

CCG-C-21-12516

**PHASE I DESK STUDY REPORT
FOR LAND AT THE FORMER
PRESCOT POLICE STATION
DERBY STREET
PRESCOT
MERSEYSIDE
L34**

SEPTEMBER 2021

Prepared for:

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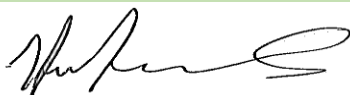
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1.0 INTRODUCTION

CC GEOTECHNICAL LIMITED (CCG) is providing consultancy services to **PRIMA GROUP** in connection with the proposed partial redevelopment of land located immediately to the north of Derby Street, Prescott, L34.

It is understood that an existing Police Station fronting on to Derby Street is to be retained and modified / converted for residential land use.

It is further proposed that the land to the rear of the Police Station is to be developed by the construction of 6nr 2.5-storey town houses constructed of traditional brick elevations under pitched roofing materials together with associated newly created hard paved access / egress roadway, off-road car parking facilities and front and rear private gardens.

The existing and proposed layouts are as annotated on **PRIMA GROUP** architectural drawings contained herein.

The proposed development falls within the administrative jurisdiction of **KNOWSLEY METROPOLITAN BOROUGH COUNCIL**.

This Phase I report was devised to generally comply with the relevant principles and requirements of a wide range of guidance including BS5930:1999 as amended 2007: "*Code of Practice for Site Investigations*", BS10175: 2011 "*Investigation of Potentially Contaminated Sites - Code of Practice*", and the DEFRA/Environment Agency Report CLR11 "*Model Procedures for the Management of Land Contamination*".

This report should be read in conjunction with the Notes on Limitations, given in Appendix E.

2.0 PURPOSE & AIMS OF THE STUDY

The primary aim of the Phase I Desk Study was to assess whether the site is likely to be affected by contamination to an extent that it may pose a risk to human health and/or the built environment and/or the wider natural environment, or is affected by any other natural or man-made features which may impact on the proposed redevelopment.

Specific tasks undertaken to achieve these objectives were as follows:

- Undertaking of a review of available historical mapping, environmental databases, and Environment Agency data
- Undertaking of a site walkover inspection
- Development of Preliminary Conceptual Model
- Development of a Phase 2 intrusive investigation strategy

3.0 SITE DATA

3.1 Site Location

The site is located immediately to the north of Derby Street, Prescott, L34 3LG as shown on **CCG** Drawing No. CCG-C-21-12517-1 contained herein. The **ORDNANCE SURVEY** coordinates for the approximate site centre are 346312 392867. It stands at an approximate elevation of c.72ma Ordnance Datum.

3.2 Site Description & Walkover Observations

The site was visited during August 2021 on completion of a review of all relevant historical and environmental mapping data (provided in Appendix D). Photographs taken at the time of the site visit are presented in Appendix E.

It must be borne in mind that access into the former Police Station at the time of undertaking the site walkover survey was not available.

It was observed that the site is situated predominantly within a residential context and comprises an irregular shaped parcel of land which extends to the approximate dimensions of c.68m x 48m, its long axis being on a north – south alignment.

It is bound to the south by public pavements extending along Derby Street (A57), and to the west by an un-named roadway. Its south-eastern boundary is adjoined by commercial premises (Bridal Storey), with its northern and eastern boundaries being adjoined by a series of private gardens associated with residential properties fronting on to Egerton Road and Stanley Crescent respectively.

Existing structures occupying the site comprise a well-maintained 2-storey property fronting on to Derby Street with associated single storey out-buildings to the rear, each constructed of traditional brick and dressed sandstone elevations under pitched roofing materials with a terrace of prefabricated flat roofed garages extending along its northern boundary.

The external topography across the site was seen to be sensibly flat with surface cover comprising black bituminous paving.

Given that the site was previously utilised for commercial land use, there is a potential for the presence of buried services to exist beneath the site.

There was no visual evidence of the presence of native and/or non-native plant species within, or adjoining, the site boundary.

Vehicle and pedestrian access can be made via its Derby Street frontage to the south.

The information obtained from the visit is summarised in Table 1 hereunder.

Table 1: Summary of Walkover Observations

FEATURE		OBSERVATION
Current Use of Land		Former police station
Context		Residential / commercial / agricultural context
Topography / Surfaces		The external topography across the site was seen to be sensibly flat with surface cover comprising black bituminous paving.
Dimensions		c.68m x 48m, its long axis being on a north – south alignment
Access		Vehicle and pedestrian access can be made via its Derby Street frontage to the south.
Buildings Adjacent to the Site		Residential to the N Commercial / residential to the E
Services		Given that the site was previously utilised for commercial land use, there is a potential for the presence of buried services to exist beneath the site.
Boundary	North	Residential properties
	South	Public pavement extending along Derby Street
	East	Mixed commercial / residential
	West	Un-named roadway
Material storage		None observed
Waste disposal		None observed
Other potential contamination		Hydrocarbon contaminants associated with former on site car parking facilities
Ecology*		There was no visual evidence of the presence of native and/or non-native plant species within, or adjoining, the site boundary.

*These comments on the ecology are for initial preliminary assessment only and are based on observations undertaken by a person who is a trained ecologist but who has not undertaken a comprehensive Phase I Habitat Survey or similar.

4.0 SITE HISTORY

The history of the site and its immediate surrounds was investigated by consultation with a range of archive resources. Geographical information, historical mapping and environmental data were primarily based on a GroundSure Environmental Report (Reference No. CMAPS-AAG-980046-4165-280721, dated July 2021), presented in Appendix C.

A summary of the historical mapping data is given hereunder:

Table 2: Historical Map Review

YEAR	SCALE	ON SITE	ADJACENT TO SITE	<250M
1850 1852	1:10,560 1:1,056	Vacant / undeveloped land	S: Fall Lane	c.30m SE: Residential properties delineating Fall Lane to the N c.100m N: Properties associated with Elm House c.130m S: t. Mary's R.C. Church c.150m W: Nurseries [extending to the W] c.180m N: Properties associated with Parkside Cottage c.200m E: Prescott Colliery c.210m NW: Properties associated with Woodbine Cottages
1891 1893 1906	1:10,560 1:2,500 1:10,560	Few unspecified properties located in the SW/S/SE portion of the site Police Station recognised in the S portion of the site, delineating Derby Street to the S [former Fall Lane]	E: Residential properties and associated gardens delineating Stanley Crescent to the E S: Derby Street [former Fall Lane] W: Unspecified properties delineating Derby Street to the S	c.250m SE: St. Mary's Chapel recognised
1908	1:2,500	No significant change	S: Tramway established along Derby Street	c.110m W: Tanks recognised
1925 1925 1927	1:10,560 1:10,560 1:2,500	No significant change	No significant change	c.100m SW: Development of semi-detached residential properties and associated gardens [extending to the SW]

1937 1938 1947-50	1:2,500 1:10,560 1:10,560			
1954-55 1954-55 1956 1955-57 1960-63	1:1,250 1:2,500 1:10,560 1:1,250 1:2,500	4nr unspecified properties located in NW portion of the site	S: Tramway along Derby Street no longer recognised	c.110m S: Ruin recognised c.140m E: Ruins recognised c.160m E: Ruin recognised c.170m NW: Ruin recognised c.180m W: Ruin recognised c.190m S: Ruin recognised c.240m S: Ruin recognised
1964-66 1965-66 1978	1:1,250 1:10,560 1:10,000	4nr unspecified properties in NW portion of the site no longer recognised 2nr unspecified properties located in the N portion of the site [delineating the site boundary]	N: Semi-detached residential properties and associated gardens delineating Egerton Road to the N SE: Court House recognised W: Road	Much of the land to the N of the site is developed for residential land use [primarily semi-detached residential properties and associated gardens]
1982-85 1990 1990-93 2001 2003 2010 2021	1:1,250 1:10,000 1:1,250 1:10,000 1:1,250 1:10,000 1:10,000	No significant change	SE: Social Services [former Court House]	c.90m W: Electric Sub-Station recognised c.150m SE: Garage recognised

5.0 ENVIRONMENTAL SETTING

5.1 Documented Geology

The geology of the site is summarised on **BRITISH GEOLOGICAL SURVEY (BGS)** Sheet No.097 Runcorn (2007): 1:50000 Scale: Solid and Drift Editions. These indicate the site is devoid of natural drift cover. However, given the presence of natural drift deposits comprising impermeable diamicton (boulder clay) of glacial origin (*Late-Quaternary Epoch - Devensian Age*), there is a potential for the presence of unrecorded drift deposits to be present.

The documented solid geology comprises the Pennine Lower Coal Measures Formation (*formerly the Lower Coal Measures*) of the Pennine Coal Measures Group comprising interbedded argillaceous mudstone, siltstones, fluvial sandstones and productive coal measure, of the Upper Carboniferous Period (*Silesian: Westphalian A: Langsettian Age*).

The study site is located within an area where ancient earth movements have caused significant displacements and miss-alignments of the underlying country rock and nearby associated coal seams. Hence the general dip of the solid geology within the surrounding area is seen on the **BGS** mapping data is seen to vary between 8°-30° in a south / south-westerly direction.

There are numerous geological lines of weakness (*i.e. faults, coal seams, etc.*) within the surrounding area, the nearest being geological fault which extends on a north – south alignment immediately to the east of the study site.

The **BGS** solid geology mapping information shows the presence of 2nr seams of coal sub-crop within close proximity to the sites northern and southern boundaries.

The 'Indicative Atlas of Radon in England and Wales' (Miles. J.C.H *et.al*, 2007) Map 13 'Northern Welsh Marches and Liverpool, shows the site to be situated within an area where it is believed that less than 1% of the properties within the area are affected by Radon and therefore no Radon Protection Measures will be required for new structures in contact with the ground.

Geological Information obtained from the GroundSure Environmental Report is presented in Appendix D, and summarised hereunder:

Table 3: Summary of Geological Data from GroundSure Report

GEOLOGY		
Data	Distance	Comments
Artificial Ground	On Site	Artificial ground and/or reworked ground deposits associated with the development of the site & its immediate surroundings.
Superficial Deposits / Drift Geology	On Site	N/A
Permeability of Drift Cover	Maximum Permeability	N/A
	Minimum Permeability	N/A

Bedrock and Solid Geology	On Site	The Pennine Lower Coal Measures Formation (formerly the Lower Coal Measures) of the Pennine Coal Measures Group
Permeability of Bedrock: On Site	Maximum Permeability	High
	Minimum Permeability	Low
Geological Lines of Weakness	On Site	No records
	<250m	7m NE. Fault (inferred) 41m SW. Coal seam 65m N. Coal seam 104m SE. Coal seam 112m SW. Coal seam 138m SE. Fault (observed) 165m N. Coal seam 190m W. Fault 203m W. Coal seam
Radon Affected Area	On Site	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
Radon Protection	On Site	No radon protective measures are necessary
MINING, GROUNDWORKINGS AND NATURAL CAVITIES		
Data	Distance	Comments
Natural cavities	<500m	No records
BritPits	<500m	No records
Surface ground workings	<250m	74m E: Colliery 185m S: Cemetery 196m S: Cemetery 214m SE: Grave Yard 225m SE: Grave Yard
Underground workings	<1000m	577m SE: Unspecified Old Shaft 580m SE: Unspecified Old Shaft 598m SE: Unspecified Old Shaft 625m SE: Unspecified Old Shaft 635m SE: Unspecified Old Shaft 959m S: Unspecified Shaft
Historical Mineral Planning Areas	<500m	No records
Non-coal mining	<1000m	No records
Mining cavities	<1000m	No records
Coal mining	On Site	The site is located within a coal mining area as defined by the Coal Authority
Brine areas	On Site	No records
Gypsum areas	On Site	No records
Tin mining	On Site	No records
Clay mining	On Site	No records
HAZARDS		
Data	Distance	Comments
Maximum shrink swell clays	On site	Negligible - Very Low
Maximum running sands	On site	Negligible
Maximum compressible deposits	On site	Negligible
Maximum collapsible deposits	On site	Very Low
Maximum landslides	On site	Very Low
Maximum ground dissolution of soluble rocks	On site	Negligible

5.2 Historical Coal Mining

The appended environmental data, **BGS** mapping data and **COAL AUTHORITY** Gazetteer confirm that the site is located within an area which is believed to be underlain by productive coal measures which may have been worked in the past and therefore a Coal Mine Risk Assessment (CMRA) was commissioned (prepared by **CCG** under Report Reference No. CCG-C-21-12517, dated September 2021).

The conclusions of the CMRA are that it is highly possible that the site may at risk of surface instability arising from historical shallow mine workings.

In the absence of any existing site investigation information pertaining directly to the site or its immediate surroundings, the CMRA could not conclusively demonstrated that the site is not underlain by collapsible voids, and hence a ground investigation was recommended. Workings in the shallow seams, if present, are likely to be pillar and stall and/or longwall, and for confidence in the investigation findings, and given that coal sub-cropping occurs within the immediate area, given the size of the site, it was recommended that 3nr boreholes be sunk in the underlying bedrock strata to c.30mbgl by rotary open hole drilling methods using water flush in the bedrock (coal bearing) strata.

The purpose of the mining boreholes is to determine the thickness and strength of the drift and bedrock strata at the 3nr locations. The **BGS** solid and drift mapping data indicates that the site is devoid of natural drift cover, however, given the presence of natural drift deposits

comprising diamicton (boulder clay) within the surrounding area, there is a potential for the presence of un-recorded drift deposits to be present. If present, the thickness and properties of these deposits will be relevant to the overall assessment of risk of instability – and to probe in the solid strata for the presence of voided or weak zones associated with coal workings and the potential for void migration to the surface.

It was further recommended that each borehole should be continuously monitored for ground gas emission and composition as the drilling works are advanced.

On completion of works, each borehole should be grouted to rockhead using PFA/cement grout. Gas monitoring standpipes should be installed within the drift (if present) and should be monitored on at least 6nr occasions for gas composition and flow rate. The results should be assessed against the guidance contained in **CIRIA** Publication C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings'.

The information obtained from the site investigation will allow for assessment of the various options potentially applicable to the development, including *inter alia*:

- Proceed with the building as planned
- Adopt special foundation precautions – e.g. raft foundations incorporating stiffened edge beams
- Stabilise the ground by grouting of voided zones
- Relocate the building away from instability risk zone

5.3 Hydrology and Hydrogeology

Information on hydrology and hydrogeology obtained from a GroundSure Environmental Report is presented in Appendix C, and summarised hereunder:

Table 5: Summary of Hydrology and Hydrogeological Data from GroundSure Environmental Report

HYDROGEOLOGY AND HYDROLOGY		
Aquifer within Superficial Drift Deposits	On site	N/A
Aquifer within Bedrock Deposits	On site	The Pennine Lower Coal Measures Formation - Secondary B Aquifer: Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
Groundwater Abstraction Licenses	<1000m	No records
Surface Water Abstraction Licenses	<1000m	415m W: James Whitaker & Sons Nurserymen Ltd. Licence No: 2569028003
Potable Water Abstraction Licences	<1000m	No records
Source Protection Zones	<500m	No records
Source Protection Zones (confined aquifer)	<500m	No records
Water Network (OS Mastermap)	<250m	229m NW: Inland river not influenced by normal tidal action
Surface water features	<250m	1nr record
WFD Surface water body catchments	On Site	On Site: River WB catchment. Water body catchment: Prescott Brook (Logwood Mill Brook)
WFD Surface water bodies	<250m	No records
WFD Groundwater bodies	<250m	No records
FLOODING		
Risk of Flooding from Rivers and Sea (RoFRaS)	<50m	No records
Historical Flood Events	<250m	No records
Flood Defences	<250m	No records
Areas Benefitting from Flood Defences	<250m	No records
Flood Storage Areas	<250m	No records
Flood Zone II	<50m	No records
Flood Zone III	<50m	No records
Surface water flooding: Highest risk	On Site	Negligible
	<50m	1 in 30 year, 0.1m – 0.3m
Groundwater flooding: Highest risk	On Site	Negligible
	<50m	Negligible

For simplified interpretation, the geological succession underlying the site may be regarded as a series of discrete units in terms of their hydrogeological significance, as illustrated hereunder:

Table 6: Hydrogeological Interpretation

UNIT	PROPERTIES	HYDROGEOLOGICAL DESIGNATION
Made / Reworked Ground	If present, likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater.	Unproductive Aquifer
The Pennine Lower Coal Measures Formation	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers	Secondary A Aquifer

6.0 FURTHER ENVIRONMENTAL DATA

Environmental data was researched using several sources including Environment Agency Maps and GroundSure EnviroSight Report presented in Appendix C and is summarised hereunder in Table 7. This environmental data has been used to carry out a Preliminary Qualitative Risk Assessment (Tier 1) and formulate the preliminary conceptual model as discussed in Section 8.0 of this report.

Table 7: Summary of Environmental Data

POTENTIALLY CONTAMINATIVE USES IDENTIFIED FROM 1:10,000 SCALE MAPPING		
Data	Distance	Comments
Historical industrial land uses	<250m	On Site: Police Station [1925-90] 74m E: Colliery [1851] 97m W: Nursery [1990] 105m W: Unspecified Commercial / Industrial [1950-55] 107m W: Nursery [1851] 109m W: Unspecified Tanks [1950-55] 122m W: Nursery [1966-75] 133m W: Nursery [1925] 137m E: Police Station [1851] 143m NW: Nursery [1906-38] 185m S: Cemetery [1950-90] 189m SW: Earthenware Pottery [1851] 201m W: Tramway Sidings [1955] 205m W: Railway Sidings [1950] 205m W: Tramway Sidings [1925] 210m SW: Tramway Sidings [1925] 214m SE: Grave Yard [1950-55]
Historical tanks	<250m	103-04m W: Tanks [1954-93] 109m W: Tanks [1908-37] 146m E: Unspecified Tank [1966-82] 156m E: Unspecified Tank [1908-27] 158m E: Unspecified Tank [1893]
Historical energy features	<250m	83m W: Electric Sub-Station [1982-93]
Historical petrol stations	<250m	No records
Historical garages	<250m	143m E: Garage [1982-93]
Historical military land	<250m	No records
Records of Current Industrial Land Use		
Data	Distance	Comments
Recent industrial land uses	<250m	94m W: Electric Sub-Station [Electrical Features] 105m W: Tank [Tanks (Generic)] 107m W: Tank [Tanks (Generic)] 109m W: Tank [Tanks (Generic)] 234m SE: Bus Station [Bus and Coach Stations, Depot and Companies]
Current or recent petrol stations	<250m	No records
Electricity cables	<250m	No records
Gas pipelines	<250m	No records
Sites determined as Contaminated Land	<250m	No records
Control of Major Accident Hazards (COMAH)	<250m	No records
Regulated explosive sites	<250m	No records
Hazardous substance storage/usage	<250m	No records
Historical licensed industrial activities (IPC)	<250m	No records
Licensed industrial activities (Part A(1))	<250m	No records
Licensed pollutant release (Part A(2)/B)	<250m	No records
Radioactive Substance Authorisations	<250m	No records
Licensed Discharges to controlled waters	<250m	No records
Pollutant release to surface waters (Red list)	<250m	No records
Pollutant release to public sewer	<250m	No records
List 1 Dangerous Substances	<250m	No records
List 2 Dangerous Substances	<250m	No records
Pollution Incidents (EA/NRW)	<250m	No records
Pollution inventory substances	<250m	No records
Pollution inventory waste transfers	<250m	No records

Pollution inventory radioactive waste	<250m	No records
WASTE AND LANDFILL		
Data	Distance	Comments
Active or recent landfill	<500m	No records
Historical landfill (BGS records)	<500m	No records
Historical landfill (LA/mapping records)	<500m	No records
Historical landfill (EA/NRW records)	<500m	479m S: Prescott WWTW. Site Reference: GDO M271
Historical waste sites	<500m	No records
Licensed waste sites	<500m	No records
Waste exemptions	<500m	190m E: Prescott House [Treating waste exemption] 218m W: Liverpool Road [Using waste exemption] 236m W: Whitakers Garden Centre [Using / Treating / Disposing of waste exemption] 243m E: McKenna Court [Treating waste exemption] 269m E: 8 Mill Street [Treating waste exemption] 432m W: Prescott brook with current silt management in o place [Using waste exemption]
ENVIRONMENTAL DESIGNATIONS		
Data	Distance	Comments
Sites of Special Scientific Interest (SSSI)	<500m	None
Conserved wetland sites (Ramsar sites)	<500m	None
ENVIRONMENTAL DESIGNATIONS		
Data	Distance	Comments
Special Areas of Conservation (SAC)	<500m	None
Special Protection Areas (SPA)	<500m	None
National Nature Reserves (NNR)	<500m	None
Local Nature Reserves (LNR)	<500m	None
Designated Ancient Woodland	<500m	None
Biosphere Reserves	<500m	None
Forest Parks	<500m	None
Marine Conservation Zones	<500m	None
Green Belt	<500m	376m N: Merseyside and Greater Manchester [Knowsley]
Proposed Ramsar sites	<500m	None
Possible Special Areas of Conservation (PSAC)	<500m	None
Potential Special Protection Areas (pSPA)	<500m	None
Nitrate Sensitive Areas	<500m	None
Nitrate Vulnerable Zones	<500m	On Site: Ditton Brook (Halewood to Mersey Estuary) NVZ [Existing]

7.0 PREVIOUS SITE INVESTIGATIONS / REPORTS

Searches and consultations have established that no previous ground investigation works have been undertaken on this site.

8.0 PRELIMINARY QUALITATIVE RISK ASSESSMENT (TIER 1)

8.1 Introduction

Based on the foregoing study, there is a low potential for the presence of contamination associated with the historic development of the site, demolition works, and previous land uses, and hence a preliminary risk assessment was undertaken.

The risk assessment methodologies adopted by **CCG** are based on current available guidance from several sources and are included in Appendix D.

The Tier 1 Risk Assessment and Preliminary Conceptual Model (PCM) were formulated using the information discussed above and based on the following assumptions:

- It is understood that an existing Police Station fronting on to Derby Street is to be retained and modified / converted for residential land use.

It is further proposed that the land to the rear of the Police Station is to be developed by the construction of 6nr 2.5-storey town houses constructed of traditional brick elevations under pitched roofing materials together with associated newly created hard paved access / egress roadway, off-road car parking facilities and front and rear private gardens.

- Drinking water will be from a mains supply.

In constructing the Preliminary Conceptual Model (PCM), **CCG** applied the guidance contained in CIRIA C552: 2001. This recommends use of a Risk Matrix which classifies risk based on the product of Probability of a source being present, and the Consequence of receptors being

exposed to the source. Guidance tables setting out the classifications of probability and consequence together with a risk matrix are given in Tables 8 - 9 hereunder. In using this approach **CCG** recommends actual intrusive investigation of any Risk Classification of “*Moderate*” or over.

Table 8: Matrix of consequences against probability to gain a risk classification [CIRIA C552, 2001]

		CONSEQUENCE			
		SEVERE	MEDIUM	MILD	MINOR
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table 9: Classification Definitions (C552 CIRIA, 2001)

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

8.2 Preliminary Conceptual Model

By application of the risk assessment methodology outlined above, the following PCM was constructed.

Table 10: Preliminary Conceptual Model (PCM)

POLLUTANT LINKAGE	SOURCE	PATHWAY	RECEPTOR	PROBABILITY	CONSEQUENCE	RISK RATING
1	Broad spectrum of heavy metals, aggressive pH, hydrocarbons, PAH's in Made Ground associated with the development & redevelopment of the site & adjoining area	Soil and / or soil dust ingestion	Construction workers Future occupants (adults & infants) Offsite receptors Flora	Likely	Medium	Moderate
2	Asbestos containing materials (ACM) in made ground soils associated with the development & redevelopment of the site & adjoining area	Fibre Inhalation	Construction workers Future occupants (adults & infants) Offsite receptors	Likely	Severe (ACM)	High
3	Inhalation of vapours associated with potential made ground deposits etc.	Inhalation	Future residents	Unlikely	Medium	Moderate
4	Inhalation of ground gases from onsite or offsite sources i.e. historical shallow mine workings made ground soils etc.	Inhalation	Future residents	Unlikely	Medium	Moderate
5	pH & Sulphate attack on concrete	Future building	Future building	Likely	Mild	Moderate / Low
6	Organic contamination	Direct contact with water mains	Potable water supply	Unlikely	Medium	Moderate

The contaminants of concern associated with those risks which require intrusive investigation were researched by reference to published industry profiles, and are summarised hereunder:

Table 11: Summary of Contaminants of Concern based on PCM

LINKAGE NO.	METALS	NON-METALS	ORGANICS	GASES	OTHERS
PL1, PL2 PL5, PL6	Be, Cd, Cr (total and VI), Ni, Cu, Pb, Hg, Se	As, sulphates	TPHCWG, PAH's, BTEX, Volatiles (by PID)	-	pH Asbestos
PL3 & PL4	-	-	-	CH ₄ , CO ₂ , H ₂ S	-
PL1, PL6	-	-	TPHCWG PAH's, BTEX, Volatiles (by PID)	-	-
PL1-PL6	Be, Cd, Cr (total and VI), Ni, Cu, Pb, Hg, Se	As, sulphates	TPHCWG, BTEX PAH's, Volatiles (by PID)	CH ₄ , CO ₂ , H ₂ S	pH Asbestos

8.3 Summary of Risks

The foregoing analysis has identified a significant number of potential risks, and if present, these could adversely impact on human or environmental receptors, and since no previous site investigations have been undertaken, an intrusive phase of investigation is recommended to determine whether the postulated pollutant linkages are actually present on site.

9.0 AIMS AND PROPOSED SCOPE OF PHASE II INTRUSIVE INVESTIGATION

Based on the findings above, it is recommended that an intrusive investigation be undertaken. The Phase II Intrusive Investigation should include for exploratory holes to be sunk through made ground into the underlying natural strata.

The primary objectives of a ground investigations are to obtain enough data to reliably ascertain ground conditions on site, and to aid confirmation of the potential pollution linkages identified within the Preliminary Conceptual Model above. Enough soil and groundwater/soil leachate contamination data should be obtained to reliably allow the Preliminary Conceptual Model to be tested and refined by the performance of a quantitative risk assessment.

Using the guidance contained in BS10175: 2011 and R&D Technical Report P5-0066/TR: 2000, is proposed that 6nr boreholes be sunk across the site by light dynamic sampling method to nominal depths of 5mbgl to assess shallow ground conditions.

It is further proposed that 3nr light dynamic borehole be utilised for the installation of standpipes, thus enabling a programme of ground gas monitoring to be undertaken. To comply with CIRIA C665 for a "Moderate" risk site, it is proposed that gas monitoring is undertaken on 6nr occasions over a period of 3-months.

The prime objective of any intrusive ground investigation is to provide reliable soil / groundwater contamination data and to assess the soil engineering properties in relation to the design of suitable foundations recommendations.

In addition to the above, given the potential for the presence of historical shallow mine workings, it is recommended that an additional 3nr boreholes be sunk in the underlying bedrock strata to c.30mbgl by rotary open hole drilling methods in to the bedrock (coal bearing) strata to assess for the presence / absence of mine related voids and/or broken ground. The finds of which would be utilised to provide an overall assessment of risk of instability and for the potential for void migration to the surface, if present.

The proposed scope of works is summarised in Table 12 hereunder:

Table 12: Proposed Scope of Works

RISK	METHOD OF ASSESSMENT
Is the superficial ground impacted by contamination to the extent it may present a risk to human health?	6nr light dynamic sampling boreholes to be sunk to a nominal depth of 5mbgl. The stratigraphy of the boreholes will be carefully logged and subsampled as appropriate. Broad spectrum contamination analyses will be performed on 1nr sub sample of recovered made ground from each borehole (5nr).
What are the geotechnical properties of the ground?	Standard Penetration Test's (SPT's) to be carried out at regular depth increments throughout the boreholes, with HSV tests to be carried out in cohesive strata on recovered soils A programme of soil engineering laboratory testing will be carried out. The in-situ tests and soil engineering test data will be used in formulating suitable foundation solutions.
Is the site affected by migrating gas from made ground underlying the site & nearby historical in-filled ponds etc.?	The evidence of the desk study is that there is a low risk of the site being contaminated by ground gases and therefore the boreholes will be utilised for the installation of gas / groundwater monitoring standpipes. CIRIA C665 recommends monitoring on 6nr occasions over a period of 3 month
Does the site pose a risk to the underlying Secondary A aquifers	Soil water samples will be recovered from the standpipes and will be analysed to the suite proposed in Table 7.

	If water does not accumulate in the standpipes, soil leachate analyses will be undertaken to the suite in Table 7. The results will be assessed against Drinking Water Standards and Environmental Quality Standards.
Is the site at risk at the surface from shallow historical mine workings?	A CMRA recently prepared for this site confirms that the site to be located within an area which is believed to be underlain by productive coal measures which may have been worked in the past. Based on the above, it is recommended that 3nr deep borehole (min 30m) be sunk to assess for the presence / absence of mine related voids and/or broken ground.

The layout of the proposed intrusive investigation and the positioning of gas – groundwater monitoring installations are as annotated on **PRIMA GROUP** Drawing No. 102-013 ‘*Existing & Proposed Site Plan*’ contained herein.

Please note to ensure that no borehole position impacts on any buried service, the final positioning of the borehole will be determined following a review of ‘*Clients*’ buried service drawings.

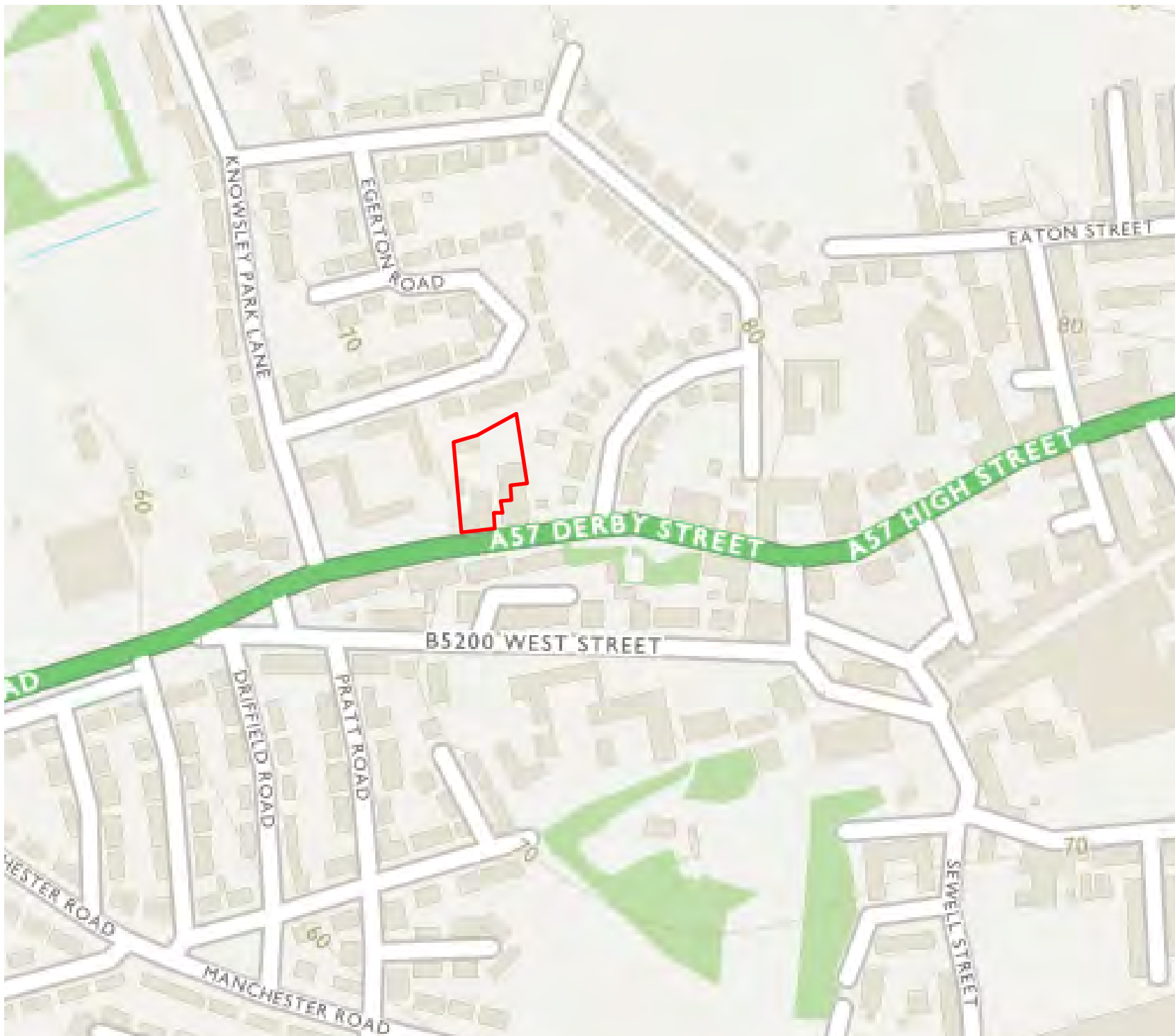
Given that the development will comprise residential end use with areas of proposed communal landscaping, contamination data obtained as part of the above recommended Phase II intrusive investigation will be based on criteria contained in publication LQM/CIEH S4UL’s for Human Health Risk Assessment (2015) (**CCG** Licence No. S4UL3233), applicable to the “*Residential*” land use With plant uptake scenario. Given this document does not provide criteria for Lead contaminants, it is proposed that Lead results are compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels for ‘*Residential Land*’ use.

APPENDIX A: DRAWINGS:

21-12516 – SITE LOCATION PLAN

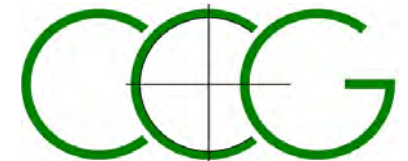
21-12516 – AERIAL PLATE

ARCHITECTURAL DRAWINGS



DO NOT SCALE

Notes: Study Site



CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client:
Prima Group

Project:
Phase I-II Geoenvironmental Report for Land at
Former Prescott Police Station, Derby Road

Title:
Aerial Photograph

Scale:
NTS

Issue:
01

Drawn by:
DG

Date:
August 2021

Project No.
CCG-C-21-12516

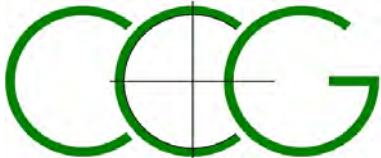
Drawing No.
01

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Notes: Study Site



CC GEOTECHNICAL LIMITED
UNIT 1 DELTIC WAY
KNOWSLEY INDUSTRIAL ESTATE
LIVERPOOL
L33 7BA
0151 545 2750

Client: Prima Group	
Project: Phase I-II Geoenvironmental Report for Land at	
Title: Aerial Photograph	
Scale: NTS	Issue: 01
Drawn by: DG	Date: August 2021
Project No. CCG-C-21-12516	Drawing No. 02



EGERTON ROAD

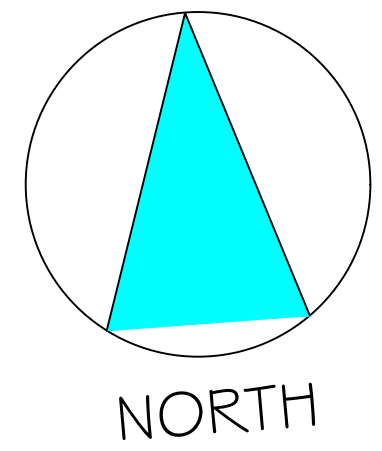
8 No FLAT CONVERSION

3B. TOWN HOUSES - 3 storey
100 SQM

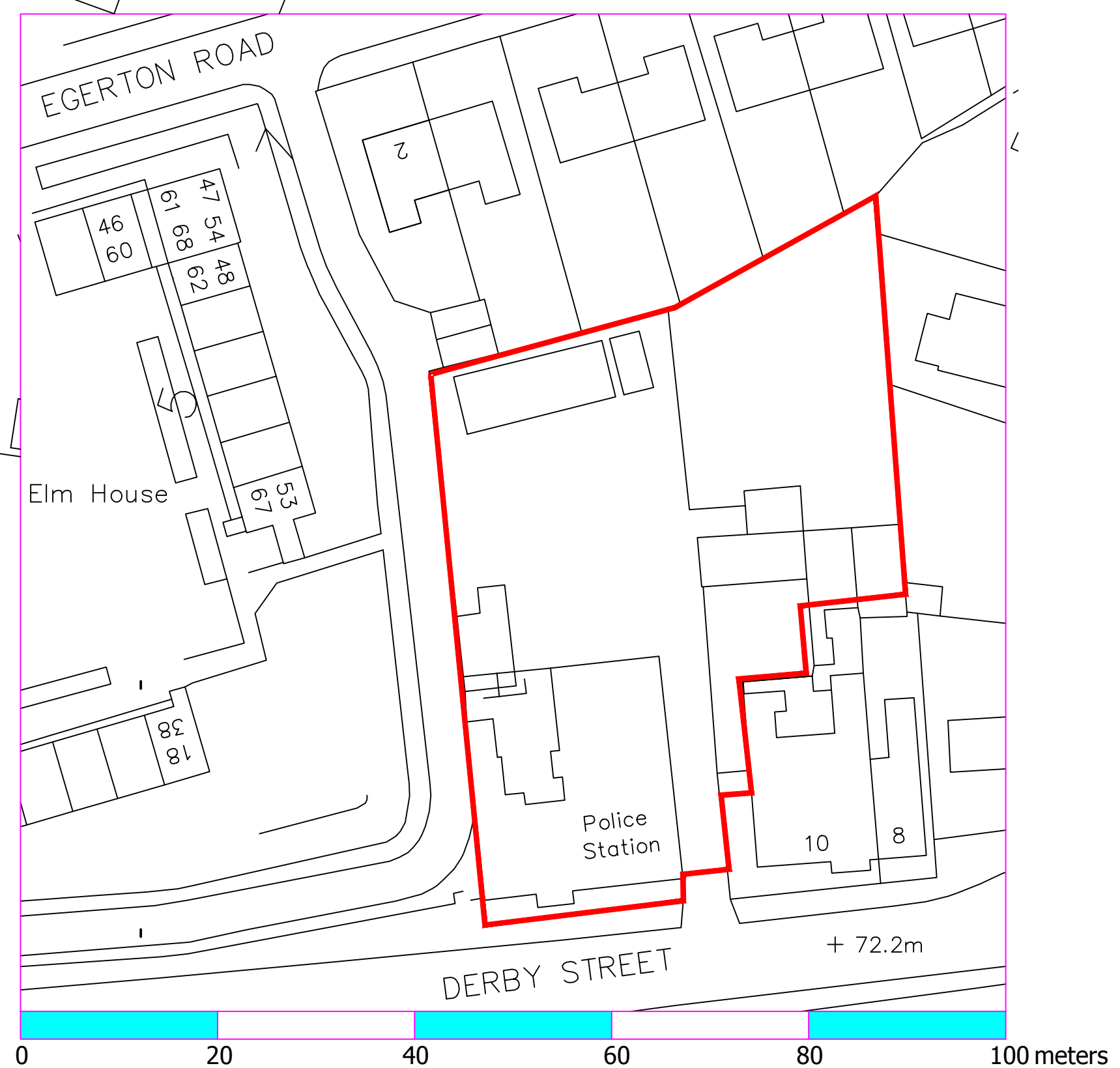


NOTE :
SITE PLAN TO BE READ IN-CONJUNCTION
WITH TOPOGRAPHICAL SURVEY AND CCG
REPORTS.

CCG TEST / TRAIL HOLE POSITIONS.



