CCG-C-21-12234

COMBINED PHASE I/II REPORT
AT
HALE VIEW ROAD, HUYTON

SEPT 2021

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1.0 INTRODUCTION

CC GEOTECHNICAL LIMITED (***CCG***) is providing consultancy services to ***MR JASON BARTON*** in connection with the proposed redevelopment of a parcel of land at Hale View Road, Huyton, Liverpool, L36 6DD.

The site comprises of two plots.

Plot 1 is currently occupied by 2 No. single storey office buildings identified as Mineral Railway Office and Railway House. It is proposed that this plot be redeveloped by the addition of a further storey to each building and conversion to residential use, providing for 2 No. two storey detached dwellings.

Plot No. 2 is currently vacant and exists as a roughly vegetated strip of land. It is proposed that this plot be redeveloped by the construction of a single 2- storey detached dwelling.

The proposed development falls within the administrative jurisdiction of ***KNOWSLEY METROPOLITAN BOROUGH COUNCIL.*** Planning permission has been granted for the proposed development of Plot 1 under Planning Application No. 19/00623/FUL. Planning permission for the proposed development at Plot 2 has been submitted under Planning Application No. 21/00498/FUL.

Plans of the proposed development are shown in Appendix A.

A combined desk study and ground investigation report was required, to provide environmental data relevant to the planning, design and construction of the project.

The findings of these studies and investigations are presented hereunder.

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

2.0 PURPOSE & AIMS OF THE STUDY & INVESTIGATION

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 feature which may impact on the proposed development. Specific tasks undertaken to achieve this were as follows:

- A review of available information including historical mapping, commercial environmental databases and Environment Agency Data.
- The development of a Preliminary Conceptual Model.

The main purpose of the Phase II Intrusive Investigation was to confirm the conclusions of the desk study, with reference to:

- The assessment of the nature and extent of contamination in relation to potential risks to human health for end users, construction workers, and worker occupants of adjacent properties.
- The assessment of the nature and extent of contamination in relation to potential risks to the fabric of buildings and services.
- The refinement of the Preliminary Conceptual Model confirming pollution linkages that have been demonstrated to be present.
- The identification of feasible remediation measures to remove or break the identified pollution linkages.

3.0 SITE DATA

3.1 Site Location

The site is situated at Hale View Road, Huyton, as presented in Appendix A. The Ordnance Survey coordinates for the approximate site centre are 345507, 390553.

3.2 Site Description & Walkover Observations

The site was visited during April 2021 on completion of a review of the historical mapping and environmental data presented herein.

The site exists as two plots considered herein as a single roughly rectangular parcel of land, approximately 86m long, and 7m wide, extending to an area of c.600m^2 and set in a mixed residential / commercial context.

The site is joined at its north boundary by Hale View Road and to the south by the wire manufacturing facility of Essex Hi-Wire. The south boundary is formed by a concrete block wall of c. 4m in height. To the east and west of the site is a strip of vegetated rough ground, openly accessible to the public with a small hard paved area immediately east of the site.

The north-western half of the site (Plot 1) is occupied by two single story commercial buildings of brick elevations and concrete tiled pitched roofing. Surface cover to external areas comprises a mix of concrete paving, gravel hardstanding and rough ground. Salvaged construction materials in the form of corrugated steel sheeting, steel beams, timber planks and plastic pipe are stored centrally within the plot.

An empty 1000L plastic bulk liquid container was present centrally within Plot 1. Staining to the sides of the container indicated it had likely been used to store waste oil. Surface hardstanding below and to the periphery of the container did not show any visual or olfactory evidence of significant hydrocarbon contamination, further there was no visual or olfactory evidence of hydrocarbon and/or other significant soil contamination across the site.

The south-eastern half of the site (Plot 2) is unoccupied but for overgrown vegetation.

The site is sensibly flat and accessible via a gated entrance at Hale View Road.

The information obtained from the visit is summarised in Table 1 hereunder. Photographs of the site are provided at Appendix B.

Table 1: Summary of Walkover Observations

FEATURE		OBSERVATION
Current use of proposed development Land		Disused commercial offices & vacant land
Context		Mixed residential / commercial setting
Surface		Mixed – concrete paving, gravel hardstanding, rough ground with densely vegetated areas
Topography		Sensibly flat
Area / dimensions		approximately 86m long, and 7m wide, extending to an area of c.600m2
Access		Access to the site can be made via Hale View Road
Buildings Adjacent to the Site		Residential
Services		Services likely to be present associated with former storage unit
Boundary	North	Hale View Road - Residential properties beyond
	East	Vacant land – small patch of hardstanding and generally densely vegetated
	South	Commercial / Industrial premises of Hi-Wire
	West	Vacant land – densely vegetated
Material storage		Corrugated steel cladding, steel beams, timber planks and plastic pipework stored to central area of Plot 1
Waste disposal		1nr boulder of concrete to central area of Plot 1
Other potential contamination		Empty oil storage container close to northeast boundary – later transported off-site
Ecology*		The south-eastern half of the site is heavily vegetated with various plant, tree and shrub species

** The presence of native and/or non-native invasive plant species within or adjoining the site boundary, was not considered by this investigation. It is advised that the Client commission a trained ecologist to undertake an Invasive Plant Survey of the site and its adjoining boundaries.*

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 Enviro+Geo Insight Report (CMAPS-AAG-949218-4165-240321) presented along with accompanying historical maps within 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	1:10,560	Mineral Railway [approx.. NW-SE alignment]	NW/SE: Extension of Mineral Railway	Much of the land surrounding the site is undeveloped / vacant land c.100m W: Pond c.130m SE: Tom Hey Pits c.200m N: Pond c.200m N: Huyton Quarry Station [railway line on an approx. E-W alignment]
1891 1892	1:10,560 1:2,500	No significant change	N: Hale View Road and Townsfield Cottages	c.75m W: Pottery c.130m SE: Iron Works [former Tom Hey Pits] with associated railway lines c.150m W: Gas Works
1906 1907	1:10,560 1:2,500	No significant change	S: Electric Lamp Works	c.240m NW: Coal Wharf recognised [adjacent railway line to the N]
1925 1925 1927	1:10,560 1:10,560 1:2,500	No significant change	No significant change	c.100m W: Chairmaking Works c.130m SE: Iron Works and associated railway lines no longer recognised
1938 1947	1:10,560 1:10,560	No significant change	N: Hale View Road [terraced residential properties 'Townsfield Cottages' largely demolished]	No significant change
1955-56 1956 1956 1957 1959 1965-67	1:10,560 1:1,250 1:2,500 1:1,250 1:2,500 1:10,560	No significant change	S: British Insulated Callendar's Cable Works	c.40m SW: Tanks c.40m SE: Tanks c.50m W: British Preserves Factory [Drained Cherries] c.130m SE: Central Saw Mills, adjacent Electric Sub-Station to the N and Timber Yard to the SE c.150m SW: Clay Pit c.160m SE: Salvage Depot c.190m W: Tushingham Metallic Brick Works with associated Kiln to the SE and NE and adjacent Electric Sub-Station to the N
1964-68 1969 1970	1:1,250 1:2,500 1:2,500	No significant change	No significant change	c.130m SE: UDC Depot [former Central Saw Mills] c.160m S: Toughed Glass Factory
1972 1974-78 1975-80 1980 1980 1980-84 1987-88 1989-90 1993 1993-94	1:1,250 1:10,000 1:1,250 1:1,250 1:10,000 1:1,250 1:1,250 1:10,000 1:1,250 1:1,250	No significant change	No significant change	c.15m N: Works recognised c.180m W: Plant Hire Depot
1994 1994 1994 2001 2003 2010 2021	1:1,250 1:1,250 1:1,250 1:10,000 1:1,250 1:10,000 1:10,000	Mineral Railway no longer recognised	No significant change	No significant change

The evidence of the historical review is that the site has been subjected to potentially contaminative past use, this is assessment being driven by the sites former use as railway land.

5.0 ENVIRONMENTAL SETTING

5.1 Geology

The geology of the site was researched by reference to the British Geological Survey (BGS) Online Geology of Britain Viewer. The superficial deposits record for the site indicates the site is underlain by Till, Devensian - Diamicton. Superficial Deposits formed up to 2 million years ago in the Quaternary Period.

The solid geology is recorded as being the Pennine Lower Coal Measures Formation - Mudstone, Siltstone and Sandstone. Sedimentary Bedrock formed approximately 318 to 319 million years ago in the Carboniferous Period.

Given the history of development and the context setting of the site, it is likely that made ground deposits are present at the surface over some portion of the site.

The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level, hence no radon protective measures are necessary.

Geological Information obtained from the GroundSure environmental data search report is presented in Appendix C, and summarised hereunder:

Table 3: Summary of Geological Data from GroundSure Report

GEOLOGY		
Data	**Distance**	**Comments**
Artificial Ground	N/A	None recorded. However, given the history of development and the context setting of the site, it is likely that Made Ground deposits are present at the surface over some portion of the site.
Superficial Deposits / Drift Geology	On Site	Devensian Till (Diamicton).
Permeability of Drift Deposits	On Site	Maximum Permeability –High.
		Minimum Permeability –Low.
Landslip	On Site	No records.
Bedrock and Solid Geology	On Site	Pennine Lower Coal Measures Formation (Mudstone, siltstone and sandstone).
Permeability of Bedrock	On Site	Maximum Permeability – High.
	On Site	Minimum Permeability – Low.
Faults	On Site	None recorded.
	<250m	87m E – Fault, inferred, displacement unknown. 129m SW – Fault, inferred
Radon Affected Area	On Site	The property is in not 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	119m W: Huyton Quarry Pottery [Clay & Shale] – Ceased 179m N: Huyton Quarry Station [Sandstone] – Ceased 189m SW: Huyton Quarry Brickworks [Clay & Shale] – Ceased 271m NW: Huyton Quarry [Sandstone] – Ceased 339m E: Huyton Hey Colliery [Coal, Deep] – Ceased 412m E: Huyton Hey Colliery [Coal, Deep] – Ceased 463m E: Ridings Colliery [Coal, Deep] - Ceased
Surface ground workings	<250m	42m SE: Unspecified Ground Workings 47m N: Unspecified Quarry 48m E: Unspecified Disused Workings 52m W: Ponds 74m N: Unspecified Quarry 77m NW: Unspecified Quarry 87-88m W: Pond 87-91m SE: Pond 96m SE: Unspecified Ground Workings

		98m S: Ponds 127m SW: Brick Fields 129m SW: Unspecified Ground Workings 143m N: Unspecified Quarry 146-49m SE: Unspecified Ground Workings 149m N: Unspecified Quarry 152m SW: Unspecified Pit 156m SE: Unspecified Ground Workings 163m SW: Pond 165m W: Ponds 166m N: Unspecified Ground Workings 174m E: Colliery 178m E: Unspecified Quarry 204m SW: Unspecified Quarry 204m NW: Coal Wharf 213m S: Unspecified Pit 214m E: Pond 214m SE: Pond 219m SE: Unspecified Quarry 222-23m SW: Pond 223m E: Unspecified Ground Workings 227m NW: Unspecified Ground Workings 233-34m SE: Pond 234m N: Unspecified Ground Workings 241m E: Unspecified / Refuse Heap 244m SE: Pond 247m SE: Ponds 250m SW: Unspecified Pit
Underground workings	<1000m	330m E: Unspecified Old Shaft 364m E: Disused Colliery 462m SW: Colliery 514m SW: Unspecified Old Shafts 528m SW: Unspecified Old Shafts 543m SW: Unspecified Old Shafts 549m SW: Unspecified Old Shafts 567m SE: Disused Colliery 569m SE: Old Colliery 572m SE: Old Colliery 594m SE: Unspecified Disused Mine 635-38m SE: Unspecified Old / Disused Shaft 640m E: Colliery 727m E: Colliery 729m SW: Unspecified Old Shaft 740m E: Disused Colliery 746m E: Unspecified Disused Mine 759m E: Unspecified Old Shaft 804m E: Unspecified Old Shaft 845m E: Unspecified Shafts 853-55m E: Unspecified Od / Disused Shafts 857-58m E: Unspecified Old Shafts 861m E: Unspecified Disused Shaft 9825m SE: Old Colliery 992m E: Old Colliery
Historical Mineral Planning Areas	<500m	68m SW: Huyton – Clay, shale and bricks 127m E: Whiston – Clay, shale and bricks 223m S: Huyton- - Clay, shale and bricks 343m E: Whiton – Clay, shale and bricks
Non-coal mining	<1000m	466m SE: Vein Mineral [Class: A] 585m SE: Vein Mineral [Class: A]
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 hazard rating	On site	Very Low.

Maximum Landslide hazard rating	On site	Very Low.
Maximum Soluble Rocks hazard rating	On site	Negligible.
Maximum Compressible Deposits hazard rating	On site	Negligible.
Maximum Collapsible Deposits hazard rating	On site	Very Low.
Maximum Running Sands hazard rating	On site	Very Low.

5.2 Mining

Geological mapping has indicated that the site is within the 1000m search distance of an identified mining area. Accordingly, the Coal Authority online viewer has been researched to indicate the following:

- There are no recorded mine entries are on site.
- The site is not recorded within a development high risk area
- The site is not within a Mine Entry Potential Zone of Influence.
- The site is not within an area of recorded past or current surface mining
- The site is not within an area of recorded past shallow coal mine workings

5.3 Hydrology and Hydrogeology

Information on hydrology and hydrogeology obtained from a GroundSure Enviro+Geo Insight Report is presented in Appendix C, and summarised hereunder:

Table 4: Summary of Hydrology and Hydrogeological Data from GroundSure Environmental Report

UNIT	PROPERTIES	HYDROGEOLOGICAL DESIGNATION
Made Ground	If present, likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater.	Unproductive Aquifer
Natural Drift Deposits	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.	Secondary (undifferentiated)
Bedrock Deposits	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

WATERCOURSES, ABSTRACTIONS, AND SOURCE PROTECTION ZONES		
Groundwater Abstraction Licenses	<1000m	No records
Surface Water Abstraction Licenses	<1000m	No records
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	No records
Surface water features	<250m	No records
WFD Surface water body catchments	On Site	On Site: River WB catchment [Prescot 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 2	<50m	No records
Flood Zone 3	<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	Low
	<50m	Low

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:

Table 5: Further Environmental Data

POTENTIALLY CONTAMINATIVE USES IDENTIFIED FROM 1:10,000 SCALE MAPPING		
Data	**Distance**	**Comments**
Historical industrial land uses	<150m	On Site: Railway Sidings [1851-1955] 1m SW: Unspecified Works [1966-90] 1m SW: Unspecified Factory [1966-75] 3m SW: Pottery [1906] 3-4m SW: Electric Lamp Works [1908-55] 39m SE: Iron Works [1891] 42m SE: Unspecified Ground Workings [1906] 45m SE: Pits [1851] 47m N: Unspecified Quarry [1906-25] 47m SE: Railway Sidings [1955] 48m E: Unspecified Disused Workings [1966] 52m W: Unspecified Works [1938] 53m NW: Unspecified Commercial / Industrial [1975] 58m SE: Railway Sidings [1906] 71m SE: Timber Yard and Saw Mill [1955] 73m SE: Iron Works [1906] 74m SE: Mineral Railway Sidings [1938] 74m N: Unspecified Quarry [1938] 77m NW: Unspecified Quarry [1891] 81m SE: Unspecified Depot [1990] 90m SE: Unspecified Mill [1966] 91m SE: Unspecified Depot [1975] 96m SE: Unspecified Ground Workings [1891] 103m SW: Unspecified Works [1966] 115m SW: Unspecified Tank [1966] 177m NW: Railway Sidings [1966-75] 118m W: Gas Works [1891] 119m NW: Mineral Railway Sidings [1925] 119-20m W: Chair Making Works [1925] 120m W: Unspecified Commercial / Industrial [1906] 123m SW: Unspecified Warehouse [1990] 127m SW: Chair Making Works [1938] 127m SW: Brick Fields [1975] 129m SW: Unspecified Ground Workings [1906] 143m N: Unspecified Quarry [1966] 146m SE: Unspecified Ground Workings [1925-38] 149m N: Unspecified Quarry [1955] 151m S: Unspecified Works [1975] 142m SW: Unspecified pit [1966]
Historical tanks	<250m	28m SE: Tanks [1956-93] 38-40m SW: Unspecified Tank [1956-72] 71-75m SE: Tanks / Unspecified Tanks [1956-87] 102m W: Unspecified Tank [1892-1927] 115m NW: Gas Works [1892-1907] 120m W: Gas Works [1892-1907] 123m W: Unspecified Tank [1927] 136m SE: Tanks [1984-94] 143m SE: Tanks [1984-94] 159m W: Unspecified Tank [1892-1927] 165m W: Unspecified Tank [1927] 165m W: Gasometer [1892-1907] 165m SW: Unspecified Tank [1969] 199m W: Unspecified Tank [1927] 199-200m W: Gasometer [1892-1907] 206m SE: Unspecified Tank [1892] 217m SW: Unspecified Tank [1956] 234m SE: Tanks [1968-94]
Historical energy features	<250m	93m SE: Electric Sub-Station [1968-94] 115m NW: Gas Works [1892-1907] 120m W: Gas Works [1892-1907]

		136m SE: Electric Sub-Station [1956] 141m W: Electric Sub-Station [1956-72] 145m W: Electric Sub-Station [1994] 165m W: Gasometer [1892-1907] 185m W: Electric Sub-Station [1956-72] 199-20m W: Gasometer [1892-1907]
Historical petrol stations	<250m	No records
Historical garages	<250m	No records
Historical military land	<250m	No records

STATUTORY AUTHORISATIONS		
Data	**Distance**	**Comments**
Control of Major Accident Hazards (COMAH)	<250m	On Site: Basf Printing Systems Ltd [Historical NIHHS Site]
Regulated explosive sites	<250m	No records
Hazardous substance storage/usage	<250m	60m SW: Essex International Ltd
Historical licensed industrial activities (IPC)	<250m	No records
Licenced industrial activities (Part A(1))	<250m	58m SW: CJ & LM Davies Ltd. Process: Intensive Farming; >40,000 Poulty
Licensed pollutant release (Part A(2)/B)	<250m	60m SW: Essex International. Process: Coating Process [Historical Permit: Part A2] 167m W: Basf Coatins & Inks. Process: Manufacture of Coating Materials [Historical Part: Part B] 176m SW: Cemex Ltd. Process: Use of Bulk Cement [Current Permit: Part B] 185m SE: Knowsley MBC. Process: Timber Manufacture [Historical Permit: Part B] 231m SW: RMC Concrete. Process: Use of Bulk Cement [Historical Permit: Part B]
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	148m W: 17/8/2001. ID: 24888. Pollutant: General Biodegradable Materials and Wastes 155m S: 25/2/2003. ID: 139343. Pollutant: General Biodegradable Materials and Wastes 183m SW: 19/6/2003. ID: 167274. Pollutant: Atmospheric Pollutants and Effects
Pollution inventory substances	<250m	No records

