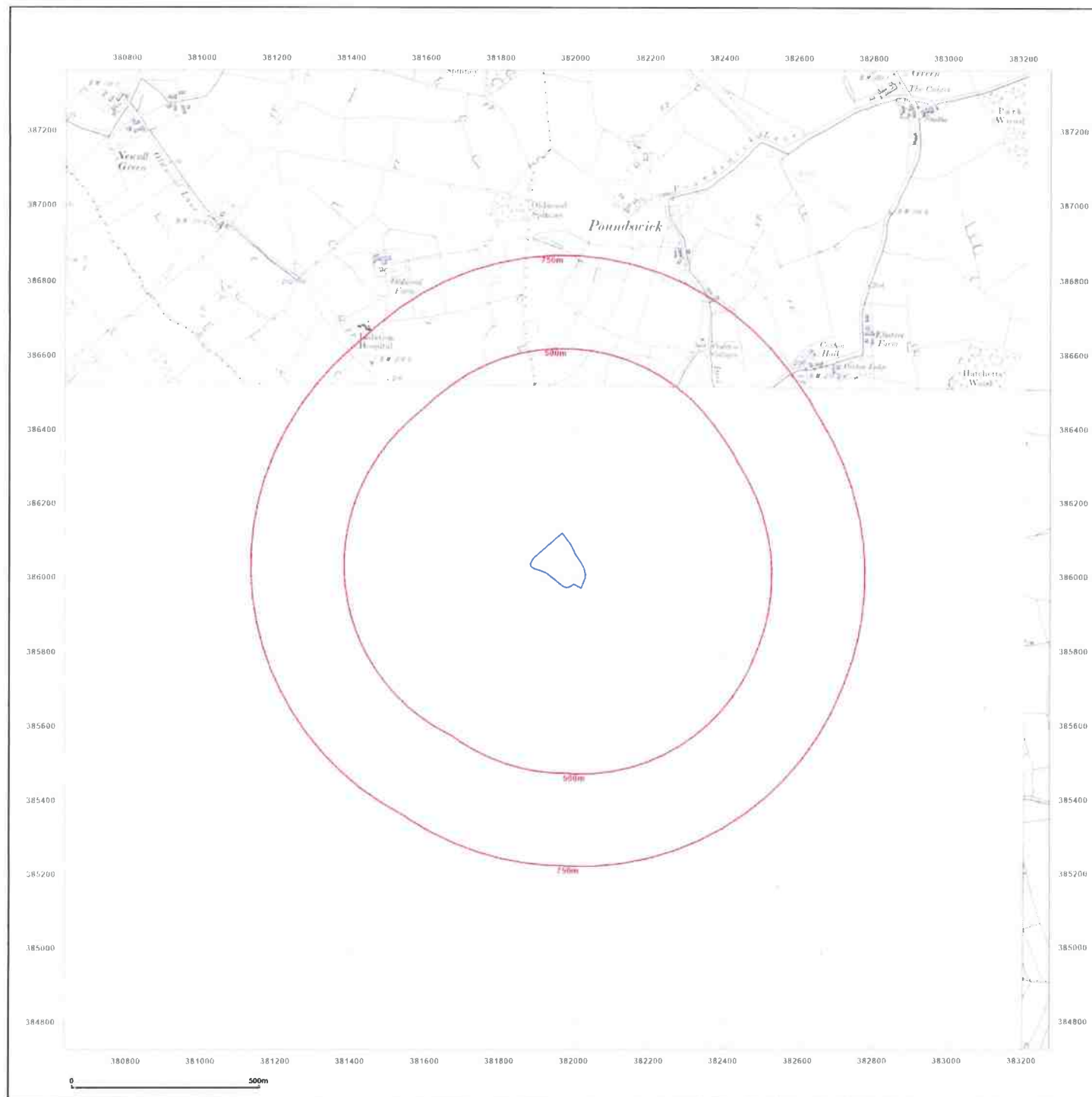


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Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: County Series

Map date: 1907-1908

Scale: 1:10,560

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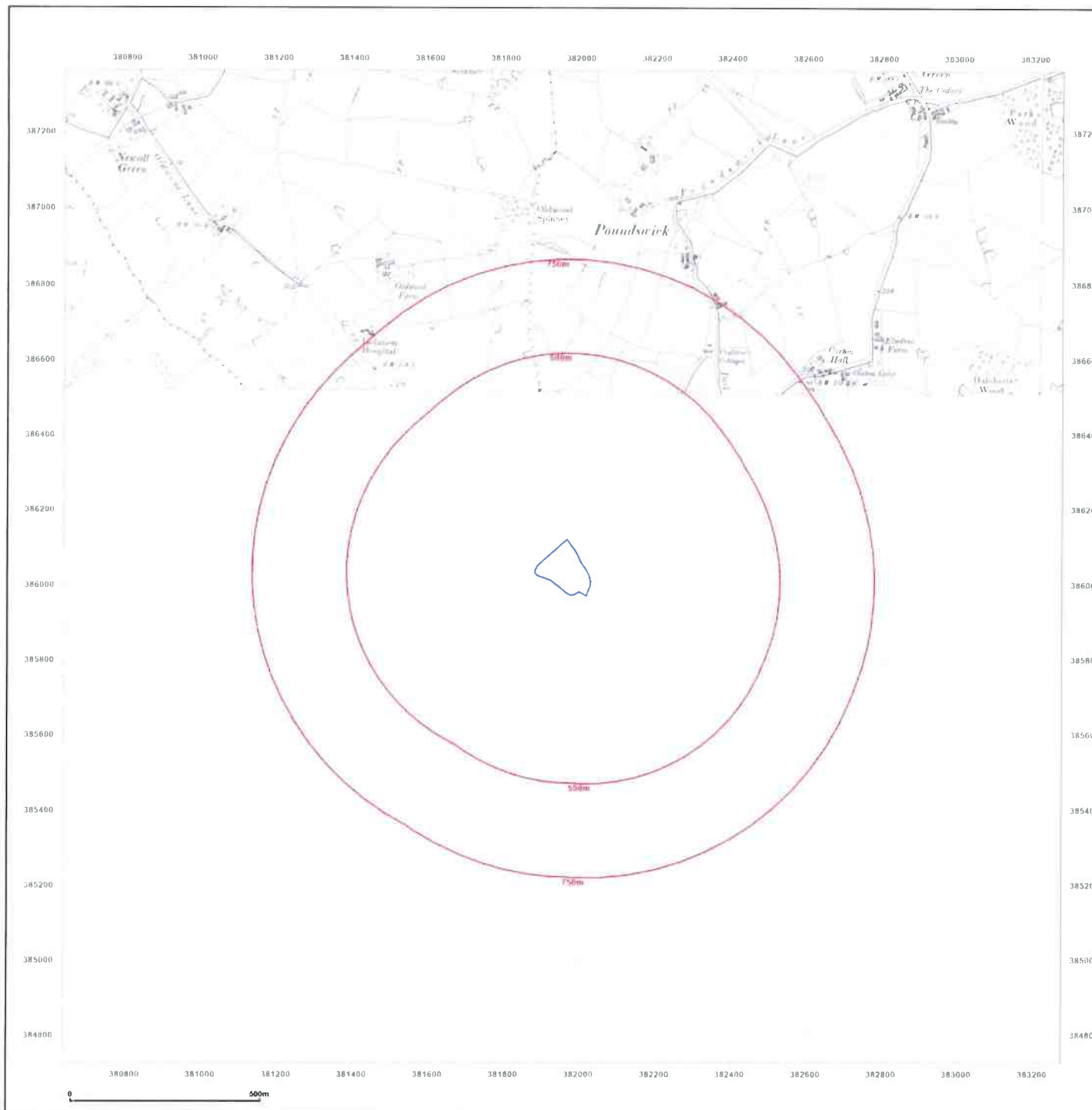
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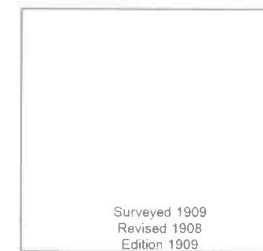
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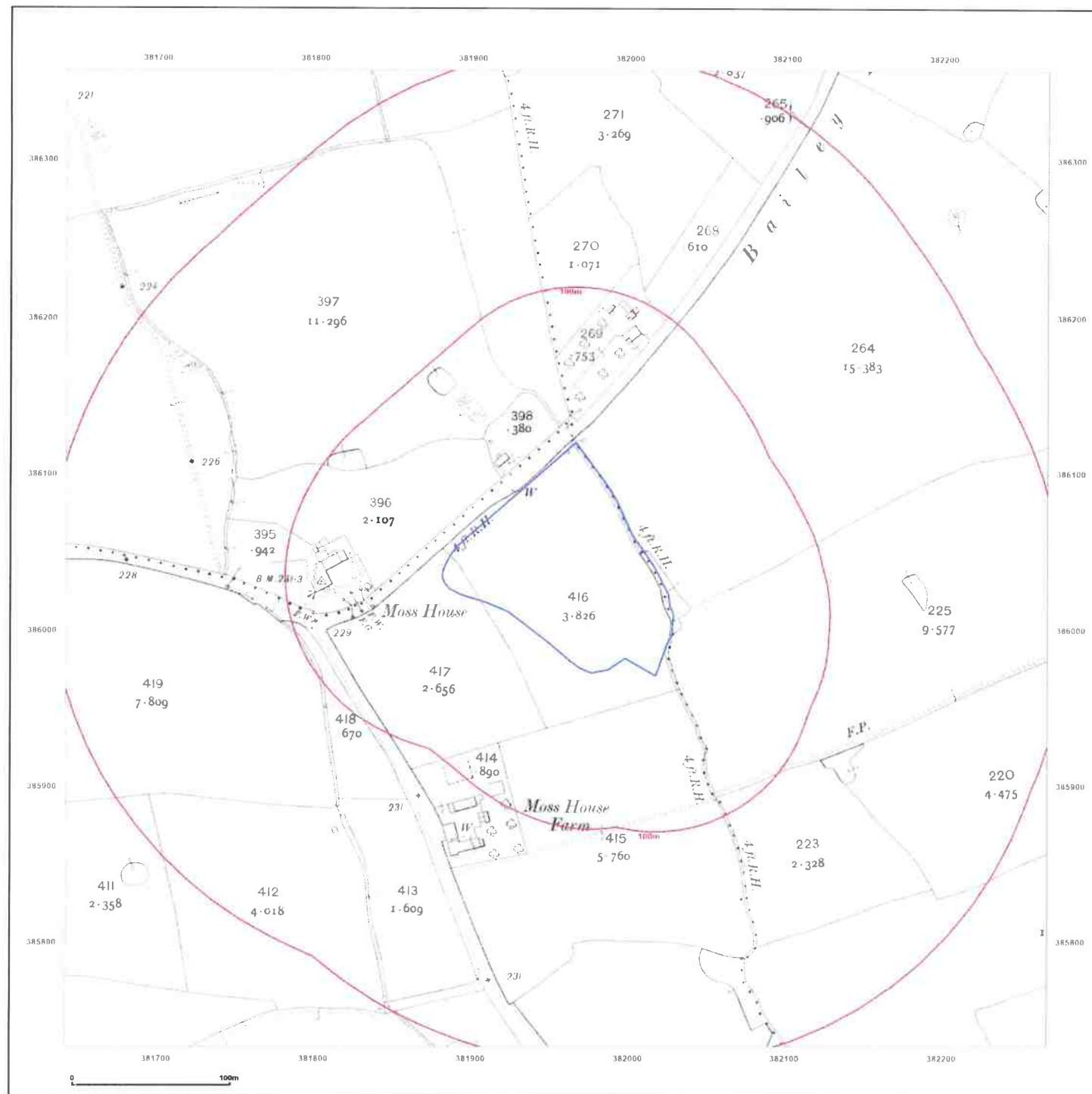
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Map date: 1938