EXISTING SITE PLAN
SCALE 1:1250

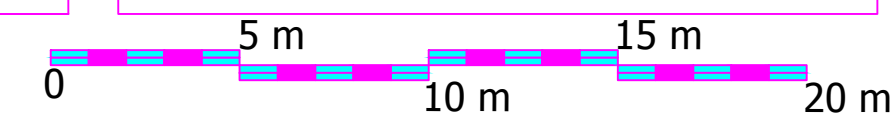


EXISTING SITE PLAN SCALE 1:500

PROPOSED SITE PLAN. PRESCOT POLICE STATION

DERBY STREET

PRIMA GROUP.		DWG TITLE EXISTING AND PROPOSED SITE PLAN.	
		JOB PRESCOT POLICE STATION, DERBY ST , PRESCOT , L34 3LG	
DRAWN	DF.	DATE	OCT'20.
SCALE	1:200@A1.	DWG No	102-01F





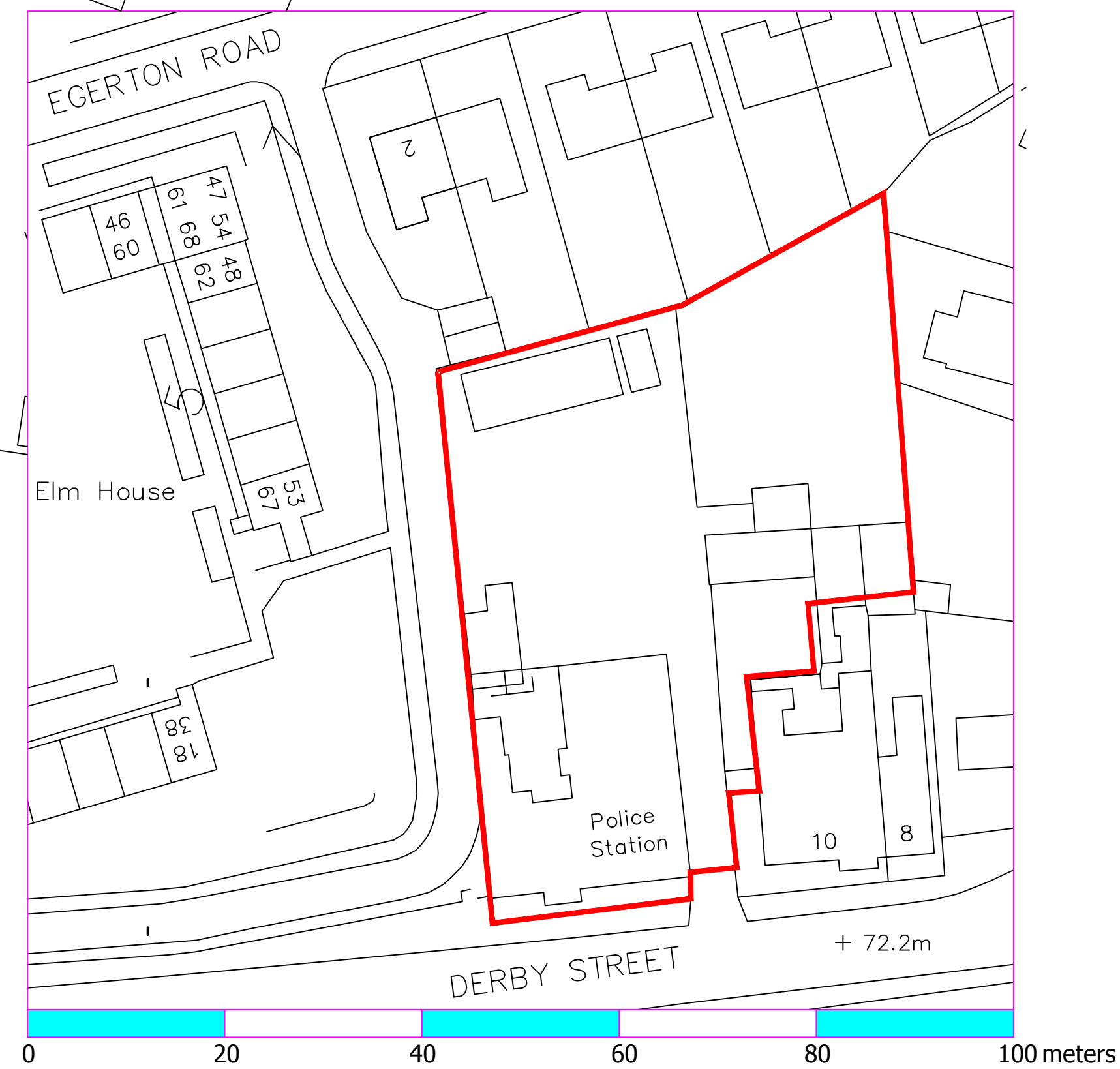
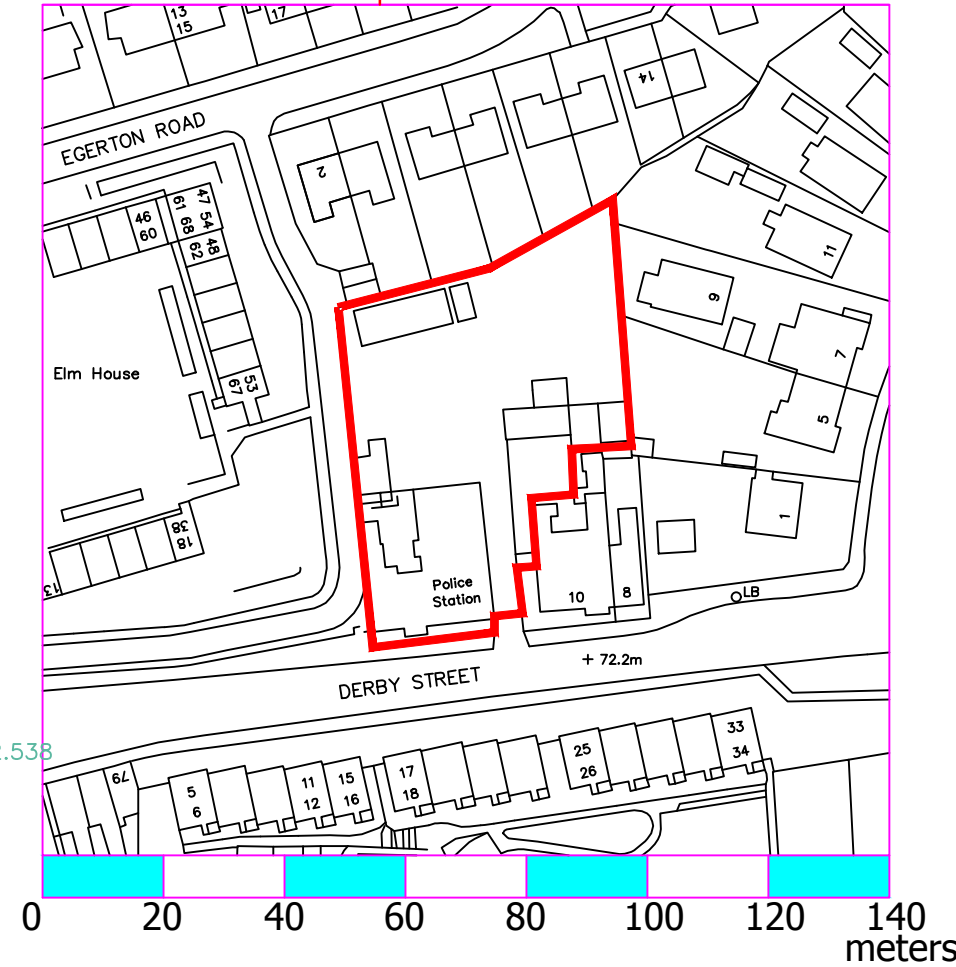
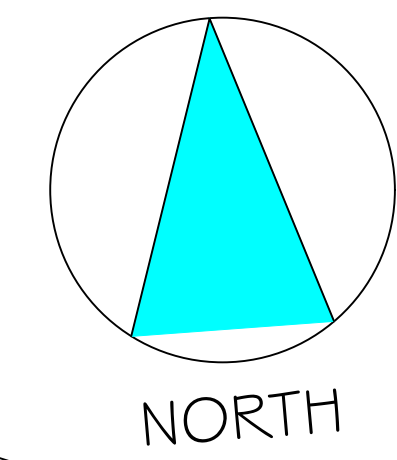
EGERTON ROAD

8 No FLAT CONVERSION

3B. TOWN HOUSES - 3 storey
100 SQM



NOTE :
SITE PLAN TO BE READ IN-CONJUNCTION
WITH TOPOGRAPHICAL SURVEY AND CCG
REPORTS.



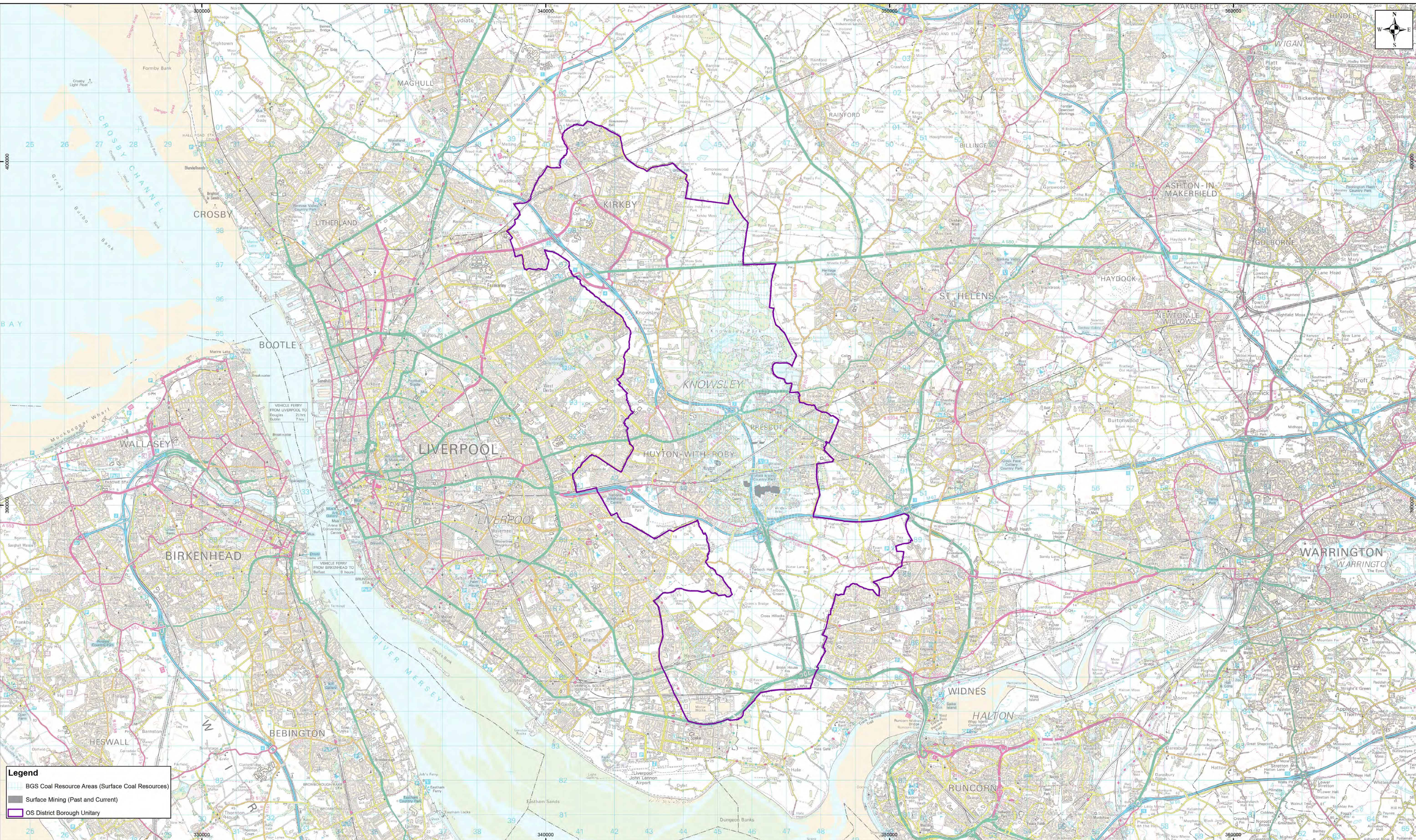
PROPOSED SITE PLAN. PRESCOT POLICE STATION

DERBY STREET

PRIMA GROUP.		DWG TITLE EXISTING AND PROPOSED SITE PLAN.	
		JOB PRESCOT POLICE STATION, DERBY ST , PRESCOT , L34 3LG	
DRAWN DF.	DATE OCT'20.	SCALE 1:200@A1.	DWG No 102-01F



Knowsley District (B) - Surface Coal Resource



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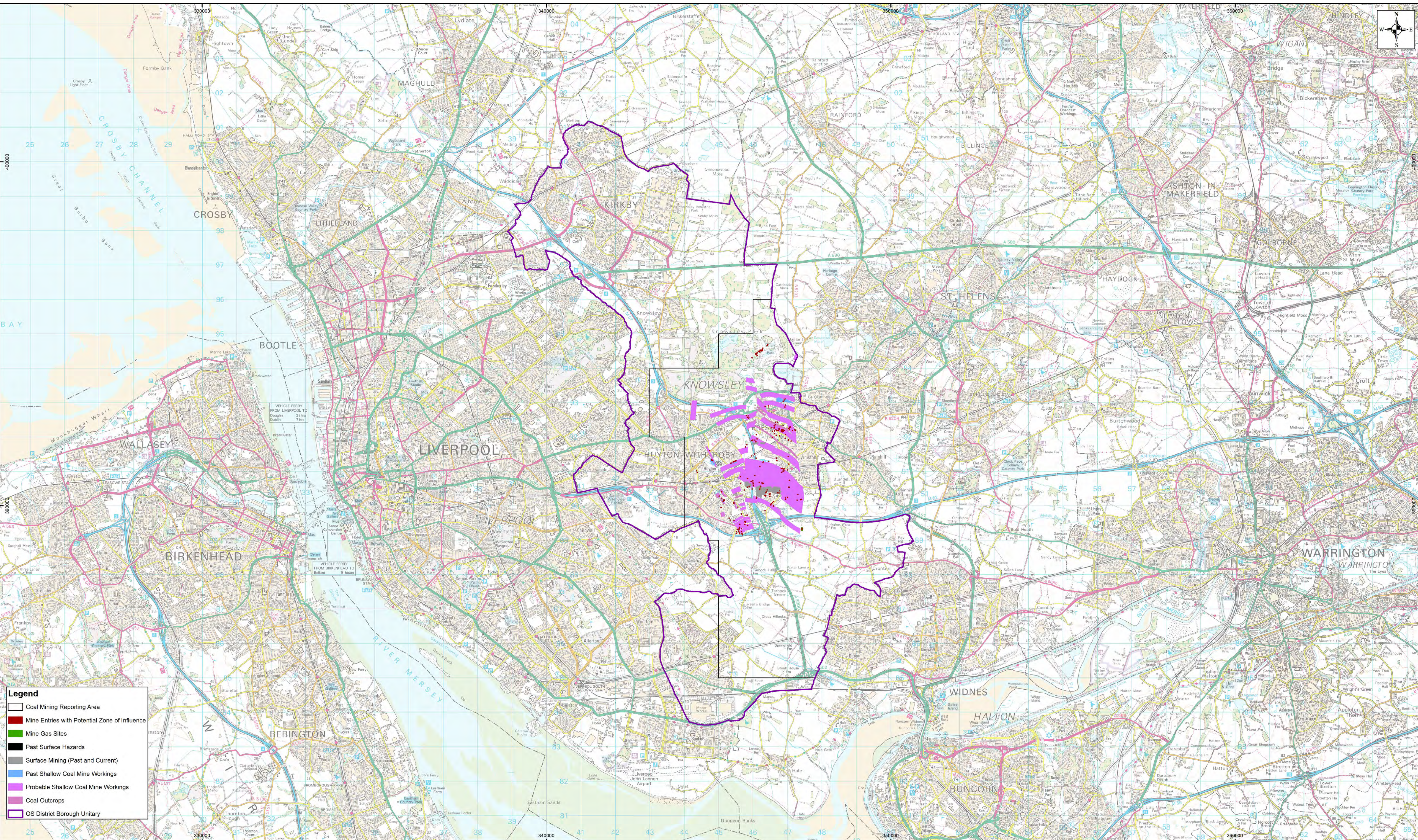
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Published on: 07/06/2014



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Knowsley District (B) - Specific Risk



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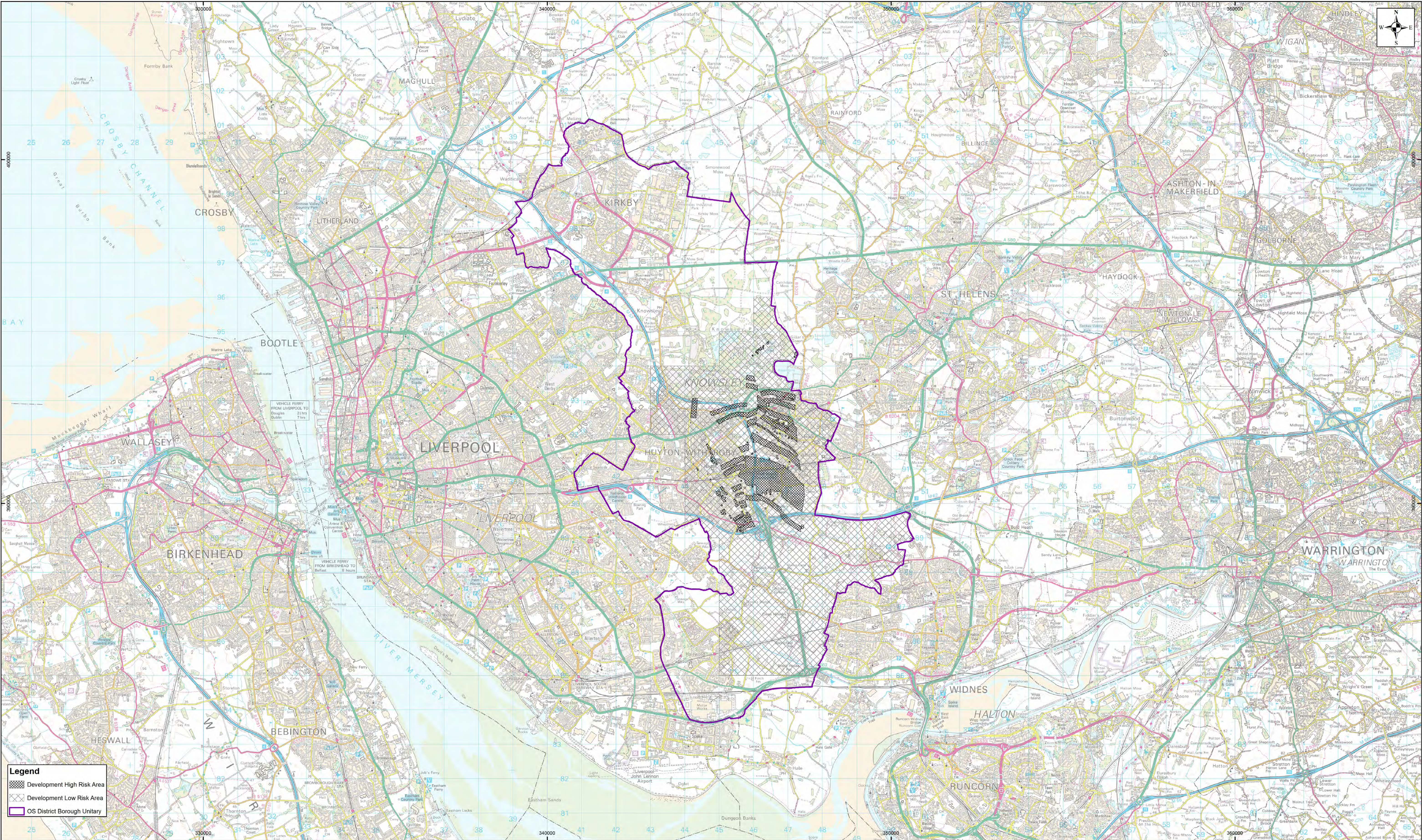
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The Coal Authority

Knowsley District (B) -Development Risk



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APPENDIX B: NOTES ON LIMITATIONS

General

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Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, **CC GEOTECHNICAL LTD** reserves the right to review such information and to modify the opinions accordingly.

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

Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing enough information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by the timescale available, and the locations of the exploratory holes may have been restricted to areas unoccupied by the building(s) on the site, and further restricted by the existence of buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, several important engineering and environmental issues may need to be resolved.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those encountered.

Geoenvironmental Ground Investigations

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

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the sites which have not been disclosed by this investigation, and which have therefore not been considered in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

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

**APPENDIX C: CURRENT CONTAMINATED LAND GUIDANCE / LEGISLATION & RISK ASSESSMENT
METHODOLOGIES**

CURRENT CONTAMINATED LAND LEGISLATION / GUIDANCE & ENVIRONMENTAL RISK ASSESSMENT METHODOLOGY

LEGISLATION OVERVIEW

This report includes hazard identification and risk assessment in line with the risk-based methods referred to in relevant UK legislation and guidance. Government environmental policy is based upon a "suitable for use approach". When considering the current use of land, Part IIA of the Environment Protection Act 1990 (EPA 1990) provides the regulatory regime, which was introduced by Section 57 of the Environment Act 1995, which came into force in England on 1 April 2000. The main objective of introducing the Part IIA regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment given the current use and circumstances of the land.

Part IIA provides a statutory definition of contaminated land under Section 78A(2) as:

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

Significant harm is being caused or there is a significant possibility of such harm being caused;
or
Pollution of controlled waters is being, or is likely to be, caused."

Part IIA provides a statutory definition of the pollution of controlled waters under Section 78A(9) as:

"the entry into controlled waters of **any** poisonous, noxious or polluting matter or **any** solid waste matter".

To assist in establishing if there is a "significant possibility of significant harm" there must be a "significant pollutant linkage" for potential harm to exist. That means there must be a source(s) of contamination, sensitive receptors present and a connection or pathway between the two. This combination of source-pathway-receptor is termed a "pollutant linkage or SPR linkage."

Part IIA of The Environmental Protection Act 1990 is supported by a substantial quantity of guidance and other Regulations, especially DEFRA Circular 01/2006 Contaminated Land (this replaces DETR Circular 02/2000). Part IIA defines the duties of Local Authorities in dealing with it. Except for situations of very high pollution risk, Part IIA places contaminated land responsibility on the planning and redevelopment process. In situations where there is very high pollution risk direct action from the Local Authority is usually necessary. Planning Policy Statement 23 (PPS23) provides guidance on the planning process and requires that sites which have been developed shall not be capable of being determined "contaminated land" under Part IIA.

The criteria for assessing levels of pollutants and hence determining whether a site represents a hazard are based on a range of techniques, models, and guidance. Within this context it is relevant to note that Government objectives are:

- (a) to identify and remove unacceptable risks to human health and the environment;
- (b) to seek to bring damaged land back into beneficial use;
- (c) to seek to ensure that the cost burdens faced by individuals, companies and society are proportionate, manageable, and economically sustainable.

These three objectives underlie the "suitable for use" approach to remediation of contaminated land. The "suitable for use" approach focuses on the risks caused by land contamination. The approach recognises that the risks presented by any given level of contamination will vary greatly according to the use of the land and a wide range of other factors, such as the underlying geology of the site. Risks therefore should be assessed on a site-by-site basis.

The "suitable for use" approach then consists of three elements:

- (a) ensuring that land is suitable for its current use - in other words, identifying any land where contamination is causing unacceptable risks to human health and the environment, assessed on the basis of the current use and circumstances of the land, and returning such land to a condition where such risks no longer arise; the contaminated land regime provides the regulatory mechanisms to achieve this;
- (b) ensuring that land is made suitable for any new use, as planning permission is given for that new use - in other words, assessing the potential risks from contamination, on the basis of the proposed future use and circumstances, before official permission is given for the development and, where necessary to avoid unacceptable risks to human health and the environment, remediating the land before the new use commences; this is the role of the town and country planning and building control regimes; and
- (c) limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought - in other words, recognising that the risks from contaminated land can be satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby running the risk of distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).

The mere presence of pollutants does not therefore necessarily warrant action, and consideration must be given to the scale of risk involved for the current and proposed end use of the site.

RISK ASSESSMENT METHODOLOGY

Current practice recommends that the determination of potential liabilities that could arise from land contamination be carried out using the process of risk assessment, whereby "risk" is defined as:

- “(a) The probability, or frequency, or occurrence of a defined hazard; and
- (b) The magnitude (including the seriousness) of the consequences.”

The UK’s approach to the assessment of environmental risk is set out in by the Department of the Environment (2000) publication “A Guide to Risk Assessment and Risk Management for Environmental Protection.” This established an iterative, systematic staged process which comprises:

- (a) Hazard identification
- (b) Hazard assessment
- (c) Risk estimation
- (d) Risk evaluation
- (e) Risk Assessment

At each stage during the investigation process the above steps are repeated as more detailed information becomes available for the site.

CLR11- ‘Model Procedures for the Management of Land Contamination’, a document published by the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) outlines a tiered approach to the assessment of risks posed by contaminated land, as summarised hereunder:

Tier 1: Preliminary Risk Assessment

A Preliminary Risk Assessment is usually undertaken as part of a desk study, outlines potential risks posed by potential contamination to all receptors by defining plausible “pollution linkages” and developing a preliminary conceptual model (PCM). The purpose of this model is to define all possible complete pollution linkages, where the requisite source – pathway – target elements are present, and these elements being defined as:

- a contaminant (source) is a hazardous substance or agent, present at levels that have the potential to cause harm or damage a receptor
- a pathway is the means by or through which a contaminant meets, or otherwise affects, the receptor
- a receptor (target) is an entity (human being, aquatic environment, flora, and fauna etc) that is vulnerable to the adverse effects of the contaminant

This relationship is termed a “pollution linkage”. It should be recognised that for a health or environmental risk to exist, all three elements of the relationship or linkage must be present, i.e.

- if there is no contaminant, or contaminant present at levels below those considered to be harmful or damaging to a receptor, then there can be no adverse effect on a receptor
- if there is no receptor present that can be adversely affected by a contaminant, no harm or damage can arise
- even where both a contaminant and a receptor are present, no harm or damage will occur if there is no pathway by or through which a linkage between the two can be established

The absence of one or more of each component (source, pathway, receptor) would prevent a pollutant linkage being established and there would be no significant environmental risk.

The PCM is subject to continual refinement as additional data becomes available. As part of a Phase I Investigation (Desk Study and site walk over) a PCM is formed. Based on the PCM, potential pollutant linkages can be assessed. If the PCM and hazard assessment indicate that a pollution linkage is not of significance, then no further assessment or action is required due to this linkage. For each significant and possible linkage, a risk assessment is carried out. The linkages which potentially pose significant risks may require a variety of responses ranging from immediate remedial action or risk management or, more commonly, further investigation and risk assessment. This next stage is usually termed a Phase II Main Site Investigation and should provide additional data to allow refinement of the PCM and assess the level of risk from each pollutant linkage. Risk assessment will usually include Tier 2 Generic Quantitative Risk Assessment and / or, if necessary, a Tier 3 Detailed Quantitative Risk Assessment.

Tier 2: Generic Quantitative Risk Assessment (GQRA)

GQRA requires an intrusive investigation to characterise the site assisting in the re-assessment of the source-pathway receptor linkage. The conceptual model should be refined accordingly.

Upon completion of an intrusive investigation a it must be decided whether Generic Assessment Criteria (GAC) are suitable for assessing the risk posed by potential contamination at the site. If GAC are deemed unacceptable for risk assessment purposes or cannot be developed a Tier 3 Detailed Quantitative Risk Assessment (DQRA) is required.

If GQRA reveals that unacceptable risks are not present, then no further action is required. If GQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is deemed not suitable not required, an Options Appraisal should be undertaken. If further risk assessment is required, the scope nature of further risk assessment must be decided – it is possible that a Tier 3 DQRA will be undertaken in this scenario.

Tier 3: Detailed Quantitative Risk Assessment (DQRA)

DQRA is used when pollutant linkages require further assessment. DQRA is often undertaken for pollutant linkages where GAC are unavailable or inappropriate for or more conservative than the actual circumstances of the site. Site specific data is used to create Site Specific Assessment Criteria (SSAC) and enable a more accurate assessment of the risks. Further investigation may or may not be required to formulate SSAC depending on the site-specific conditions and information already obtained.

If DQRA reveals that unacceptable risks are not present, then no further action is required. If DQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is deemed not suitable not

required, an Options Appraisal should be undertaken. If further risk assessment is required, the scope and nature of further risk assessment must be decided at this point.

NOTE: A Tier 1 Preliminary Risk Assessment is undertaken as part of a Desk Study Report and a Preliminary Conceptual Model is developed for all pollutant linkages. However, the methodologies for assessing the risks to human health, risks to controlled waters and risk posed by ground gas using quantitative techniques vary considerably, therefore GQRA and DQRA for human health, controlled waters and ground gas must be undertaken separately. The risk assessment methodologies where quantitative assessment is used for risks to human health, risks to controlled waters and risks posed by ground gas, if relevant, are described hereunder.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO HUMAN HEALTH

Background

In March 2002, the Department for Environment, Food and Rural Affairs (DEFRA) and the EA published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land. These reports (CLR7-10) together with associated "SGV" documents have since been withdrawn (August 2008) and the following documents have been published as revised guidance to the CLEA assessment:

Environment Agency : 2008: Updated Technical Background to the CLEA model Science Report SC050021/SR3

Environment Agency : 2008: Human Health Toxicological Assessment of Contaminants in Soil SC050021/SR2

Additional guidance on statistical assessment replacing CLR 7 is provided in:

CL:AIRE :2008 Guidance on Comparing Data with a Critical Concentration

Other guidance/software used in spatial / statistical assessment is provided in:

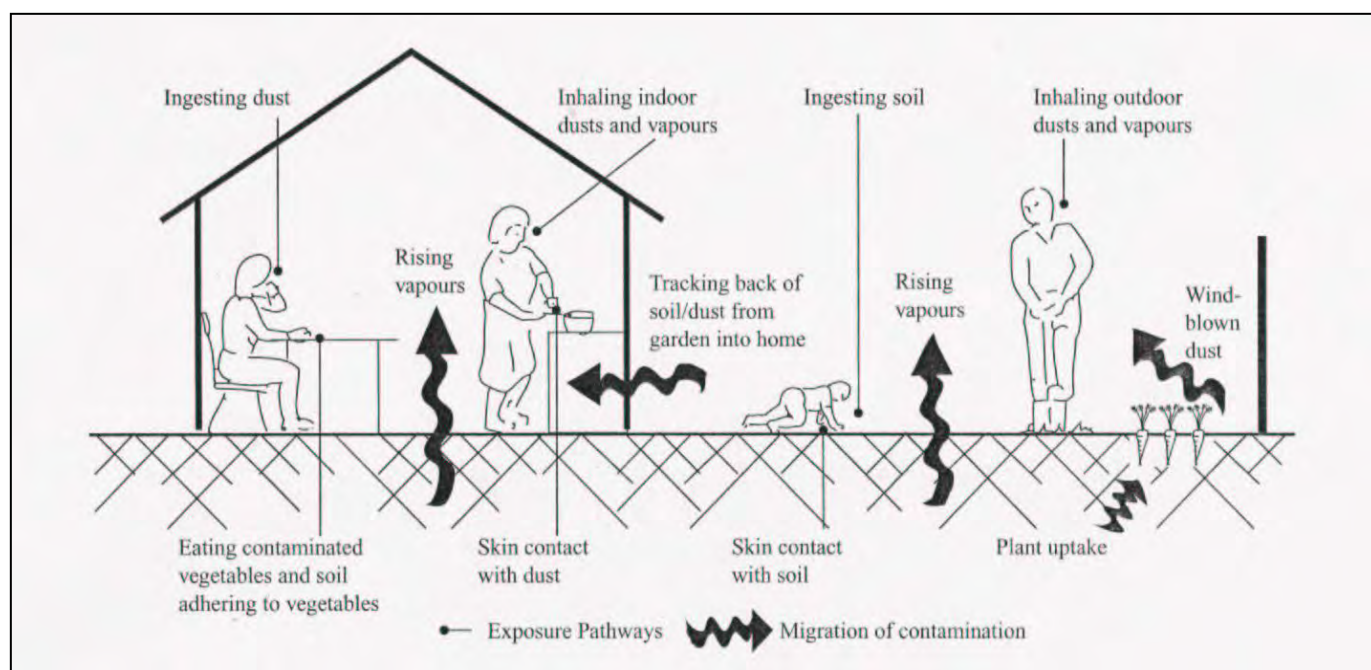
USEPA 2006: Data Quality Assessment: Statistical Methods for Practitioners

Spatial Analysis and Decision Assistance (SADA) – The University of Tennessee

A different approach to the statistical appraisal of data is required depending on whether the assessment of risk is to assess whether land is Contaminated Land in accordance with regulations, or whether the assessment is to determine whether the site is suitable for new development in according with Planning guidance. This is discussed further in CL:AIRE :2008 "Guidance on Comparing Data with a Critical Concentration".

A program for the derivation of GAC's based on the above guidance is provided by the Environment Agency and is entitled "CLEA Software Version 1.04".

The CLEA model has been developed to calculate an estimated tolerable daily soil intake (TDSI) for site users given a set 'default' exposure pathway. Ten human exposure pathways are covered in the CLEA model as presented below:



Ingestion

ingestion of outdoor soil

ingestion of indoor dust

ingestion of home grown produce

ingestion of soil attached to home grown produce

Dermal Contact

dermal contact with outdoor soil
dermal contact with indoor dust

Inhalation

inhalation of outdoor dust
inhalation of indoor dust
inhalation of outdoor soil vapour
inhalation of indoor soil vapour

It should be noted that there are other potential exposure pathways on some sites not included in the CLEA model e.g. certain organic compounds can pass through plastic water pipes into drinking water supply.

Where contaminated water is present at a depth less than 2.00mbgl and there is a potential risk of inhalation of vapours (only when volatile compounds are present) the risk from inhalation of vapours from soil water will be assessed using a UK compliant version of BP Risc v4.02.

The presence and/or significance of each of the above exposure pathways are dependent on the type of land use being considered and the nature of the contaminant under scrutiny. Accordingly, the CLEA model considers for principle 'default' land use types and makes a series of 'default' assumptions about human exposure frequency, duration and critical human target groups for each land use considered:

residential
allotments
commercial / industrial land use

The above land use categories defined in the CLEA are detailed below:

Residential: This generic scenario assumes a typical residential property consisting of a two-storey house built on a ground-bearing slab with a private garden consisting of lawn, flowerbeds, and a small fruit and vegetable patch. The occupants are assumed to be parents with young children, who make regular use of the garden area.

Allotments: This generic scenario assumes a plot of open space (about 250 m²), commonly made available by the local authority to tenants to grow fruit and vegetables for their own consumption. There are usually several plots to a site and the overall site area may cover more than a hectare. The tenants are assumed to be parents or grandparents and that young children make occasional accompanied visits to the plot.

Commercial/Industrial: There are many kinds of workplace and work-related activities. This generic scenario assumes a typical commercial or light industrial property consisting of a three-storey building at which employees spend most time indoors and are involved in office based or relatively light physical work.

Human Health Risk Assessment Methodology

Assessment of risk for the protection of human health is undertaken using the methodology as outlined previously, and summarised hereunder:

Tier 1 Preliminary Risk Assessment
Tier 2 Generic Quantitative Risk Assessment
Tier 3 Detailed Quantitative Risk Assessment

The Tier 1 Preliminary Risk Assessment is undertaken as part of the desk study report and includes the development of a Preliminary Conceptual Model. Tier 2 and Tier 3 Quantitative Risk Assessments are undertaken to develop and refine the Preliminary Conceptual Model aiding a more detailed assessment of the risk posed by contaminants revealed by site investigation and soil / soil water chemical analyses.

The methods used by CC GEOTECHNICAL LTD to derive assessment criteria, to statistically analyse chemical data and to compare chemical data to the derived assessment criteria are discussed hereunder.

Derivation of Generic Assessment Criteria (GAC) and Site-Specific Assessment Criteria (SSAC)

GAC's are derived based on the proposed land use and the associated applicable exposure pathways. It should be noted that there are difficulties in establishing soil concentrations of contaminants beyond which risks from exposure to these contaminants would be 'unacceptable' and the GAC value does not necessarily equate to the level for "significant possibility of significant harm" as defined in Part IIA of The Environmental Protection Act (1990) to determine whether land is "contaminated." This ultimately requires detailed 'toxicological' information of the health effects of individual contaminants and a scientific judgement on what constitutes an 'unacceptable' risk. The primary purpose of the CLEA derived GAC's are as 'minimal risk thresholds' for the assessment of human health risks in relation to land use.

Minimal risk thresholds calculated using generic input parameters for each of the above land uses are termed Generic Assessment Criteria (GAC) and are used for Generic Quantitative Risk Assessment (GQRA). However, further assessment may be required taking into consideration site specific factors such as the way the land is used, the soil type, the building characteristics and the exact nature of the receptor, to determine whether there is a significant possibility of risk to human health to site users. Such an assessment is known as a Detailed Quantitative Risk Assessment (DQRA) and the resultant threshold concentrations are known as Site Specific Assessment Criteria (SSAC). Such assessments should be conducted with the agreement of the local authority (or the Environment Agency) since it is the authority that determines whether land is Contaminated Land or whether Planning Permission for a new development may be granted.

For the purposes of this report, assessment criteria have been derived in accordance with current guidance based on the conceptual model for the proposed land use using the CLEA v1.04 software. These criteria are not intended to indicate whether the site may be contaminated land, nor do they replace any published soil guideline values. However, the values are intended to provide guidance for the local authority on whether the site may be considered uncontaminated. If, based on the site's proposed future use, the site would be considered by the local authority to be uncontaminated and therefore, on the basis of soil concentrations, fit for purpose, then no further risk assessment based on soil concentrations and the risk to human health would be necessary. However, should these criteria be exceeded, or the conceptual site model vary from the model used in the risk assessment to derive these values then the risk assessment should be updated accordingly.

For contaminants routinely analysed where inhalation is a significant pathway (naphthalene, phenanthrene, Aromatic EC5-EC7, Aromatic EC7-EC8, Aromatic EC8-EC10, Aromatic EC10-EC12, Aromatic EC12-EC16, Aliphatic EC5-EC6, Aliphatic EC8-EC10, Aliphatic EC10-EC12, Aliphatic EC12-EC16), plots of the GAC as a function of Soil Organic Matter (SOM) are used to determine if they pose a potential risk to human health, which are presented hereunder. Where there is an exceedance further assessment may be undertaken.

Statistical Assessment of Soil Contamination Data & Comparison of Contamination Data to Threshold Values

In any site investigation only a small fraction of the soil on the site is analysed. Therefore, the mean derived from the contamination data for a contaminant may not be the same as the true mean for the contaminant distribution on the site. To improve the reliability of any assessment a statistical analysis is undertaken in line with the CL:AIRE document "Guidance on Comparing Soil Contamination Data with a Critical Concentration".

Statistical assessment of soil data is undertaken using programs based on the guidance in the CL:AIRE document or the USEPA software ProUCL v4.0.

Where the number of results in a dataset is less than four, a statistical assessment is not undertaken, and the assessment is performed by comparison of the maximum value(s) with a Health Criteria Value (HCV), such as Generic Assessment Criteria value(s).

For the Planning situation, the regulator needs to check whether the concentration of contaminants is low compared to the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is lower than the HCV.

For the Part IIA scenario the regulator needs to determine whether the concentration of contaminants is greater than the HCV. This decision is based on whether there is at least a 95% confidence level that the true mean of the dataset is higher than the HCV. However, the regulator may proceed with determination if there is just a 51% probability, "on the balance of probabilities".

The Outlier Test used in the statistical assessment may not be able identify separate populations if numerous populations are present. To ensure that this is not the case a spatial assessment of the data will be undertaken using SADA.

If the screening levels are exceeded, then more sophisticated quantitative risk assessment or remedial action may be undertaken. The benefits of undertaking a quantitative risk assessment must be weighed against the likelihood that it will bring about cost savings in the proposed remediation.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED TO CONTROLLED WATER

Definition of Controlled Waters

The term 'controlled waters' is defined in Section 104 of the Water Resources Act 1991 as:

"Territorial Waters...which extend seawards for three miles..., coastal waters..., inland freshwaters, waters in any relevant lake or pond or of so much of any relevant river or watercourse as is above the freshwater limit, and ground waters, that is to say, any waters contained in underground strata."

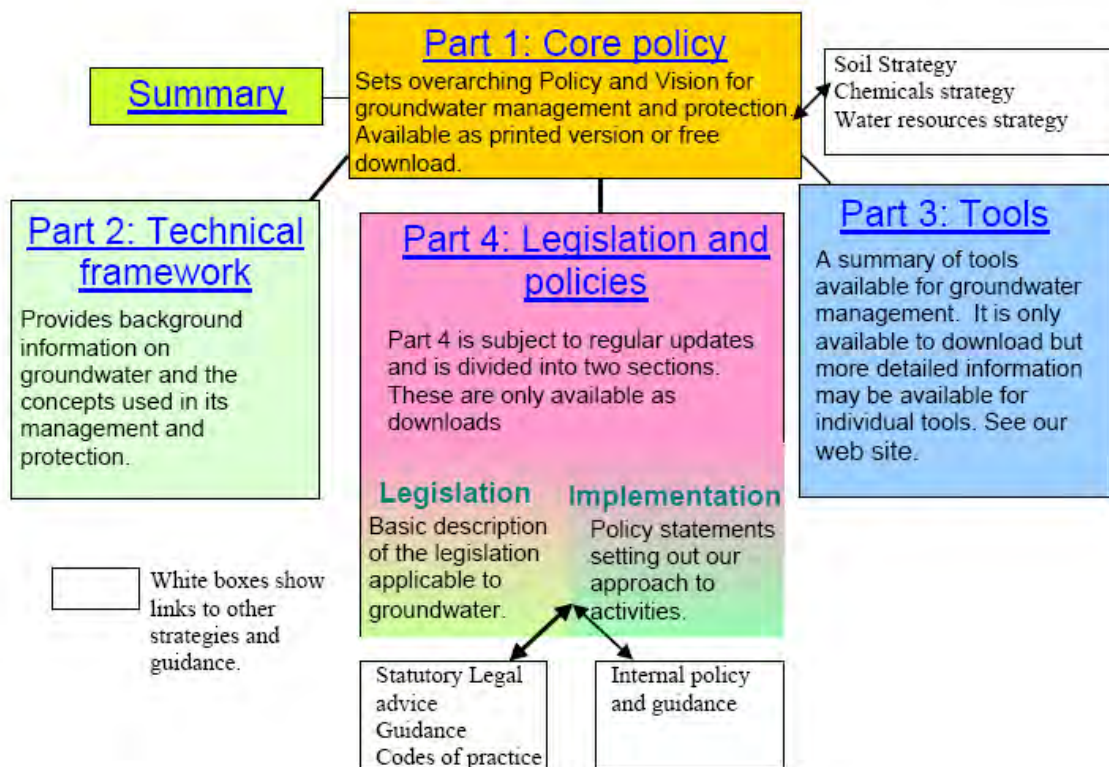
Note that the definition of groundwater under the Water Resources Act 1991 includes all water within underground strata (including soil / pore water in the unsaturated zone). The definition of groundwater under the Groundwater Directive however is limited to water in the saturated zone. For the purposes of Part IIA of the Environmental Protection Act 1990, the Environment Agency recommends that the groundwater within the saturated zone only is considered as the receptor (rather than soil / pore water).