RECORDS OF POTENTIALLY CONTAMINATIVE LAND USES		
Data	**Distance**	**Comments**
Recent industrial land uses	<250m	19m NE: Depot [Container and Storage] 69m SW: Electric Sub-Station [Electrical Features] 74m SE: Works [Unspecified Works or Factories] 81m W: Robcliffe Ltd [Vehicle Breakdown and Recovery Services] 100m SW: Gas Governor [Gas Features] 100m SE: Link Warehouse [Container and Storage] 100m W: Factory [Unspecified Works or Factories] 124m SE: Link Warehouse [Container and Storage] 130m W: Ellis Ashton Motor Company [New Vehicles] 132m NW: Electric Sub-Station [Electrical Features] 141m SW: Sand Hopper [Hoppers and Silos] 143m W: Knowsley Art Glass Ltd [Glass] 145m S: Mast [Telecommunications Features] 147m SW: Works [Unspecified Works or Factories] 149m SE: Link Warehouse [Container and Storage] 151m SW: Works [Unspecified Works or Factories] 159m W: Locker Freight [Distribution and Haulage] 172m SE: Link Warehouse [Container and Storage] 172m W: Warehouse [Container and Storage] 182m SW: Scrap Yard [Scrap Metal Merchants] 186m SW: Warehouse [Container and Storage] 193m SE: Link Warehouse [Container and Storage] 197m W: Huyton Quarry [Unspecified Quarries or Mines]

		214m SE: Link Warehouse [Container and Storage] 214m S: Big Padlock UK Ltd [Container and Storage] 214m W: Warehouse [Container and Storage] 215m S: Factory [Unspecified Works or Factories] 225m SE: Electric Sub-Station [Electrical Features] 233m SE: Tanks [Tanks (Generic)] 240Msw: Depot [Container and Storage] 245m SW: Mainsway Ltd [Construction and Tool Hire] 245m SE: Link Warehouse [Container and Storage] 246m W: Warehouse [Container and Storage]
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

LANDFILL & OTHER WASTE SITES		
Data	**Distance**	**Comments**
Active or recent landfill	<500m	No records
Historical landfill (BGS records)	<500m	226m NE: West View Tip
Historical landfill (LA/mapping records)	<500m	153m S: Refuse Tip 194m S: Refuse Tip
Historical landfill (EA/NRW records]	<500m	11m NE: Huyton Quarry 74m E: West View Tip 121m SW: Brickfields 480m E: Coalgate Lane Landfill Site
Historical waste sites	<500m	308m SE: Refuse Destructor 315m NW: Scrap Metal Yard 323m SE: Refuse Destructor 344m SE: Waste Transfer Station 355m E: Refuse Dump 396m SE: Waste Transfer Station
Licensed waste sites	<500m	81m W: Robcliffe Ltd [ELV Facility] 145m S: Mainsway Ltd [Household, Commercial & Industrial Waste Transfer Station] 177m SW: Huyton Quarry [ELV Facility] 241m SW: Mainsway Ltd [Household, Commercial & Industrial Waste Transfer Station] 304m S: Restart Recycling Ltd [75kte WEEE Treatment Facility] 304m S: Link Recycling Limited [75kte Materials Recycling Facility] 370m SE: Huyton Waste Transfer Station & Waste Reception Centre [Special Waste Transfer Station] 370m SE: Huyton WTS/HWRC [Household, Commercial & Industrial Waste Transfer Station] 420m SE: Huyton Waste Transfer Station [Household, Commercial & Industrial Waste Transfer Station]
Waste exemptions	<500m	61m SW: Ellis Ashton Street [Storing waste exemption] 68m SE: JK Pallets Ltd [Disposing of waste exemption] 129m W: Huyton Waste Transfer Station [Treating waste exemption] 130m W: Locker Freight [Treating waste exemption] 201m S: Carbon I.T Recycling Ltd [Storing waste exemption] 259m SW: Unit 4 Brickfields [Storing waste exemption] 264m SW: Unit 4 Brickfields [Storing waste exemption] 290m SW: Unit 4 Brickfields [Storing waste exemption] 303m S: Unit 1-3 Link Road [Storing / Treating waste exemption] 314m S: Unit 5 The Park [Treating waste exemption] 316m S: Units 1-3 The Lombard Centre [Storing / Treating waste exemption] 337m SW: Unit 4 Wilson Business Centre [Storing waste exemption] 374m SE: Link Recycling Ltd [Treating waste exemption] 388m S: 11A-11B Wilson Road [Storing waste exemption] 397m SE: Unit 1 The Lombard [Storing / Treating waste exemption]

DESIGNATED ENVIRONMENTALLY SENSITIVE SITES		
Data	**Distance**	**Comments**
Sites of Special Scientific Interest (SSSI)	<500m	None
Conserved wetland sites (Ramsar sites)	<500m	None
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	71m E: 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] 299m N: Alt NVZ [Existing]

7.0 ARCHAEOLOGICAL DATA

Examination of historical maps indicates no features of significant archaeological interest in the general vicinity of the site.

8.0 PREVIOUS SITE INVESTIGATIONS / REPORTS

Searches and consultations have not established evidence of previous site investigations having been undertaken on the subject site.

9.0 PRELIMINARY QUALITATIVE RISK ASSESSMENT (TIER 1)

9.1 Introduction

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

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 proposed that the site be redeveloped by the extension / conversion of existing buildings and construction of a 2-storey residential property. Plans of the proposed development are shown in Appendix A.
- 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 on the basis of 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 7 - 9 hereunder. In using this approach ***CCG*** recommends actual intrusive investigation of any Risk Classification of "Moderate" or above.

Table 6: 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 7: Classification Definitions (C552 CIRIA, 2001)

CLASSIFICATION	DEFINITION
Very High	Severe harm could arise to a designated receptor, as a result of an identified potential source and credible pathway each of which have a high likelihood of being present. 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 highly likely to be required.
High	Severe harm could arise to a designated receptor, as a result of an identified potential source and credible pathway each which have a likelihood of being present. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works are likely to be necessary.
Moderate	Severe harm could arise to a designated receptor, as a result of an identified potential source and credible pathway, but either the source or pathway or both have a low likelihood of being present. Investigation (if not undertaken already) is normally required to clarify the risk and to determine to potential liability. Some remedial works may be required.
Moderate / Low	Severe harm could arise to a designated receptor, as a result of an identified potential source and credible pathway, but either the source or pathway or both are unlikely to be present. Investigation (if not undertaken already) is normally required to clarify the risk and to determine to potential liability. Some remedial works may be required.
Low	Medium harm could arise to a designated receptor, as a result of an identified potential source and credible pathway, but either the source or pathway or both are unlikely to be present. Specific investigation is not normally required unless evidence of a potential risk arises during ground investigation. Some remedial works may be required
Very Low	Mild or Medium harm could arise to a designated receptor, as a result of an identified potential source and credible pathway, but either the source or pathway or both unlikely to be present. Specific investigation is not normally required unless evidence of a potential risk arises during ground investigation. Some remedial works may be required

9.2 Preliminary Conceptual Model

The site walkover and the historical review has identified a moderate/low risk of contamination affecting the site. However, the proposed end use is of high sensitivity, and the impact of past land uses over the developed history of the site are unknown, hence by application of the risk assessment methodology outlined above, the following PCM was constructed.

Table 8: Preliminary Conceptual Model (PCM)

POLLUTANT LINKAGE	SOURCE	PATHWAY	RECEPTOR	PROBABILITY	CONSEQUENCE	RISK RATING
1	Contaminants held within made ground soils associated with historic site demolition and construction activities	Oral Dermal Inhalation Ingestion	Construction workers Future occupants General public	Likely	Medium	**Moderate**
		Direct contact with building fabric (aggressivity to concrete)	Future building	Likely	Mild	**Low**
2	Asbestos fibre / ACM contamination of soils – due to historic railway use	Fibre Inhalation	Construction workers Future occupants General public	Likely	Severe (ACM)	**High**
3	Hydrocarbon, VOC and PCB contamination of site due to historic railway use	Oral Dermal Inhalation Ingestion	Construction workers Future occupants General public	Likely	Medium	**Moderate**
		Direct contact with water mains	Potable water supply	Likely	Medium	**Moderate**

4	Hydrocarbon contamination of site soils as a consequence of leakage / spillage at bulk liquids storage container (likely waste oil use)	Oral Dermal Inhalation Ingestion	Construction workers Future occupants General public	Low likelihood	Medium	**Moderate / Low**
		Direct contact with water mains	Potable water supply	Likely	Medium	**Moderate**
5	Ground gases associated with made ground deposits and infilling of off-site ponds	Accumulation in buildings	Future occupants Fabric of buildings	Low likelihood	Medium	**Moderate / Low**

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 9: Summary of Contaminants of Concern based on PCM

LINKAGE NO.	METALS	NON-METALS	ORGANICS	GASES	OTHERS
PL1	Cd, Cr, Ni, Cu, Pb, Hg, Se, Zn	As, sulphates	TPHCWG, PAH's	-	pH Asbestos
PL2	-	-	-	-	Asbestos
PL3	-	-	TPHCWG, PAH's, BTEX, VOC's, PCB's	-	-
PL4	-	-	TPHCWG, PAH's, BTEX	-	-
PL5	-	-	-	CH_4, CO, CO_2, H_2S	-

9.3 Summary of Risks

The foregoing analysis identified several potential risks, and if present, these could adversely impact on human or environmental receptors. Given the sensitivity of the proposed end use, and since no previous site investigation has been undertaken, an intrusive phase of investigation was undertaken to determine whether the postulated pollutant linkages are present on site.

10.0 SCOPE OF PHASE II INTRUSIVE INVESTIGATION

Based on the findings of the Phase I desk study and taking account of the potential presence of pollution linkages an intrusive investigation was undertaken. The Phase II Intrusive Investigation provided for 7nr exploratory boreholes to be advanced through made ground into the underlying natural strata to allow for sampling of soils and groundwater if present. The primary objectives of the investigation were to obtain sufficient soil and groundwater contamination data to reliably assess risks to human and environmental receptors.

11.0 FIELDWORK

11.1 Introduction

A programme of fieldwork investigation was undertaken in May 2021. The programme works comprised of:

- The sinking of 7nr boreholes by light dynamic sampling methods.
- The installation of gas / groundwater monitoring standpipes at 4 of the 7nr borehole positions.

- The undertaking of a programme of groundwater level monitoring, and gas composition and flow monitoring.

The fieldwork was planned in accordance with BS10175: 2011+A2:2017 and carried out in accordance with BS10175: 2011+A2:2017 and BS5930: 2015+A1:2020, and the sampling and monitoring methodologies employed by ***CCG*** as presented in Appendix D, insofar as they related to the scope of the investigation.

11.2 Dynamic Sampling Boreholes

7nr boreholes (WS1-WS7) were sunk by light dynamic sampling methods using a Dando Terrier 2000 light dynamic sampling rig at locations as annotated on ***CCG*** drawing No.12234/3 appended herein.

The boreholes were advanced to terminate at depths of up to 4mbgl, and typically upon reaching bedrock.

Each borehole was positioned clear of services and scanned using CAT service scanner before and during hand excavation of a starter pit extending to 1.0mbgl.

Boring tools were decontaminated prior to commencement and between positional moves.

In this method of investigation, relatively undisturbed samples of the subsoils are recovered by the driving of a series of reducing diameter Perspex lined steel sampling barrels. The Perspex liners are extracted from the steel sampling barrel, split, logged and subsampled as required.

Logs of the boreholes annotated with sampling details and SPT 'N' values are given in Appendix E.

11.3 Monitoring Installations

Standpipes comprising 50mm diameter HDPE plain and slotted well-tube, set in bentonite and non-limestone pea gravel surround was installed in each of 4nr boreholes. Each standpipe was fitted with a gas valve connector and was protected by a flush cover set in concrete. Details of standpipe installations are provided on the relevant borehole logs in Appendix E and summarised in the tabulation hereunder:

Table 10: Borehole Installation Details

BOREHOLE	DEPTH OF BOREHOLE (mbgl)	DEPTH OF STANDPIPE [mbgl]	TARGET STRATUM	RESPONSE ZONE	
				FROM [mbgl]	TO [mbgl]
WS1	4.00	3.20	NATURAL	1.00	3.20
WS3	3.00	3.00	NATURAL	0.50	3.00
WS4	4.00	2.50	NATURAL	1.00	2.50
WS7	3.00	2.30	MADE GROUND / NATURAL	0.50	2.30

The standpipe installations were periodically monitored for flow rate and composition of ground gas using a Geotechnical Instruments GRM 436 infra-red analyser. The installations were also monitored for standing water levels with an electronic dip-meter.

The results of the gas and groundwater monitoring, together with calibration certificates of the instruments used are given in Appendix F.

12.0 OBSERVED GROUND CONDITIONS

12.1 Stratigraphy

The stratigraphy of the boreholes was observed to accord with the documented geology and was generally consistent across the site. The succession commences with granular made ground, comprising of sand or gravel with inclusions of coal, cinders and

sandstone, proven to a typical depth of 0.5mbgl and locally extending to 1.0mbgl. Below the made ground the succession continues into interbedded highly variable deposits of sand, gravel and clay to a typical depth of 2.5mbgl. These soils are proven to be of variable strength and may potentially represent redeposited or reworked ground. Completely weathered mudstone bedrock is encountered typically below 2.5mbgl, recovered as gravelly clay, and proven to the point of boring termination at a depth of up to 4.0mbgl.

No visual and/or olfactory evidence of free phase hydrocarbon or other significant contamination affecting the made ground or underlying natural sols was observed within the boreholes.

Borehole logs containing detailed descriptions of observed stratigraphy are provided at Appendix E.

12.2 Groundwater Regime

Post fieldwork monitoring has shown standpipes installed at WS1, WS3, WS4, and WS7 to record standing water levels in the range of typically 1.4-2.2mbgl. Slow water recharge rates were recorded at each of the installations. It is likely that the variation in water level, and limited rate of recharge may be explained by the presence of localised perched water bodies at each of these standpipe positions rather than a single continuous body of underlying groundwater. It is likely that the perched water exists due to the migration of surface water through made ground deposits to rest within localised depressions at the interface of the made ground or natural granular deposits and the underlying natural clay.

13.0 LABORATORY TESTING

13.1 Soil Contamination Testing

A programme of soil chemical analyses was undertaken at a UKAS / MCERTS accredited laboratory as follows:

- 6nr subsamples of made ground soils were analysed to a broad-spectrum suite of contaminants including pH, sulphates, metals, non-metals, speciated PAH's, hydrocarbons to the TPHCWG methodology, BTEX compounds, phenols and asbestos.
- 3 of the 6nr subsamples of made ground were additionally subjected to speciated analysis for VOC's and PCB's
- 3nr subsamples of underlying natural soils were subjected to pH and sulphate analysis.
- 2nr groundwater samples recovered from standpipe installations at WS1 and WS7 were analysed for pH, metals, non-metals, speciated PAH's, hydrocarbons to the TPHCWG methodology and BTEX compounds.

The soil and groundwater water contamination test results and certificates are presented in Appendix G.

14.0 RISK ASSESSMENT FOR THE PROTECTION OF HUMAN HEALTH

14.1 Generic Quantitative Risk Assessment (Tier 2 / GQRA)

An assessment of the soil analysis data was carried out in accordance with the guidance presented in CLR11 and in accordance with current guidance and legislation.

The Human Health Risk Assessment was carried out in accordance with the ***CCG*** methodology for assessing soil contamination data as contained in Appendix J, and since it is proposed that the site be redeveloped for residential land use, the assessment was based on criteria contained in publication LQM/CIEH S4UL`s for Human Health Risk Assessment (2015) (CCG licence S4UL3233), applicable to the "Residential with Home Grown Produce" land use scenario. This document does not provide criteria for Lead, for which the results were compared to the C4SL published by DEFRA SP1010 Development of Category 4 Screening Levels.

14.2 Assessment of Contamination Data

Based on a Soil Organic Matter content of 1%, the assessment of the soil data is summarised in the tabulations hereunder, and presented on the worksheets in Appendix H.

14.2.1 Assessment of Metal Data

The assessment of the metal data is presented hereunder:

Table 11: Assessment of Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Cadmium	11	1.1	-	-
Chromium	910	31.9	-	-
Chromium VI	6	<0.8	-	-
Copper	2400	592	-	-
Lead	200	736	**227**	**WS2 @ 0.30mbgl**
			349	**WS4 @ 0.50mbgl**
			248	**WS6 @ 0.30mbgl**
			736	**WS7 @ 0.40mbgl**
Mercury (Inorganic)	40	134	**134**	**WS7 @ 0.40mbgl**
Nickel	180	95.9	-	-
Zinc	3700	522	-	-

The above assessment concludes that Lead and Mercury are present at concentrations that exceed their respective guideline criteria and hence a potential risk to human health is indicated.

14.2.2 Assessment of Non-Metal Data

The assessment of the non-metal data is presented hereunder:

Table 12: Assessment of Non-Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Arsenic	37	83.7	**37.6**	**WS2 @ 0.30mbgl**
			60.8	**WS4 @ 0.50mbgl**
			83.7	**WS7 @ 0.40mbgl**
Boron	290	0.9	-	-
Selenium	250	<1.0	-	-
Free Cyanide	22	<1.0	-	-

The above assessment concludes that Arsenic is present at concentrations in exceedance of the guideline criteria and hence a potential risk to human health is indicated.

14.2.3 Assessment of Polycyclic Aromatic Hydrocarbon [PAH's] Data

The assessment of the Polycyclic Aromatic Hydrocarbon (PAH's) data is presented hereunder:

Table 13: Assessment of PAH Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Acenaphthene	210	2.7	-	-
Acenaphthylene	170	1.2	-	-
Anthracene	2400	8	-	-
Benz(a)anthracene	7.2	25.2	**25.2**	**WS1 @ 0.20mbgl**
			9.2	**WS3 @ 0.40mbgl**
Benzo(a)pyrene	2.2	3.5	**26.8**	**WS1 @ 0.20mbgl**
			8.3	**WS2 @ 0.30mbgl**
			9.7	**WS3 @ 0.40mbgl**
Benzo(b)fluoranthene	2.6	24.8	**24.8**	**WS1 @ 0.20mbgl**
			8.5	**WS2 @ 0.30mbgl**
			8.7	**WS3 @ 0.40mbgl**
Benzo(g,h,i)perylene	320	20.6	-	-

Benzo(k)fluoranthene	77	21.9	-	-
Chrysene	15	26	**26**	**WS1 @ 0.20mbgl**
Dibenzo(ah)anthracene	0.24	4.8	**4.8**	**WS1 @ 0.20mbgl**
			2.0	**WS2 @ 0.30mbgl**
			2.0	**WS3 @ 0.40mbgl**
			0.8	**WS4 @ 0.50mbgl**
			0.4	**WS6 @ 0.30mbgl**
			0.5	**WS7 @ 0.40mbgl**
Fluoranthene	280	46.3	-	-
Fluorene	170	2.1	-	-
Indeno(1,2,3-cd)pyrene	27	23.3	-	-
Naphthalene	2.3	0.8	-	-
Phenanthrene	95	26.2	-	-
Pyrene	620	43.3	-	-

The above assessment concludes that concentrations of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene and Dibenzo(a,h)anthracene are present at concentrations in exceedance of their respective guideline criteria and hence a potential risk to human health is indicated.