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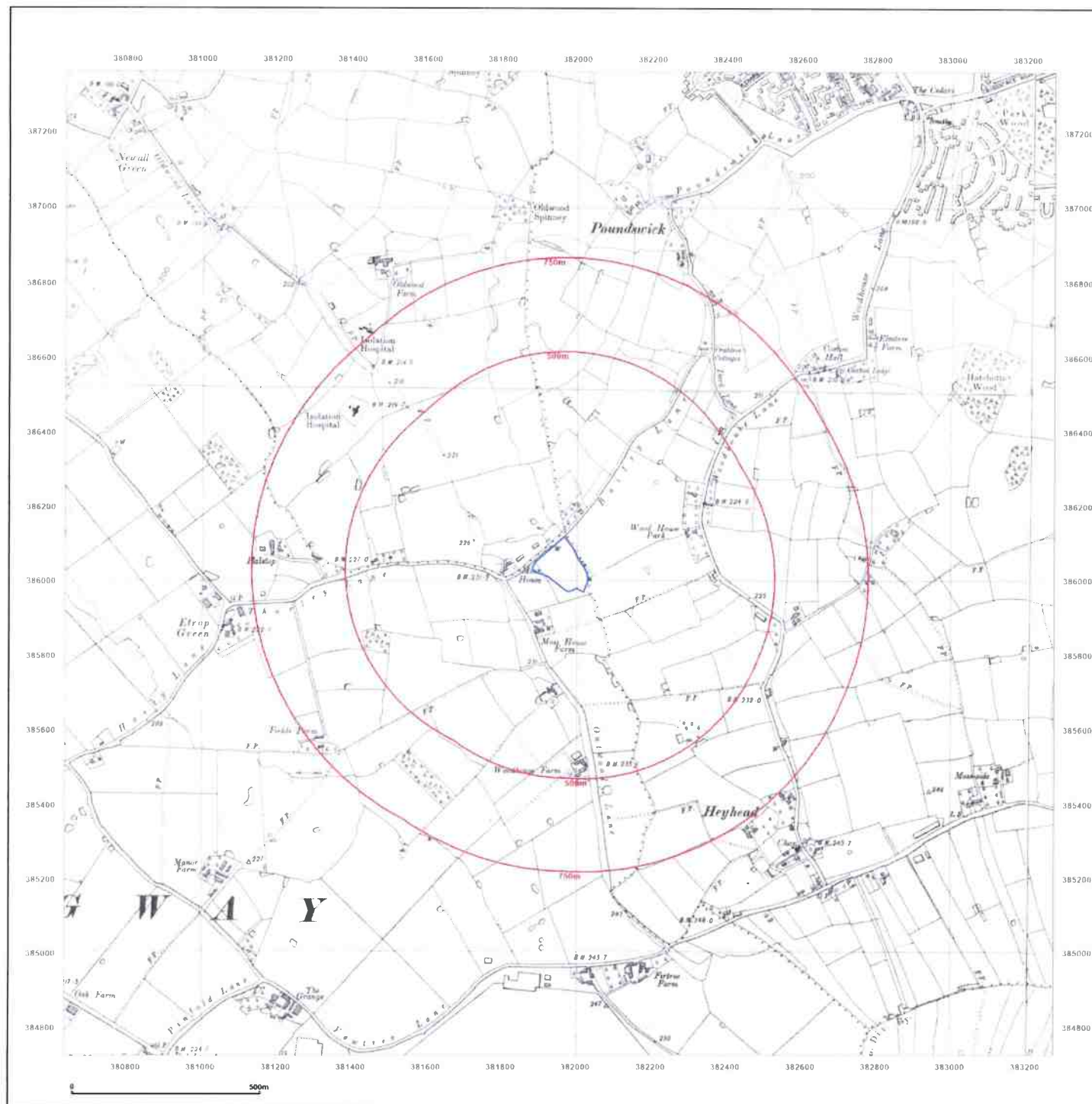
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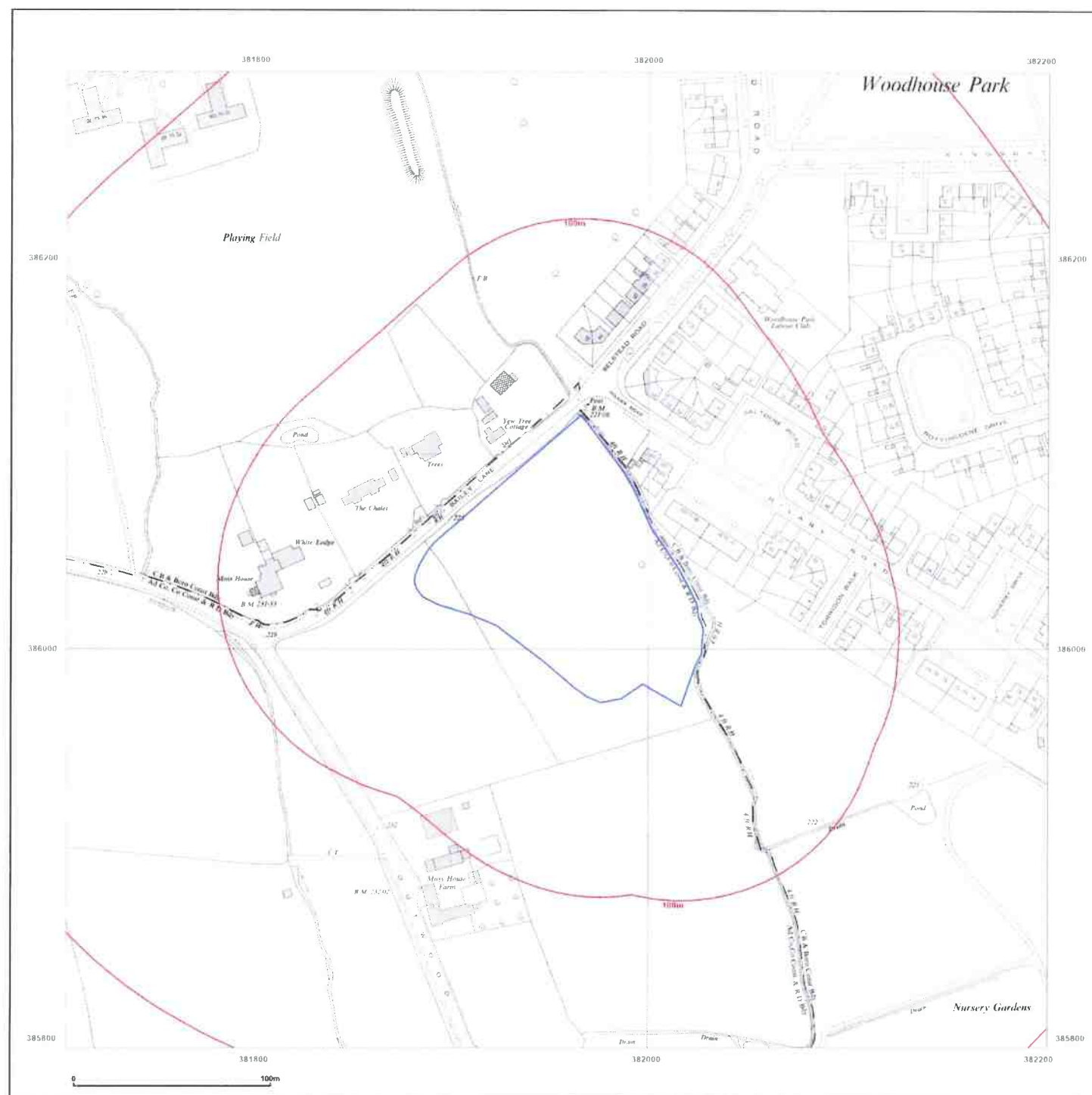