Environment Agency Guidance

Legislation and guidance surrounding the protection of controlled waters in the UK is abundant and can be complex. The Environment Agency's overall position on groundwater is "To protect and manage groundwater resources for present and future generation in ways that are appropriate for the risks that we identify" (Groundwater Protection : Policy and Practice GP3, 2006). In brief, the core objectives of the existing legislation serve to enforce this position.

In 1992, the National Rivers Authority published their Policy and Practice for the Protection of Groundwater (PPPG), this document was influential as it provided a focus for key developments such as Source Protection Zones (SPZs) and Groundwater Vulnerability Maps. The Policy was then revised in 1998, since which there have been substantial changes in legislation, driven by Europe. Key European Directives relating to groundwater include the Groundwater Directive (80/68/EEC) and the Water Framework Directive (2000/60/EC). Aspects of these directives are controlled by primary UK legislation such as the Water Resources Act 1991. Further to legislative changes, gaps identified in the 1998 PPPG required addressing. These changes are reflected in the forthcoming Environment Agency Policy document entitled Groundwater Protection : Policy and Practice (GP3), a draft version of which was available for public consultation (Parts 1 to 3) ending July 2006 with Part 4 issued in March 2008. Part 4 includes a section on key groundwater legislation and the Environment Agency's interpretation of it.

The following gives a breakdown of the structure of the document (taken from the Environment Agency GP3 draft consultation document, 2006)



Controlled Water Risk Assessment Methodology

The risk posed to controlled water is assessed by CC GEOTECHNICAL in accordance with current guidance as outlined hereunder.

In order for a developer of a potentially contaminated site to fulfil their obligations under the legislation, a site assessment would be required to be undertaken in order to identify any potential risks to controlled waters and to derive suitable clean-up criteria if necessary to ensure the protection of controlled waters. The general approach for Groundwater Protection is detailed further in Part 3 of GP3.

When assessing groundwater impact the Environment Agency advocate the application of their framework methodology "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination" Environment Agency (2006). The methodology has four levels of assessment as described below:

Level 1 considers whether contaminant concentrations in "pore water" in contaminated soil are enough to impact on the receptor, ignoring dilution, dispersion, and attenuation along the pathway. The "pore water" concentration is determined from:

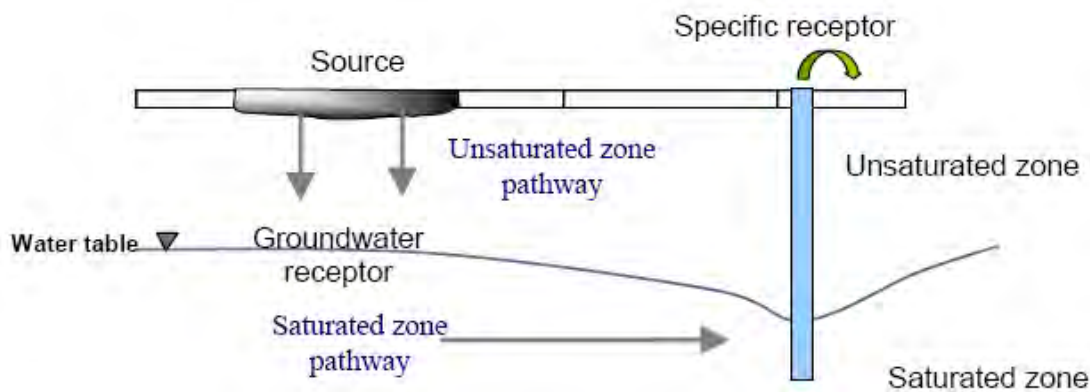
- measured "pore water" concentrations or perched water quality
- ii) soil leaching tests
- iii) theoretical calculations based on soil/water partitioning equations

Level 2 considers dilution by the receiving groundwater or surface water body and whether this is enough to reduce contaminant concentrations to acceptable levels. The remedial target is defined as the target concentration multiplied by a dilution factor (DF).

Levels 3 and 4 consider whether natural attenuation (including dispersion, retardation, and degradation) of the contaminant as it moves through the unsaturated and saturated zones to the receptor are enough to reduce contaminant concentrations to acceptable levels. The remedial target is defined as target concentration multiplied by a dilution factor (DF) and attenuation factor (AF). In Level 3 simple analytical models are used to calculate the significance of attenuation. The Environment Agency has released a "Remedial targets worksheet v3.1" to carry out basic calculations using a conservative approach up to Level 3 using basic principles assuming a simple migration of contaminants from the source zone into the aquifer receptor. Level 4 assessment uses more sophisticated numerical models and allows for the introduction of additional geological horizons and is used mainly to determine whether soil contaminants will reach their target within a specified timeframe. Use of such software should only be used once agreement has been obtained from the Environment Agency.

Three main stages apply to any risk assessment of controlled waters, these are:

1. Risk Screening (Tier 1 Preliminary Risk Assessment): The understanding of the Conceptual Site Model (CSM) is the key to assessing any site. Using a robust CSM, potential pathways or receptors may be screened out from any further assessment at an early stage. For example, if the pathway through the unsaturated zone is blocked by the presence of a significant thickness of low permeability clay. A greater understanding of the CSM is achieved with each tier of risk assessment. An example of a basic CSM is given below (taken from the Environment Agency GP3 draft consultation document, 2006):



2. Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Level 1): When undertaking the Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Tier 1), comparison of chemical analytical results is made with screening criteria. Published values of screening criteria with which chemical test results can be compared are published in the following guidance:

Water Supply (Water Quality) Regulations 2000

The Private Water Supplies Regulations 1991

Environmental Quality Standards for surface waters based on The EC Dangerous Substances Directive (76/464/EEC and Daughter Directives)

The Surface Waters (Abstraction for Drinking Water Classification) Regulations 1996

World Health Organisation Drinking Water Standards 2004

Should the Level 1 assessment indicate threshold levels to be exceeded, then there are three alternative ways in which to proceed:

To devise suitable remedial solutions

To carry out more investigation, sampling, and analysis

To conduct a site specific Detailed Quantitative Risk Assessment (DQRA) to determine if the materials are suitable for their proposed use, or devise site specific clean-up level

3. Detailed Quantitative Risk Assessment (EA Remedial Targets Methodology Levels 2 to 4): The decision to carry out a DQRA will be dependant on the extent and implications of the initial qualitative and generic assessment. The scope of any such assessment will be accurately defined by the outcomes of the previous levels of assessment. The conceptual model will be sufficiently refined by this stage that only certain contaminants of concern, certain pathways and certain receptors will require further assessment, the remainder having been screened out.

Additional site-specific data is normally required for this stage of assessment, as explained above, more processes that are capable of affecting contaminant concentrations are considered (such as dilution and attenuation).

Remediation criteria, if derived, will therefore be specific to each site and will be based on a detailed assessment of the potential impact at the identified receptor or compliance point. A greater level of confidence can be placed on the predicted impact on the compliance point following a DQRA.

BACKGROUND INFORMATION, CURRENT GUIDANCE AND RISK ASSESSMENT METHODOLOGY FOR RISKS POSED BY GROUND GAS

Origin of Ground and Landfill Gases

When carrying out a ground gas risk assessment, the origin or source of the gases is important as potential risks will vary depending on the source. This Appendix relates to the risk of the two main ground gases of concern; methane and carbon dioxide and does not apply to other ground gases (e.g. radon or vapours from hydrocarbon spills). Methane and carbon dioxide are major constituents of landfill gas but can also occur from a variety of anthropogenic and natural sources, as summarised in Table 5 below:

Gas	Source	Comments
Landfill Gas	Anaerobic decomposition of degradable waste within landfill sites. Typically, 60% methane and 40% carbon dioxide during methanogenic phase.	Composition varies over time, particularly in early stages. Contains a range of minor constituents (particularly carbon monoxide and hydrogen sulphide).
Landfill Associated Gases	- Anaerobic degradation of leachate external to the site; - Degassing of dissolved gases in groundwater; - Evolution of gases following interaction between leachate and groundwater	Can result in secondary (external) production of methane or carbon dioxide.
Made Ground	Anaerobic degradation of organic components	Very variable depending on source
Sewer Gas, Cess Pits	Anaerobic degradation of organic components of sewage producing methane and carbon dioxide.	Often characterised by hydrogen sulphide odour.
Mains Gas	Leakage from underground pipework or storage tanks. Mainly methane but often contains higher alkanes.	An odourise is added to permit detection of leaks. Typically, 90% CH ₄ , but 1 to 27% C ₂ -C ₄ alkanes, May

Gas	Source	Comments
		also contain other trace gases e.g. CO, helium and CO ₂ (from degradation of CH ₄ in the ground).
Other Anthropogenic Sources	- Degradation of leaked or spilled hydrocarbons or other industrial chemicals; - Anaerobic degradation of organic contaminants in groundwaters (e.g. silage liquor); - Reactions between monitoring well construction components and environment; - Burial grounds/cemeteries.	Hydrocarbon spillages often have an 'oily' odour. Fuel spillages common – Petrol or Diesel and can contain a wide range of VOC's. Can degrade to produce methane / carbon dioxide.
Alluvium / Marsh / Peat Gas	Anaerobic microbial degradation of organic material (usually waterlogged vegetation / peat). Often associated with the presence of alluvial deposits or dredging's.	
Geogenic Gas	Natural seepages of carbon dioxide and hydrocarbon gases derived from geologic sources such as coal seams and deep oil / gas source formations. Can be present in solution in groundwaters.	Methane most common but can contain carbon dioxide and higher alkanes.
Mine Gases	Various types. Most common is "fire damp" with high methane, produced by the desorption of gas trapped in coal. "Black damp" (Scythe gas) with high carbon dioxide and denser than air. "White damp" is high in carbon monoxide.	Methane most common. Can contain higher alkanes, carbon dioxide and carbon monoxide. Often low in oxygen.
Natural Shallow Ground Gas	Various types - high carbon dioxide formed by subsurface aerobic activity leading to depleted oxygen and elevated carbon dioxide; - chemical degradation of rocks (e.g. carbonates) producing carbon dioxide; - carbon dioxide production in root zone of soils by plants.	Gases can be emitted from ground under falling barometric pressure conditions.

Table 5. Potential Sources of Ground Gases

This Appendix does not provide guidance for the assessment of risk when other gases are present due to 'Other Sources' from the above table (particularly organic compounds such as BTEX and VOC's or for the risk from radon or hydrogen sulphide).

To determine the origin of the gas a range of factors must be considered together, including;

1. Proximity of likely sources
2. Ground conditions (geology, hydrogeology, anthropogenic pathways etc)
3. Properties of gases present including:
 - Chemical composition
 - Physical properties
 - Ratios of components e.g. methane : carbon dioxide
4. Timeframe of activities such as infilling periods, capping works, installation of gas control systems etc

Identification of the originating source may be problematic given that there may be more than one source present and trace gas analysis may be required. Identification of the sources of the gases encountered during monitoring is usually carried out through a process of eliminating the most unlikely potential sources (given the site setting) and selecting those which are most likely.

Hazards Associated with Presence of Methane

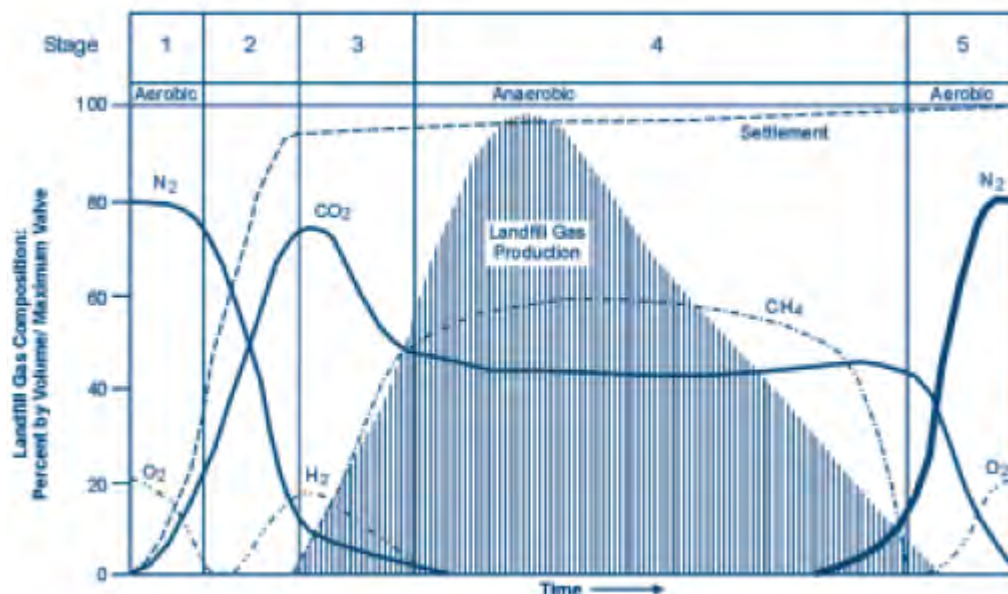
Methane gas is combustible and potentially explosive. When the concentration of methane in air is between the limits of 5.0%v/v and 15.0%v/v an explosive mixture is formed. The Lower Explosive Limit (LEL) of methane is 5.0%v/v, which is equivalent to 100% LEL. The 15.0%v/v limit is known as the Upper Explosive Limit (UEL), but concentrations above this level cannot be assumed to represent safe concentrations. Further, the LEL and UEL will vary (up and down) depending upon the proportion of other gases (including oxygen). However, the fact that methane is a colourless, odourless gas means that there is no simple indicator of the presence of the gas until such a time as explosive limits are reached, and an incident occurs. Methane is lighter than air and has a low toxicity. However, at high concentrations it can result in asphyxiation due to oxygen displacement.

Hazards Associated with Presence of Carbon Dioxide

Carbon dioxide is a colourless, odourless gas, which, although non-flammable, is both toxic and an asphyxiant. As carbon dioxide is denser than air, it will collect in low points and depressions. The UK Health & Safety Executive (HSE) has published information relating to concentrations of carbon dioxide that humans may be exposed to, which uses concentrations contained in the Control of Substances Hazardous to Health Regulations 2002 (as amended). These are the Long-Term Occupational Exposure Limit (LTOEL, 8-hour period) and the Short-Term Occupational Exposure Limit (STOEL, 15-minute period), which are 0.5% and 1.5% carbon dioxide, respectively.

Parameters Influencing the Rate of Ground Gas Production

The figure below is taken from EA guidance document LFTGN 03 illustrates typical ground gas generation curves from biodegradable materials:



The production of methane and carbon dioxide at a landfill site may be expected to be considerable and ongoing. Concentrations of methane will eventually decrease, followed by concentrations of carbon dioxide, but the duration and rate of gas production can vary markedly between sites. Five distinct phases of gas production occur during the process which are, in order of event as marked above, as follows:

1. An aerobic phase involving oxygen depletion and temperature increase through aerobic respiration;
2. The establishment of anaerobic conditions and the evolution of carbon dioxide and hydrogen through acidogenic activity;
3. Commencement of methanogenic activity; the establishment of populations of methanogenic bacteria;
4. A phase of stable methanogenic activity, which may go on for many tens of years;
5. A phase of decreasing methanogenic activity, representing depletion of the organic material and a return to aerobic conditions.

The time scale for the return to the normal ground gas concentrations will be highly variable, depending upon the types and quantities of materials present. In addition, the optimum parameters influencing the rate of decomposition and ground gas production within the ground at a site are as follows:

High water content with adequate rainfall and water infiltration to provide moisture content between approximately 20 to 26%;
 Conditions that either are or are very close to anaerobic;
 High proportion of biodegradable materials;
 A pH between 6.5 and 8.5, ideally verging slightly on the acidic between pH 6 to 7;
 Temperature between 25°C and 55°C;
 The ratio of the biochemical and chemical oxygen demands (BOD:COD);
 High permeability;
 Small particle size, as finer subsurface materials possess a greater surface area to provide a growing 'face' for the micro-organisms, but high fines levels reduces permeability and reduces decomposition rate.

For this reason, it is vital that sources of methane and carbon dioxide are identified prior to the commencement of any work on a construction site, and that the ground gas regime is characterised at the worst temporal conditions a site may experience. From this, a risk assessment is carried out to identify the risk at the site from ground gases so that suitable protection measures can be designed and incorporated into a development to prevent a dangerous build-up of gas occurring.

Factors Influencing the Migration and Behaviour of Ground Gases

There are many factors that influence the migration of ground gases which can affect the risk from a gassing source:

driving force – pressure differential along a pathway, diffusion and dissolved in solution;
 meteorological conditions – short term and seasonal conditions including atmospheric pressure changes (e.g. rapidly falling pressure causes gas to expand increasing emission rates), rainfall, frozen ground and thawing, temperature;
 geological and groundwater conditions – these can have the over riding influence on the direction/pathways and quantity of migrating gas;
 anthropogenic influences – man-made pathways include mine shafts, service runs/drains, foundation piles, underground voids/pits/basements, foundation/building design/construction

Current Guidance

Previous versions of Building Regulations Approved Document C provided statutory guidance stating that consideration should be given to appropriate action and / or specific solutions in situations where methane concentration exceeded 1%v/v or carbon dioxide concentrations exceeded 5%v/v. The latest Building Regulations Approved Document C (DoE 2004) no longer endorses this approach and recommends the use of a risk-based approach to interpreting a gas monitoring survey. This is in line with current EA guidance for landfill gas (LFTGN 03, 2004) which recommends the use of a structured risk-based approach like that outlined in CLR 11. On this basis, recent guidance has been produced in 2006 and 2007 with the aim of providing up to date advice in relation to residential and commercial development. The guidance does not address issues associated with gas derived from landfills, for this refer to "Guidance on the Management of Landfill Gas" (Environment Agency 2004) for an overview.

Recent guidance relevant to gas assessments for residential and commercial development includes;

Wilson et al. (CIRIA C665, December 2007) "Assessing Risks Posed by Hazardous Ground Gases for Buildings."

This document provides up to date advice on all aspects of ground gas risk assessment such as investigation, monitoring programmes, data collection and interpretation. The guidance presents separate methodologies for the characterisation of:

All development types except low rise housing with gardens (Situation A)

Low rise housing with gardens (Situation B)

Boyle and Witherington (NHBC / RSK Group, Report 10627-R01(04) January 2007) "Guidance on the Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present."

This document presents the "Traffic Lights System" detailed below and is relevant only for low rise properties (e.g. bungalows and town houses) that have a ventilated sub-floor void (i.e. Situation B as described in CIRIA C665).

British Standard (BS 8485, December 2007) "Code of Practice for the Characterization and Remediation from Ground Gas in Affected Developments"

This document provides an overview of gas characterisation and assessment. The Standard is intended to be used by designers of gas protection measures and regulators involved in the assessment of design solutions.

Further guidance, Wilson, and Card (CIEH) "Ground Gas Handbook for Designers and Regulators" providing practical guidance on ground gas assessments and the design and evaluation of protection measures, is expected to be published in March 2009.

Each of these documents continues to highlight the importance of, and give further guidance towards, carrying out a tiered risk-based decision-making process in accord with government policy on dealing with contamination from historic or natural sources and highlight the importance of the Conceptual Model in site characterisation.

Ground Gas Risk Assessment Methodology

Assessment of risk posed by ground gas is undertaken using the methodology as outlined previously, and summarised hereunder:

Tier 1 Preliminary Risk Assessment

Tier 2 Generic Quantitative Risk Assessment

Tier 3 Detailed Quantitative Risk Assessment

The methodology used in each of the above assessments with concern to ground gas is discussed hereunder.

Tier 1 Preliminary Risk Assessment

All potential sources of methane and carbon dioxide are identified in the Preliminary Conceptual Model and the generation potential determined. The background information discussed earlier is referred to in order to determine the potential for a source to generate ground gas.

CIRIA C665 provides idealised monitoring frequency / period dependant upon generation potential of gas source and sensitivity of the proposed land use as below:

Idealised Frequency and Period of Monitoring (after Table 5.5a and 5.5b, CIRIA C665)

		Generation Potential of Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4/1	6/2	6/3	12/6	12/12
	Moderate (Flats)	6/2	6/3	9/6	12/12	24/24
	High (Residential with Gardens)	6/3	9/6	12/6	24/12	24/24

Notes

1. First number is the number of readings and the second is the minimum period in months (e.g. 6/2 – six sets of readings over two months).
2. At least two sets of readings must be at low (preferably under 1,000 mb) and falling pressure.

The monitoring programme is decided using the above table prior to the intrusive site investigation. However, if the intrusive investigation reveals that the potential source is better or worse than anticipated the monitoring programme should be modified accordingly. For example, if the made ground contains no evidence of organic material and comprises entirely granular brick fill, the potential for that made ground to generate ground gas is reduced considerably.

Tier 2 Generic Quantitative Risk Assessment

Generic Quantitative Risk Assessment is undertaken upon completion of the required gas monitoring period.

All three current guidance documents propose that both ground gas concentrations and flow rates are used to calculate the limiting gas well gas volume flow rates for methane and carbon dioxide, based on the ground gas conditions monitored for during the worse-case temporal conditions. This limiting gas well volume flow rate is termed the Gas Screening Value (GSV, note that this was termed borehole gas volume flow), and is calculated as follows:

$$GSV (l/hr) = [\text{gas well gas concentration (\%v/v)}] \times [\text{gas well flow rate (l/hr)}]$$

GSV's are compared to typical max concentrations and limiting gas screening values derived for either Situation A - All development except low rise housing with gardens, or Situation B low rise housing with gardens (NHBC Traffic Light System). Table 8.5 from CIRIA C665 is used for comparison of gas screening values for "Situation A Developments" and is presented hereunder:

Characteristic Situation (CIRIA R149)	Comparable Partners in Technology gas Regime (see Box 8.2)	Risk Classification	Gas Screening Value (CH ₄ or CO ₂) (l/hr) ¹	Additional Factors	Typical Source of Generation
1	A	Very low risk	<0.07	Typically, methane ≤ 1% and/or carbon dioxide ≤ 5%. Otherwise consider increase to Situation 2	Natural soils with low organic content "Typical" made ground
2	B	Low risk	<0.7	Borehole air flow rate not to exceed 70l/hr. Otherwise consider increase to characteristic Situation 3	Natural soil, high peat/organic content. "Typical" made ground
3	C	Moderate risk	<3.5		Old landfill, inert waste, mineworking flooded
4	D	Moderate to high risk	<15	Quantitative risk assessment required to evaluate scope of protective measures.	Mineworking susceptible to flooding, completed landfill (WMP 26B criteria)
5	E	High risk	<70		Mineworking unflooded inactive with shallow workings near surface
6	F	Very high risk	>70		Recent landfill site

Table 8.5 from CIRIA C665 Modified Wilson and Card Classification

Table 8.7 is used for comparison of gas screening values for "Situation B Developments" and is presented hereunder:

Traffic Light	Methane ¹		Carbon Dioxide ²	
	Typical max concentration ³ (% by volume)	Gas screening value ^{2,4} (litres/hour)	Typical concentration ³ (% max by volume)	Gas screening value ^{2,4} (litres/hour)
Green				
Amber 1	1	0.13	5	0.78
Amber 2	5	0.63	10	1.60
Red	20	1.60	30	3.10

Notes:

- The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter will be the decoder as to what Traffic Light is allocated;
- Borehole Gas Volume Flow Rate, in litres per hour as defined in Wilson and Card (1999), is the borehole flow rate multiplied by the concentration in the air stream of the gas being considered;
- The Typical Maximum Concentration can be exceeded in certain circumstances should the Conceptual Site Model indicate it is safe to do so;
- The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment considering site-specific conditions.

Table 8.7 from CIRIA C665 - NHBC Traffic light system for 150 mm void

Dependant on the outcome of the assessment of risk posed by ground gas it is determined whether gas protection measures are required for the proposed development, and or whether a detailed quantitative risk assessment is required for the site.

Selection & Design of Protective Measures

Table 8.6 and Box 8.4 of CIRIA C665 contain information on the detailed design of protection measures and were initially intended for the purposes of determining then level of protection measures a development requires. These tables and related text include some useful information on the design of gas protection measures, however BS8485:2007, which supersedes the guidance included within CIRIA C665, is used for selection of gas protection measures.

BS8485: 2007 uses a scoring system dependant on the Characteristic Situation / NHBC Traffic Light and proposed end use of the site. The scoring system is summarised in BS8485:2007 Table 2 as presented hereunder:

Characteristic gas	NHBC traffic	Required gas protection
--------------------	--------------	-------------------------

situation, CS	light	Non-managed property e.g. private housing	Public building (a)	Commercial buildings	Industrial buildings (b)
1	Green	0	0	0	0
2	Amber 1	3	3	2	1 (c)
3	Amber 2	4	3	2	2
4	Red	6 (d)	5(d)	4	3
5			6(e)	5	4
6				7	6

NOTE Traffic light indications are taken from NHBC Report no.:10627-RO1 (04) and are mainly applicable to low-rise residential housing¹. These are for comparative purposes but the boundaries between the traffic light indications and CS values do not coincide.

a) Public buildings include, for example, managed apartments, schools, and hospitals.
b) Industrial buildings are generally open and well ventilated. However, areas such as office pods might require a separate assessment and may be classified as commercial buildings and require a different scope of gas protection to the main building.
c) Maximum methane concentration 20% otherwise consider and increase to CS3.
d) Residential building on higher traffic light/CS sites is not recommended unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.
e) Consideration of issues such as ease of evacuation and how false alarms will be handled are needed when completing the design specification of any gas protection scheme

¹ The NHBC guidance and CIRIA C665 guidance refers to low rise housing (which is up to three storeys without lifts) that is constructed with a 150mm ventilated sub-floor void.

BS8485:2007 Table 2 Required gas protection by characteristic gas situation and type of building

Once a score is assigned, a combination of protection systems / elements is chosen from BS8485:2007 Table 3 shown below:

PROTECTION ELEMENT/SYSTEM		SCORE	COMMENTS
a) Venting/dilution (See Annex A BS8485)			
Passive sub floor ventilation (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.)A Subfloor ventilation with active abstraction/pressurization (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.)A Ventilated car park (basement or undercroft)	Very good performance	2.5	Ventilation performance in accordance with Annex A (BS8485)
	Good performance	1	If passive ventilation is poor this is generally unacceptable, and some form of active system will be required.
		2.5	There must be robust management systems in place to ensure the continued maintenance of any ventilation system. Active ventilation can always be designed to meet good performance.
		4	Mechanically assisted systems come in two forms: extraction and positive pressurization.
b) Barriers			
Floor slabs			
Block and beam floor slab		0	It is good practice to install ventilation in all foundation systems to effect pressure relief as a minimum. Breaches in floor slabs such as joints must be effectively sealed against gas ingress in order to maintain these performances.
Reinforced concrete ground bearing slab		0.5	
Reinforced concrete ground bearing foundation raft with limited service penetrations that are cast into slab		1.5	
Reinforced concrete cast in situ suspended floor slab with minimal service penetrations and water bars around all slab penetrations and at joints		1.5	
Fully tanked basement		2	
c) Membranes			
Taped and sealed membrane to reasonable levels of workmanship/in line with current good practice with validation B,C		0.5	The performance of membranes is heavily dependent on the quality of design of the installation, resistance to damage after installation, and the integrity of joints.
Proprietary gas resistant membrane to reasonable levels of workmanship /in line with good practice under independent inspection (CQA)B,C		1	
Proprietary gas resistant membrane installed to reasonable levels of workmanship/in line with current good practice under CQA with integrity testing and independent validation		2	
d) Monitoring and detection (not applicable to non-managed property, or in isolation)			
Intermittent monitoring using handheld equipment		0.5	Where fitted, permanent monitoring systems ought to be installed in the underfloor venting/dilution system in the first instance but can also be provided within the occupied space as a fail safe.
Permanent monitoring and alarm system A	Installed in the underfloor venting/dilution system	2	
	Installed in the building	1	
e) Pathway Intervention			
Pathway intervention		-	This can consist of site protection measures for off-site or on-site sources (see Annex A, BS8485)
NOTE In practice the choice of materials might well rely on factors such as construction method and the risk of damage after installation. It is important to ensure that the chosen combination gives an appropriate level of protection			
It is possible to test ventilation systems by installing monitoring probes for post installation validation. If a 1 200g DPM material is to function as a gas barrier it should be installed according to BRE 212 /BRE 414 being taped and sealed to all penetrations			

Polymeric Materials > 1200 g (proportional to thickness) but their physical properties mean that they are more robust and resistant to damage.

BS8485:2007 Table 3 Solution Scores

Where the gas situation is 4 or more (and for NHBC Red situations) the site requires a comprehensive risk assessment to confirm the scope of protection measures. These are higher risk sites and reliance on Table 2 and 3 alone is not enough.

For a site which is impacted by migratory gases from an off-site source, the development may be protected by imposing pathway intervention methods, which if successfully validated, could also remove the need for further analysis. It is essential that the gas regime in these circumstances has been fully characterised and that the only source impacting the site is located off site and that the pathway is clearly defined and its interception equally proven before construction commences. Pathway intervention methods may include vertical membrane installations, venting trenches, rows of stone columns, activated trenches and various proprietary systems. These systems are particularly relevant to domestic housing where there is limited scope for foundation type solutions.

CURRENT GUIDANCE ON REMEDIATION

When risk assessment of the site has been completed and it indicates that remedial works are required, the main guidance in managing this process is set out in the DEFRA/EA publication CLR11 (2004) "Model Procedures for the Management of Land Contamination." The stages of managing remediation are as follows:

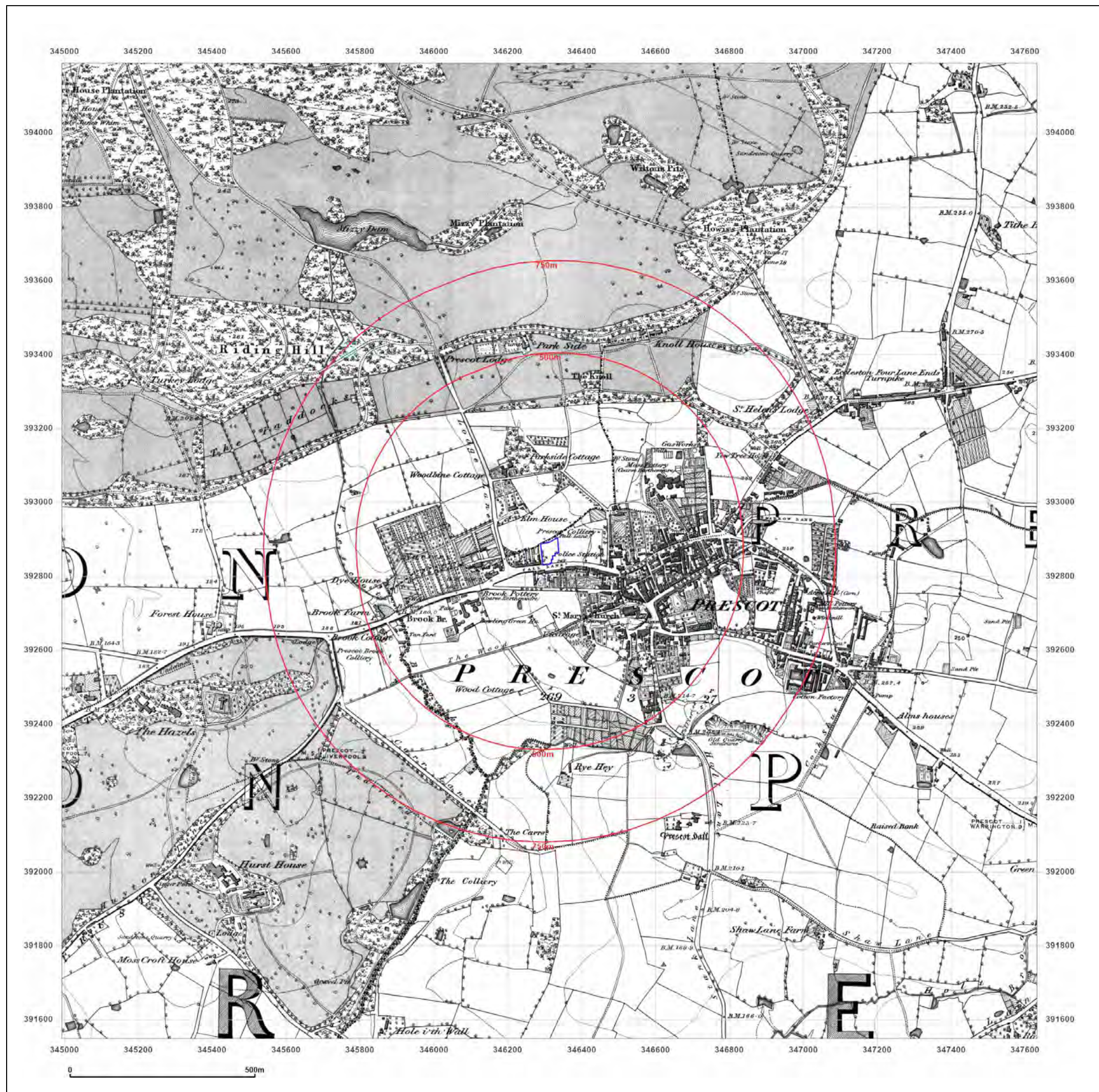
- (a) Options Appraisal and develop Remediation Strategy;
- (b) Develop Implementation Plan and Verification Plan;
- (c) Remediation, Verification and Monitoring.

The Remediation Strategy sets out the remediation targets, identifies technically feasible remedial solutions and presents an evaluation of the options so that these can be assessed enabling that the most suitable solution is adopted. An outline of the proposed remedial method should be presented. Agreement should be sought of the appropriate statutory bodies for the Remediation Strategy before proceeding to the next stage.

The Implementation Plan is a detailed method statement setting out how the remediation is to be carried out including stating how the site will be managed, welfare procedures, health and safety considerations together with practical measures such as details of temporary works, programme of works, waste management licences and regulatory consents required. Agreement should again be sought of the appropriate statutory bodies for this Plan.

The Verification Plan sets out the requirements for gathering data to demonstrate that the remediation has met the required remediation objectives and criteria. The Verification Plan presents the requirements for a wide range of issues including the level of supervision, sampling and testing regimes for treated materials, waste and imported materials, required monitoring works during and post remediation, how compliance with all licenses and consents will be checked etc. Agreement should again be sought of the appropriate statutory bodies for the Verification Plan. On completion of the remediation a Verification Report should be produced to provide a complete record of all remediation activities on site and the data collected as required in the Verification Plan. The Verification Report should demonstrate that the remediation has met the remedial targets to show that the site is suitable for the proposed use.

APPENDIX D: COMMERCIAL ENVIRONMENTAL DATA



Site Details:

Prescot Police Station, L34 3LG

Client Ref: 4165
Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

Map Name: County Series

Map date: 1850

Scale: 1:10,560

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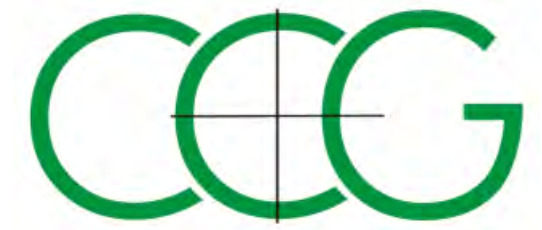
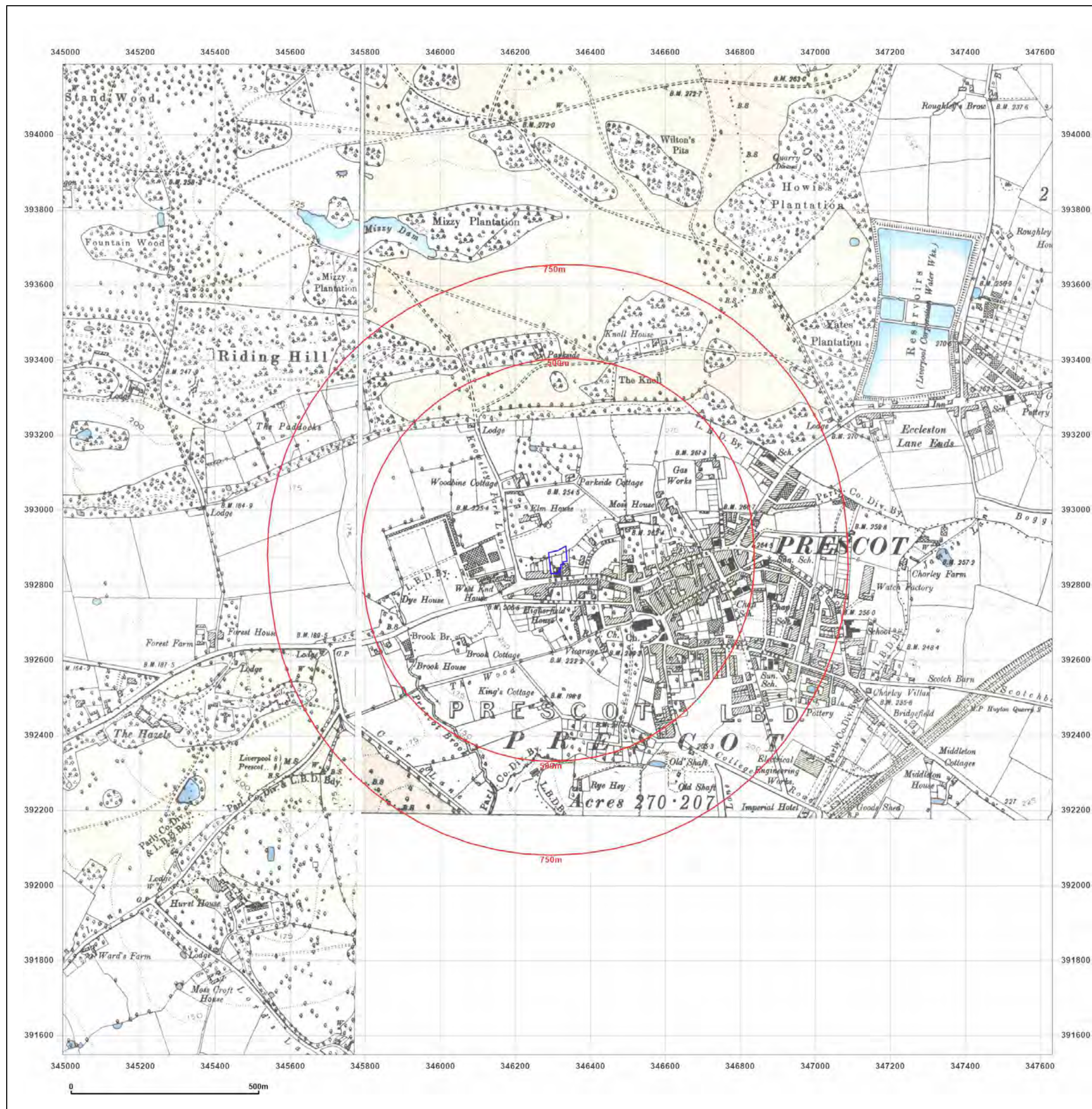


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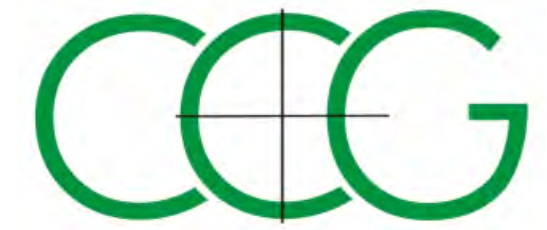
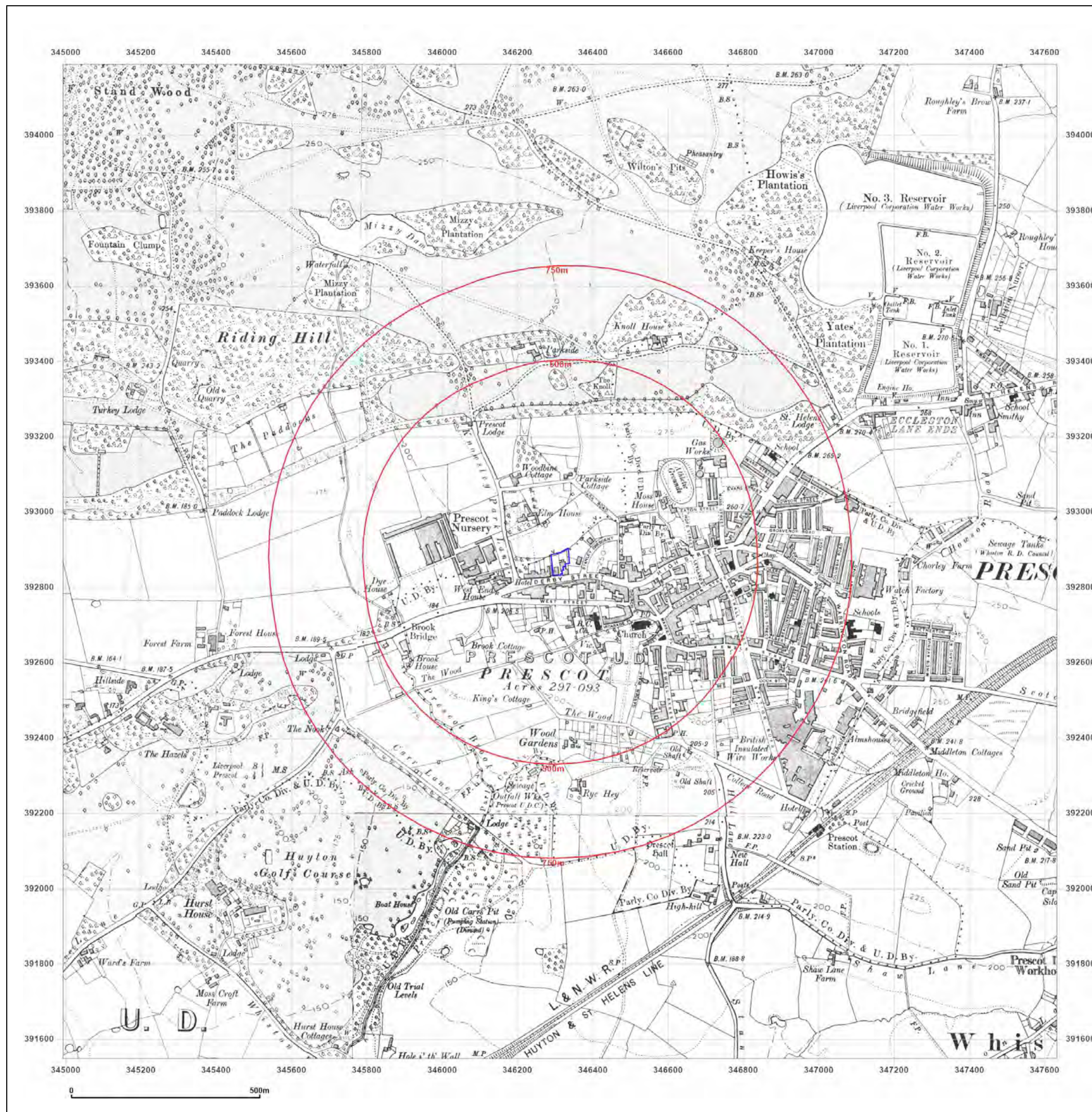