14.2.4 Assessment of Total Petroleum Hydrocarbon [TPH's] Data

The assessment of TPH data is presented hereunder:

Table 14: Assessment of Hydrocarbon Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Aromatic EC5-EC7	70	<0.01	-	-
Aromatic EC7-EC8	130	<0.01	-	-
Aromatic EC8-EC10	34	<1.0	-	-
Aromatic EC10-EC12	74	<1.0	-	-
Aromatic EC12-EC16	140	1.6	-	-
Aromatic EC16-EC21	260	16.1	-	-
Aromatic EC21-EC35	1100	366	-	-
Aromatic EC35-EC44	1100	192	-	-
Aliphatic EC5-EC6	42	<0.01	-	-
Aliphatic EC6-EC8	100	<0.01	-	-
Aliphatic EC8-EC10	27	<1.0	-	-
Aliphatic EC10-EC12	130	<1.0	-	-
Aliphatic EC12-EC16	1100	7.0	-	-
Aliphatic EC16-EC35	65000	490.3		
Aliphatic EC35-EC44	65000	294	-	-

The above assessment concludes that no hydrocarbon fraction is present at concentrations that exceed their respective guideline criteria and hence no risk to human health is indicated.

14.2.5 Assessment of BTEX Data

All BTEX compounds were below their limit of detection (*LOD*) and therefore no risk to human health is indicated.

14.2.6 Assessment of PCB Data

All PBC compounds were below their limit of detection (*LOD*) and therefore no risk to human health is indicated.

14.2.7 Assessment of VOC Data

All VOC compounds were below their limit of detection (*LOD*) and therefore no risk to human health is indicated.

14.2.8 Assessment of Phenol Data

All Phenol compounds were below their limit of detection (*LOD*) and therefore no risk to human health is indicated.

14.2.9 Assessment of Asbestos Data

Asbestos was not detected within any sample analysed and therefore no risk to human health is indicated.

14.2.10 Summary of Human Health Risk Assessment

Based on the above assessment, it is concluded that soil concentrations of Arsenic, Lead, Mercury, and a number of PAH species are present at concentrations in exceedance of their respective guideline criteria and hence a potential risk to human health is indicated.

15.0 CONTROLLED WATERS RISK ASSESSMENT

Whist the sensitivity of this site in relation to risk to controlled waters is considered low, the risk assessment undertaken herein has been conservatively undertaken against a 'freshwater' designated water receptor.

The investigation has included for the chemical analysis of 2nr groundwater samples for a broad range of contaminants, including metals, non-metals, phenols, speciated PAHs, hydrocarbons to the TPHCWG methodology and BTEX compounds. The results were assessed against published Environmental Quality Standards (AA - freshwater).

A number of contaminant species were observed within the sampled groundwater to be present above their respective Environmental Quality Standards (AA - freshwater) assessment criteria. These transgressions are tabulated below:

Table 15: Assessment of Water Data

Contaminant	AA-EQS (Freshwater) (ug/l)	Exceedances	
		(ug/l)	Location
Cadmium	0.25	2	WS7
Nickel	20	31	WS7
Zinc	125	161	WS7
Fluoranthene	0.0063	0.02	WS1
Benzo(a)pyrene	0.00017	0.01	WS1

Further to the above, whilst AA-EQS values are not published for petroleum hydrocarbons, it was noted that TPHCWG analysis reported a total C5-C40 concentration of 850ug/l at WS1 and 72.4ug/l at WS7. These results were generally attributable to the C21-35 aliphatic and aromatic fractions, and to a lesser extent the C35-C40 fractions. C16-C21 aliphatic and aromatic fractions both reported values <10ug/l. All other TPHCWG fractions were proven to be below the limit of detection at <1.0ug/l or <5.0ug/l. All BTEX compounds were proven to be below the limit of detection at <1ug/l. Free-phase hydrocarbons were not detected within groundwater at any sampling point.

Taking account of the above and considering the context setting of the site with the absence of potable abstractions or sensitive surface watercourse, it is the opinion of ***CCG*** that the site does not pose a significant risk to controlled waters. Furthermore, given the variation in groundwater levels, detected contaminant species and magnitude of results between sampling points, it is considered likely that the observed water exists as isolated pockets of groundwater perched within the granular layers of the highly variable and poorly defined drift soils rather than one body in continuous hydraulic equilibrium.

In consideration of potential risk to human health from exposure to volatile groundwater vapours, the results of the water analysis were screened against the SoBRA published GACgwvap criteria 'Development of Generic Assessment Criteria for Assessing vapour risks to Human Health in Groundwater'. As all volatile groundwater contaminants were observed at concentrations below their respective GACgwvap for the residential land use scenario, no credible risk to human health via this pathway is established, and groundwater vapour is not considered to pose a credible risk to human health at this site.

The full controlled waters risk assessment is provided as a tabulated worksheet contained in Appendix I.

16.0 GAS RISK ASSESSMENT

The potential sources of gas identified in the desk study were generally considered as sources of "Moderate / Low" generation potential. However, given that the development is of high sensitivity, a programme of monitoring comprising of 6 rounds over a 3-month period was adopted.

A gas risk assessment was subsequently undertaken in accordance with current UK guidelines set out in CIRCA C665 2007 "Assessing Risk Posed by Hazardous Gases to Buildings". The CIRIA risk assessment methodology uses typical maximum soil gas concentrations and worse case borehole flow rates to define a "Characteristic Situation" for the shallow gas regime.

The volumetric gas flow rate used by the risk assessment is termed "Gas Screening Value (GSV)" in the guidance and is defined below.

GSV (litres/hr) = borehole flow rate (litres/hr) x gas concentration.

There are two stages to the assessment method proposed in CIRIA C665; compliance with a GSV Threshold Value and secondly, compliance with additional factors such as maximum permissible gas concentration. A summary of the gas monitoring data is presented hereunder and provided fully at Appendix F.

Table 16: Summary of Gas Monitoring Data

Position	WS1	WS3	WS4	WS7
No Monitoring Visits	6	6	6	6
Max CH_4 (%)	0.0	0.0	0.0	0.0
Max CO_2 (%)	0.1	1.3	3.3	0.0
Min O_2 (%)	19.7	19.4	16.8	19.6
Max H_2S (ppm)	0.0	0.0	0.0	0.0
Max CO (ppm)	0.0	0.0	0.0	0.0
Max Flow (l/hr)	<0.1	<0.1	<0.1	<0.1
Water Level Range (mbgl)	1.20-1.60	1.77-2.13	2.04-2.25	1.15-1.43
Max PID response (ppm)	0.0	0.0	0.0	0.0
Pressure Range (mb)	995-1022			

Based on the obtained results, a maximum Gas Screening Value (GSV) for CO_2 of 0.0033 litres/hr is calculated. A GSV for CH_4 could not be calculated due to the absence of gas.

Based on the above data, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1. This classification does not require the adoption of remedial measures with respect to ground gas.

17.0 NEW WATER MAINS SUPPLY

Assessment of the soil chemical data to specify the construction of new water mains at the development site was based on the criteria specified in Paper 10/WM/03/21 'Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites' January 2011 published by UK Water Industry Research (UKWIR) and the supplementary guidance UUENG/RL/V2/July 2011 published by United Utilities Water (UUW).

Concentrations of hydrocarbons within the EC16-EC40 fraction were found to be above the threshold values recommended under the UKWIR and UUW guidance. On this basis, new water mains should be specified as barrier pipe.

Notwithstanding the above preliminary assessment, the developer should contact the local water supplier (UUW) to obtain concurrence with the recommendations given above. The supplier may require the developer to return a completed UUW Risk Assessment document.

18.0 CONCRETE SPECIFICATION

The data obtained in the investigations was assessed against the guidance given in BRE Special Digest 1: 2005, as summarised hereunder:

Table 17A: Design Chemical Class Based on Soil Data

CONCRETE SPECIFICATION DATA SHEET		
Is the site Brownfield or Greenfield?	Brownfield	
Is the water table static or mobile?	Static	
Highest water-soluble Sulphate results	130mg/l	Design Sulphate Class of DS-1 Class of ***AC-1s***
Lowest pH result	7.0	
Intended Working Life	100 years	Adopt Design Chemical Classification of DC-1

Table 18B: Design Chemical Class Based on Water Data

CONCRETE SPECIFICATION DATA SHEET		
Is the site Brownfield or Greenfield?	Brownfield	
Is the water table static or mobile?	Static	
Highest water-soluble Sulphate results	423mg/l	Design Sulphate Class of DS-1 Class of ***AC-1s***
Lowest pH result	6.7	
Intended Working Life	100 years	Adopt Design Chemical Classification of DC-1

Based on the foregoing assessment, concrete in the ground should be specified to conform to the compositional requirements of Design Chemical Class DC-1, as defined in BRE Special Digest 1: 2005.

19.0 POST INVESTIGATION CONCEPTUAL MODEL & REMEDIATION

Based on the findings of the investigation, a credible pollution linkage has been established with respect to soil contamination and risk to human health. Arsenic, Lead, Mercury (Inorganic), and PAH species; Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene and Dibenzo(a,h)anthracene are present at concentrations in excess of their respective guideline criteria, thus mitigation of risk by remedial action is warranted.

It is recommended that in order to protect end users that a cover system be constructed to all garden and soft landscaped areas. The cover system shall comprise the reduction in finished level by 600mm, placement of a geotextile barrier membrane (Terram 1000 or similar) and restoration in 300mm of virgin sand topped by 300mm of top-quality Grade A non-recycled topsoil. No remedial action is proposed below areas of hardstanding as, all pertinent pathways of exposure are broken.

In accordance with Local Authority requirements, the construction of the proposed remedial measures should be independently inspected and verified. A validation report should be prepared by the independent party documenting the construction and verification inspections undertaken and should include analysis and assessment of topsoil against recognised human health criteria for the residential with home grown produce land use scenario. It is proposed that a minimum of 1nr analysis of topsoil per dwelling is undertaken.

The Client has communicated an intention to revise the development layout to remove all garden/landscaped areas and replace with hardstanding throughout. In this circumstance remediation of site soils is not required as all pertinent contaminant exposure

pathways would be broken.

20.0 CONCLUSIONS & RECOMMENDATIONS

The conclusions and recommendations hereunder are based on the salient sections of the report and should not be referred to in isolation of the relevant sections of the text. All recommendations are subject to Regulatory Authority review.

Table 19: Conclusions & Recommendations

Soil Contamination / Remediation	Arsenic, Lead, Mercury (Inorganic), and PAH species; Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene and Dibenzo(a,h)anthracene are present within soils at concentrations in excess of their respective guideline criteria, thus mitigation of risk by remedial action is warranted. It is recommended that in order to protect end users that a cover system be constructed to all garden and soft landscaped areas. The cover system shall comprise the reduction in finished level by 600mm, placement of a geotextile barrier membrane (Terram 1000 or similar) and restoration in 300mm of virgin sand topped by 300mm of top-quality Grade A non-recycled topsoil. No remedial action is proposed below areas of hardstanding as, all pertinent pathways of exposure are broken. In accordance with Local Authority requirements, the construction of the proposed remedial measures should be independently inspected and verified. A validation report should be prepared by the independent party documenting the construction and verification inspections undertaken and should include analysis and assessment of topsoil against recognised human health criteria for the residential with home grown produce land use scenario. It is proposed that a minimum of 1nr analysis of topsoil per dwelling is undertaken. The Client has communicated an intention to revise the development layout to remove all garden/landscaped areas and replace with hardstanding throughout. In this circumstance remediation of site soils is not required as all pertinent contaminant exposure pathways would be broken.
Controlled Waters Assessment	A number of contaminant species were observed within the sampled groundwater to be present above their respective Environmental Quality Standards (AA - freshwater) assessment criteria. Further to the above, whilst AA-EQS values are not published for petroleum hydrocarbons, it was noted that TPHCWG analysis reported a total C5-C40 concentration of 850ug/l at WS1 and 72.4ug/l at WS7. These results were generally attributable to the C21-35 aliphatic and aromatic fractions, and to a lesser extent the C35-C40 fractions. C16-C21 aliphatic and aromatic fractions both reported values <10ug/l. All other TPHCWG fractions were proven to be below the limit of detection at <1.0ug/l or <5.0ug/l. All BTEX compounds were proven to be below the limit of detection at <1ug/l. Taking account of the above, and considering the context setting of the site with the absence of a potable abstractions or sensitive surface watercourse, it is the opinion of CCG that the site does not pose a significant risk to controlled waters. Furthermore, given the variation in groundwater levels, detected contaminant species and magnitude of results between sampling points, it is considered likely that the observed water exists as isolated pockets of groundwater perched within the granular layers of the highly variable and poorly defined drift soils rather than one body in continuous hydraulic equilibrium.
Gas Risk Assessment	Based on the obtained results, a maximum Gas Screening Value (GSV) for CO_2 of 0.0033 litres/hr is calculated. A GSV for CH_4 could not be calculated due to the absence of gas. Based on the above data, the risk to the proposed development was assessed in line with Situation A as defined in CIRIA C665, and on this basis the site complies with Characteristic Situation 1. This classification does not require the adoption of remedial measures with respect to ground gas.
Water Mains	Assessment of the soil chemical data to specify the construction of new water mains at the development site was based on the criteria specified in Paper 10/WM/03/21 'Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites' January 2011 published by UK Water Industry Research (UKWIR) and the supplementary guidance UUENG/RL/V2/July 2011 published by United Utilities Water (UUW). Concentrations of hydrocarbons within the EC16-EC40 fraction were found to be above the threshold values recommended under the UKWIR and UUW guidance. On this basis, new water mains should be specified as barrier pipe. Notwithstanding the above preliminary assessment, the developer should contact the local water supplier (UUW) to obtain concurrence with the recommendations given above. The supplier may require the developer to return a completed UUW Risk Assessment document.
Concrete Specification	Concrete in the ground should be specified to conform to the compositional requirements of Design Chemical Class DC-1, as defined in BRE Special Digest 1: 2005.
Further Work	• Submit Phase I/Phase II Report for Local Authority regulatory review • Prepare Phase III Remediation Strategy Report • Prepare Phase IV Validation / Completion Report Note – should the site development layout be revised to remove all garden/landscaped areas, remediation is not required, and thus no further work or reporting is proposed.

APPENDIX A

DRAWINGS

DO NOT SCALE

Notes: Study Site

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

Client:
Jason Barton

Project:
Phase I-II Geoenvironmental Report for Land at Hale View Road, Huyton, Liverpool

Title:
Site Location Plan

Scale:	Issue:
NTS	01
Drawn by: PMC	Date: September 2021
Project No. CCG-C-21-12234	Drawing No. 01

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DO NOT SCALE

Notes: Study Site

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

Client:
Jason Barton

Project:
Phase I-II Geoenvironmental Report for Land at Hale View Road, Huyton, Liverpool

Title:
Aerial Photograph

Scale:	Issue:
NTS	01
Drawn by: PMC	Date: Sept 2021
Project No. CCG-C-21-12234	Drawing No. 02

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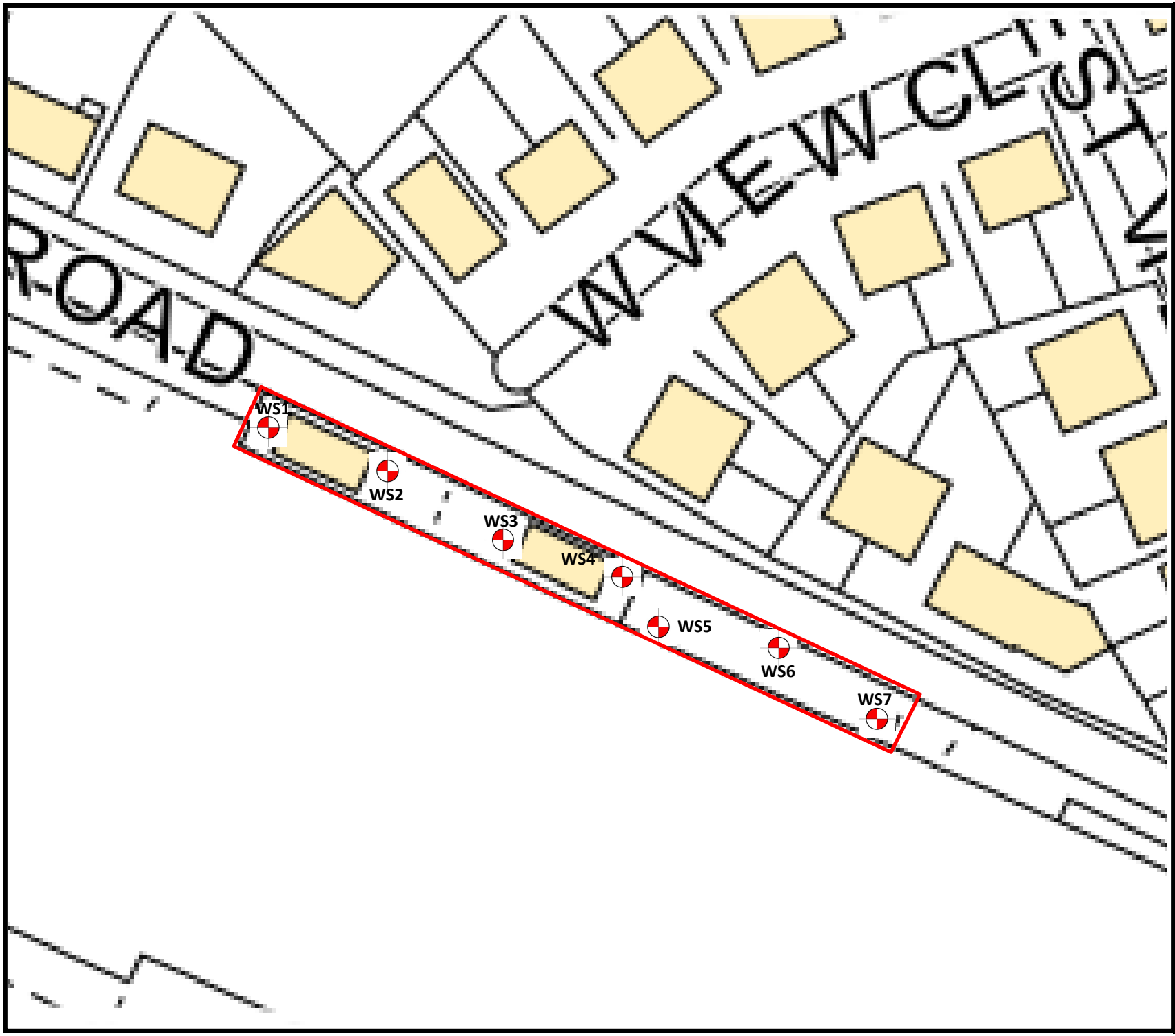