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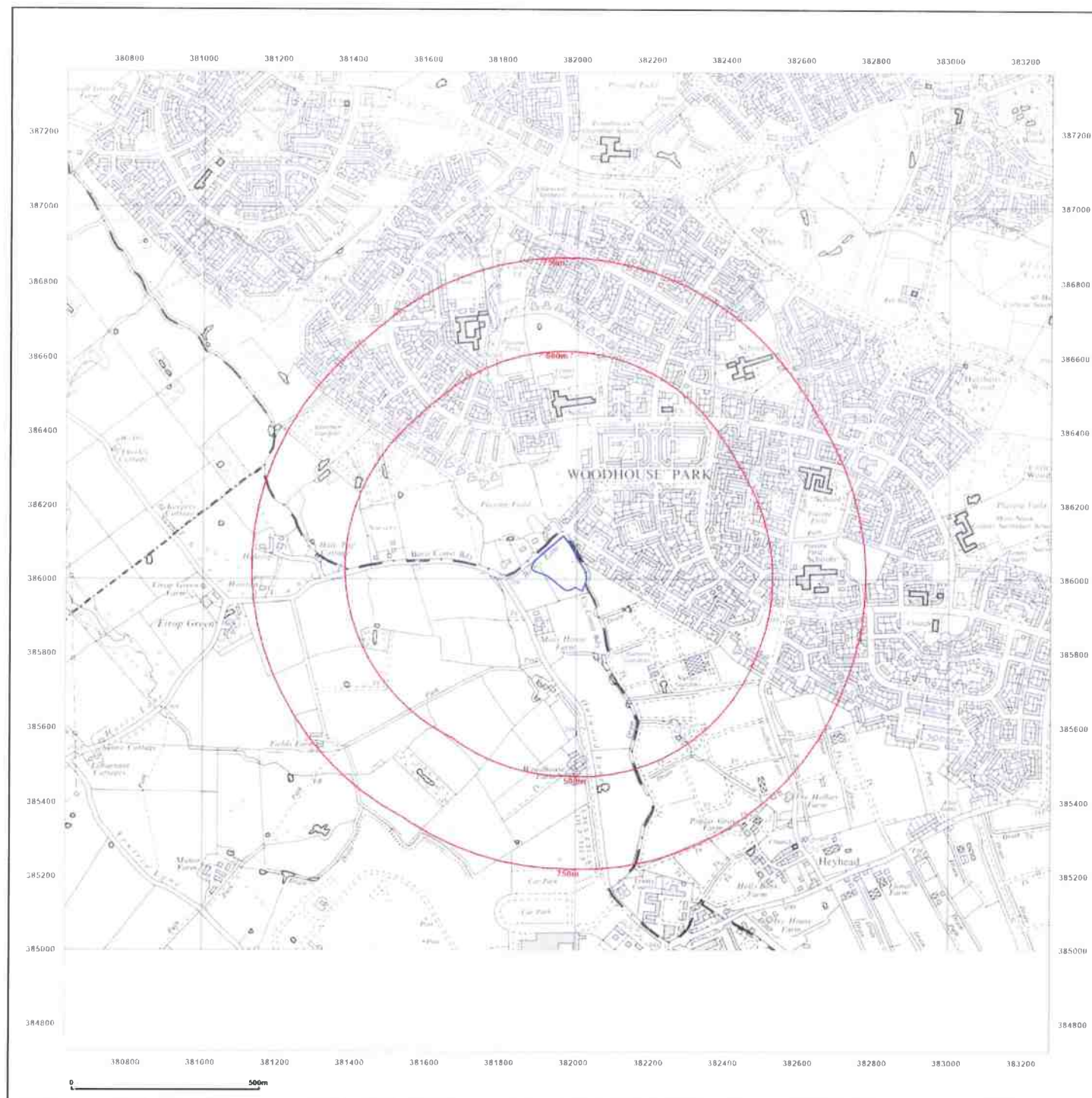
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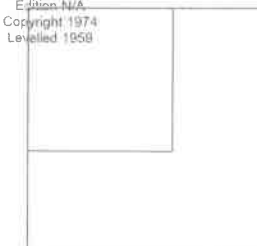
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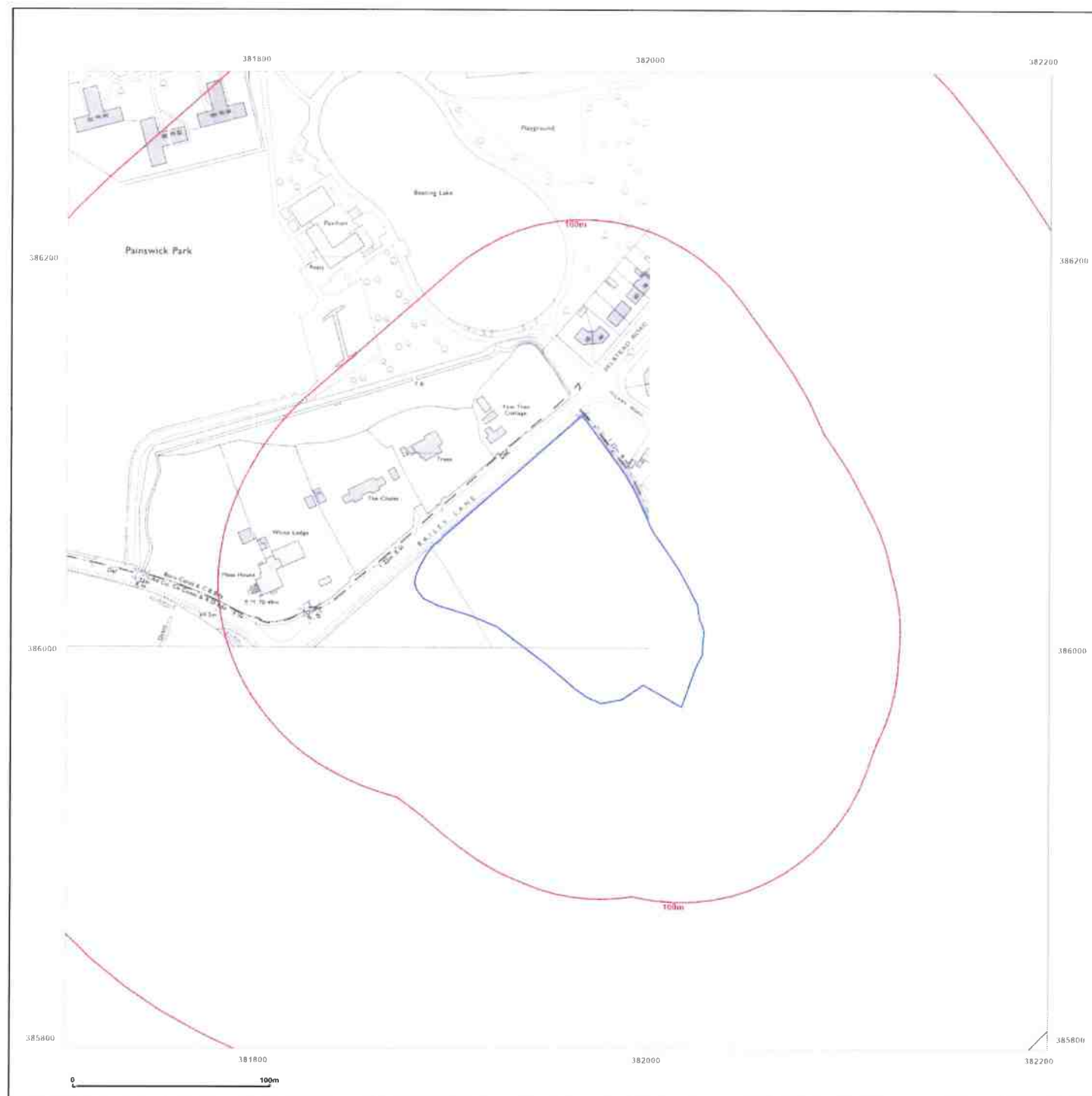


