

Bruntwood

City Labs 4.0

Geotechnical & Geoenvironmental Desk Study Report

GEO-REP-001

Issue | 7 May 2019

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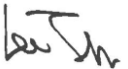
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Appendix A

Groundsure Reports & Historical Mapping

Executive Summary

This desk study report has been prepared for Bruntwood to support the proposed development of the diabetes centre site for the City Labs 4.0 development. The report describes the site, summarises the site history and anticipated ground conditions and likely consequences for the proposed development.

Prior to development of the site for the diabetes centre and associated car park in circa 2005, the entire site was occupied by a car park. Residential properties were present on the site from 1890 to 1970. The site was undeveloped prior to 1890.

Arup knowledge of ground conditions within Manchester and information from adjacent sites has been reviewed. Anticipated ground conditions comprise a variable thickness of made ground, overlying glacial till over Sherwood Sandstone and Manchester Marl bedrock at approximately 10-15m depth. Perched groundwaters are anticipated to be present within made ground with main groundwater within the Sherwood Sandstone and Manchester Marl.

Backfilled cellars/basements and other elements of substructure associated with residential properties are anticipated to be present, which if not adequately investigated and remediated could be a constraint on future development.

Given the expected structural loads, it is anticipated that bored piled foundations will be the most suitable foundation solution for the main structures.

Ground bearing floor slabs may be appropriate for use at the site subject to establishing the nature and thickness of the made ground deposits and the risk of residual below ground voids. Excavation and recompaction of the made ground may be a solution to mitigate these risks.

A conceptual model has been developed for the site and a preliminary geoenvironmental assessment undertaken. Whilst a number of potential pollutant linkages have been identified, the site is anticipated to be low risk with regards to contamination and ground gas. However further ground investigation is required to confirm this.

An intrusive ground investigation is recommended to provide information to inform geotechnical and geoenvironmental assessment of the site and provide information to assist with discharging planning conditions.

1 Introduction

In April 2019 Ove Arup and Partners (Arup) was appointed by Bruntwood to provide civil and structural design services to support outline proposals for the City Labs 4.0 scheme.

The City Labs 4.0 scheme comprises the redevelopment of the existing diabetes centre and associated car park. This involves the demolition and removal of the diabetes centre building and the construction of a seven-storey steel framed office structure.

As part of this commission, Arup have undertaken a geotechnical desk study of the site for the proposed development. This study describes the site, summarises the site history and likely ground related implications for the proposed development. The report presents the current understanding of ground conditions on the site and discusses suitable foundation options for the project. An intrusive ground investigation is recommended and an outline scope for this is provided.

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2 The Site

2.1 Location

The site is located to the south of Manchester City Centre approximately 1.5km south of the A57(M) Mancunian Way. The site area is approximately 0.3ha and centred on National Grid Reference SJ851958 (385166 , 395814). A recent aerial photograph of the site is shown in Figure 1 below.



Figure 1: Site satellite image © Groundsure Report [1].

2.2 Present site use

The majority of the site is currently occupied by the car park in the eastern part and associated Manchester Royal Infirmary diabetes centre building in the western part which was constructed circa 2004. This is a two-storey temporary portacabin structure. This was confirmed by a site visit undertaken on 26th April 2019. During the site visit it was noted that the ground level slopes gently towards the south eastern corner. The property to the west of the site has a ramp which leads to a basement entrance at the eastern side of the building. The difference in

level is approximately 2m. Also, a footpath which runs along the eastern side of the site is at a level approximately 300mm lower than the car park.

2.3 Surrounding land use

The site is bounded by Wilmslow Park House, a combined commercial and residential development and Oxford Road to the west, and Hathersage Road to the north, residential properties to the east and south. Across Hathersage Road to the north of the site is Ronald McDonald House. City Labs 2.0 and 3.0 developments are situated immediately north west of the site, across Hathersage Road.

2.4 Topography

The site is relatively flat, sloping slightly to the south. The level in the north west corner is approximately 37.8mOD. A topographical survey is currently being procured to confirm the site levels.

2.5 Site history

The site history has been assessed through examination of a range of historical mapping held in the Arup Manchester archive, supplemented by the Groundsure report [3], and Google Earth Pro aerial imagery. A sequence of historical mapping and aerial image extracts are presented below. Table 1 summarises the historical development both on the site and on neighbouring sites.



Figure 2 Historical OS mapping extract, 1848 to 1850, scale 1:1,056 [3].



Figure 3 Historical OS mapping extract, 1891 scale 1:500 [3].

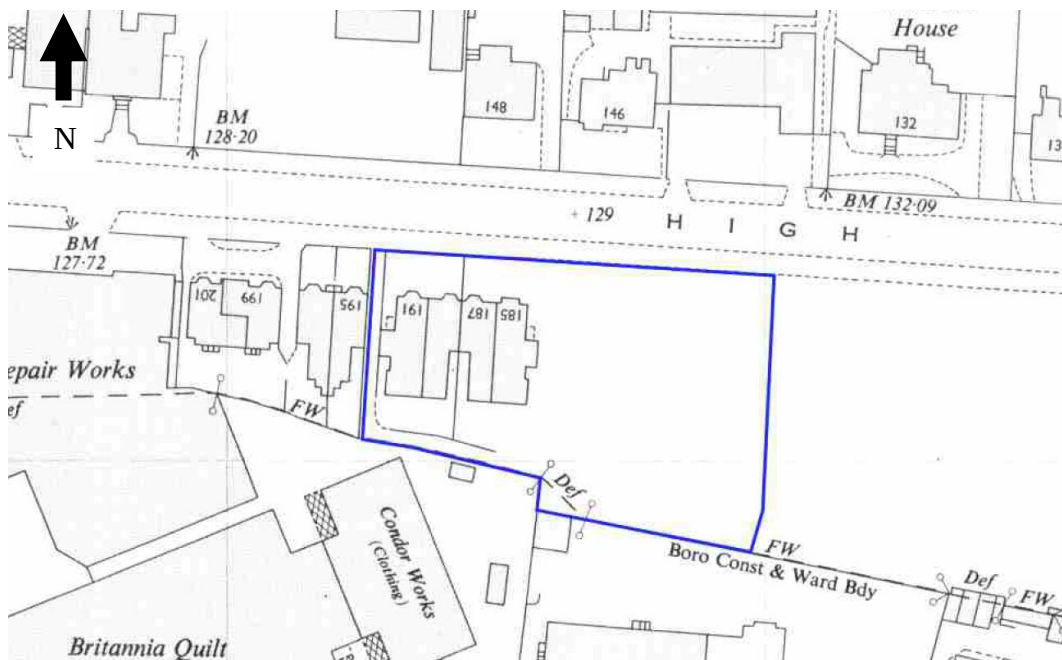


Figure 4 Historical OS mapping extract, 1949-1950, scale 1:2,500 [3].

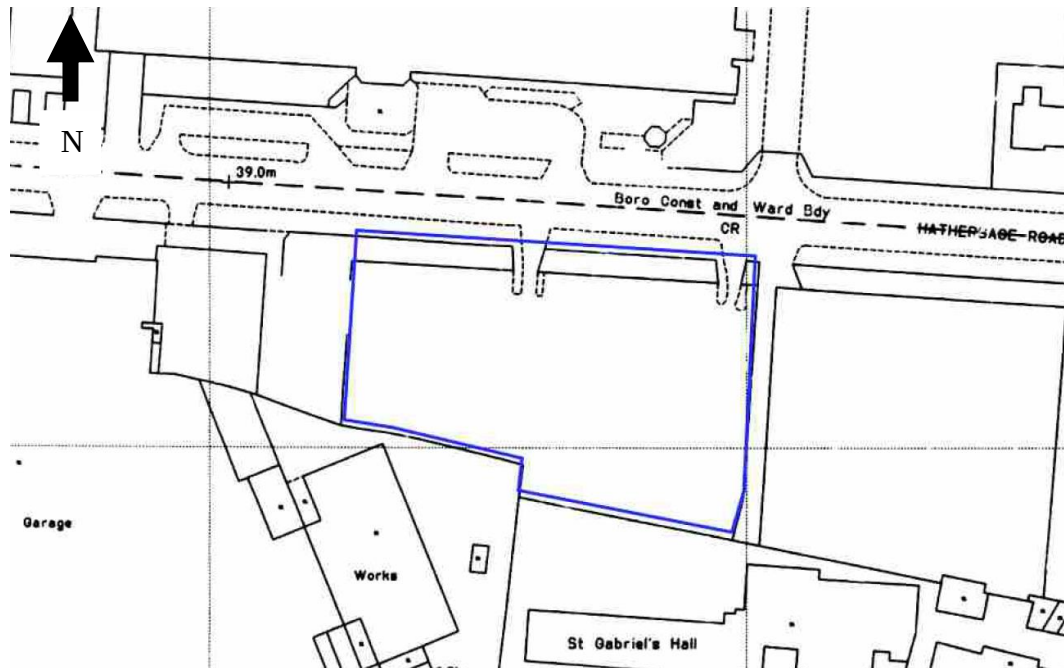


Figure 5 Historical OS mapping extract, 1992-1994 scale 1:1,250 [3].

Date	Map & Scale	On-site	Off-site
1848 to 1851	Historical OS mapping, 1:1,056 & 1:10,560	The site is undeveloped.	A number of large residential 'villa' properties with significant gardens are shown in the vicinity of the site. The present day Oxford Road is shown to the west of the site but is called Oxford Street / Wilmslow Road. A road labelled as High Street is shown along approximately the present day Hathersage Road alignment. Rusholme Hall is shown to the south west of the site. The Rush Brook is shown in open channel some 20m south of the site.
1890 to 1893	Historical OS mapping, 1:500, & 10, 560	The site is covered with residential properties and associated gardens.	Significant development in surrounding areas; residential properties extend to the east and west along Hathersage Road. Tramway shown to have been installed on the present day Oxford Road west of the site. An area of undeveloped land is shown on the corner of the present day Oxford Road and Hathersage Road. Richmond House is shown north east of the site. Rush Brook is no longer shown, it is assumed to have been culverted by this time.
1905 to 1908	Historical OS mapping, 1:2,500 & 1:10,560	No significant changes.	Whitworth Park shown west of site across the present day Oxford Road. Significant residential development in surrounding areas. A laboratory building is shown to the north of the site across Hathersage Road. A brickworks and slaughter works are shown approximately 1km south west of the site.
1922 to 1923	Historical OS mapping, 1:2,500 & 1:10,560	No significant changes.	Significant further residential development is shown both east and south of the site. The St. Mary's Hospital building is shown to the north west of the site across Hathersage Road.

Date	Map & Scale	On-site	Off-site
1932 to 1934	Historical OS mapping, 1:2,500 & 1:10,560	No significant changes.	West of the site Britannia Quilt Works, Condor Works (clothing) & Daimler Motor Repair Works are shown. St. Gabriel's Hall, a residential housing development, is shown to the south of the site.
1949-1955	Historical OS mapping, 1:1,250 & 1:10,560	The residential properties across the eastern part of the site have been demolished. Residential properties are still present on the western part of the site.	Additional Motor Repair Works building shown west of the site, north of the aforementioned Britannia Quilt Works. Tramway no longer shown on Oxford Road.
1970	Historical OS mapping, 1:1,250	The residential properties in the western part of the site are no longer shown.	A new laboratory block is shown some 100m north east of the site. Motor repair works west of the site has been extended and is now occupying the former quilt works footprint. The St. Mary's Hospital development has extended to the east.
1988-1994	Historical OS mapping, 1:1,250 & 1:10,000	No significant changes.	No significant changes.
2000-2018	Historical OS mapping, 1:10,000, Google Earth mapping	By 2000, the site is covered by hardstanding surface area used for car parking. Between 2003 and 2005 the western part of the car park was covered by a two storey rectangular portacabin structure named Diabetes Centre. There have been no significant changes on the site since 2005.	Mapping indicates the present day Wilmslow Park House constructed between 2002 and 2010. 2002 mapping shows an industrial estate is shown approximately 400m south east of the site on land previously occupied by playing fields. Between 2010 and 2014 the 1970's St Mary's Hospital extension to the north of the site is shown to have been demolished.

Table 1 Summary of site history.

2.6 Published geology

The published Manchester geological maps (SJ89NE, 1:10,000) show the superficial geology at the site to comprise glacial till. The bedrock present beneath the western edge of the site is the Sherwood Sandstone formation, the Manchester Marl formation is present beneath the remainder of the site (Figure 6

below). Although the geological mapping does not show any made ground on site, given the site history a variable thickness of made ground is anticipated to be present above the glacial till.

The West Manchester Fault is shown trending north-west to south-east approximately 500m north-east of the site. The Manchester Marl is shown to sub-crop beneath the site. The Sherwood Sandstone is shown to sub-crop at the western edge of the site.

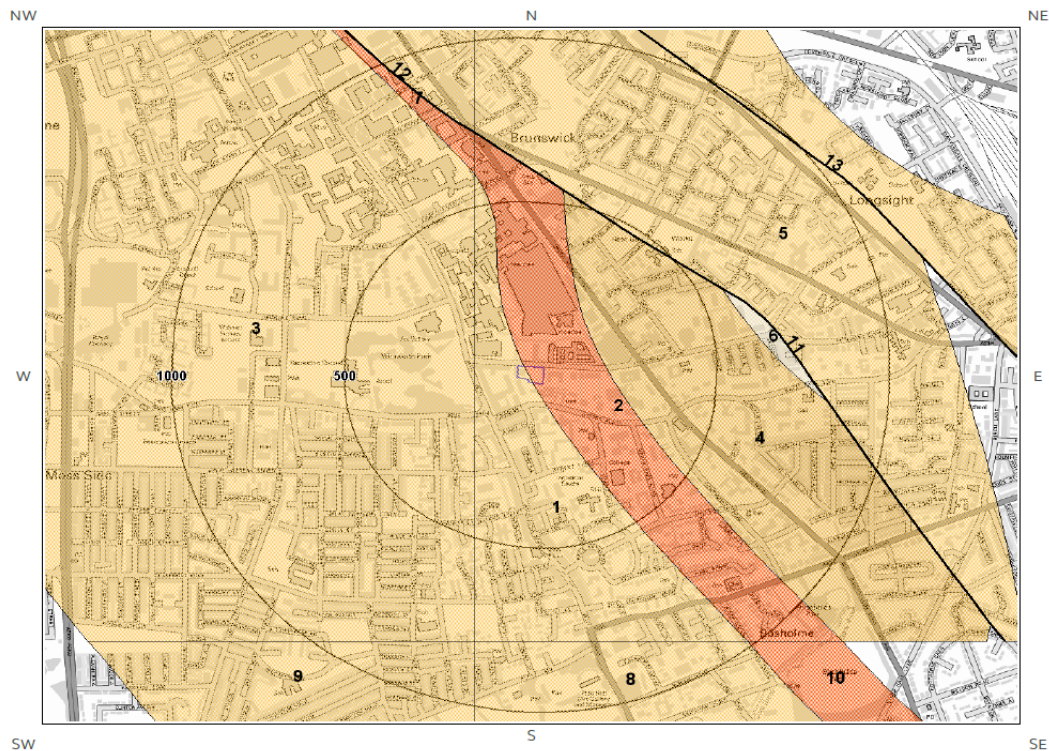


Figure 6: Solid geology present in area derived from BGS 1:50,000 mapping (Sheet 085). 1, 3, 4, 5, 8, 9, - Chester Pebble Bed Formation (sandstone), 2, 10 -Manchester Marls Formation (sandstone), 6- Collyhurst Sandstone Formation (sandstone), 11, 12, 13 – Fault. © Groundsure Report [1].

2.7 Hydrogeology

The glacial till beneath the site is classified by the Environment Agency (EA) as an Unproductive stratum.

The Manchester Marl is classified by the EA as a Secondary (B) Aquifer. The EA defines Secondary (B) Aquifers as strata with predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. The Sherwood Sandstone is classified as a Principal Aquifer.

The western edge of the site is located within a Source Protection Zone (SPZ) 3 (total catchment). The EA defines this as an area around a source within which all groundwater recharge is presumed to be discharged at the source.

The Groundsure report states there are no active groundwater abstraction licenses within 1,000m of the site.

2.8 Hydrology

The Groundsure Report states there are no rivers within 500m of the site. The nearest watercourse, Gore Brook, is located greater than 1km south east of the site. Gore Brook flows in a north east to south west direction into the Platt Brook which feeds the River Mersey.

Rush Brook is present to the south of the site and is discussed in further detail in Section 2.12.

The site does not lie within an EA flood risk zone. However, Whitworth Park located west of the site across Oxford Road is designated as a Zone 2 floodplain.

2.9 Landfills

One EA historic landfill site has been recorded within 1500m of the site. A summary of this site has been provided in Table 2 below.

Type of landfill	Name	Approximate distance from site (m)	Dates of Operation	Types of Waste Accepted
EA historic landfill site	Moss Side Shopping Centre	1394m west	1994-1995	Inert and Industrial

Table 2 Summary of landfills recorded within 1,500m of the site.

2.10 Unexploded Ordnance (UXO)

A preliminary risk assessment in accordance with the guidance set out in CIRIA C681 (2009) has been undertaken to assess the likely potential for UXO to be present on the site.

The preliminary unexploded ordnance risk assessment provided by Dynasafe BACTEC Limited identified several UXOs within 10km of the site. The report concluded that there is a medium risk of UXO based on WWII German bombing density [5]. The preliminary unexploded ordnance risk assessment report is presented in Appendix A.

In addition to the Dynasafe BACTEC report, the pre and post war historical mapping has been reviewed alongside the Zetica online Manchester unexploded bomb risk mapping and an interactive map of WWII bomb strikes in the area.

The Zetica mapping confirms a moderate risk to bomb damage across the site [8]. From experience of other projects this is the standard classification for the majority of the Manchester area.

At the start of the Second World War the majority of the site was already occupied by residential housing, as evidenced on the 1938 map.

It is noted that six of the houses in the east of the site are absent on the 1949-50 map, along with other housing further to the east of the site. This may be an indicator of bomb damage but it is not possible to confirm based only on this information; their demolition may be completely unrelated.

However given the occupation of the site, it is likely that any bomb damage and UXO presence would have been realised immediately and dealt with at the time.

There has been some development on the site following the Second World War. This included the demolition of the residential properties. Whilst the depth and scale of the groundworks associated with this development is currently unknown, it is considered likely that if there were any UXO present on this part of the site, this again would have been an opportunity to locate and deal with it.

Examination of registered WWII bomb strikes interactive mapping shows that bombing in the area did take place and there was a strike approximately 200m north east of the site at York Place Nursing Home. Another strike was registered approximately 500m north of the site at the Royal Eye Hospital.

Considering the above it is considered likely that the residual risk of unexploded bombs on site is lower than the 'Moderate' risk identified by the specialists in the preliminary assessment.

The UXO specialists often have access to wider data sets which are not available to the public. Therefore in accordance with the findings of the Preliminary Risk Assessment, it is recommended that a detailed UXO risk assessment is undertaken to confirm the above.

Following this, the risk mitigation measures can be developed for the construction phase.

If the residual risk is considered 'low' CIRIA 681 does not stipulate any specific residual risk mitigation measures for low risk sites. However, it suggests that site staff be made aware of the findings of the preliminary risk assessment and a discussion of potential UXO hazards be included as part of the site health and safety programme.

2.11 Additional factual information

Other factors which have been considered on the site are: radon, mining, landfill/waste sites and environmentally sensitive sites. None of these factors pose any risk on the site.

The site is not shown to be located in a radon affected area, as such no radon protective measures are necessary [1].

There are no historical mining areas within 1,000m of the site boundary [1].

There are no designated environmentally sensitive sites within 1,000m of the study boundary [2].

2.12 Utilities and drainage

2.12.1 Utilities

A review of utilities on and adjacent to the site is outside the scope of this report and is part of a separate commission by Hilson Moran which will be reported separately. It is considered likely that numerous utilities, both main and private supplies, will be present on and adjacent to the site, particularly within the highway and pavements which bound the site.

2.12.2 Drainage

A drainage desk study technical note was prepared for the area in October 2015 as part of the City Labs 2.0 & 3.0 developments by Arup commission [14].

There is evidence of a culverted watercourse, the Rush (or Rusholme) Brook – originally a tributary of the Corn Brook, flowing westwards across Oxford Road and onwards across Whitworth Park. Records suggest that the natural route of this watercourse has now become a combined sewer.

Although an original tributary to the Corn Brook, there is no evidence to suggest this sewer continues to discharge into the Corn Brook and, due to its combined nature, it is likely to flow eventually into a treatment works via the highway sewer network. However, no physical investigation has been undertaken.

The culvert is understood to be a UU asset and there is likely to be an easement and potential restrictions on building on or adjacent to it.

Arup have prepared a separate technical note dated 2nd May 2019 which contains further details, options and recommendations.

3 Historical Ground Investigation

3.1 Introduction

It has not been possible to locate any on-site ground investigation information as part of this study. Arup experience within Central Manchester and a number of sources have been consulted to provide off-site historical ground investigation data to inform the ground model for the site.

3.2 BGS Geo-Index

The on-shore British Geological Survey (BGS) Geoindex has been consulted. No records of exploratory holes undertaken on the site are held. A total of 10 exploratory hole records have been obtained within a 250m radius of the site. Of these 10 records, two are for boreholes ranging from 8.0 to 13.1m deep. The closest available BGS record is some 128m south-west of the site on the corner of Rusholme Place & Oxford Road.

The historical ground conditions show 0.7 to 1.2m of made ground, over approximately 11m of stiff to very stiff boulder clay. Sandstone was only proven in one of these holes at 12.19m below ground level (approximately 26.4mOD).

3.3 City Labs (2010)

White Young Green undertook a ground investigation in November 2010 for the City Labs development located on the former Royal Eye Hospital (FREH), approximately 200m north of the site. This consisted of three boreholes and two hand-dug trial pits; borehole depths ranged from 7.4 to 16.6m.

Ground conditions encountered between 1.1 to 1.5m of made ground, over approximately 6.0m of glacial till (firm to very stiff clay), over sandstone. Probable weathered sandstone was identified 7.0 to 7.5m below ground level (31.6 to 32.4 mOD). More competent sandstone was not identified and is assumed to exist >16.6m below ground level (22.5mOD).

No groundwater was observed in any of the boreholes.

3.4 Arup ground investigation (2017)

The most recent recorded ground investigation was completed in April 2017 as part of the City Labs 2.0 and 3.0 developments, also known as Cluster Labs, situated to the north west of the site across Hathersage Road. This ground investigation was designed by Arup to provide more information within the development area and update the previous ground model outlined in the Cluster Labs Desk Study report issued in December 2016. Arup issued a ground risk assessment and outline remediation strategy for the City Labs 2.0 site in March 2018 [16]. The scope of this report was to assess the geoenvironmental risks and remediation requirements, to provide preliminary foundation advice and assess

pavement build up, and to inform earthworks, foundation and remediation specifications.

The 2017 ground investigation completed within the City Labs 2.0 site comprised six machine dug trial pits to depths between 1.7-4.0mbgl, two windowless sampling boreholes to depths of 6mbgl and two rotary boreholes to depths between 18.4-18.5mbgl.

The ground conditions encountered comprised made ground, which was present as a well-compacted fill within the former hospital basement and a highly variable material outside the basement footprint. The made ground overlies glacial till and Sherwood Sandstone bedrock. The made ground was proven to be between 2.7 and 4.2m thick. The glacial till was encountered in all locations that penetrated through the made ground, with the top of the stratum being encountered at 39.7 to 35.2mOD. The weathered Sherwood Sandstone was proven in both deep boreholes, the top of the stratum was encountered at depths of 12.4 to 13m (24.5 and 26.3mOD).

Post fieldwork groundwater monitoring was undertaken on six occasions. The groundwater monitoring results indicate that a shallow groundwater is perched within the made ground associated with the former basement structure which had been left in situ. Groundwater levels outside the former basement lie at around 28mOD (BH02).

A slight sheen was observed on the perched basement water at TP02, however it was not noted in the other trial pits or boreholes. No other visual or olfactory signs of contamination were encountered during the investigation. No grossly contaminated soil was identified during the ground investigations however, asbestos was identified in excess of the human health screening values within a small number of made ground samples.

No elevated concentration of ground gases were identified during the monitoring period. The site is not recorded as being within an area at risk of radon gas. No special gas protection measures were considered to be necessary within the new building.

4 Anticipated Ground Conditions

4.1 Ground model

Published geological mapping, historical ground investigation and site history have all been considered in conjunction with Arup knowledge of ground conditions within the vicinity of the site to develop a preliminary ground model for the site.

Geological unit	Approximate Extent (mbgl)	Typical Description
Made ground	GL to 3.0*	Loose, brown, slightly clayey, gravelly, fine to coarse SAND with occasional pockets of firm, brown, sandy clay. Gravel is angular to subrounded, fine to coarse including sandstone, brick, cinder and ash.
Glacial till	3.0 to 12.0	Stiff, brown/grey, slightly sandy, slightly gravelly CLAY.
Sherwood Sandstone	12.0 to 20+	Very weak to weak, red-brown, fine to coarse SANDSTONE. Contains medium spaced very thin beds of extremely weak sandstone.
Manchester Marl	Unproven	Moderately weathered SILTSTONE.

Table 3 Preliminary ground model

* variable depth anticipated dependent upon extent of existing and historic basements on site

It is considered that the Manchester Marl will underlie the Sherwood Sandstone at a relatively shallow depth. BGS information suggests the bedding is dipping to the west, and anecdotal evidence has shown Manchester Marl outcrops west of the West Manchester Fault.

4.2 Groundwater

No information regarding groundwater on site is currently available. Perched waters within made ground and superficial deposits are likely to be encountered across the site, particularly where granular pockets and bands are present.

Recent experience in Manchester, along the Oxford Road corridor, would suggest the main groundwater level within the aquifer will lie within the upper 5m of the sandstone i.e. 21 to 26mOD (assuming sandstone is 12m below ground level).

Historical groundwater modelling undertaken to inform a proposed abstraction borehole within the Manchester Royal Infirmary site indicates groundwater levels within Sherwood Sandstone to be between 28 to 32m above Ordnance Datum (aOD) [15].

5 Proposed Development

The development will involve the demolition of the existing temporary diabetes centre building and construction of a seven-storey new-build steel framed office with associated bin and cycle space to the south.

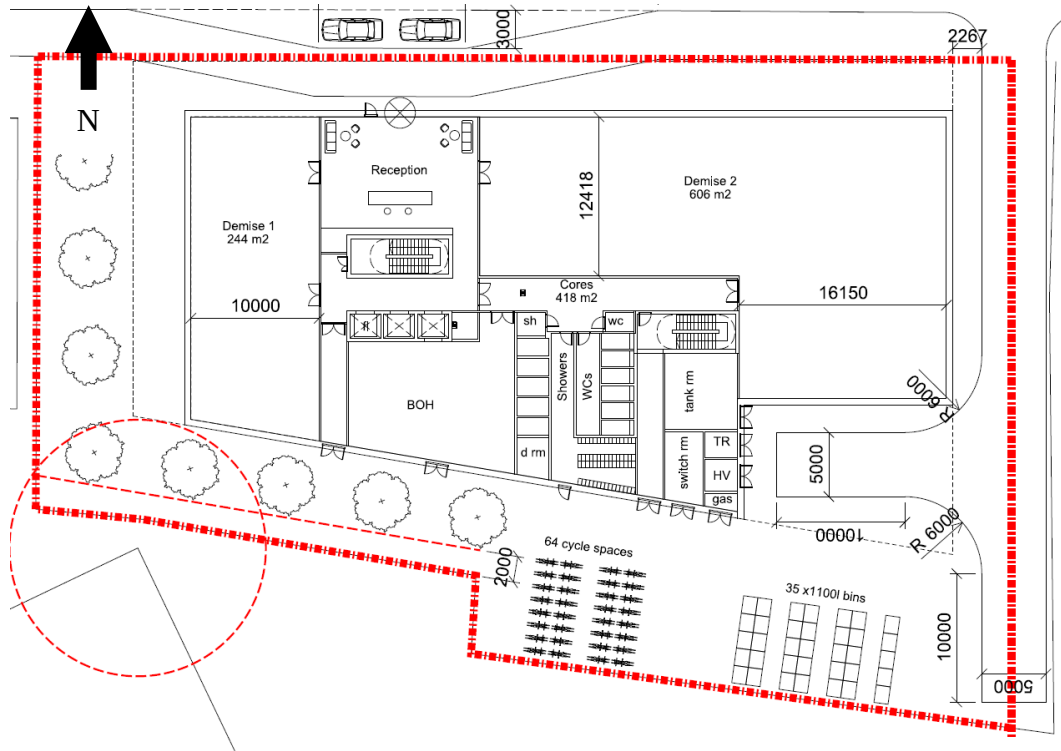


Figure 7 Proposed development ground floor plan [9].

The geoenvironmental and geotechnical considerations relating to the new buildings are discussed in Section 7. Preliminary foundation recommendations are made in Section 8.

6 Geoenvironmental Conceptual Model

6.1 Introduction

A conceptual model describes the scenario in which the risks to human health and the environment (posed by contaminated land) are assessed. It describes the ground and surface conditions, and the activities performed on the site in terms of the ground works and the final form of the development. In particular the model identifies and describes the sources of the potential contamination, the behaviour of the contamination in the environmental media such as soil and groundwater, surface water and air. It also identifies and characterises potential human health and environmental receptors, and plausible pathways.

The potential risks to human health and the environment have been considered in the context of a conceptual source-pathway-receptor (SPR) model of the site, identifying:

- The principal pollutant hazards associated with the site (the sources);
- The principal receptors at risk from the identified hazards; and
- The existence, or absence, of plausible pathways which may exist between the identified hazards and receptor.

For risks to be present at the site, all three elements (source-pathway-receptor) of a plausible pollutant linkage must be present. Potential SPR linkages are described below, based on the proposed site end-uses.

6.2 Potential sources

Potential sources of soil and groundwater contamination and ground gases may be present associated with previous land uses. A summary of the potential contaminants and sources are provided in Table 4.

Potential Source	Potential Contaminative Materials	Comments
Made ground (demolition material)	Asbestos Ground Gases (methane, carbon dioxide)	Made ground deriving from demolition of buildings onsite could contain asbestos. The generation of ground gas will depend on the thickness and organic content of made ground.
Offsite sources: laboratories, clothing works, motor repair, garage, St. Mary's Hospital, industrial works, brickworks, slaughter works and brewery.	Heavy metals Petroleum Hydrocarbons Polycyclic aromatic hydrocarbons (PAHs) Acids/alkalis Chlorinated and non-chlorinated solvents	St Mary's Hospital previously housed maternity, gynaecology and paediatrics units. Potential contamination may have derived from use of fuels in hospital boilers. Nothing from available information suggests hospital waste disposal occurred within the site. However practices at old hospitals were generally not as rigorous as today. Note that recent demolition of the offsite sources including St. Mary's Hospital and subsequent redevelopment involved remediation.

Table 4 Potential Sources of Contamination

6.3 Receptors

Receptors during construction and after completion of the development include:

- Construction workers, site workers/visitors and site neighbours during construction;
- Site workers/visitors post construction;
- Groundwater within the Principal and Secondary B Aquifers; and
- Rush Brook and Gore Brook.

6.4 Pathways

Potential pathways that may be present during construction and after completion of the development include:

- Human health – Ingestion of soils or dust;
- Human health – Inhalation of dust, vapour or soil gas;
- Human health – Dermal contact with soils or groundwater;

- Controlled waters – Migration of dissolved phase contamination within groundwater;
- Controlled waters (and human health by vapours) – Transport of non-aqueous phase contaminants (such as petroleum hydrocarbons and solvents);
- Ground gas – Ingress of ground gas into buildings.

6.5 Preliminary assessment of potential pollutant linkages

6.5.1 Human health linkages

During the site preparation and construction dermal, inhalation and ingestion pathways will be present to construction workers. The inhalation pathway will be present for site neighbours.

After completion of the development ingestion, inhalation and dermal contact pathways will be present to site users in any areas of soft landscaping. Gas and vapour pathways will be present in areas of existing/proposed buildings and excavations during construction along with indoor inhalation of tracked back dust from potential landscaped areas.

6.5.2 Controlled waters linkages

A potential pollutant linkage exists between any contaminants present in the made ground and the Principal Aquifer (the sandstone) via vertical migration of perched water and leachate. The pathway from the made ground to the Principal Aquifer will only be viable if the lower permeability cohesive superficial deposits (glacial till) are locally absent/discontinuous above the Principal Aquifer, or if piled foundations create new pathways by which contamination can migrate through the superficial deposits into the Principal Aquifer.

It is unlikely that the groundwater within the superficial deposits is in hydraulic continuity with the Gore Brook or Rush Brook due to the expected low permeability of the cohesive glacial till.

6.5.3 Summary

A summary of the plausible pollutant linkages requiring assessment in relation to the site is presented in Table 5.

Sources	Pathways	Receptors
Potentially contaminated soils	Ingestion of soils or dust Dermal contact with soils or dust Inhalation of dust and gases/vapour	Construction workers Future site users/visitors Site neighbours during construction
	Inhalation of dust and gases/vapour	Site neighbours during construction
Ground gases and vapours	Migration through permeable deposits and pipe runs. Accumulation of gases/vapours in confined spaces/excavations producing an asphyxiation and explosion risk	Future site users/visitors Construction workers
Leachable contaminants in the made ground or free phase hydrocarbons in the made ground	Downward percolation and migration. Migration into the Principal aquifer if glacial till is locally absent or piled foundations create new pathways through low permeability deposits	Groundwater within the Principal aquifers

Table 5 Plausible Pollutant Linkages.

7 Development Considerations

7.1 Geotechnical Issues

7.1.1 Foundations

Given the expected magnitudes of structural loads, shallow foundations are not considered appropriate for the main structures.

Bored piled foundations, socketed in to the underlying rockhead, are recommended to support the main building loads. Conservative preliminary pile capacities (based on a 2m rock socket) are presented in the table below:

Pile Diameters (mm)	Preliminary Vertical Capacity (kN)
450	1000
600	1500
750	2000

Table 6 Preliminary pile 2m deep rock socket capacities.