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Grid Ref: 346312, 392868

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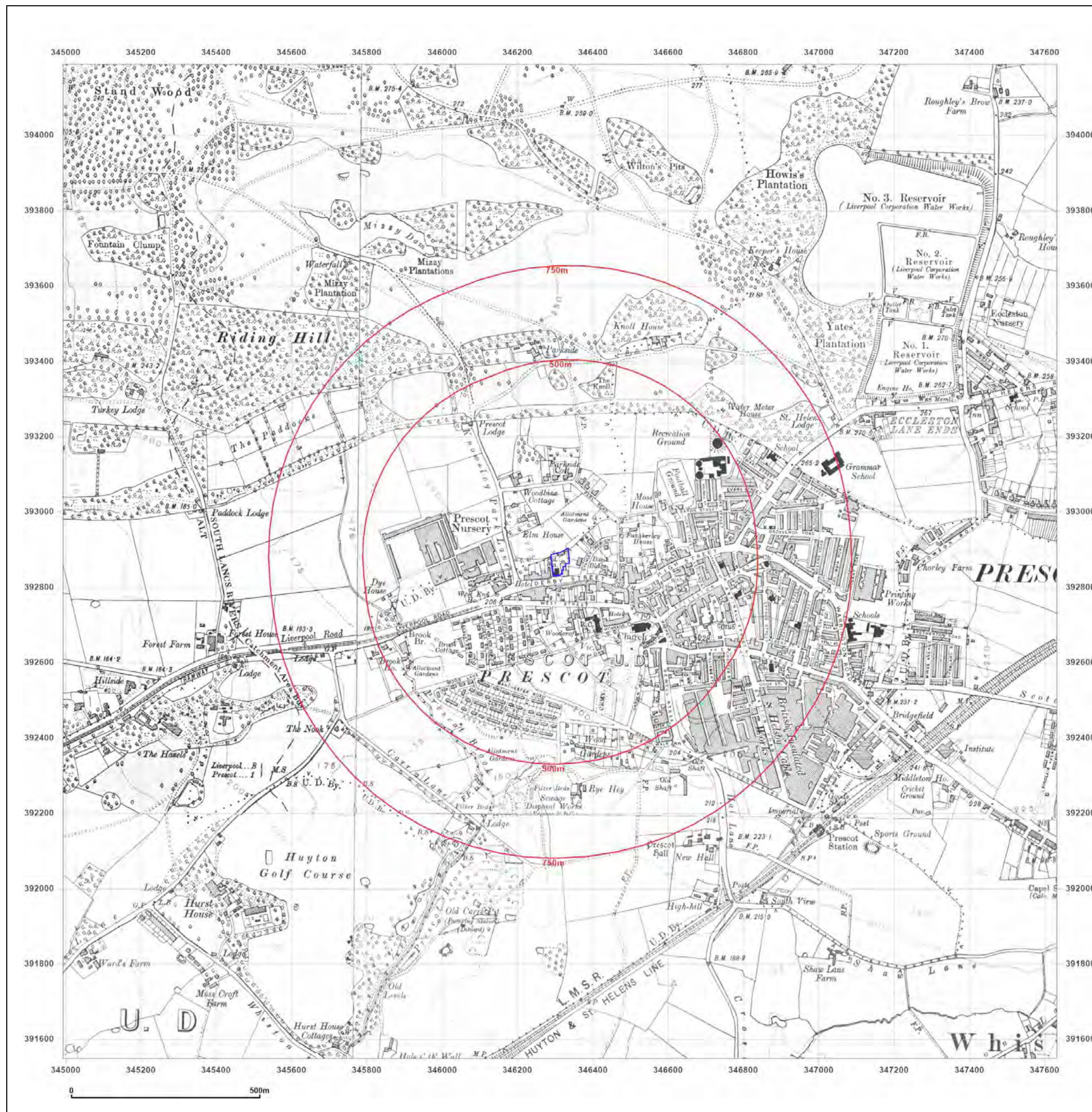


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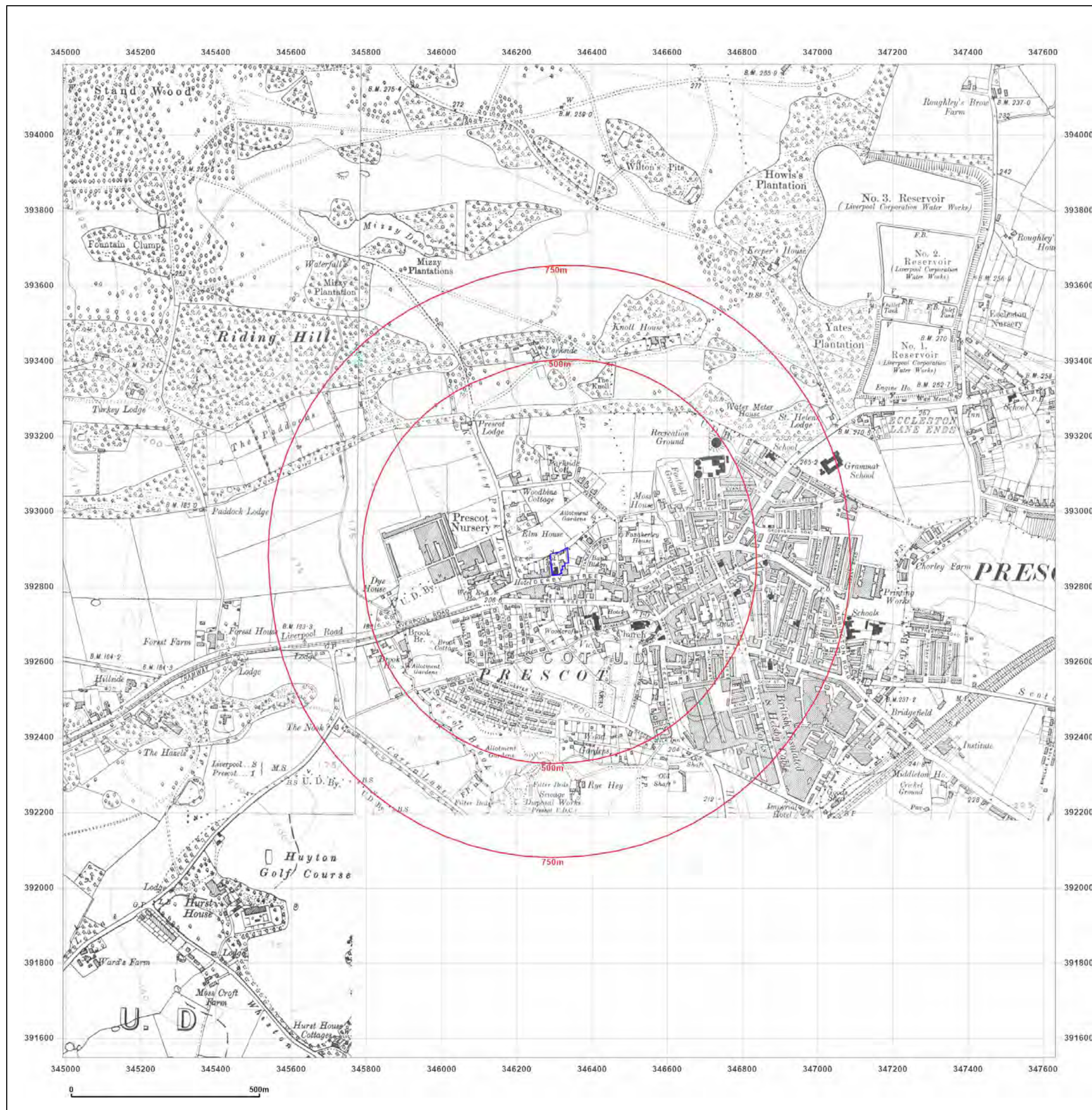


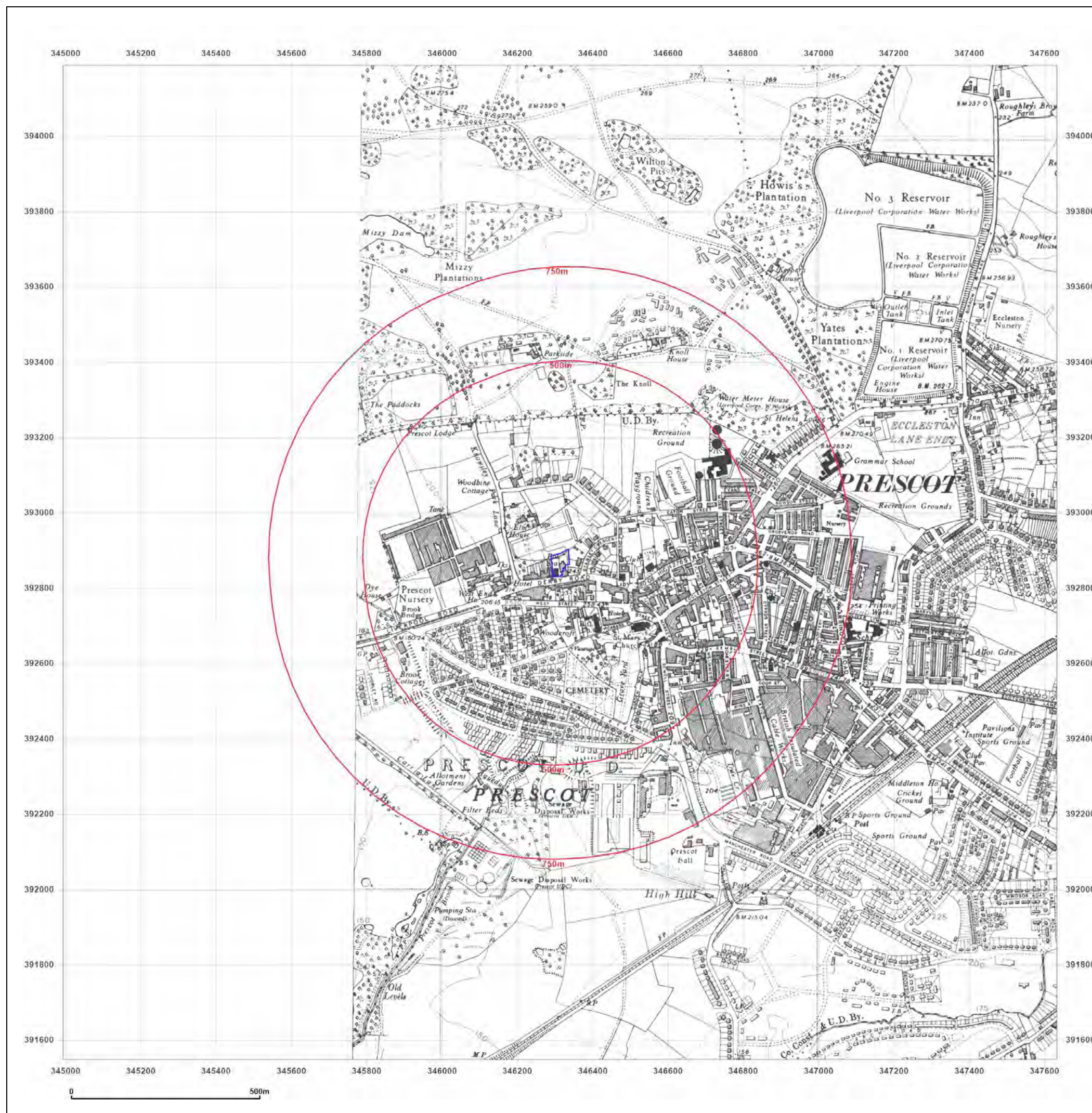
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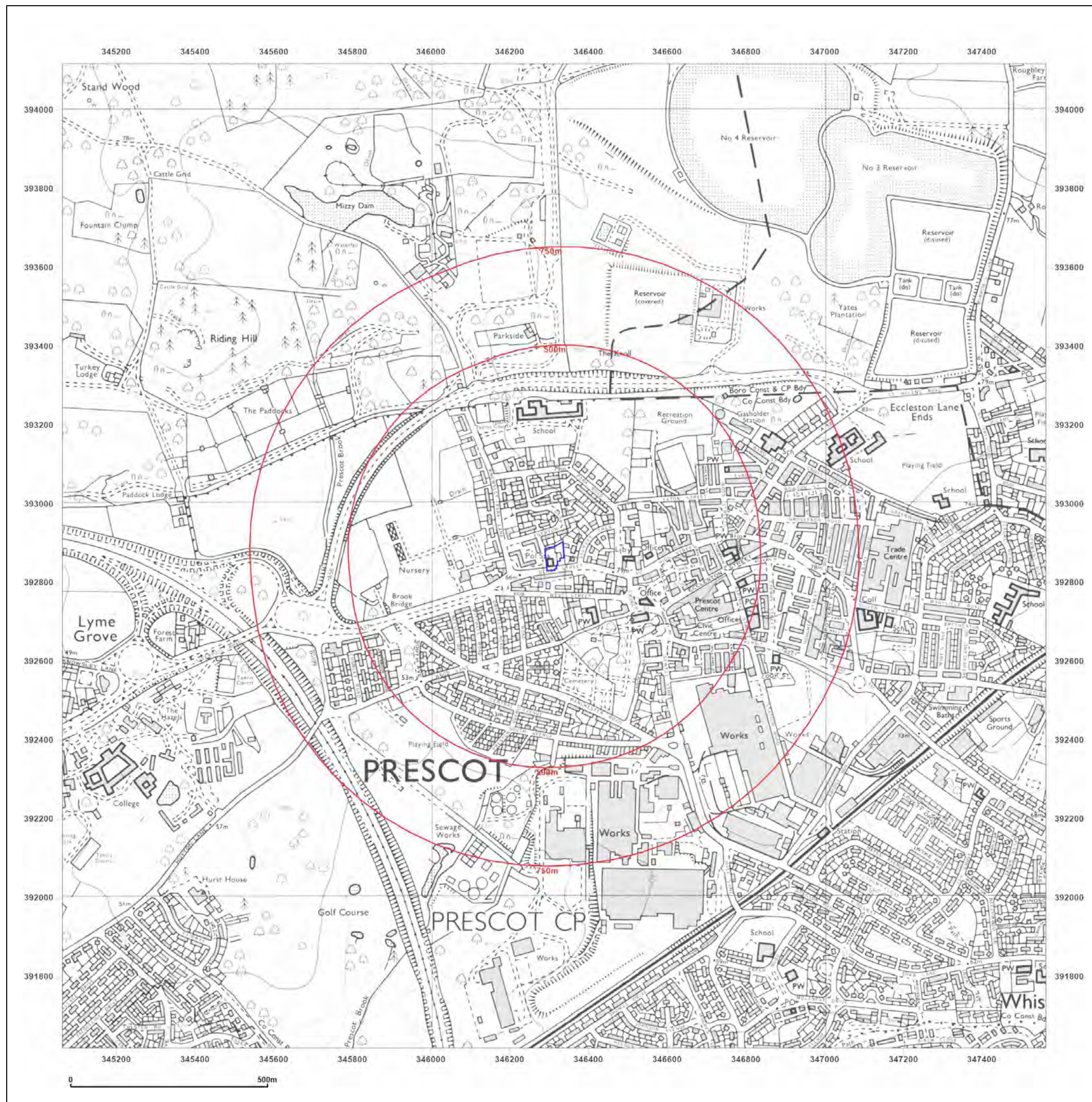
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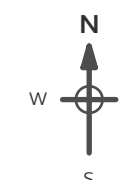
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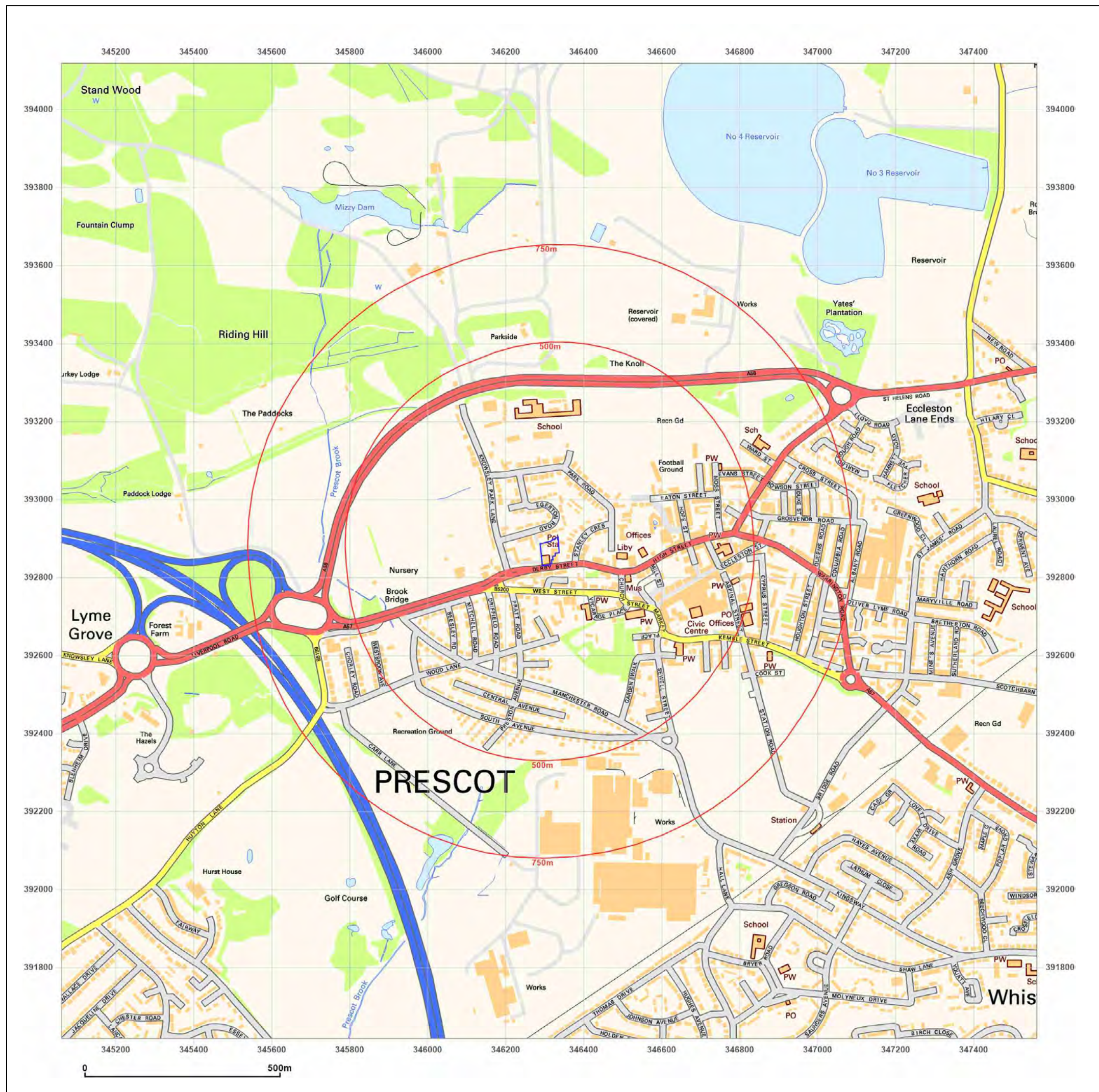


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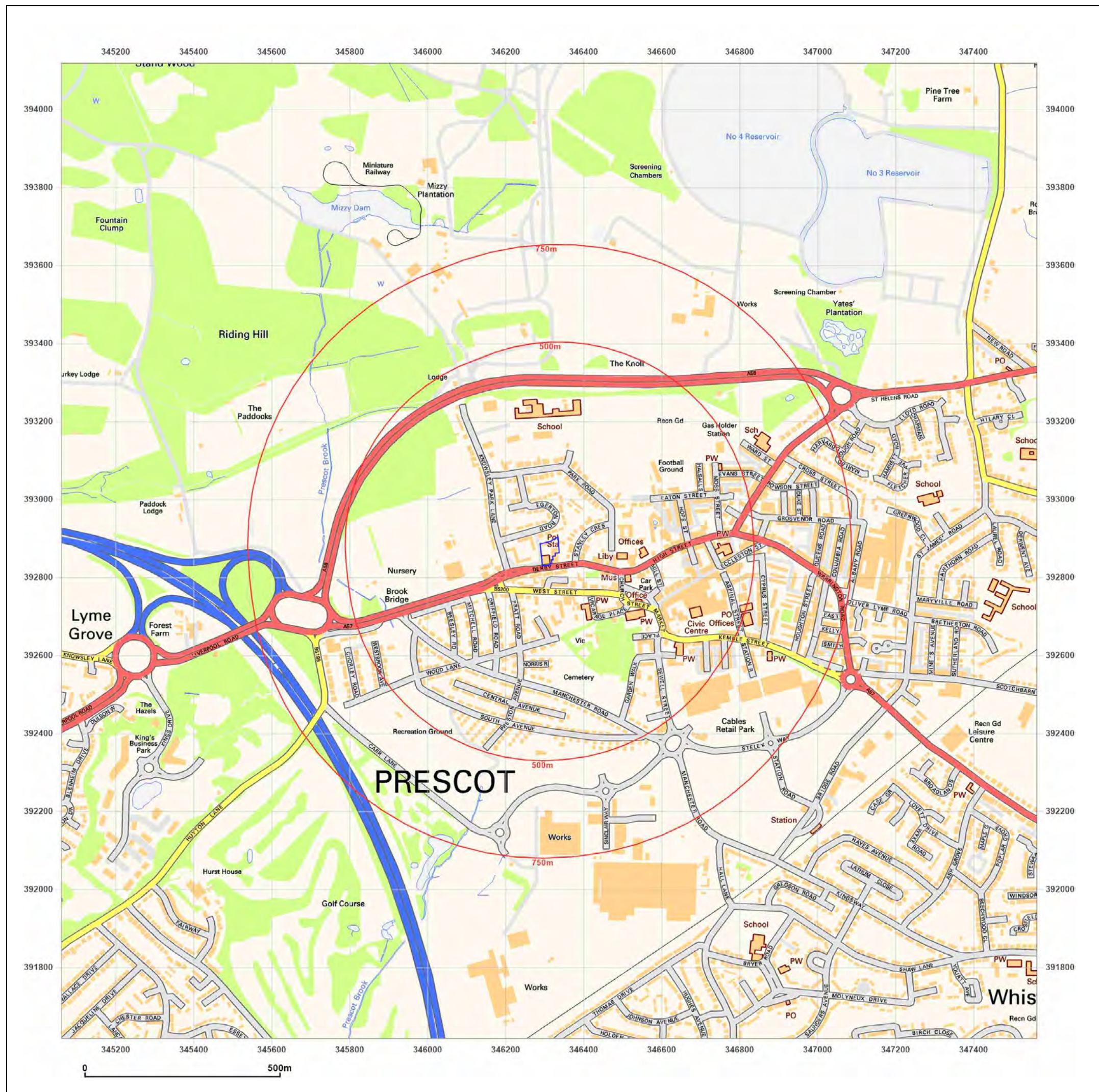


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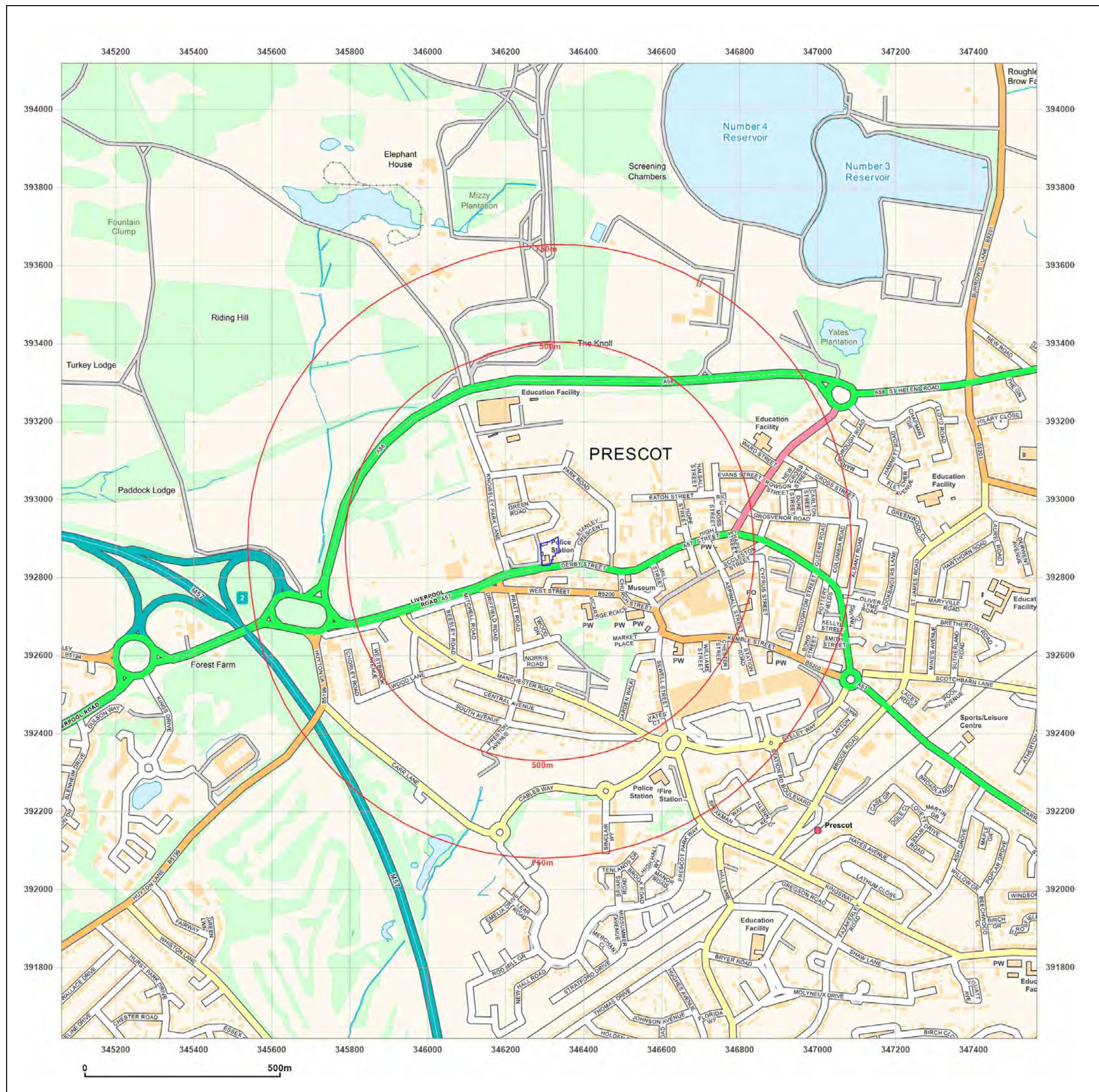


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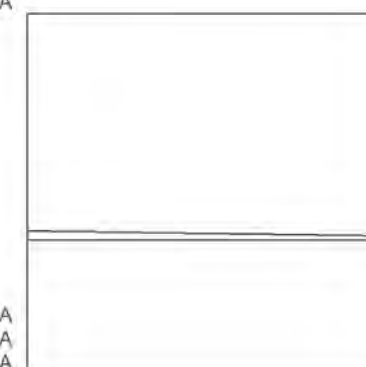
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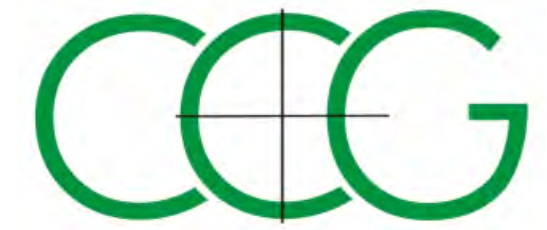
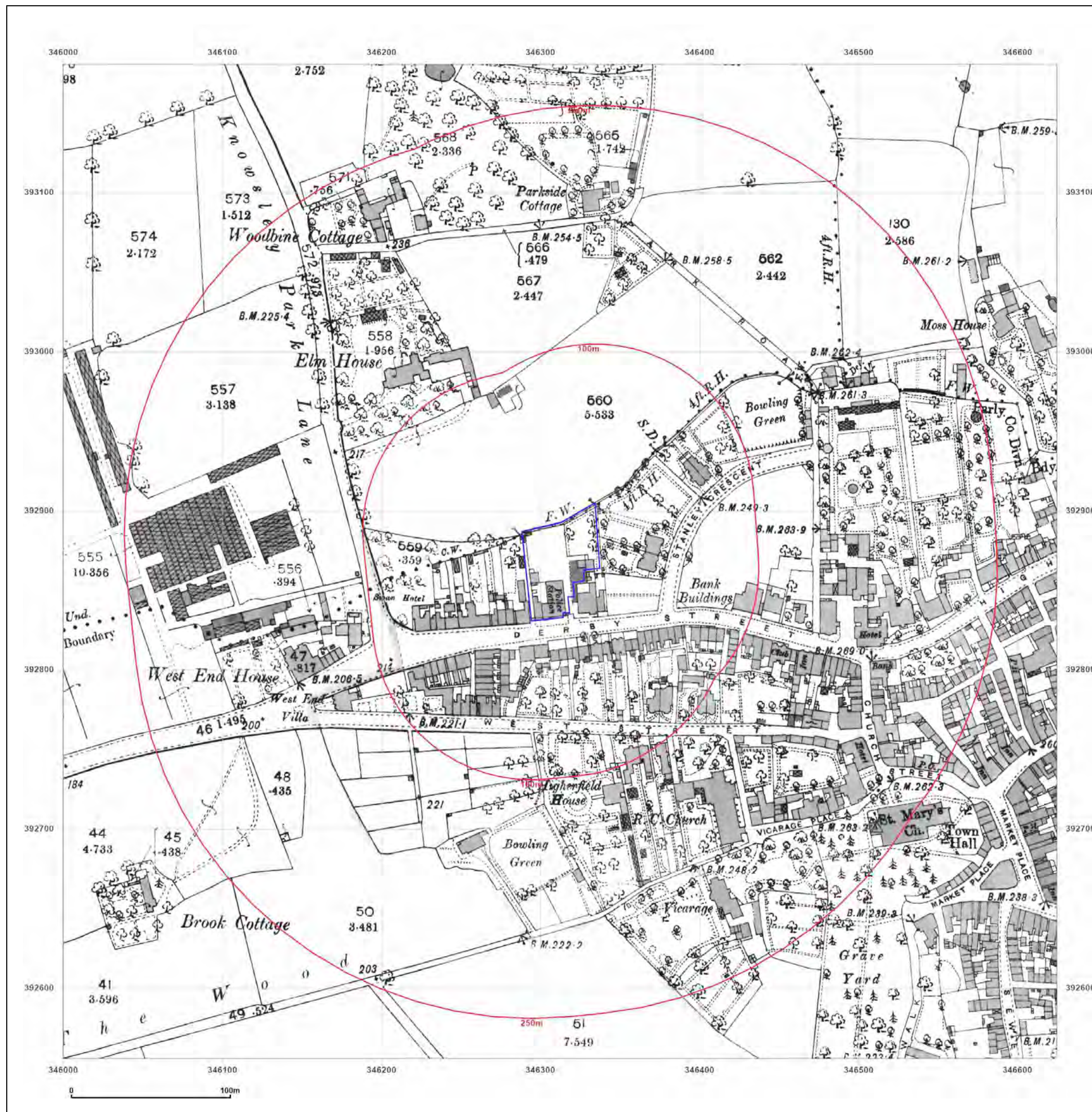
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Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

Map Name: County Series

Map date: 1893

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Client Ref: 4165
Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

Map Name: County Series

Map date: 1908

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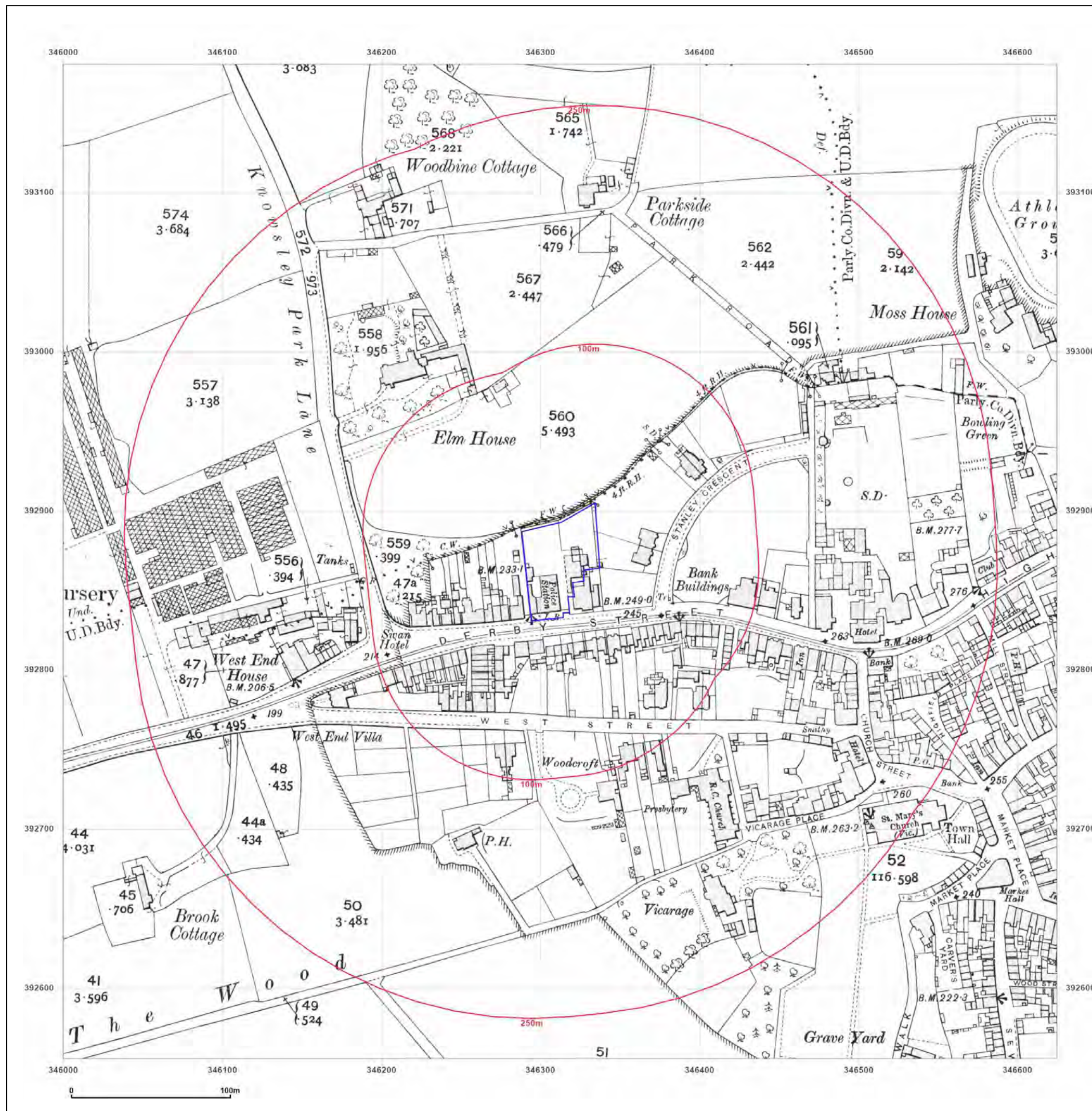


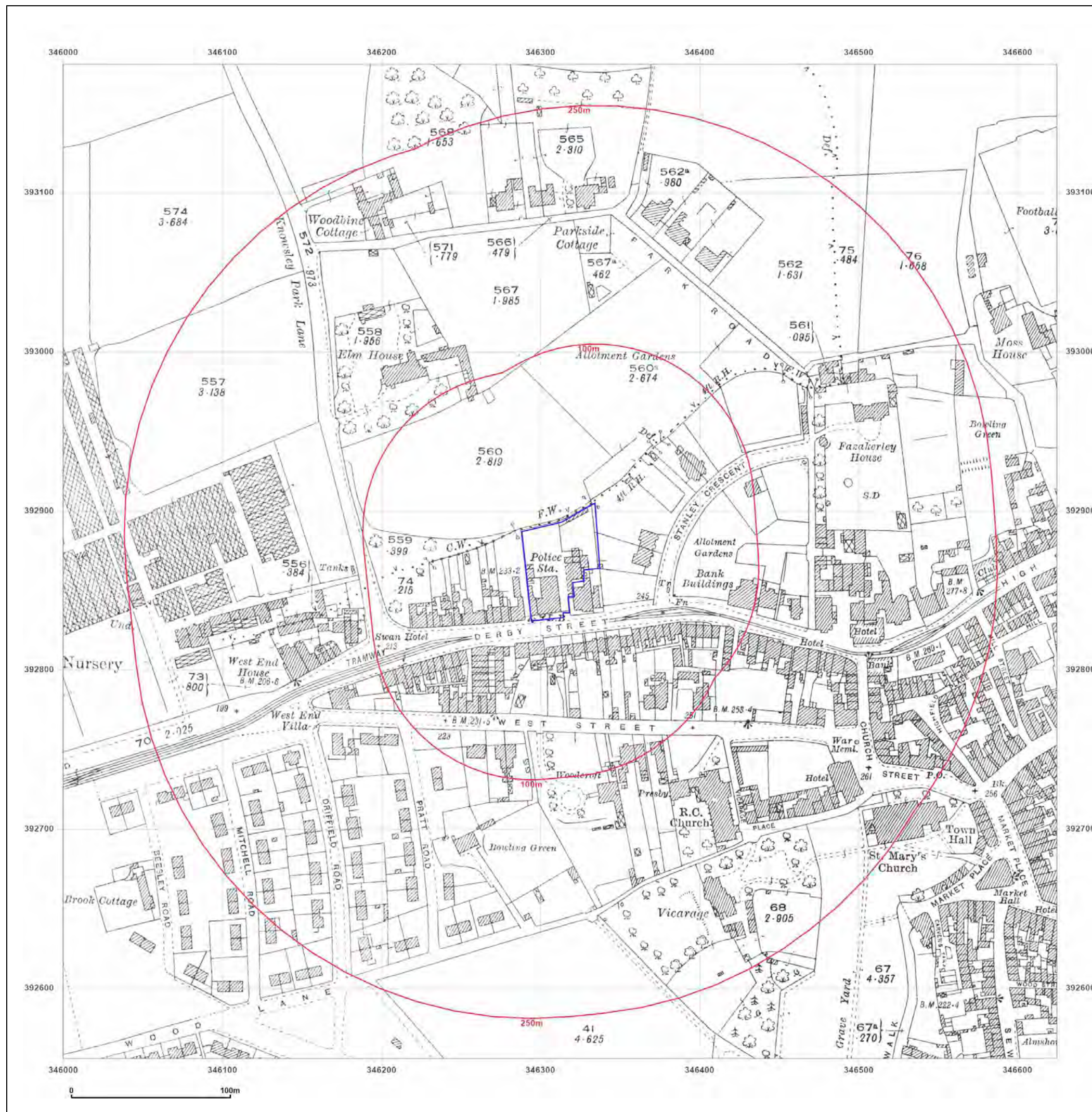
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Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