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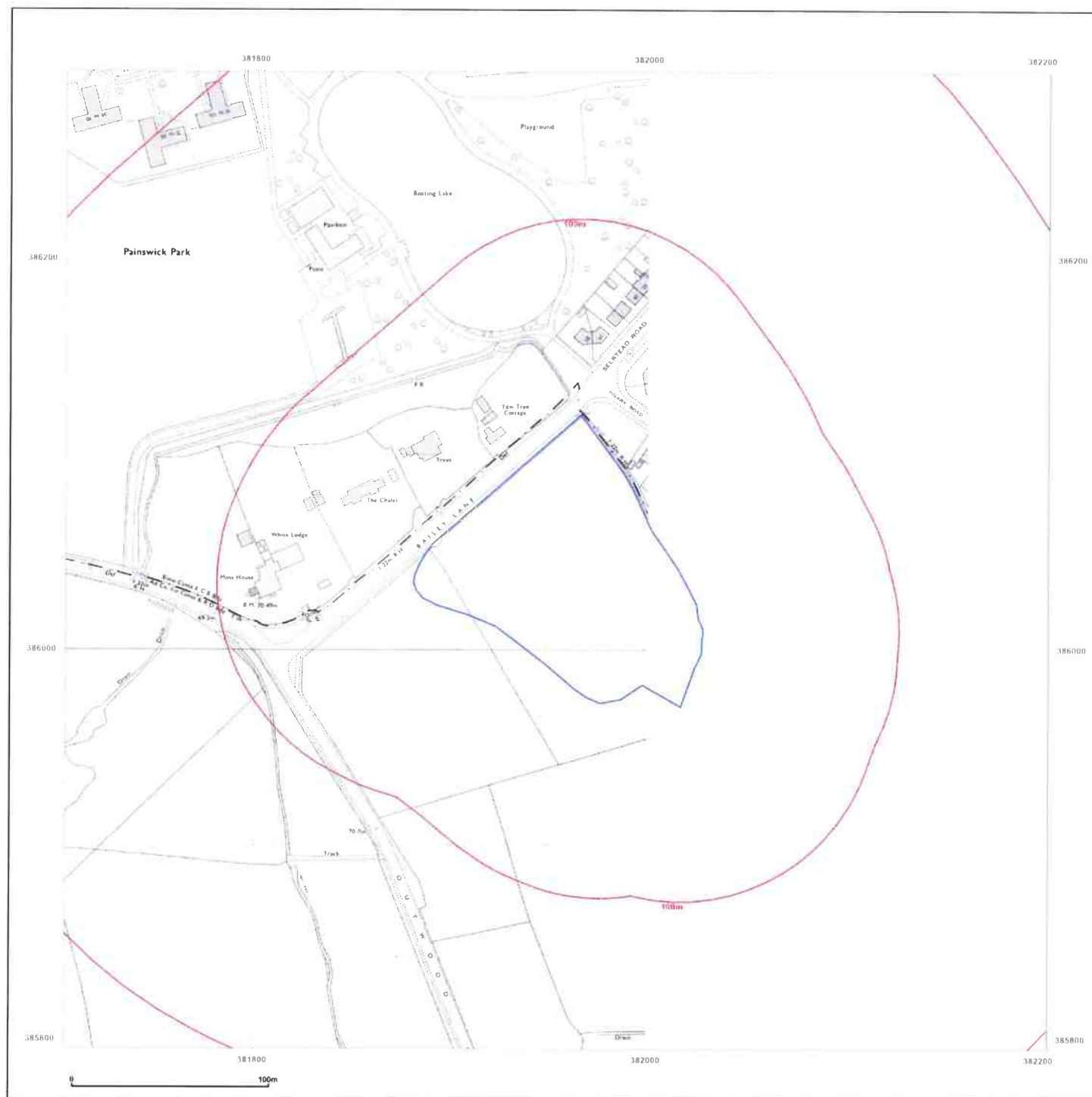


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Printed at: 1:10,000



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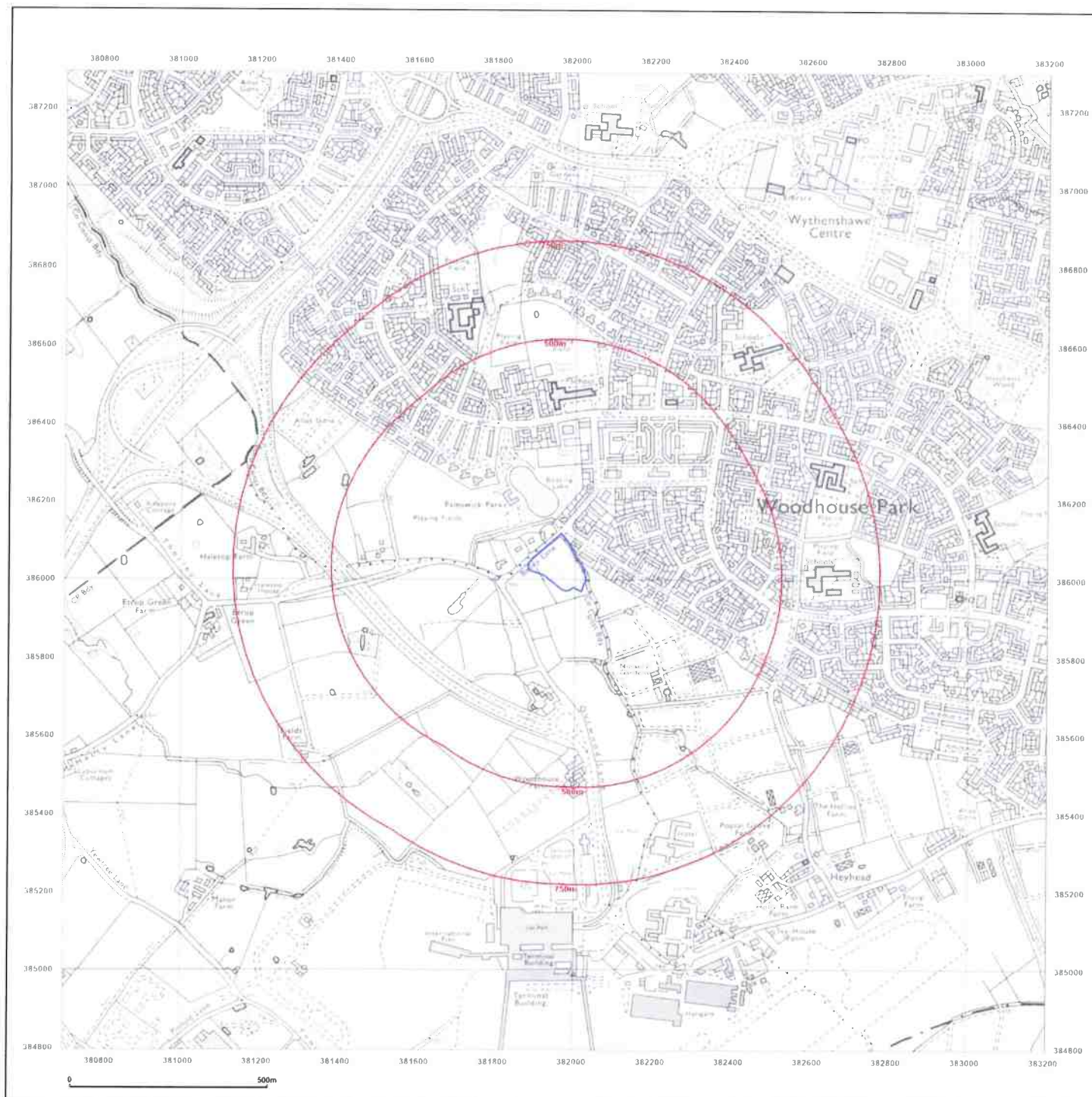
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Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 1986-1990

Scale: 1:1,250

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Map Name: National Grid

Map date: 1987-1992

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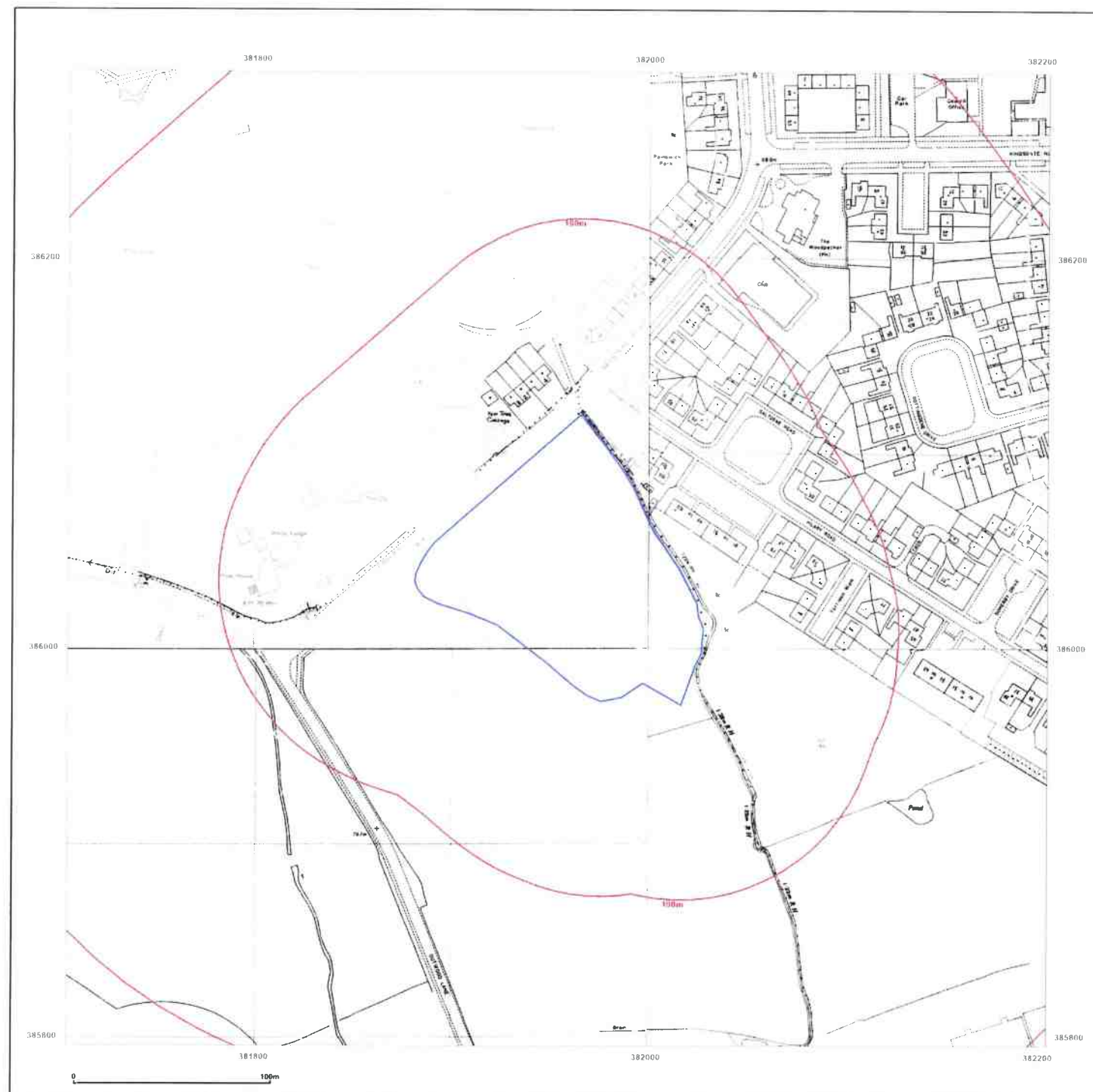