Legend:

Dynamic Sampling Borehole Locations (**WS**)

North

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

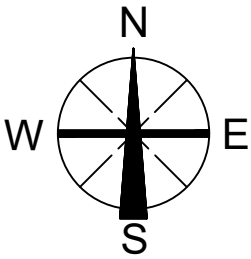
Client:
Jason Barton

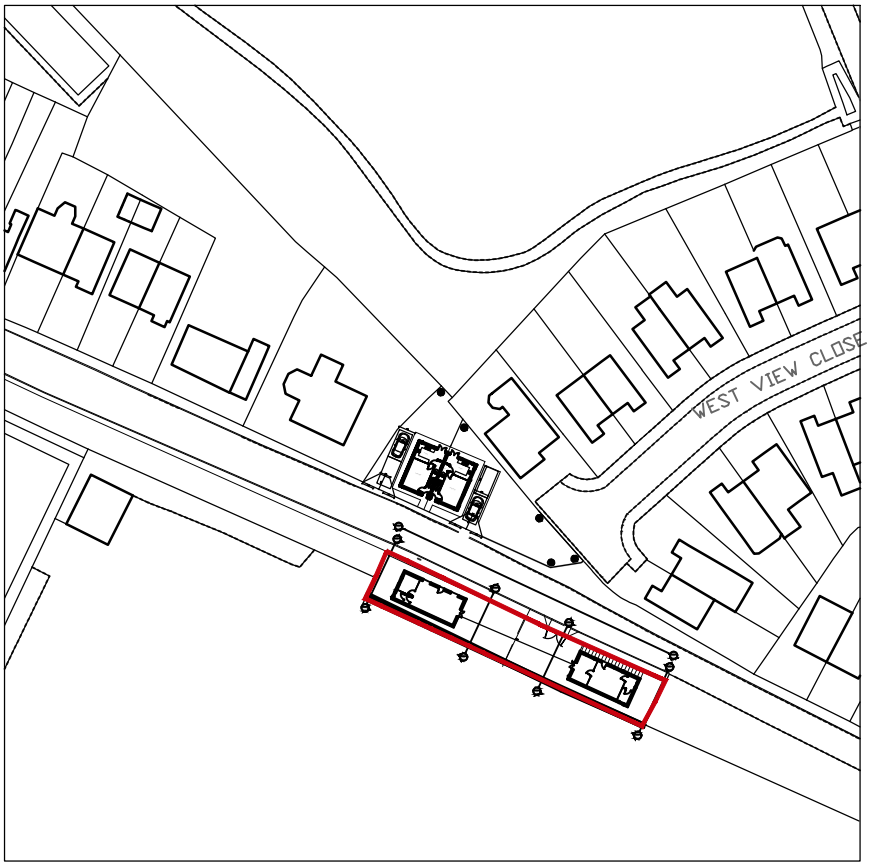
Project:
Hale View Road, Huyton

Title:
Site Investigation Layout Plan

Scale:	Issue:
NTS	1
Drawn by: PMC	Date: Sept 21
Project No. CCG-C-21-12234	Drawing No. 12234/3

CC GEOTECHNICAL LIMITED





SITE PLAN AT 1:1250 SCALE

NOTE:This drawing is for the communication of design intent at **developed design stage only**

'This plan has been produced for Mr J. Barton for his project at Haleview Road, Liverpool L36 6DD and has been prepared for communicating developed design (stage 3) information and is not intended for use by any other person or for any other purpose.'

NOTE:Any Levels and figured dimensions are for the purposes of communicating design intent and must be verified by site measure

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Revisions:

Date:	Rev:	Description:	Init:

- ○ Stage 0: Strategic Definition
- ○ Stage 1: Preparation and Brief
- ○ Stage 2: Concept Design
- ● Stage 3: Developed Design
- ○ Stage 4: Technical Design
- ○ Stage 5: Construction
- ○ Stage 6: Hand Over & Close Out
- ○ Stage 7: In Use Services

PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:

Mr J. Barton

JOB TITLE:

Mineral Railway Site, Opposite
20 Haleview Road

DRAWING TITLE:

Site Location Plan at 1:1250

DRAWN:	SCALE:	DATE:
TPB	1 : 1250	07:11:19

DRAWING NUMBER:	REVISION:
19-026 (01)001	P01

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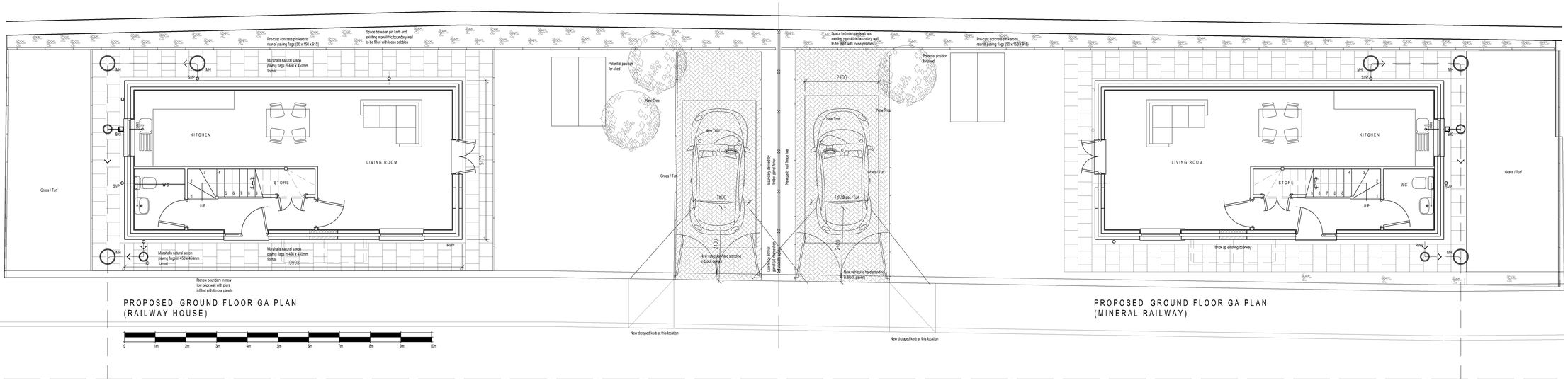
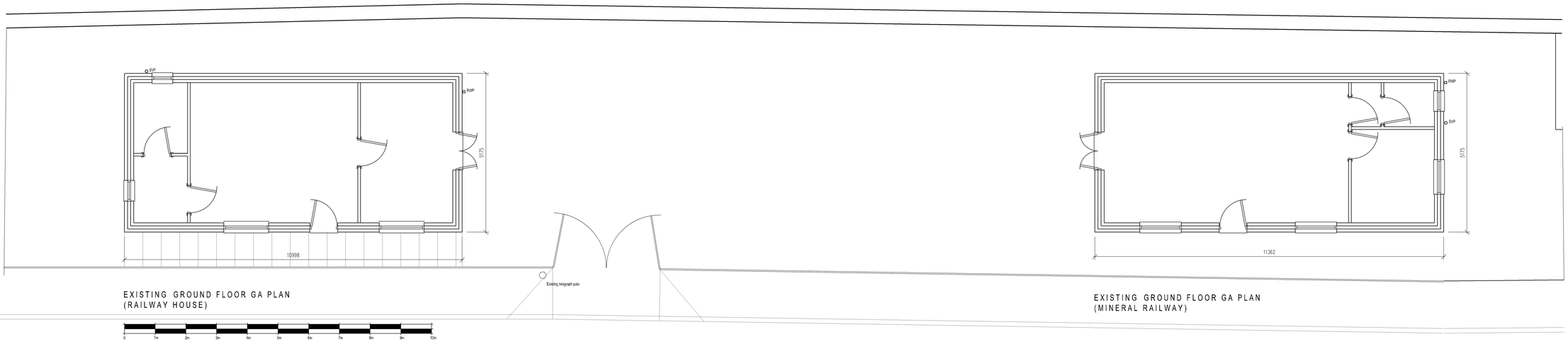


PROPOSED GROUND FLOOR GA PLAN
(RAILWAY HOUSE)

PROPOSED GROUND FLOOR GA PLAN
(MINERAL RAILWAY)



EXISTING GROUND FLOOR GA PLAN
(RAILWAY HOUSE)

EXISTING GROUND FLOOR GA PLAN
(MINERAL RAILWAY)

EXISTING AND PROPOSED GROUND FLOOR GA PLANS @ 1:50 at A0

NOTE: This drawing is for the communication of design intent at **developed design stage only**

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Revisions

Date	Rev	Description	Init.
15-10-19	P02	Overall scheme proposal altered. Proposal relates to gable ended roof with storey and a half buildings.	TPB
24-10-19	P03	Building layout following client feedback	TPB
28-11-19	P04	Changes incorporated following invalid letter from Joanne Bide of Knowsley planning department dated the 22:11:19.	TPB
03-02-20	P05	Revision of location of drive way further to feedback from local highways department.	TPB

Notes

- Stage 0: Strategic Definition
- Stage 1: Preparation and Brief
- Stage 2: Concept Design
- ● Stage 3: Developed Design
- Stage 4: Technical Design
- Stage 5: Construction
- Stage 6: Hand Over & Close Out
- Stage 7: In Use Services

PROJECT STATUS:
DEVELOPED DESIGN

CLIENT:
Mr J. Barton

JOB TITLE:
Mineral Railway Site, Opposite 20 Haleview Road

DRAWING TITLE:
Existing and Proposed Ground Floor GA Plan

DRAWN:	SCALE:	DATE:
TPB	1 : 50	07:10:19

DRAWING NUMBER:	REVISION:
19-026 (04)002	P05

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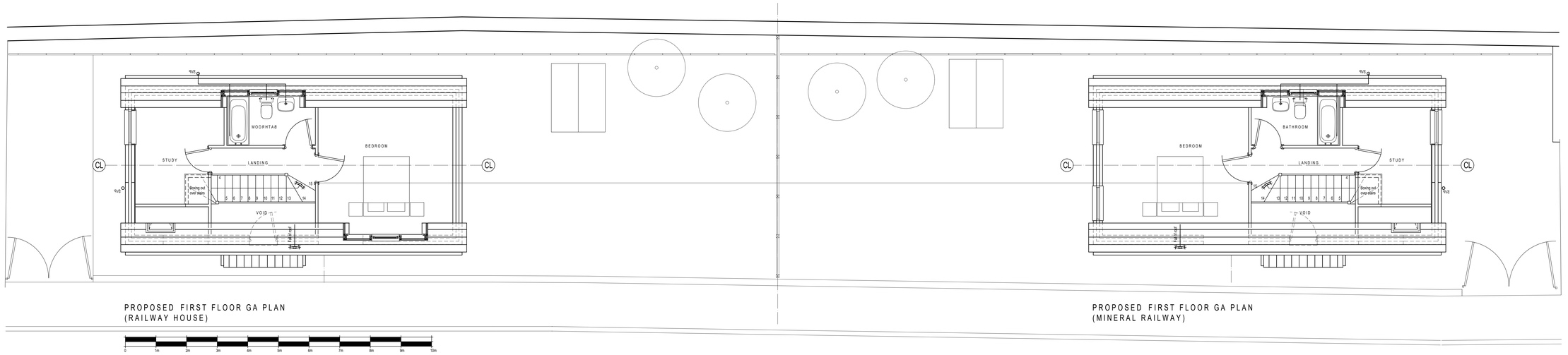

PROPOSED FIRST FLOOR GA PLAN
(RAILWAY HOUSE)

PROPOSED FIRST FLOOR GA PLAN
(MINERAL RAILWAY)

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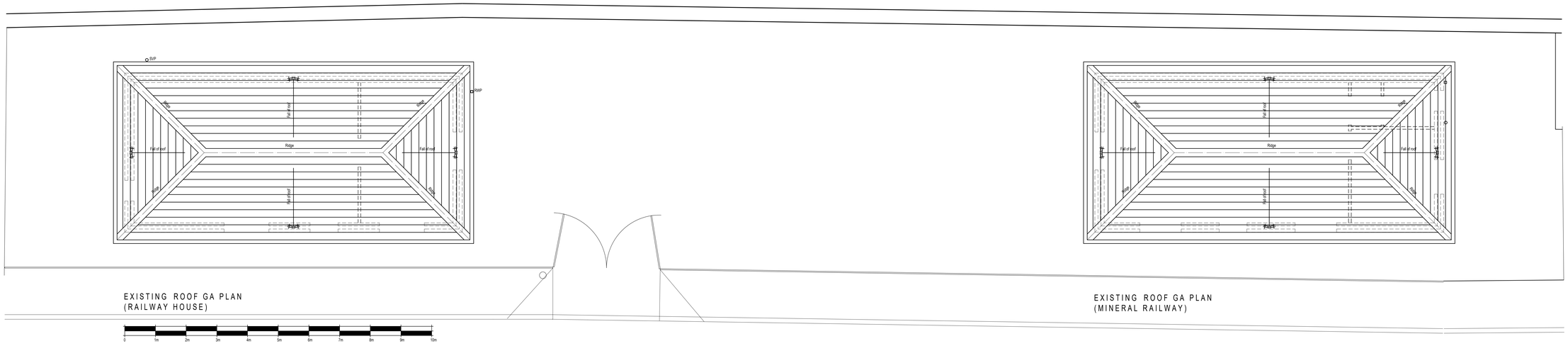

EXISTING ROOF GA PLAN
(RAILWAY HOUSE)

EXISTING ROOF GA PLAN
(MINERAL RAILWAY)

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

EXISTING AND PROPOSED FIRST FLOOR GA PLANS @ 1:50 at A0

NOTE: This drawing is for the communication of design intent at **developed design stage only**

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16-10-19	P02	Overall scheme proposal altered. Proposal relates to gable ended roof with storey and a half buildings.	TPB
24-10-19	P03	Building layout following client feedback	TPB
28-11-19	P04	Changes incorporated following invalid letter from Joanne Bide of Knowsley planning department dated the 22:11:19.	TPB

Notes

- Stage 0: Strategic Definition
- Stage 1: Preparation and Brief
- Stage 2: Concept Design
- ● Stage 3: Developed Design
- Stage 4: Technical Design
- Stage 5: Construction
- Stage 6: Hand Over & Close Out
- Stage 7: In Use Services

PROJECT STATUS:
DEVELOPED DESIGN

CLIENT:
Mr J. Barton

JOB TITLE:
Mineral Railway Site, Opposite 20 Haleview Road

DRAWING TITLE:
Existing and Proposed First Floor GA Plan

DRAWN:	SCALE:	DATE:
TPB	1 : 50	07:10:19

DRAWING NUMBER:	REVISION:
19-026 (04)003	P04

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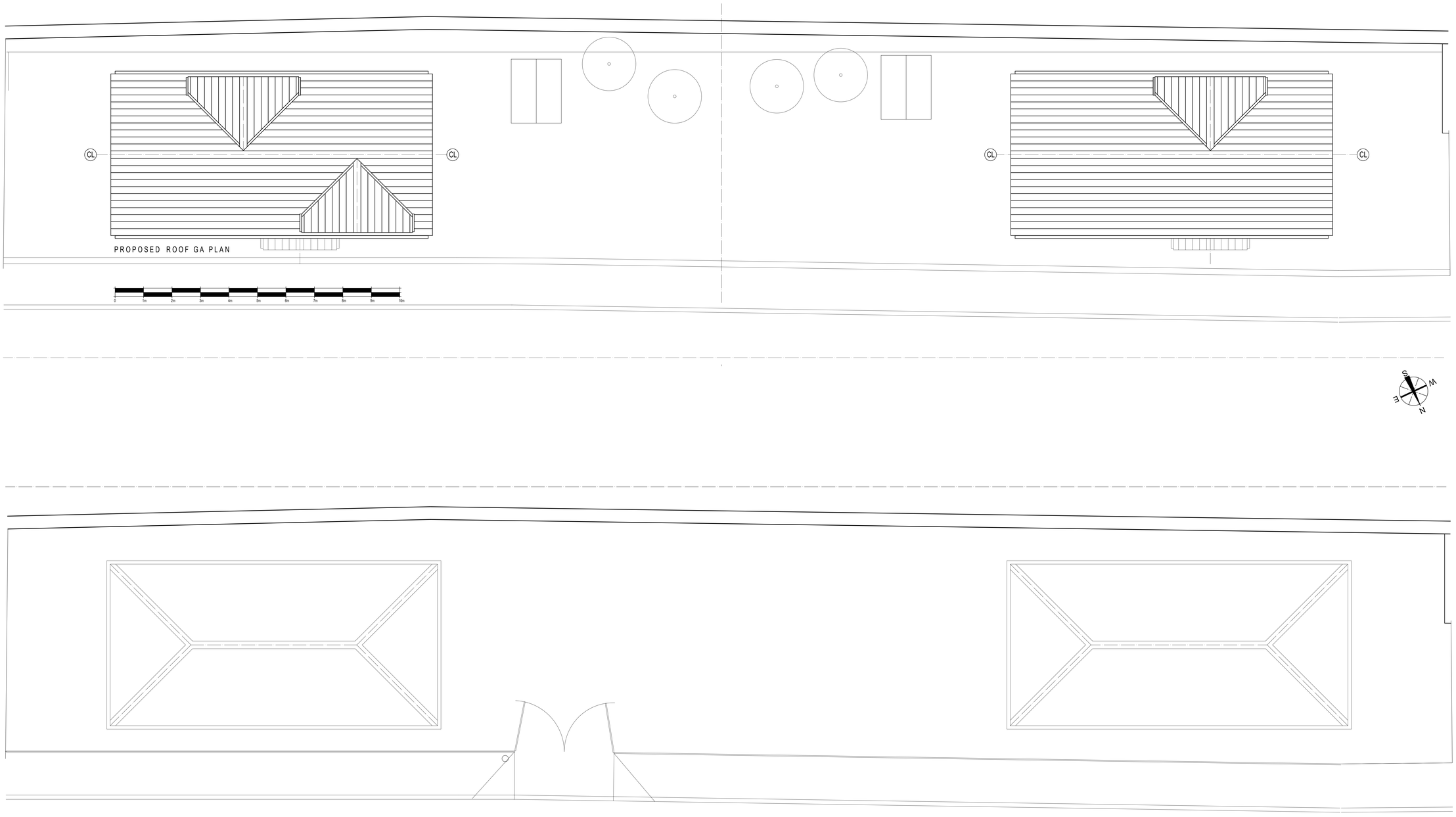