Ground bearing floor slabs may be appropriate for use at the site subject to establishing the nature and thickness of the made ground deposits, the magnitude of the proposed loading and the risk of residual below ground voids. Excavation and recompaction of the made ground may be a solution to mitigate these risks.

Compared to the City Labs 2.0 and 3.0 developments, smaller floor loadings are proposed along with a central core to improve efficiency.

Foundation and floor slab design considerations and capacities should be reassessed following the intrusive ground investigation.

7.1.2 Buried obstructions

Buried obstructions, primarily those associated with domestic cellars/basements, foundations and associated sub-structure elements will pose a constraint to future development of the site and these risks will need to be managed. The extent of existing and remnant substructure across the site is not well understood. An intrusive ground investigation is recommended to further understand this risk.

7.1.3 Unexploded Ordnance

UXO Specialists have concluded that there is a 'Moderate' risk of unexploded bombs being present onsite (refer to Section 2.10). However this is based on a Preliminary Risk Assessment in accordance with CIRIA C681.

Based on information reviewed by Arup as part of this desk study, there are mitigating factors which should allow a reduction in this risk.

It is recommended that a detailed UXO risk assessment is undertaken to confirm the above.

The detailed UXO assessment should be conducted prior to any intrusive ground investigation works in order that a UXO Risk Management Plan can be implemented and ensure best practise set out in CIRIA 681 is adhered too.

7.1.4 Buried utilities

Buried utilities will present a constraint to development and are reported elsewhere. In addition, a culverted sewer associated with the Rush Brook is present along the southern site boundary.

7.2 Contamination constraints

A low risk of contamination due to previous site use has been identified by this desk study. The extent of soil and groundwater contamination is not yet known. However given the available historical information on previous uses, the presence of gross contamination is unlikely.

During the construction phase dermal, inhalation and ingestion pathways will be present to construction workers. The inhalation pathway will be present for site neighbours. The level of mitigation required during construction will depend on the results of soil chemical testing but is likely to include appropriate briefings, personal protective equipment (PPE) and dust suppression.

Following redevelopment ingestion, inhalation and dermal contact pathways will be present to site users in any areas of soft landscaping. Gas and vapour pathways are also potentially present. It is considered unlikely that imported soils will be required for landscaping, or that large quantities of contaminated soils will need to be removed from site. However, this will require confirmation following site investigation and risk assessment.

A potential pollutant linkage exists between any contaminants present in the made ground and groundwater (the sandstone Principal Aquifer).

Ground investigation is required (in accordance with BS10175:2011) to further assess the extent and characteristics of contamination, followed by appropriate risk assessment to determine the need for remediation or other mitigation to protect human health and controlled waters receptors during construction and following redevelopment (in accordance with EA CLR11[12]).

The potential for creation of new pathways to the Principal Aquifer for contamination by construction of piled foundations should be considered. A foundation works risk assessment in accordance with EA guidance may be required.

It may be possible to re-use on site material excavated during redevelopment, if the material can be demonstrated to be chemically and geotechnically suitable for use.

The requirements for ground gas protection measures to the structures will be established following the intrusive investigation and the phase of ground gas monitoring.

At this stage, it would be prudent to make an allowance for the provision of a ground gas protection membrane on all proposed structures.

8 Conclusions and Recommendations

8.1 Preliminary foundation assessment

Given the expected magnitudes of structural loads, shallow foundations are not considered appropriate for the main structures. Bored piled foundations, socketed in to the underlying rockhead, are recommended to support the main building loads.

Ground bearing floor slabs may be appropriate for use at the site subject to establishing the nature and thickness of the made ground deposits, the magnitude of the proposed loading and the risk of residual below ground voids.

Buried obstructions associated with domestic basements, foundations and sub-structure associated with previous buildings which occupied the site are likely to pose a constraint to foundations for the new structures and will require further investigation and management.

Ground investigation is recommended to assist in understanding and mitigating these geotechnical risks to the development and inform the foundation design.

8.2 Preliminary geoenvironmental assessment

Previous uses of the site and the areas surrounding the site, have potentially resulted in contamination and ground gas risks that require further assessment in order to comply with guidance and regulatory requirements [12].

It is recommended that ground investigation is undertaken that incorporates soil and groundwater sampling and ground gas monitoring to determine the presence of contamination and ground gas, as outlined below.

Data generated by the ground investigation should be interpreted to refine the conceptual model, and the need for remediation should be assessed through quantitative risk assessment in accordance with EA Model Procedures for the Management of Land Contamination (CLR11) [12].

The ground investigation data will also inform the assessment of earthworks material suitability for re-use and a foundation works risk assessment (if piled foundations are proposed).

At this stage, it is recommended that an allowance is made for a ground gas protection membrane on all proposed structures.

8.3 Ground investigation

An intrusive ground investigation is recommended to provide information to inform future foundation design and geoenvironmental assessment of the site and provide information to assist with discharging the standard Manchester Council ground related planning conditions.

The proposed scope of the ground investigation is summarised below:

- Three cable percussive boreholes with rotary cored follow-on to approximately 18-20m deep (Rockhead plus 6m) to provide information on general stratigraphy, groundwater and obtain soil and water samples for geotechnical and geoenvironmental testing;
- Ten machine dug trial pits to investigate the made ground microfabric, obtain soil samples for geotechnical and geoenvironmental testing, investigate potential below ground obstructions and domestic basements associated with the previously existing residential properties;
- Installations in boreholes and window sampler holes to provide gas and groundwater monitoring data; and
- Geotechnical and geoenvironmental testing.

In addition to the above, subject to further information on the proposed development, there may be requirements to conduct hand excavated trial pits to investigate existing structures and a requirement for soakaway testing. These are to be confirmed.

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Appendix A

Groundsure Reports & Historical Mapping

Ove Arup & Partners International Ltd
6th Floor, 3 PICCADILLY PLACE,
MANCHESTER, M1 3BN

Groundsure Reference: GS-5962525

Your Reference: 267661-11

Report Date 24 Apr 2019

Report Delivery Method: Email - pdf

Geo Insight

Address: MANCHESTER DIABETES CENTRE, 193 MANCHESTER DIABETIES CENTRE, HATHERSAGE ROAD, MANCHESTER, M13 0JE

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

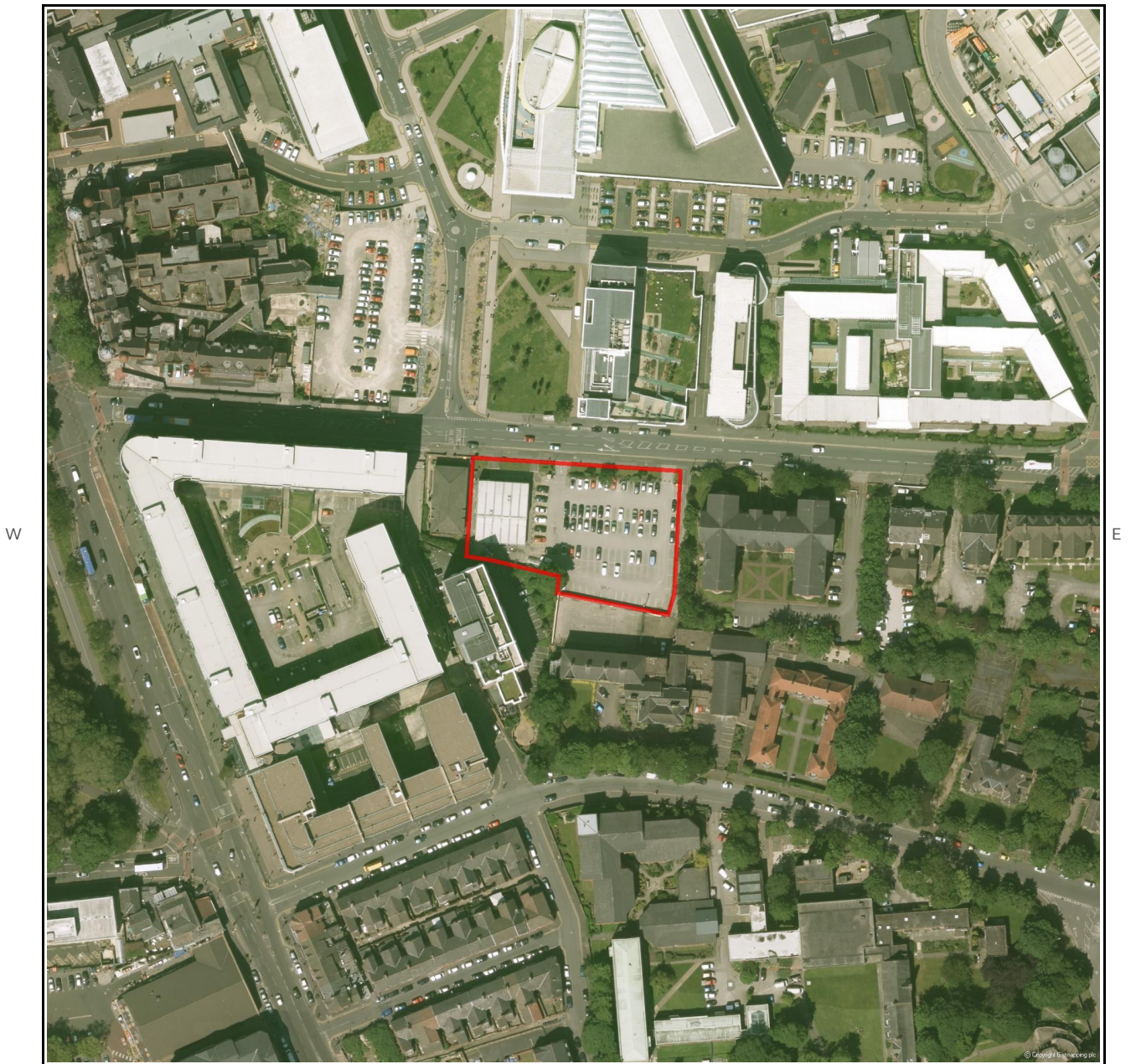
Address: MANCHESTER DIABETES CENTRE, 193 MANCHESTER DIABETES CENTRE, HATHERSAGE ROAD, MANCHESTER, M13 0JE

Date: 24 Apr 2019

Reference: GS-5962525

Client: Ove Arup & Partners International Ltd

NW N NE



SW S SE

Aerial Photograph Capture date: 11-Jun-2015
Grid Reference: 385172,395812
Site Size: 0.3272ha

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	Yes
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	Yes

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

Yes

Section 3: Radon

3. Radon

3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

3.2 Radon Protection

No radon protective measures are necessary.

Section 4: Ground Workings

	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	1	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
4.3 Current Ground Workings	0	0	0	0	0

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	0
5.2 Coal Mining	1	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	1	0	3	0	4
5.4 Non-Coal Mining*	0	0	0	0	0
5.5 Non-Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

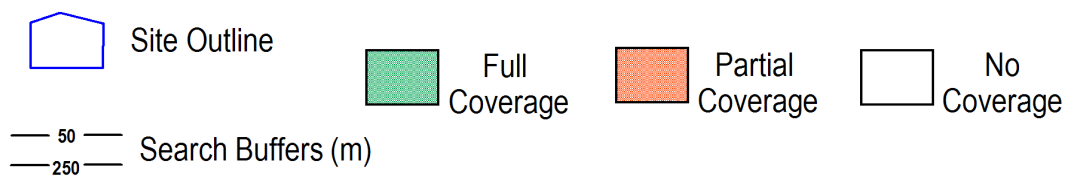
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Very Low				
6.2 Landslides	Very Low				
6.3 Ground Dissolution of Soluble Rocks	Negligible				
6.4 Compressible Deposits	Negligible				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Very Low				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	0	0	10		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	2	0	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	0	0	1	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	0	0	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	Some deposits are mapped
2	125.0	Some deposits are mapped	Full	Full	No coverage
3	783.0	Some deposits are mapped	Full	Full	No coverage
4	807.0	Some deposits are mapped	Full	Full	No coverage

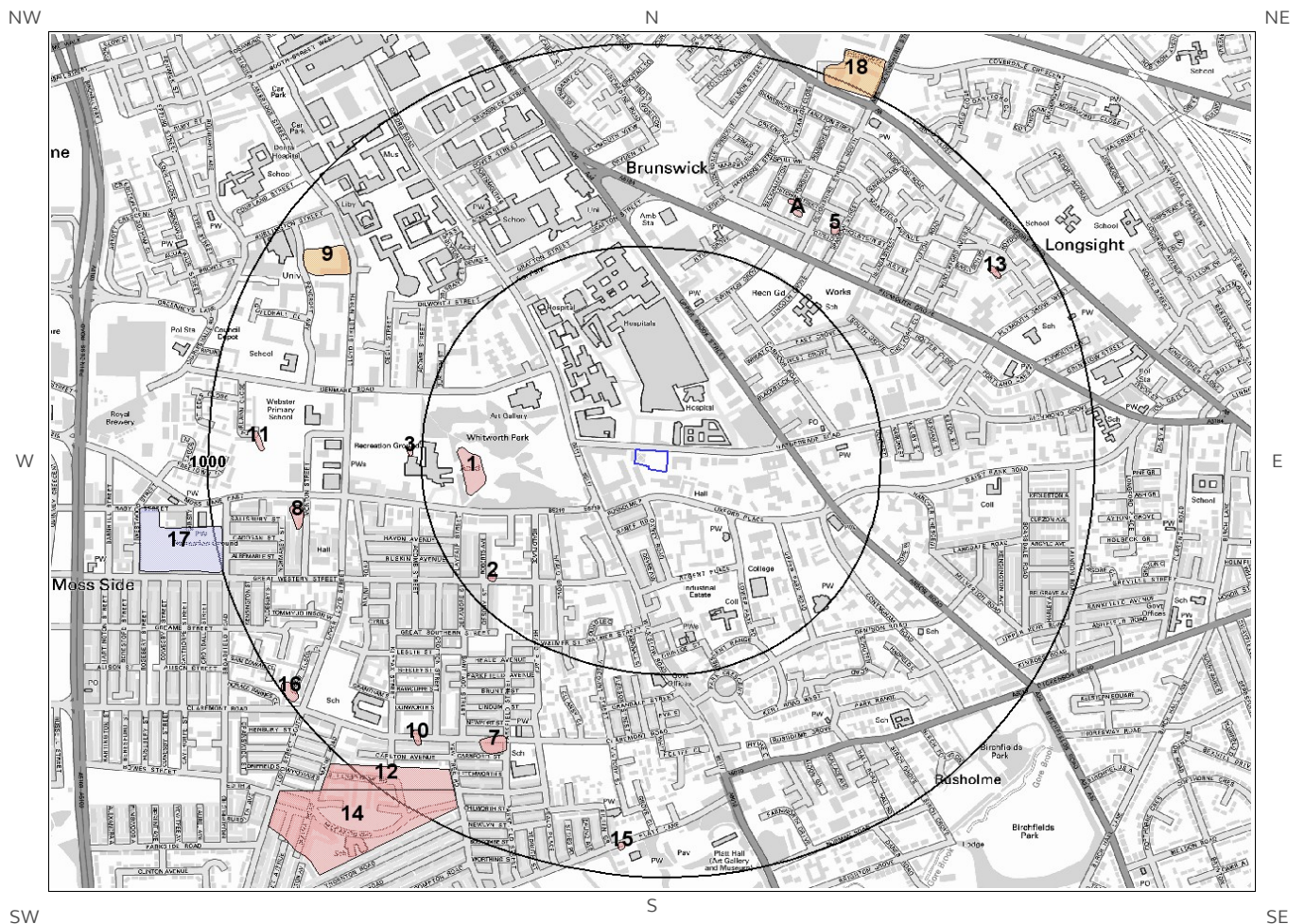
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

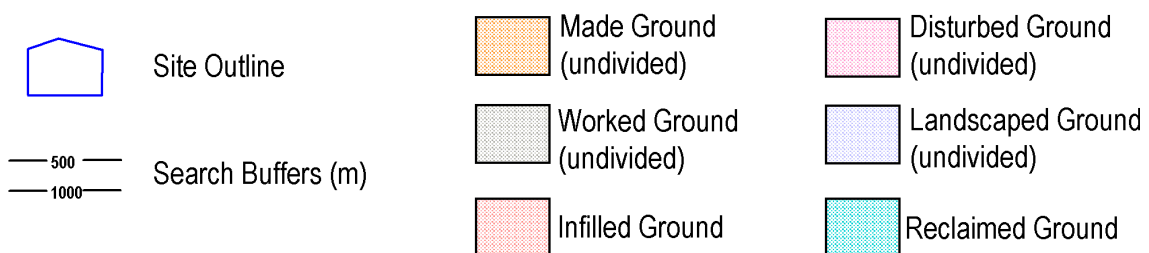
1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

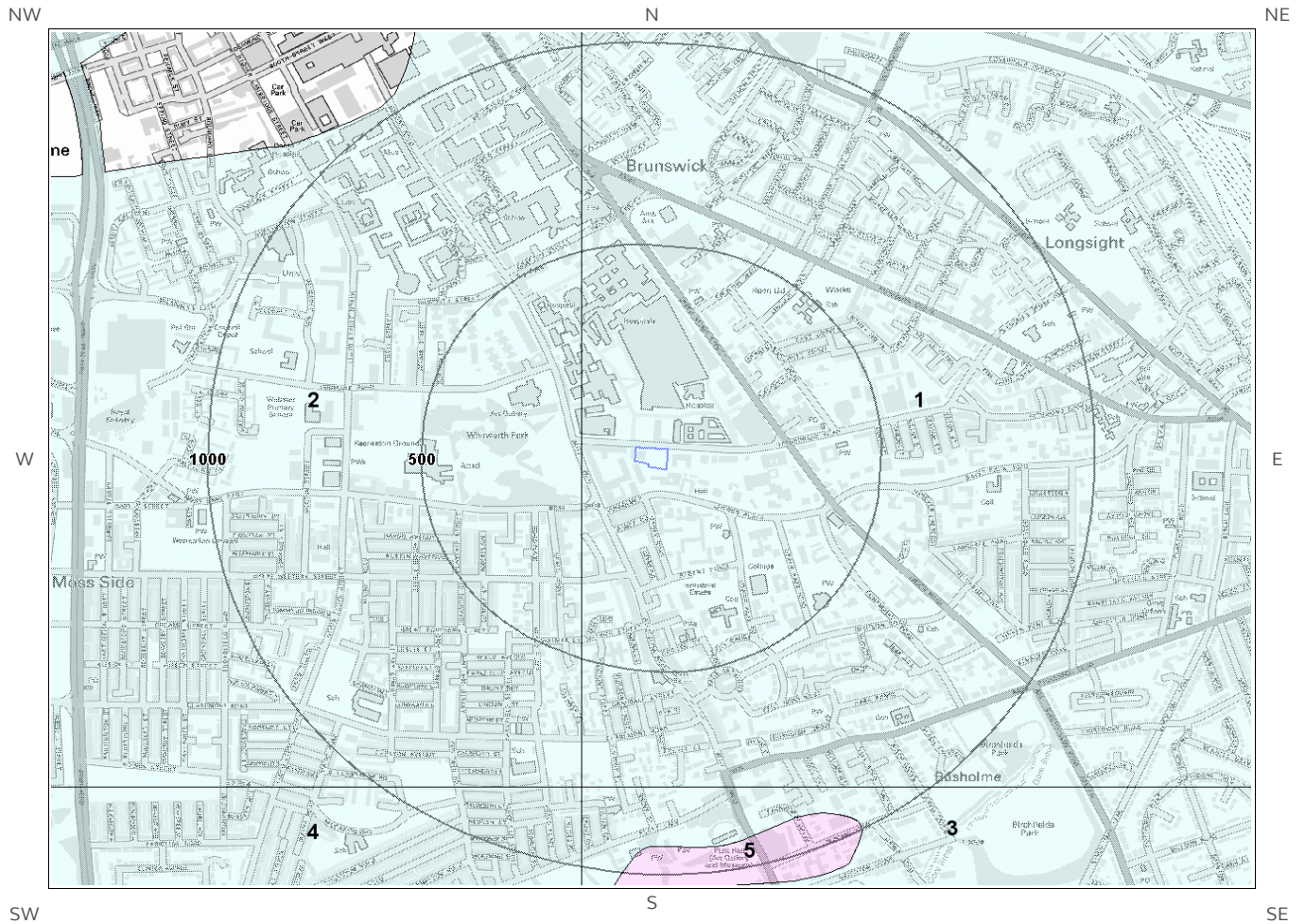
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

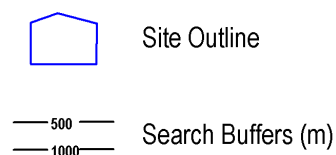
ID	Distance	Direction	LEX Code	Description	Rock Description
1	351.0	W	WMGR-ARTDP	Infilled Ground	Artificial Deposit
2	424.0	SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
2	125.0	W	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton

1.2.2 Landslip

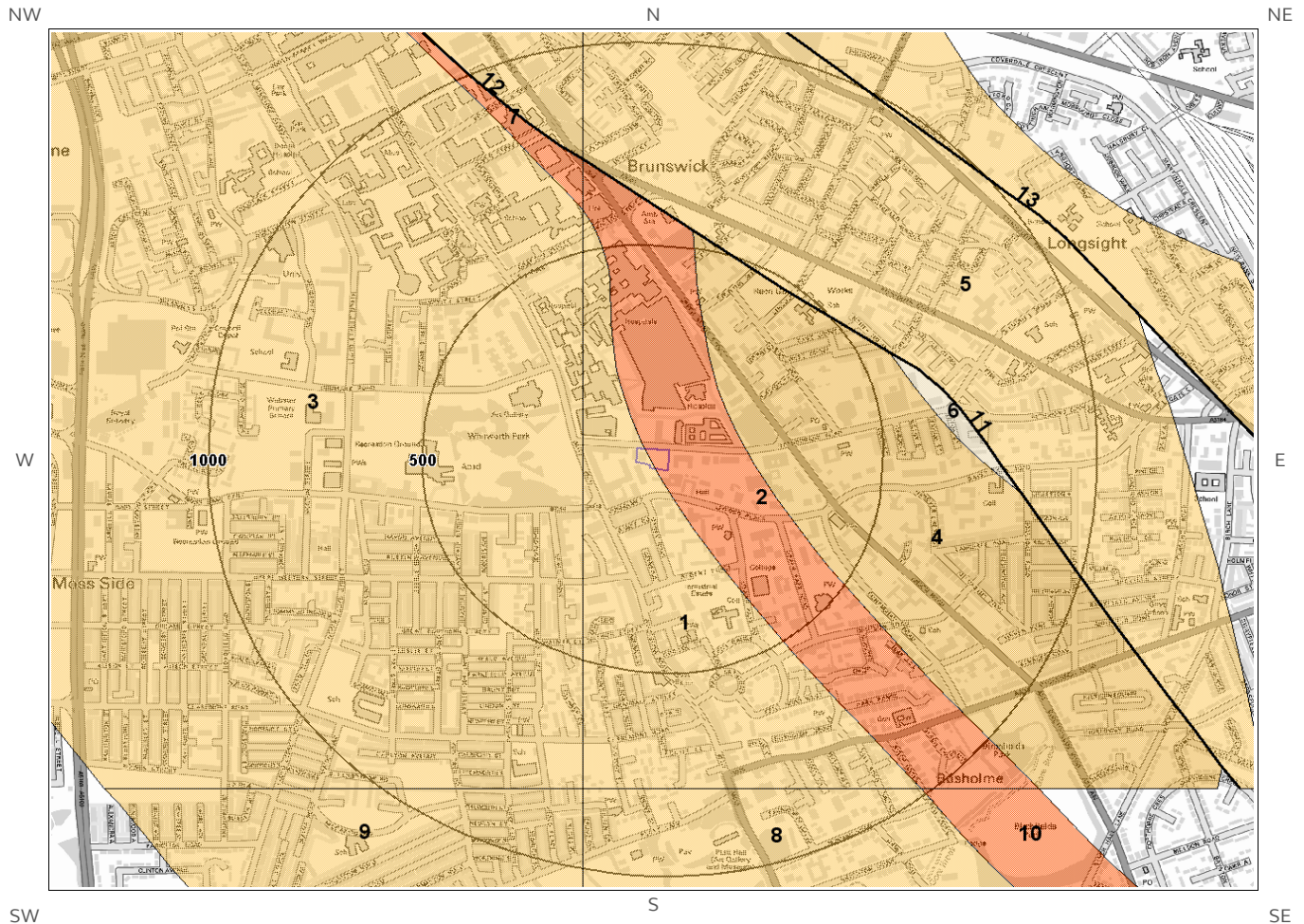
Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

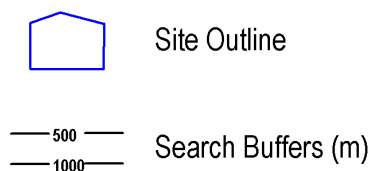
This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

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1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch
2	0.0	On Site	MM-MDST	Manchester Marls Formation - Mudstone	Late Permian Epoch [Obsolete name]
3	125.0	W	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch
4	161.0	NE	CS-SDST	Collyhurst Sandstone Formation - Sandstone	Cisuralian Epoch
5	479.0	NE	CPB-SDST	Chester Pebble Beds Formation - Sandstone	Early Triassic Epoch

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? Yes

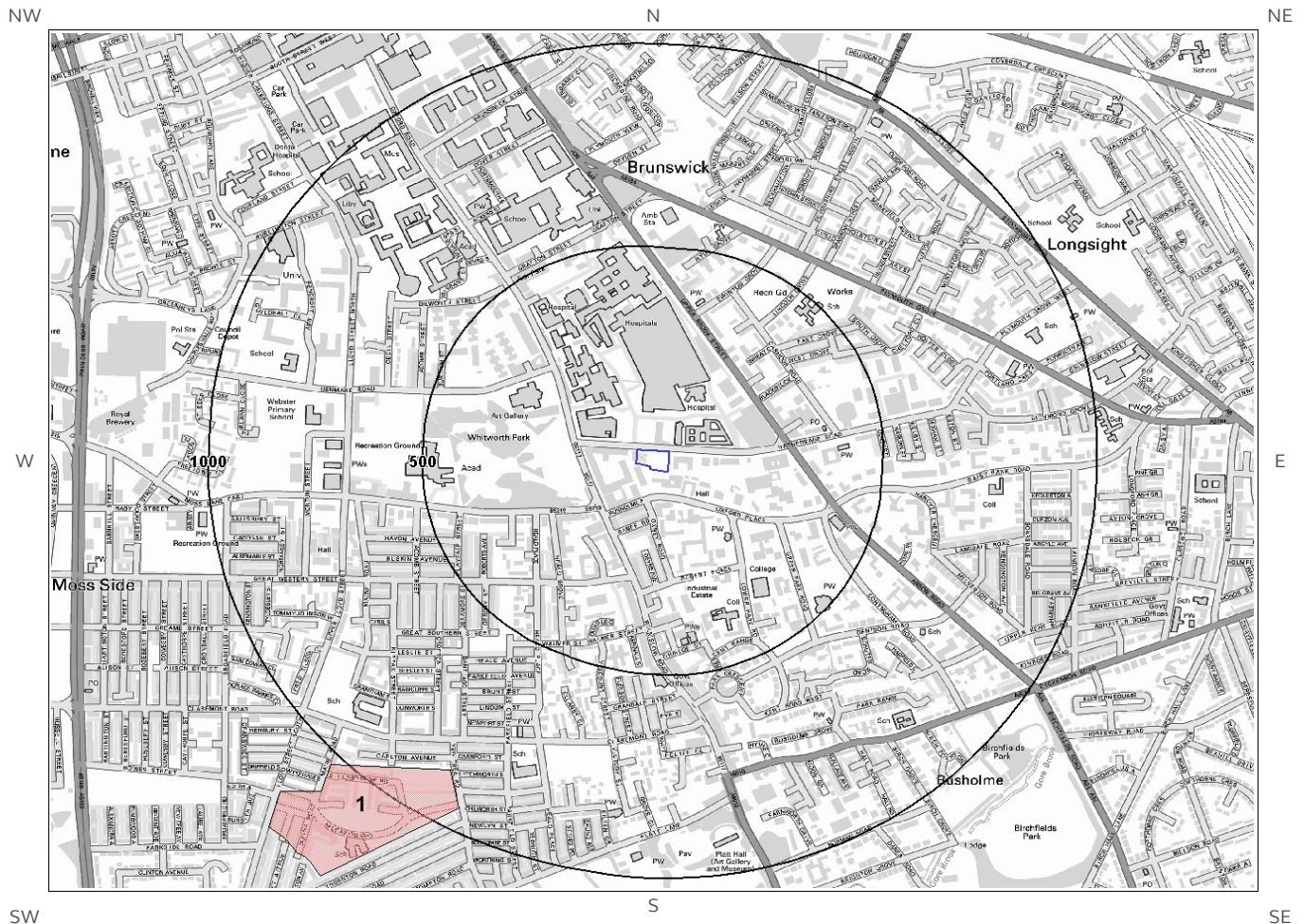
ID	Distance (m)	Direction	Category Description	Feature Description
11	479.0	NE	FAULT	Normal fault, inferred; crossmarks on downthrow side

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

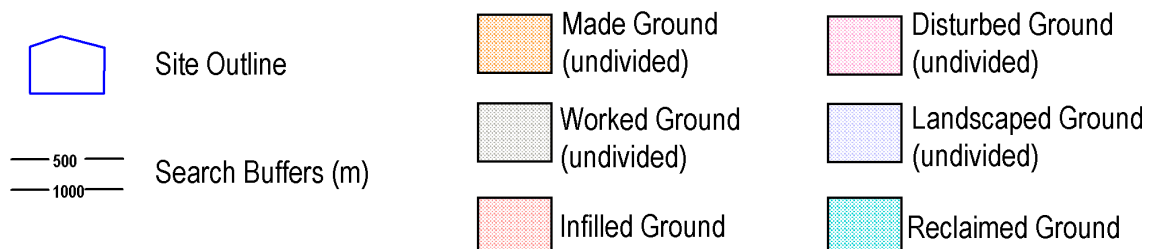
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 085

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? No

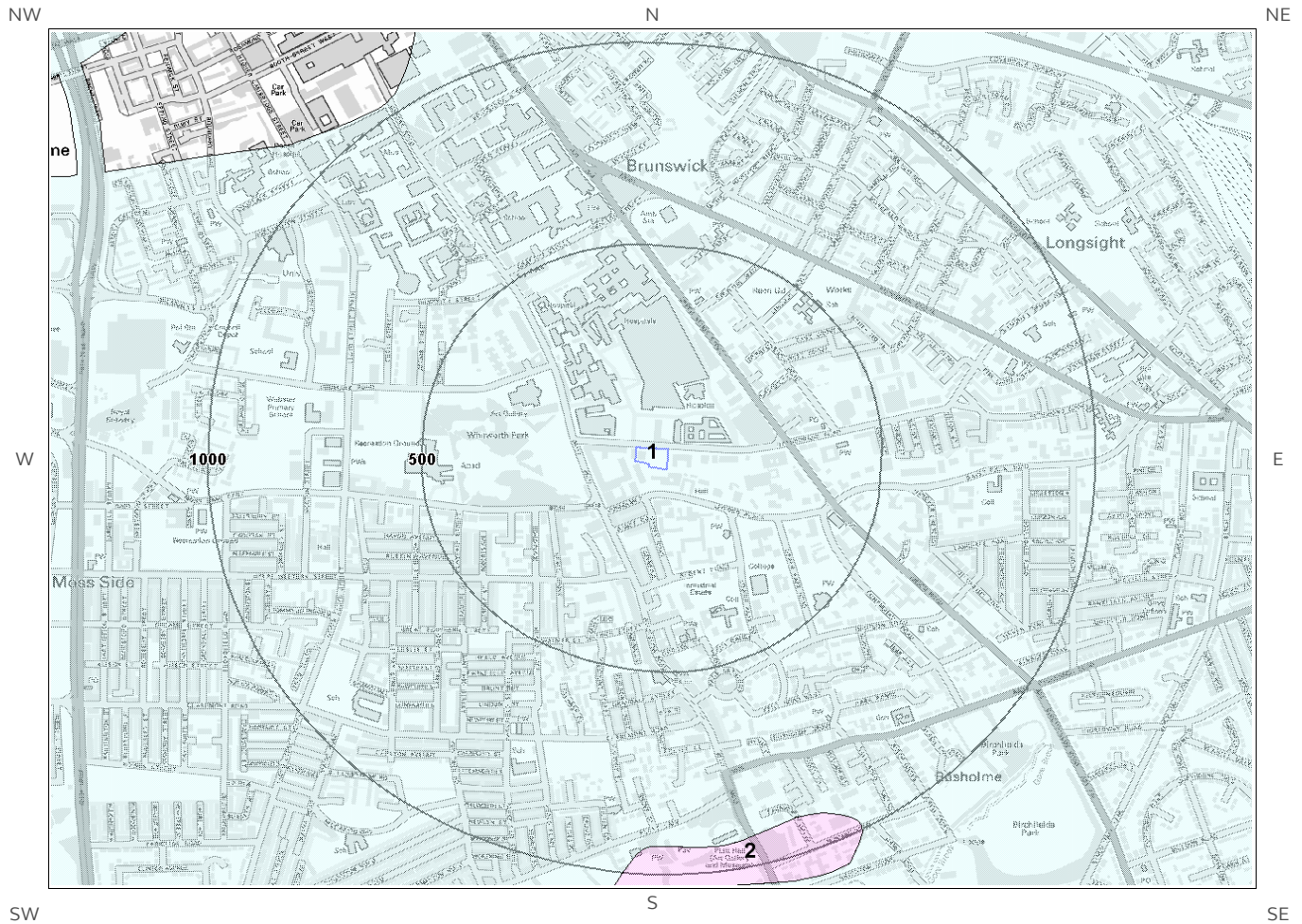
Database searched and no data found.