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Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 1989

Scale: 1:10,000

Printed at: 1:10,000



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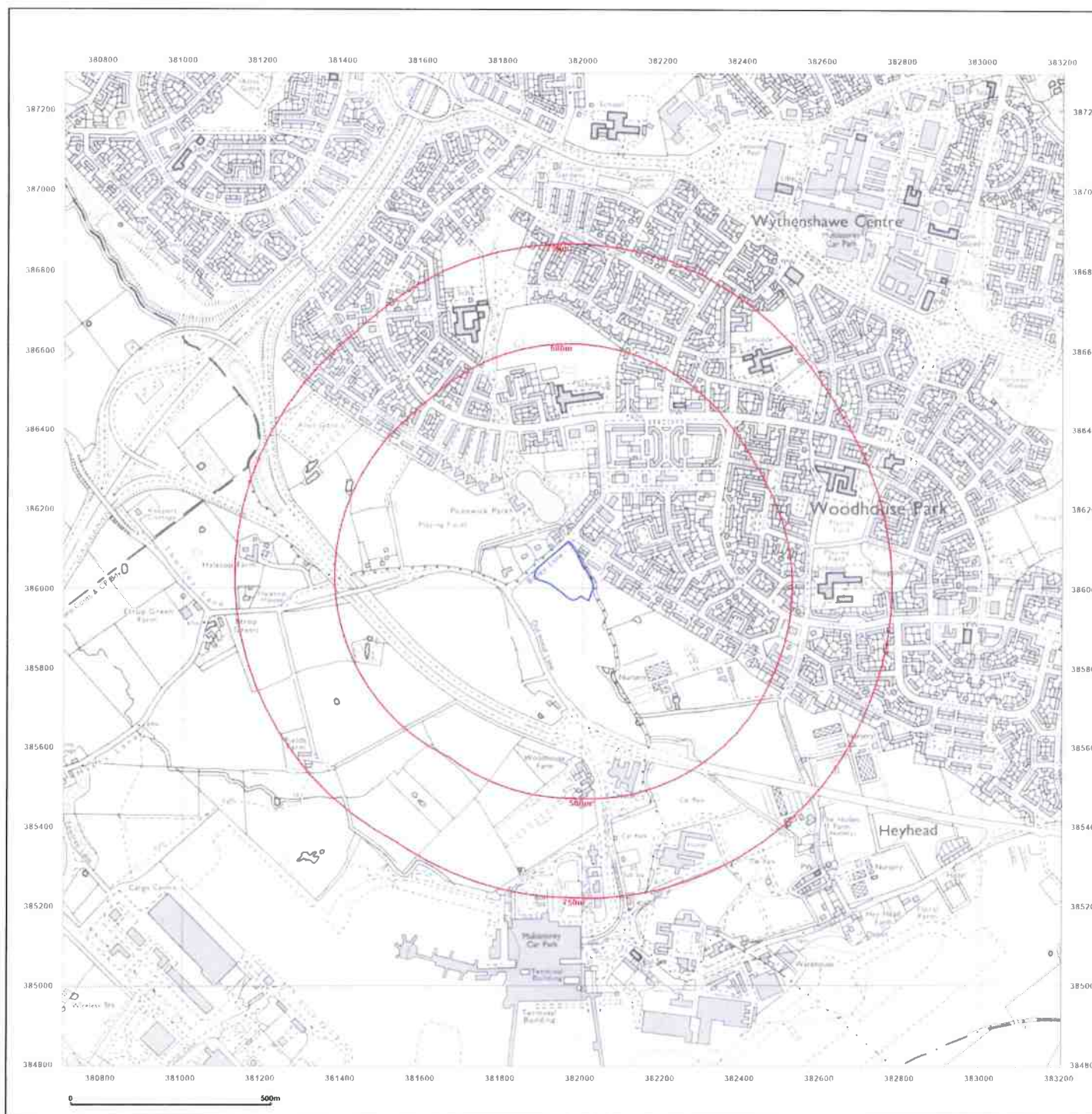


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Map Name: National Grid

Map date: 1989-1994

Scale: 1:1,250

Printed at: 1:2,000



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4AB

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Map date: 1992-1995

Scale: 1:1,250

Printed at: 1:2,000



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Site Details:

Bailey Lane, Manchester, M90
4AB

Client Ref: CMAPS-JPG-1145816-65579-240124
Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 1992-1994

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1992
Revised 1992
Edition N/A
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Levelled N/A

Surveyed 1994
Revised 1994
Edition N/A
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Site Details:

Bailey Lane, Manchester, M90
4AB

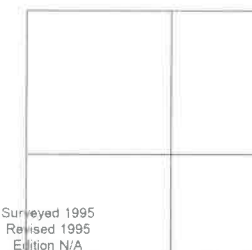
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Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 1995

Scale: 1:1,250

Printed at: 1:2,000



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Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 1995

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
Revised 1995
Edition N/A
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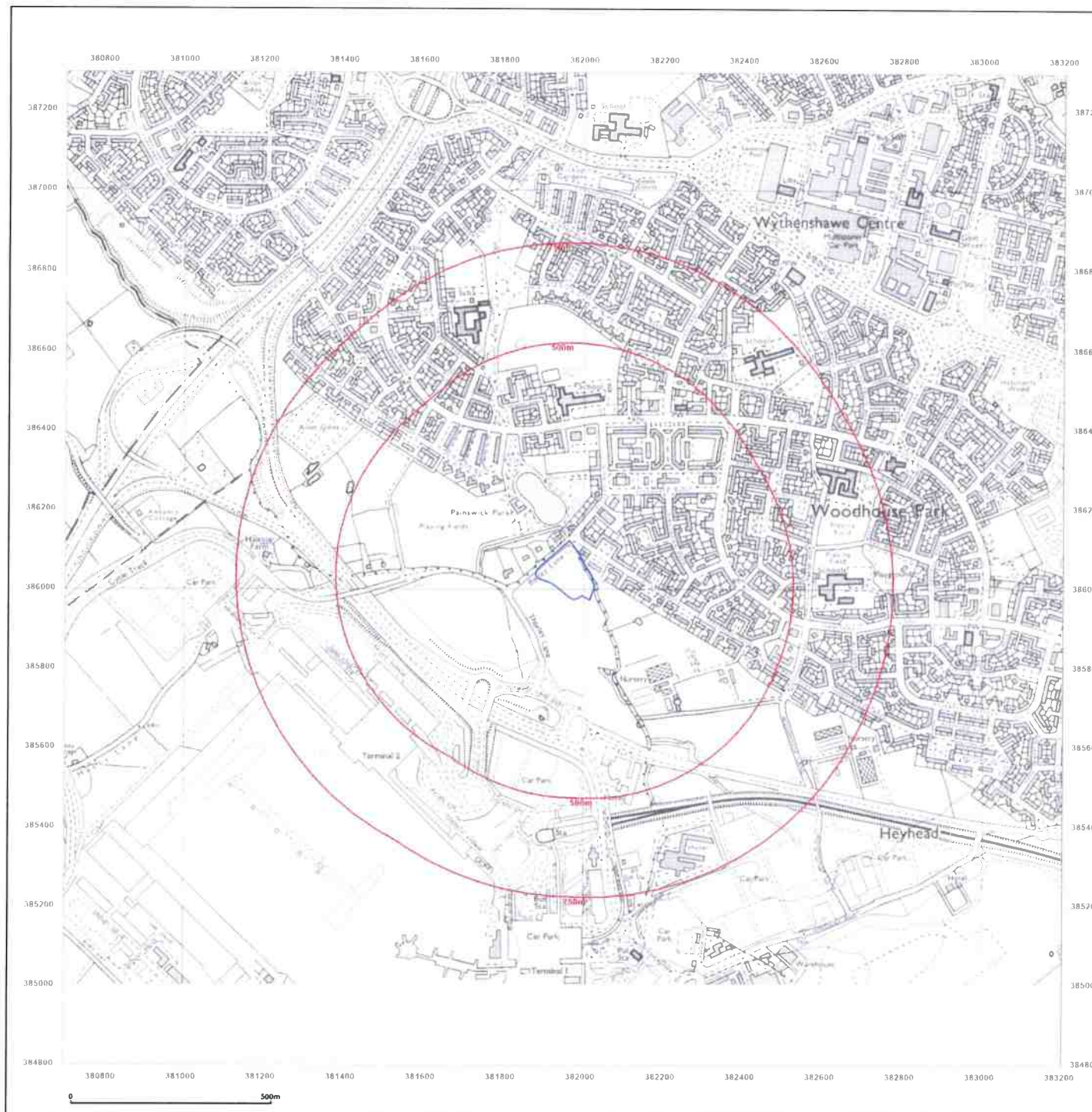


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Site Details:

Bailey Lane, Manchester, M90
4AB

Client Ref: CMAPS-JPG-1145816-65579-240124
Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