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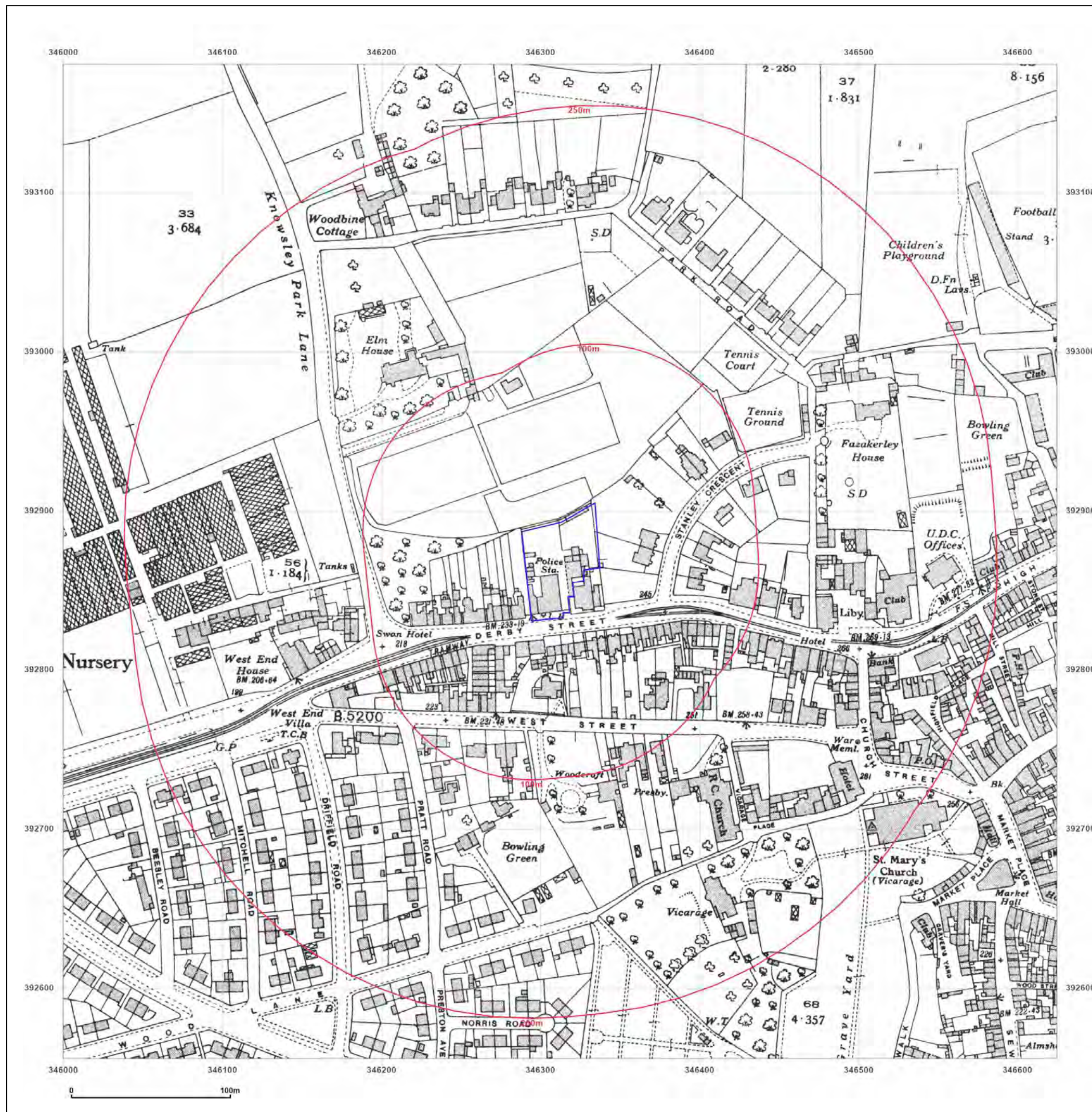


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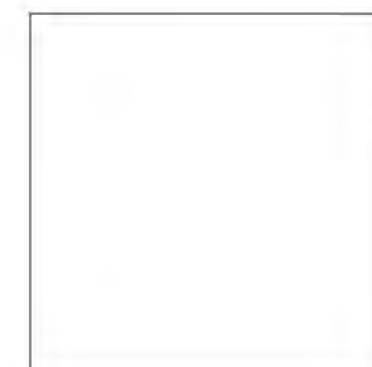
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Map Name: County Series

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Grid Ref: 346312, 392868

Map Name: National Grid

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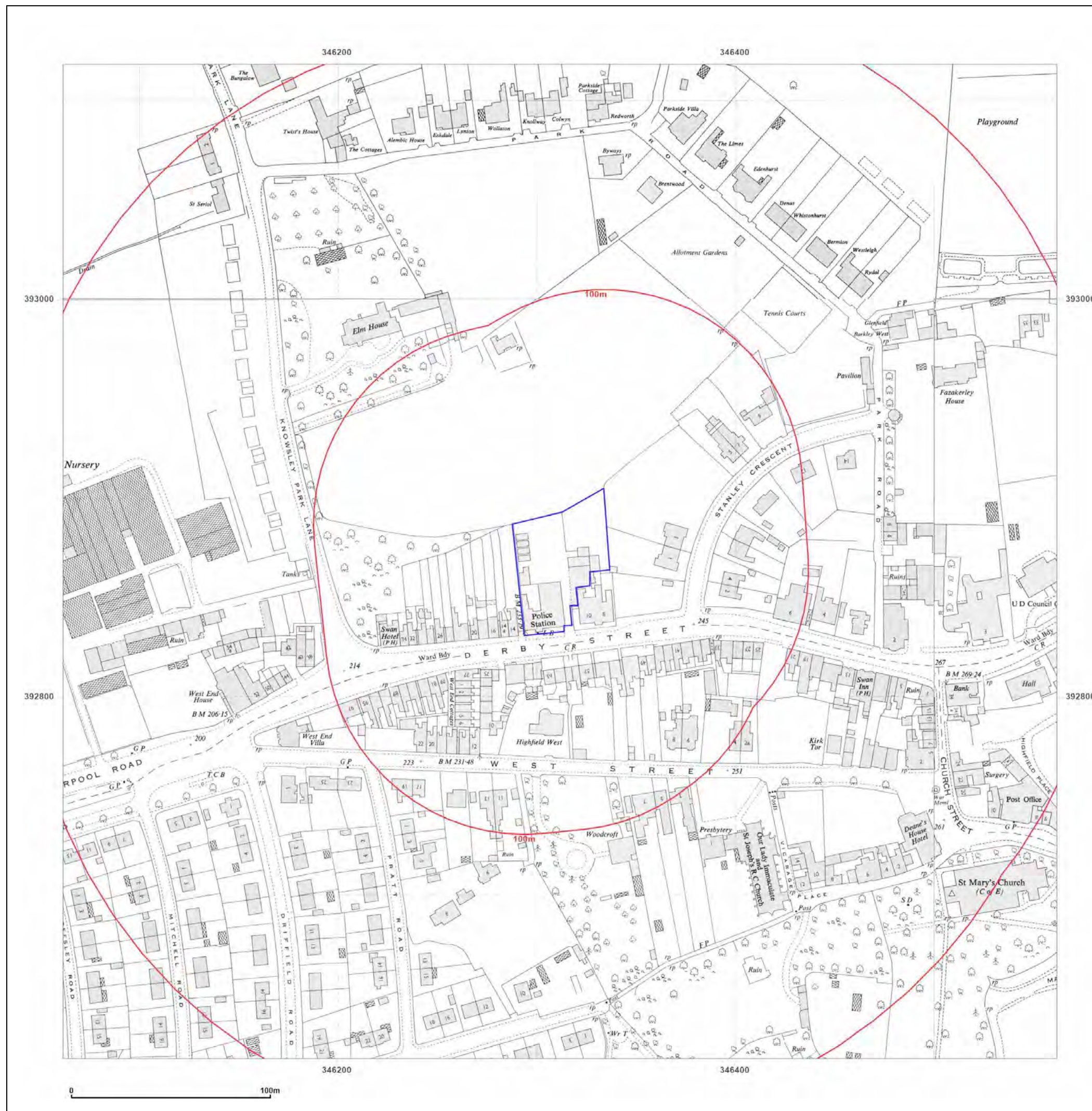


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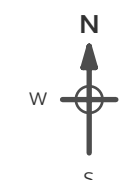
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Map date: 1954-1955

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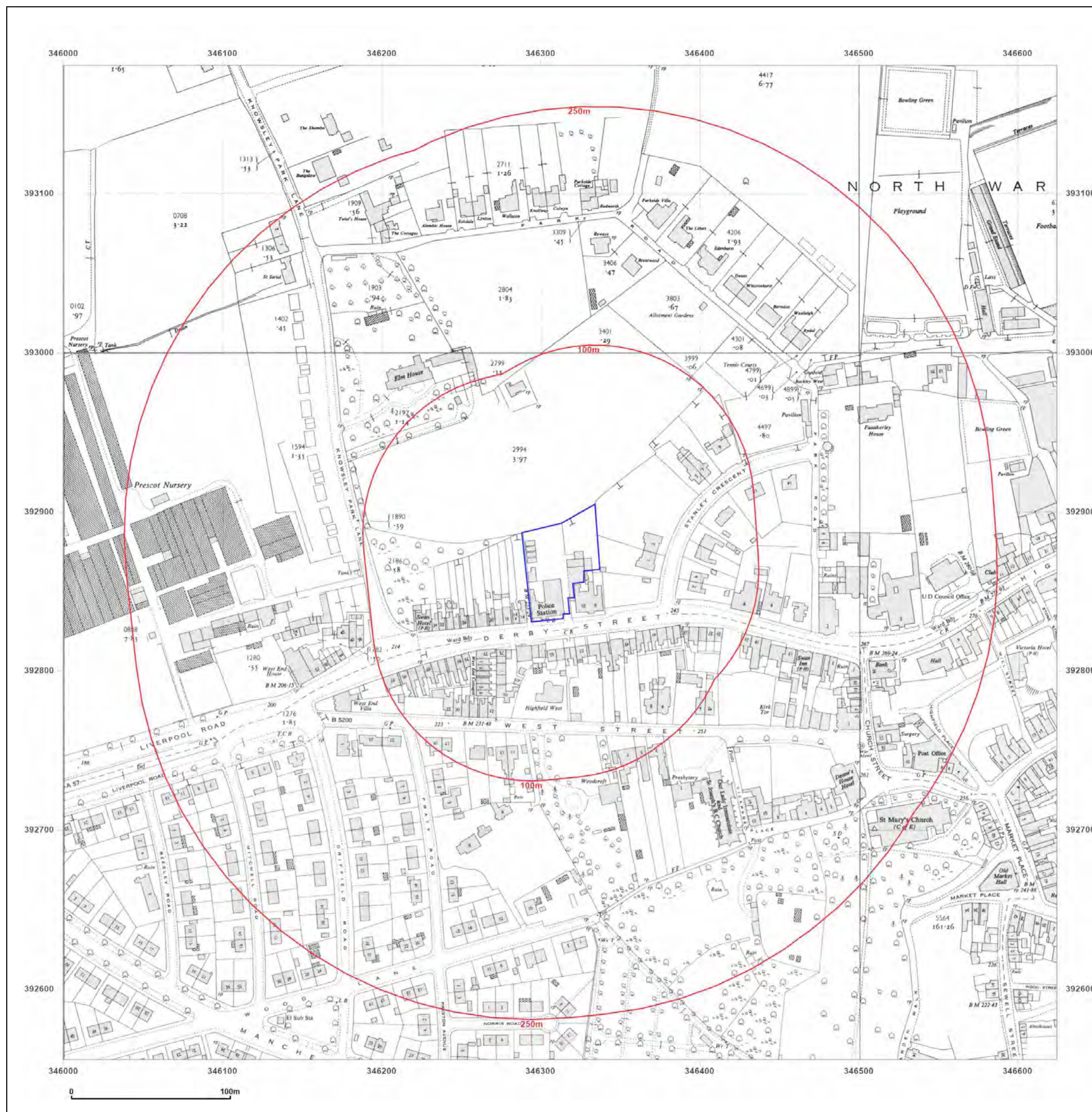


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Site Details:

Prescot Police Station, L34 3LG

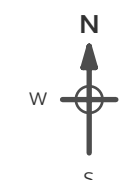
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Grid Ref: 346312, 392868

Map Name: National Grid

Map date: 1955-1957

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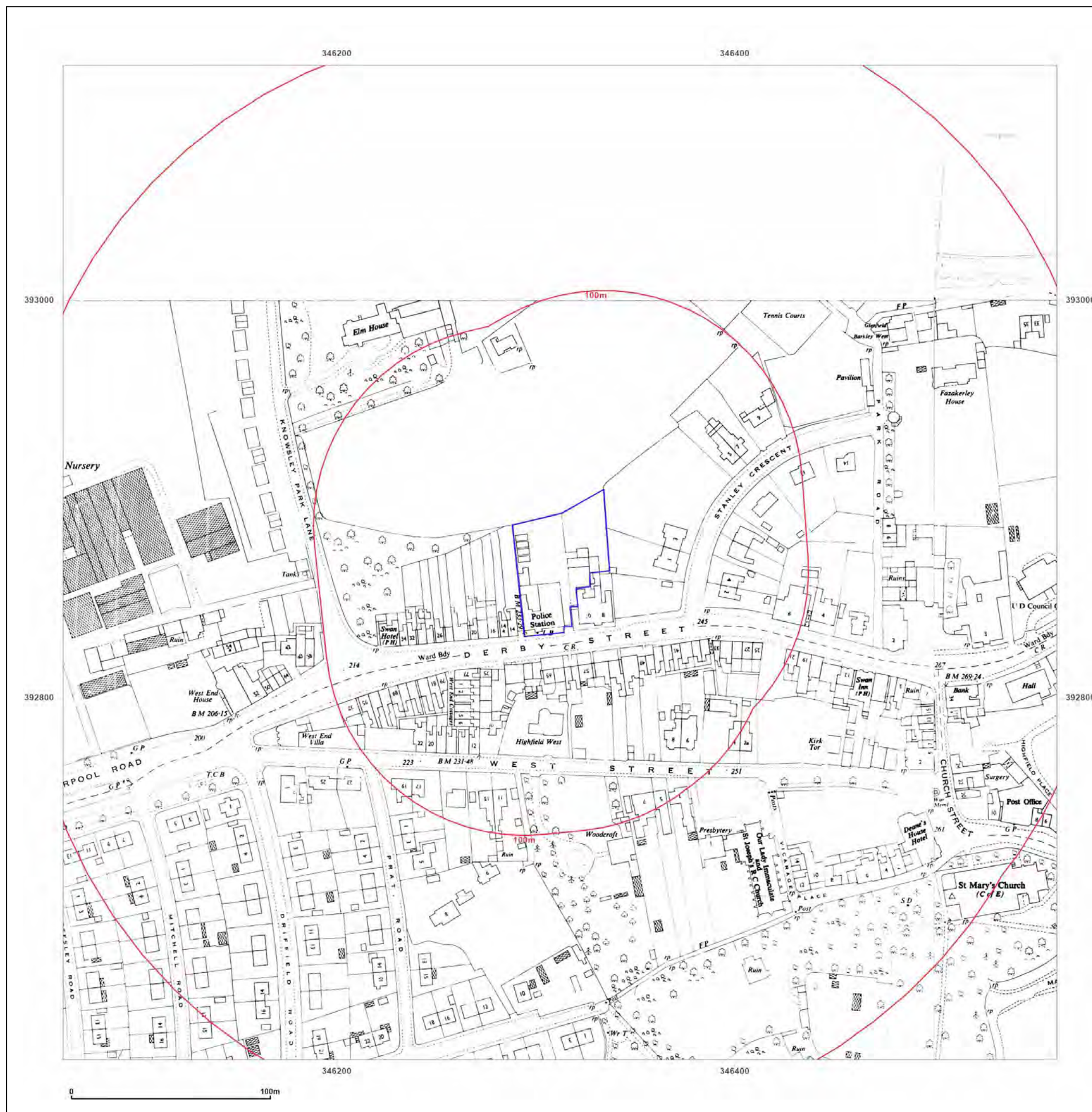


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Site Details:

Prescot Police Station, L34 3LG

Client Ref: 4165
Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

Map Name: National Grid

Map date: 1964-1966

Scale: 1:1,250

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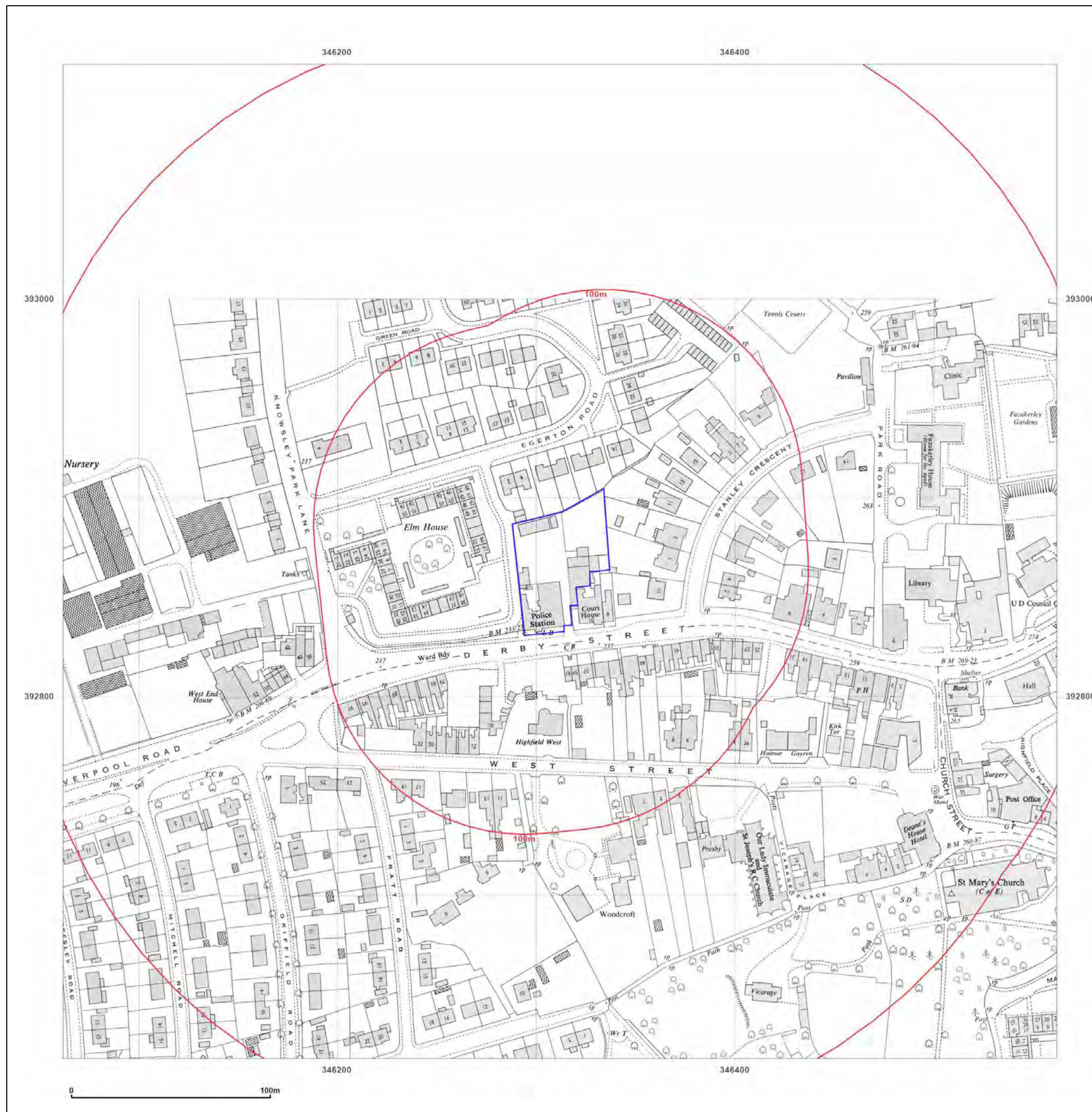


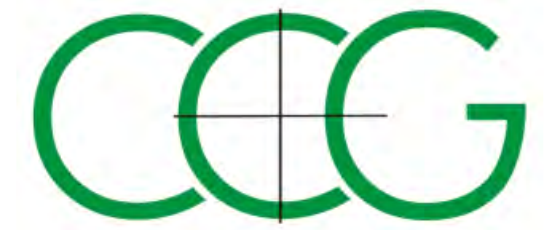
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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

Map Name: National Grid

Map date: 1982-1985

Scale: 1:1,250

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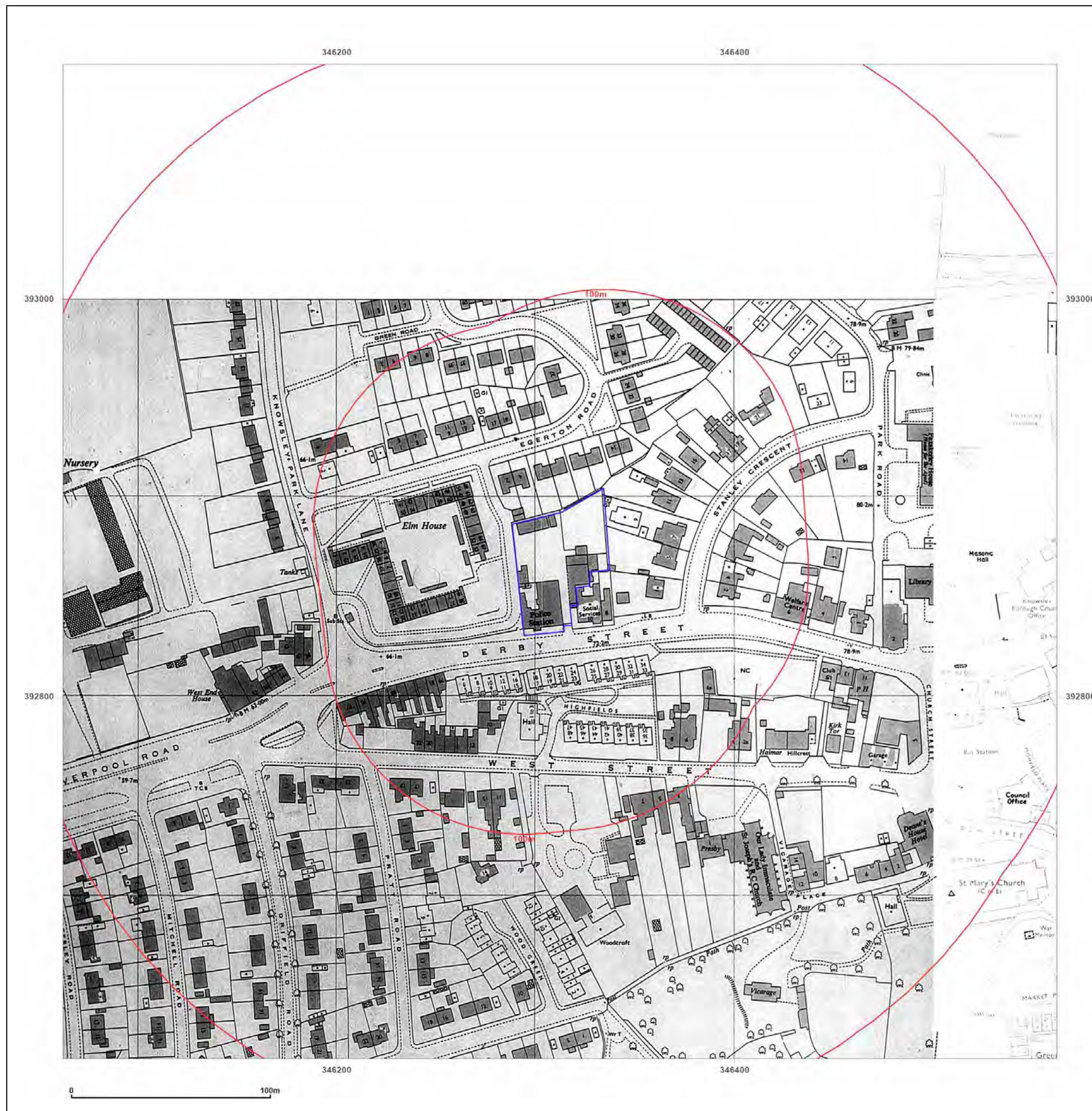


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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

Map Name: National Grid

Map date: 1990-1993

Scale: 1:1,250

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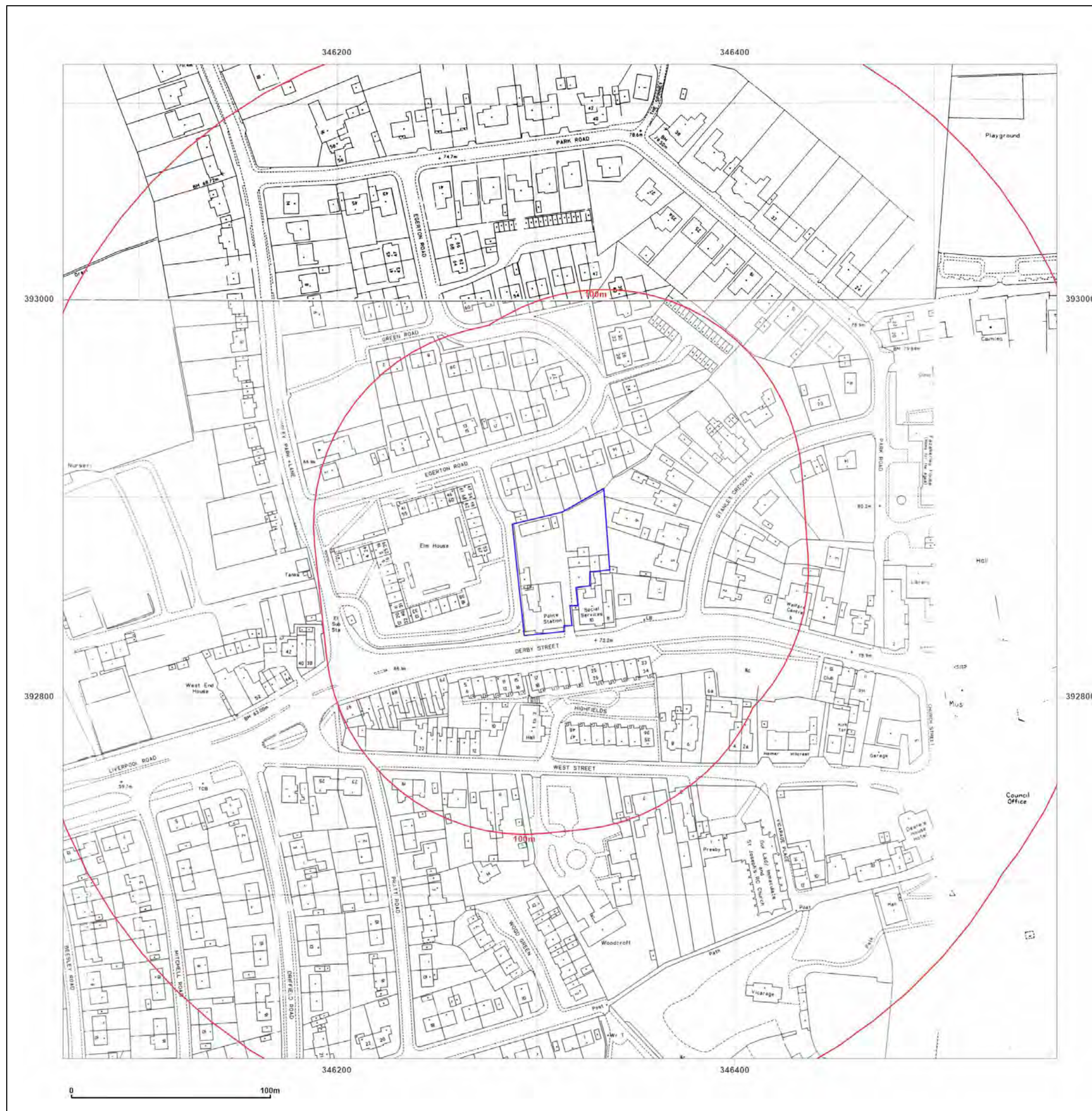


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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-980046-4165-280721HIS
Grid Ref: 346312, 392868

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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Prescot Police Station, L34 3LG

Order Details

Date: 28/07/2021
Your ref: 4165
Our Ref: CMAPS-AAG-980046-4165-280721EDRGEO
Client: CENTREMAPS

Site Details

Location: 346312 392867
Area: 0.23 ha
Authority: [Knowsley Metropolitan Borough Council](#)



Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.12

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info@groundsure.com

08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
<u>13</u>	<u>1.1</u>	<u>Historical industrial land uses</u>	4	0	19	80	-
<u>17</u>	<u>1.2</u>	<u>Historical tanks</u>	0	0	7	24	-
<u>19</u>	<u>1.3</u>	<u>Historical energy features</u>	0	0	1	19	-
20	1.4	Historical petrol stations	0	0	0	0	-
<u>20</u>	<u>1.5</u>	<u>Historical garages</u>	0	0	1	7	-
21	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
<u>22</u>	<u>2.1</u>	<u>Historical industrial land uses</u>	7	0	27	97	-
<u>27</u>	<u>2.2</u>	<u>Historical tanks</u>	0	0	14	47	-
<u>30</u>	<u>2.3</u>	<u>Historical energy features</u>	0	0	2	47	-
32	2.4	Historical petrol stations	0	0	0	0	-
<u>32</u>	<u>2.5</u>	<u>Historical garages</u>	0	0	2	13	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
34	3.1	Active or recent landfill	0	0	0	0	-
34	3.2	Historical landfill (BGS records)	0	0	0	0	-
35	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
<u>35</u>	<u>3.4</u>	<u>Historical landfill (EA/NRW records)</u>	0	0	0	1	-
35	3.5	Historical waste sites	0	0	0	0	-
35	3.6	Licensed waste sites	0	0	0	0	-
<u>36</u>	<u>3.7</u>	<u>Waste exemptions</u>	0	0	10	2	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
<u>38</u>	<u>4.1</u>	<u>Recent industrial land uses</u>	0	0	5	-	-
<u>39</u>	<u>4.2</u>	<u>Current or recent petrol stations</u>	0	0	0	1	-
39	4.3	Electricity cables	0	0	0	0	-
39	4.4	Gas pipelines	0	0	0	0	-
39	4.5	Sites determined as Contaminated Land	0	0	0	0	-



40	4.6	<u>Control of Major Accident Hazards (COMAH)</u>	0	0	0	2	-
40	4.7	Regulated explosive sites	0	0	0	0	-
40	4.8	Hazardous substance storage/usage	0	0	0	0	-
40	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
41	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
41	4.11	<u>Licensed pollutant release (Part A(2)/B)</u>	0	0	0	2	-
41	4.12	Radioactive Substance Authorisations	0	0	0	0	-
42	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
42	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
42	4.15	Pollutant release to public sewer	0	0	0	0	-
42	4.16	List 1 Dangerous Substances	0	0	0	0	-
42	4.17	List 2 Dangerous Substances	0	0	0	0	-
43	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
43	4.19	Pollution inventory substances	0	0	0	0	-
43	4.20	Pollution inventory waste transfers	0	0	0	0	-
43	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
44	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
46	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
47	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
48	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
48	5.5	Groundwater vulnerability- local information	None (within 0m)				
49	5.6	<u>Groundwater abstractions</u>	0	0	0	0	5
51	5.7	<u>Surface water abstractions</u>	0	0	0	2	0
52	5.8	<u>Potable abstractions</u>	0	0	0	0	3
53	5.9	Source Protection Zones	0	0	0	0	-
53	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
54	6.1	<u>Water Network (OS MasterMap)</u>	0	0	1	-	-



55	6.2	<u>Surface water features</u>	0	0	1	-	-
55	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
55	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
56	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
57	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
57	7.2	Historical Flood Events	0	0	0	-	-
57	7.3	Flood Defences	0	0	0	-	-
57	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
58	7.5	Flood Storage Areas	0	0	0	-	-
59	7.6	Flood Zone 2	None (within 50m)				
59	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
60	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.1m - 0.3m (within 50m)				
Page	Section	Groundwater flooding					
62	9.1	<u>Groundwater flooding</u>	Negligible (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
63	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
64	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
64	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
64	10.4	Special Protection Areas (SPA)	0	0	0	0	0
64	10.5	National Nature Reserves (NNR)	0	0	0	0	0
65	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
65	10.7	Designated Ancient Woodland	0	0	0	0	0
65	10.8	Biosphere Reserves	0	0	0	0	0
65	10.9	Forest Parks	0	0	0	0	0
66	10.10	Marine Conservation Zones	0	0	0	0	0
66	10.11	<u>Green Belt</u>	0	0	0	1	3
66	10.12	Proposed Ramsar sites	0	0	0	0	0



66	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
67	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
67	10.15	Nitrate Sensitive Areas	0	0	0	0	0
67	10.16	<u>Nitrate Vulnerable Zones</u>	1	0	0	0	3
68	10.17	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
69	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
70	11.1	World Heritage Sites	0	0	0	-	-
71	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
71	11.3	National Parks	0	0	0	-	-
71	11.4	<u>Listed Buildings</u>	0	0	13	-	-
72	11.5	<u>Conservation Areas</u>	1	0	0	-	-
72	11.6	Scheduled Ancient Monuments	0	0	0	-	-
73	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
74	12.1	<u>Agricultural Land Classification</u>	Grade 3b (within 250m)				
75	12.2	Open Access Land	0	0	0	-	-
75	12.3	Tree Felling Licences	0	0	0	-	-
75	12.4	Environmental Stewardship Schemes	0	0	0	-	-
75	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
76	13.1	<u>Priority Habitat Inventory</u>	0	0	11	-	-
77	13.2	Habitat Networks	0	0	0	-	-
77	13.3	Open Mosaic Habitat	0	0	0	-	-
77	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
79	14.1	<u>10k Availability</u>	Identified (within 500m)				
80	14.2	Artificial and made ground (10k)	0	0	0	0	-
81	14.3	Superficial geology (10k)	0	0	0	0	-



81	14.4	Landslip (10k)	0	0	0	0	-
82	14.5	Bedrock geology (10k)	0	0	0	0	-
82	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
83	15.1	<u>50k Availability</u>	Identified (within 500m)				
84	15.2	Artificial and made ground (50k)	0	0	0	0	-
84	15.3	Artificial ground permeability (50k)	0	0	-	-	-
85	15.4	<u>Superficial geology (50k)</u>	0	0	1	1	-
86	15.5	Superficial permeability (50k)	None (within 50m)				
86	15.6	Landslip (50k)	0	0	0	0	-
86	15.7	Landslip permeability (50k)	None (within 50m)				
87	15.8	<u>Bedrock geology (50k)</u>	1	3	11	7	-
89	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
89	15.10	<u>Bedrock faults and other linear features (50k)</u>	0	2	8	4	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
91	16.1	<u>BGS Boreholes</u>	0	0	2	-	-
Page	Section	Natural ground subsidence					
92	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
93	17.2	<u>Running sands</u>	Negligible (within 50m)				
94	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
95	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
96	17.5	<u>Landslides</u>	Very low (within 50m)				
97	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
98	18.1	Natural cavities	0	0	0	0	-
99	18.2	BritPits	0	0	0	0	-
99	18.3	<u>Surface ground workings</u>	0	0	8	-	-
99	18.4	<u>Underground workings</u>	0	0	0	0	7
100	18.5	Historical Mineral Planning Areas	0	0	0	0	-



100	18.6	Non-coal mining	0	0	0	0	0
100	18.7	Mining cavities	0	0	0	0	0
101	18.8	JPB mining areas	None (within 0m)				
101	18.9	<u>Coal mining</u>	Identified (within 0m)				
101	18.10	Brine areas	None (within 0m)				
101	18.11	Gypsum areas	None (within 0m)				
101	18.12	Tin mining	None (within 0m)				
102	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
103	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
104	20.1	<u>BGS Estimated Background Soil Chemistry</u>	1	3	-	-	-
104	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
105	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
106	21.1	Underground railways (London)	0	0	0	-	-
106	21.2	Underground railways (Non-London)	0	0	0	-	-
107	21.3	Railway tunnels	0	0	0	-	-
107	21.4	<u>Historical railway and tunnel features</u>	0	0	5	-	-
107	21.5	Royal Mail tunnels	0	0	0	-	-
108	21.6	Historical railways	0	0	0	-	-
108	21.7	Railways	0	0	0	-	-
108	21.8	Crossrail 1	0	0	0	0	-
108	21.9	Crossrail 2	0	0	0	0	-
108	21.10	HS2	0	0	0	0	-

Recent aerial photograph



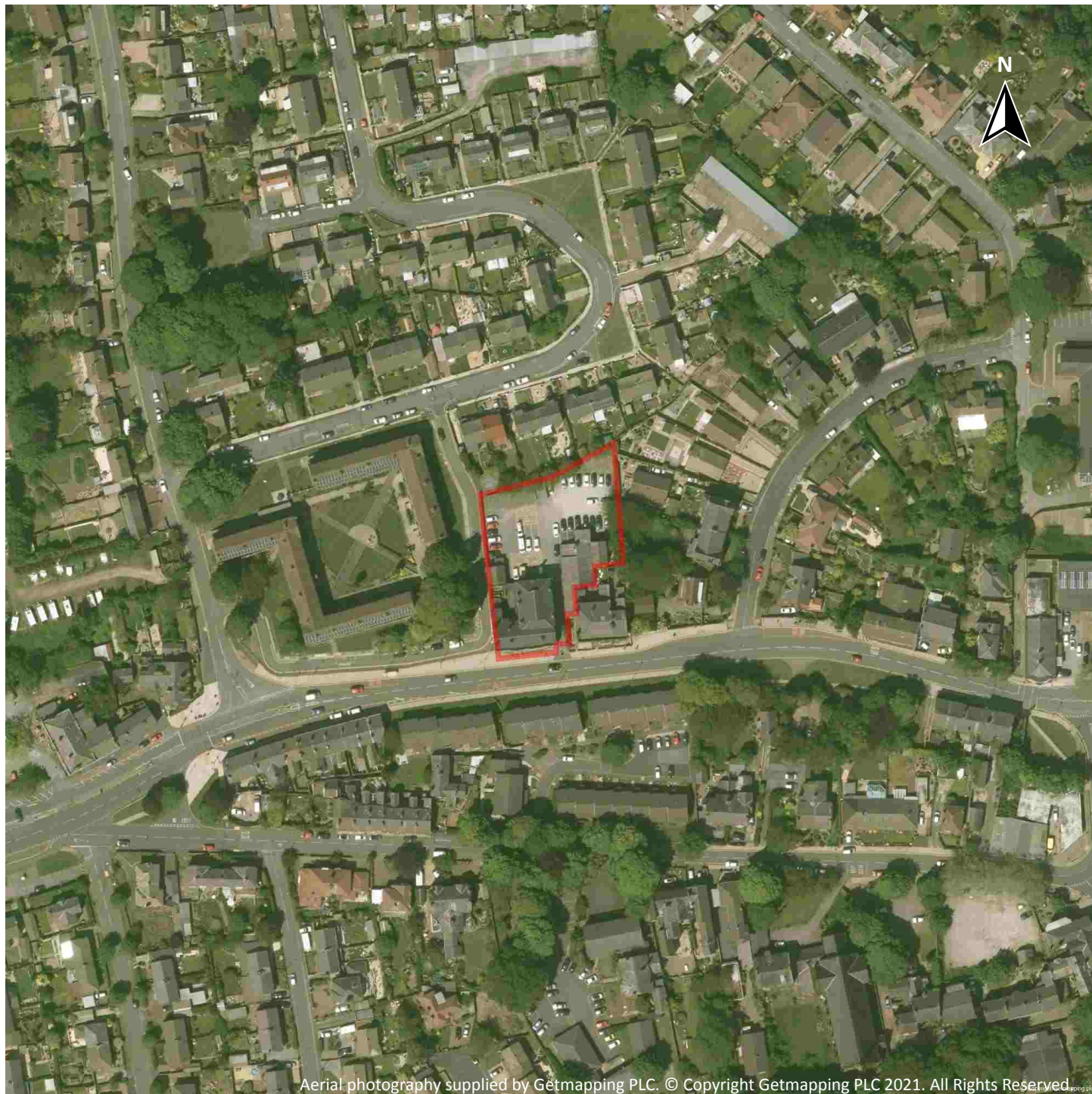
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Capture Date: 22/04/2019

Site Area: 0.23ha



Recent site history - 2015 aerial photograph



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Capture Date: 11/06/2015

Site Area: 0.23ha



Recent site history - 2005 aerial photograph



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Capture Date: 02/09/2005

Site Area: 0.23ha



Recent site history - 2000 aerial photograph



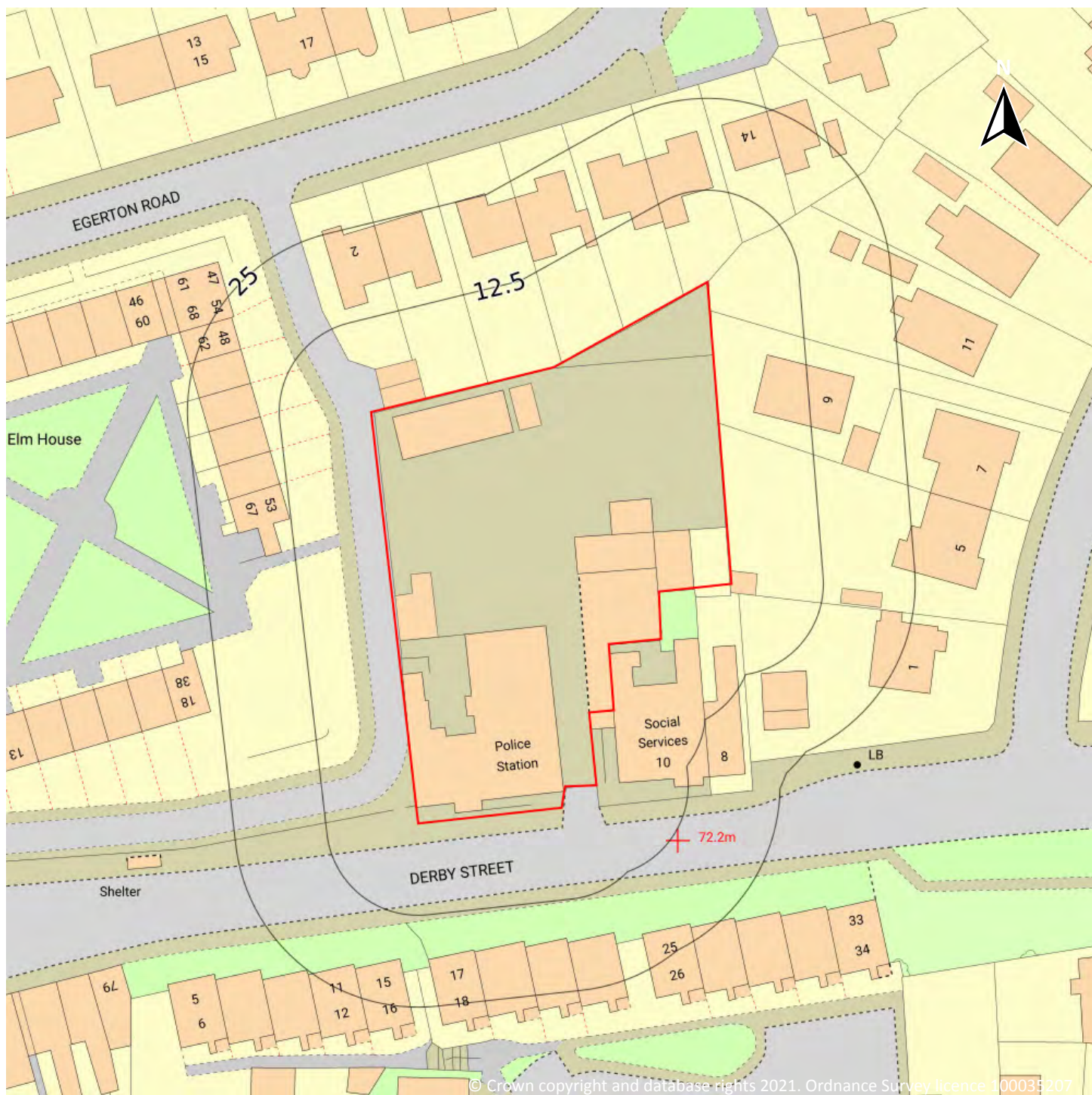
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Capture Date: 21/07/2000