EXISTING AND PROPOSED ROOF GA PLANS @ 1:50 at A0

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Revisions

Date	Rev	Description	Init.
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24-10-19	P03	Building layout following client feedback	TPB
28-11-19	P04	Changes incorporated following invalid letter from Joanne Blde of Knowsley planning department dated the 22:11:19.	TPB

Notes

- Stage 0: Strategic Definition
- Stage 1: Preparation and Brief
- Stage 2: Concept Design
- ◆ Stage 3: Developed Design
- Stage 4: Technical Design
- Stage 5: Construction
- Stage 6: Hand Over & Close Out
- Stage 7: In Use Services

PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:
Mr J. Barton

JOB TITLE:
Mineral Railway Site, Opposite 20 Haleview Road

DRAWING TITLE:
Existing and Proposed Roof GA Plan

DRAWN:	SCALE:	DATE:
TPB	1 : 50	07:10:19

DRAWING NUMBER:	REVISION:
19-026 (04)004	P04

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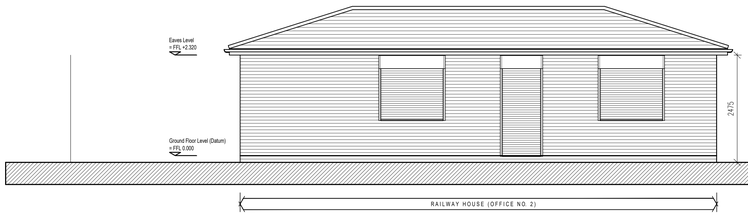
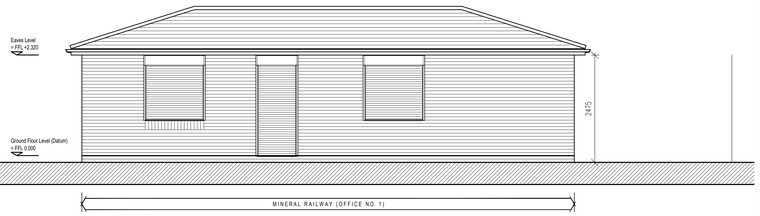
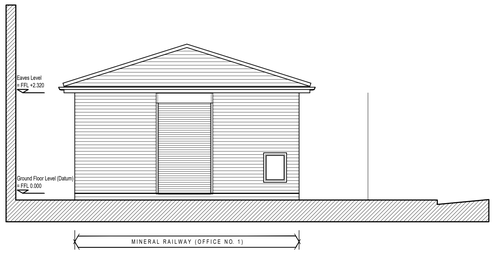


EXISTING SECTION A-A

EXISTING NORTH EAST ELEVATION





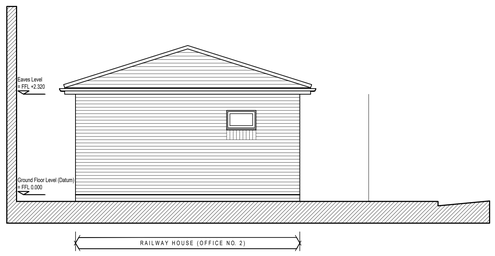
EXISTING SECTION B-B

EXISTING SOUTH EAST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)

EXISTING SECTION C-C

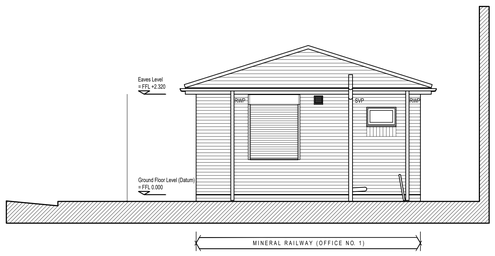
EXISTING NORTH WEST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)

EXISTING SECTION F-F



EXISTING SECTION D-D

EXISTING SOUTH EAST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)



EXISTING SECTION E-E

EXISTING NORTH WEST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)

EXISTING ELEVATIONS @ 1:50 at A0

NOTE: This drawing is for the communication of design intent at **developed design stage only**

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Revisions

Date	Rev	Description	Init.
28-11-19	P02	Changes incorporated following invalid letter from Joanne Bide of Knowsley planning department dated the 22:11:19.	TPB

Notes

- Stage 0: Strategic Definition
- Stage 1: Preparation and Brief
- Stage 2: Concept Design
- ● Stage 3: Developed Design
- Stage 4: Technical Design
- Stage 5: Construction
- Stage 6: Hand Over & Close Out
- Stage 7: In Use Services

PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:
Mr J. Barton

JOB TITLE:
Mineral Railway Site, Opposite 20 Haleview Road

DRAWING TITLE:
Existing Elevations

DRAWN:	SCALE:	DATE:
TPB	1 : 50	07:10:19

DRAWING NUMBER:	REVISION:
19-026 (05)001	P02

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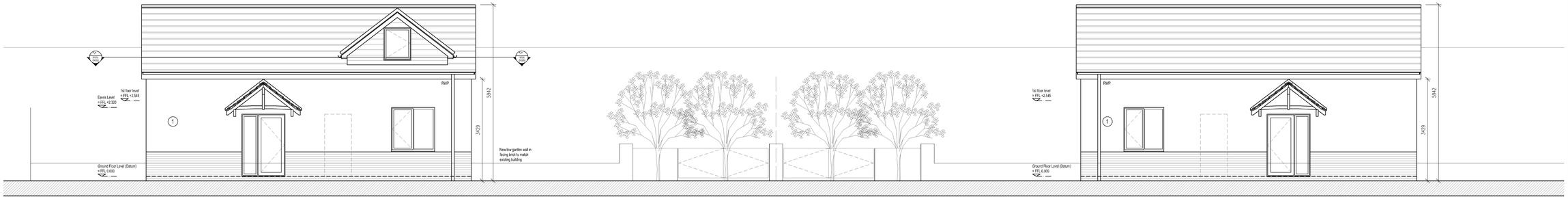


RAILWAY HOUSE (OFFICE NO. 2)

MINERAL RAILWAY (OFFICE NO. 1)

(PROPOSED SECTION A-A)

PROPOSED NORTH EAST ELEVATION

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

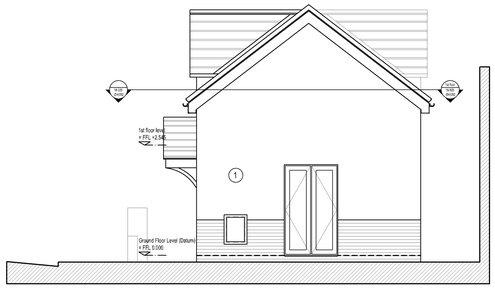
MINERAL RAILWAY (OFFICE NO. 1)

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

PROPOSED SECTION B-B

PROPOSED SOUTH EAST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

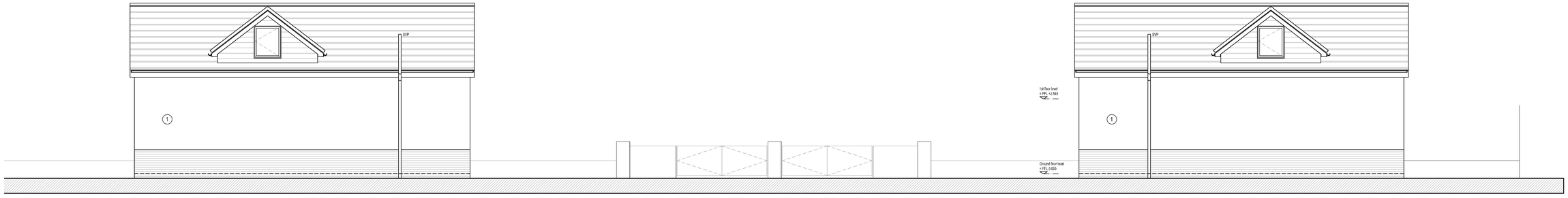


RAILWAY HOUSE (OFFICE NO. 2)

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

PROPOSED SECTION C-C

PROPOSED NORTH WEST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)



MINERAL RAILWAY (OFFICE NO. 1)

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

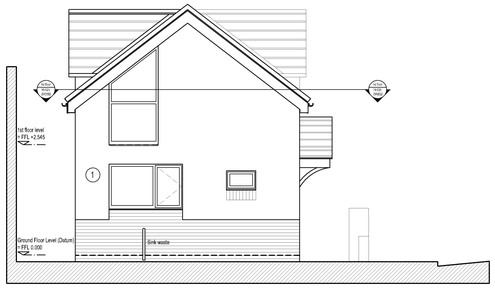
PROPOSED SECTION F-F

PROPOSED SOUTH WEST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

RAILWAY HOUSE (OFFICE NO. 2)

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.



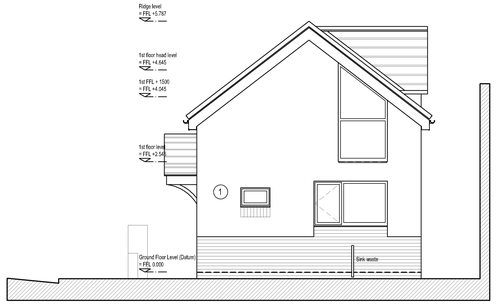
RAILWAY HOUSE (OFFICE NO. 2)

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

PROPOSED SECTION D-D

PROPOSED SOUTH EAST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m



MINERAL RAILWAY (OFFICE NO. 1)

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

PROPOSED SECTION E-E

PROPOSED NORTH WEST ELEVATION
(MINERAL RAILWAY OFFICE NO.1)

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

PROPOSED ELEVATIONS @ 1:50 at A0

NOTE: This drawing is for the communication of design intent at **developed design stage only**

'This plan has been produced for Mr J. Barton for his project at the mineral railway site opposite 20 Haleview Road, Liverpool, L36 6DD and has been prepared for communicating developed design (stage 3) information and is not intended for use by any other person or for any other purpose.'

NOTE: Any Levels and figured dimensions are for the purposes of communicating design intent. Any figured dimensions and levels **must be varified by site meassure**

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Revisions

Date	Rev	Description	Init.
15-10-19	P02	Overall scheme proposal altered. Proposal relates to gable ended roof with storey and a half buildings.	TPB
24-10-19	P03	Building layout following client feedback	TPB
08-11-19	P04	Omit Velux type roof windows. Add high windows to ground floor WC.	TPB
28-11-19	P04	Changes incorporated following invalid letter from Joanne Bide of Knowsley planning department dated the 22:11:19.	TPB
14-01-20	P05	Changes incorporated following email from Mark Quinn of Knowsley planning department dated the 08:01:2020. i) Elevations amended to be rendered above cill level.	TPB
19-02-20	P06	Proposed elevations updated to reflect changed position of vehicular access onto site indicated on plan drawings	TPB

Notes

- Stage 0: Strategic Definition
- Stage 1: Preparation and Brief
- Stage 2: Concept Design
- Stage 3: Developed Design
- Stage 4: Technical Design
- Stage 5: Construction
- Stage 6: Hand Over & Close Out
- Stage 7: In Use Services

PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:
Mr J. Barton

JOB TITLE:
Mineral Railway Site, Opposite 20 Haleview Road

DRAWING TITLE:
Proposed Elevations

DRAWN:	SCALE:	DATE:
TPB	1 : 50	07:10:19

DRAWING NUMBER:	REVISION:
19-026 (05)002	P06

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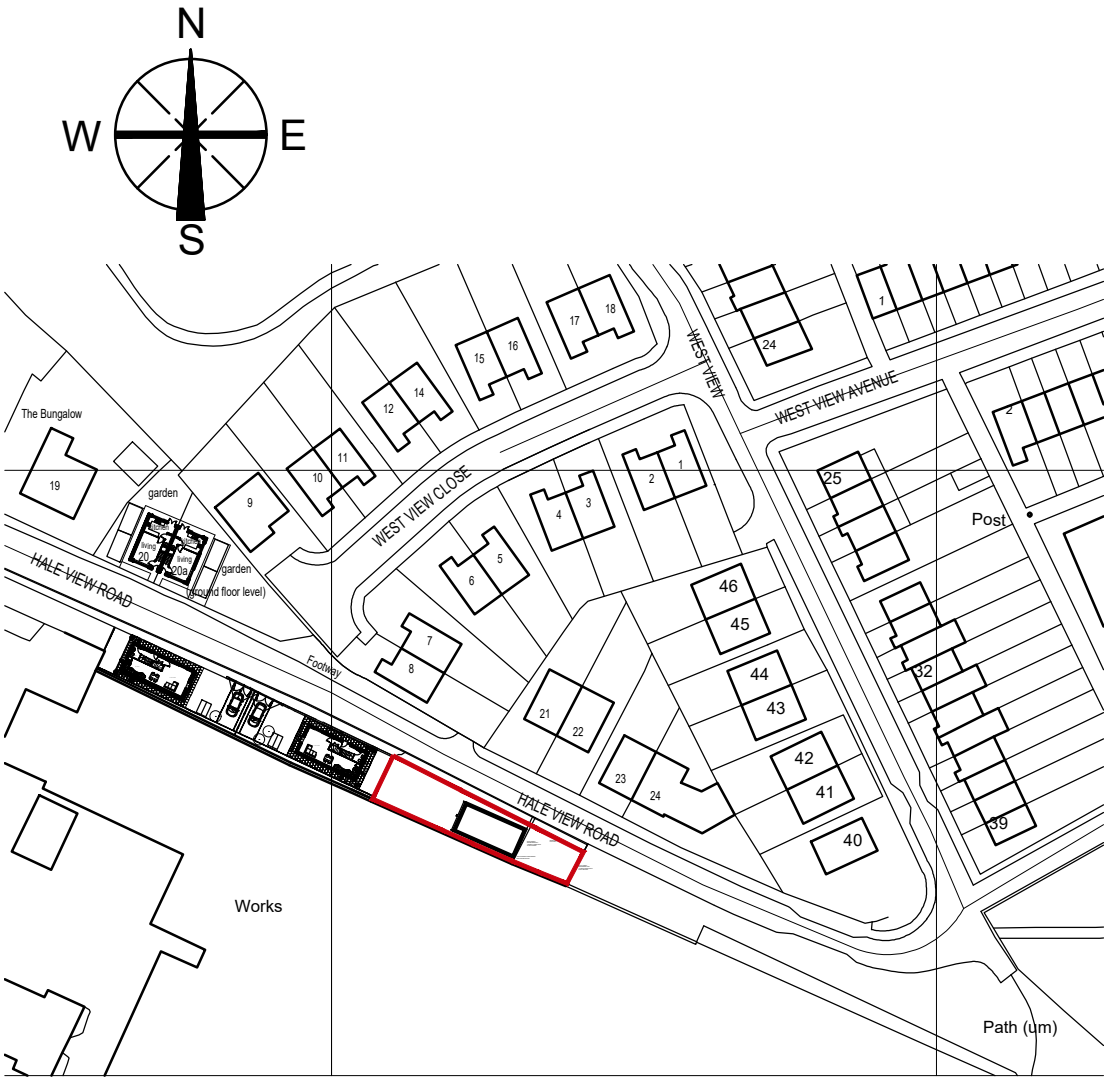

SITE PLAN AT 1:1250 SCALE at A4

NOTE:This drawing is for the communication of design intent at **developed design only**

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Revisions:

Date:	Rev:	Description:

Notes:

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- Stage 2: Concept Design
- ● Stage 3: Developed Design
- Stage 4: Technical Design
- Stage 5: Construction
- Stage 6: Hand Over & Close Out
- Stage 7: In Use Services

PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:

Mr Jason Barton

JOB TITLE:

Mineral Railway Site, Opposite 21 & 22 Hale View Road, Huyton

DRAWING TITLE:

Site Location Plan at 1:1250

DRAWN:	SCALE:	DATE:
TPB	1 : 1250 @A4	10-06-21

DRAWING NUMBER:	REVISION:
21-005 (01)001	P01

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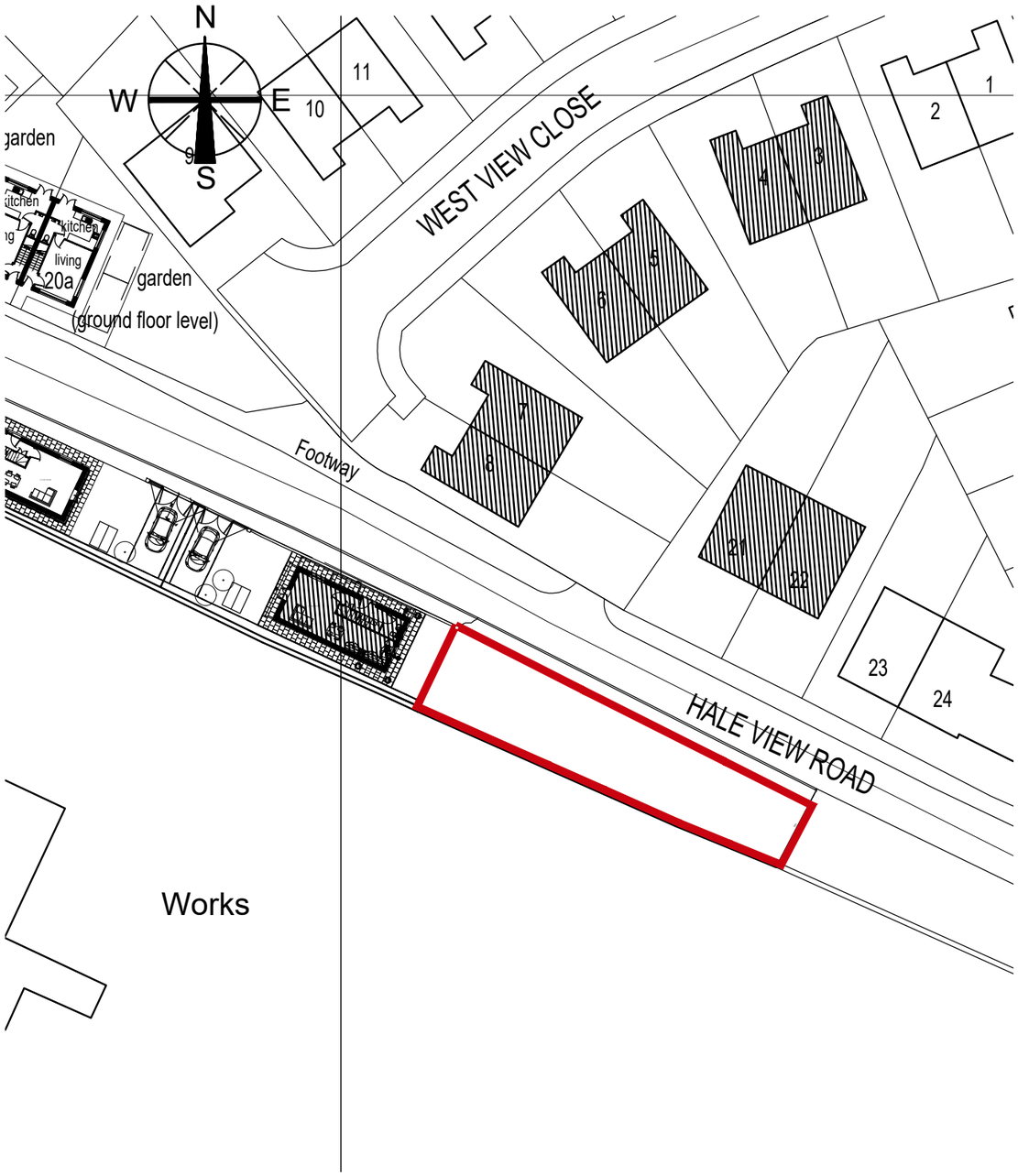