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

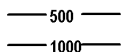
2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	High	Low

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

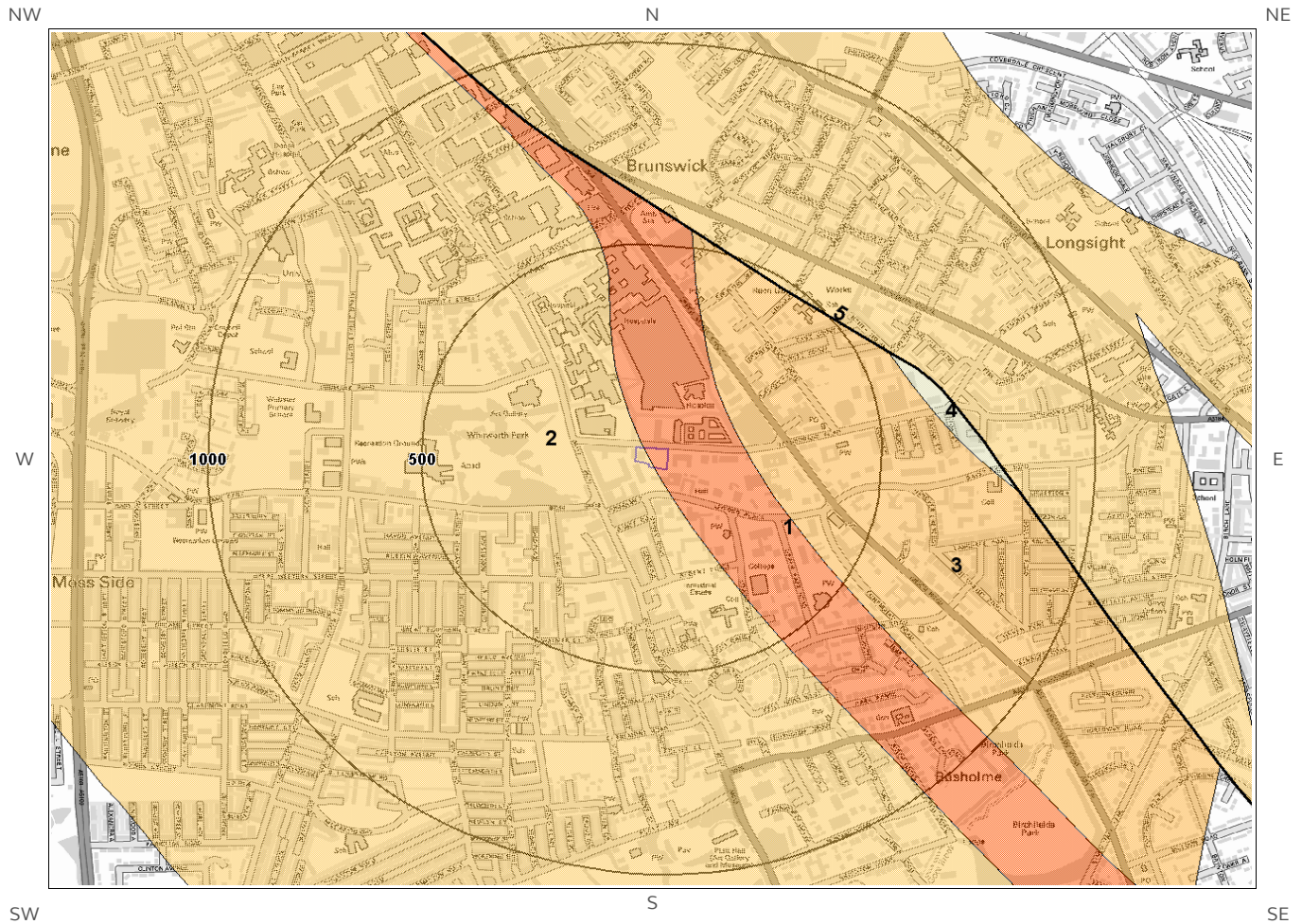
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

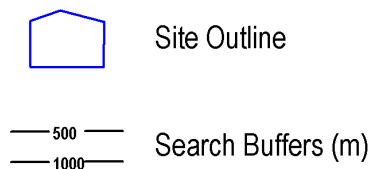
Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

2.3 Bedrock and linear features map (1:50,000 scale)



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2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 085

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	MM-MDST	MANCHESTER MARLS FORMATION - MUDSTONE	-
2	0.0	On Site	CHES-SDST	CHESTER FORMATION - SANDSTONE	OLENEKIAN
3	162.0	NE	CS-SDST	COLLYHURST SANDSTONE FORMATION - SANDSTONE	-

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Low	Low
0.0	On Site	Mixed	High	Moderate

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? Yes

ID	Distance	Direction	Category Description	Feature Description
5	479.0	NE	FAULT	Fault, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

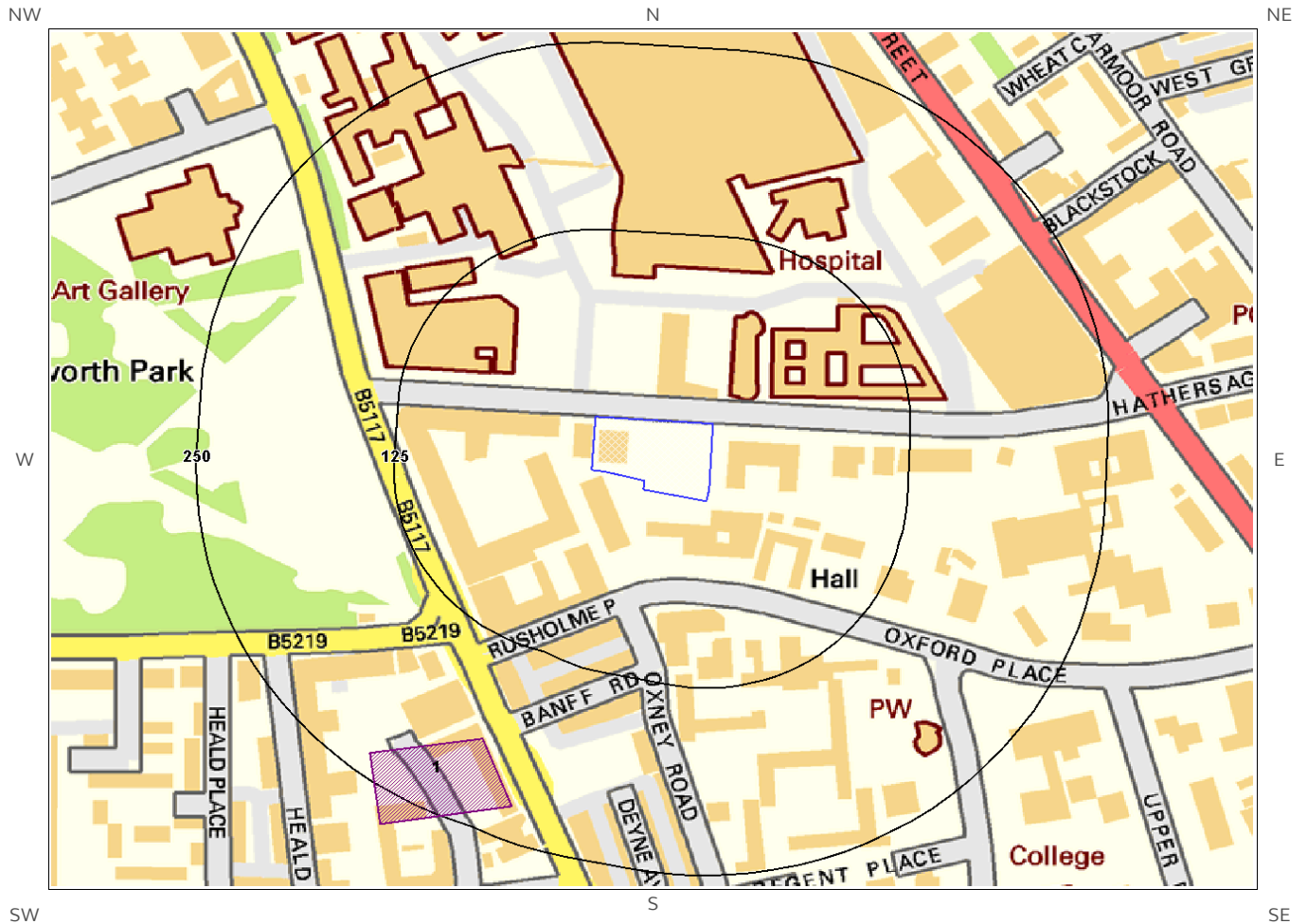
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

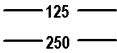
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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- | | | | |
|---|--------------------|---|----------------------------------|
|  | Site Outline |  | Historic Surface Ground Workings |
|  | Search Buffers (m) |  | Historic Underground Workings |
| | |  | Current Ground Workings |

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1	192.0	S	385030 395596	Depository	1923

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

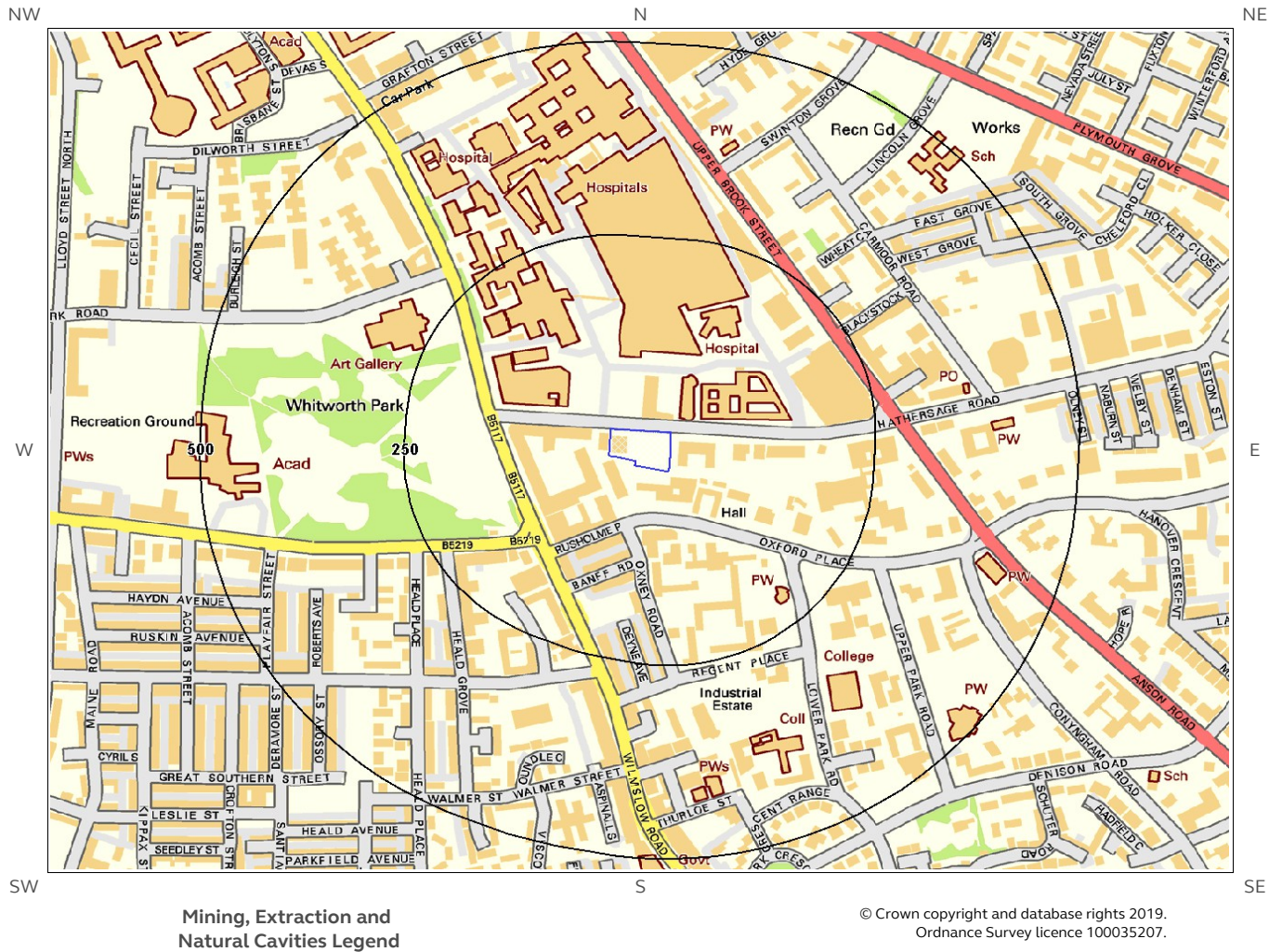
4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? No

Database searched and no data found.

5 Mining, Extraction & Natural Cavities map



5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? Yes

The following information provided by JPB is not represented on mapping: In addition to being located inside an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property which may supplement this information. Further details and a quote for services can be obtained by emailing this report to enquiries.gs@jpb.co.uk.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

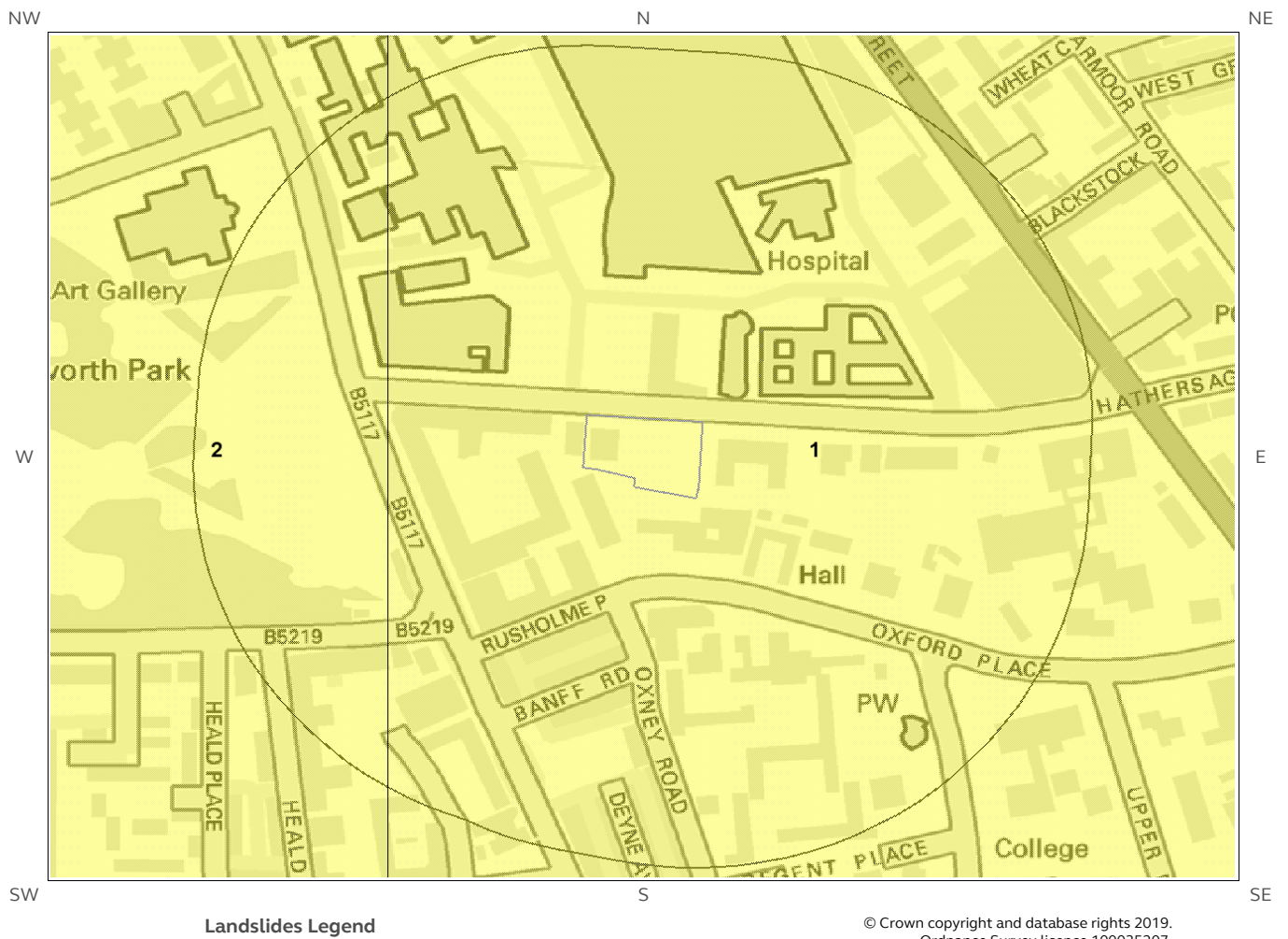


Shrink Swell Clay Legend

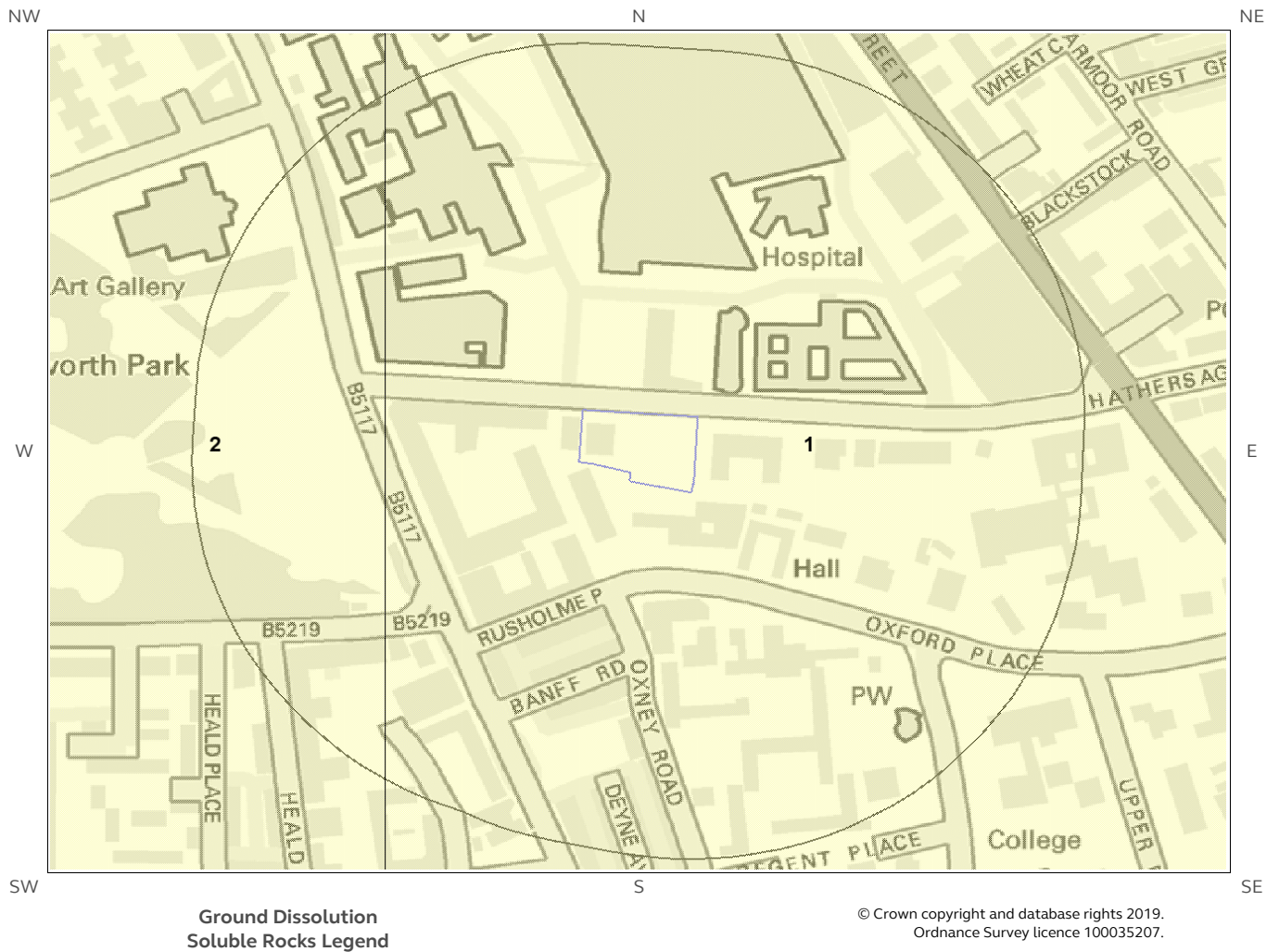
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6.2 Landslides map



6.3 Ground Dissolution of Soluble Rocks map



6.4 Compressible Deposits map

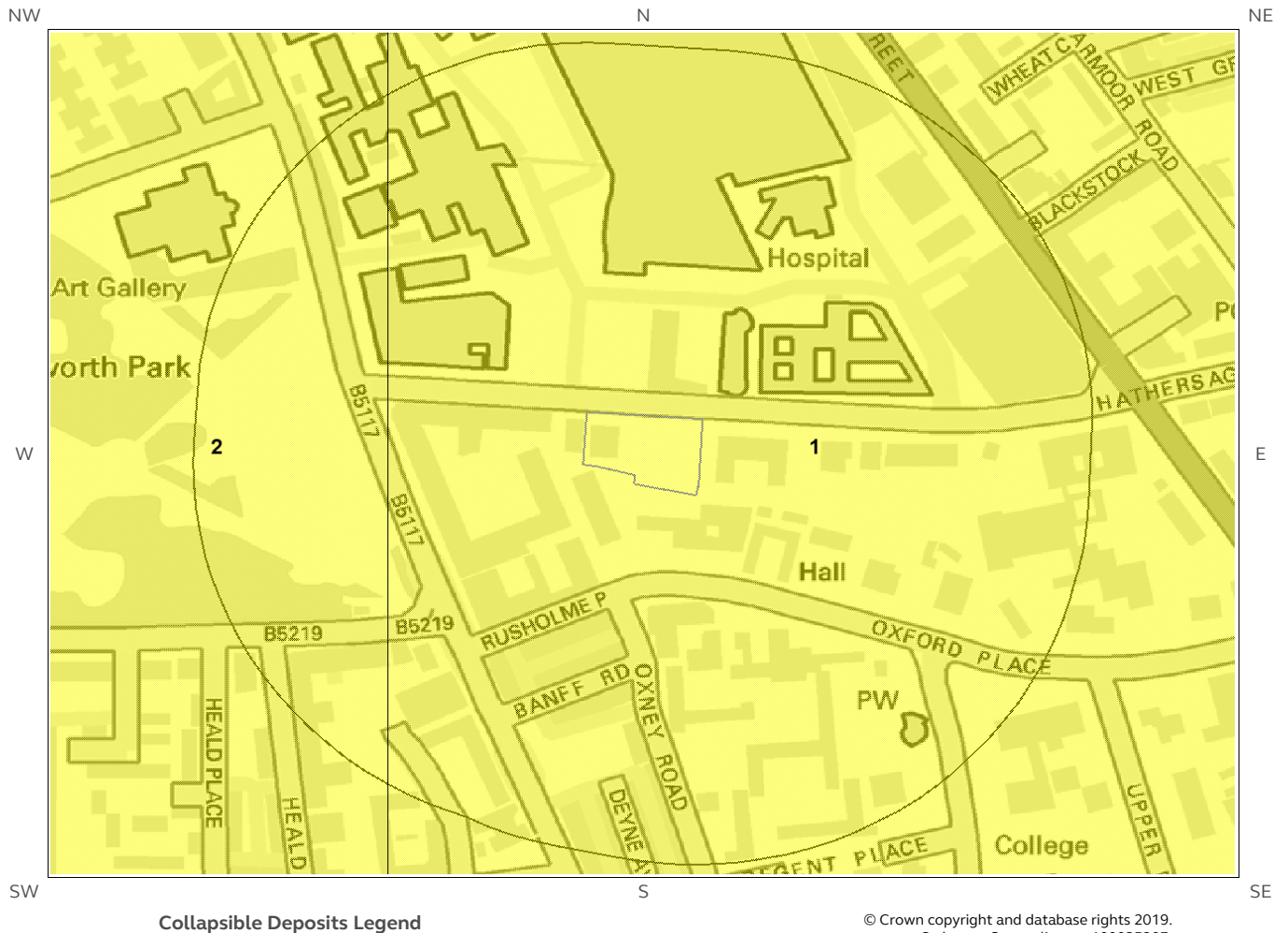


Compressible Deposits Legend

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6.5 Collapsible Deposits map



6.6 Running Sand map



Running Sand Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? Very Low

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This includes an automatically generated 50m buffer zone around the site

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

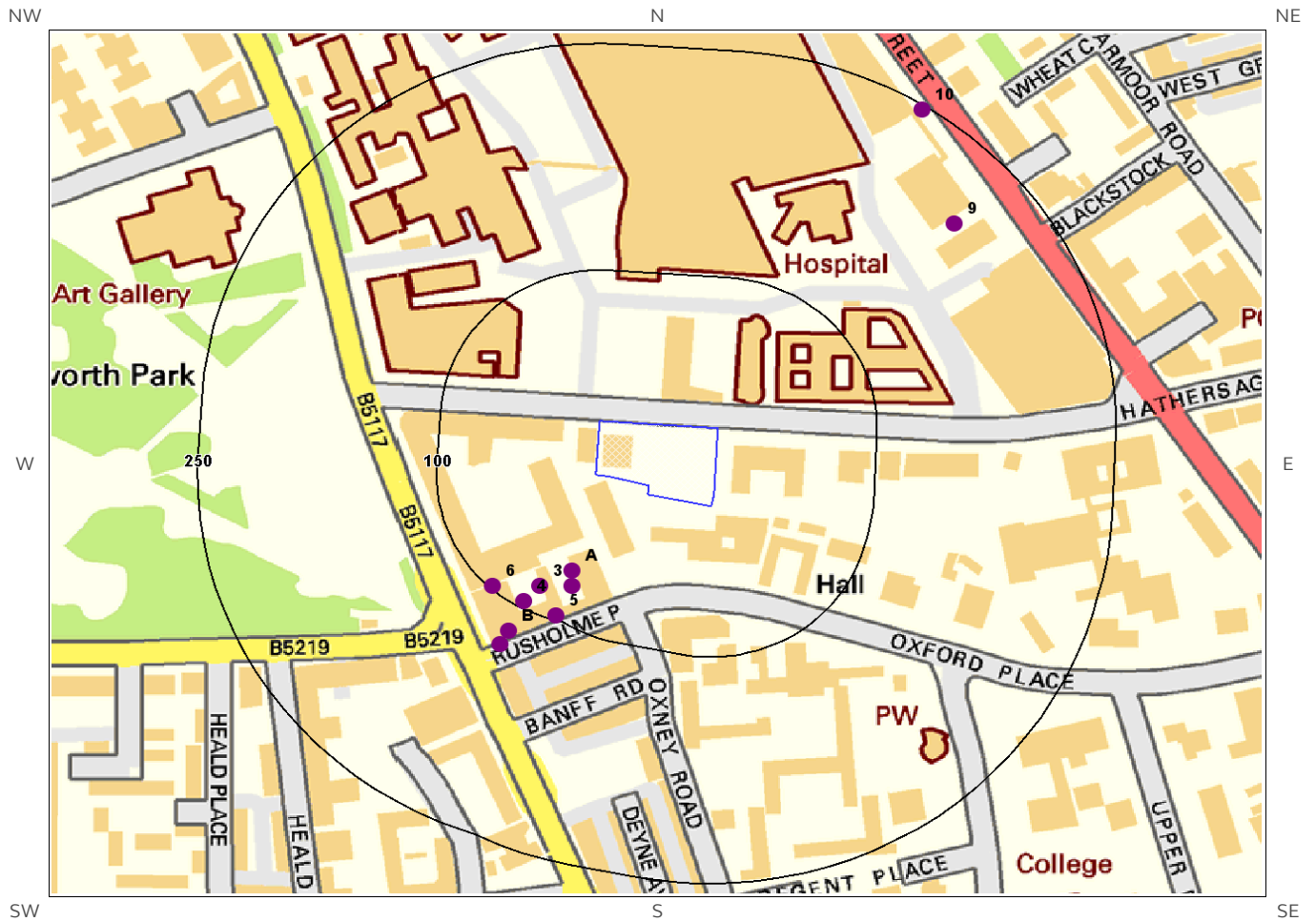
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

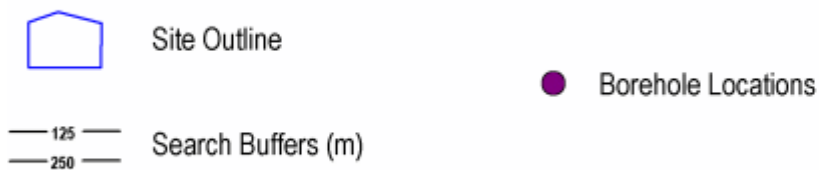
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

10

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1A	66.0	S	385110 395740	SJ89NE2441	-1.0	WILMSLOW ROAD FALLOWFIELD WS2
2A	76.0	S	385110 395730	SJ89NE2443	-1.0	WILMSLOW ROAD FALLOWFIELD WS4
3	82.0	SW	385090 395730	SJ89NE2439	-1.0	WILMSLOW ROAD FALLOWFIELD 2
4	95.0	SW	385080 395720	SJ89NE2442	-1.0	WILMSLOW ROAD FALLOWFIELD WS3
5	97.0	S	385100 395710	SJ89NE2444	-1.0	WILMSLOW ROAD FALLOWFIELD WS5
6	99.0	SW	385060 395730	SJ89NE2440	-1.0	WILMSLOW ROAD FALLOWFIELD WS1
7B	118.0	SW	385070 395700	SJ89NE2438	-1.0	WILMSLOW ROAD FALLOWFIELD 1
8B	128.0	SW	385065 395691	SJ89NE38	13.0	MANCHESTER CORP. WILNSLOW ROAD
9	201.0	NE	385350 395970	SJ89NE460	-1.0	CLINICAL WASTE INCINERATOR 1
10	247.0	NE	385330 396045	SJ89NE813	8.0	UPPER BROOK STREET MANCHESTER B6

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#8B: scans.bgs.ac.uk/sobi_scans/boreholes/936439

#10: scans.bgs.ac.uk/sobi_scans/boreholes/937230

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

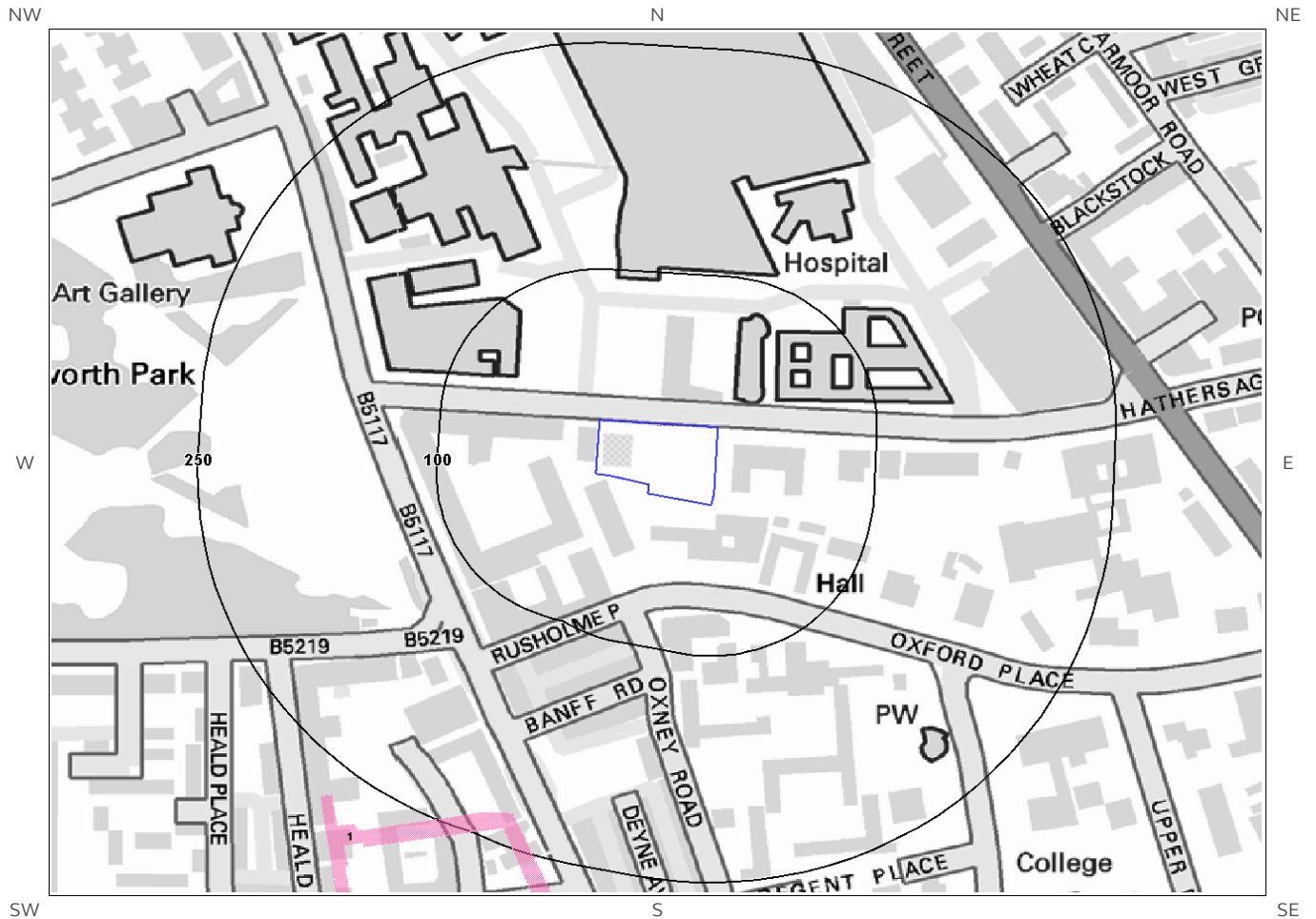
2

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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 © OpenStreetMapContributors

- | | | |
|--|--|---|
|  Site Outline |  Underground or Partially Underground Railway / Subway System |  Railway Track (OpenStreetMap) |
|  Search Buffers (m) |  Railway Tunnel (OS Mapping) |  High Speed 2 |
| |  Abandoned or Dismantled Railway (OpenStreetMap) |  High Speed 2 Revised Proposed Route |
| |  Railway Track (OS Mapping) |  Crossrail 1 |
| | |  Railway and/or Tunnel Feature from Historical Mapping |

9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	229	S	384963 395558	Tramway Sidings	1893

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? Yes

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

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Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk



BGS Geological Hazards Reports and general geological enquiries

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Ove Arup & Partners International Ltd
6th Floor, 3 PICCADILLY PLACE,
MANCHESTER, M1 3BN

Groundsure Reference: GS-5962524

Your Reference: 267661-11

Report Date 24 Apr 2019

Report Delivery Method: Email - pdf

Enviro Insight

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Managing Director
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Date: 24 Apr 2019

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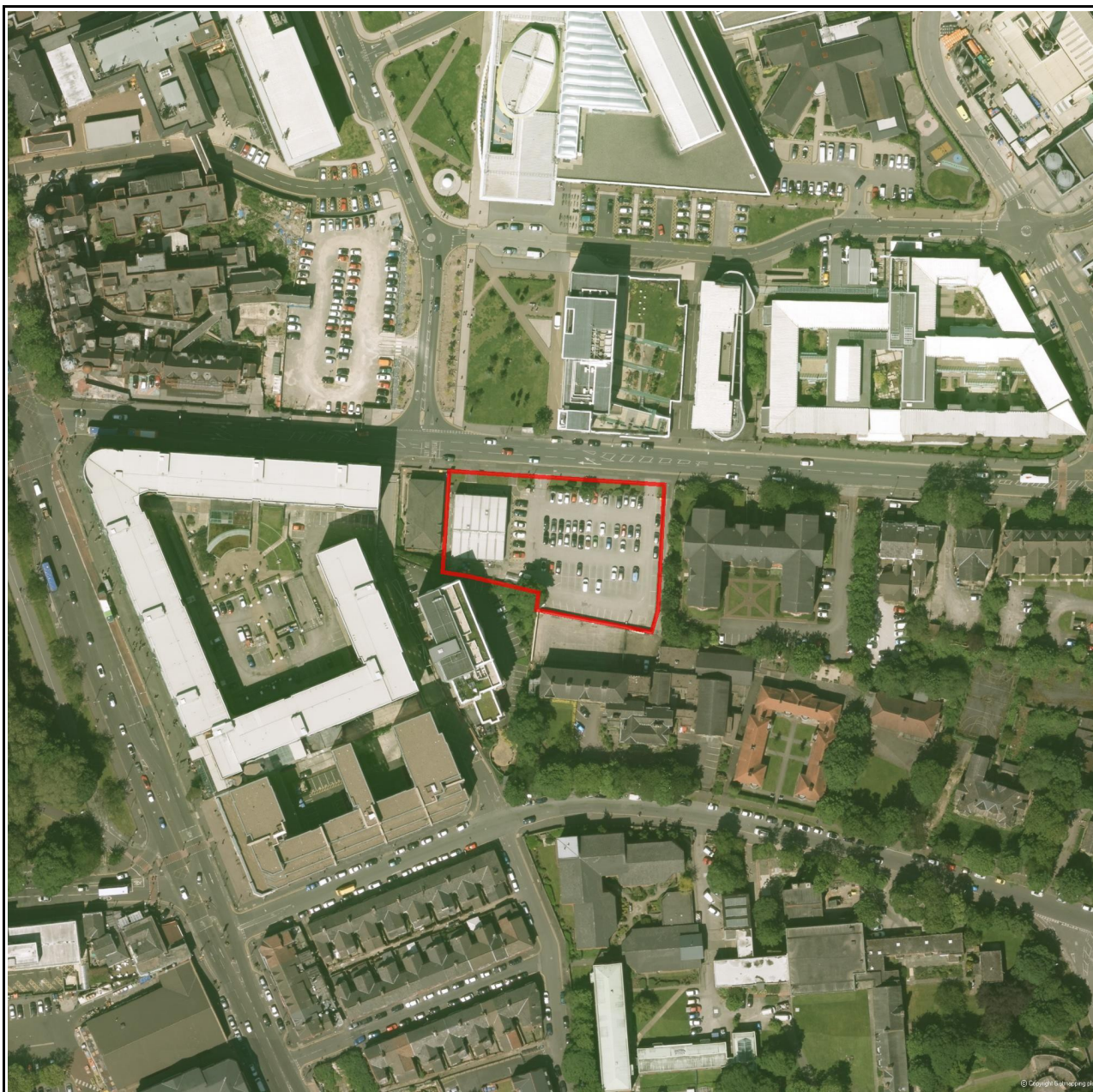
NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 11-Jun-2015

Grid Reference: 385172,395812

Site Size: 0.3272ha

Report Reference: GS-5962524

Client Reference: 267661-11

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8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:.....	52
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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	4	11	31	40
1.2 Additional Information – Historical Tank Database	0	0	8	7
1.3 Additional Information – Historical Energy Features Database	0	0	0	63
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	14	14	16
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	0	0	1	7
Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	4	5
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	7
2.1.8 Records of Licensed Discharge Consents	0	0	0	6
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	0
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	0	0	1
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	3	0	0	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	12	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	2	3
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	None identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m					
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified					
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified					
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	19
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.6 Source Protection Zones (within 500m of the study site)	1	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	0	Not searched	Not searched

Section 6: Hydrogeology and Hydrology	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	0	0	0	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 7: Flooding	
7.1 Environment Agency Zone 2 floodplains within 250m of the study site	None identified
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	None identified
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Very Low
7.4 Flood Defences within 250m of the study site	None identified
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified
7.6 Areas used for Flood Storage within 250m of the study site	None identified
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential at Surface
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	Moderate

Section 8: Designated Environmentally Sensitive Sites						
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards	
9.1 Maximum risk of natural ground subsidence	Very Low
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Very Low
9.1.2 Maximum Landslides hazard rating identified on the study site	Very Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	Negligible
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Very Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining	
10.1 Coal mining areas within 75m of the study site	Identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

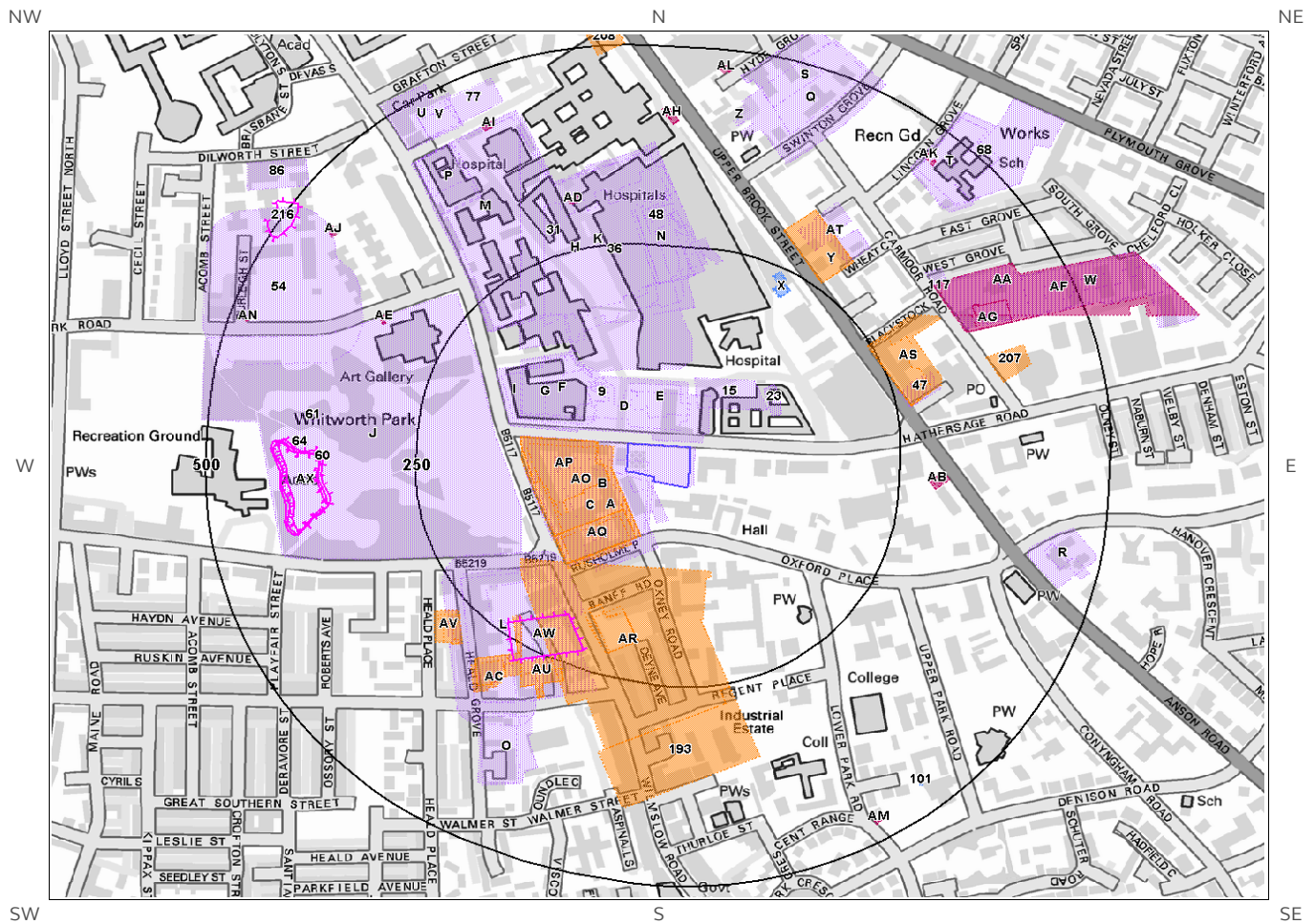
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

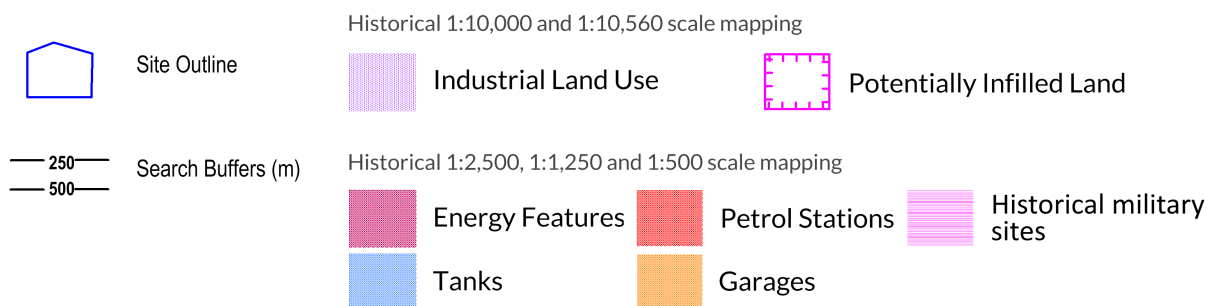
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 86

ID	Distance [m]	Direction	Use	Date
1A	0	On Site	Unspecified Works	1985
2B	0	On Site	Unspecified Works	1978
3A	0	On Site	Unspecified Works	1991
4B	0	On Site	Unspecified Works	1968
5C	5	S	Quilt Works	1938
6C	5	S	Quilt Works	1934
7D	5	N	Hospital	1991
8D	5	N	Hospital	1985
9	20	N	Hospital	1978
10E	34	N	Unspecified Laboratory	1934
11E	34	N	Unspecified Laboratory	1915
12E	34	N	Unspecified Laboratory	1938
13F	48	NW	Hospital	1968
14F	50	NW	Hospital	1956
15	50	N	Unspecified Laboratory	1923
16G	62	W	Hospital	1915
17G	62	W	Hospital	1934
18G	62	W	Hospital	1938
19G	62	W	Hospital	1923
20H	93	N	Infirmery	1915
21H	93	N	Infirmery	1938
22H	93	N	Infirmery	1934
23	104	E	Unspecified Laboratory	1968
24I	131	W	Hospital	1994
25I	131	W	Hospital	1988
26L	133	SW	Unspecified Factory	1923
27J	133	W	Infirmery	1988
28J	133	W	Infirmery	1978
29J	133	W	Infirmery	1985
30J	133	W	Infirmery	1994
31	134	NW	Infirmery	1923
32K	141	N	Infirmery	1978
33K	141	N	Infirmery	1956
34K	141	N	Infirmery	1968

35L	158	SW	Unspecified Commercial/Industrial	1934
36	163	N	Infirmary	1985
37L	165	SW	Unspecified Factory	1915
38AW	192	S	Depository	1923
39M	196	NW	Infirmary	1994
40M	196	NW	Hospital	1971
41M	196	NW	Hospital	1956
42M	196	NW	Infirmary	1988
43M	196	NW	Hospital	1978
44M	196	NW	Infirmary	1985
45N	202	N	Hospital	1915
46N	203	N	Hospital	1923
47	257	E	Laundry	1915
48	259	N	Hospital	1905
49AT	287	NE	Unspecified Works	1968
50O	327	S	Laundry	1923
51O	331	SW	Laundry	1934
52O	331	SW	Laundry	1938
53O	331	SW	Laundry	1915
54	347	W	Infirmary	1971
55AF	354	NE	Unspecified Depot	1978
56P	356	NW	Eye Hospital	1923
57P	358	NW	Eye Hospital	1938
58P	358	NW	Eye Hospital	1934
59P	358	NW	Eye Hospital	1915
60	359	W	Boat House	1915
61	371	W	Unspecified Tank	1915
62Q	373	N	Unspecified Works	1985
63Q	373	N	Unspecified Works	1991
64	381	W	Boat House	1923
65P	383	NW	Eye Hospital	1905
66S	409	N	Unspecified Commercial/Industrial	1978
67R	413	E	Hospital	1968
68	424	NE	Unspecified Works	1968
69T	427	NE	Bakery	1934
70R	432	E	Hospital	1956
71R	432	E	Hospital	1978
72W	437	E	Unspecified Depot	1968
73S	437	N	Unspecified Works	1968
74T	438	NE	Bakery	1956
75U	444	NW	Unspecified Works	1923
76U	447	NW	Hospital	1971
77	448	NW	Unspecified Works	1915
78V	450	NW	Hospital	1988

79V	450	NW	Hospital	1978
80V	450	NW	Eye Hospital	1985
81V	450	NW	Hospital	1994
82W	454	NE	Unspecified Depot	1985
83W	454	NE	Unspecified Depot	1991
84R	461	E	Hospital	1985
85R	461	E	Hospital	1991
86	499	NW	Laundry	1923

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

15

ID	Distance (m)	Direction	Use	Date
87X	216	NE	Unspecified Tank	1991
88X	216	NE	Unspecified Tank	1991
89X	216	NE	Unspecified Tank	1994
90X	217	NE	Unspecified Tank	1992
91X	230	NE	Unspecified Tank	1991
92X	230	NE	Unspecified Tank	1991
93X	230	NE	Unspecified Tank	1994
94X	230	NE	Unspecified Tank	1992
95Y	284	NE	Unspecified Tank	1949
96Y	284	NE	Unspecified Tank	1949
97Z	415	N	Unspecified Tank	1949
98Z	416	N	Unspecified Tank	1949
99AA	420	NE	Tanks	1991
100AA	420	NE	Tanks	1991
101	461	SE	Unspecified Tank	1893

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

63

ID	Distance (m)	Direction	Use	Date
102AB	285	E	Electricity Substation	1993

103AB	285	E	Electricity Substation	1986
104AB	285	E	Electricity Substation	1991
105AB	285	E	Electricity Substation	1991
106AB	285	E	Electricity Substation	1950
107AB	290	E	Electricity Substation	1970
108AB	290	E	Electricity Substation	1950
109AC	304	SW	Electricity Substation	1994
110AC	307	SW	Electricity Substation	1994
111AD	307	N	Electricity Substation	1984
112AD	309	N	Electricity Substation	1976
113AE	325	NW	Electricity Substation	1994
114AE	325	NW	Electricity Substation	1989
115AF	352	NE	Electricity Mains Depot	1976
116AF	352	NE	Electricity Mains Depot	1949
117	352	NE	Electricity Mains Depot	1949
118AF	352	NE	Electricity Mains Depot	1949
119AG	354	NE	Electricity Mains Depot	1950
120AG	354	NE	Electricity Mains Depot	1950
121AG	371	NE	Electricity Substation	1980
122AG	371	NE	Electricity Substation	1992
123AG	371	NE	Electricity Substation	1967
124AG	375	NE	Electricity Substation	1999
125AG	378	NE	Electricity Substation	1976
126AG	378	NE	Electricity Substation	1991
127AG	378	NE	Electricity Substation	1991
128AG	378	NE	Electricity Substation	1996
129AH	402	N	Electricity Substation	1992
130AH	404	N	Electricity Substation	1991
131AH	404	N	Electricity Substation	1986
132AH	404	N	Electricity Substation	1991
133AH	404	N	Electricity Substation	1984
134AH	404	N	Electricity Substation	1994
135AI	427	NW	Electricity Substation	1980
136AI	428	NW	Electricity Substation	1993
137AI	428	NW	Electricity Substation	1994
138AI	428	NW	Electricity Substation	1998
139AI	428	NW	Electricity Substation	1987
140AI	428	N	Electricity Substation	1949
141AI	428	N	Electricity Substation	1949
142AJ	435	NW	Electricity Substation	1994
143AJ	435	NW	Electricity Substation	1993
144AJ	435	NW	Electricity Substation	1998
145AJ	435	NW	Electricity Substation	1980
146AJ	437	NW	Electricity Substation	1987
147T	456	NE	Electricity Substation	1949
148T	456	NE	Electricity Substation	1949

149AK	457	NE	Electricity Substation	1994
150AK	458	NE	Electricity Substation	1991
151AK	458	NE	Electricity Substation	1991
152AK	458	NE	Electricity Substation	1986
153AK	458	NE	Electricity Substation	1984
154AK	458	NE	Electricity Substation	1992
155AK	458	NE	Electricity Transformer	1976
156AL	470	N	Electricity Substation	1991
157AL	470	N	Electricity Substation	1991
158AM	471	SE	Electricity Substation	1994
159AM	471	SE	Electricity Substation	1983
160AM	473	SE	Electricity Substation	1983
161AL	473	N	Electricity Substation	1994
162AL	473	N	Electricity Substation	1992
163AN	476	W	Electricity Substation	1994
164AN	477	W	Electricity Substation	1989

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 44

ID	Distance (m)	Direction	Use	Date
165AO	14	W	Garage	1993
166AO	15	W	Garage	1986
167AO	15	W	Garage	1991
168AO	15	W	Garage	1991
169AO	20	SW	Motor Repair Works	1970
170AP	22	W	Motor Repair Works	1950
171AP	22	W	Motor Repair Works	1950
172AQ	37	S	Garage	1986
173AQ	37	S	Garage	1991
174AQ	37	S	Garage	1991

175AQ	47	S	Garage	1993
176AQ	47	S	Motor Repair Works	1970
177AQ	47	S	Motor Repair Works	1950
178AQ	48	S	Motor Repair Works	1950
179AQ	56	S	Motor Repair Works	1933
180AR	102	S	Garage	1991
181AR	161	S	Garage	1986
182AR	166	S	Garage	1993
183AR	166	S	Garage	1970
184AR	167	S	Garage	1991
185AR	167	S	Garage	1991
186L	220	SW	Coach Works	1951
187L	239	SW	Coach Works	1951
188L	239	SW	Coach Works	1949
189AU	245	S	Coach Works	1950
190AS	245	NE	Garage	1991
191AS	245	NE	Garage	1991
192AS	247	NE	Garage	1993
193	254	S	Garage	1991
194AT	258	NE	Garage	1976
195AU	258	SW	Coach Works	1970
196AU	259	SW	Coach Works	1950
197AT	259	NE	Coach Building Works	1949
198AT	259	NE	Coach Building Works	1949
199AC	259	SW	Coach Works	1951
200AC	260	SW	Coach Works	1951
201AC	260	SW	Coach Works	1949
202AV	264	SW	Garage	1951
203AV	264	SW	Garage	1949
204AV	267	SW	Garage	1951
205AC	270	SW	Coach Works	1950
206AC	279	SW	Coach Works	1933
207	369	E	Garage	1967
208	488	N	Garage	1976

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary:

0

Database searched and no data found.

1.7 Potentially Infilled Land

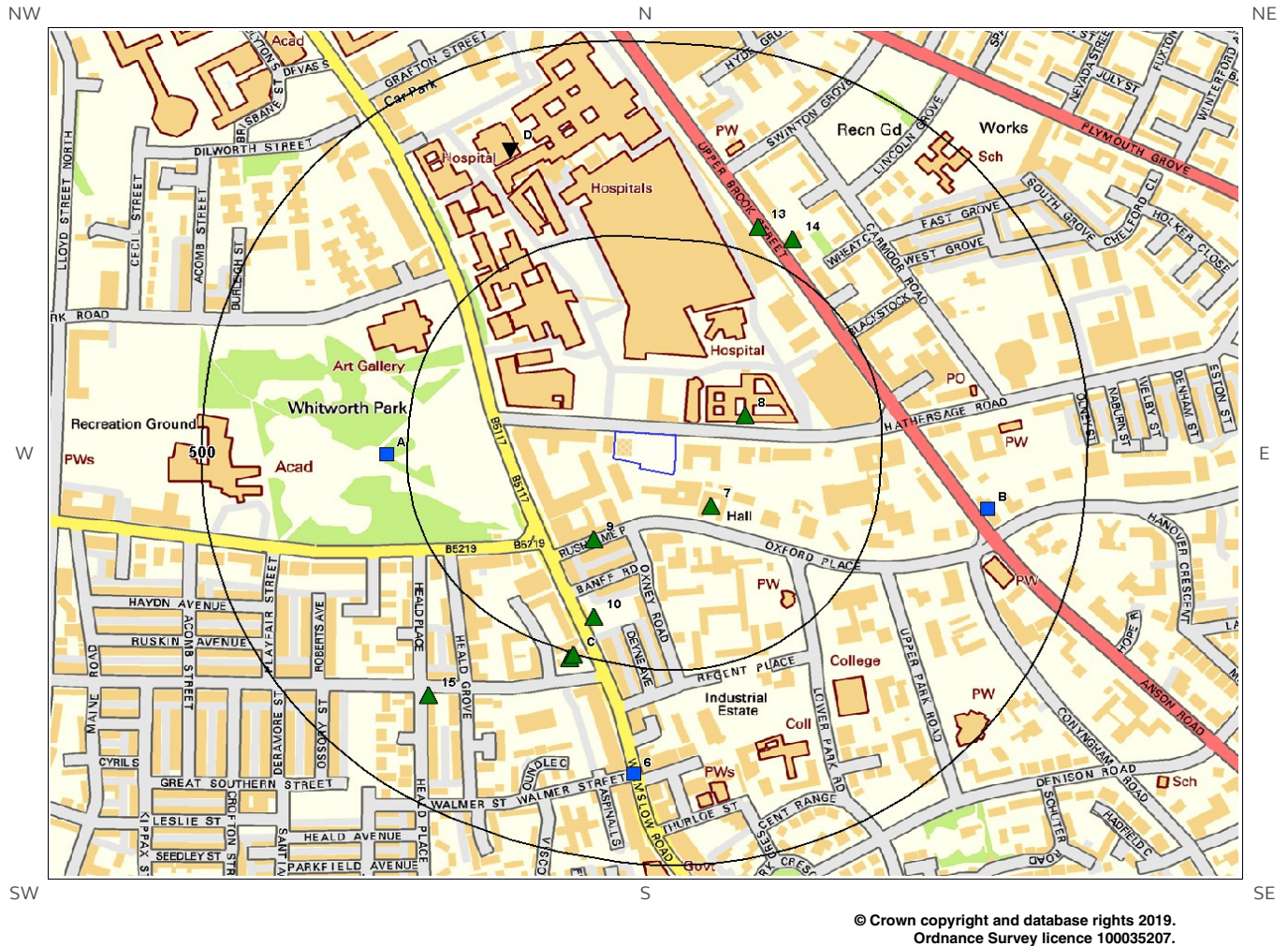
Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site:

8

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
209AW	192	S	Depository	1923
210AX	353	W	Pond	1956
211AX	357	W	Pond	1923
212AX	357	W	Pond	1905
213AX	358	W	Pond	1934
214AX	358	W	Pond	1938
215AX	358	W	Pond	1915
216	485	NW	Pond	1851

2. Environmental Permits, Incidents and Registers Map



- | | | | |
|---|-----------------------------|---|--|
|  | Recorded Pollution Incident |  | RAS 3 & 4 Authorisations |
|  | Site Outline |  | Dangerous Substances (List 1) |
|  | Search Buffers (m) |  | Dangerous Substances (List 2) |
|  | Water Industry Referrals |  | Part A(1) Authorised Processes and Historic IPC Authorisations |
|  | Licenced Discharge Consents |  | Part A(2) and Part B Authorised Processes |
|  | Red List Discharge Consents |  | COMAH / NIHHS Sites |
| | |  | Sites Determined as Contaminated Land |
| | |  | Hazardous Substance Consents and Enforcements |

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

9

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
7	62	SE	385243 395741	Address: Manchester Garages Ltd, Oxford Road, Rusholme, M13 0JD Process: Respraying of Road Vehicles Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
8	86	E	385285 395857	Address: Manchester Royal Infirmary, Central Services Complex Off Hathersage Road, Rusholme, M13 9WL Process: Combustion & Incineration Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
9	108	S	385101 395699	Address: Green Bros Ltd, Condor Wks, Rusholme Place, M14 5GB Process: Coating Processes Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
10	200	S	385101 395599	Address: Rusholme Serv Stn, Wilmslow Rd, M14 5TB Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
11C	253	S	385077 395551	Address: Total Convenience Store (Rusholme), 25-33 Wilmslow Road, Rusholme, M14 5AQ Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
12C	260	S	385072 395546	Address: Moss Side Service Station, Wilmslow Road, Rusholme, M14 5AQ Process: Unloading of Petrol into Storage at Service Stations Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
13	283	N	385301 396099	Address: Mancunian Serv Stn, Upper Brook Rd, M13 0HL Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
14	286	NE	385343 396083	Address: Tesco Express Rusholme, 257 Upper Brook Street, Longsight, Manchester, M13 0HL Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified
15	379	SW	384901 395499	Address: Save, Moss Lane East, M14 4PA Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

7

The following RAS Licence (3 or 4) records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Address	Operator	Type	Permission Number	Dates	Status
23D	383	N	385000 396200	Manchester Central Hospitals Nhs Trust, Nuclear Medicine Department, Manchester Royal Infirmary, Oxford Road, Manchester, Greater Manchester, M13 9WL	Manchester Central Hospitals Nhs Trust	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AB9712	Date of Approval:31/3/1991 Effective from:31/3/1991 Last date of update:2015-01-01	Revoked/cancelled
24D	383	N	385000 396200	Central Manchester University Hospitals Nhs Foundation Trust, Nuclear Medicine Department, Manchester Royal Infirmary, Oxford Road, Manchester, Greater Manchester, M13 9WL	Central Manchester University Hospitals Nhs Foundation Trust	Disposal Of Radioactive Waste (was Rsa60 Section 6).	BZ4675	Date of Approval:19/9/2005 Effective from:14/10/2005 Last date of update:2015-01-01	Superseded By Variation
25D	383	N	385000 396200	Central Manchester University Hospitals Nhs Foundation Trust, Nuclear Medicine Department, Manchester Royal Infirmary, Oxford Road, Manchester, Greater Manchester, M13 9WL	Central Manchester University Hospitals Nhs Foundation Trust	Disposal Of Radioactive Waste (was Rsa60 Section 6).	AS1266	Date of Approval:29/3/1995 Effective from:31/3/1995 Last date of update:2015-01-01	Superseded By Variation
26D	383	N	385000 396200	Central Manchester University Hospitals Nhs Foundation Trust, Nuclear Medicine Department, Manchester Royal Infirmary, Oxford Road, Manchester, Greater Manchester, M13 9WL	Central Manchester University Hospitals Nhs Foundation Trust	Disposal Of Radioactive Waste (was Rsa60 Section 6).	BM2926	Date of Approval:19/11/2001 Effective from:17/12/2001 Last date of update:2015-01-01	Superseded By Variation

ID	Distance (m)	Direction	NGR	Address	Operator	Type	Permission Number	Dates	Status
27D	383	N	385000 396200	Central Manchester University Hospitals Nhs Foundation Trust, Nuclear Medicine Department, Manchester Royal Infirmary, Oxford Road, Manchester, Greater Manchester, M13 9WL	Central Manchester University Hospitals Nhs Foundation Trust	Disposal Of Radioactive Waste (was Rsa60 Section 6).	BW6051	Date of Approval: 1/12/2003 Effective from: 1/1/2004 Last date of update: 2015-01-01	Superseded By Variation
28D	383	N	385000 396200	Manchester Royal Infirmary, Oxford Road, Manchester, M13 9WL	Central Manchester University Hospitals NHS Foundation Trust	Disposal Of Radioactive Waste (was Rsa60 Section 6).	CD4508	Date of Approval: 17/3/2009 Effective from: 14-04-2009 Last date of update: 2018-11-01	Issued
29D	383	N	385000 396200	Manchester Royal Infirmary, Oxford Road, Manchester, M13 9WL	Central Manchester University Hospitals NHS Foundation Trust	Keeping And Use Of Radioactive Materials (was Rsa60 Section 1).	CD4486	Date of Approval: 17/3/2009 Effective from: 17-03-2009 Last date of update: 2018-11-01	Issued

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

6

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
1A	275	W	384850 395810	Address: OXFORD ROAD CSO, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 016982917 Permit Version: 3 Receiving Water: MALKIN BROOK TRIB CORN BK Status: REVOKED - UNSPECIFIED Issue date: 08/11/1995 Effective Date: 08-Nov-1995 Revocation Date: 13/07/2005
2A	275	W	384850 395810	Address: OXFORD ROAD CSO, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 016982917 Permit Version: 1 Receiving Water: MALKIN BROOK TRIB CORN BK Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 01-Jan-1995 Revocation Date: 10/05/1995
3A	275	W	384850 395810	Address: OXFORD ROAD CSO, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 016982917 Permit Version: 2 Receiving Water: MALKIN BROOK TRIB CORN BK Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 11-May-1995 Revocation Date: 07/11/1995

ID	Distance (m)	Direction	NGR	Details
4B	384	E	385580 395740	Address: BUTLER STREET/WOODWARD STREET CSO, BUTLER STREET, ., MANCHESTER, GREATER MANCHESTER, M4 7JH Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0038 Permit Version: 2 Receiving Water: RIVER MEDLOCK Status: VARIED UNDER EPR 2010 Issue date: 03/09/2010 Effective Date: 03-Sep-2010 Revocation Date: 04/02/2016
5B	384	E	385580 395740	Address: BUTLER STREET/WOODWARD STREET CSO, BUTLER STREET, ., MANCHESTER, GREATER MANCHESTER, M4 7JH Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0038 Permit Version: 1 Receiving Water: RIVER MEDLOCK Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: - Effective Date: 01-Jan-1995 Revocation Date: 02/09/2010
6	386	S	385150 395400	Address: WALMER ST/WILMSLOW RD, MANCHESTER, GREATER MANCHESTER Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01MAN0382 Permit Version: 1 Receiving Water: - Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: - Effective Date: 01-Jan-1995 Revocation Date: -

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

0

Database searched and no data found.

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

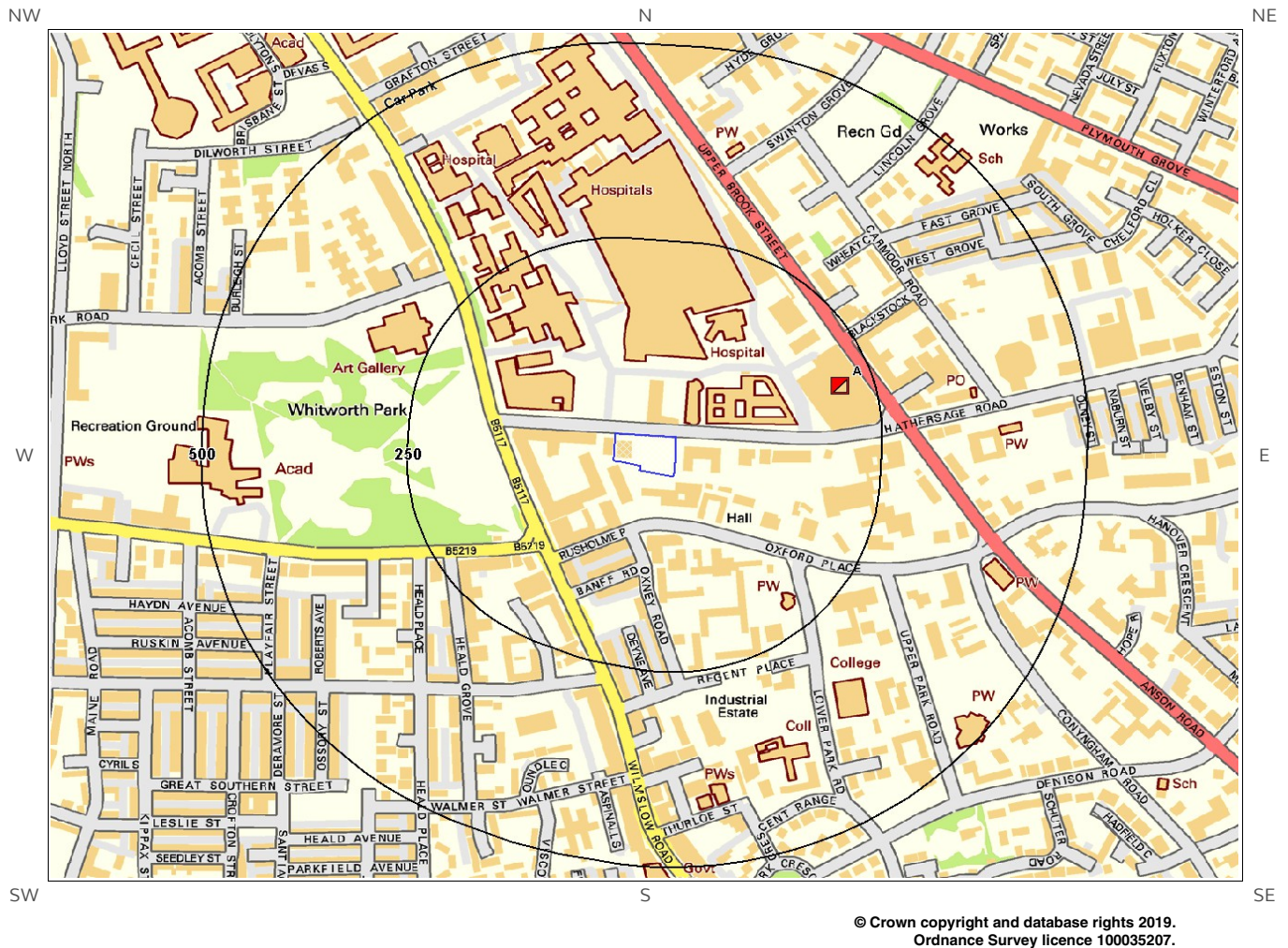
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



- | | | | | | |
|---|---------------------------|---|----------------------------|---|---|
|  | Site Outline |  | EA/NRW Active Landfill |  | Historic and Planned Waste Sites |
|  | EA/NRW Historic Landfill |  | EA/NRW Licensed Waste Site |  | Local Authority/Historical Mapping Landfill Records |
|  | BGS / DoE Survey Landfill | | | | |

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

1

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
Not shown	1394	W	Site Address: Moss Side Shopping Centre, Hulme, Manchester Waste Licence: Yes Site Reference: F061 ,0103, RD/LIC/1036/93 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 11-Apr-1994 Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: Demolition Service Limited First Recorded: 31-May-1994 Last Recorded: 05-Jun-1995

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

Database searched and no data found.