Site Area: 0.23ha



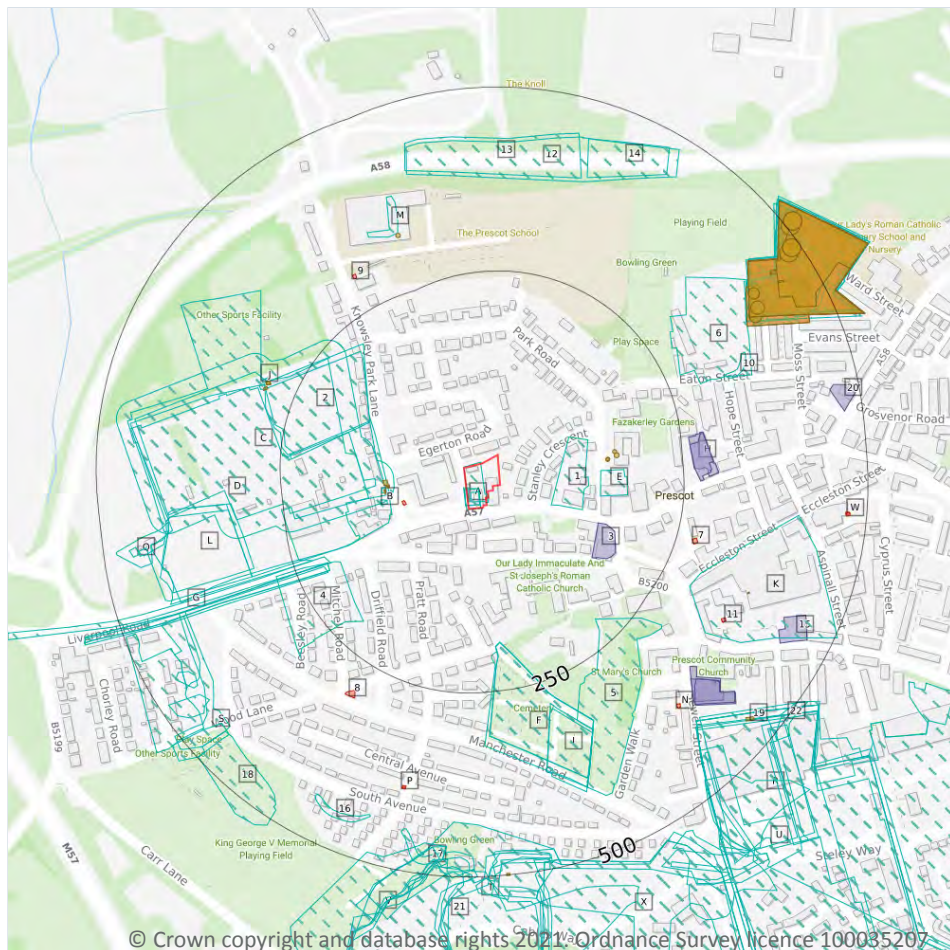
OS MasterMap site plan



Site Area: 0.23ha



1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

1.1 Historical industrial land uses

Records within 500m

103

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
A	On site	Police Station	1990	848585



ID	Location	Land use	Dates present	Group ID
A	On site	Police Station	1955	860103
A	On site	Police Station	1966 - 1975	877999
A	On site	Police Station	1925 - 1950	899232
1	74m E	Colliery	1851	798244
C	97m W	Nursery	1990	935132
C	105m W	Unspecified Commercial/Industrial	1950 - 1955	970823
D	107m W	Nursery	1851	850321
B	109m W	Unspecified Tanks	1955	815148
B	109m W	Unspecified Tanks	1950	815147
C	122m W	Nursery	1966 - 1975	964074
D	133m W	Nursery	1925	859770
E	137m E	Police Station	1851	832552
2	143m NW	Nursery	1906 - 1938	916443
F	185m S	Cemetery	1950 - 1955	868720
F	185m S	Cemetery	1990	938974
F	185m S	Cemetery	1966 - 1975	985196
4	189m SW	Earthenware Pottery	1851	834889
G	201m W	Tramway Sidings	1955	854072
G	205m W	Railway Sidings	1950	794599
G	205m W	Tramway Sidings	1925 - 1938	892387
G	210m SW	Tramway Sidings	1925	985822
5	214m SE	Grave Yard	1950 - 1955	941638
6	271m NE	Earthenware Pottery	1851	834890
I	281m S	Cemetery	1925 - 1938	901116
I	289m S	Cemetery	1925	951793
J	291m NW	Unspecified Tank	1955	824619
J	291m W	Unspecified Tank	1950	824618
K	292m SE	Unspecified Commercial/Industrial	1990	796683



ID	Location	Land use	Dates present	Group ID
L	303m W	Nursery	1955	903324
L	308m W	Nursery	1950	870017
10	328m E	Unspecified Ground Workings	1925	799847
M	330m N	Unspecified Ground Workings	1975	799848
12	376m N	Cuttings	1975	900807
13	381m N	Cuttings	1990	921792
O	383m NE	Unspecified Commercial/Industrial	1925	967274
O	383m NE	Unspecified Commercial/Industrial	1925 - 1950	991155
O	384m NE	Gas Works	1906	937755
O	388m NE	Unspecified Tank	1925	937563
O	389m NE	Gasometer	1891 - 1906	864745
O	389m NE	Unspecified Tank	1925 - 1950	908448
O	390m NE	Gas Works	1891	954530
O	393m NE	Unspecified Works	1966	830283
O	393m NE	Unspecified Commercial/Industrial	1955	874436
14	396m N	Cuttings	1990	886365
O	397m NE	Gas Holder Station	1975	891256
O	397m NE	Gas Holder Station	1990	929682
O	399m NE	Unspecified Tank	1955	886278
O	399m NE	Unspecified Tank	1966	931710
O	405m NE	Unspecified Tank	1925	869636
O	405m NE	Unspecified Tank	1925 - 1938	905508
O	407m NE	Gasometer	1891 - 1906	881641
Q	408m W	Dye House	1955	896032
R	409m SE	Unspecified Commercial/Industrial	1955	896926
R	409m SE	Unspecified Works	1990	925182
R	409m SE	Unspecified Works	1966	991105
R	409m SE	Unspecified Works	1975	991861



ID	Location	Land use	Dates present	Group ID
S	410m W	Unspecified Ground Workings	1955	799863
R	414m SE	Insulated Cable Works	1925 - 1938	954255
S	414m W	Tan Yard	1851	797996
R	415m SE	Insulated Cable Works	1950	848751
R	418m SE	Unspecified Commercial/Industrial	1925	948573
O	426m NE	Gas Works	1851	933630
T	426m S	Sewage Disposal Works	1955	955403
S	435m SW	Unspecified Heap	1966	803300
16	436m S	Unspecified Ground Workings	1925 - 1938	942574
S	438m SW	Unspecified Pit	1966	839691
Q	440m W	Dye House	1851	973203
U	442m SE	Railway Sidings	1925	878216
17	443m S	Unspecified Ground Workings	1925 - 1938	847780
S	443m SW	Colliery	1851	798241
S	444m SW	Unspecified Heap	1950	803294
18	446m SW	Unspecified Pit	1950 - 1955	873550
U	449m SE	Railway Sidings	1925	853647
Q	450m W	Dye House	1950	954305
V	458m S	Unspecified Works	1966	882261
O	459m NE	Unspecified Heap	1925	803329
V	460m S	Unspecified Pit	1966	961148
V	462m S	Unspecified Pit	1955	929379
T	467m S	Unspecified Ground Workings	1990	957075
T	469m S	Unspecified Ground Workings	1966	878899
O	470m NE	Unspecified Tank	1925 - 1950	878311
T	470m S	Unspecified Ground Workings	1955	846547
O	470m NE	Gasometer	1906	809741
O	476m NE	Unspecified Tanks	1966	815149



ID	Location	Land use	Dates present	Group ID
V	477m S	Sewage Disposal Works	1950	960416
U	477m SE	Collieries	1851	811434
R	477m SE	Railway Sidings	1950	926299
V	478m S	Sewage Outfall Works	1906	818076
T	478m S	Unspecified Ground Workings	1950	846308
R	479m SE	Railway Sidings	1938	867114
O	479m NE	Unspecified Tank	1975	938846
21	479m S	Sewage Disposal Works	1925 - 1938	944190
O	479m NE	Unspecified Tank	1955	943827
V	486m S	Sewage Disposal Works	1925	987628
X	489m S	Unspecified Works	1966 - 1975	947081
X	489m S	Unspecified Works	1990	962306
V	489m S	Unspecified Works	1990	859148
O	491m NE	Unspecified Tank	1950	976039
R	492m SE	Railway Sidings	1925	846055
22	492m SE	Railway Sidings	1955	944895
O	492m NE	Unspecified Tank	1938	919524
X	499m S	Railway Sidings	1966 - 1975	909266

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

31

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**



ID	Location	Land use	Dates present	Group ID
B	103m W	Tanks	1954 - 1993	138418
B	104m W	Tanks	1982	132179
B	109m W	Tanks	1908 - 1937	133952
E	146m E	Unspecified Tank	1966 - 1993	133537
E	146m E	Unspecified Tank	1982	133794
E	156m E	Unspecified Tank	1908 - 1927	134423
E	158m E	Unspecified Tank	1893	140280
J	286m NW	Unspecified Tank	1995	123065
J	286m NW	Unspecified Tank	1955 - 1974	127986
J	287m W	Unspecified Tank	1937	113181
M	324m NW	Unspecified Tank	1937	113185
K	367m SE	Unspecified Tank	1985	113163
O	382m NE	Gas Works	1893 - 1908	139697
O	389m NE	Gasometer	1893 - 1908	142135
O	389m NE	Unspecified Tank	1927 - 1937	143786
O	390m NE	Gas Works	1955	148951
O	390m NE	Gas Holder Station	1996	122151
O	397m NE	Unspecified Tank	1955 - 1963	123474
O	404m NE	Unspecified Tank	1927 - 1937	127825
O	404m NE	Gasometer	1893 - 1908	133576
O	439m NE	Gasholder Station	1957 - 1984	144213
O	445m NE	Tanks	1955	140210
O	447m NE	Unspecified Tank	1955	129297
19	456m SE	Unspecified Tank	1975	113173
O	469m NE	Unspecified Tank	1908 - 1937	147823
O	477m NE	Gasometer	1955	108457
O	477m NE	Unspecified Tank	1955 - 1963	133684
O	492m NE	Unspecified Tank	1937 - 1963	123743

ID	Location	Land use	Dates present	Group ID
T	498m S	Unspecified Tank	1972 - 1994	141346
O	500m NE	Gasometer	1955	108458
O	500m NE	Gasholder	1957 - 1996	149183

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

20

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
B	83m W	Electricity Substation	1982 - 1993	76582
7	272m E	Electricity Substation	1975 - 1994	74750
8	291m SW	Electricity Substation	1954 - 1993	77747
9	296m NW	Electricity Substation	1974 - 1995	77412
11	351m SE	Electricity Substation	1975 - 1994	83532
N	374m SE	Electricity Substation	1975 - 1994	66390
O	382m NE	Gas Works	1893 - 1908	70988
P	386m S	Electricity Substation	1994	80899
P	386m S	Electricity Substation	1972	72250
O	389m NE	Gasometer	1893 - 1908	82186
O	390m NE	Gas Works	1955	67245
O	390m NE	Gas Holder Station	1996	63809
O	404m NE	Gasometer	1893 - 1908	64390
O	417m NE	Electricity Substation	1955 - 1996	72698
O	439m NE	Gasholder Station	1957 - 1984	66739



ID	Location	Land use	Dates present	Group ID
W	471m E	Electricity Substation	1985 - 1990	64436
W	472m E	Electricity Substation	1994	69487
O	477m NE	Gasometer	1955	59650
O	500m NE	Gasometer	1955	59651
O	500m NE	Gasholder	1957 - 1996	80382

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0
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Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	8
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Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
3	143m E	Garage	1982 - 1993	24369
H	261m E	Garage	1985 - 1990	27772
H	261m E	Garage	1994	22612
N	353m SE	Garage	1994	21932
N	364m SE	Garage	1964 - 1975	26302
N	370m SE	Garage	1985 - 1990	25814



ID	Location	Land use	Dates present	Group ID
15	425m SE	Garage	1985	20156
20	460m E	Garage	1975 - 1985	25295

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

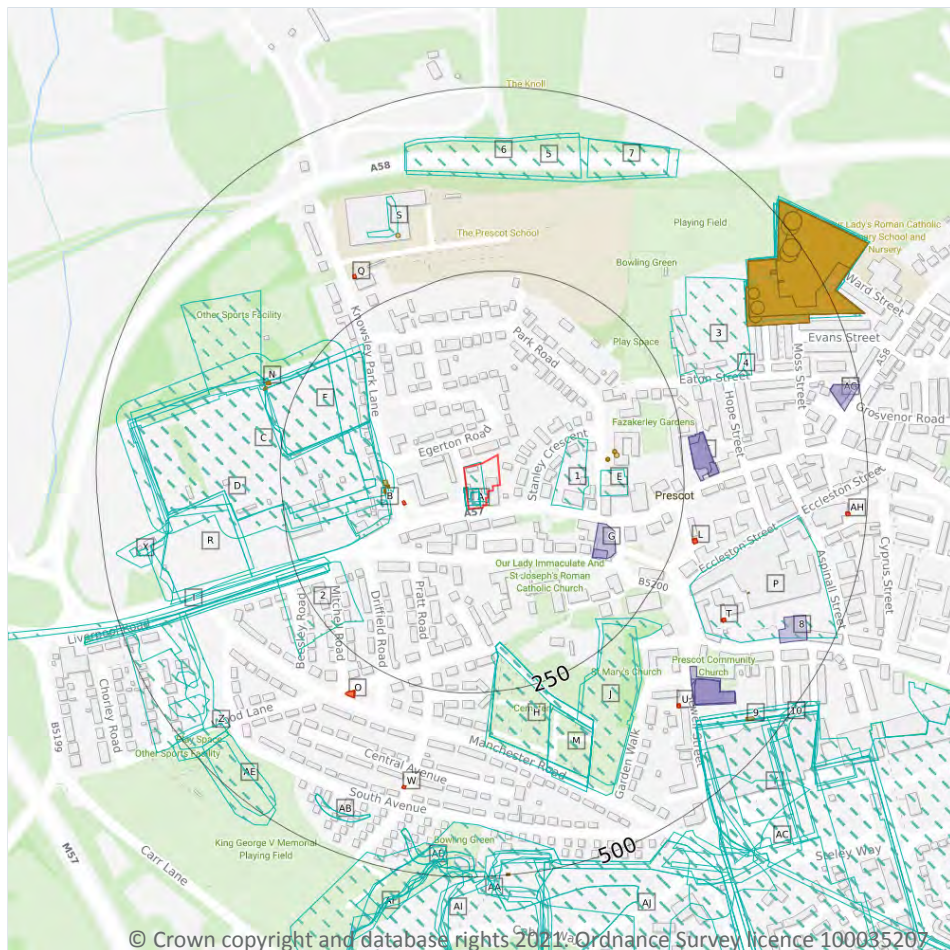
Records within 500m

0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

2.1 Historical industrial land uses

Records within 500m

131

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 22**

ID	Location	Land Use	Date	Group ID
A	On site	Police Station	1938	899232
A	On site	Police Station	1925	899232
A	On site	Police Station	1950	899232



ID	Location	Land Use	Date	Group ID
A	On site	Police Station	1955	860103
A	On site	Police Station	1975	877999
A	On site	Police Station	1990	848585
A	On site	Police Station	1966	877999
1	74m E	Colliery	1851	798244
C	97m W	Nursery	1990	935132
C	105m W	Unspecified Commercial/Industrial	1955	970823
D	107m W	Nursery	1851	850321
C	108m W	Unspecified Commercial/Industrial	1950	970823
B	109m W	Unspecified Tanks	1955	815148
B	109m W	Unspecified Tanks	1950	815147
C	122m W	Nursery	1975	964074
C	122m W	Nursery	1966	964074
D	133m W	Nursery	1925	859770
E	137m E	Police Station	1851	832552
F	143m NW	Nursery	1938	916443
F	143m NW	Nursery	1925	916443
F	143m NW	Nursery	1906	916443
H	185m S	Cemetery	1955	868720
H	185m S	Cemetery	1975	985196
H	185m S	Cemetery	1990	938974
H	185m S	Cemetery	1966	985196
2	189m SW	Earthenware Pottery	1851	834889
H	196m S	Cemetery	1950	868720
I	201m W	Tramway Sidings	1955	854072
I	205m W	Tramway Sidings	1938	892387
I	205m W	Tramway Sidings	1925	892387
I	205m W	Railway Sidings	1950	794599



ID	Location	Land Use	Date	Group ID
I	210m SW	Tramway Sidings	1925	985822
J	214m SE	Grave Yard	1950	941638
J	225m SE	Grave Yard	1955	941638
3	271m NE	Earthenware Pottery	1851	834890
M	281m S	Cemetery	1938	901116
M	281m S	Cemetery	1925	901116
M	289m S	Cemetery	1925	951793
N	291m NW	Unspecified Tank	1955	824619
N	291m W	Unspecified Tank	1950	824618
P	292m SE	Unspecified Commercial/Industrial	1990	796683
R	303m W	Nursery	1955	903324
R	308m W	Nursery	1950	870017
4	328m E	Unspecified Ground Workings	1925	799847
S	330m N	Unspecified Ground Workings	1975	799848
5	376m N	Cuttings	1975	900807
6	381m N	Cuttings	1990	921792
V	383m NE	Unspecified Commercial/Industrial	1925	967274
V	383m NE	Unspecified Commercial/Industrial	1938	991155
V	383m NE	Unspecified Commercial/Industrial	1925	991155
V	383m NE	Unspecified Commercial/Industrial	1950	991155
V	384m NE	Gas Works	1906	937755
V	388m NE	Unspecified Tank	1925	937563
V	389m NE	Gasometer	1906	864745
V	389m NE	Unspecified Tank	1938	908448
V	389m NE	Unspecified Tank	1925	908448
V	389m NE	Unspecified Tank	1950	908448
V	390m NE	Gas Works	1891	954530
V	393m NE	Unspecified Works	1966	830283



ID	Location	Land Use	Date	Group ID
V	393m NE	Unspecified Commercial/Industrial	1955	874436
V	395m NE	Gasometer	1891	864745
7	396m N	Cuttings	1990	886365
V	397m NE	Gas Holder Station	1975	891256
V	397m NE	Gas Holder Station	1990	929682
V	399m NE	Unspecified Tank	1955	886278
V	399m NE	Unspecified Tank	1966	931710
V	405m NE	Unspecified Tank	1925	869636
V	405m NE	Unspecified Tank	1938	905508
V	405m NE	Unspecified Tank	1925	905508
V	407m NE	Gasometer	1906	881641
X	408m W	Dye House	1955	896032
Y	409m SE	Unspecified Commercial/Industrial	1955	896926
Y	409m SE	Unspecified Works	1975	991861
Y	409m SE	Unspecified Works	1990	925182
Y	409m SE	Unspecified Works	1966	991105
V	409m NE	Gasometer	1891	881641
Z	410m W	Unspecified Ground Workings	1955	799863
Y	414m SE	Insulated Cable Works	1938	954255
Z	414m W	Tan Yard	1851	797996
Y	415m SE	Insulated Cable Works	1925	954255
Y	415m SE	Insulated Cable Works	1950	848751
Y	418m SE	Unspecified Commercial/Industrial	1925	948573
V	426m NE	Gas Works	1851	933630
AA	426m S	Sewage Disposal Works	1955	955403
Z	435m SW	Unspecified Heap	1966	803300
AB	436m S	Unspecified Ground Workings	1938	942574
AB	436m S	Unspecified Ground Workings	1925	942574



ID	Location	Land Use	Date	Group ID
Z	438m SW	Unspecified Pit	1966	839691
X	440m W	Dye House	1851	973203
AC	442m SE	Railway Sidings	1925	878216
AD	443m S	Unspecified Ground Workings	1938	847780
AD	443m S	Unspecified Ground Workings	1925	847780
Z	443m SW	Colliery	1851	798241
Z	444m SW	Unspecified Heap	1950	803294
AE	446m SW	Unspecified Pit	1955	873550
AC	449m SE	Railway Sidings	1925	853647
X	450m W	Dye House	1950	954305
AE	457m SW	Unspecified Pit	1950	873550
AF	458m S	Unspecified Works	1966	882261
V	459m NE	Unspecified Heap	1925	803329
AF	460m S	Unspecified Pit	1966	961148
AF	462m S	Unspecified Pit	1955	929379
AA	467m S	Unspecified Ground Workings	1990	957075
AA	469m S	Unspecified Ground Workings	1966	878899
V	470m NE	Unspecified Tank	1925	878311
AA	470m S	Unspecified Ground Workings	1955	846547
V	470m NE	Gasometer	1906	809741
V	470m NE	Unspecified Tank	1938	878311
V	470m NE	Unspecified Tank	1925	878311
V	470m NE	Unspecified Tank	1950	878311
V	476m NE	Unspecified Tanks	1966	815149
AF	477m S	Sewage Disposal Works	1950	960416
AC	477m SE	Collieries	1851	811434
Y	477m SE	Railway Sidings	1950	926299
AF	478m S	Sewage Outfall Works	1906	818076



ID	Location	Land Use	Date	Group ID
AA	478m S	Unspecified Ground Workings	1950	846308
Y	479m SE	Railway Sidings	1938	867114
V	479m NE	Unspecified Tank	1975	938846
V	479m NE	Unspecified Tank	1955	943827
AI	479m S	Sewage Disposal Works	1938	944190
AI	479m S	Sewage Disposal Works	1925	944190
AF	486m S	Sewage Disposal Works	1925	987628
AJ	489m S	Unspecified Works	1975	947081
AJ	489m S	Unspecified Works	1990	962306
AF	489m S	Unspecified Works	1990	859148
V	491m NE	Unspecified Tank	1950	976039
Y	492m SE	Railway Sidings	1925	846055
10	492m SE	Railway Sidings	1955	944895
V	492m NE	Unspecified Tank	1938	919524
AJ	499m S	Unspecified Works	1966	947081
AJ	499m S	Railway Sidings	1966	909266

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

61

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 22**

ID	Location	Land Use	Date	Group ID
B	103m W	Tanks	1993	138418
B	103m W	Tanks	1954	138418
B	104m W	Tanks	1966	138418
B	104m W	Tanks	1954	138418



ID	Location	Land Use	Date	Group ID
B	104m W	Tanks	1982	132179
B	109m W	Tanks	1908	133952
B	109m W	Tanks	1927	133952
B	109m W	Tanks	1937	133952
E	146m E	Unspecified Tank	1966	133537
E	146m E	Unspecified Tank	1982	133794
E	147m E	Unspecified Tank	1993	133537
E	156m E	Unspecified Tank	1908	134423
E	156m E	Unspecified Tank	1927	134423
E	158m E	Unspecified Tank	1893	140280
N	286m NW	Unspecified Tank	1995	123065
N	286m NW	Unspecified Tank	1963	127986
N	286m NW	Unspecified Tank	1955	127986
N	286m NW	Unspecified Tank	1955	127986
N	286m NW	Unspecified Tank	1974	127986
N	287m W	Unspecified Tank	1937	113181
S	324m NW	Unspecified Tank	1937	113185
P	367m SE	Unspecified Tank	1985	113163
V	382m NE	Gas Works	1893	139697
V	382m NE	Gas Works	1908	139697
V	389m NE	Gasometer	1893	142135
V	389m NE	Gasometer	1908	142135
V	389m NE	Unspecified Tank	1927	143786
V	389m NE	Unspecified Tank	1937	143786
V	390m NE	Gas Works	1955	148951
V	390m NE	Gas Works	1955	148951
V	390m NE	Gas Holder Station	1996	122151
V	397m NE	Unspecified Tank	1963	123474

ID	Location	Land Use	Date	Group ID
V	397m NE	Unspecified Tank	1955	123474
V	397m NE	Unspecified Tank	1955	123474
V	404m NE	Gasometer	1893	133576
V	404m NE	Gasometer	1908	133576
V	404m NE	Unspecified Tank	1927	127825
V	404m NE	Unspecified Tank	1937	127825
V	439m NE	Gasholder Station	1984	144213
V	439m NE	Gasholder Station	1957	144213
V	445m NE	Tanks	1955	140210
V	445m NE	Tanks	1955	140210
V	447m NE	Unspecified Tank	1955	129297
V	448m NE	Unspecified Tank	1955	129297
9	456m SE	Unspecified Tank	1975	113173
V	469m NE	Unspecified Tank	1908	147823
V	469m NE	Unspecified Tank	1927	147823
V	469m NE	Unspecified Tank	1937	147823
V	477m NE	Gasometer	1955	108457
V	477m NE	Unspecified Tank	1963	133684
V	477m NE	Unspecified Tank	1955	133684
V	492m NE	Unspecified Tank	1937	123743
AA	498m S	Unspecified Tank	1972	141346
AA	498m S	Unspecified Tank	1994	141346
AA	498m S	Unspecified Tank	1994	141346
V	499m NE	Unspecified Tank	1963	123743
V	499m NE	Unspecified Tank	1955	123743
V	500m NE	Gasometer	1955	108458
V	500m NE	Gasholder	1996	149183
V	500m NE	Gasholder	1984	149183



ID	Location	Land Use	Date	Group ID
V	500m NE	Gasholder	1957	149183

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	49
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Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 22**

ID	Location	Land Use	Date	Group ID
B	83m W	Electricity Substation	1993	76582
B	84m W	Electricity Substation	1982	76582
L	272m E	Electricity Substation	1985	74750
L	272m E	Electricity Substation	1990	74750
L	272m E	Electricity Substation	1990	74750
L	272m E	Electricity Substation	1975	74750
L	272m E	Electricity Substation	1994	74750
O	291m SW	Electricity Substation	1954	77747
O	291m SW	Electricity Substation	1954	77747
O	291m SW	Electricity Substation	1993	77747
O	292m SW	Electricity Substation	1982	77747
Q	296m NW	Electricity Substation	1995	77412
Q	298m NW	Electricity Substation	1974	77412
T	351m SE	Electricity Substation	1990	83532
T	352m SE	Electricity Substation	1985	83532
T	352m SE	Electricity Substation	1975	83532
T	352m SE	Electricity Substation	1994	83532
U	374m SE	Electricity Substation	1975	66390
U	374m SE	Electricity Substation	1985	66390



ID	Location	Land Use	Date	Group ID
U	374m SE	Electricity Substation	1990	66390
U	375m SE	Electricity Substation	1994	66390
V	382m NE	Gas Works	1893	70988
V	382m NE	Gas Works	1908	70988
W	386m S	Electricity Substation	1994	80899
W	386m S	Electricity Substation	1994	80899
W	386m S	Electricity Substation	1972	72250
V	389m NE	Gasometer	1893	82186
V	389m NE	Gasometer	1908	82186
V	390m NE	Gas Works	1955	67245
V	390m NE	Gas Works	1955	67245
V	390m NE	Gas Holder Station	1996	63809
V	404m NE	Gasometer	1893	64390
V	404m NE	Gasometer	1908	64390
V	417m NE	Electricity Substation	1955	72698
V	417m NE	Electricity Substation	1996	72698
V	417m NE	Electricity Substation	1955	72698
V	417m NE	Electricity Substation	1984	72698
V	417m NE	Electricity Substation	1957	72698
V	439m NE	Gasholder Station	1984	66739
V	439m NE	Gasholder Station	1957	66739
AH	471m E	Electricity Substation	1985	64436
AH	471m E	Electricity Substation	1990	64436
AH	471m E	Electricity Substation	1990	64436
AH	472m E	Electricity Substation	1994	69487
V	477m NE	Gasometer	1955	59650
V	500m NE	Gasometer	1955	59651
V	500m NE	Gasholder	1996	80382



ID	Location	Land Use	Date	Group ID
V	500m NE	Gasholder	1984	80382
V	500m NE	Gasholder	1957	80382

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m

15

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 22**

ID	Location	Land Use	Date	Group ID
G	143m E	Garage	1982	24369
G	155m SE	Garage	1993	24369
K	261m E	Garage	1985	27772
K	261m E	Garage	1990	27772
K	261m E	Garage	1990	27772
K	261m E	Garage	1994	22612
U	353m SE	Garage	1994	21932
U	364m SE	Garage	1964	26302
U	370m SE	Garage	1975	26302
U	370m SE	Garage	1985	25814
U	370m SE	Garage	1990	25814

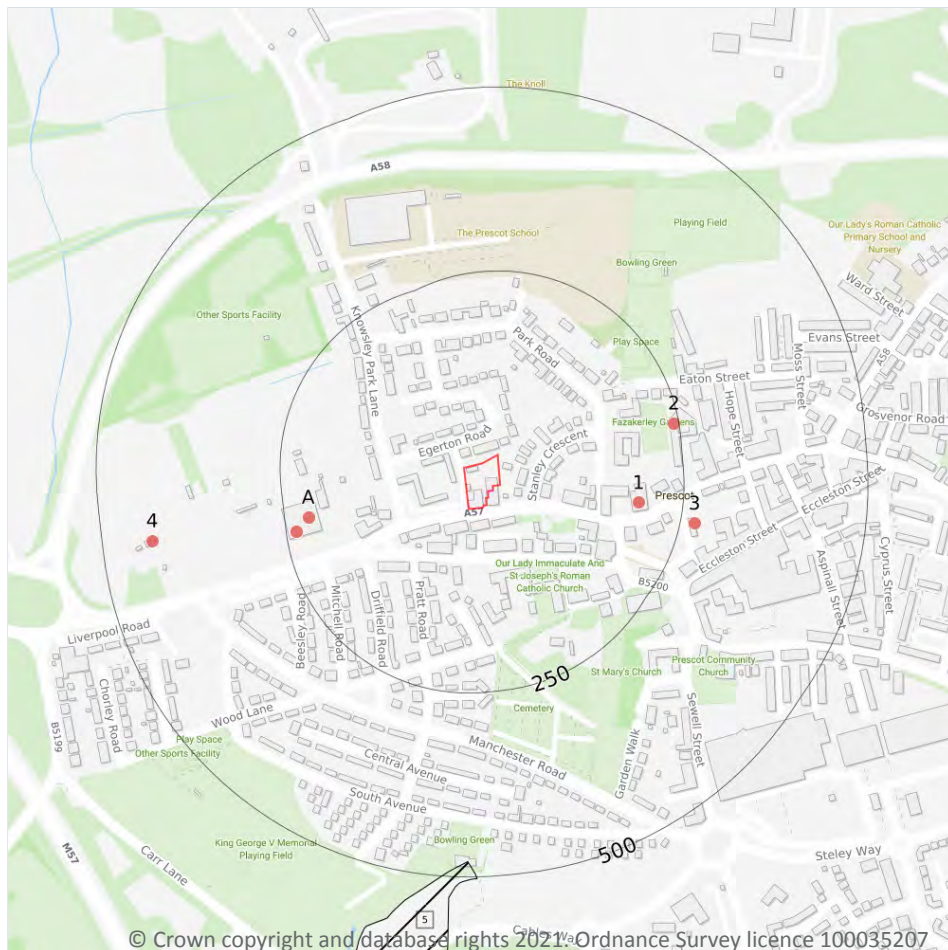


ID	Location	Land Use	Date	Group ID
U	370m SE	Garage	1990	25814
8	425m SE	Garage	1985	20156
AG	460m E	Garage	1985	25295
AG	461m E	Garage	1975	25295

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (EA/NRW)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m

0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m

1

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 34**

ID	Location	Details		
5	479m S	Site Address: Prescot WWTW, Carr Lane, Prescot Licence Holder Address: -	Waste Licence: - Site Reference: GDO M271 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded: - Last Recorded: -

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m

0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m

0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m

12

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 34**

ID	Location	Site	Reference	Category	Sub-Category	Description
1	190m E	PRESCOT HOUSE, 3, HIGH STREET, PRESCOT, L34 3LD	WEX258709	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
A	218m W	LIVERPOOL ROAD, PRESCOT, L34 3LX	WEX061986	Using waste exemption	On a farm	Spreading waste on non-agricultural land to confer benefit
A	218m W	LIVERPOOL ROAD, PRESCOT, L34 3LX	WEX061986	Using waste exemption	On a farm	Use of mulch
A	236m W	WHITAKERS GARDEN CENTRE Liverpool Road PRESCOT Merseyside L34 3LX	EPR/QF0738X X/A001	Disposing of waste exemption	Both agricultural and non-agricultural waste	Burning waste in the open
A	236m W	WHITAKERS GARDEN CENTRE Liverpool Road PRESCOT Merseyside L34 3LX	EPR/QF0738X X/A001	Treating waste exemption	Both agricultural and non-agricultural waste	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	236m W	WHITAKERS GARDEN CENTRE Liverpool Road PRESCOT Merseyside L34 3LX	EPR/QF0738X X/A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of waste in construction
A	236m W	WHITAKERS GARDEN CENTRE Liverpool Road PRESCOT Merseyside L34 3LX	EPR/QF0738X X/A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of mulch
A	236m W	WHITAKERS GARDEN CENTRE Liverpool Road PRESCOT Merseyside L34 3LX	EPR/QF0738X X/A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading of plant matter to confer benefit

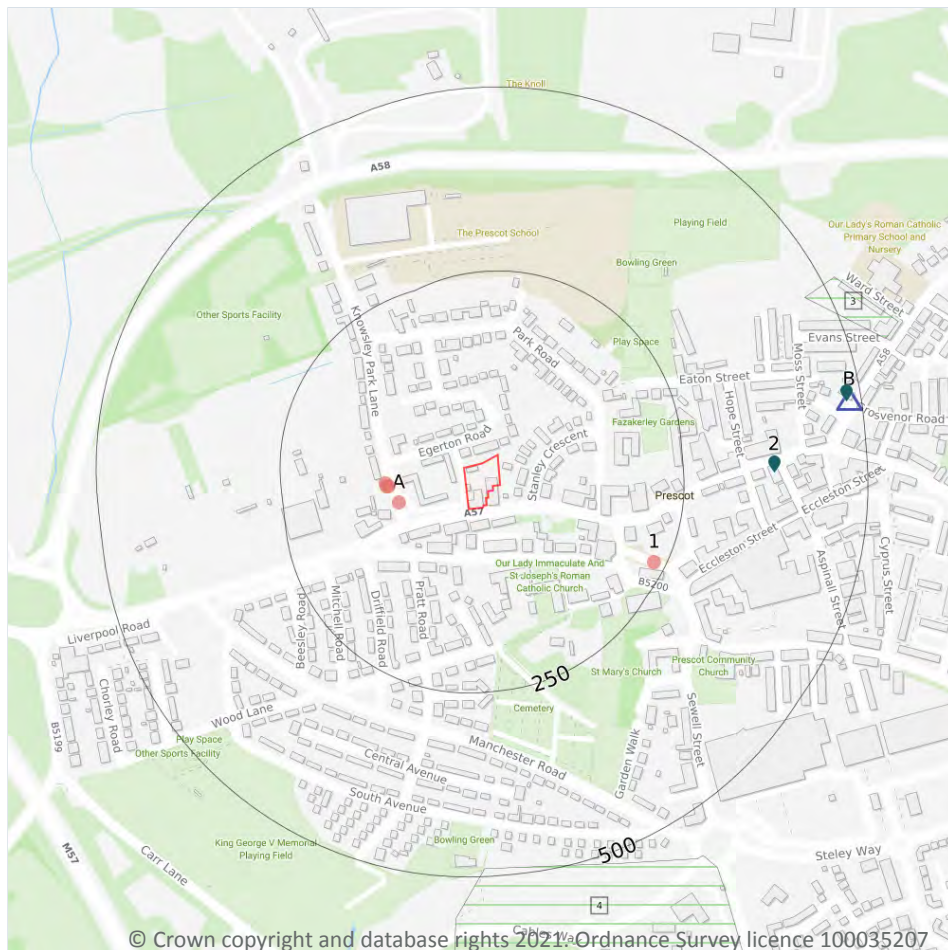


ID	Location	Site	Reference	Category	Sub-Category	Description
A	236m W	WHITAKERS GARDEN CENTRE Liverpool Road PRESCOT Merseyside L34 3LX	EPR/QF0738X X/A001	Using waste exemption	Both agricultural and non- agricultural waste	Incorporation of ash into soil
2	243m E	MCKENNA COURT 11A, HIGH STREET, PRESCOT, L34 3LD	WEX164956	Treating waste exemption	Not on a Farm	Sorting and de-naturing of controlled drugs for disposal
3	269m E	8, MILL STREET, PRESCOT, L34 6HA	WEX167417	Treating waste exemption	Not on a farm	Screening and blending of waste
4	432m W	Prescot brook with current silt management in place. Existing garden centre to remain for 2 years of initial site remediation	WEX268937	Using waste exemption	Not on a farm	Use of waste in construction

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- ▲ Current or recent petrol stations
- Control of Major Accident Hazards
- Licensed pollutant release (Part A(2)/B)

4.1 Recent industrial land uses

Records within 250m

5

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 38**

ID	Location	Company	Address	Activity	Category
A	94m W	Electricity Sub Station	Merseyside, L34	Electrical Features	Infrastructure and Facilities
A	105m W	Tank	Merseyside, L34	Tanks (Generic)	Industrial Features
A	107m W	Tank	Merseyside, L34	Tanks (Generic)	Industrial Features
A	109m W	Tank	Merseyside, L34	Tanks (Generic)	Industrial Features



ID	Location	Company	Address	Activity	Category
1	234m SE	Bus Station	Merseyside, L34	Bus and Coach Stations, Depots and Companies	Public Transport, Stations and Infrastructure

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	1
----------------------------	----------

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on **page 38**

ID	Location	Company	Address	LPG	Status
B	483m E	TEXACO	19, St Helens Road, Prescott, Merseyside, L34 6HN	No	Open

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0
----------------------------	----------

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0
----------------------------	----------

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0
----------------------------	----------

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m

2

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

Features are displayed on the Current industrial land use map on **page 38**

ID	Location	Company	Address	Operational status	Tier
3	469m NE	British Gas	British Gas, Ward Street, Prescot, L34 6JJ	Historical NIHHS Site	-
4	489m S	Bicc Metals Ltd	Bicc Metals Ltd, Carr Lane, Prescott, L34 1PD	Historical NIHHS Site	-

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m

2

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 38**

ID	Location	Address	Details	
2	373m E	Prescot Dry Cleaners, 40 High Street, Prescot, L34 6HQ	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
B	480m E	Prescot Fuel Service Station (Formerly Texaco), St. Helens Road, Prescot, L34 6HN	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m

0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.13 Licensed Discharges to controlled waters

Records within 500m**0**

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m**0**

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m**0**

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m**0**

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m**0**

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m**0**

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m**0**

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m**0**

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

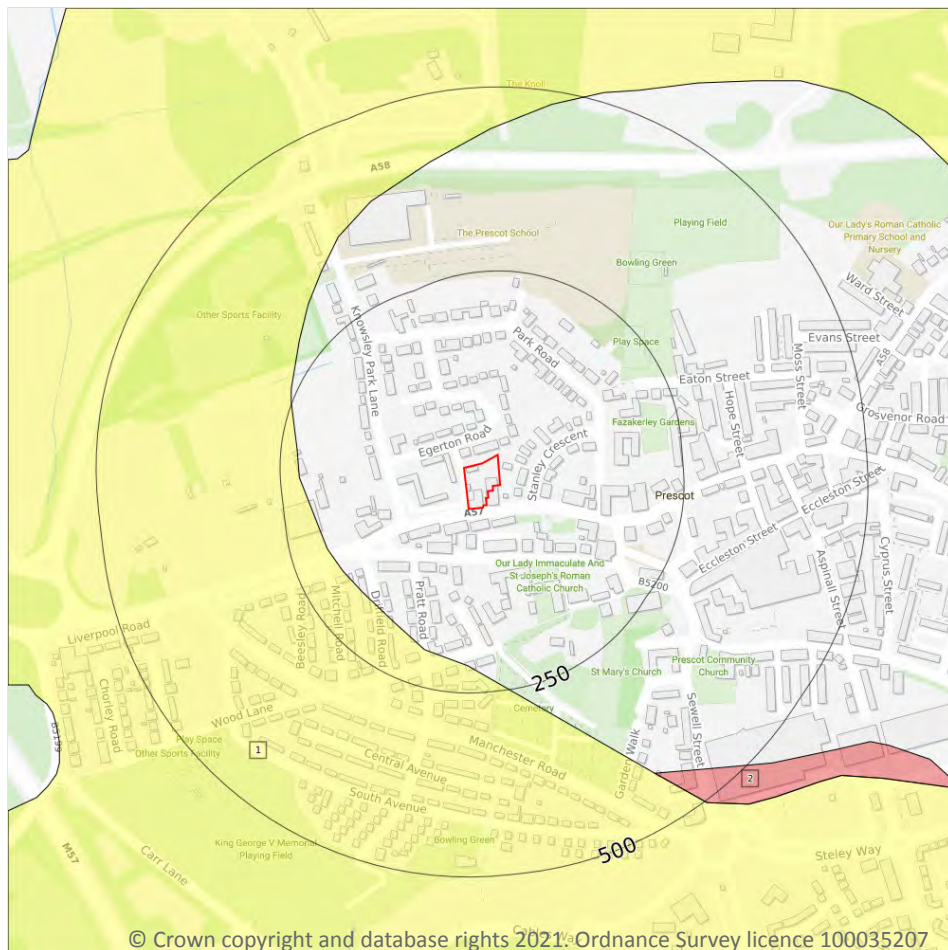
4.21 Pollution inventory radioactive waste

Records within 500m**0**

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



- Site Outline**
- Search buffers in metres (m)**
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive
 - Unknown

5.1 Superficial aquifer

Records within 500m

2

Aquifer status of groundwater held within superficial geology.