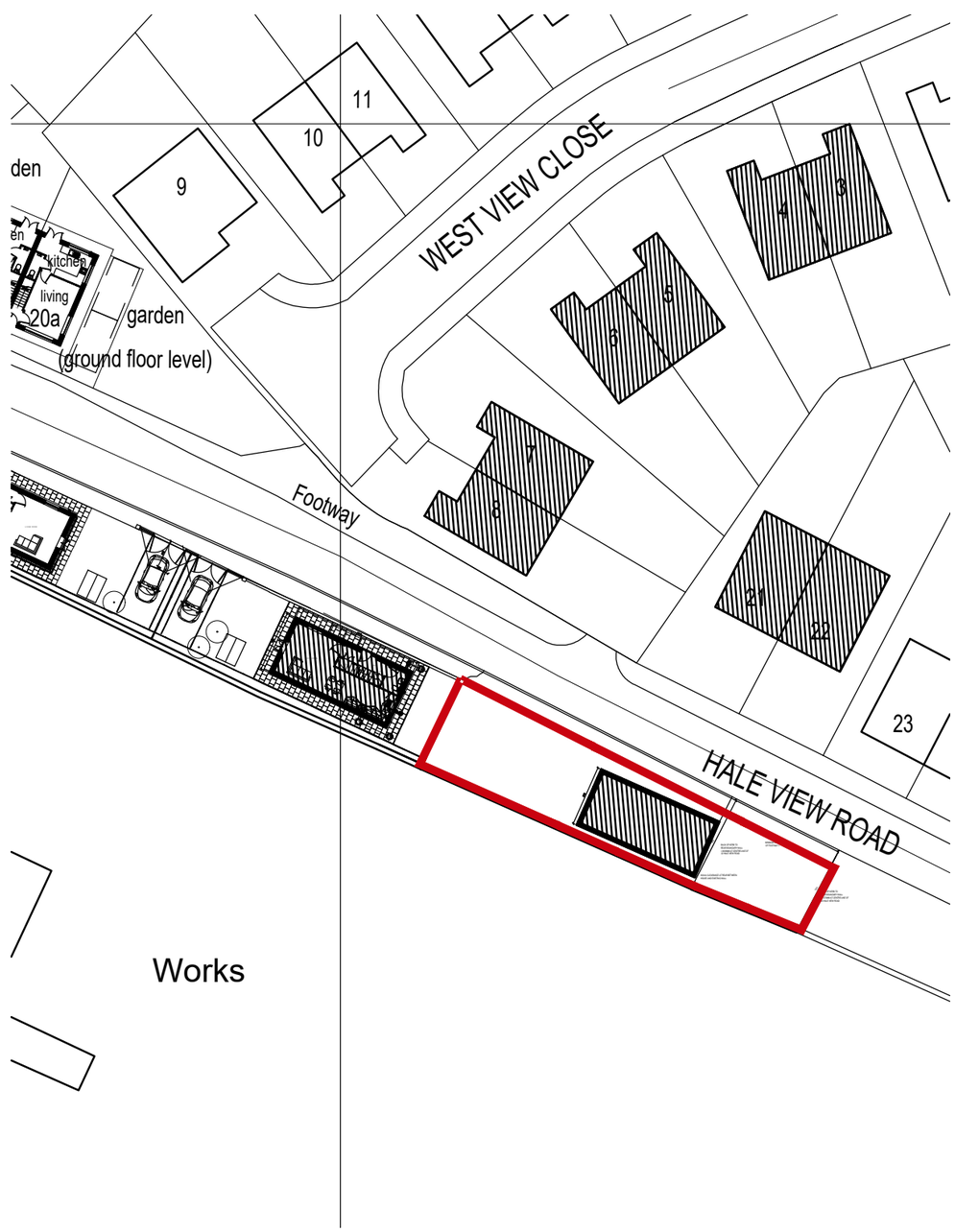

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Revisions:

Date:	Rev:	Description:

Notes:

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- ● Stage 3: Developed Design
- Stage 4: Technical Design
- Stage 5: Construction
- Stage 6: Hand Over & Close Out
- Stage 7: In Use Services

PROJECT STATUS:
DEVELOPED DESIGN

CLIENT:
Mr Jason Barton

JOB TITLE:
Mineral Railway Site, Opposite 21 & 22 Hale View Road, Huyton

DRAWING TITLE:
Existing & Proposed Block Plan @ 1:500

DRAWN:	SCALE:	DATE:
TPB	1 : 500 @ A3	10-06-21

DRAWING NUMBER:	REVISION:
21-005 (01)002	P01

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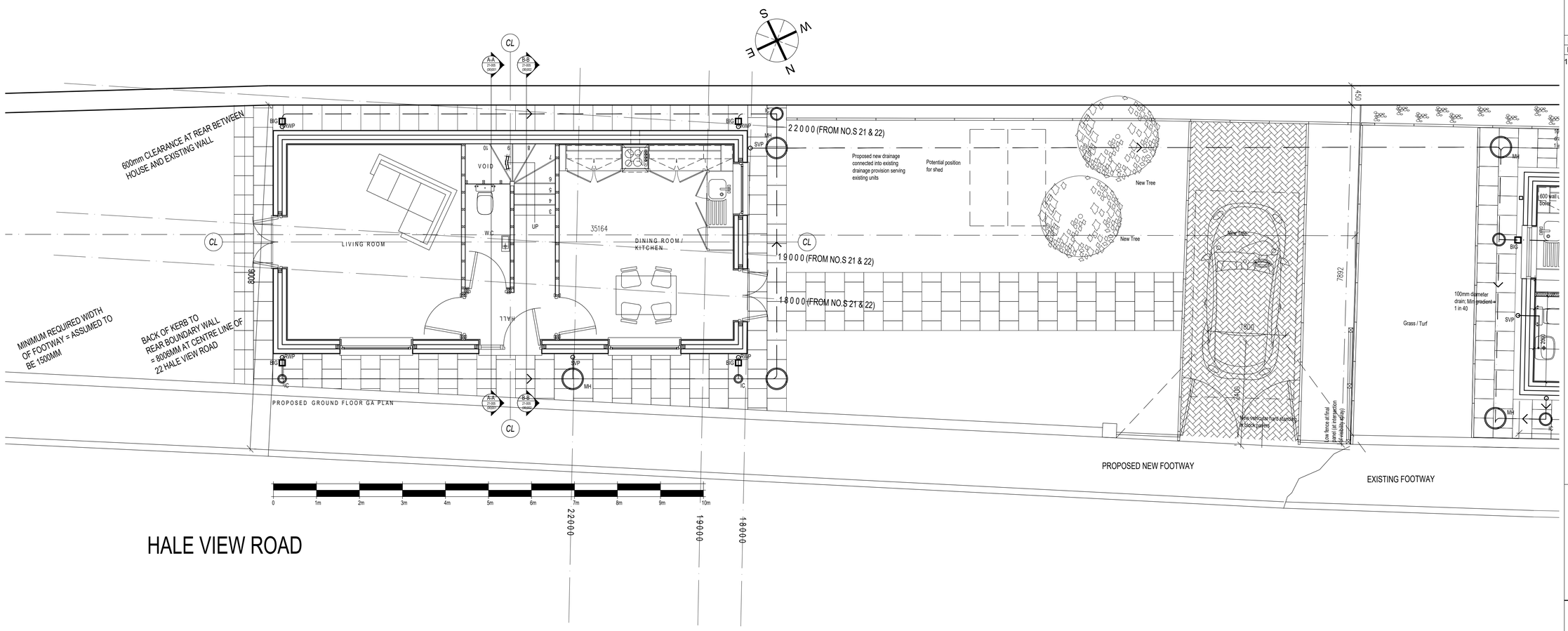
EXISTING & PROPOSED BLOCK PLAN @ 1:500 AT A3



PROPOSED SITE PLAN @ 1:50 AT A1

NOTE:This drawing is for the communication of design intent at **developed design stage only**

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Revisions

Date	Rev	Description	Init.
13:04:21	P02	Drawing revised to carry note stating that drainage serving new unit is taken across site and connected into the existing drainage provision serving the existing 2no. units.	TPB

Notes

- ○ Stage 0: Strategic Definition
- ○ Stage 1: Preparation and Brief
- ○ Stage 2: Concept Design
- ● Stage 3: Developed Design
- ○ Stage 4: Technical Design
- ○ Stage 5: Construction
- ○ Stage 6: Hand Over & Close Out
- ○ Stage 7: In Use Services

PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:
Mr Jason Barton

JOB TITLE:
Mineral Railway Site, Opposite 21 & 22 Hale View Road, Huyton

DRAWING TITLE:
Proposed Site Plan at 1:50

DRAWN:	SCALE:	DATE:
TPB	1:50 @ A1	29:03:2021

DRAWING NUMBER:	REVISION:
21-005 (01)003	P02

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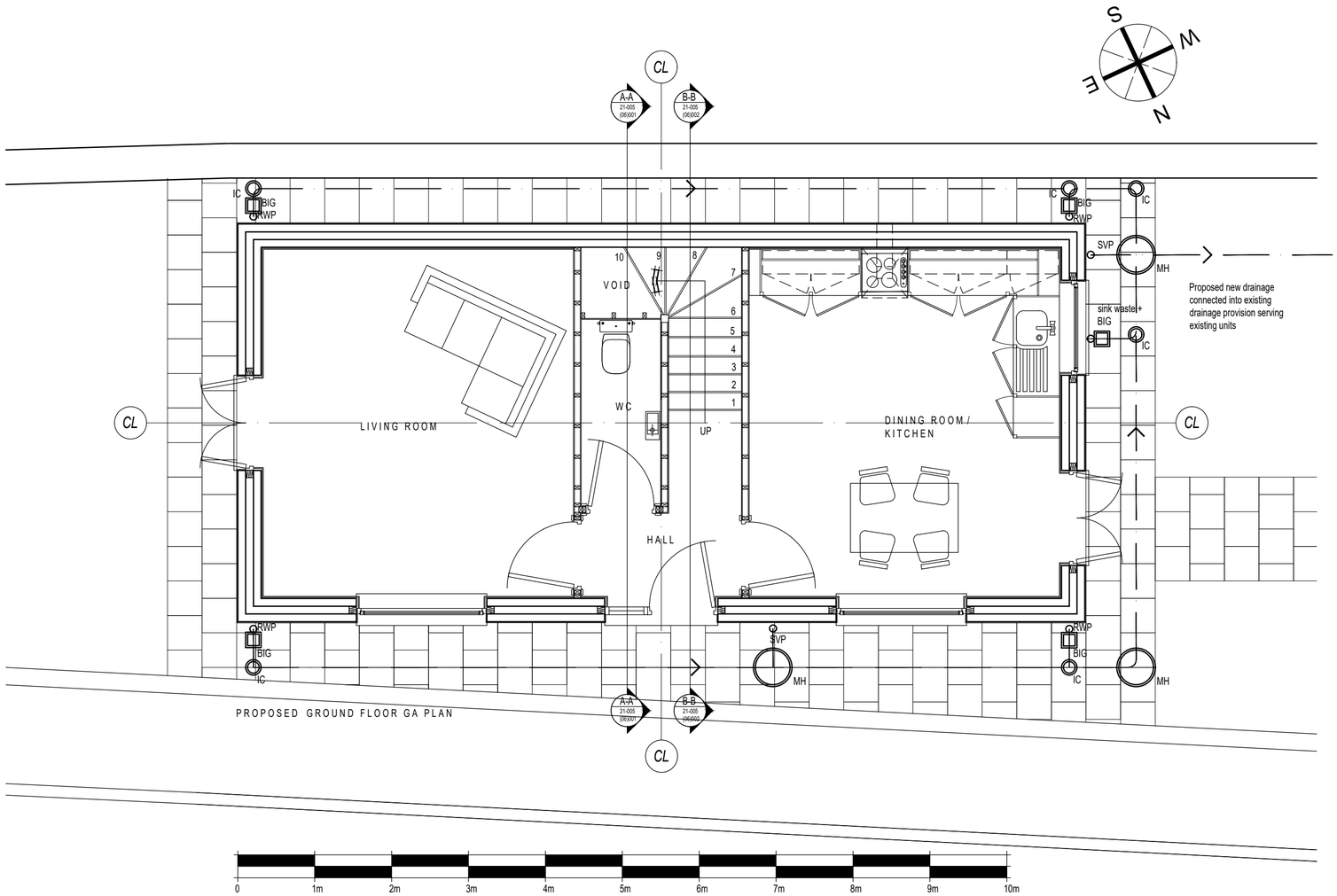

PROPOSED GROUND FLOOR GA PLAN

PROPOSED GROUND FLOOR GA PLAN @ 1:50 AT A2

NOTE:This drawing is for the communication of design intent at **developed design stage only**

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Revisions:

Date:	Rev:	Description:	Init:
13:04:21	P02	Drawing revised to carry note stating that drainage serving new unit is taken across site and connected into the existing drainage provision serving the existing 2no. units.	TPB

Notes:

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- ● Stage 3: Developed Design
- ○ Stage 4: Technical Design
- ○ Stage 5: Construction
- ○ Stage 6: Hand Over & Close Out
- ○ Stage 7: In Use Services

PROJECT STATUS:
DEVELOPED DESIGN

CLIENT:
Mr Jason Barton

JOB TITLE:
Mineral Railway Site, Opposite 21 & 22 Hale View Road, Huyton

DRAWING TITLE:
Proposed Ground Floor GA Plan

DRAWN:	SCALE:	DATE:
TPB	1 : 50 @ A2	29:03:21

DRAWING NUMBER:	REVISION:
21-005 (04)001	P02

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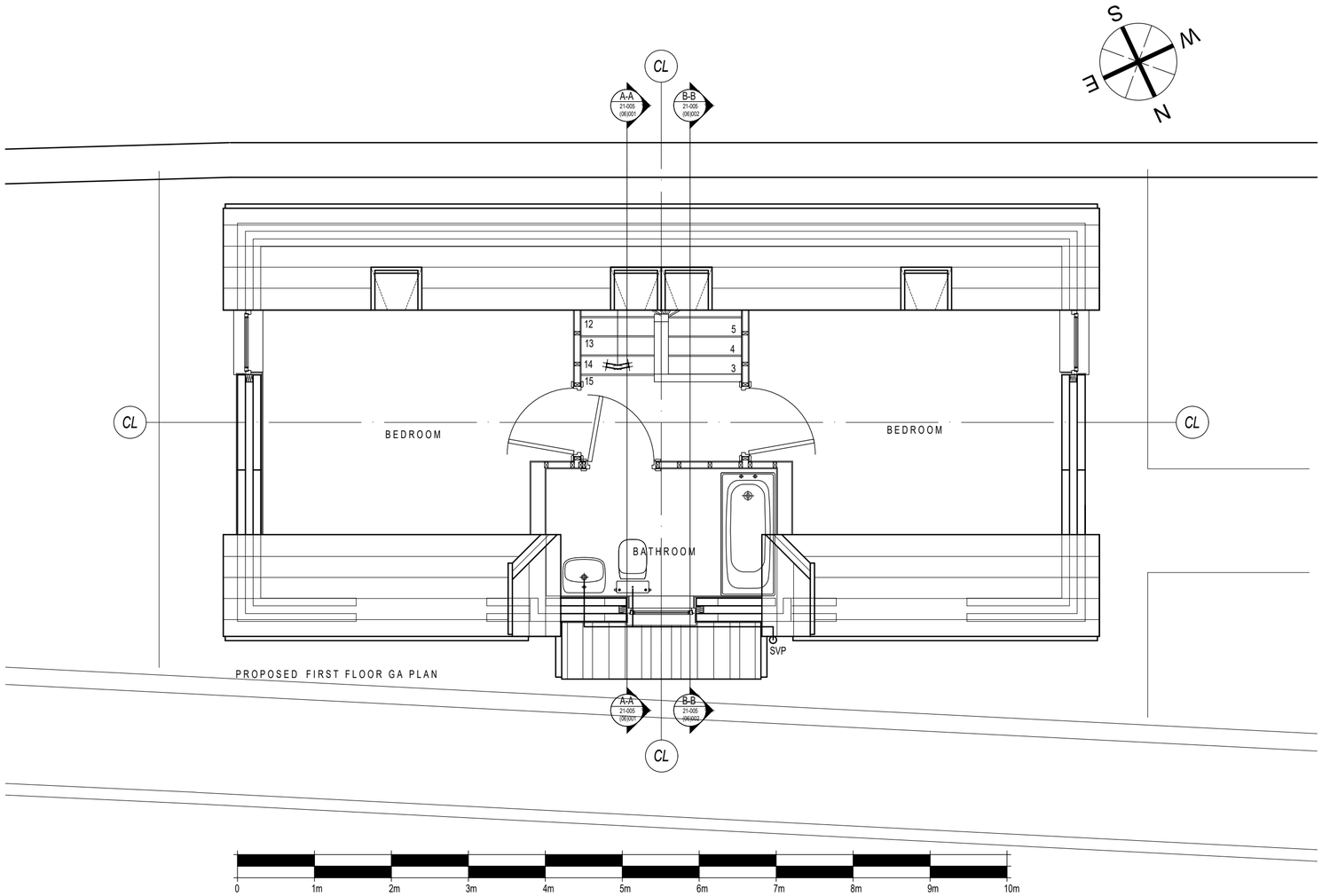