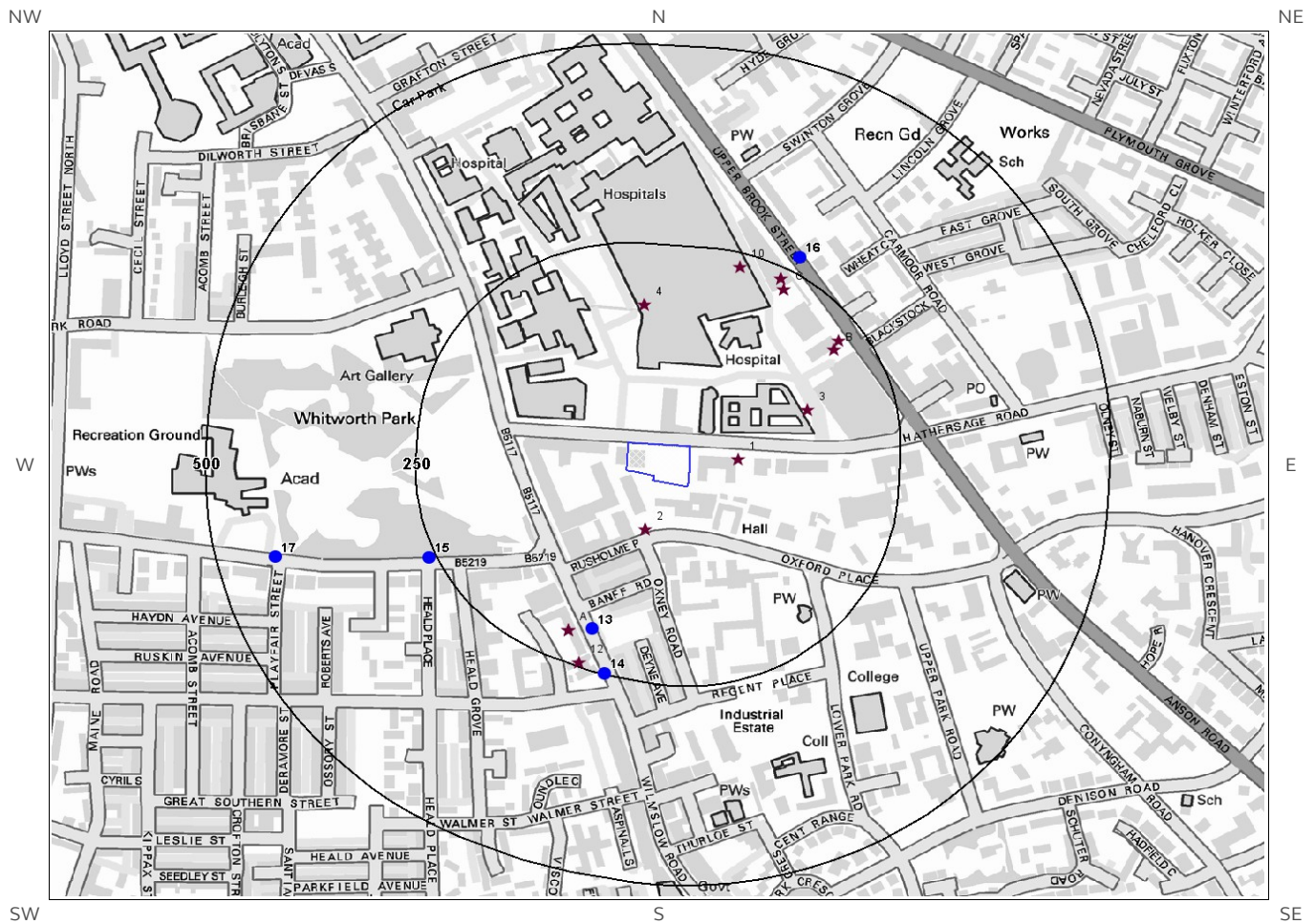
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

3

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
2A	209	E	385400 395900	Site Address: Manchester Royal Infirmary, Oxford Road, Manchester, M13 9WL Type: Clinical Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CMH001 EPR reference: EA/EPR/PP3391CE/S002 Operator: Central Manchester University Hospitals N H S Foundation Trust Waste Management licence No: 53906 Annual Tonnage: 110088.0 Issue Date: 18/04/1990 Effective Date: - Modified: - Surrendered Date: Aug 24 2012 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Central Manchester University Hospitals N H S Foundation Trust Correspondence Address: -
3A	209	E	385400 395900	Site Address: - Type: Clinical Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CMH001 EPR reference: - Operator: Central Manchester Area Health Authority Waste Management licence No: 53906 Annual Tonnage: 417.0 Issue Date: 18/04/1990 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Manchester Royal Infirmary Correspondence Address: Facilities Directorate, Gate 9, Oxford Road, Manchester, M13 9WL
4A	209	E	385400 395900	Site Address: Manchester Royal Infirmary, Oxford Road, Manchester, M13 9WL Type: Clinical Waste Transfer Station Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CMH001 EPR reference: EA/EPR/PP3391CE/A001 Operator: Central Manchester & Manchester Childrens University Hospital Nhs Trust Waste Management licence No: 53906 Annual Tonnage: 417.0 Issue Date: 18/04/1990 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Central Manchester & Manchester Childrens University Hospital Nhs Trust Correspondence Address: -

4. Current Land Use Map



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Site Outline

★ Current Industrial Sites

— Electricity Transmission Cables

— 250 — Search Buffers (m)
— 500 —

● Petrol & Fuel Sites

— Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

12

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	57	E	Electricity Sub Station	385258 395819	Greater Manchester, M13	Electrical Features	Infrastructure and Facilities
2	61	S	Electricity Sub Station	385148 395731	Greater Manchester, M14	Electrical Features	Infrastructure and Facilities
3	146	E	Electricity Sub Station	385340 395881	Greater Manchester, M13	Electrical Features	Infrastructure and Facilities
4	175	N	Royal Manchester Children's Hospital	385147 396013	Manchester Royal Infirmary, Oxford Road, Manchester, Greater Manchester, M13 9WL	Hospitals	Health Practitioners and Establishments
5B	209	NE	Electricity Sub Station	385372 395956	Greater Manchester, M13	Electrical Features	Infrastructure and Facilities
6A	211	S	Manchester Flatpack	385056 395604	6, Wilmslow Road, Manchester, Greater Manchester, M14 5TP	Packaging	Industrial Products
7A	212	S	Techways	385056 395604	10, Wilmslow Road, Manchester, Greater Manchester, M14 5TP	Electrical Equipment Repair and Servicing	Repair and Servicing
8B	221	NE	Electricity Sub Station	385378 395967	Greater Manchester, M13	Electrical Features	Infrastructure and Facilities
9C	226	NE	Tank	385312 396032	Greater Manchester, M13	Tanks (Generic)	Industrial Features
10	233	N	Paediatric Emergency Department - Royal Manchester Children's Hospital	385260 396060	Manchester Royal Infirmary, Oxford Road, Manchester, Greater Manchester, M13 9WL	Accident and Emergency Hospitals	Health Practitioners and Establishments
11C	236	NE	Tank	385309 396045	Greater Manchester, M13	Tanks (Generic)	Industrial Features
12	244	S	Shell Service Station	385069 395564	10, Wilmslow Road, Manchester, Greater Manchester, M14 5TQ	Petrol and Fuel Stations	Road and Rail

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

5

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
13	200	S	385085 395605	OBSOLETE	25-33, Wilmslow Road, Rusholme, Manchester, Greater Manchester, M14 5TB	Not Applicable	Obsolete
14	248	S	385100 395549	SHELL	10, Wilmslow Road, Rusholme, Manchester, Greater Manchester, M14 5TQ	No	Open
15	259	SW	384890 395695	OBSOLETE	490, Moss Lane East, Heald Grove & Heald Place, Rusholme, Manchester, Greater Manchester, M14 4PA	Not Applicable	Obsolete
16	270	NE	385332 396072	ESSO	257, Upper Brook Street, Rusholme, Manchester, Greater Manchester, M13 0HL	No	Open
17	431	W	384708 395695	OBSOLETE	353, Moss Lane East, Manchester, Greater Manchester, M14 4PY	Not Applicable	Obsolete

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

5.3 Bedrock and Solid Geology

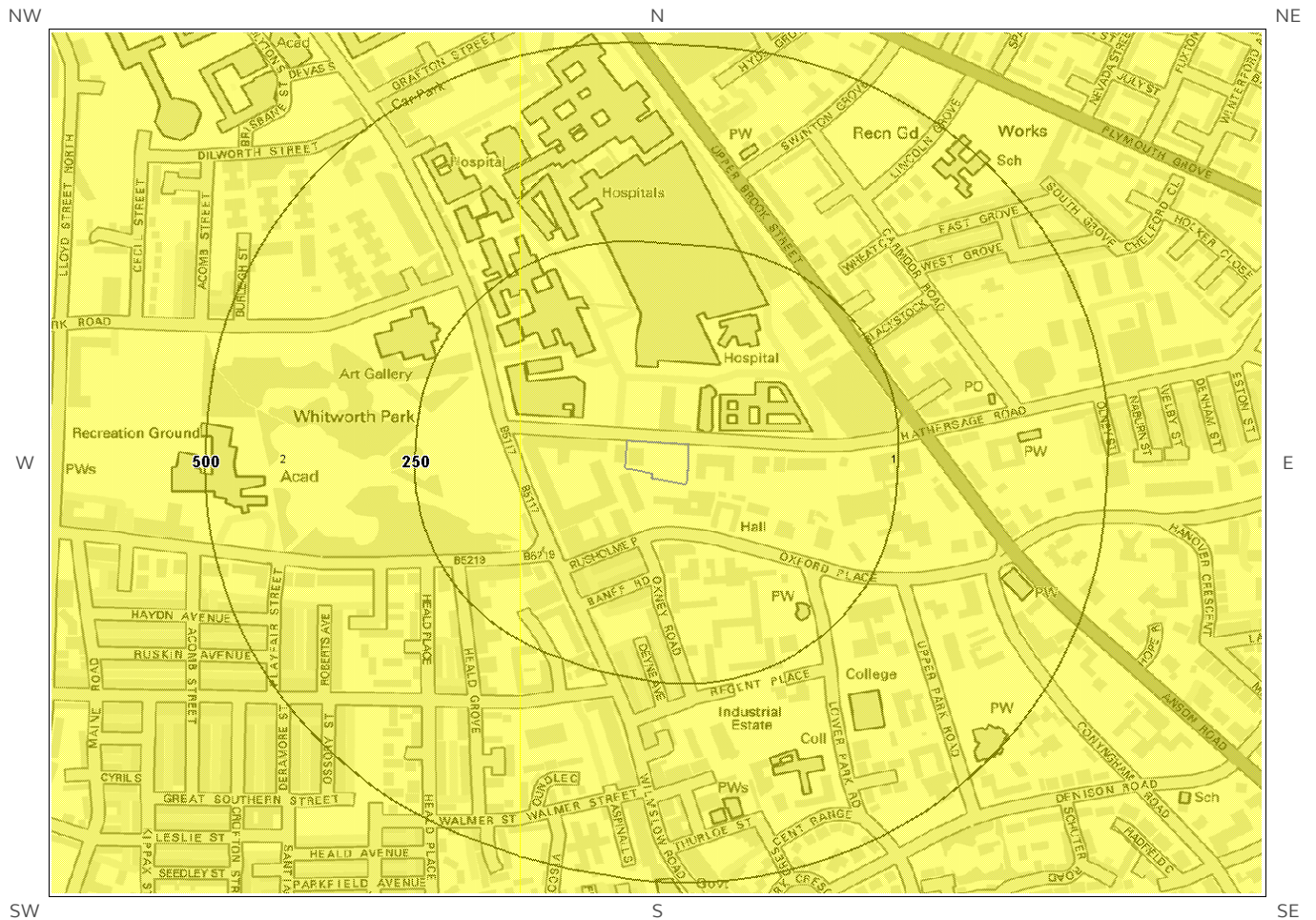
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
MM-MDST	MANCHESTER MARLS FORMATION	MUDSTONE
CHES-SDST	CHESTER FORMATION	SANDSTONE

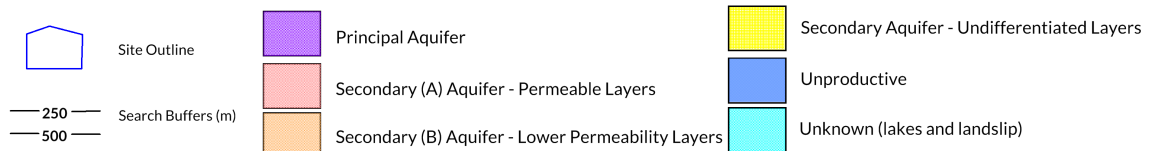
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

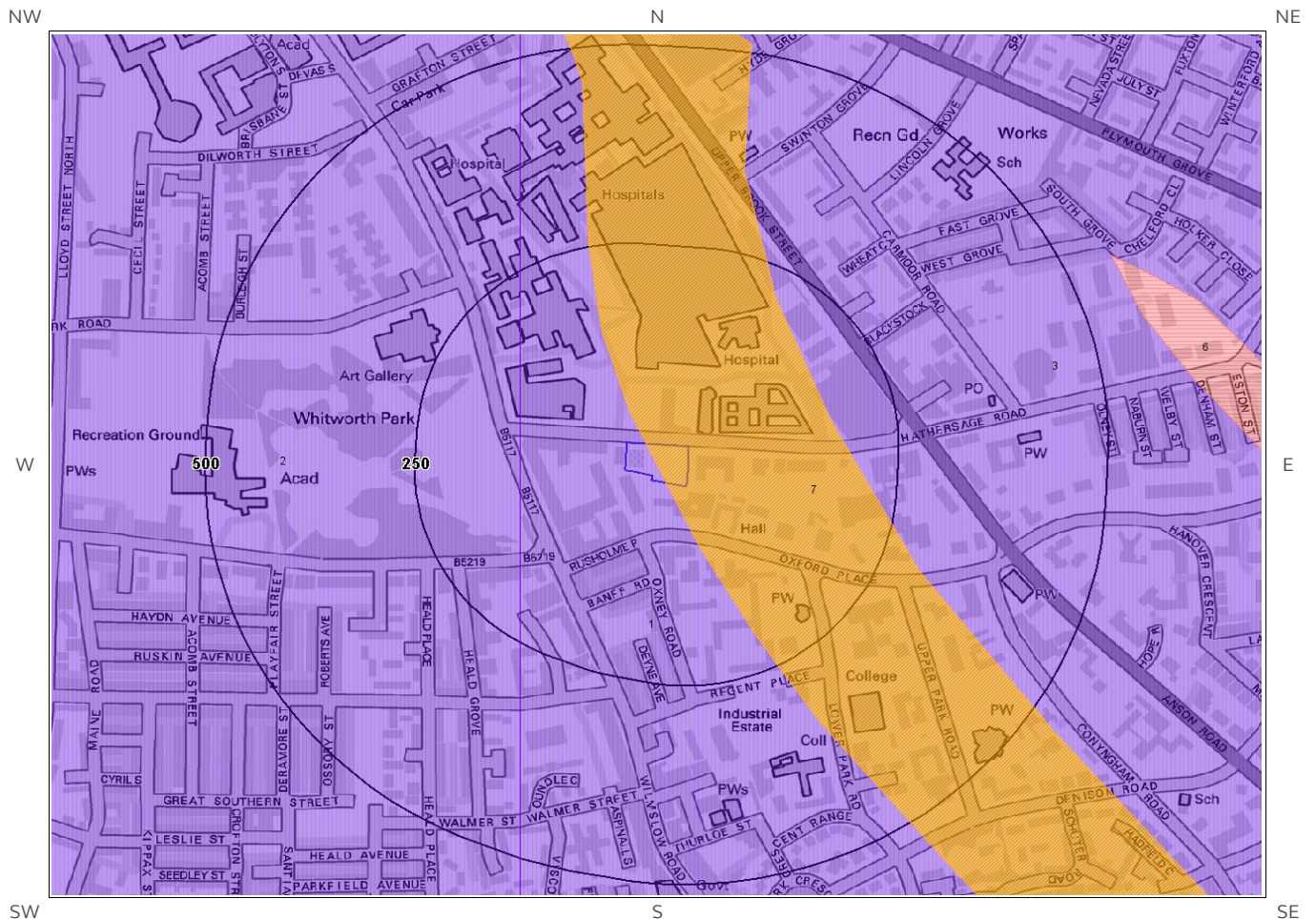
6a. Aquifer Within Superficial Geology



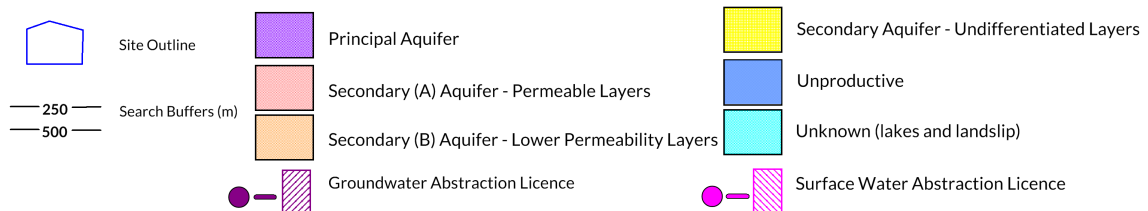
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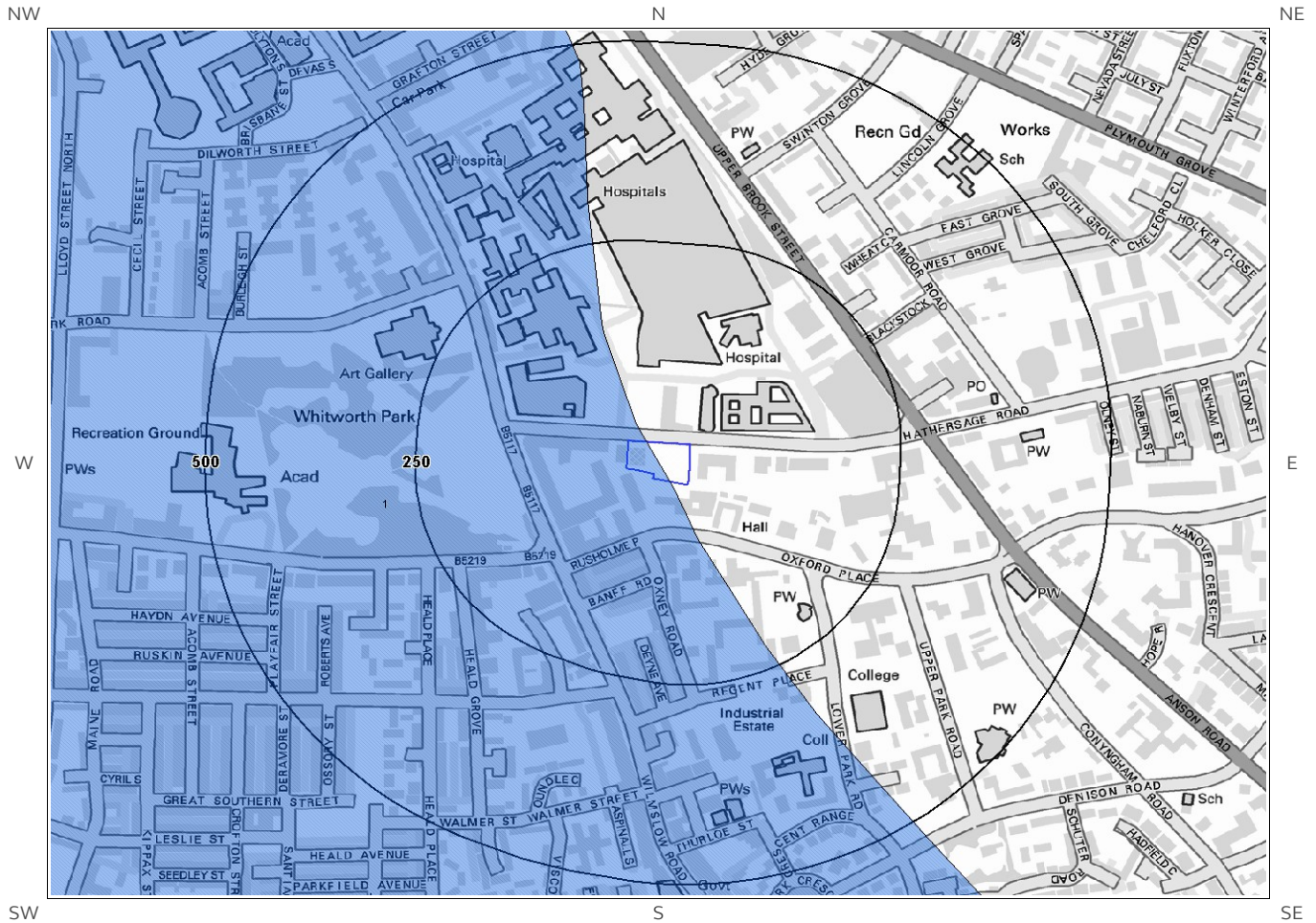
6b. Aquifer Within Bedrock Geology and Abstraction Licences



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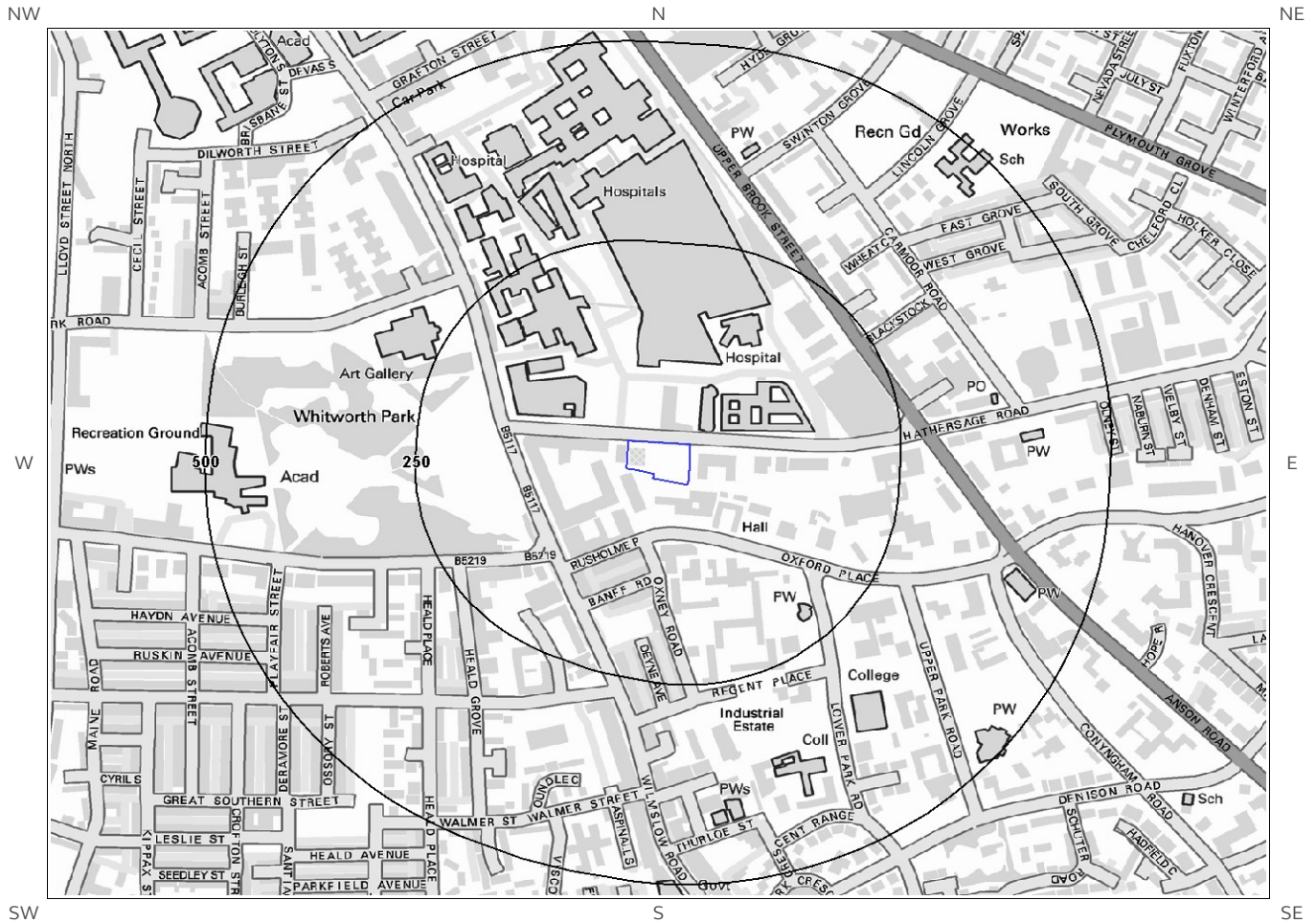


6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences

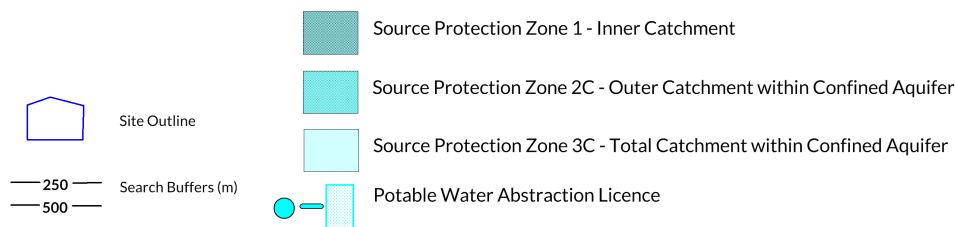


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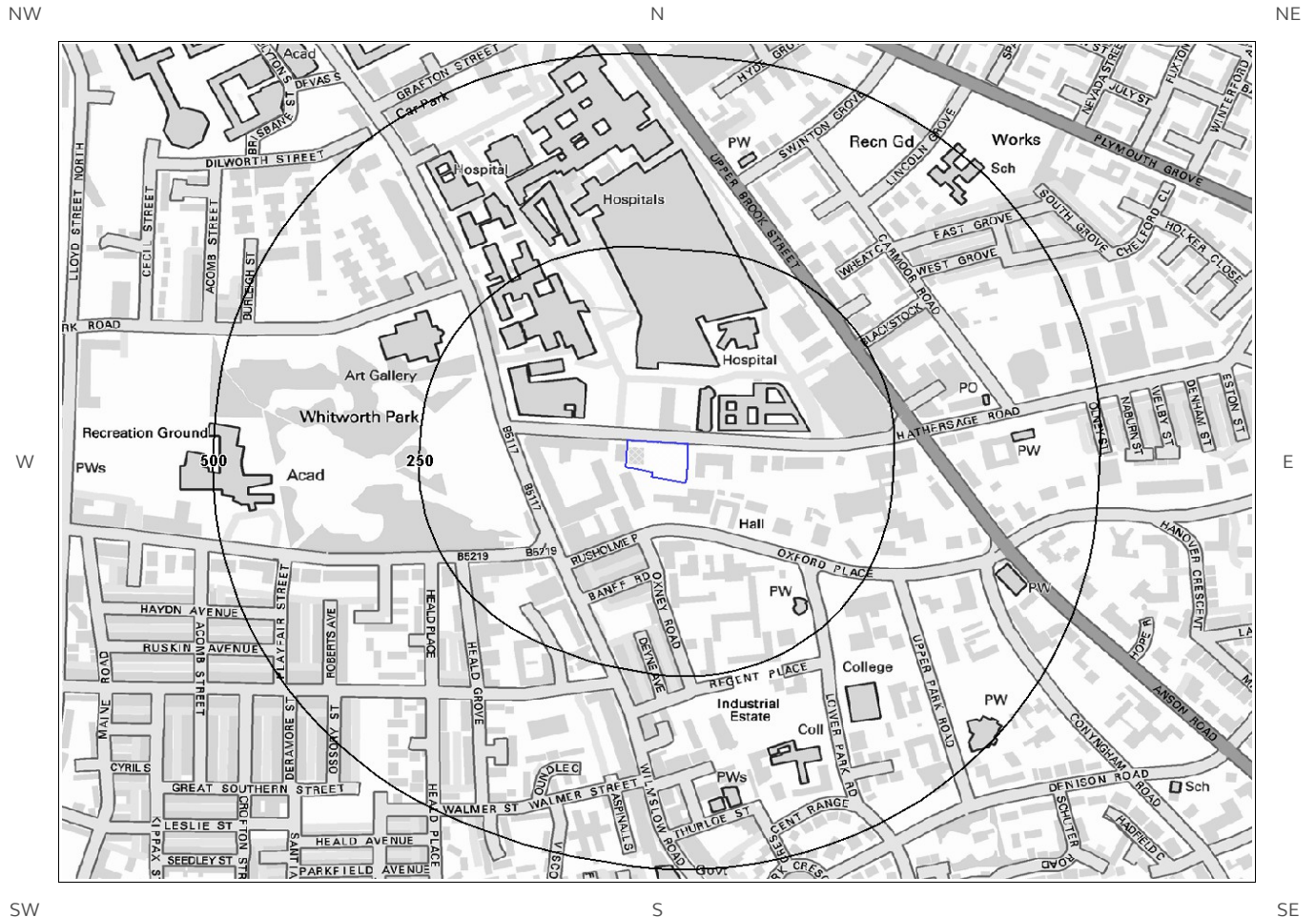
6d. Hydrogeology – Source Protection Zones within confined aquifer



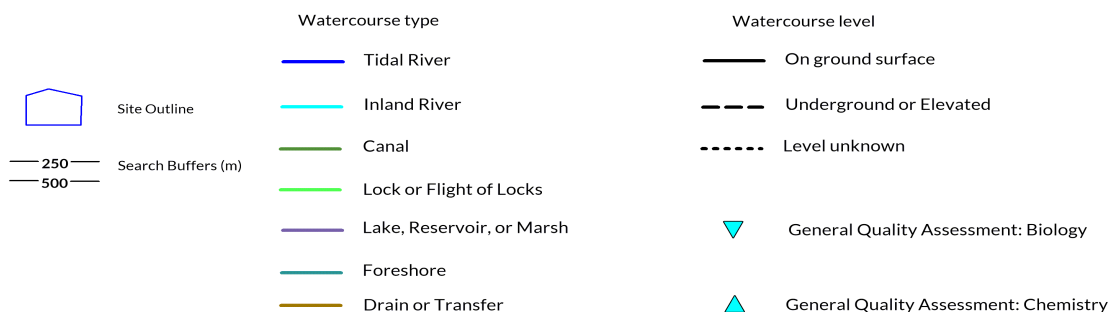
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6e. Hydrology – Watercourse Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	125	W	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
7	0	On Site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	125	W	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
3	168	NE	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site

Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
Not shown	1049	NE	385729 396778	Status: Historical Licence No: NW/069/0004/005 Details: Heat Pump Direct Source: Ground Water - North West Region Point: AREA OF ABSTRACTION - LOWER CARBONIFEROUS LIMESTONE Data Type: Poly4 Name: G T Energy UK Limited Annual Volume (m³): 2.04984e+006 Max Daily Volume (m³): 8640 Original Application No: - Original Start Date: 17/01/2013 Expiry Date: 16/01/2037 Issue No: 2 Version Start Date: 11/06/2013 Version End Date:
Not shown	1229	W	383900 395900	Status: Historical Licence No: 2569007007 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES MOSS SIDE MANCHESTER Data Type: Point Name: Heineken UK Ltd Annual Volume (m³): 227000 Max Daily Volume (m³): 900 Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 23/11/2009 Version End Date:
Not shown	1229	W	383900 395900	Status: Historical Licence No: 2569007007 Details: Process water Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, MOSS SIDE, MANCHESTER" Data Type: Point Name: SCOTTISH COURAGE BREWING LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 16/08/1995 Version End Date:
Not shown	1229	W	383900 395900	Status: Historical Licence No: 2569007007 Details: Process Water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES MOSS SIDE MANCHESTER Data Type: Point Name: Heineken UK Ltd Annual Volume (m³): 227000 Max Daily Volume (m³): 900 Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 23/11/2009 Version End Date:
Not shown	1229	W	383900 395900	Status: Historical Licence No: 2569007007 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, MOSS SIDE, MANCHESTER" Data Type: Point Name: SCOTTISH COURAGE BREWING LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 16/08/1995 Version End Date:
Not shown	1229	W	383900 395900	Status: Historical Licence No: 2569007007 Details: Process water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, MOSS SIDE, MANCHESTER Data Type: Point Name: SCOTTISH COURAGE BREWING LTD Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 31/12/2003 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1229	W	383900 395900	Status: Historical Licence No: 2569007007 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, MOSS SIDE, MANCHESTER Data Type: Point Name: SCOTTISH COURAGE BREWING LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 31/12/2003 Version End Date:
Not shown	1264	W	383865 395909	Status: Active Licence No: 2569007007 Details: Process Water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES MOSS SIDE MANCHESTER Data Type: Point Name: Heineken UK Ltd	Annual Volume (m³): 227000 Max Daily Volume (m³): 900 Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 103 Version Start Date: 08/05/2014 Version End Date:
Not shown	1264	W	383865 395909	Status: Active Licence No: 2569007007 Details: General Cooling (Existing Licences Only) (High Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES MOSS SIDE MANCHESTER Data Type: Point Name: Heineken UK Ltd	Annual Volume (m³): 227000 Max Daily Volume (m³): 900 Original Application No: - Original Start Date: 15/02/1966 Expiry Date: - Issue No: 103 Version Start Date: 08/05/2014 Version End Date:
Not shown	1570	NW	384180 397091	Status: Active Licence No: NW/069/0006/003 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE 1 AT LOWER CHATHAM STREET Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m³): 283240 Max Daily Volume (m³): 1532 Original Application No: - Original Start Date: 04/04/2014 Expiry Date: 31/03/2027 Issue No: 2 Version Start Date: 04/04/2014 Version End Date:
Not shown	1570	NW	384180 397091	Status: Active Licence No: NW/069/0006/003 Details: Heat Pump Direct Source: Ground Water - North West Region Point: BOREHOLE 1 AT LOWER CHATHAM STREET Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m³): 283240 Max Daily Volume (m³): 1532 Original Application No: - Original Start Date: 04/04/2014 Expiry Date: 31/03/2027 Issue No: 2 Version Start Date: 04/04/2014 Version End Date:
Not shown	1679	NW	383715 396746	Status: Active Licence No: NW/069/0004/003 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT MANCHESTER METROPOLITAN UNIVERSITY Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m³): 274115 Max Daily Volume (m³): 751 Original Application No: - Original Start Date: 20/09/2013 Expiry Date: 31/03/2027 Issue No: 1 Version Start Date: 01/01/2015 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1679	NW	383715 396746	Status: Active Licence No: NW/069/0004/003 Details: Heat Pump Direct Source: Ground Water - North West Region Point: BOREHOLE AT MANCHESTER METROPOLITAN UNIVERSITY Data Type: Point Name: Manchester Metropolitan University	Annual Volume (m³): 274115 Max Daily Volume (m³): 751 Original Application No: - Original Start Date: 20/09/2013 Expiry Date: 31/03/2027 Issue No: 1 Version Start Date: 01/01/2015 Version End Date:
Not shown	1704	N	385240 397540	Status: Historical Licence No: 2569006001 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, BROADIE ST, ARDWICK, MANCHESTER" Data Type: Point Name: MOSELEY RUBBER CO LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 08/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 08/02/1966 Version End Date:
Not shown	1704	N	385240 397540	Status: Historical Licence No: 2569006001 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, BROADIE ST, ARDWICK, MANCHESTER Data Type: Point Name: MOSELEY RUBBER CO LTD	Annual Volume (m³): 331858 Max Daily Volume (m³): 909.2 Original Application No: - Original Start Date: 08/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 08/02/1966 Version End Date:
Not shown	1906	W	383220 395850	Status: Historical Licence No: 2569007009 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, MOSS LANE WEST MANCHESTER" Data Type: Point Name: HYDES BREWERY LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 07/10/2000 Version End Date:
Not shown	1906	W	383220 395850	Status: Historical Licence No: 2569007009 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, MOSS LANE WEST MANCHESTER Data Type: Point Name: HYDES BREWERY LTD	Annual Volume (m³): 66826.2 Max Daily Volume (m³): 372.772 Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 07/10/2000 Version End Date:
Not shown	1906	W	383220 395850	Status: Historical Licence No: 2569007009 Details: Process water Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, MOSS LANE WEST MANCHESTER" Data Type: Point Name: HYDES BREWERY LTD	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 07/10/2000 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1906	W	383220 395850	Status: Active Licence No: 2569007009 Details: Process Water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, MOSS LANE WEST MANCHESTER Data Type: Point Name: HYDES BREWERY LTD	Annual Volume (m³): 66826.2 Max Daily Volume (m³): 372.772 Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 103 Version Start Date: 19/07/2018 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site None identified

Database searched and no data found.