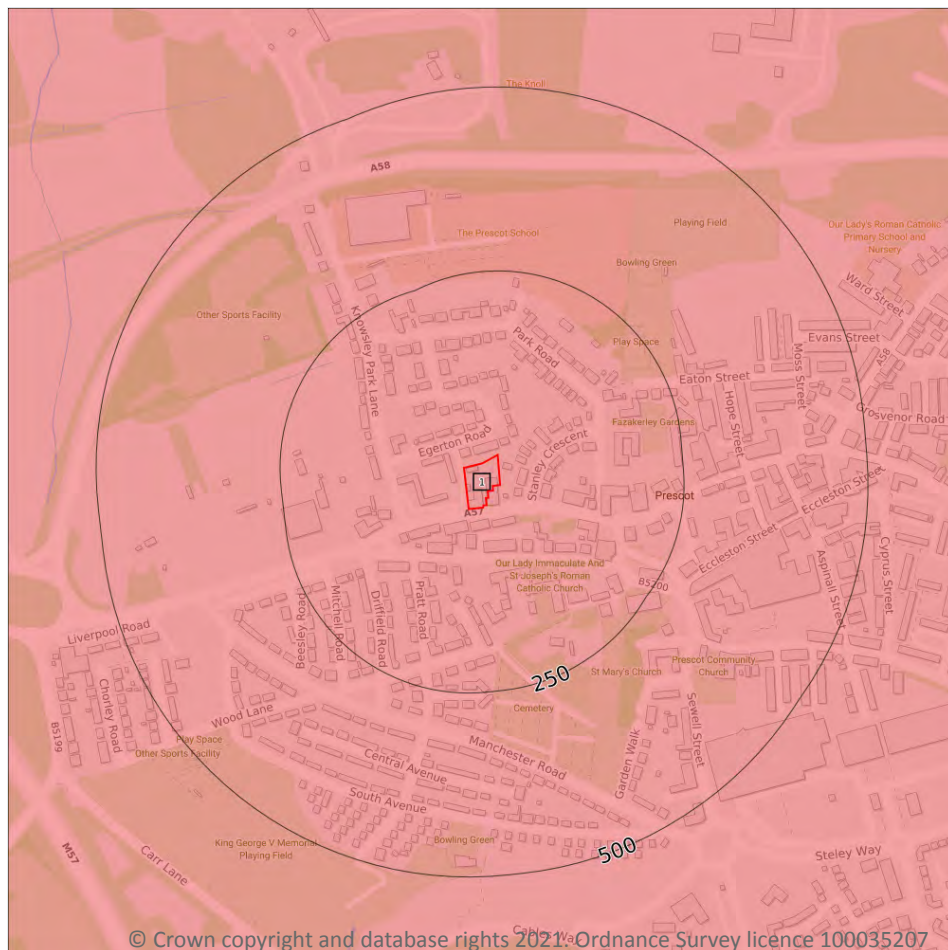
Features are displayed on the Hydrogeology map on **page 44**

ID	Location	Designation	Description
1	181m SW	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	430m SE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

1

Aquifer status of groundwater held within bedrock geology.

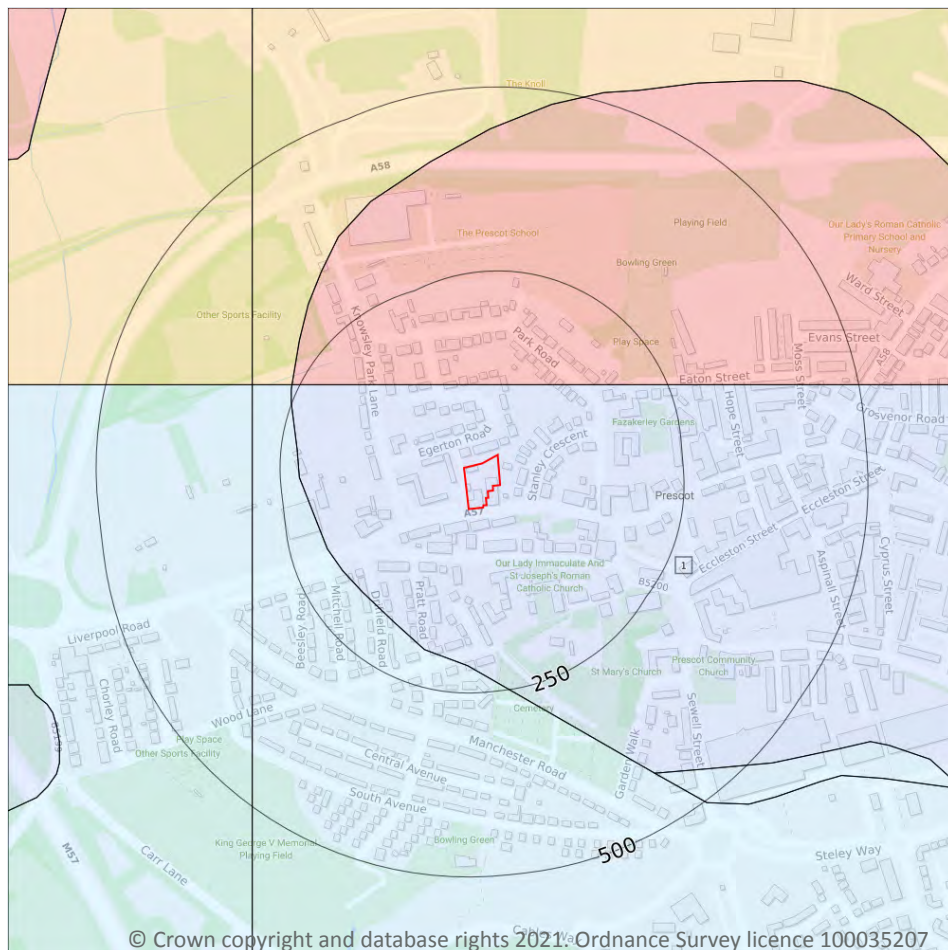
Features are displayed on the Bedrock aquifer map on **page 46**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



— Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m

1

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 47**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: 300- 550mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	0
------------------------	----------

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

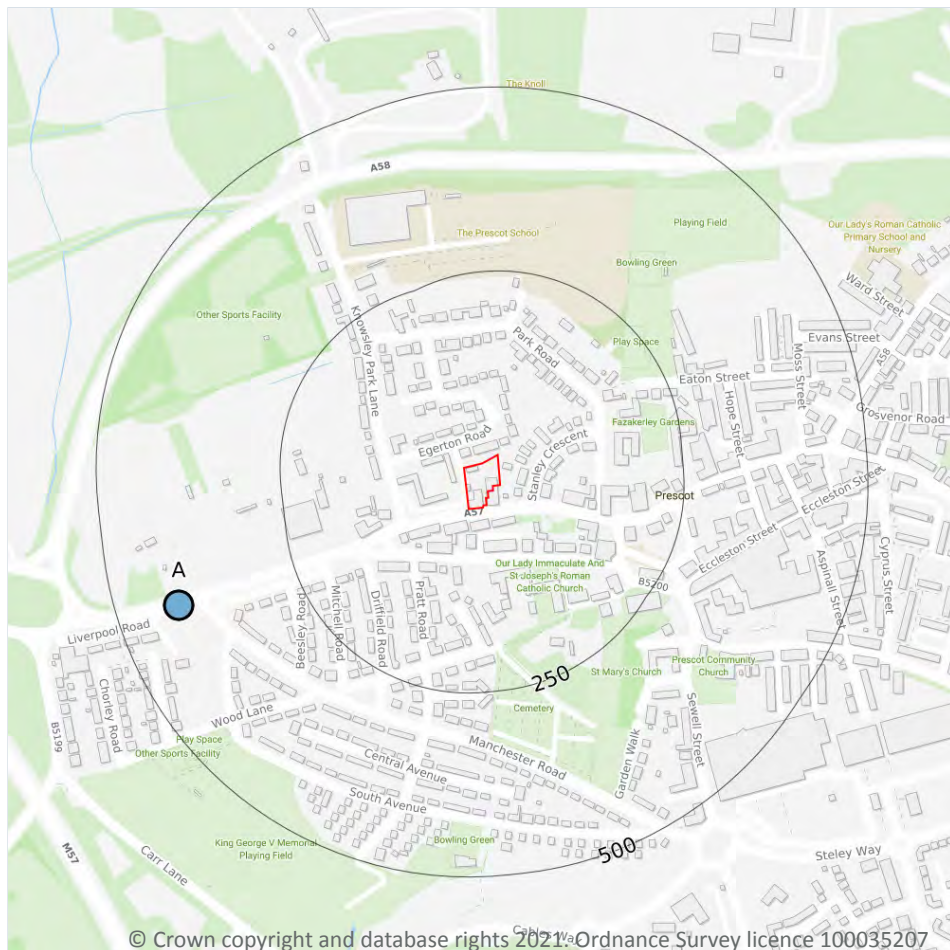
5.5 Groundwater vulnerability- local information

Records on site	0
------------------------	----------

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

5

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 49**

ID	Location	Details	
-	1830m SE	Status: Historical Licence No: 2569025072 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "TWO BOREHOLES AT WHISTON HOSPITAL, PRESCOT, MERSEYSIDE" Data Type: Point Name: ST HELENS AND KNOWSLEY HOSPITALS Easting: 348000 Northing: 392100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 13/08/1992 Expiry Date: - Issue No: 100 Version Start Date: 13/08/1992 Version End Date: -
-	1830m SE	Status: Historical Licence No: 2569025072 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "TWO BOREHOLES AT WHISTON HOSPITAL, PRESCOT, MERSEYSIDE" Data Type: Point Name: ST HELENS AND KNOWSLEY HOSPITALS Easting: 348000 Northing: 392100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 13/08/1992 Expiry Date: - Issue No: 100 Version Start Date: 13/08/1992 Version End Date: -
-	1830m SE	Status: Historical Licence No: 2569025072 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: TWO BOREHOLES AT WHISTON HOSPITAL, PRESCOT, MERSEYSIDE Data Type: Point Name: ST HELENS AND KNOWSLEY HOSPITALS Easting: 348000 Northing: 392100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 13/08/1992 Expiry Date: - Issue No: 100 Version Start Date: 13/08/1992 Version End Date: -
-	1830m SE	Status: Historical Licence No: 2569025072 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: TWO BOREHOLES AT WHISTON HOSPITAL, PRESCOT, MERSEYSIDE Data Type: Point Name: ST HELENS AND KNOWSLEY HOSPITALS Easting: 348000 Northing: 392100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 13/08/1992 Expiry Date: - Issue No: 100 Version Start Date: 13/08/1992 Version End Date: -



ID	Location	Details	
-	1963m E	Status: Historical Licence No: 2569025020 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT ECCLESTON PARK RAILWAY STATION Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 348300 Northing: 392900	Annual Volume (m ³): 295490 Max Daily Volume (m ³): 986.482 Original Application No: - Original Start Date: 31/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 10/07/1975 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m

2

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 49**

ID	Location	Details	
A	415m W	Status: Historical Licence No: 2569028003 Details: Spray Irrigation - Direct Direct Source: "Surface, Non-Tidal - North West Region" Point: "LOGWOOD MILL BROOK AT LH'S PREMISES, PRESCOT, MERSEYSIDE" Data Type: Point Name: JAMES WHITAKER & SONS NURSERYMEN LTD Easting: 345900 Northing: 392700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1999 Version End Date: -
A	415m W	Status: Historical Licence No: 2569028003 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: LOGWOOD MILL BROOK AT LH'S PREMISES, PRESCOT, MERSEYSIDE Data Type: Point Name: JAMES WHITAKER & SONS NURSERYMEN LTD Easting: 345900 Northing: 392700	Annual Volume (m ³): 772.82 Max Daily Volume (m ³): 77.282 Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1999 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.



5.8 Potable abstractions

Records within 2000m

3

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 49**

ID	Location	Details	
-	1830m SE	Status: Historical Licence No: 2569025072 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "TWO BOREHOLES AT WHISTON HOSPITAL, PRESCOT, MERSEYSIDE" Data Type: Point Name: ST HELENS AND KNOWSLEY HOSPITALS Easting: 348000 Northing: 392100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 13/08/1992 Expiry Date: - Issue No: 100 Version Start Date: 13/08/1992 Version End Date: -
-	1830m SE	Status: Historical Licence No: 2569025072 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: TWO BOREHOLES AT WHISTON HOSPITAL, PRESCOT, MERSEYSIDE Data Type: Point Name: ST HELENS AND KNOWSLEY HOSPITALS Easting: 348000 Northing: 392100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 13/08/1992 Expiry Date: - Issue No: 100 Version Start Date: 13/08/1992 Version End Date: -
-	1963m E	Status: Historical Licence No: 2569025020 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT ECCLESTON PARK RAILWAY STATION Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 348300 Northing: 392900	Annual Volume (m ³): 295490 Max Daily Volume (m ³): 986.482 Original Application No: - Original Start Date: 31/05/1966 Expiry Date: - Issue No: 100 Version Start Date: 10/07/1975 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.



5.9 Source Protection Zones

Records within 500m

0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

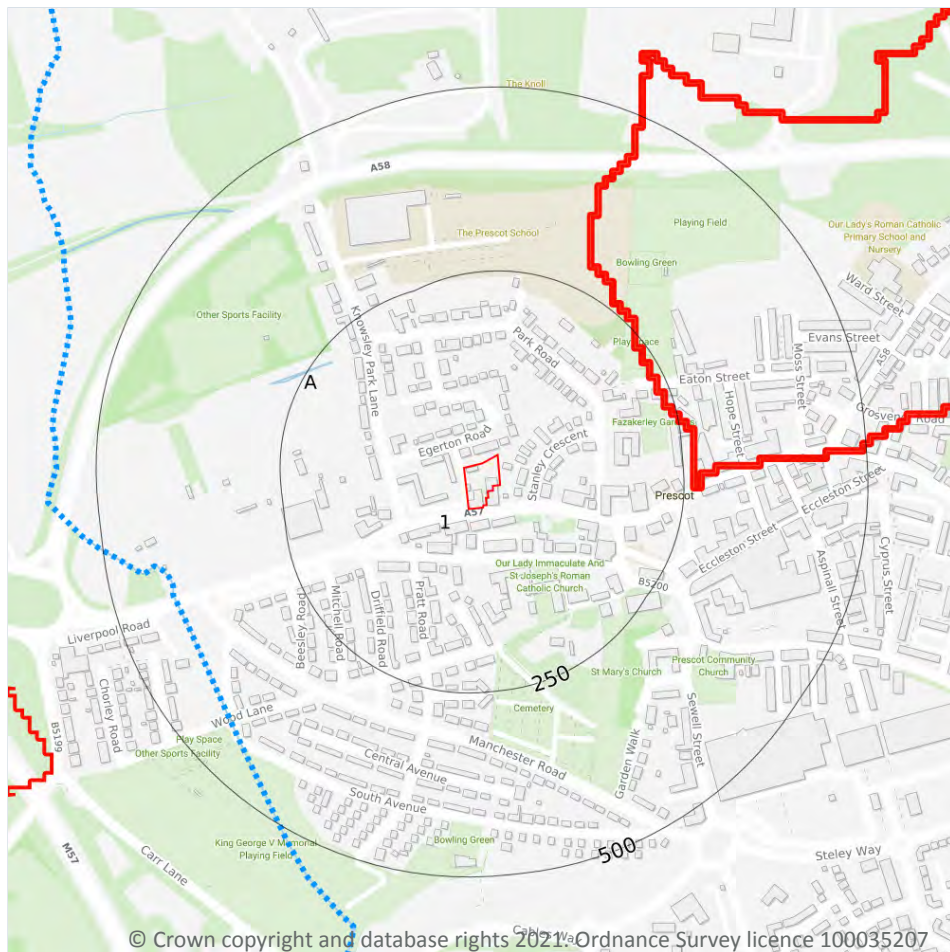
Records within 500m

0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

1

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 54**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	229m NW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.



6.2 Surface water features

Records within 250m

1

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 54**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site

1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 54**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River WB catchment	Prescot Brook (Logwood Mill Brook)	GB112069060710	Ditton	Lower Mersey

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified

1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 54**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
3	413m SW	River	Prescot Brook (Logwood Mill Brook)	GB112069060710	Poor	Good	Poor	2016

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site

0

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m

0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m

0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m

0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m

0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m

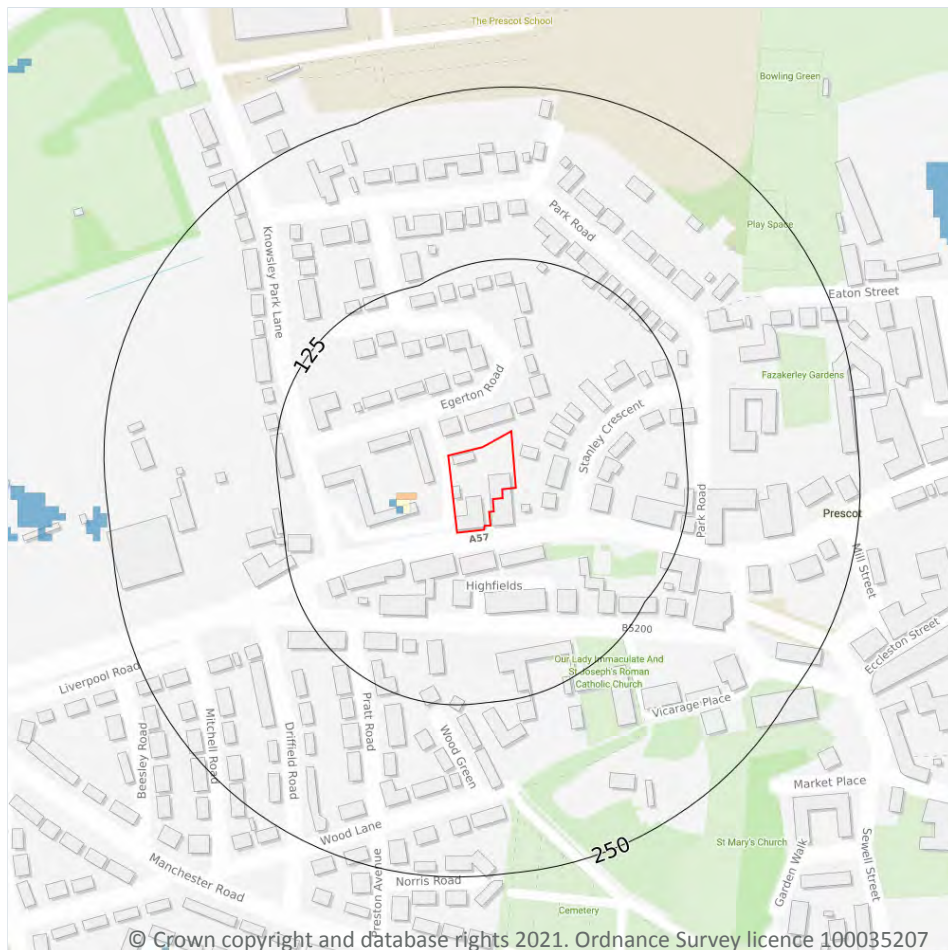
0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



— Site Outline

Search buffers in metres (m)

1 in 1000 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site

Negligible

Highest risk within 50m

1 in 30 year, 0.1m - 0.3m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 60**

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

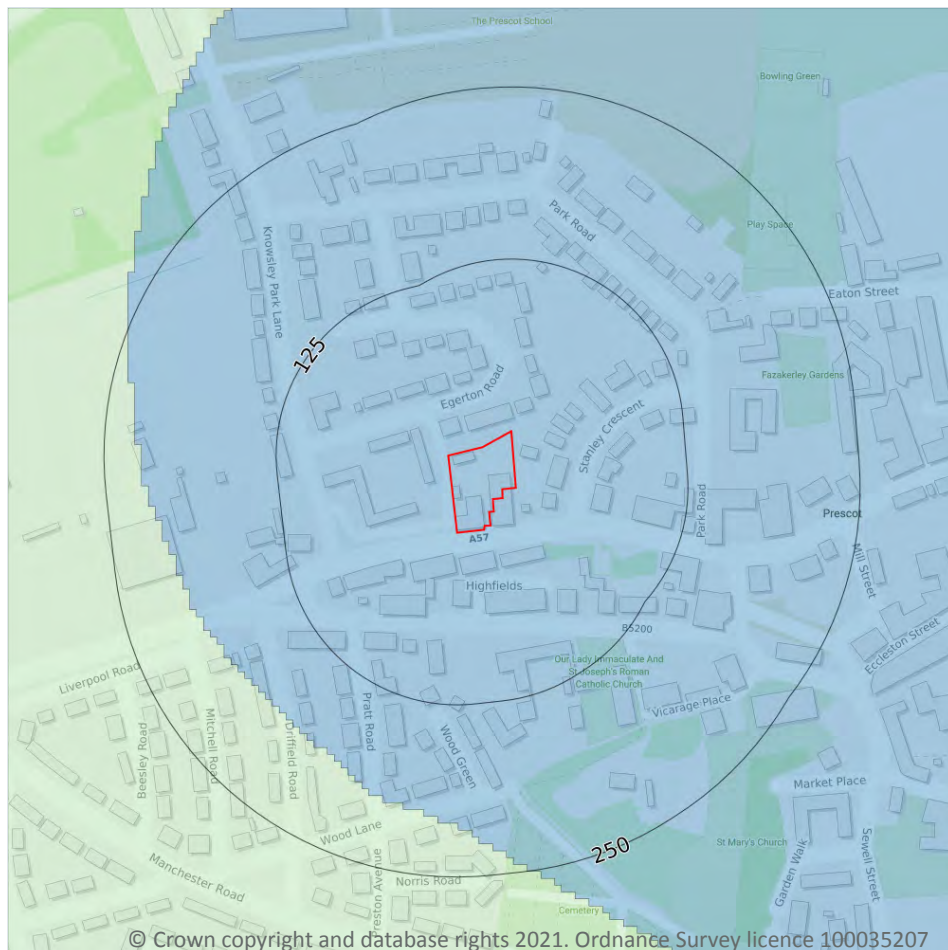
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

Highest risk on site

Negligible

Highest risk within 50m

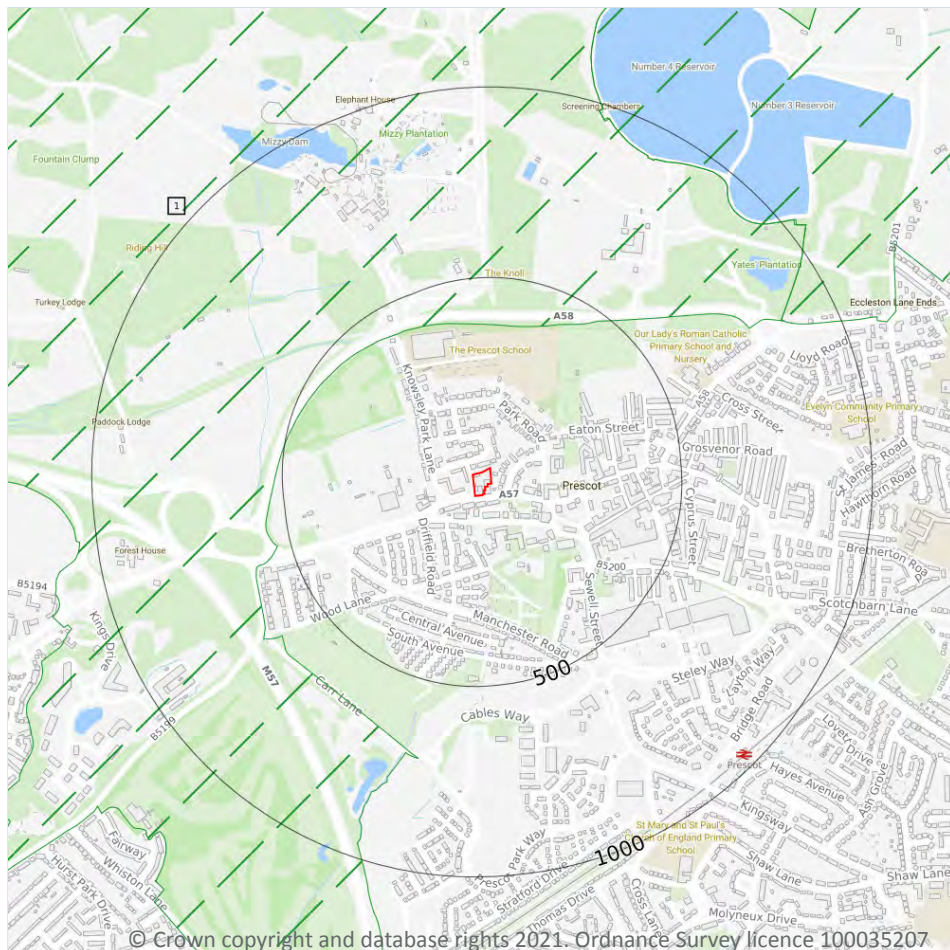
Negligible

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 62**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- ▨ Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m**0**

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m**0**

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m**0**

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m**0**

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m**0**

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m**0**

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m**0**

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m**0**

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

4

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 63**

ID	Location	Name	Local Authority name
1	376m N	Merseyside and Greater Manchester	Knowsley
2	858m NE	Merseyside and Greater Manchester	St. Helens
-	1823m E	Merseyside and Greater Manchester	St. Helens
-	1946m E	Merseyside and Greater Manchester	Knowsley

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.



10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

4

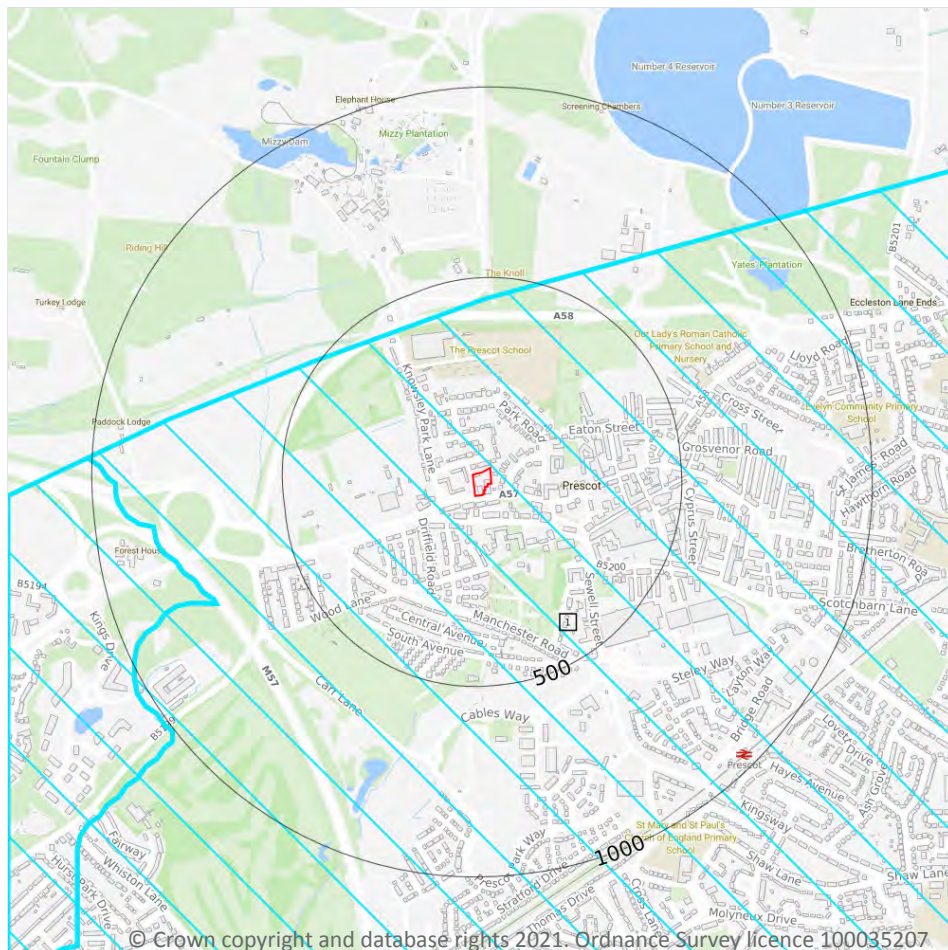
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	Dittton Brook (Halewood to Mersey Estuary) NVZ	Surface Water	S640	Existing
731m E	Sankey Brook (Black Bk to Mersey) NVZ	Surface Water	S639	Existing
792m NW	ALT NVZ	Surface Water	S642	Existing
1302m NW	Dittton Brook (Halewood to Mersey Estuary) NVZ	Surface Water	S640	Existing

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 68**

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines Air pollution - Livestock & poultry units with floorspace > 500m², slurry lagoons > 4000m². Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Discharges - Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location)

This data is sourced from Natural England.

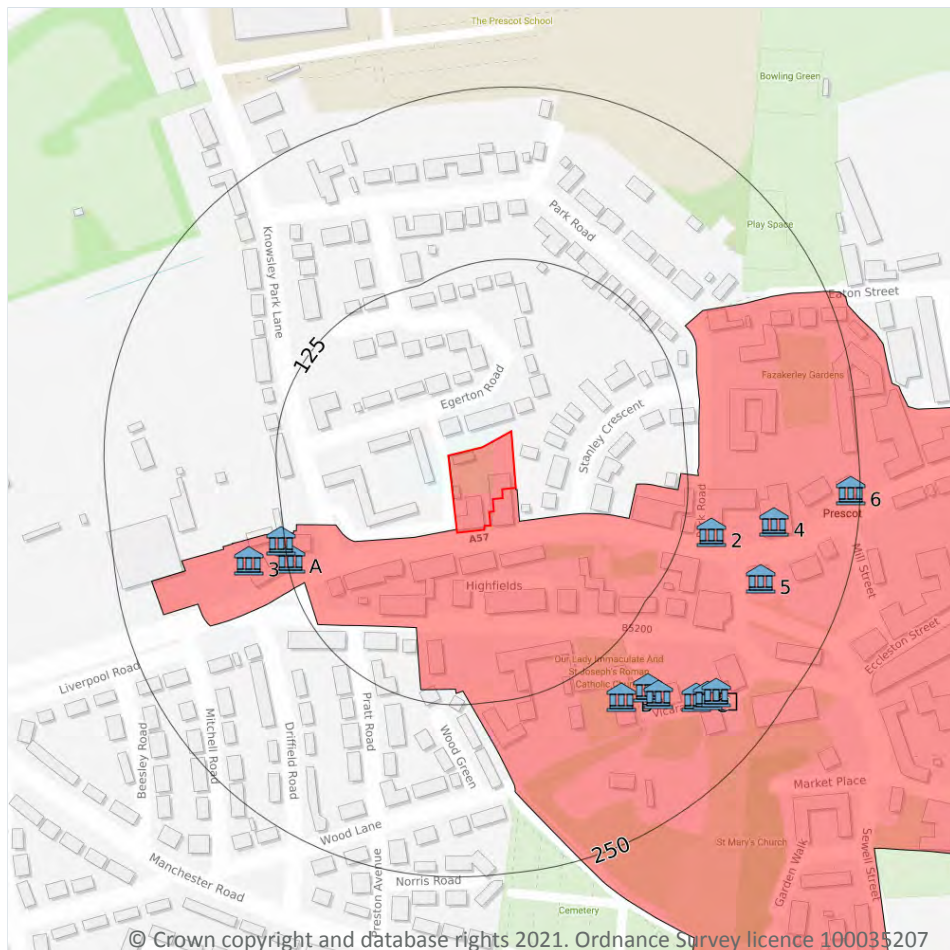
10.18 SSSI Units

Records within 2000m	0
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

13

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 70**

ID	Location	Name	Grade	Reference Number	Listed date
A	123m W	44-50, Derby Street, Prescot, Knowsley, L34	II	1283501	06/04/1979
A	128m W	Stable Block To North East Of Number 54, Prescot, Knowsley, L34	II	1199248	03/08/1981
2	146m E	2, Derby Street, Prescot, Knowsley, L34	II	1075501	19/03/1987
3	153m W	Clock Face Public House, Prescot, Knowsley, L34	II	1075502	19/03/1951
B	157m SE	Church Of Our Lady Immaculate, Prescot, Knowsley, L34	II	1199627	19/03/1987



ID	Location	Name	Grade	Reference Number	Listed date
B	164m SE	14, Vicarage Place, Prescot, Knowsley, L34	II	1075507	19/03/1987
B	173m SE	Number 10 Including Garden Wall, Prescot, Knowsley, L34	II	1199612	19/03/1951
4	189m E	Masonic Hall, Prescot, Knowsley, L34	II	1283414	19/03/1951
5	190m E	Prescot Museum, Prescot, Knowsley, L34	II	1075500	19/03/1987
C	194m SE	6, Vicarage Place, Prescot, Knowsley, L34	II	1343470	19/03/1951
C	200m SE	4, Vicarage Place, Prescot, Knowsley, L34	II	1199607	19/03/1951
C	204m SE	2, Vicarage Place, Prescot, Knowsley, L34	II	1075506	19/03/1951
6	243m E	Number 11, Including Wall And Gatepiers, Prescot, Knowsley, L34	II	1075504	19/03/1951

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m

1

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

Features are displayed on the Visual and cultural designations map on **page 70**

ID	Location	Name	District	Date of designation
1	On site	Prescot Town Centre, Knowsley	Knowsley	1974

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



11.7 Registered Parks and Gardens

Records within 250m

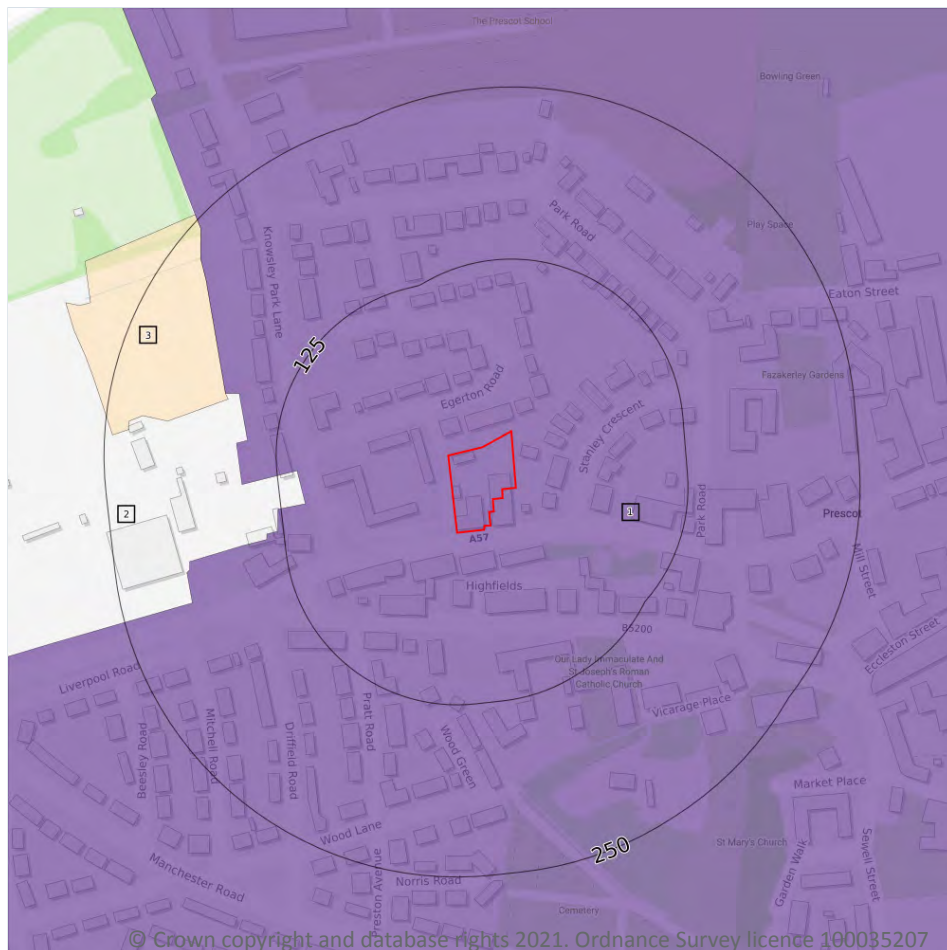
0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

3

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 74**

ID	Location	Classification	Description
1	On site	Urban	-
2	107m W	Not Surveyed	-

ID	Location	Classification	Description
3	165m W	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0
----------------------------	----------

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0
----------------------------	----------

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0
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Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	0
----------------------------	----------

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations



Site Outline
Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks
Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

11

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 76**

ID	Location	Main Habitat	Other habitats
1	176m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	187m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	187m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	206m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

ID	Location	Main Habitat	Other habitats
B	217m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	217m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	220m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
A	230m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	241m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	244m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
B	248m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

0

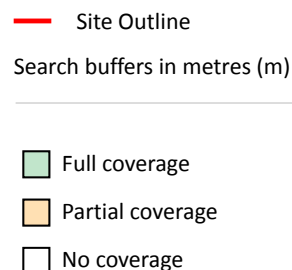
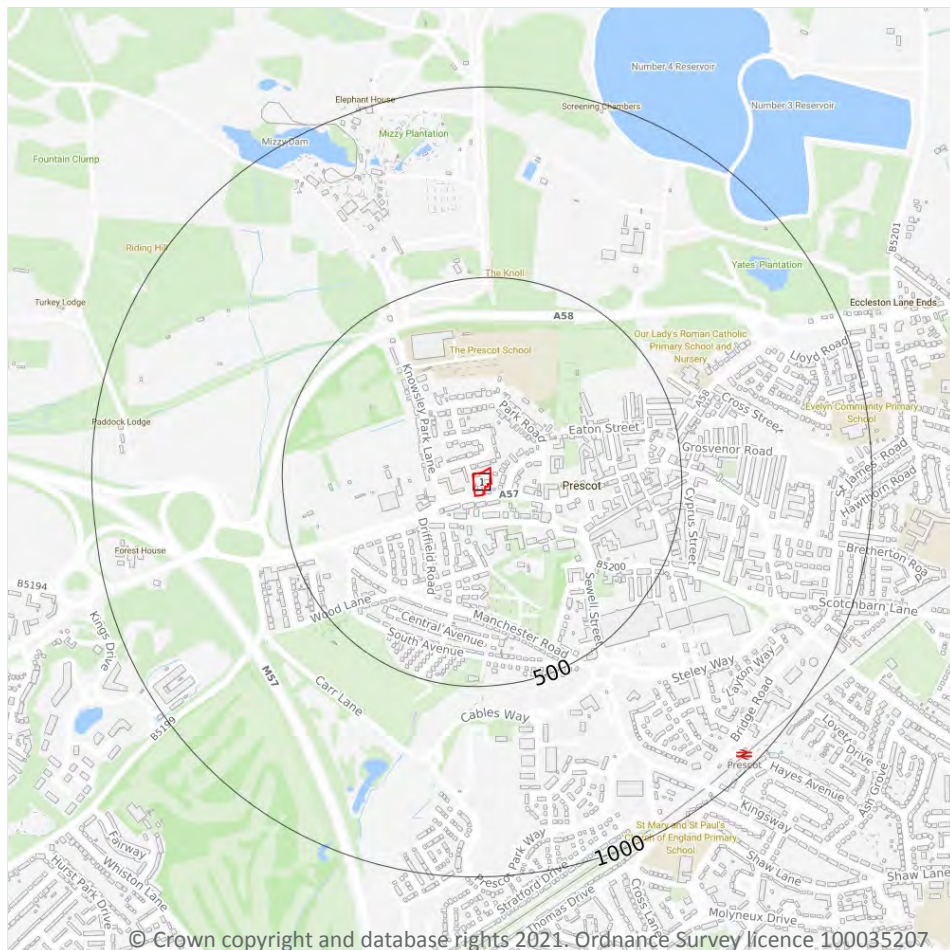
Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.