PROPOSED FIRST FLOOR GA PLAN @ 1:50 AT A2

NOTE:This drawing is for the communication of design intent at **developed design stage only**

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Revisions:

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- ○ Stage 2: Concept Design
- ● Stage 3: Developed Design
- ○ Stage 4: Technical Design
- ○ Stage 5: Construction
- ○ Stage 6: Hand Over & Close Out
- ○ Stage 7: In Use Services

PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:

Mr Jason Barton

JOB TITLE:

Mineral Railway Site, Opposite 21 & 22 Hale View Road, Huyton

DRAWING TITLE:

Proposed First Floor GA Plan

DRAWN:	SCALE:	DATE:
TPB	1 : 50 @ A2	29:03:21

DRAWING NUMBER:	REVISION:
21-005 (04)002	P01

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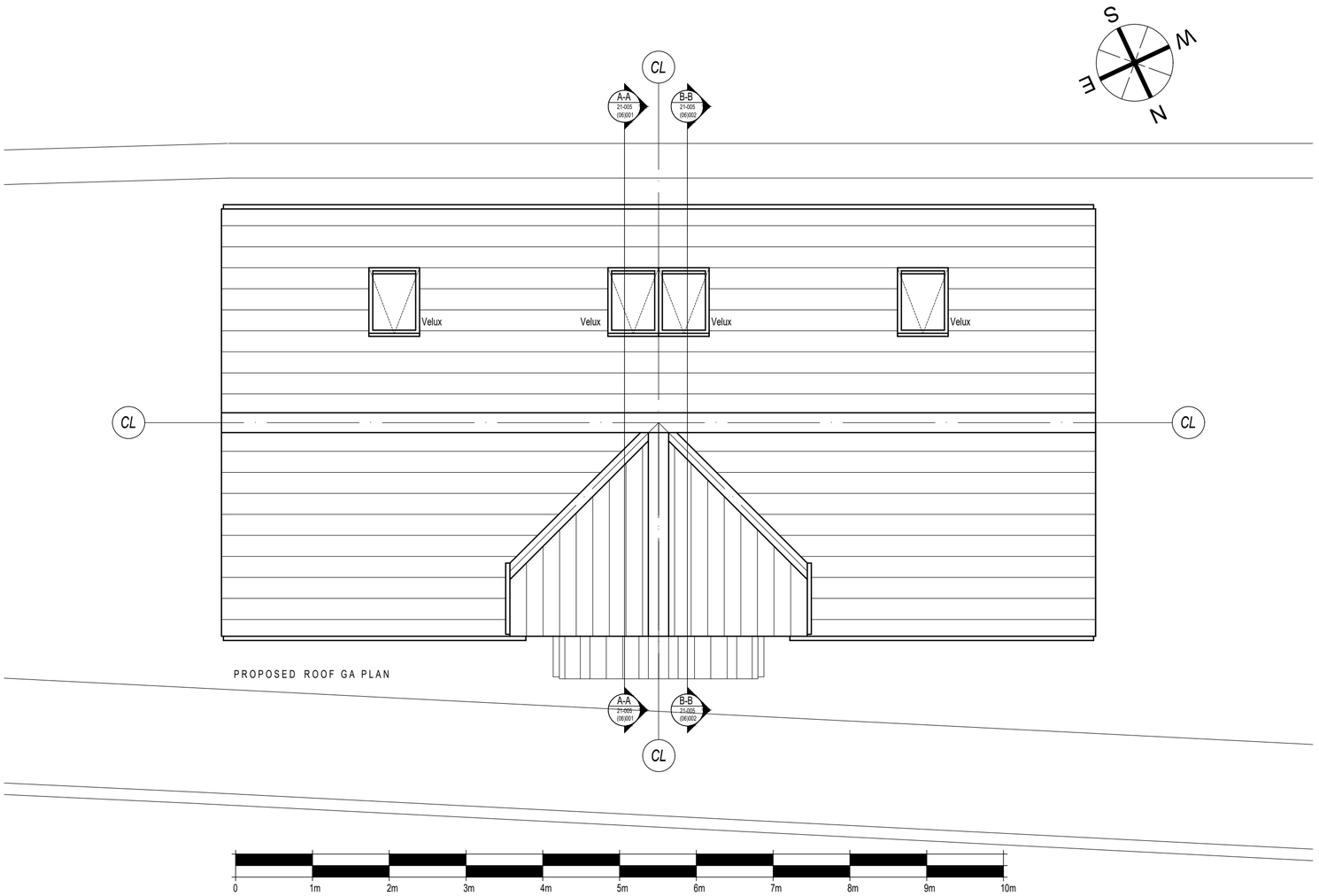

PROPOSED ROOF GA PLAN @ 1:50 AT A2

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- ○ Stage 6: Hand Over & Close Out
- ○ Stage 7: In Use Services

PROJECT STATUS:
DEVELOPED DESIGN

CLIENT:
Mr Jason Barton

JOB TITLE:
Mineral Railway Site, Opposite 21 & 22 Hale View Road, Huyton

DRAWING TITLE:
Proposed Roof GA Plan

DRAWN:	SCALE:	DATE:
TPB	1 : 50 @ A2	29:03:21

DRAWING NUMBER:	REVISION:
21-005 (04)003	P01

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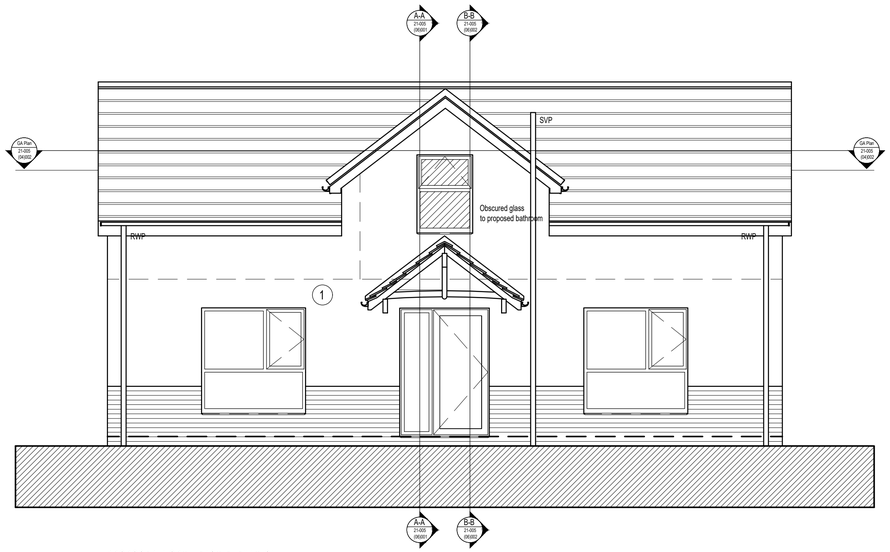
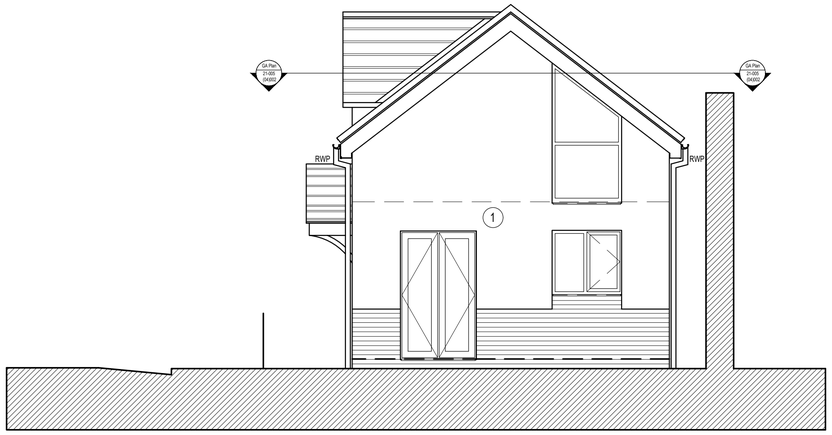


PROPOSED NORTH EAST ELEVATION

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

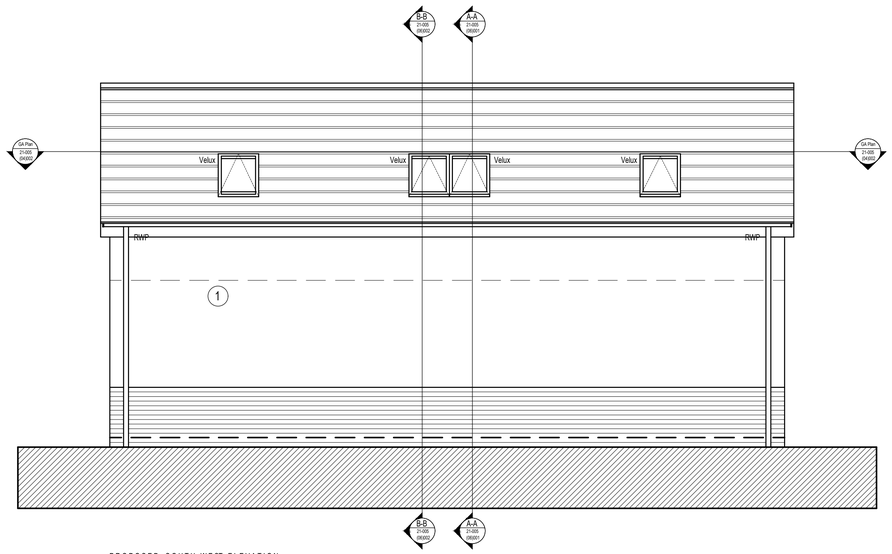
0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m



PROPOSED NORTH WEST ELEVATION

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

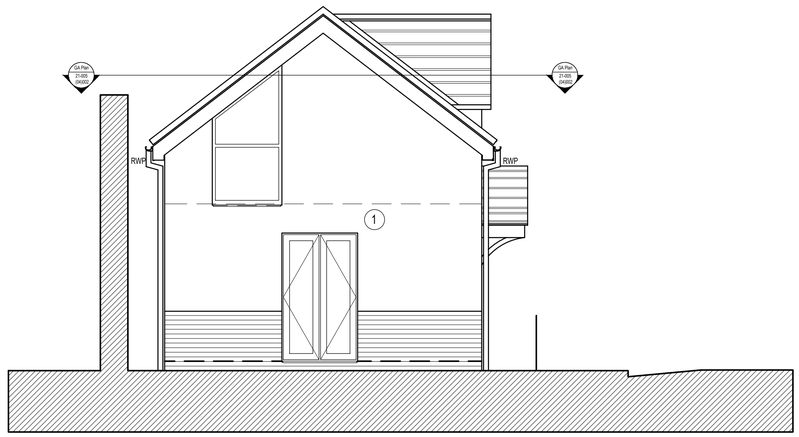
0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m



PROPOSED SOUTH WEST ELEVATION

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m



PROPOSED SOUTH EAST ELEVATION

1 Proposed external textured cement render such as Sto or K-Systems finished in a white or white colour.

0 1m 2m 3m 4m 5m 6m 7m 8m 9m 10m

PROPOSED ELEVATIONS @ 1:50 AT A1

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PROJECT STATUS:

DEVELOPED DESIGN

CLIENT:
Mr Jason Barton

JOB TITLE:
Mineral Railway Site, Opposite 21 & 22
Hale View Road, Huyton

DRAWING TITLE:
Proposed Elevations at 1:50

DRAWN:	SCALE:	DATE:
TPB	1:50 @ A1	29:03:2021

DRAWING NUMBER:	REVISION:
21-005 (05)001	P01

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APPENDIX B

SITE PHOTOGRAPHS

CCG-C-21-12234: Hale View Road, Huyton
View SE across Plot 1. Foreground - Mineral Railway.
Background - Railway House

CCG-C-21-12234: Hale View Road, Huyton
View S at Railway House and central area of Plot 1

CCG-C-21-12234: Hale View Road, Huyton
View S at Mineral Railway

CCG-C-21-12234: Hale View Road, Huyton
View W across Plot 2

CCG-C-21-12234: Hale View Road, Huyton
View S at Plot 2

CCG-C-21-12234: Hale View Road, Huyton
View SE at Plot 2

APPENDIX C

GROUNDSURE DATA & HISTORIC MAPPING

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo Insight

Hale View Road

Order Details

Date: 24/03/2021

Your ref: 4165

Our Ref: CMAPS-AAG-949218-4165-240321EDRGEO

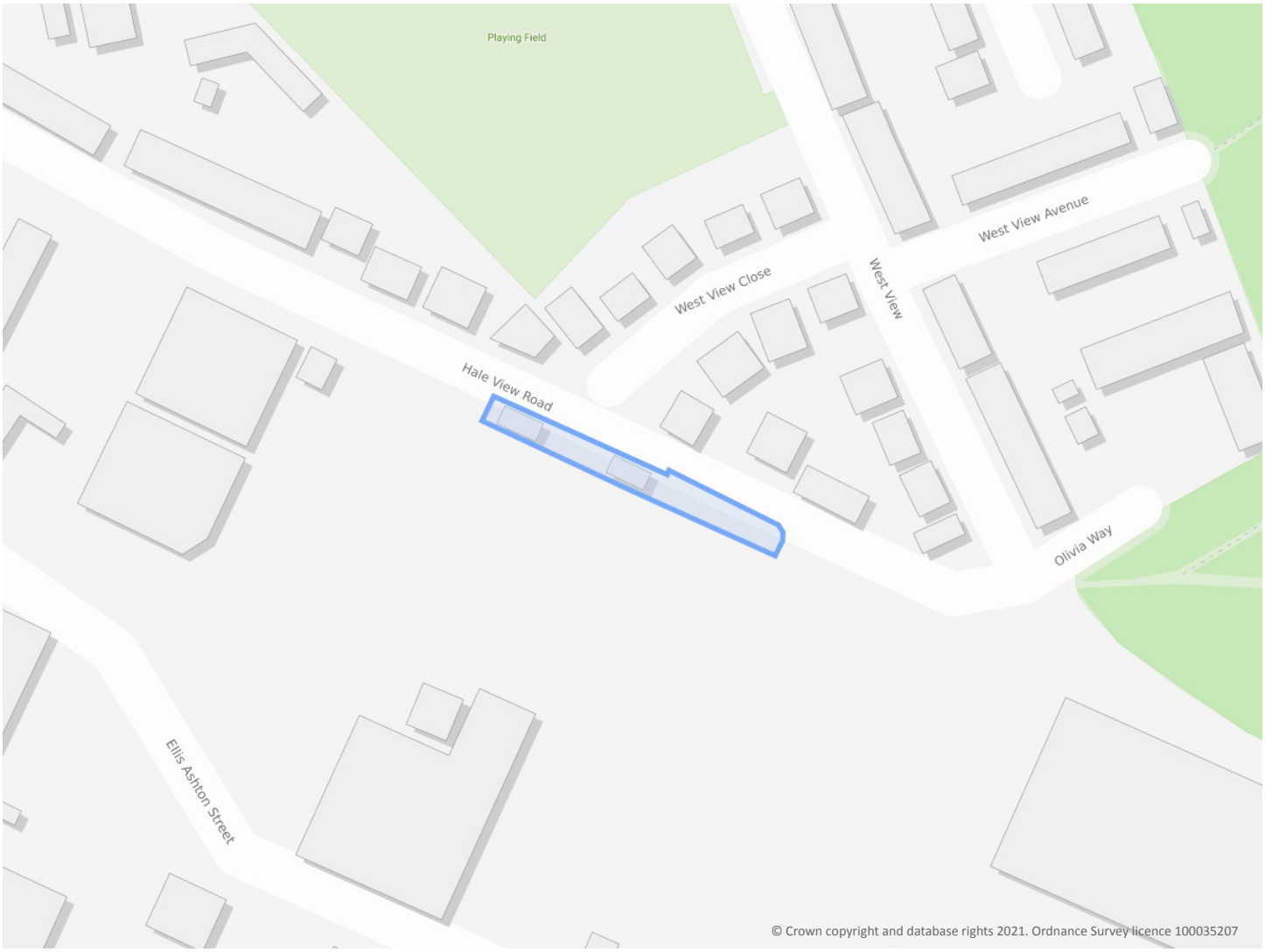
Client: CENTREMAPS

Site Details

Location: 345501 390552

Area: 0.07 ha

Authority: Knowsley Metropolitan Borough Council



Summary of findings p. 2

Aerial image p. 8

OS MasterMap site plan p.13

groundsure.com/insightuserguide

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

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	Historical industrial land uses	3	13	73	76	-
21	1.2	Historical tanks	0	4	25	16	-
23	1.3	Historical energy features	0	0	13	17	-
24	1.4	Historical petrol stations	0	0	0	0	-
24	1.5	Historical garages	0	0	0	0	-
25	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**
26	2.1	Historical industrial land uses	3	16	86	89	-
34	2.2	Historical tanks	0	9	65	31	-
38	2.3	Historical energy features	0	0	27	52	-
41	2.4	Historical petrol stations	0	0	0	0	-
41	2.5	Historical garages	0	0	0	0	-
Page	**Section**	**Waste and landfill**	**On site**	**0-50m**	**50-250m**	**250-500m**	**500-2000m**
42	3.1	Active or recent landfill	0	0	0	0	-
42	3.2	Historical landfill (BGS records)	0	0	1	0	-
43	3.3	Historical landfill (LA/mapping records)	0	0	2	0	-
43	3.4	Historical landfill (EA/NRW records)	0	1	2	1	-
44	3.5	Historical waste sites	0	0	0	7	-
45	3.6	Licensed waste sites	0	0	4	5	-
48	3.7	Waste exemptions	0	0	8	19	-
Page	**Section**	**Current industrial land use**	**On site**	**0-50m**	**50-250m**	**250-500m**	**500-2000m**
51	4.1	Recent industrial land uses	0	1	33	-	-
53	4.2	Current or recent petrol stations	0	0	0	0	-
54	4.3	Electricity cables	0	0	0	0	-
54	4.4	Gas pipelines	0	0	0	0	-
54	4.5	Sites determined as Contaminated Land	0	0	0	0	-