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site None identified

Database searched and no data found.

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site Identified

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distance (m)	Direction	Zone	Description
1	0	On Site	3	Total catchment

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site None identified

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

Database searched and no data found.

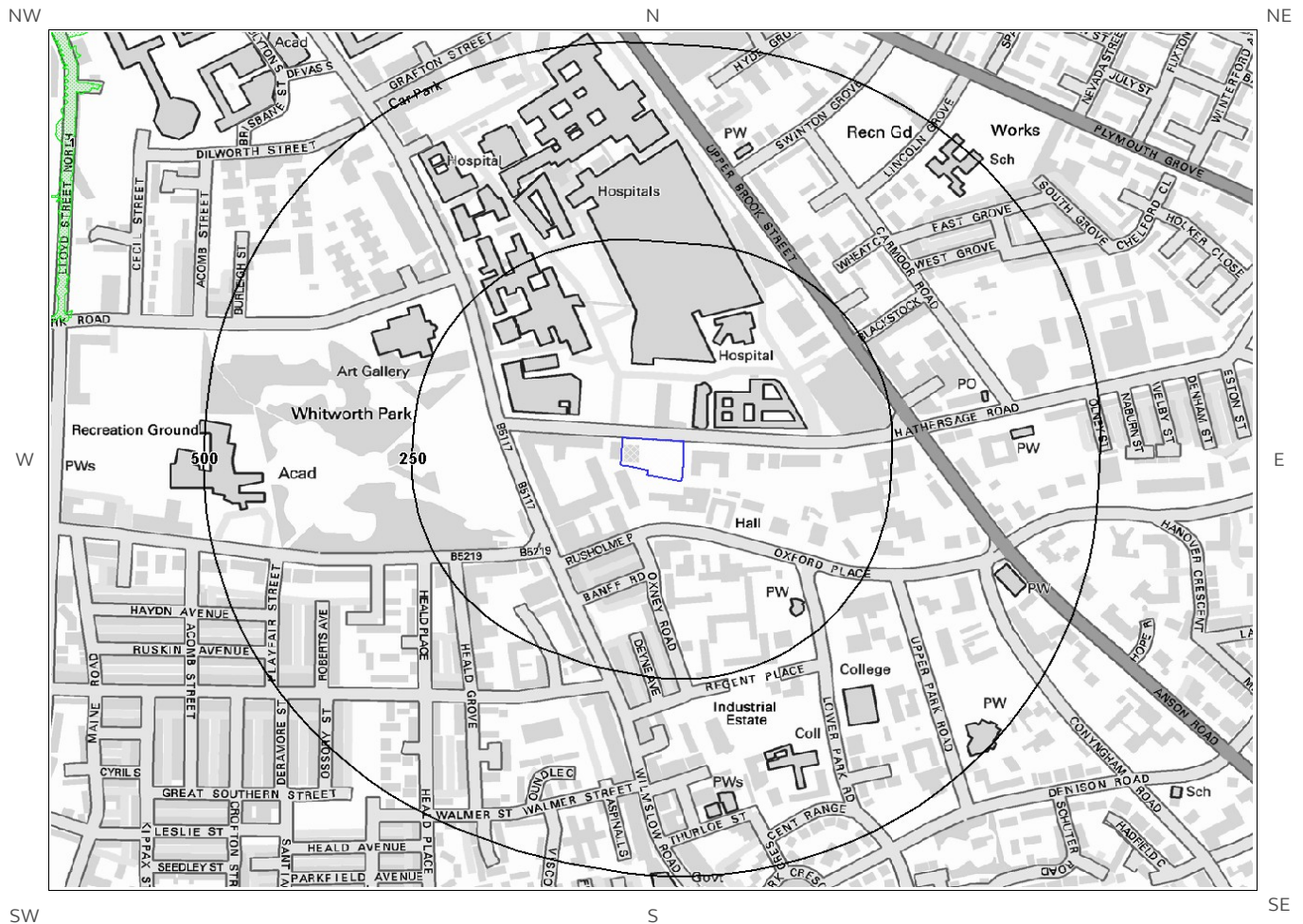
6.11 Surface Water Features

Surface water features within 250m of the study site

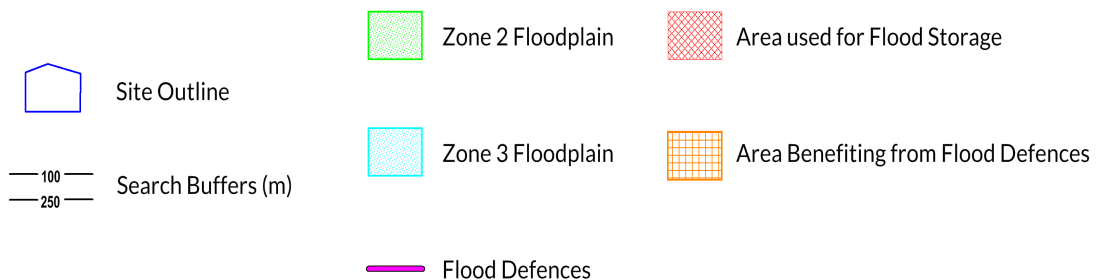
None identified

Database searched and no data found.

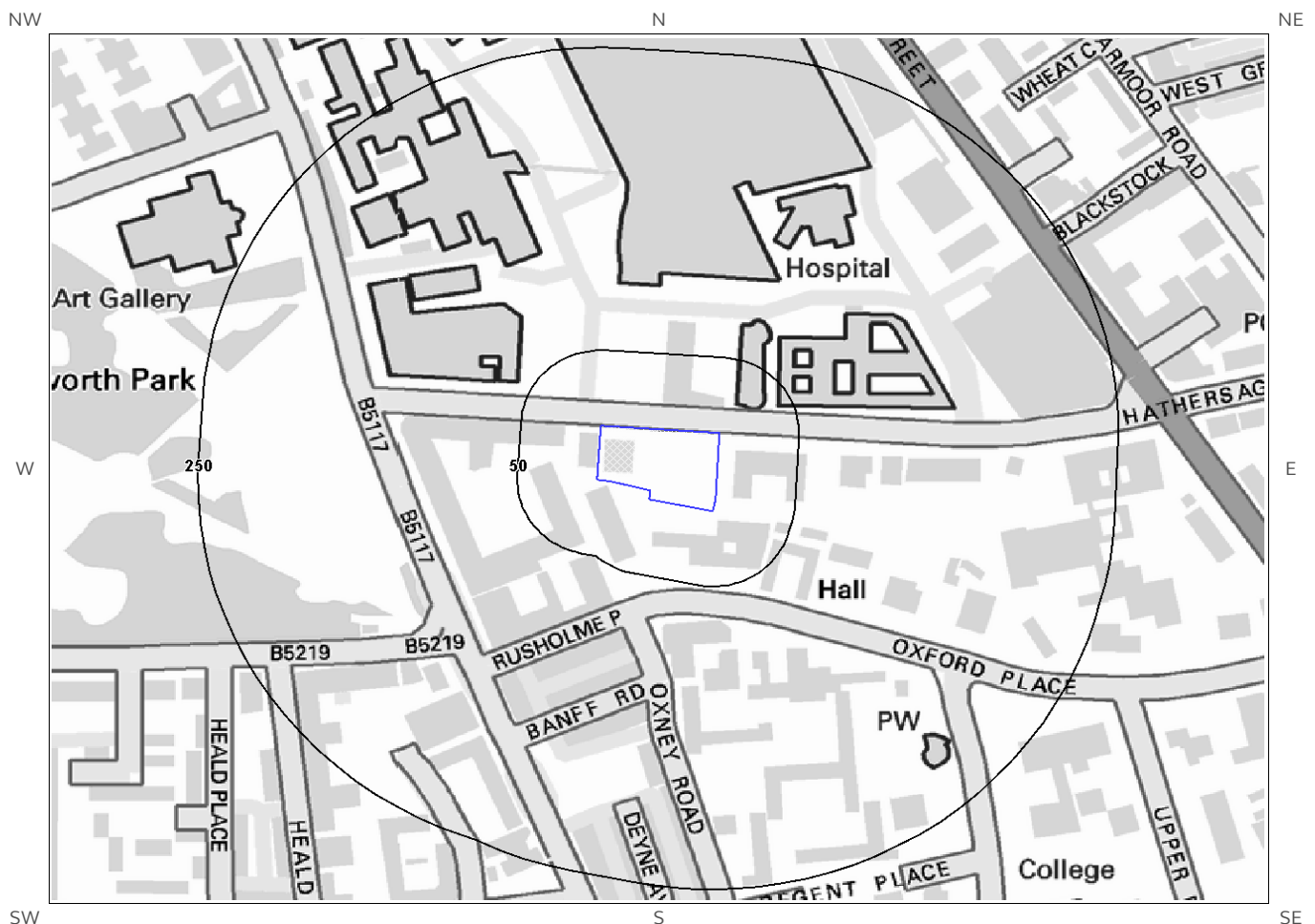
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



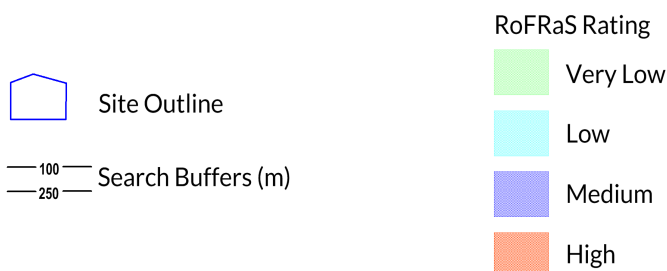
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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m None identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m None identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Flood Defences within 250m of the study site None identified
Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site None identified

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site

None identified

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site

Identified

Clearwater Flooding or Superficial Deposits Flooding

Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

7.8 Groundwater Flooding Confidence Areas

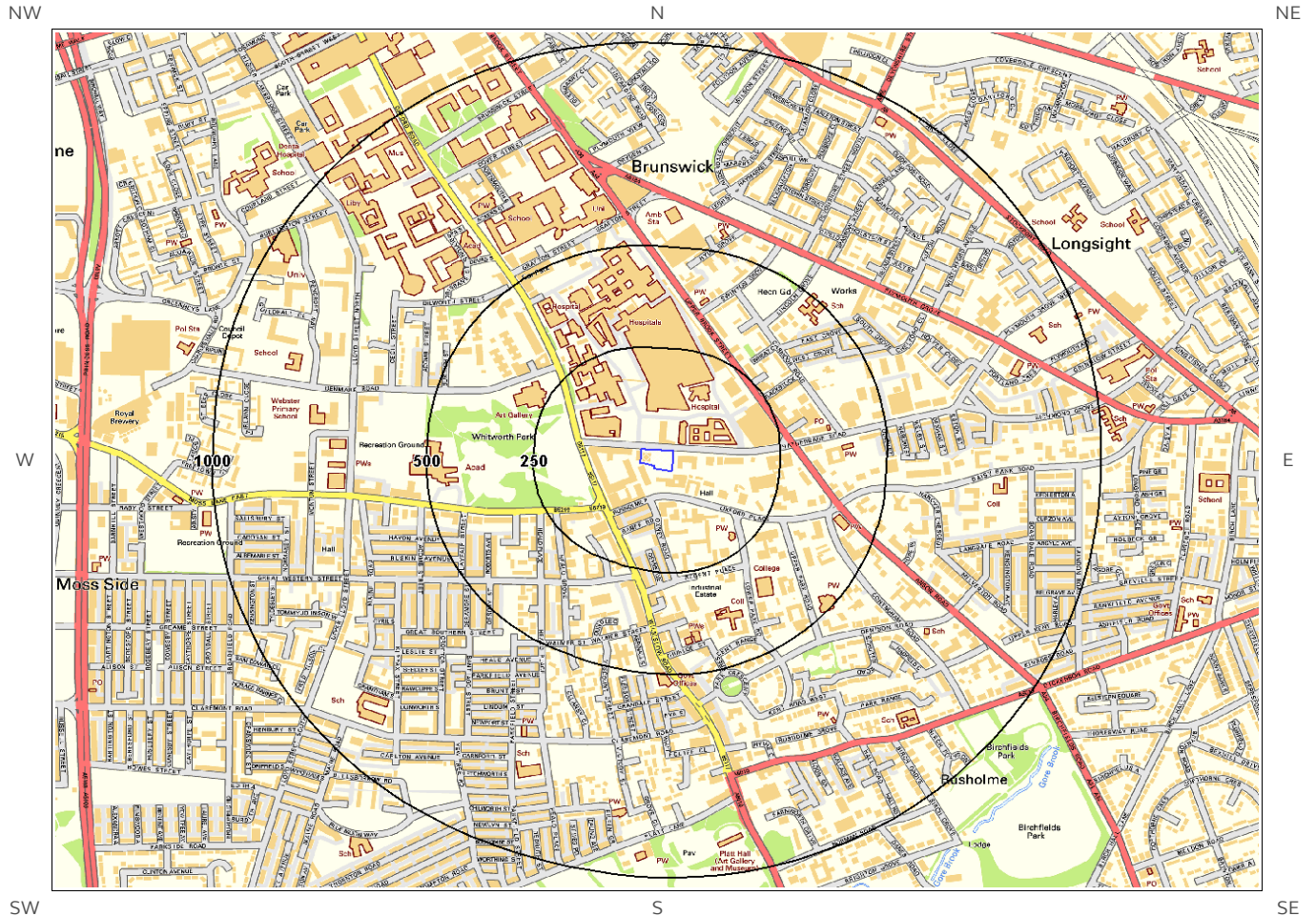
British Geological Survey confidence rating in this result

Moderate

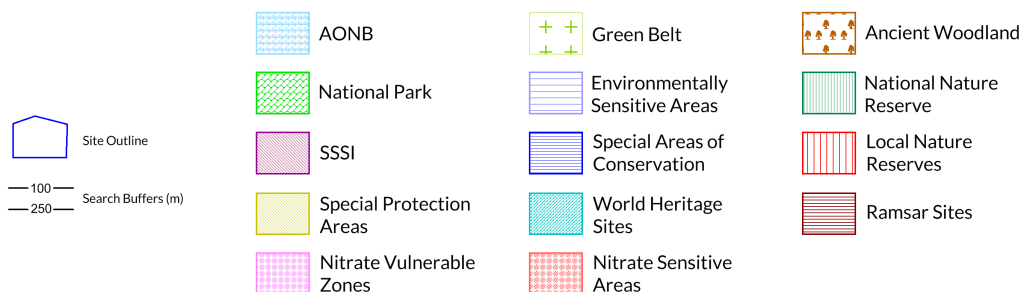
Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site

None identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

0

Database searched and no data found.

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **Groundsure Geo Insight**, available from our **website**. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell** hazard rating identified on the study site Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site

Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site

Identified

The following coal mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0	On Site	The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary

None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site

None identified

Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:

Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency

National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 03708 506 506

Web: www.environment-agency.gov.uk

Email: enquiries@environment-agency.gov.uk

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe

Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority

Authority: Manchester City Council
Phone: 0161 234 5000
Web: <http://www.manchester.gov.uk/>
Address: , Manchester, M60 2LA

Gemapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444



Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.

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Conveyancing Department

Ove Arup & Partners International Ltd
6th Floor, 3 PICCADILLY PLACE,
MANCHESTER, M1 3BN

Groundsure Reference: GS-5962523
Your Reference: 267661-11
Report Date: 24 Apr 2019
Report Delivery Method: **xml**

Client Email: tom.hartley@arup.com

Groundsure Radon Check

**Address: MANCHESTER DIABETES CENTRE, 193 MANCHESTER
DIABETIES CENTRE, HATHERSAGE ROAD, MANCHESTER, M13
0JE**

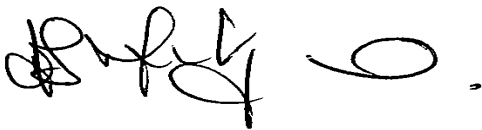
Dear Sir/Madam,

Thank you for placing your order with Groundsure.

Please find enclosed the Groundsure Radon Check as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Radon Check

Groundsure Radon Check

Address: MANCHESTER DIABETES CENTRE, 193 MANCHESTER DIABETES CENTRE,
HATHERSAGE ROAD, MANCHESTER, M13 0JE

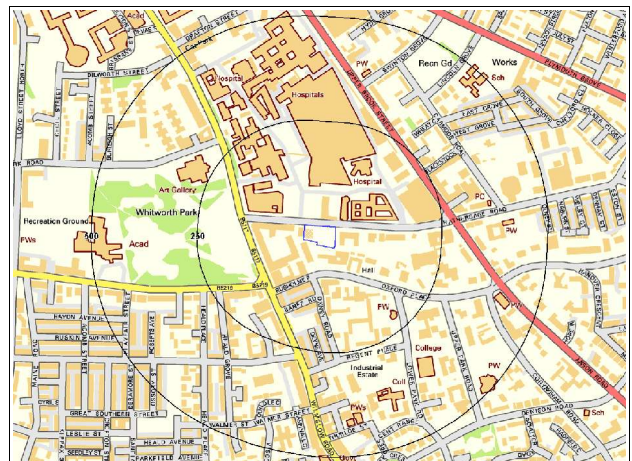
Date: 24 Apr 2019

Groundsure Reference: GS-5962523

Your Reference: 267661-11

Grid Reference: 385172,395812

Client: Ove Arup & Partners International Ltd



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Report Reference: [GS-5962523](#)

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If you would like any further assistance regarding this report then please contact
Groundsure on (T) 08444 159 000, email: info@groundsure.com

1. Residential Radon Potential Result

1.1 Is the property in a Radon Affected Area?

The information in this section provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as *CON29 standard Enquiry of Local Authority; 3.13 Radon Gas: Location of the Property in a Radon Affected Area*.

Question: Is the property in a Radon Affected Area as defined by Public Health England(PHE) and if so what percentage of homes are above the Action Level?

Answer: The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

1.2 Are radon protective measures required?

The information in this section will detail the level of protection required for new dwellings under as described in the latest Building Research Establishment guidance on radon protective measures for new dwellings. This may include extensions to the property.

Question: Is the property in an area where radon protection measures are required for new properties or extensions to existing ones as described in either publications BR211 (England and Wales) or BR376 (Scotland) by the Building Research Establishment?

Answer: No radon protective measures are necessary.

1.3 Radon Guidance

Radon is a colourless, odourless radioactive gas which is present in all areas of the United Kingdom, usually at levels that pose a negligible risk to homebuyers. However, in some areas levels of radon are much higher than in others, and in these cases it can pose a health risk. The data supplied by the Public Health England (PHE) and the British Geological Survey (BGS) is not able to determine exact Radon levels, as this information can only be obtained through site-specific, in-situ testing. As less than 1% of properties in the area may be radon affected, the PHE do not consider that further action is necessary.

The responses given on the level of radon protective measures required are based on a joint radon potential dataset from the Public Health England (PHE) and the British Geological Survey (BGS). No radon protective measures are required for new builds or extensions.

1.4 Further details on radon

Radon is a naturally occurring radioactive gas, which enters buildings from the ground. Outdoors, it is diluted to very low levels. However, in some cases the radon level indoors can build up to high concentrations. In such cases, it does pose a serious risk to health. Exposure to high concentrations increases the risk of lung cancer. Public Health England recommends that radon levels should be reduced in homes where the annual average is at or above 200 becquerels per cubic metre (200 Bq m⁻³). This is termed the Action Level. Public Health England defines Radon Affected Areas as those with 1% chance or more of a house having a radon concentration at or above the Action Level of 200 Bq m⁻³.

The joint PHE-BGS digital Radon Potential Dataset used in this report provides the current definitive map of Radon Affected Areas in England and Wales.

Indoor radon levels can usually be substantially reduced at a cost comparable to many home improvements, such as replacing carpets. Details of methods of reducing radon levels are given on the Building Research Establishment Website. <http://www.bre.co.uk/radon/index.html>

2. Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com



Local Authority - Manchester City Council.
Address: Town Hall, Albert Square, Manchester,
M60 2LA. Web: www.manchester.gov.uk. Tel:
0161 234 5000

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143. Fax: 0115 936 3276.
Email: enquiries@bgs.ac.uk
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general
geological enquiries



Public Health England

Public information access office, Public Health
England
Wellington House, 133-155 Waterloo Road,
London, SE1 8UG
[https://www.gov.uk/government/organisations/
public-health-england](https://www.gov.uk/government/organisations/public-health-england)
Email: enquiries@phe.gov.uk



Ordnance Survey
Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505



CoPSO
29 Harley Street, London W1G 9QR
Tel: 020 7927 6836
(www.copso.org.uk)



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- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

COMPLAINTS

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if they find that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details:

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Website: www.tpos.co.uk
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Report Reference: [GS-5962523](#)

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If you would like any further assistance regarding this report then please contact Groundsure on (T) 08444 159 000, email: info@groundsure.com

COMPLAINTS PROCEDURE

If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

Complaints should be sent to: Groundsure Ltd, Sovereign House, Church Street, Brighton, BN1 1UJ. Tel: 08444 159 000. Email: info@groundsure.com

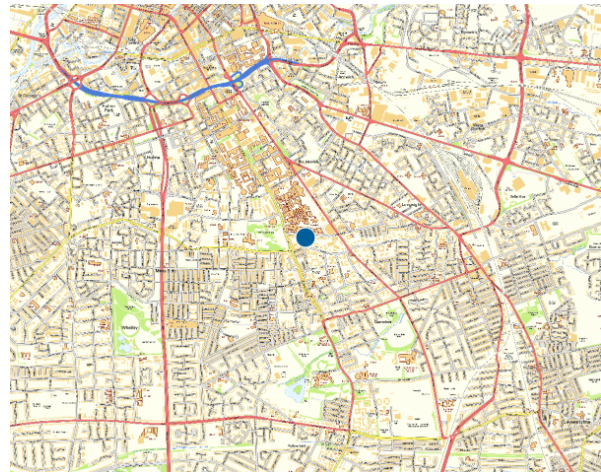
If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with their final decision.

3. Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:
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Preliminary Unexploded Ordnance Risk Assessment



Project: MANCHESTER DIABETES CENTRE, 193 MANCHESTER DIABETES CENTRE,
HATHERSAGE ROAD, MANCHESTER, M13 0J...

Groundsure Ref: GS-5962527

Report prepared by Dynasafe BACTEC Limited and FIND Mapping Limited

Report reference: 503289

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Preliminary Unexploded Ordnance Threat Assessment

MANCHESTER DIABETES CENTRE, 193 MANCHESTER DIABETIES CENTRE, HATHERSAGE ROAD, MANCHESTER, M13 0J...

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1 Executive Summary

1 Has a potential unexploded ordnance (UXO) risk been identified at the site in question?

YES

Indicative British / Allied UXO Risk

LOW

Indicative German UXO Risk

MEDIUM

2 Does the site in question require further research to clarify the unexploded ordnance (UXO) risk to future ground works?

YES

3 Dynasafe BACTEC's recommendation:

A Stage 2 Detailed Unexploded Ordnance Desktop Threat Assessment of the site is carried out.

To request a quotation please call Dynasafe BACTEC Limited on 01322 284 550

If you order the recommended Stage 2 Detailed Desktop Threat Assessment, you will be refunded the fee for this BombRisk Preliminary Threat Assessment.

2 Introduction

About Dynasafe BACTEC Limited

Since 1991, Dynasafe BACTEC Limited has supported the UK construction industry by assessing the risk of encountering items of unexploded ordnance (UXO) during intrusive works. Dynasafe BACTEC's specialist advice provides essential information for threat assessments, improving safety and enhancing reputations, helping contractors avoid costly delays.

Dynasafe BACTEC holds the following accreditations: Occupational Health & Safety Management Systems (OHAS 18001:2007), Environmental Management Systems (ISO 14001:2004) and Quality Management Systems (ISO 9001:2008).

The risk of encountering UXO on most sites in the UK is low. However, where a site is at increased risk it is necessary to take measures to mitigate that risk. The factors affecting UXO threat assessment are based upon the history and previous usage of a site and its surroundings.

In 2009, the Construction Industry Research and Information Association (CIRIA) established a set of guidelines to assist industry professionals.

CIRIA recommends a four stage risk management process:

- **Preliminary threat assessment**
- **Detailed threat assessment**
- **Risk mitigation**
- **Implementation**

The preliminary threat assessment enables a non-UXO specialist to place a site in context and to identify whether a more detailed assessment is necessary. The assessment is based upon data obtained from desktop reviews of the site's history and its proximity to potential indicators of UXO contamination.

There are two principal groups of onshore UXO in the UK:

- **British / Allied Army, Air Force and Navy activities – domestic military activity**
- **Enemy bombing during WWI and WWII – aerial bombing and naval bombardment**

These two groups comprise many potential UXO risk contributing sources within the UK, the most significant of which are listed below. Georeferenced databases containing this information are used by BombRisk.com to identify areas of potentially elevated UXO risk.

- **Historic army, navy and air-force facilities**
- **Explosives / ammunition factories**
- **Munitions storage depots**
- **Historic military training areas and firing ranges**

- British army explosive ordnance clearance tasks / recces
- WWII heavy anti-aircraft batteries
- WWII anti-invasion defensive fortifications
- Miscellaneous WWII pipe mined locations
- WWII prisoner of war camps
- WWII German bombing density statistics
- WWII bombing decoy sites
- Press articles regarding UXO finds
- Locations of Dynasafe BACTEC UXO finds
- Locations of Dynasafe BACTEC desktop threat assessments
- Locations of Dynasafe BACTEC on-site support services

About FIND Mapping Limited

Established in 2006, FIND Mapping Limited is a pioneering web mapping and spatial data technology company offering online mapping and consultancy services. FIND technology powers the generation of this report.

www.findmaps.co.uk provides detailed mapping and a wealth of data sets to hundreds of the UK's top property, environmental and design/build companies.

FIND's consultancy services provide bespoke internet mapping solutions to a range of businesses enabling them to manage their spatial data more effectively.

While working closely with a wide range of reputable data providers including Ordnance Survey and the Environment Agency, FIND works independently of these organisations. A similar arm's-length relationship is maintained in terms of software and hardware providers. This enables the team at FIND to offer truly independent advice.

3 Methodology

Dynasafe BACTEC Limited and FIND have compiled a geo-referenced database of potential sources of UXO risk within the UK. From this information a range of risk zones have been defined.

The weighting of these zones is based upon the influence of all relevant factors. A WWII-era RAF airfield, for example, has a far greater zone of influence than a single WWII-era Anti-Aircraft Battery, as it would have covered a larger area, housed a much greater quantity / variety of munitions, seen more domestic troop training activities and would have been a more likely target for enemy bombers.

An online Preliminary Automated UXO Threat Assessment will determine an indicative level of UXO risk relating to a site. Note that these risk levels could be subject to change following the completion of any Detailed Desktop Threat Assessment for the same site.

The assessment will list all factors contributing to this weighting and will also give appropriate recommendations for further action, if considered necessary.

4 Search Results

Dynasafe BACTEC Limited's UXO Source Database

Within 10km of the site the following potential sources of explosive ordnance have been recorded:

Source	Number within 10km
Bombing Decoy Sites	1
Abandoned Bombs	4
Press Articles regarding UXO Finds	7
WWII Defence Related Positions & Pillboxes	12
Historic Army Camps	4
Prisoner of War Camps	1
Heavy Anti-Aircraft Batteries	23
Army Explosive Ordnance Clearance Tasks/Recces	4
Sites Related to the Manufacture of Explosives and Explosive Ordnance	8
Dynasafe BACTEC Desk-top Threat Assessments	13
Military Airfield Facilities	None recorded
Military Training Areas and Firing Ranges	None recorded
Pipe Mined WWII Airfields	None recorded
Miscellaneous WWII Pipe Mined Locations	None recorded
Dynasafe BACTEC Unexploded Ordnance Finds	None recorded
Dynasafe BACTEC On-Site Support Services	None recorded

Of these sources, the following are deemed the most significant:

Sites Related to the Manufacture of Explosives and Explosive Ordnance

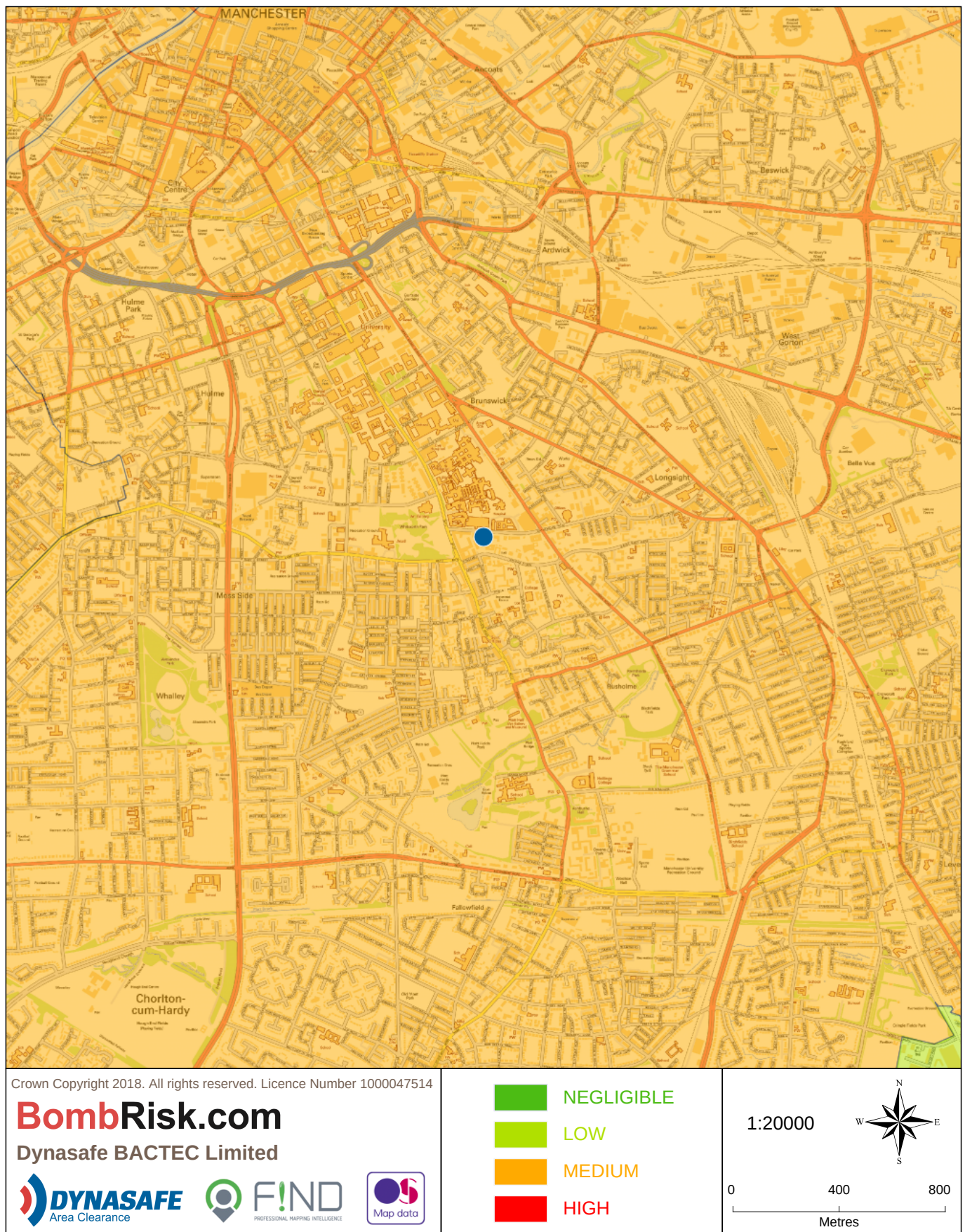
Facility Name	Approximate distance (km) from site
H M Factory, M N Morris and Co Ltd, Gorton Brook, West Gorton, Great War, chemical works - synthetic phenol, MNT; explosives fac	2.2

During both WWI and WWII many factories were established (or existing sites converted) to produce explosives and/or fill ordnance with explosive and chemical constituents. These ranged from small engineering works to large National Filling Factories (WWI) and Royal Ordnance Factories (WWII). The site of the proposed works lies in the vicinity of one of these facilities.