This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



14.1 10k Availability

Records within 500m

1

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 79**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground

14.2 Artificial and made ground (10k)

Records within 500m

0

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock

14.5 Bedrock geology (10k)

Records within 500m

0

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

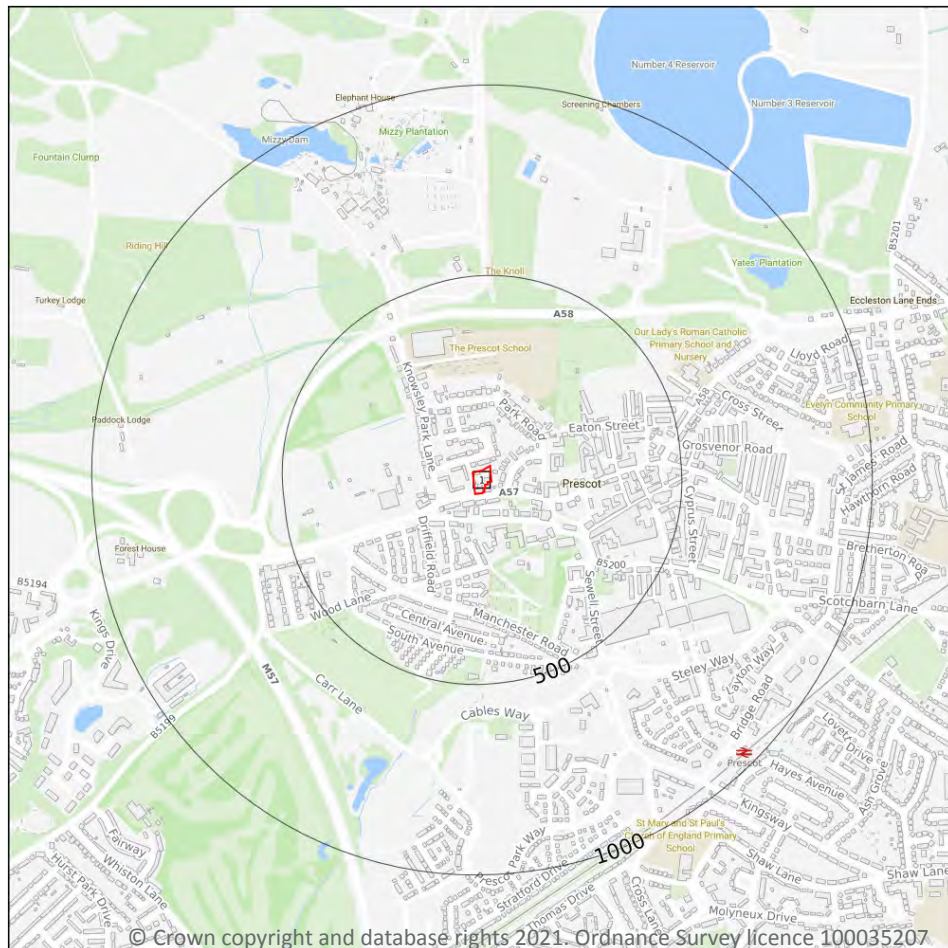
0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 83**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	No coverage	EW097_runcorn_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground

15.2 Artificial and made ground (50k)

Records within 500m

0

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

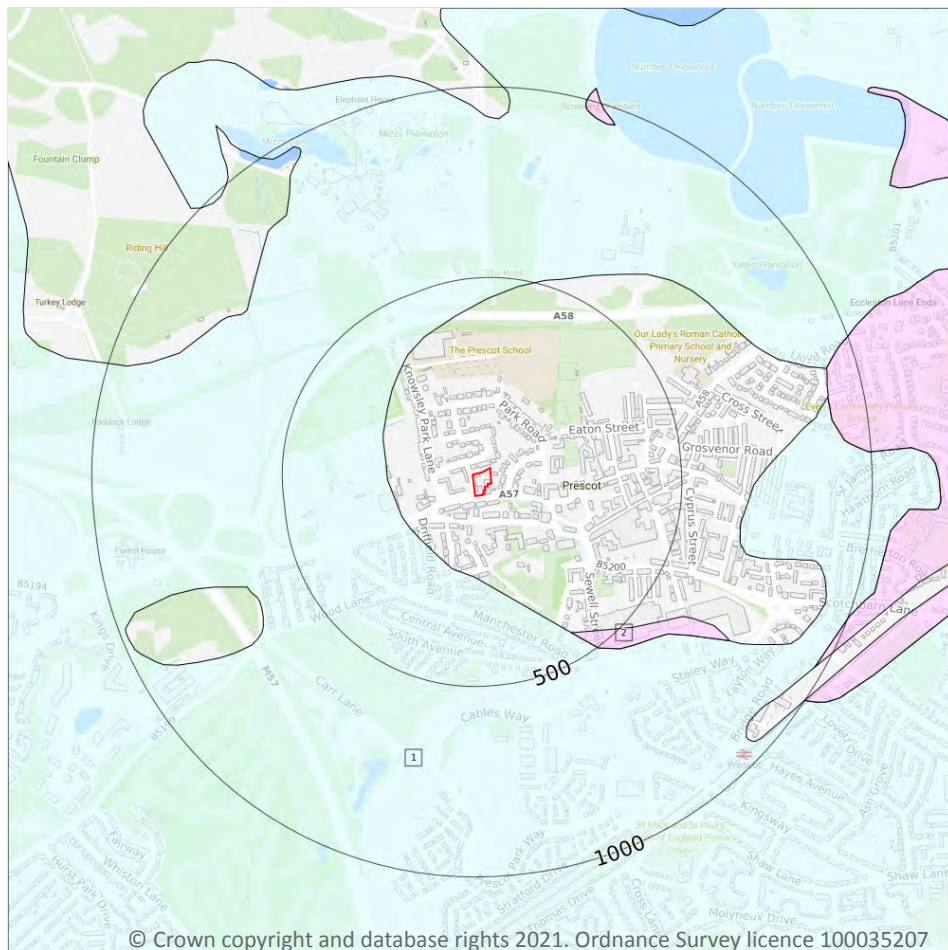
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

2

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 85**

ID	Location	LEX Code	Description	Rock description
1	181m SW	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON
2	430m SE	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVANSIAN	SAND AND GRAVEL

This data is sourced from the British Geological Survey.



15.5 Superficial permeability (50k)

Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

Records within 50m

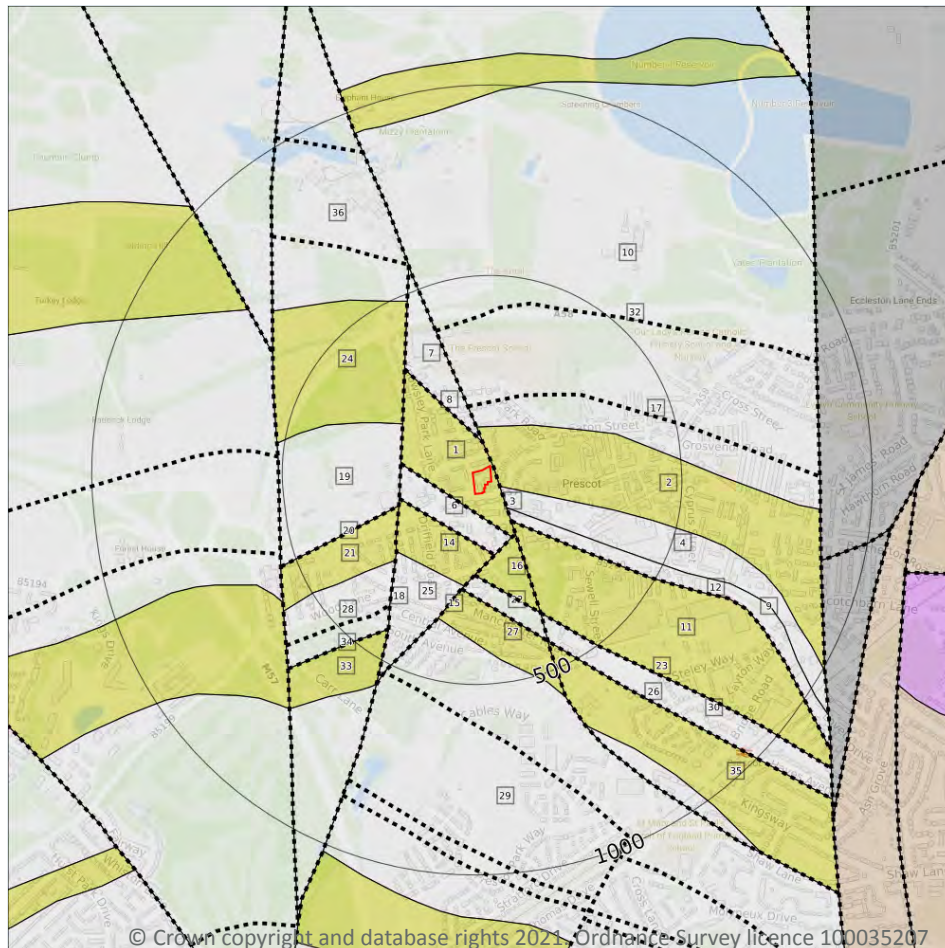
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

22

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 87**

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
2	7m NE	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN

ID	Location	LEX Code	Description	Rock age
4	26m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
6	41m SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
7	65m N	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
9	72m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
10	104m N	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
11	104m SE	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
14	112m SW	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
16	138m SE	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
19	190m W	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
21	203m W	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
22	213m S	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
24	224m NW	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
25	228m SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
27	252m S	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
28	272m SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
29	340m S	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
30	349m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
33	421m SW	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
35	424m SE	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
36	482m N	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

3

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	High	Low
25m SE	Fracture	High	Low
41m N	Fracture	High	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

14

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 87**

ID	Location	Category	Description
3	7m NE	FAULT	Fault, inferred
5	41m SW	ROCK	Coal seam, inferred
8	65m N	ROCK	Coal seam, inferred
12	104m SE	ROCK	Coal seam, inferred
13	112m SW	ROCK	Coal seam, inferred
15	138m SE	FAULT	Fault, observed

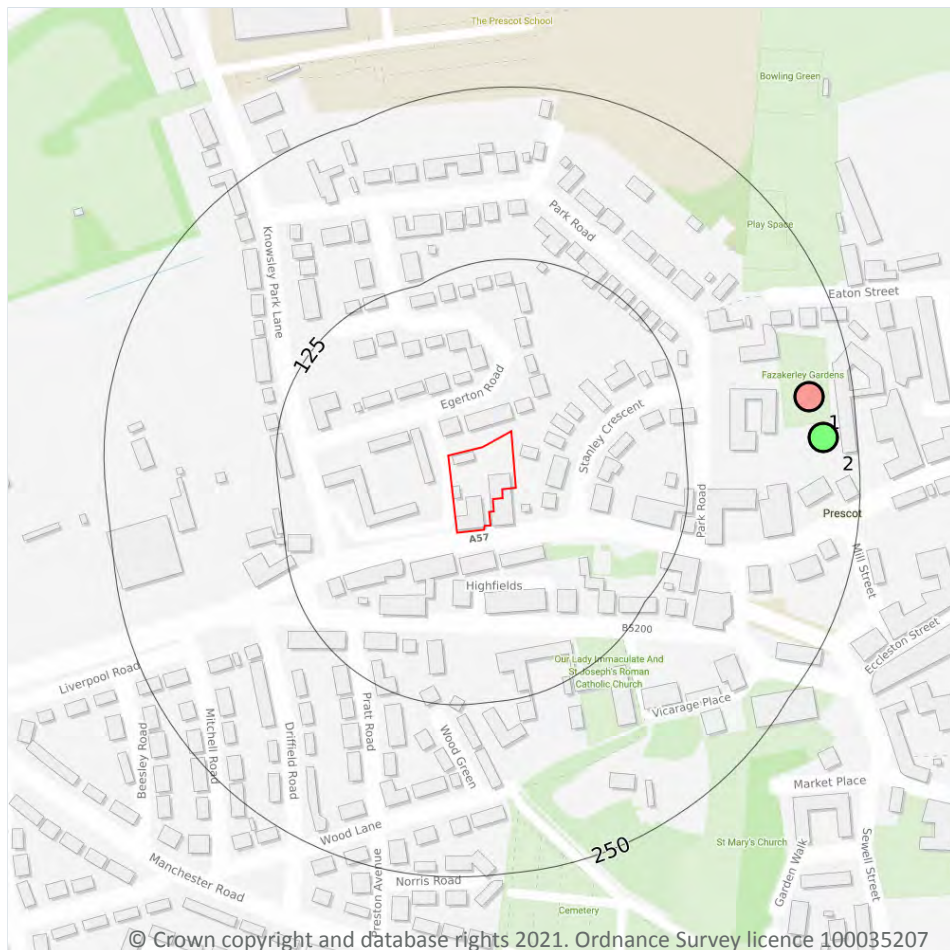


ID	Location	Category	Description
17	165m N	ROCK	Coal seam, inferred
18	190m W	FAULT	Fault, inferred
20	203m W	ROCK	Coal seam, inferred
23	213m S	ROCK	Coal seam, inferred
26	252m S	ROCK	Coal seam, inferred
31	367m SW	ROCK	Coal seam, inferred
32	381m N	ROCK	Coal seam, inferred
34	421m SW	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m

2

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

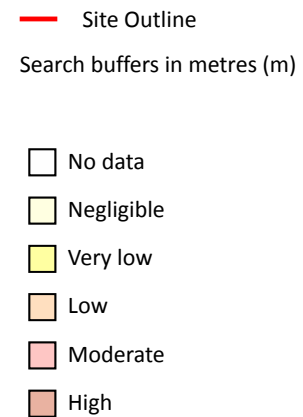
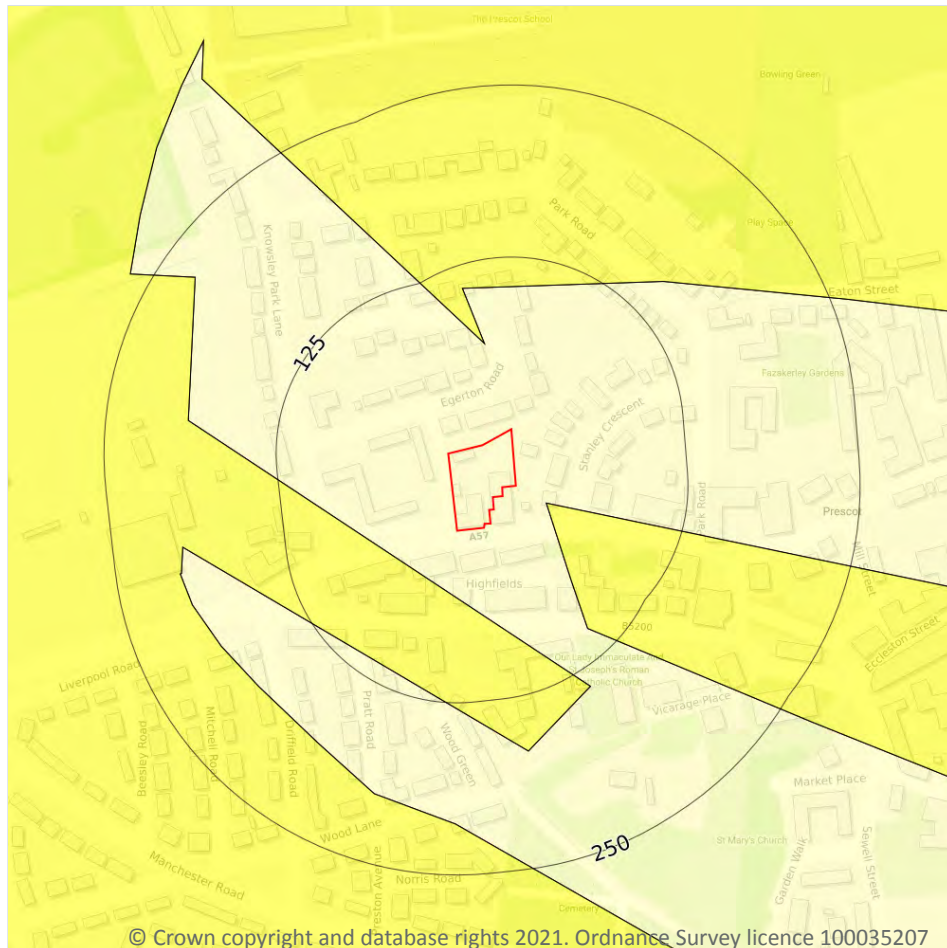
Features are displayed on the Boreholes map on **page 91**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	218m E	346550 392930	NURSING HOME PRESCOTT 2	36.0	N	165876
2	225m E	346560 392900	NURSING HOME PRESCOTT 3	26.0	N	165877

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

2

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

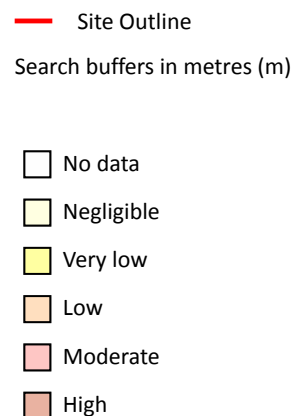
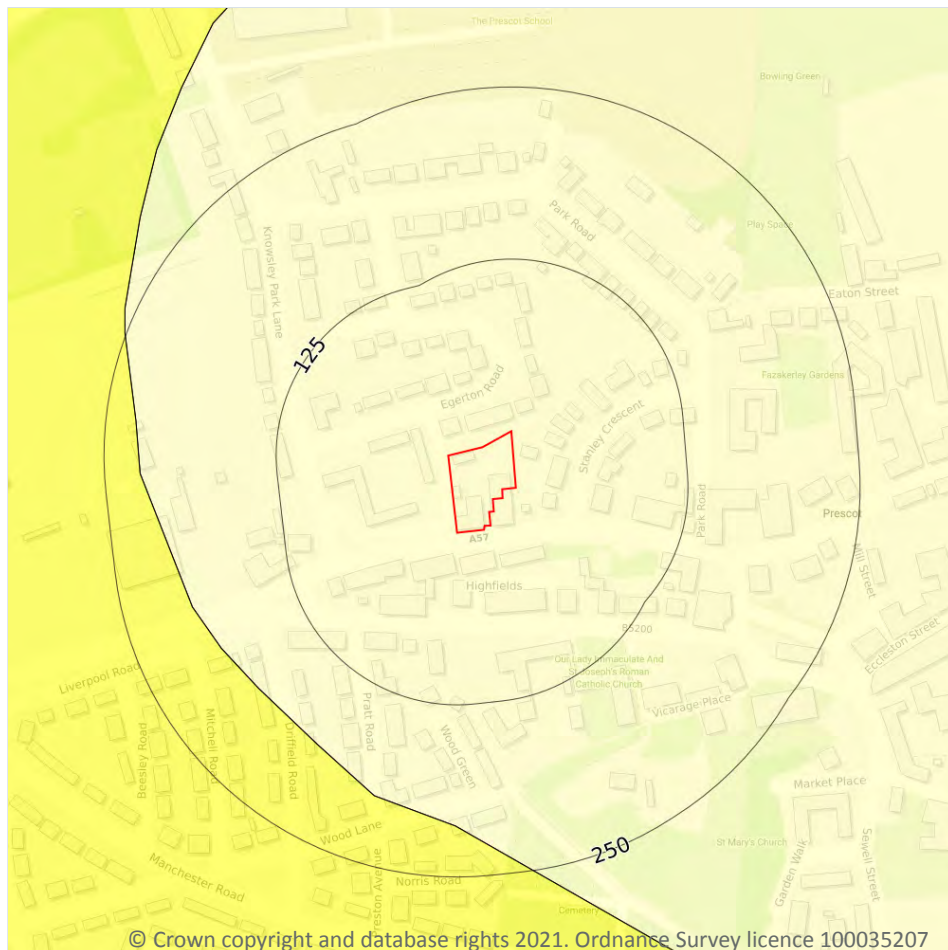
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 92**

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
26m SE	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



17.2 Running sands

Records within 50m

1

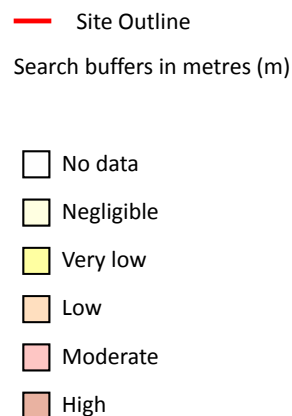
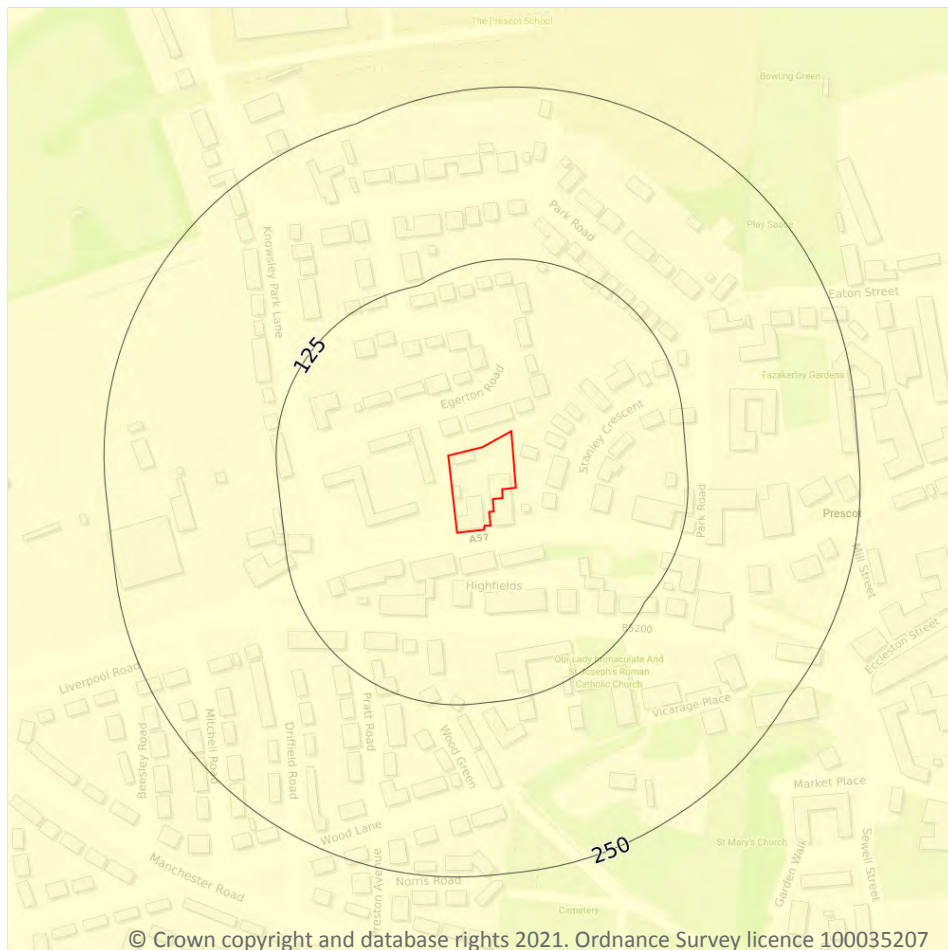
The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 93**

Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



17.3 Compressible deposits

Records within 50m

1

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 94**

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



An aerial photograph of a residential area in Highfields, with a red polygon highlighting a specific plot. Two concentric circles are drawn around the plot, labeled '125' and '250' in blue. The map includes various street names such as Egerton Road, Stanley Crescent, Park Road, and Highfields. Other landmarks like 'Old Lady Inmanulate And St Joseph's Roman Catholic Church' and 'Prescot' are also visible. The bottom of the image contains a copyright notice: '© Crown copyright and database rights 2021. Ordnance Survey licence 100035207'.

 No data
 Negligible
 Very low
 Low
 Moderate
 High

Records within 50m	1
--------------------	---

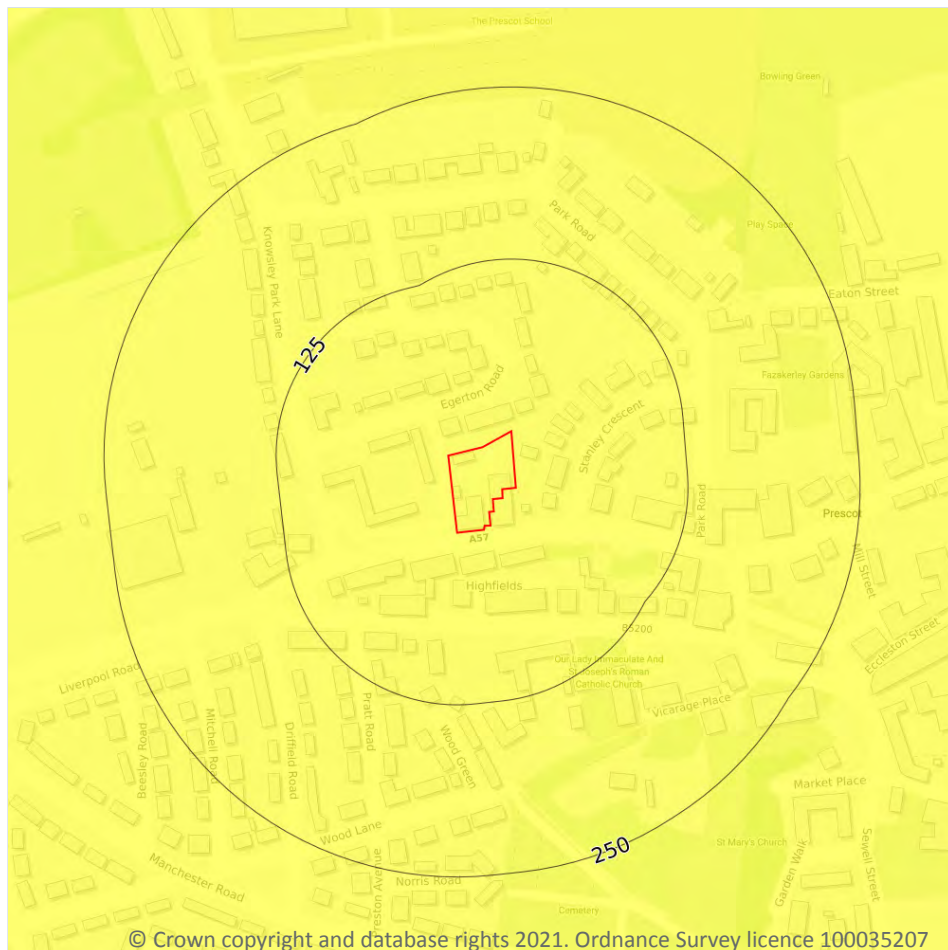
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 95**

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.


 Contact us with any questions at:
info@groundsure.com
 08444 159 000

Date: 28 July 2021
 

Natural ground subsidence - Landslides



— Site Outline
Search buffers in metres (m)

- ☐ No data
- ☐ Negligible
- ☐ Very low
- ☐ Low
- ☐ Moderate
- ☐ High

17.5 Landslides

Records within 50m

1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

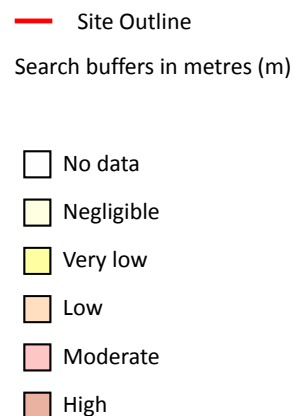
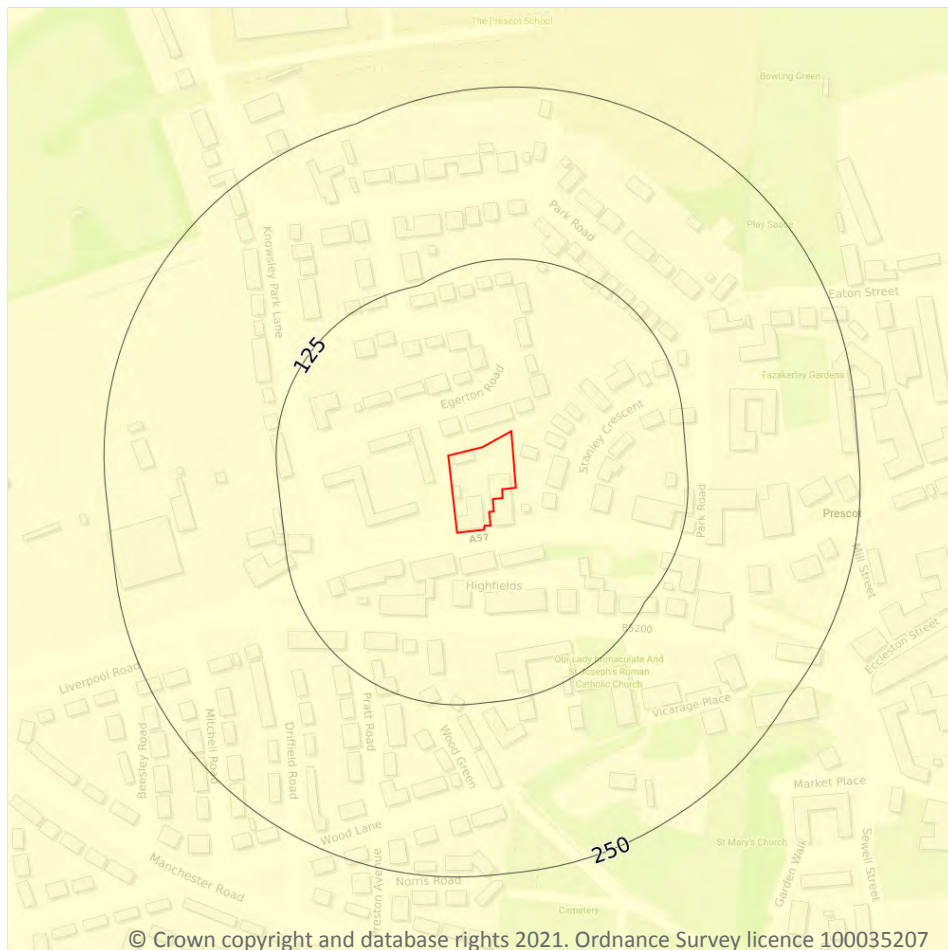
Features are displayed on the Natural ground subsidence - Landslides map on **page 96**

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

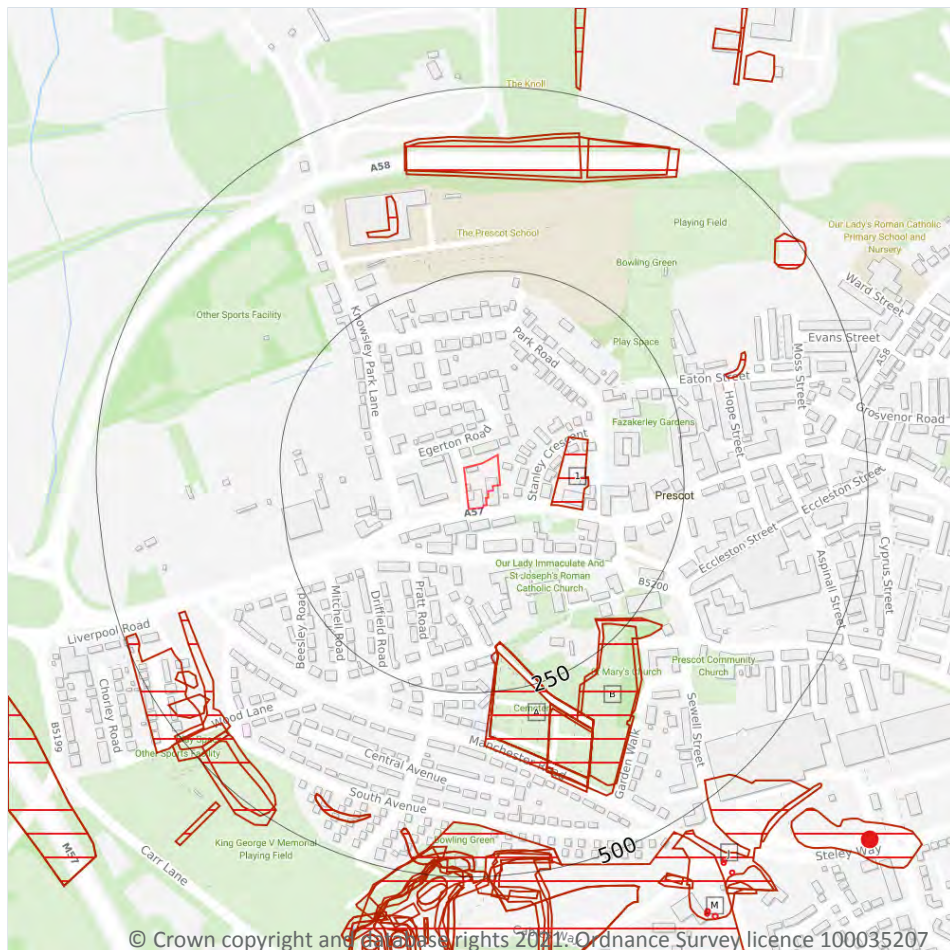
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 97**

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities
- Non Coal Mining
- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m

0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

8

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 98**

ID	Location	Land Use	Year of mapping	Mapping scale
1	74m E	Colliery	1851	1:10560
A	185m S	Cemetery	1955	1:10560
A	185m S	Cemetery	1975	1:10000
A	185m S	Cemetery	1990	1:10000
A	185m S	Cemetery	1966	1:10560
A	196m S	Cemetery	1950	1:10560
B	214m SE	Grave Yard	1950	1:10560
B	225m SE	Grave Yard	1955	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

7

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 98**

ID	Location	Land Use	Year of mapping	Mapping scale
J	577m SE	Unspecified Old Shaft	1906	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
J	580m SE	Unspecified Old Shaft	1925	1:10560
J	598m SE	Unspecified Old Shaft	1891	1:10560
M	625m SE	Unspecified Old Shaft	1906	1:10560
M	628m SE	Unspecified Old Shaft	1925	1:10560
M	635m SE	Unspecified Old Shaft	1891	1:10560
-	959m S	Unspecified Shaft	1891	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m

0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m

0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.



18.8 JPB mining areas

Records on site	0
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Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	1
-----------------	---

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0
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The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0
-----------------	---

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

18.13 Clay mining

Records on site

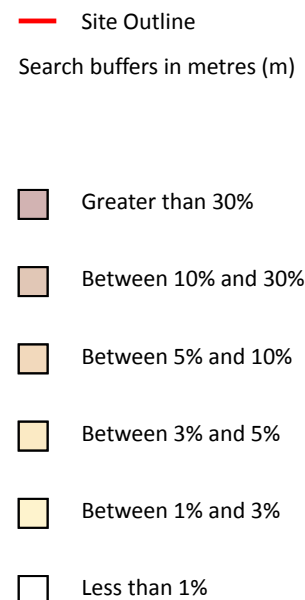
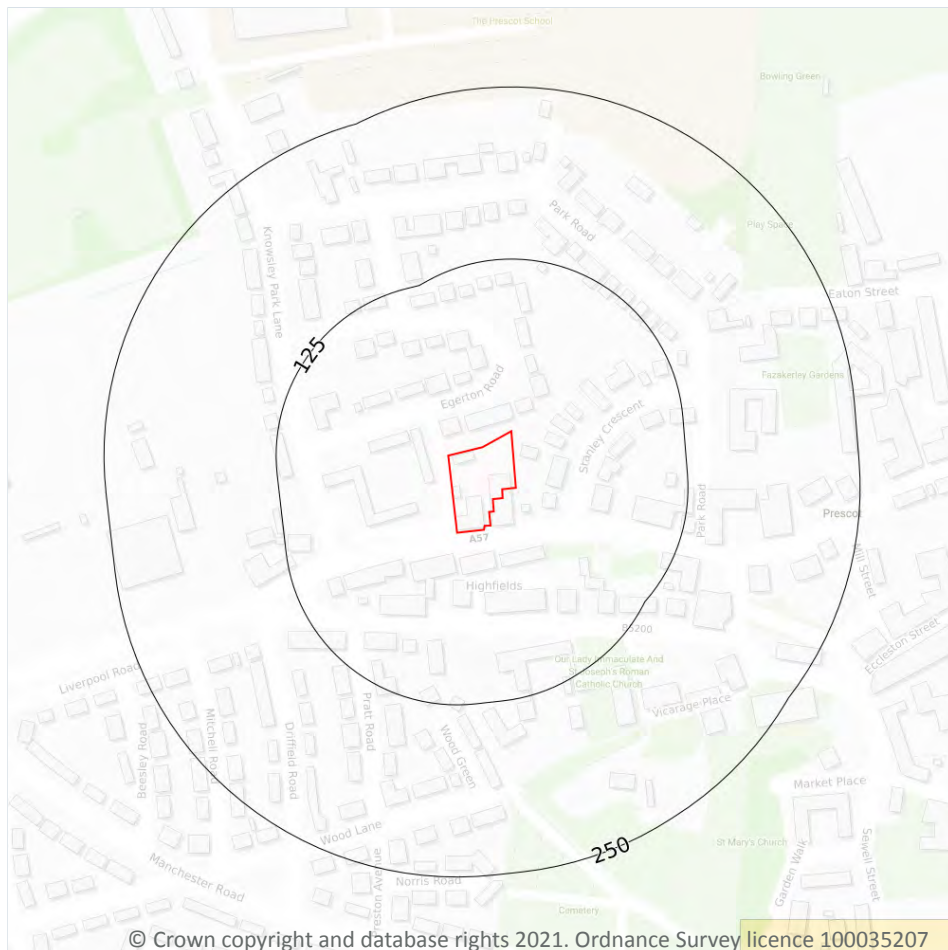
0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).



19 Radon



19.1 Radon

Records on site

1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 103**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None**

This data is sourced from the British Geological Survey and Public Health England.



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

4

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
7m NE	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
25m SE	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
41m SW	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.



20.3 BGS Measured Urban Soil Chemistry

Records within 50m

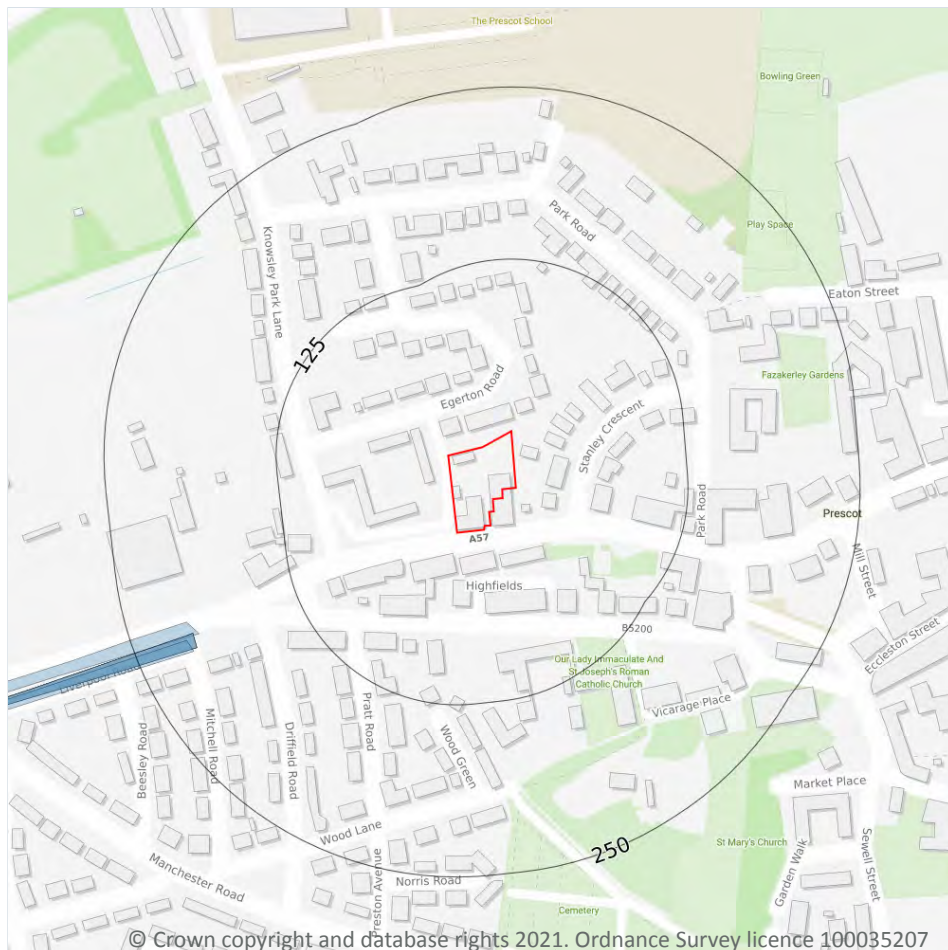
0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



21 Railway infrastructure and projects



- Site Outline
- Search buffers in metres (m)**
- C1 Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- C2 Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

21.1 Underground railways (London)

Records within 250m

0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m

0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.



This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m

5

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 106**

Location	Land Use	Year of mapping	Mapping scale
201m W	Tramway Sidings	1955	10560
205m W	Railway Sidings	1950	10560
205m W	Tramway Sidings	1938	10560
205m W	Tramway Sidings	1925	10560
210m SW	Tramway Sidings	1925	10560

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m

0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.



21.6 Historical railways

Records within 250m

0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m

0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m

0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m

0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m

0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

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APPENDIX E: SITE PHOTOGRAPHS



1. Study site as seen from Derby Street
2. As above





3. Un-named roadway extending along the western site boundary
4. Hard paved surface & out-buildings to the rear of existing building





5. Timber gate way leading to the rear of study site from Derby Street
6. Alley way forming the eastern section of the study site, leading to the site rear





7. Hard paved surface to the rear of existing building
8. As above