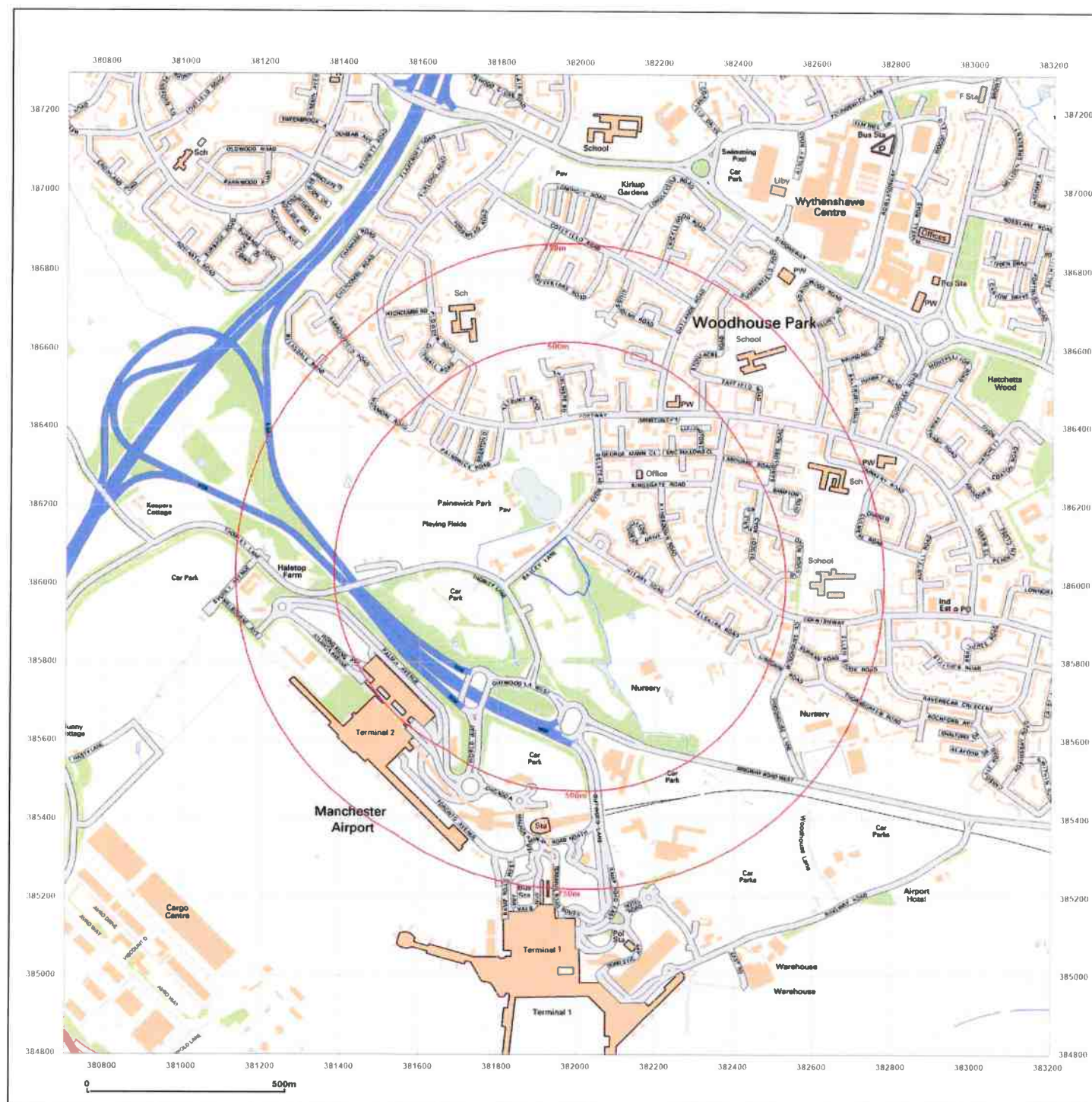


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Site Details:

Bailey Lane, Manchester, M90
4AB

Client Ref: CMAPS-JPG-1145816-65579-240124
Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250

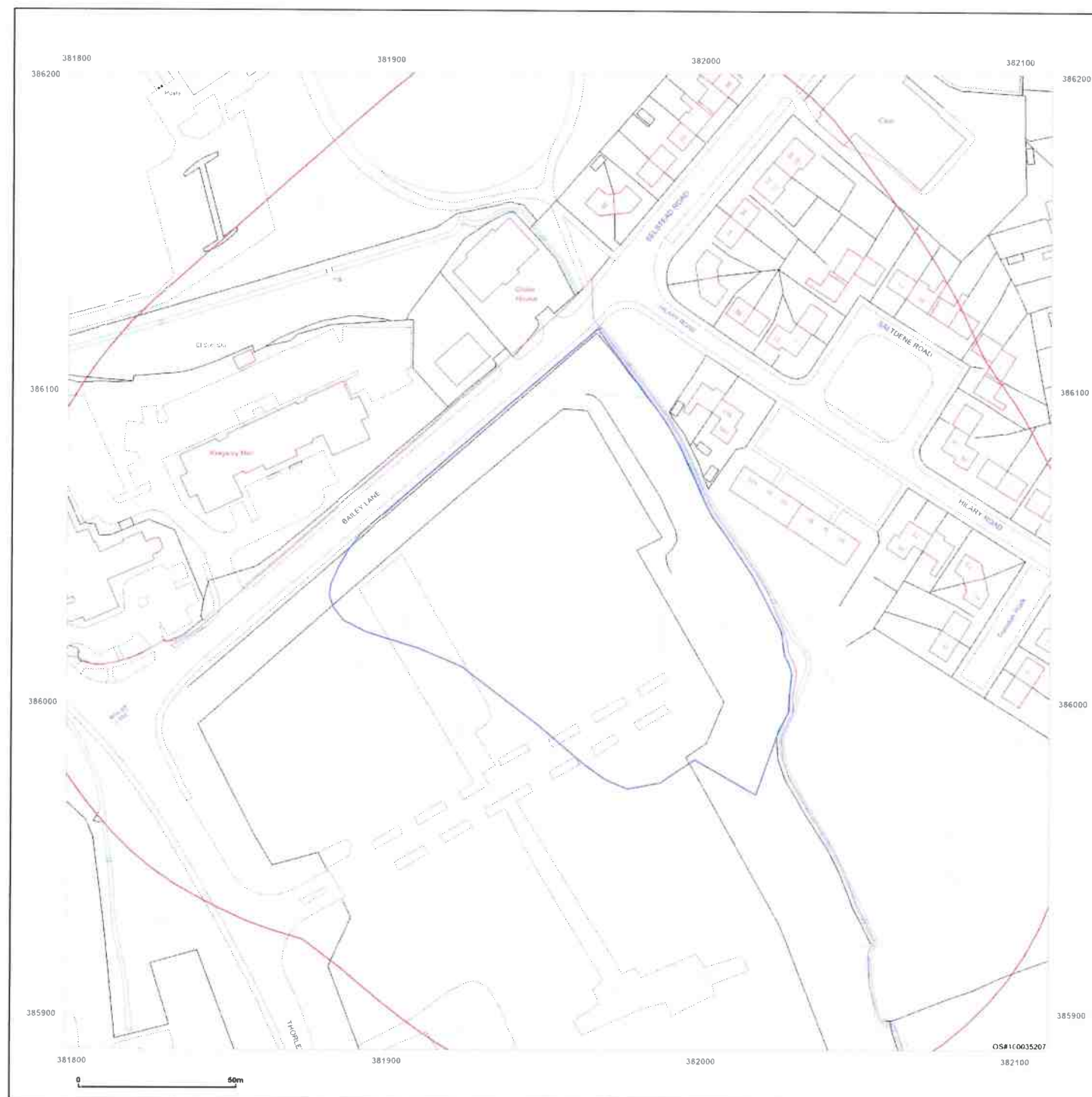


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Site Details:

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4AB

Client Ref: CMAPS-JPG-1145816-65579-240124
Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010