For a factory producing casings, for example, the associated risk is negligible. However, on sites

handling or producing explosive and chemical weapons the risk of soil contamination can be high. Disposal areas (often on site boundaries) can pose considerable risk. The history of the facility should be more fully researched.

5 Risk of UXO based on WWII German bombing density



6 Conclusions

Risk Levels and Recommendation

Indicative British / Allied UXO Risk

LOW

There are potential sources of British / Allied UXO recorded in Dynasafe BACTEC's historical database in the general area surrounding the site. However, they are not considered close enough to the site or significant enough to warrant further research. If there is any empirical evidence of actual or potential contamination, Dynasafe BACTEC should be contacted for advice. Otherwise, the risk on site from UXO is considered to be Low.

Indicative German UXO Risk

MEDIUM

Historical records indicate a medium level of bombing density across the borough in which the site was situated during WWII.

More research should be undertaken to identify whether the site itself was bombed or damaged during WWII.

This preliminary assessment has identified a Medium risk from German unexploded bombs at this site.

Conclusion

This preliminary assessment has resulted in an overall Medium risk from UXO. Dynasafe BACTEC would recommend that a Detailed UXO Threat Assessment Desk Top Study is undertaken for this site.

Detailed assessments are conducted offline by Dynasafe BACTEC's researchers and use information such as historical mapping, WWII-era aerial photography, written air-raid precaution records and where necessary local archive research to fully qualify the risk on site. Land use, changes to building layout during WWII and post war redevelopment will also have an impact on any remaining level of risk from UXO. It is often possible to 'zone' sites into different risk categories. The lead time for a detailed assessment will vary between 3-10 working days dependent upon the complexity of the site and the additional site specific information required.

For a quotation, or more information, please contact Dynasafe BACTEC on 01322 284 550.

www.bombrisk.com



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CENTRE, 193 MANCHESTER
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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: 1056 Scale Town Plan

Map date: 1848-1850

Scale: 1:1,056

Printed at: 1:1,056



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Client Ref: 267661-11
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Map Name: County Series

Map date: 1881

Scale: 1:2,500

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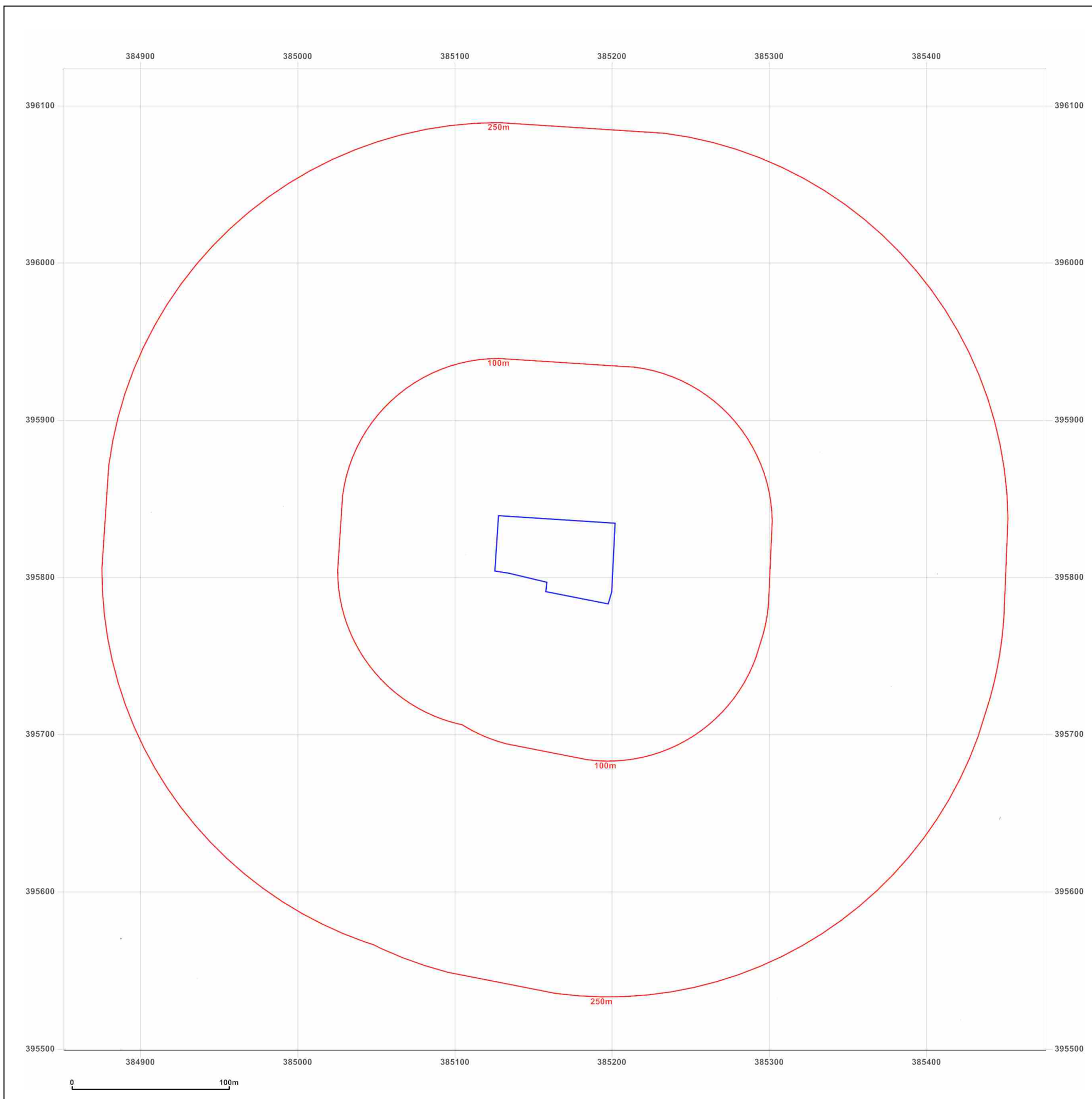


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Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: County Series Town Plan

Map date: 1891

Scale: 1:500

Printed at: 1:1,000



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Map Name: County Series

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Map Name: County Series

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Map Name: County Series

Map date: 1922

Scale: 1:2,500

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Grid Ref: 385163, 395811

Map Name: County Series

Map date: 1933

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Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1949-1950

Scale: 1:1,250

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Map date: 1949-1950

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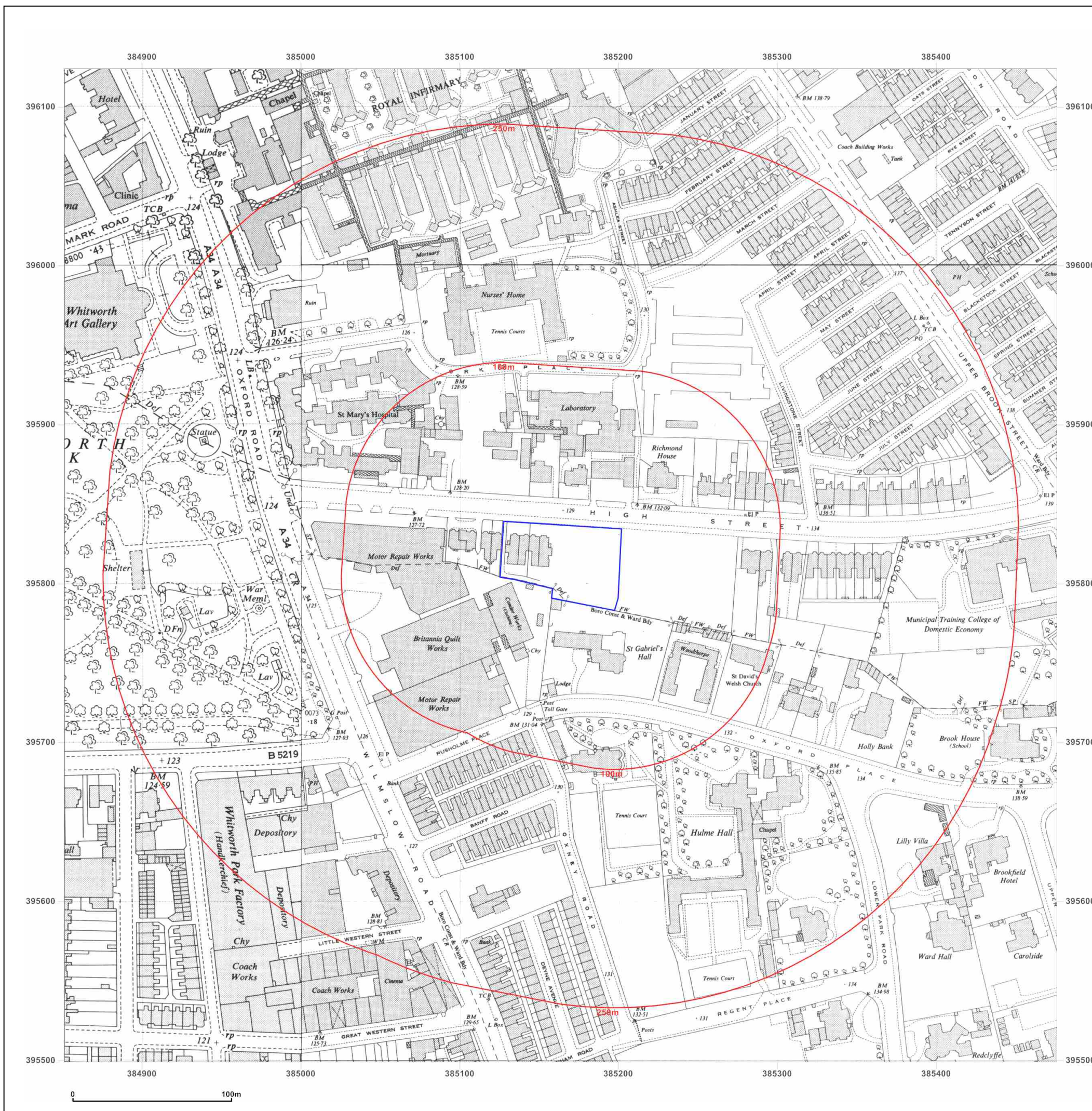


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Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1986-1989

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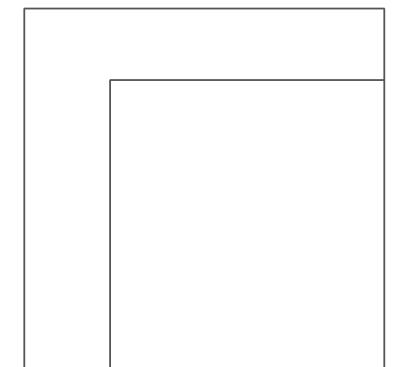
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Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1991

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Map Name: National Grid

Map date: 1991-1992

Scale: 1:1,250

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Map Name: National Grid

Map date: 1993-1994

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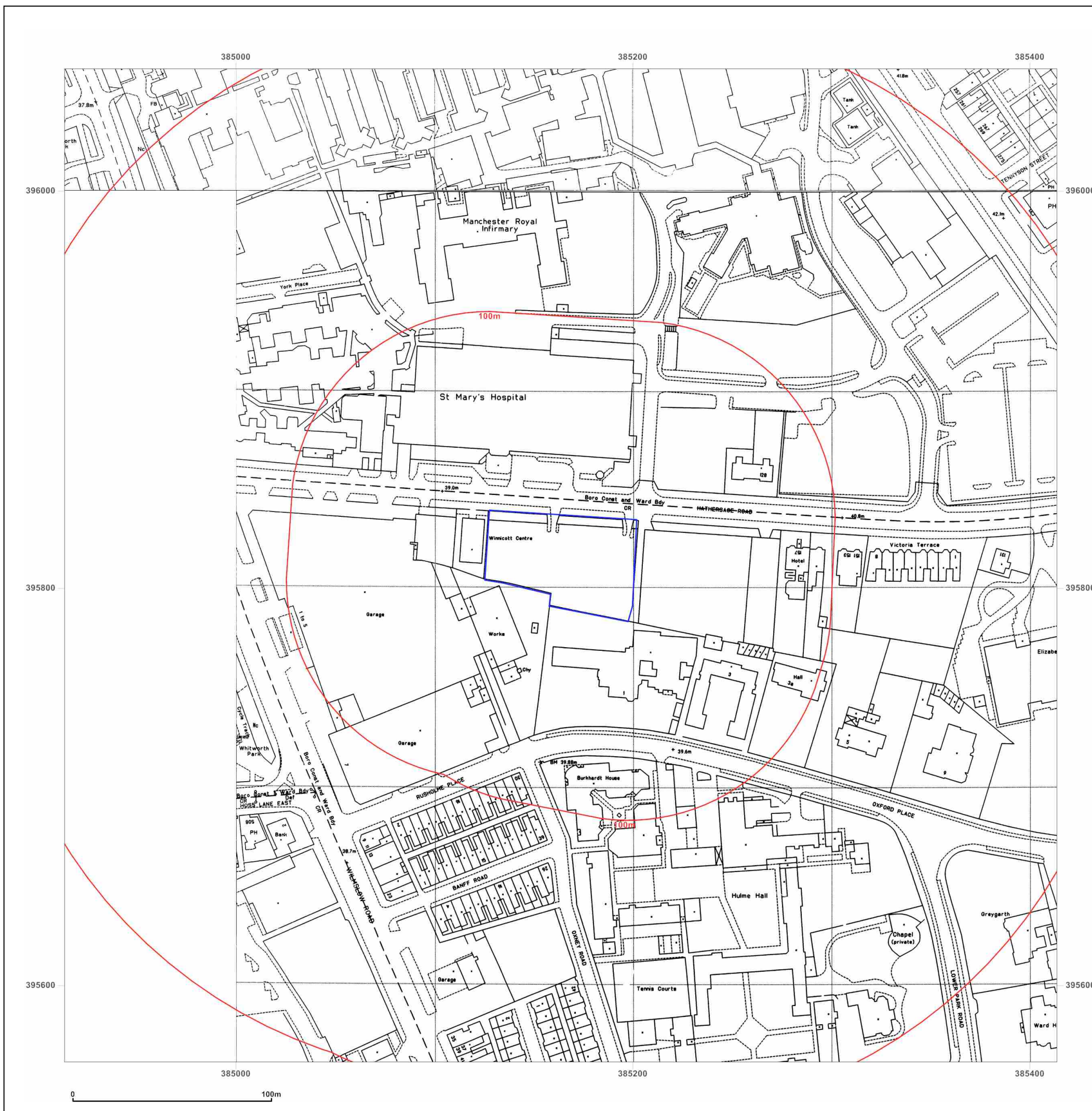


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Site Details:

MANCHESTER DIABETES
CENTRE, 193 MANCHESTER
DIABETES CENTRE,
HATHERSAGE ROAD,
MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1991-1994

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1993
Revised 1993
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1963
Revised 1991
Edition N/A
Copyright 1991
Levelled 1963

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1994
Levelled N/A

Surveyed 1965
Revised 1991
Edition N/A
Copyright 1991
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Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1992-1994

Scale: 1:1,250

Printed at: 1:2,000



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

Surveyed 1994
Revised 1994
Edition N/A
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HATHERSAGE ROAD,
MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: County Series

Map date: 1848-1849

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised N/A
Edition 1848
Copyright N/A
Levelled N/A

Surveyed 1845
Revised 1849
Edition 1849
Copyright N/A
Levelled N/A

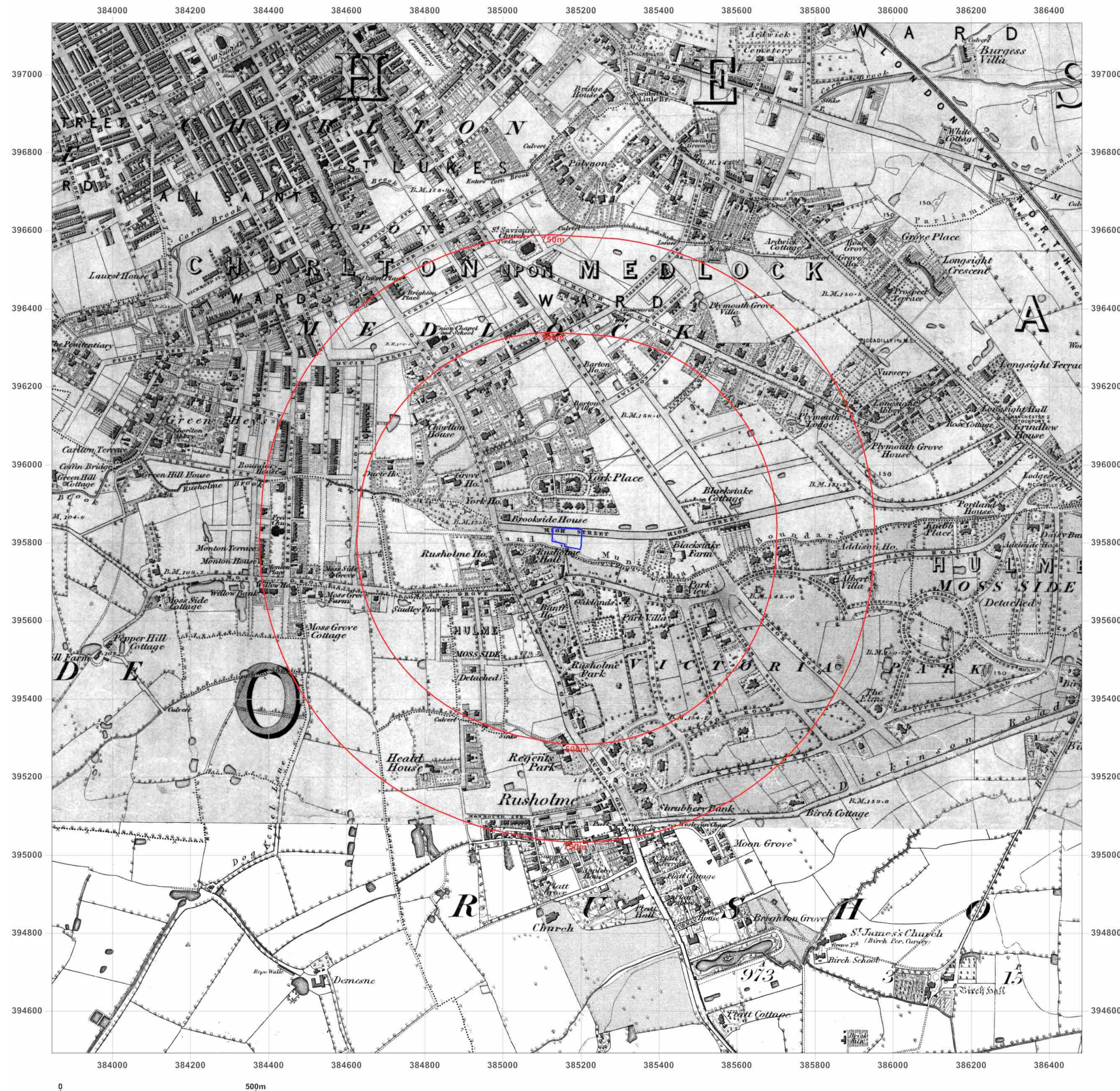


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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: County Series

Map date: 1890-1892

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1890 Revised 1890 Edition 1890 Copyright N/A Levelled N/A	
Surveyed 1892 Revised 1892 Edition 1892 Copyright N/A Levelled N/A	



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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: County Series

Map date: 1905

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1905
Edition 1905
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Surveyed 1844
Revised 1905
Edition 1905
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Surveyed 1892
Revised 1905
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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: County Series

Map date: 1923

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

Surveyed 1844
Revised 1915
Edition 1923
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Levelled 1915

Surveyed 1844
Revised 1916
Edition 1923
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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: County Series

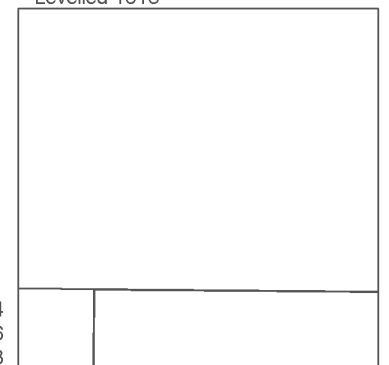
Map date: 1923

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915



Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

Surveyed 1844
Revised 1916
Edition 1923
Copyright N/A
Levelled 1915

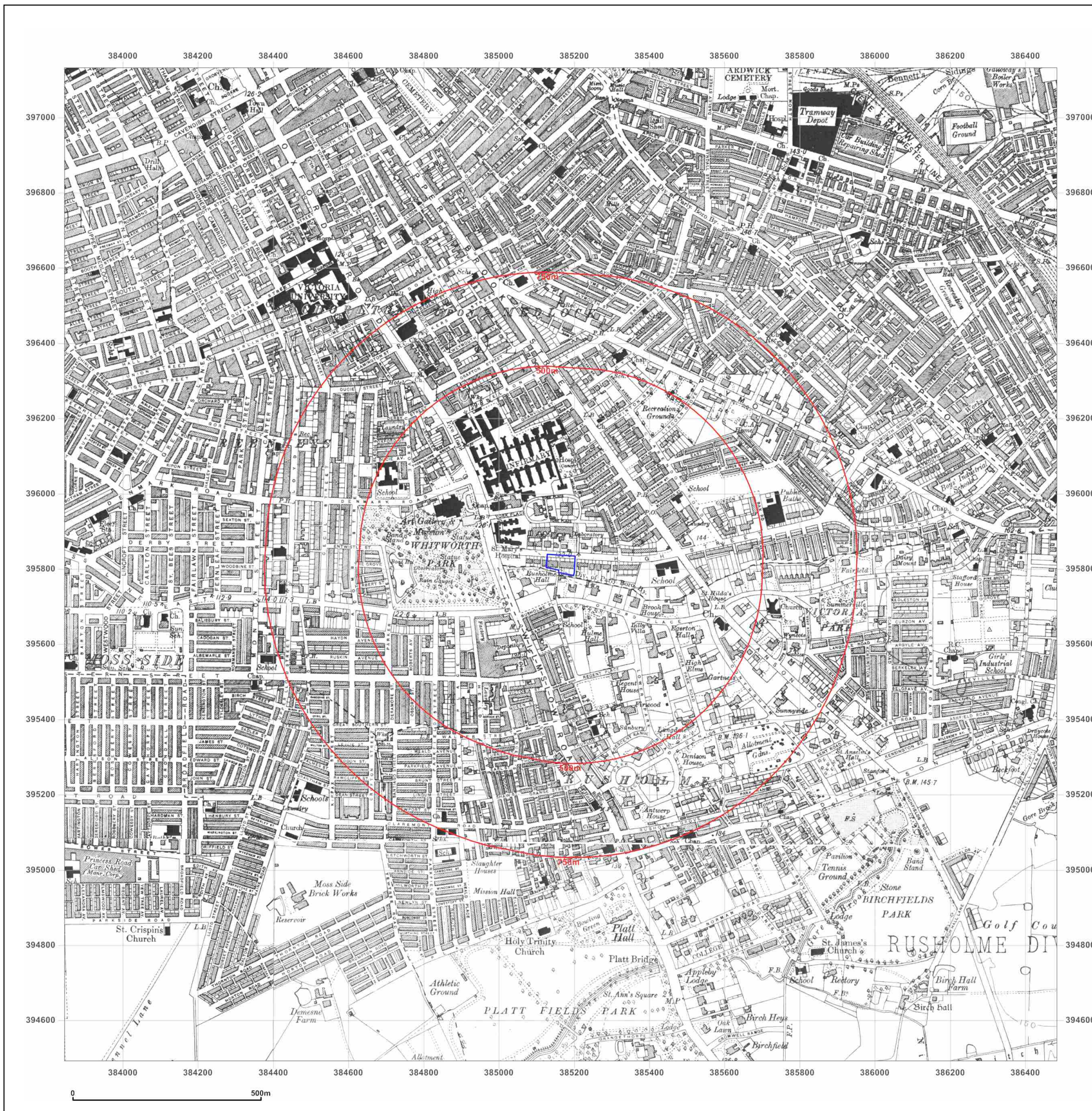


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Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

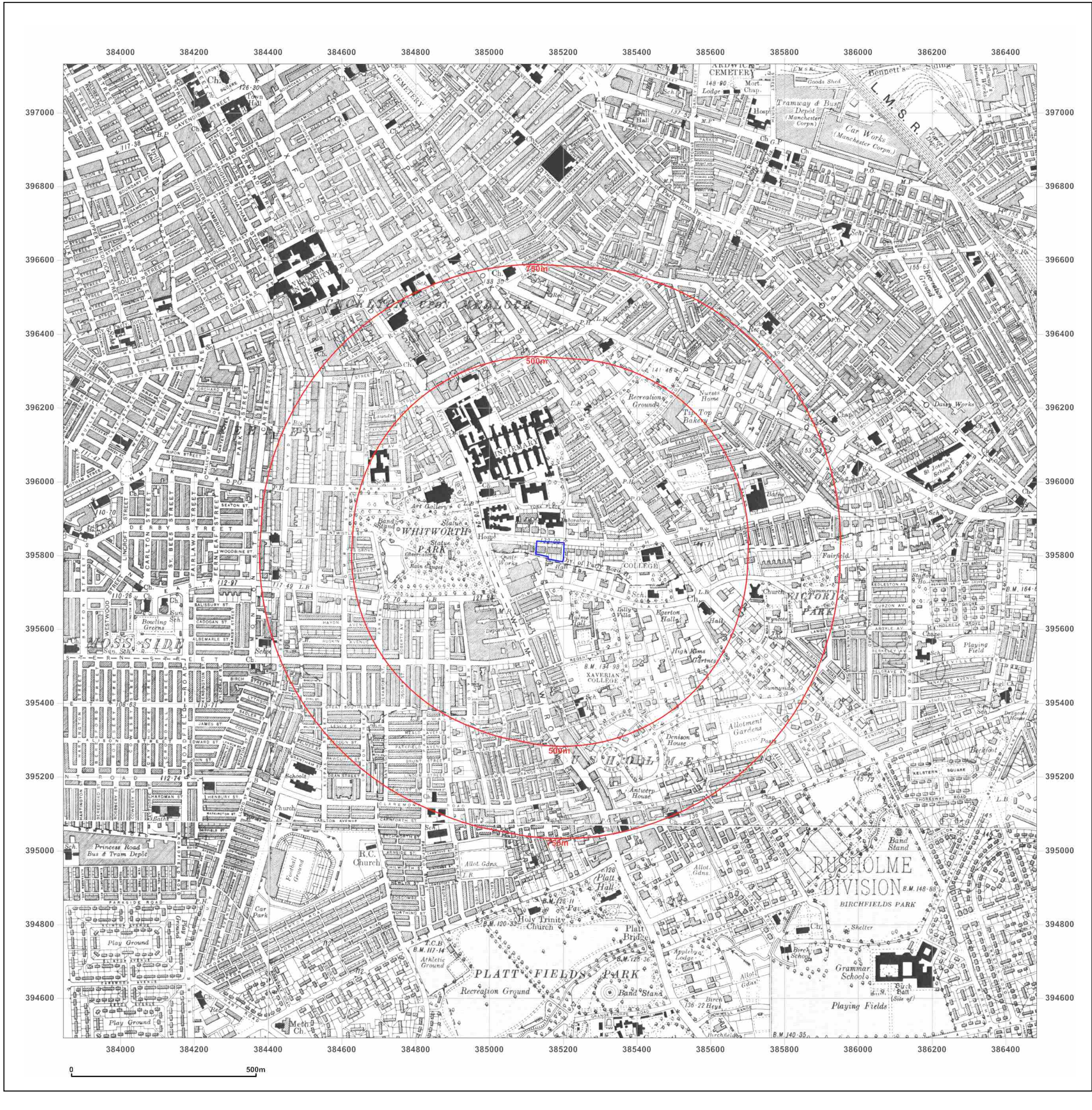
Map Name: County Series
Map date: 1932-1934
Scale: 1:10,560
Printed at: 1:10,560



Surveyed 1844 Revised 1932 Edition 1932 Copyright N/A Levelled 1927		Surveyed 1844 Revised 1934 Edition 1934 Copyright N/A Levelled 1927
Surveyed 1844 Revised 1934 Edition 1934 Copyright N/A Levelled 1927		Surveyed 1844 Revised 1934 Edition 1934 Copyright N/A Levelled 1927



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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1844
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Edition 1938
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1938
Edition 1938
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Levelled 1927

Surveyed 1844
Revised 1938
Edition 1938
Copyright N/A
Levelled 1927

Surveyed 1844
Revised 1938
Edition 1938
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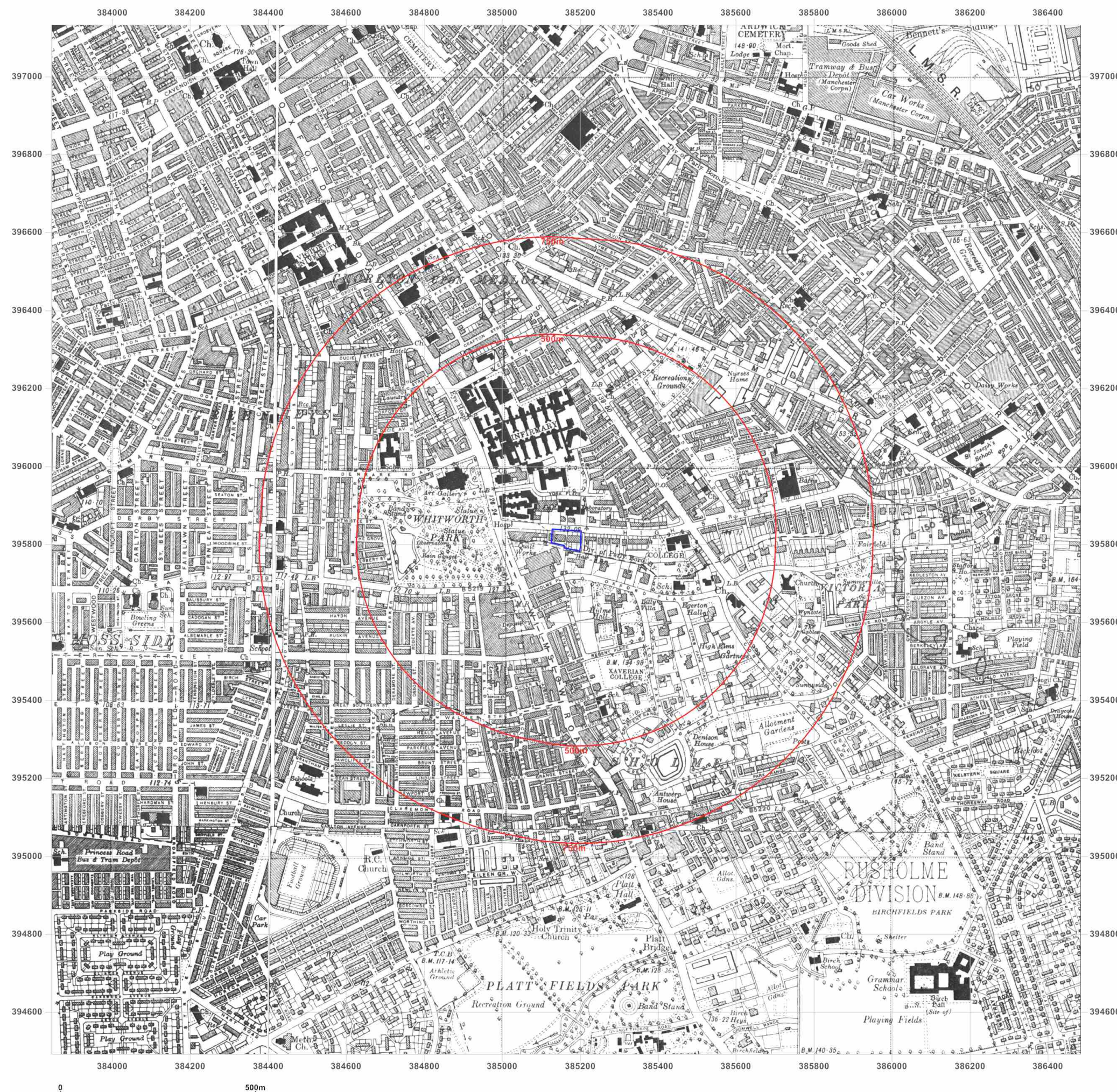


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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: Provisional

Map date: 1955-1956

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1956
Revised 1956
Edition N/A
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Levelled N/A

Surveyed 1956
Revised 1956
Edition N/A
Copyright 1956
Levelled N/A

Surveyed N/A
Revised 1955
Edition N/A
Copyright 1955
Levelled N/A

Surveyed N/A
Revised 1955
Edition N/A
Copyright 1955
Levelled N/A

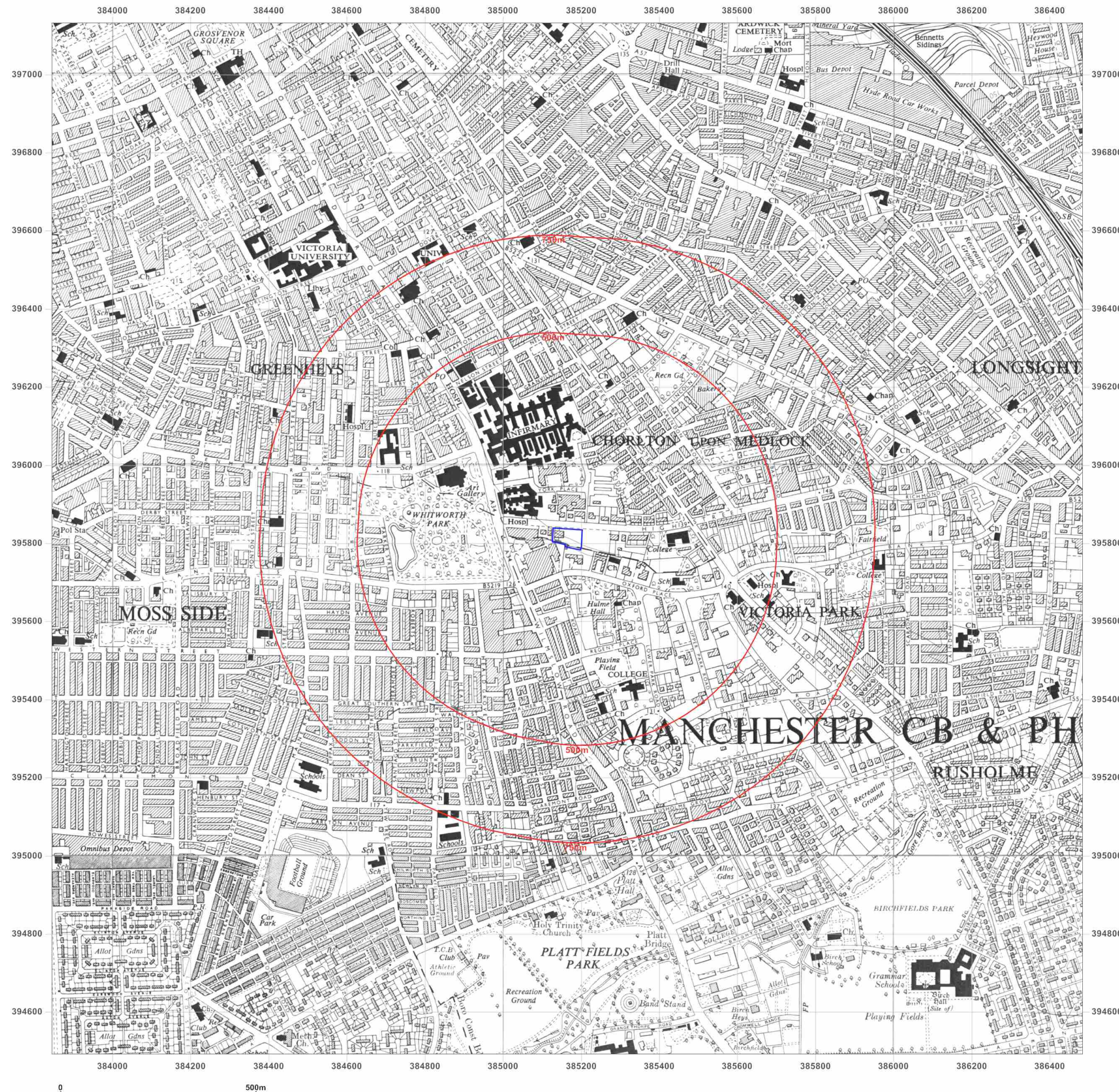


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Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: Provisional

Map date: 1965-1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1968
Revised 1968
Edition N/A
Copyright 1968
Levelled N/A

Surveyed 1966
Revised 1966
Edition N/A
Copyright 1966
Levelled N/A

Surveyed 1965
Revised 1965
Edition N/A
Copyright 1965
Levelled N/A

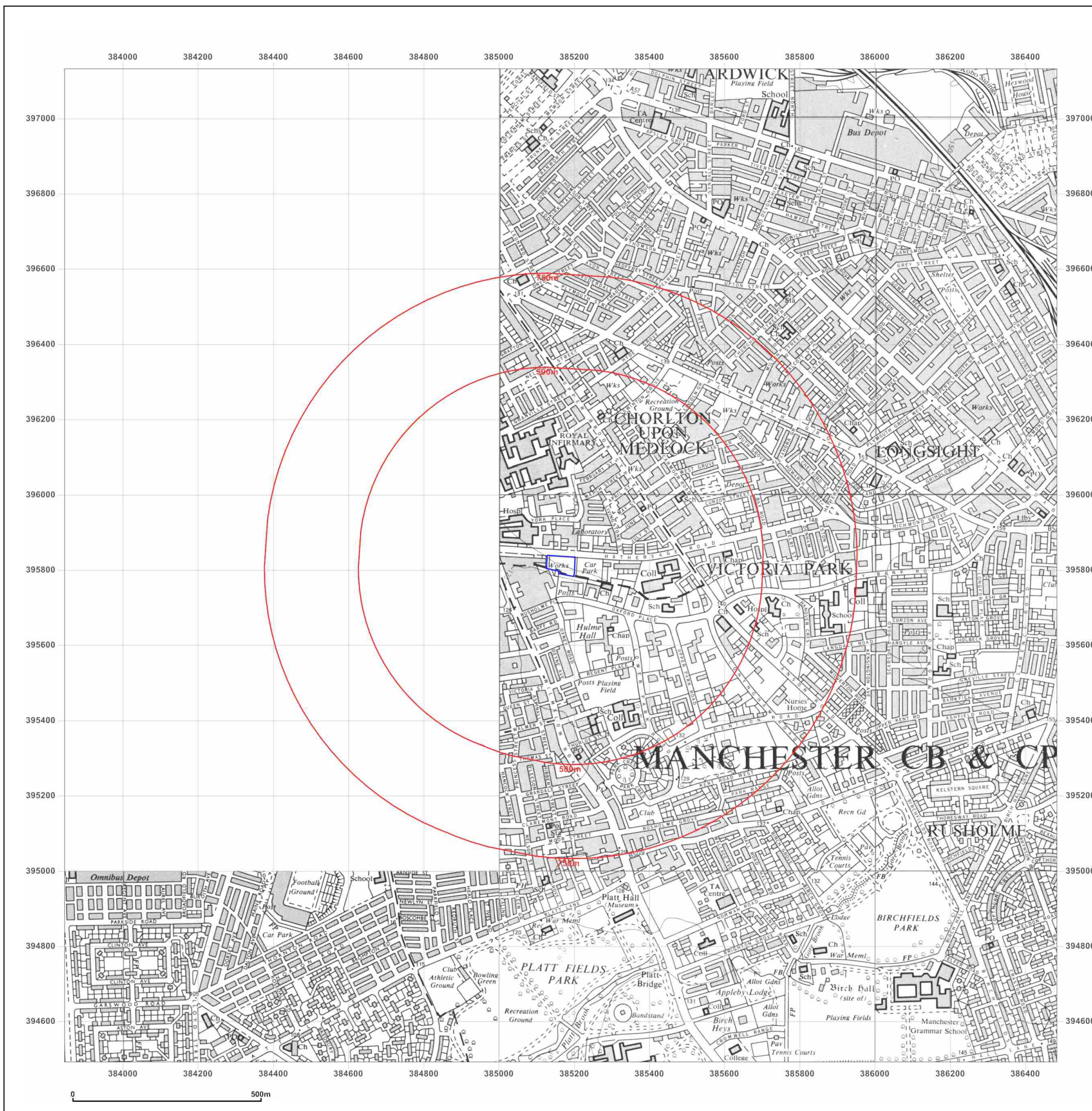


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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

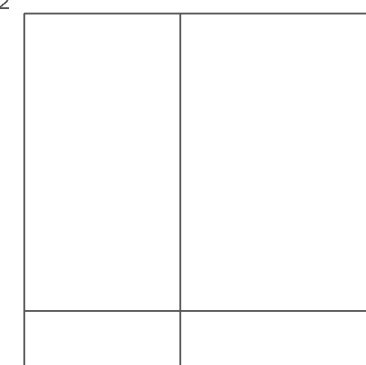
Map date: 1972-1976

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1971
Revised 1972
Edition N/A
Copyright 1972
Levelled 1972



Surveyed 1974
Revised 1975
Edition N/A
Copyright 1976
Levelled 1964

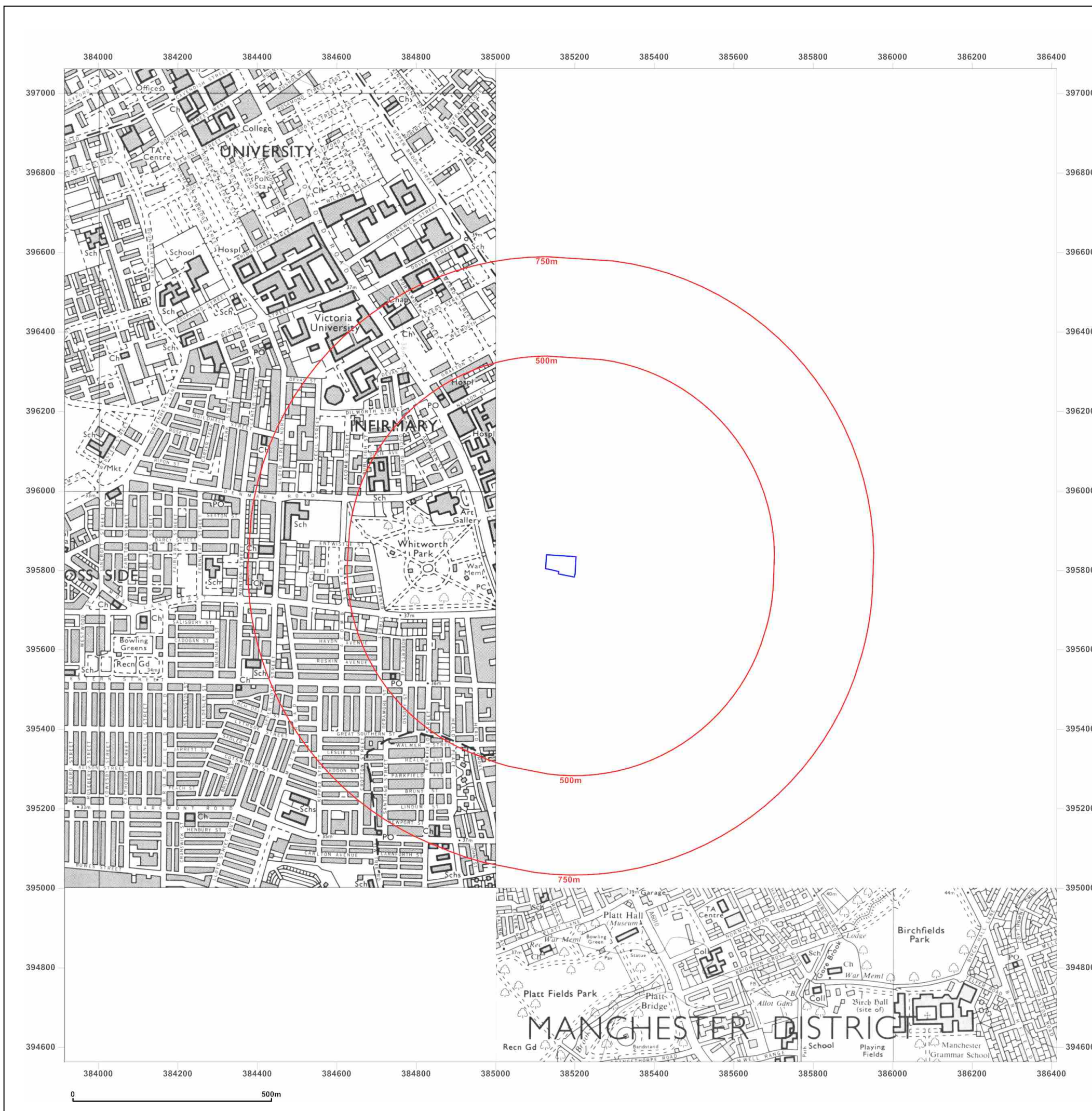


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Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1980-1983

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1976
Revised 1980
Edition N/A
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Levelled 1976

Surveyed 1976
Revised 1980
Edition N/A
Copyright 1981
Levelled 1976

Surveyed 1977
Revised 1981
Edition N/A
Copyright 1981
Levelled 1976

Surveyed 1981
Revised 1983
Edition N/A
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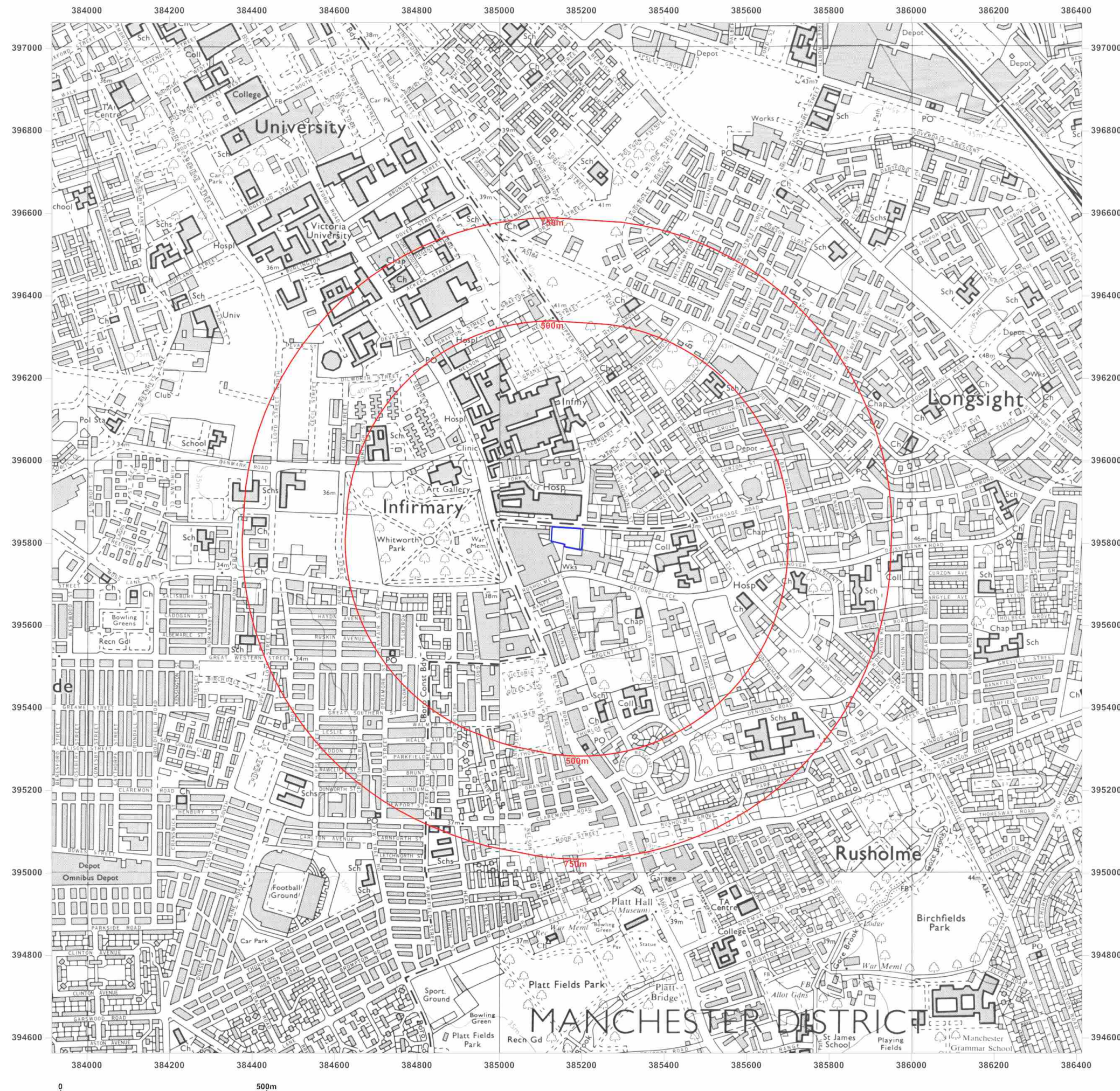


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HATHERSAGE ROAD,
MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1985-1989

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1983
Revised 1985
Edition N/A
Copyright 1985
Levelled 1981

Surveyed 1985
Revised 1985
Edition N/A
Copyright 1985
Levelled 1981

Surveyed 1985
Revised 1988
Edition N/A
Copyright 1988
Levelled 1981

Surveyed 1986
Revised 1989
Edition N/A
Copyright 1989
Levelled 1981

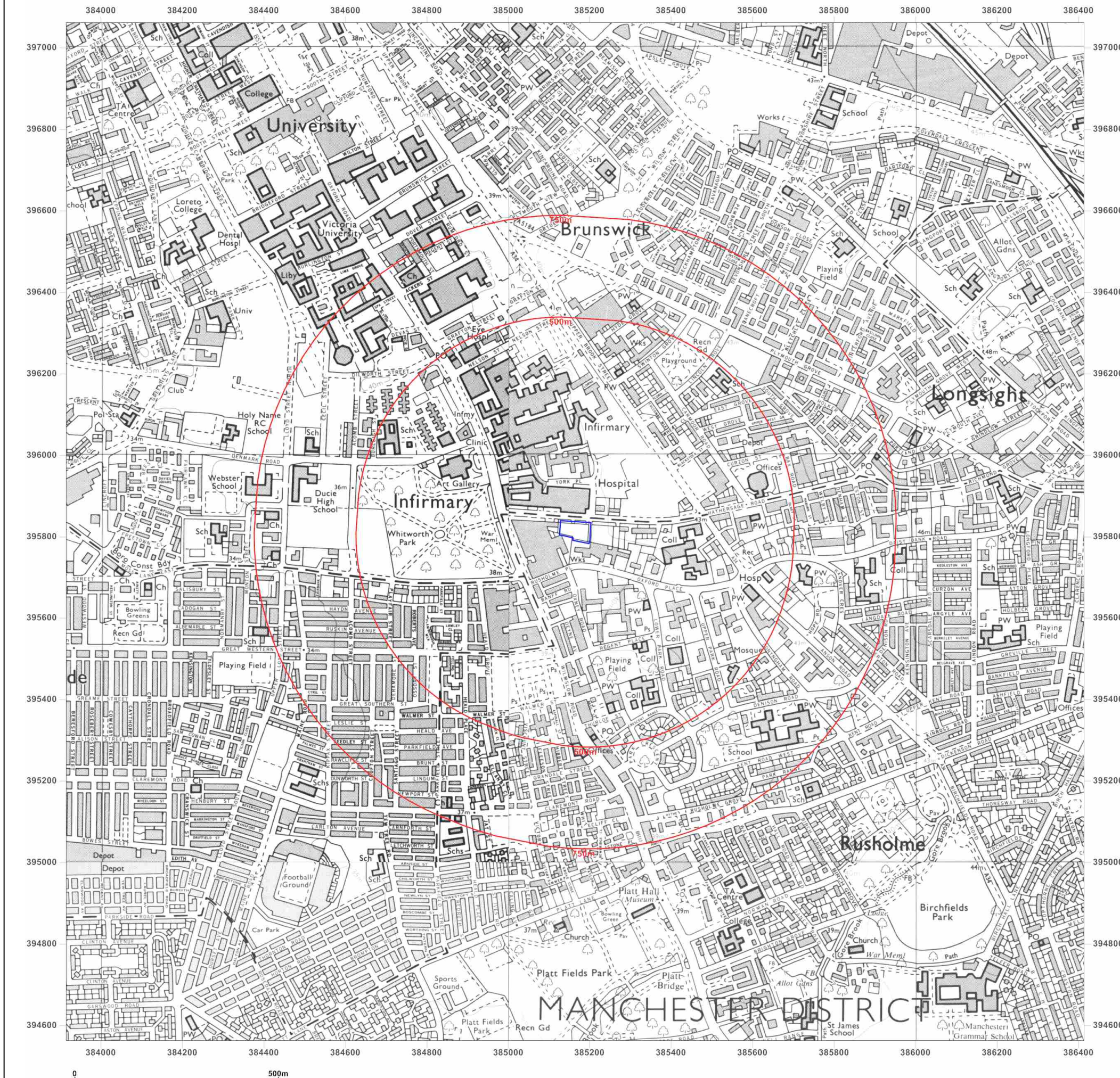


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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 1988-1991

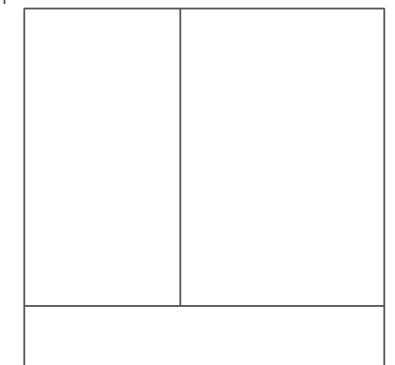
Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1986
Revised 1988
Edition N/A
Copyright 1988
Levelled 1981

Surveyed 1985
Revised 1991
Edition N/A
Copyright 1991
Levelled 1981

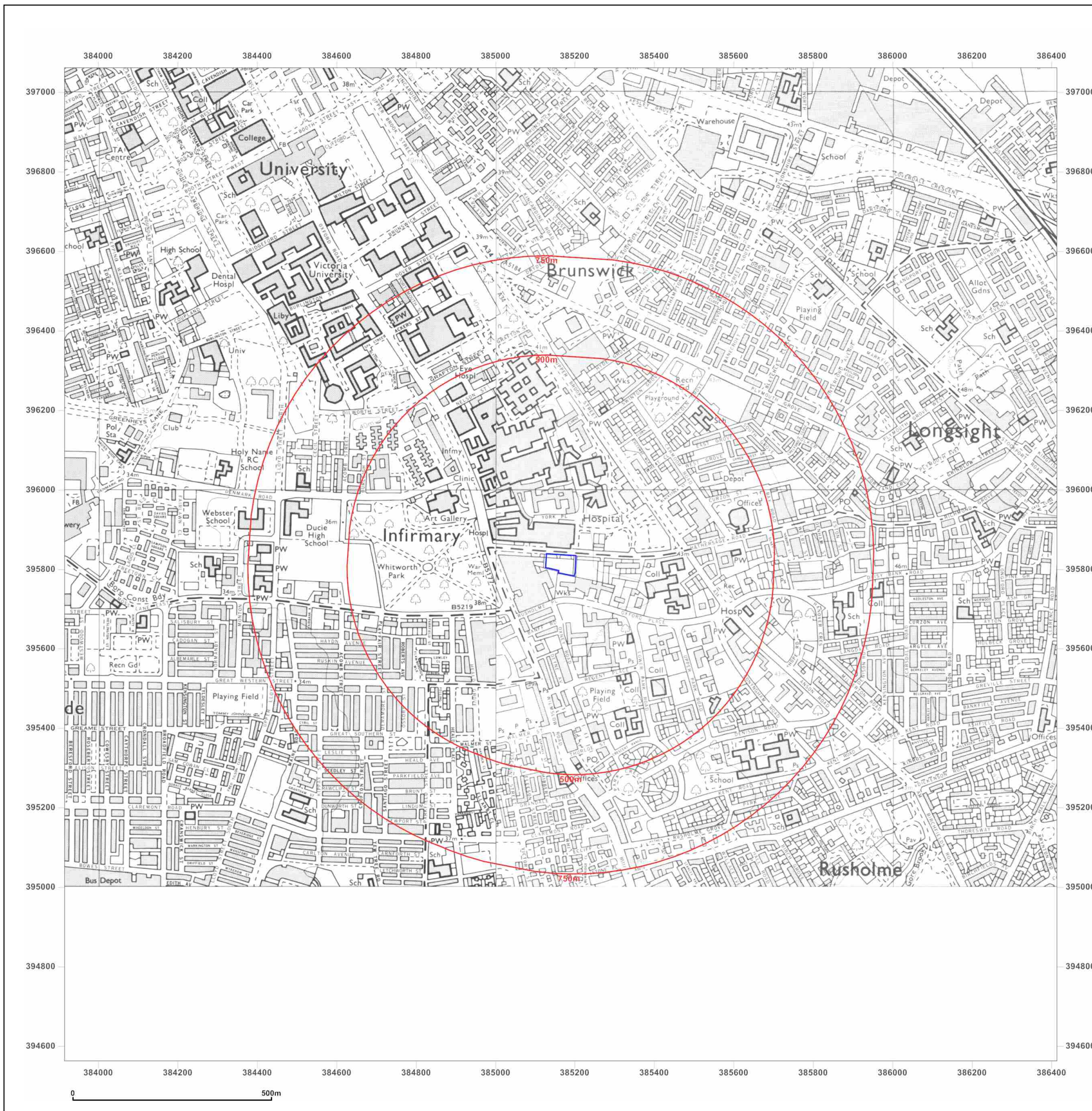


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Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

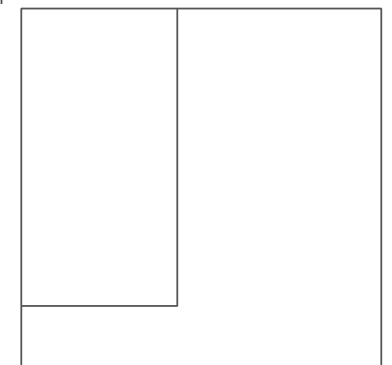
Map date: 1994

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1986
Revised 1994
Edition N/A
Copyright 1994
Levelled 1981

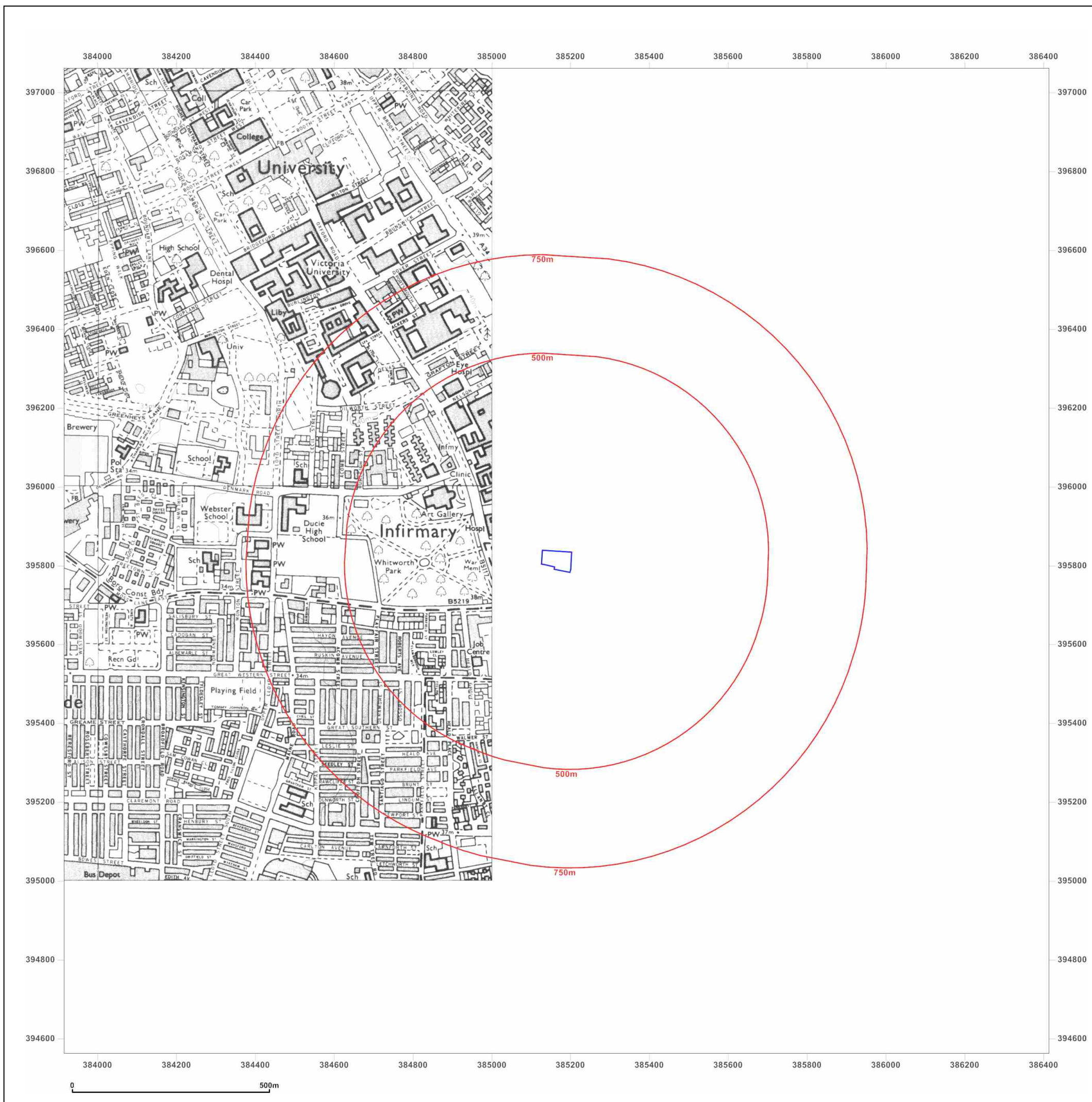


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DIABETES CENTRE,
HATHERSAGE ROAD,
MANCHESTER, M13 0JE

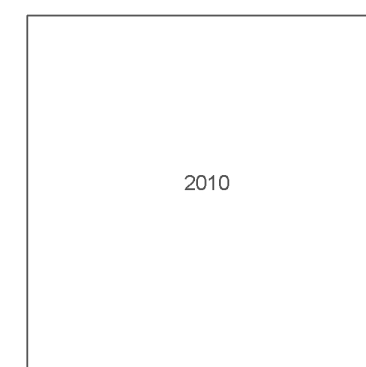
Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

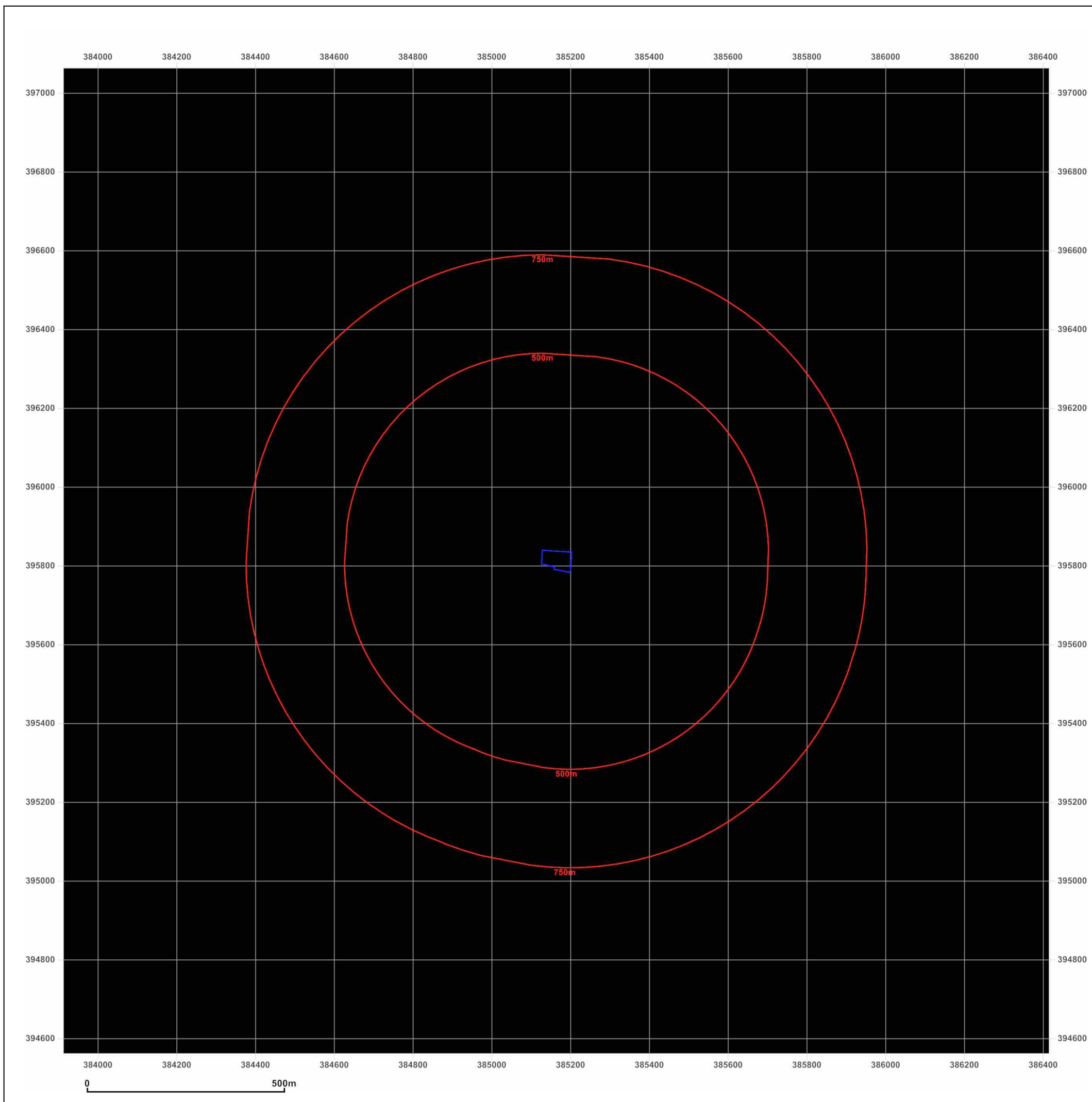


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MANCHESTER, M13 0JE

Client Ref: 267661-11
Report Ref: GS-5962526
Grid Ref: 385163, 395811

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014



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