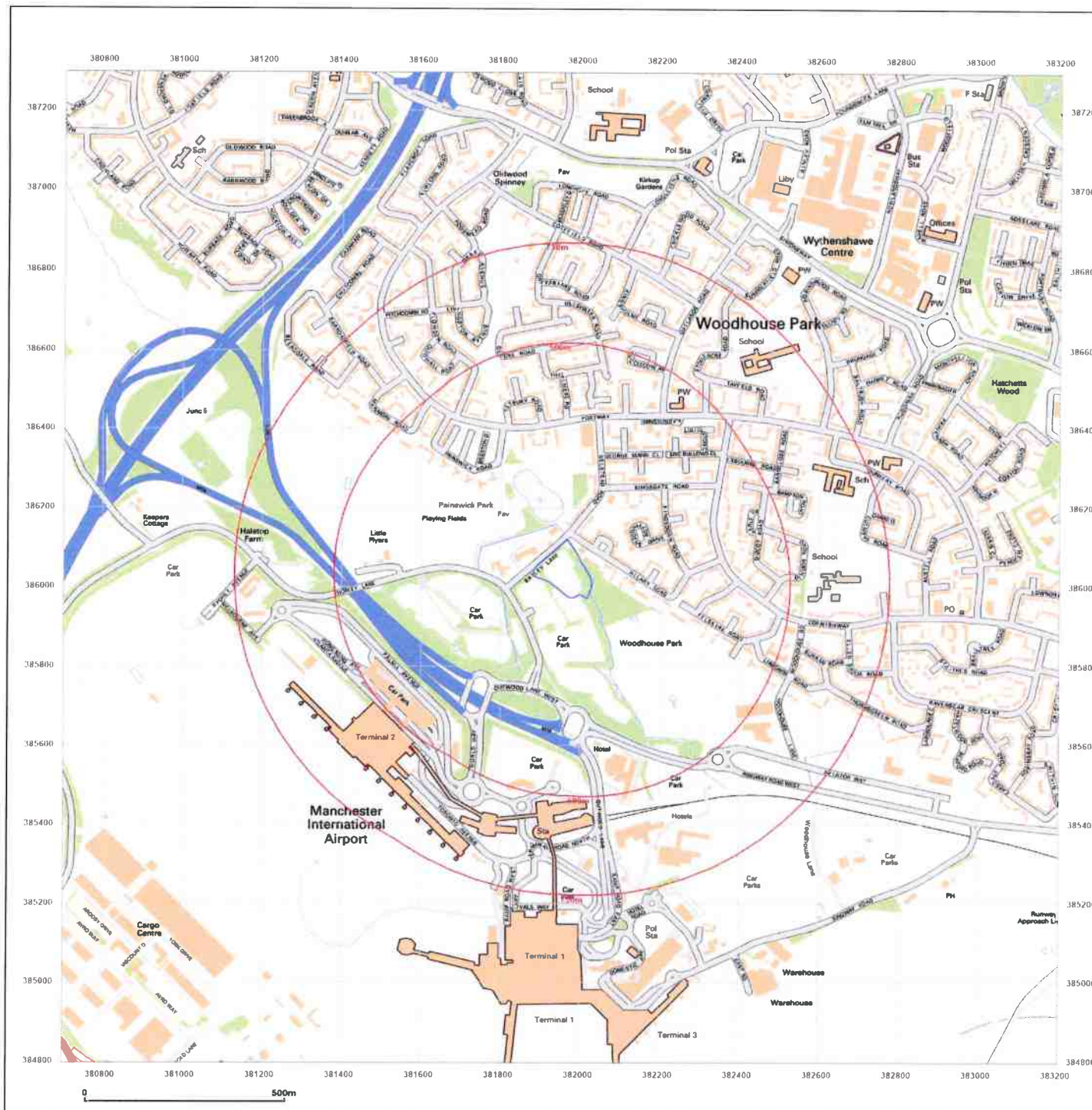
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Client Ref: CMAPS-JPG-1145816-65579-240124
Report Ref: CMAPS-JPG-1145816-65579-240124HIS
Grid Ref: 381954, 386045

Map Name: National Grid

Map date: 2024

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Printed at: 1:10,000

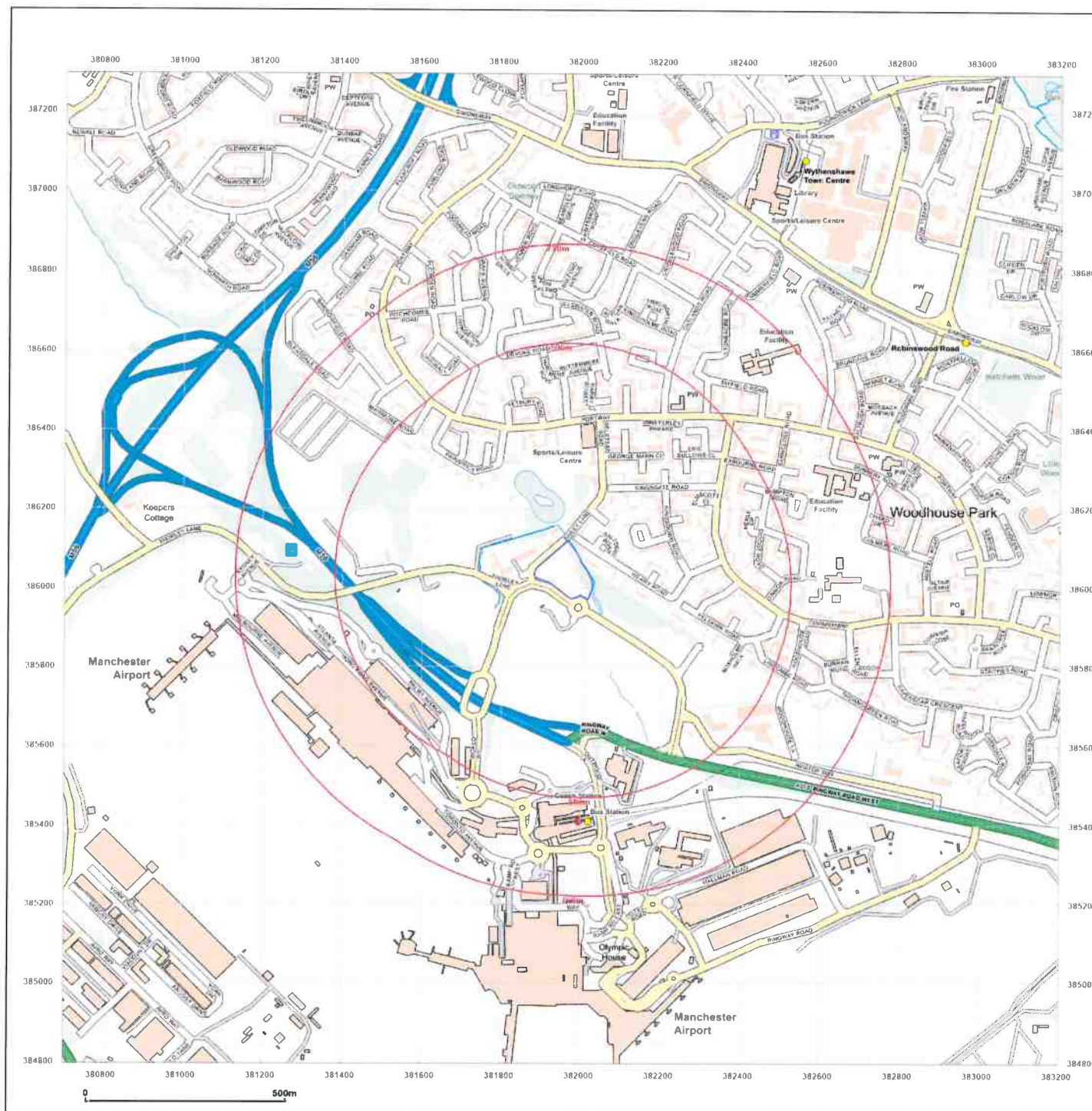


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Appendix C BGS Borehole Records



BGS ID: 914666 : BGS Reference: SJ88NW14
British National Grid (27700) : 381951,386131

(•11932) Wt.30370/0370 10.000 9/39 A.& E.W.Ltd. Gp.685

RECORD OF SHAFT OR BORE LOG GENERAL

Name and Number of Shaft or Bore given by Geological Survey:

M/c Corporation boxes No 11.

Name and Number given by owner (if different from above):

Town or Village Kingway Date of sinking

Exact site 6 yds from NW side Bailey Lane at
a point 166 yds NE along lane from NE fence
of Moss House. (10 yds S.W. of boundary line)

Purpose for which made.

Level at which bore commenced relative to O.D..

...If not down bore, state if horizontal or up.

Made by.

for Messrs.

Information from.

Date received.....

Specimens.

.....Dip of strata.

A sketch-map or tracing from a large-scale map is desirable.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

G.S.M. Office
File No.

Site marked
on 6" Map by

Site marked
on 1" Map by



SJ 8196 8616

SJ 88/22
15 SE/2

*119321 Wt.30370 0370 10.000 9.30 A.C.E.W.Ltd. Gp.685

RECORD OF SHAFT OR BORE FOR MINERALS

Name and Number of Shaft or Bore given by Geological Survey:

M/C Corporation Bore No 11.

Name and Number given by owner (if different from above):

Town or Village Ringway Date of sinking

Exact site 6 yds from NW side Bailey Lane at
a point 166 yds NE along lane from NE fence
of Moss House. (10 yds SW of boundary fence)

A sketch-map or tracing from a large-scale map is desirable.

Purpose for which made

Level at which bore commenced relative to O.D. If not down bore, state if horizontal or up

Made by for Messrs

Information from Date received

Specimens Dip of strata

GEOLOGICAL CLASSIFICATION	DESCRIPTION	THICKNESS		DEPTH	
	Soil	1	9	1	9
	Brown Clay	2	3	4	0
	Variegated Clay	22	-	26	0



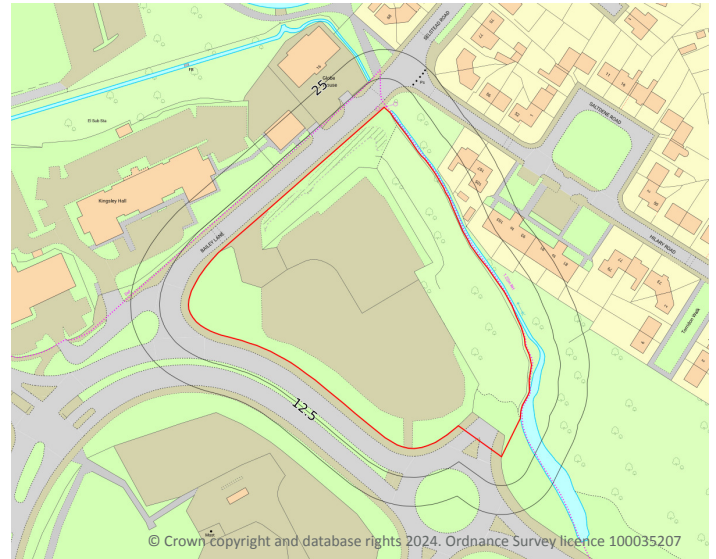
Appendix D Cheshire Salt Search

BAILEY LANE,, MANCHESTER AIRPORT,, MANCHESTER, M90 4AB

Location plan



Site plan



Search results



Compensation District
Identified



Consultation Area
No



Notice of Damage
No



Commuted Claims
No



Future Claims Cover
Yes



Well/Shaft
No



Historical Salt Mining
No



Within DM32 Planning Policy
No



Active Salt Mining
No

Based on and limited to records held by the Cheshire Brine Subsidence Compensation Board (CBSCB) at the date of search and in relation to the address details identified by the customer in the procurement process.



Search results



— Site Outline

Search buffers in metres (m)

 Prescribed notice of damage

 Area of weakness

— Lines of weakness

 Points of weakness

 Shafts and wells



[Back to Summary](#)

For any Brine subsidence queries please
contact the CBSCB:
01782 276859
info@cheshirebrine.com ↗

For all other queries and assistance
please contact Groundsure:
01273 257 755
info@groundsure.com ↗

Cheshire Salt Search

This report is based on and limited to the records held by the Cheshire Brine Subsidence Compensation Board (CBSCB) in relation to this property and its environs, at the date of the search.

1. Is the property situated within the Compensation District?

The property is situated within the Cheshire Brine Subsidence Compensation District as prescribed by the First Schedule to the Cheshire Brine Pumping (Compensation for Subsidence) Act, 1952 (see note 2).

2. Is the property within a Consultation Area prescribed by the Cheshire Brine Subsidence Compensation Board under the provisions of section 38(1) of the 1952 Act?

The property is not within a Consultation Area prescribed by the Cheshire Brine Subsidence Compensation Board (the Board) under the provisions of Section 38(1) of the 1952 Act. It should be noted, however, that there are areas outside the consultation areas that could be at risk from the natural dissolution of the underlying saliferous strata.

3. Have any Prescribed Notice of Damage (PNOD) been filed in respect of the property since 08 January 1959 and, if so, was the claim accepted and discharged?

There is no record of a prescribed notice of damage having been filed in relation to the property, or part thereof since 08 January 1959.

4. Have any claims in respect of the property been commuted by a once and for all payment of compensation?

There has been no commutation of claims in connection with the property.

5. Would the compensation provisions of the 1952 and 1964 Acts apply should the property be affected at some future date by subsidence due to brine pumping?

If claims in respect of the property have not been commuted, then should the property suffer damage at some future date through subsidence due to brine pumping, the compensation provisions of the Cheshire Brine Pumping (Compensation for Subsidence) Acts 1952 and 1964 would be expected to apply to the property (see note 6).

6. Is there an historic brine well/shaft located within 20m of the property?

There are no historic brine wells/shafts located within 20m of the property (see note 7).

7. Is there a recorded area, line or point of weakness, relating to historic brine pumping or natural dissolution, within 50m of the property?

There is no area, line, or point of weakness relating to historic brine pumping or natural dissolution, within 50m of the property (see note 8).



8. Is there any current or proposed uncontrolled brine pumping within 3km of the property?

There are no current or proposed uncontrolled brine pumping sites within 3km of the property (see note 9).

9. Is there any planning consent for brine extraction by controlled methods of pumping within 200m of the property?

There is no existing planning consent for brine extraction by controlled methods within 200m of the property (see note 10).

10. Is the site within 90m of an area that could be affected by historical (abandoned) rock salt underground mining?

The Board does not possess any records of abandoned rock salt underground mining within 90m of the site (see note 11).

11. Is the site within the DM32 planning policy boundary which requires planning applications to have regard to potentially unstable rock salt mine workings?

The site is not within the DM32 planning policy area, which places conditions on development within the former mined areas (see note 12).

12. Is there any planning consent for rock salt extraction by underground mining within 120m of the property?

There is no existing planning consent for rock salt mining within 120m of the property (see note 13).



Additional remarks

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In relation to the determination of whether a damage notice has been filed in respect of the property, the boundaries of such notices have been identified by best endeavours in the absence of definitive file records and as such can only be regarded as approximate. For larger prescribed notice of damage boundaries, the subject of the notice could be remote from the subject property boundary.

Explanatory notes

1) Site Location

The area of land identified by the customer when digitising the enquiry boundary during the procurement process as shown on the attached plan. If the digitised boundary touches or overlaps with an adjoining property, then details relating to those adjoining properties will be included and may not be relevant to the enquiry property.

2) Compensation District

The geographic area prescribed by the Cheshire Brine Pumping (Compensation for Subsidence) Act, 1952 as subsequently amended, largely situated within Cheshire, but excluding Nantwich, and other areas, where redress is generally available for damage associated with the pumping of brine. This report only includes areas covered by the Cheshire Brine Compensation District. There are parts of Cheshire (and other parts of the country) where salt/brine can still pose a risk of subsidence. Further research may be necessary in these areas to determine the nature if this risk (if any).

3) Consultation Area

There is a statutory obligation to consult the Board with regard to development involving new foundations within these areas. Consultation with the Board is required at both the Planning Application and Building Control approval stages of development. As part of the development proposals, a suitable risk assessment should be prepared for submission and consideration by the Board.

4) Prescribed Notice of Damage Since 08 January 1959

A remedy for damage due to subsidence associated with the pumping of brine in Cheshire (in particular Northwich) dates back to 1891. However, a large proportion of the records relating to such damage are incomplete and a number of those properties have since been demolished. The Cheshire Brine Pumping (Compensation for Subsidence) Act 1952, introduced a more widespread means of redress for damage due to brine pumping within the identified Compensation District, see above. Regulations introduced on 08 January 1959 provided a specific format for the submission of a notice and progression of redress for damage and as such details of damage notices issued since 08 January 1959 contained in these searches have been limited to those received in accordance with the more formal procedures established on 08 January 1959. In relation to



the determination of whether a prescribed notice of damage has been filed in respect of the property, the boundaries of such notices have been identified by best endeavours in the absence of definitive file records and as such can only be regarded as approximate. For larger prescribed notices of damage boundaries, the subject of the notice could be removed from the subject property boundary.

5) Commutation

Where the damage to a property is likely to recur or exceed its market value, there is an option to discharge liability by a once and for all payment involving a commutation under cover of a deed of release. These deeds of release can extinguish any further means of redress and can contain a condition requiring future foundation designs to be approved by the Board to ensure future rights of redress. As a commutation has long term implications these will be declared in the searches back to 1891.

6) Future Liability

The provisions of the 1952 and 1964 Acts would be expected to be available for most properties, within the Compensation District, the exception being in relation to properties for which a commutation applies.

7) Brine Wells/Shafts

The location of the reported wells/shafts has been derived from source plan records of varying reliability, accordingly their locations have to be regarded as approximate.

8) Recorded Lines of Weakness

These features related to records of subsidence identified from historic plans. These features are referred to as 'subsidence hollows', 'lines of subsidence' etc and are regarded to represent areas of potential higher risk of subsidence.

9) Uncontrolled (wild) Brine Pumping

There are currently no wild brine pumping activities taking place within the Compensation District and there are unlikely to be such in the foreseeable future. Should the situation change then the search reports will thereafter be updated accordingly.

10) Planning Consent for Controlled Brine Pumping

Pumping of brine by controlled methods avoids the significant subsidence problems associated with uncontrolled pumping (wild brine pumping). Subsidence from controlled pumping is eliminated or of very low magnitudes. The current planning consent boundaries are likely to be significantly larger than the operational areas.

11) Abandoned Rock Salt mine workings

Rock Salt has been mined by underground mining techniques within the Cheshire Saltfield at various depths but typically within a depth of 90m. A number of these mines were abandoned without the mine having been stabilised and represent a significant subsidence risk. Some of the workings, in particular the bottom bed workings beneath Northwich town centre, have been the subject of a stabilisation scheme. In some instances, shaft records indicate the presence of workings the extent of which is unknown and in formulating this report it has been assumed that such unrecorded workings would lie within a 50m radius surrounding the respective shaft. As an initial sieving procedure, where the records of mine workings held by the Board indicate the presence or assumed presence of mine workings, a 90m reporting buffer has been applied to those boundaries for the purpose of these reports.



12) DM32 Planning Policy

This policy was introduced by Vale Royal Borough Council to ensure that no development takes place within the area covered by the policy until such time that the site is rendered fit for development and mitigated against the serious subsidence risk potentially associated with abandoned rock salt mines. Cheshire West and Chester Council is in the process of replacing this policy but the replacement policy is intended to include similar development constraints.

13) Planning Consent for Underground Rock Salt Mining

There is a single mine operation involving the extraction of rock salt by underground mining techniques currently taking place within the Cheshire Saltfield. This mining is subject to a number of conditions including the control of surface subsidence. The mine layouts have been designed by leading rock mechanics consultants acting for both the operator and planning authority to ensure compliance with the planning conditions.

Further details

Further details may be able to be obtained from the CBSCB in relation to the information provided herein, e.g. PNOD boundary or damage details, but such enquiries would be subject to a bespoke report and charge.



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Appendix E Notes on Limitations



General

JPG (Leeds) Limited have prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from JPG (Leeds) Limited; a charge may be levied against such approval.

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- b) the use of this document by any third party with whom an agreement has not been executed.

Phase I Desk Study Reports

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including any information provided by the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties where appropriate. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, JPG (Leeds) Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Geo-Environmental Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics and ground and groundwater conditions to allow a reasonable assessment of the environmental risks together with engineering and development implications.

The objectives of the investigation have been limited to establishing the risks associated with potential human receptors, building materials, the environment (including adjacent land) and controlled waters (surface water and groundwater).

The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

5 John Charles Way
LEEDS
LS12 6QA

Tel: 0113 263 1155
admin@jpg.group
www.jpg.group