54	**4.6**	**Control of Major Accident Hazards (COMAH)**	1	0	0	0	-
55	4.7	Regulated explosive sites	0	0	0	0	-
55	**4.8**	**Hazardous substance storage/usage**	0	0	1	1	-
55	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
56	**4.10**	**Licensed industrial activities (Part A(1))**	0	0	1	1	-
56	**4.11**	**Licensed pollutant release (Part A(2)/B)**	0	0	5	5	-
57	4.12	Radioactive Substance Authorisations	0	0	0	0	-
58	**4.13**	**Licensed Discharges to controlled waters**	0	0	0	5	-
59	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
59	4.15	Pollutant release to public sewer	0	0	0	0	-
59	4.16	List 1 Dangerous Substances	0	0	0	0	-
59	4.17	List 2 Dangerous Substances	0	0	0	0	-
59	**4.18**	**Pollution Incidents (EA/NRW)**	0	0	4	13	-
61	4.19	Pollution inventory substances	0	0	0	0	-
62	4.20	Pollution inventory waste transfers	0	0	0	0	-
62	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
63	**5.1**	**Superficial aquifer**	Identified (within 500m)				
65	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
67	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
68	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
68	5.5	Groundwater vulnerability- local information	None (within 0m)				
69	5.6	Groundwater abstractions	0	0	0	0	0
70	**5.7**	**Surface water abstractions**	0	0	0	0	3
71	5.8	Potable abstractions	0	0	0	0	0
71	5.9	Source Protection Zones	0	0	0	0	-
71	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
72	6.1	Water Network (OS MasterMap)	0	0	0	-	-

72	6.2	Surface water features	0	0	0	-	-
73	**6.3**	**WFD Surface water body catchments**	1	-	-	-	-
73	**6.4**	**WFD Surface water bodies**	0	0	0	-	-
74	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
75	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
75	7.2	Historical Flood Events	0	0	0	-	-
75	7.3	Flood Defences	0	0	0	-	-
75	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
76	7.5	Flood Storage Areas	0	0	0	-	-
77	7.6	Flood Zone 2	None (within 50m)				
77	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
78	**8.1**	**Surface water flooding**	1 in 30 year, 0.1m - 0.3m (within 50m)				
Page	Section	Groundwater flooding					
80	**9.1**	**Groundwater flooding**	Low (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
81	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
82	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
82	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
82	10.4	Special Protection Areas (SPA)	0	0	0	0	0
82	10.5	National Nature Reserves (NNR)	0	0	0	0	0
83	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
83	**10.7**	**Designated Ancient Woodland**	0	0	0	0	2
83	10.8	Biosphere Reserves	0	0	0	0	0
83	10.9	Forest Parks	0	0	0	0	0
84	10.10	Marine Conservation Zones	0	0	0	0	0
84	**10.11**	**Green Belt**	0	0	1	0	2
84	10.12	Proposed Ramsar sites	0	0	0	0	0

84	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
85	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
85	10.15	Nitrate Sensitive Areas	0	0	0	0	0
85	**10.16**	**Nitrate Vulnerable Zones**	1	0	0	1	2
86	**10.17**	**SSSI Impact Risk Zones**	1	-	-	-	-
87	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
88	11.1	World Heritage Sites	0	0	0	-	-
88	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
88	11.3	National Parks	0	0	0	-	-
88	11.4	Listed Buildings	0	0	0	-	-
89	11.5	Conservation Areas	0	0	0	-	-
89	11.6	Scheduled Ancient Monuments	0	0	0	-	-
89	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
90	**12.1**	**Agricultural Land Classification**	Urban (within 250m)				
91	12.2	Open Access Land	0	0	0	-	-
91	**12.3**	**Tree Felling Licences**	0	0	2	-	-
91	12.4	Environmental Stewardship Schemes	0	0	0	-	-
91	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
92	**13.1**	**Priority Habitat Inventory**	0	0	1	-	-
93	13.2	Habitat Networks	0	0	0	-	-
93	13.3	Open Mosaic Habitat	0	0	0	-	-
93	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
94	**14.1**	**10k Availability**	Identified (within 500m)				
95	14.2	Artificial and made ground (10k)	0	0	0	0	-
96	14.3	Superficial geology (10k)	0	0	0	0	-

96	14.4	Landslip (10k)	0	0	0	0	-
97	14.5	Bedrock geology (10k)	0	0	0	0	-
97	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
98	**15.1**	**50k Availability**	Identified (within 500m)				
99	15.2	Artificial and made ground (50k)	0	0	0	0	-
99	15.3	Artificial ground permeability (50k)	0	0	-	-	-
100	**15.4**	**Superficial geology (50k)**	1	0	0	0	-
101	**15.5**	**Superficial permeability (50k)**	Identified (within 50m)				
101	15.6	Landslip (50k)	0	0	0	0	-
101	15.7	Landslip permeability (50k)	None (within 50m)				
102	**15.8**	**Bedrock geology (50k)**	1	0	3	8	-
103	**15.9**	**Bedrock permeability (50k)**	Identified (within 50m)				
104	**15.10**	**Bedrock faults and other linear features (50k)**	1	0	7	23	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
106	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence					
107	**17.1**	**Shrink swell clays**	Very low (within 50m)				
108	**17.2**	**Running sands**	Very low (within 50m)				
109	**17.3**	**Compressible deposits**	Negligible (within 50m)				
110	**17.4**	**Collapsible deposits**	Very low (within 50m)				
111	**17.5**	**Landslides**	Very low (within 50m)				
112	**17.6**	**Ground dissolution of soluble rocks**	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
114	18.1	Natural cavities	0	0	0	0	-
115	**18.2**	**BritPits**	0	0	3	4	-
116	**18.3**	**Surface ground workings**	0	4	50	-	-
118	**18.4**	**Underground workings**	0	0	0	3	36
120	**18.5**	**Historical Mineral Planning Areas**	0	0	3	1	-

121	**18.6**	**Non-coal mining**	0	0	0	1	1
121	18.7	Mining cavities	0	0	0	0	0
121	18.8	JPB mining areas	None (within 0m)				
122	**18.9**	**Coal mining**	Identified (within 0m)				
122	18.10	Brine areas	None (within 0m)				
122	18.11	Gypsum areas	None (within 0m)				
122	18.12	Tin mining	None (within 0m)				
122	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
123	**19.1**	**Radon**	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
124	**20.1**	**BGS Estimated Background Soil Chemistry**	2	2	-	-	-
124	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
125	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
126	21.1	Underground railways (London)	0	0	0	-	-
126	21.2	Underground railways (Non-London)	0	0	0	-	-
127	21.3	Railway tunnels	0	0	0	-	-
127	**21.4**	**Historical railway and tunnel features**	6	3	38	-	-
129	21.5	Royal Mail tunnels	0	0	0	-	-
129	21.6	Historical railways	0	0	0	-	-
129	**21.7**	**Railways**	0	0	4	-	-
130	21.8	Crossrail 1	0	0	0	0	-
130	21.9	Crossrail 2	0	0	0	0	-
130	21.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 22/04/2019

Site Area: 0.07ha

Recent site history - 2015 aerial photograph

Capture Date: 11/06/2015

Site Area: 0.07ha

Recent site history - 2009 aerial photograph

Capture Date: 24/06/2009

Site Area: 0.07ha

Recent site history - 2005 aerial photograph

Capture Date: 02/09/2005

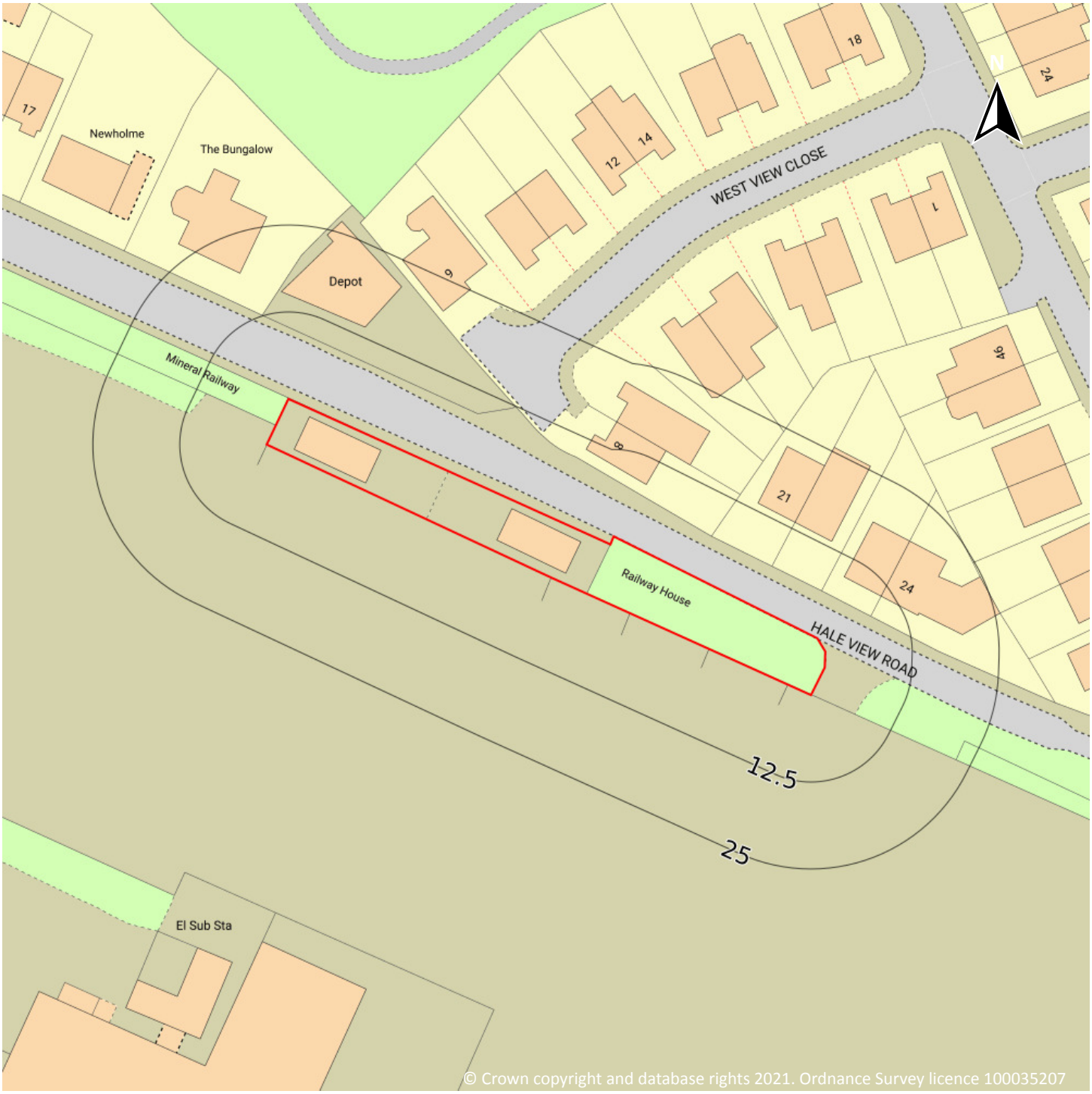
Site Area: 0.07ha

Recent site history - 2000 aerial photograph

Capture Date: 21/07/2000

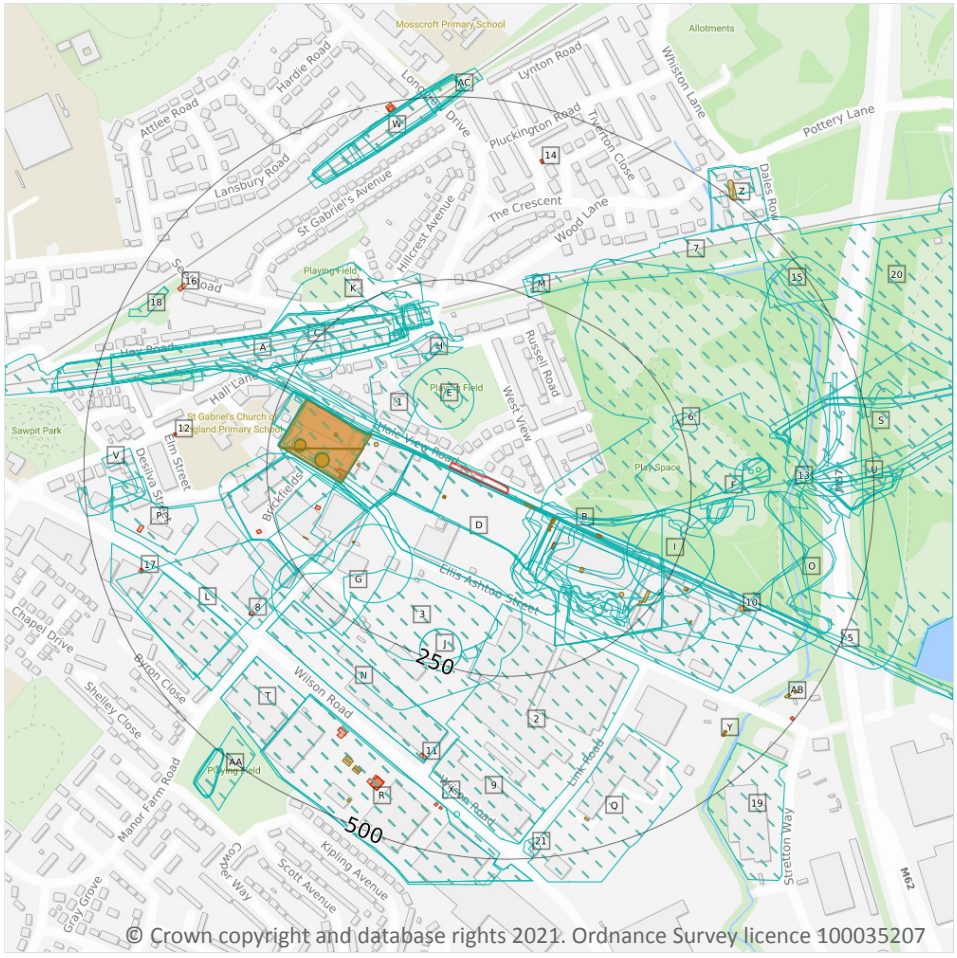
Site Area: 0.07ha

OS MasterMap site plan



Site Area: 0.07ha

1 Past land use



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Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

1.1 Historical industrial land uses

Records within 500m	165

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 14**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Railway Sidings**	**1955**	**905446**

ID	Location	Land use	Dates present	Group ID
B	**On site**	**Railway Sidings**	**1851**	**959646**
C	**On site**	**Railway Sidings**	**1891**	**924318**
D	1m SW	Unspecified Works	1966	873615
D	1m SW	Unspecified Works	1990	950861
D	1m SW	Unspecified Factory	1966 - 1975	969058
C	3m SW	Pottery	1906	818628
D	3m SW	Electric Lamp Works	1906 - 1938	851119
C	3m SW	Electric Lamp Works	1955	872339
D	4m SW	Electric Lamp Works	1925	846896
B	39m SE	Iron Works	1891	846158
B	42m SE	Unspecified Ground Workings	1906	969063
B	45m SE	Pits	1851	794106
E	47m N	Unspecified Quarry	1906 - 1925	850005
B	47m SE	Railway Sidings	1955	896484
F	48m E	Unspecified Disused Workings	1966	842253
C	52m W	Unspecified Works	1938	978330
C	53m NW	Unspecified Commercial/Industrial	1975	929619
B	58m SE	Railway Sidings	1906	916677
B	71m SE	Timber Yard and Saw Mill	1955	826725
B	73m SE	Iron Works	1906	889004
B	74m SE	Mineral Railway Sidings	1938	834012
E	74m N	Unspecified Quarry	1938	914467
1	77m NW	Unspecified Quarry	1891	891708
B	81m SE	Unspecified Depot	1990	910233
B	90m SE	Unspecified Mill	1966	810244
B	91m SE	Unspecified Depot	1975	961971
B	96m SE	Unspecified Ground Workings	1891	960123
G	103m SW	Unspecified Works	1966	978443

ID	Location	Land use	Dates present	Group ID
G	115m SW	Unspecified Tank	1966	904633
A	117m NW	Railway Sidings	1966 - 1975	894061
C	118m W	Gas Works	1891	802198
C	119m NW	Mineral Railway Sidings	1925	834017
C	119m W	Chair Making Works	1925	932280
C	120m W	Chair Making Works	1925	986489
C	120m W	Unspecified Commercial/Industrial	1906	920735
G	123m SW	Unspecified Warehouse	1990	807171
G	127m SW	Chair Making Works	1938	866159
G	127m SW	Brick Fields	1975	832437
G	129m SW	Unspecified Ground Workings	1906	799819
H	143m N	Unspecified Quarry	1966	978250
B	146m SE	Unspecified Ground Workings	1925 - 1938	954430
B	149m SE	Unspecified Ground Workings	1955	990672
H	149m N	Unspecified Quarry	1955	853733
2	151m S	Unspecified Works	1975	875478
3	152m SW	Unspecified Pit	1966	845345
B	156m SE	Unspecified Ground Workings	1906	904043
G	156m W	Chair Making Works	1955	990065
C	165m W	Unspecified Tank	1906 - 1925	977147
C	165m W	Unspecified Tank	1938	883928
H	166m N	Unspecified Ground Workings	1955	799818
C	166m W	Gasometer	1891	809737
C	167m W	Unspecified Tank	1925	939112
F	174m E	Colliery	1851	897691
I	178m E	Unspecified Quarry	1947	864888
I	178m E	Unspecified Quarry	1925	921136
A	183m N	Railway Sidings	1990	909884

ID	Location	Land use	Dates present	Group ID
H	183m N	Railway Building	1966 - 1975	949545
A	183m NW	Railway Sidings	1925 - 1938	856833
A	183m NW	Railway Sidings	1906	899919
H	183m N	Railway Building	1891	962629
H	184m N	Railway Building	1990	846068
H	188m N	Railway Building	1955	921171
H	189m N	Railway Station	1891	847138
H	190m N	Railway Station	1925	963563
H	190m N	Railway Building	1891	819912
H	191m N	Railway Station	1966	901957
H	192m N	Railway Station	1938 - 1955	890275
H	192m N	Railway Station	1906 - 1925	983933
A	195m NW	Railway Sidings	1925	976082
C	198m W	Gasometer	1891	809738
C	198m W	Unspecified Tank	1938	909229
C	198m W	Unspecified Tank	1906 - 1925	950957
J	204m SW	Unspecified Quarry	1990	854655
J	204m SW	Unspecified Quarry	1975	908063
4	204m NW	Coal Wharf	1906	794091
A	212m NW	Railway Sidings	1925	981614
J	213m S	Unspecified Pit	1966	960973
H	215m N	Railway Station	1851	961279
K	217m N	Sandstone Flags and Slate Quarry	1851	821266
B	219m SE	Unspecified Quarry	1906	934563
F	223m E	Unspecified Ground Workings	1966	799823
5	227m SE	Railway Sidings	1906	936496
K	227m NW	Unspecified Ground Workings	1955	799817
H	234m N	Unspecified Ground Workings	1955	799816

ID	Location	Land use	Dates present	Group ID
6	241m E	Unspecified Heap	1966	803336
F	241m E	Refuse Heap	1851	828767
7	249m NE	Railway Sidings	1891	979851
G	250m SW	Unspecified Pit	1966	839702
L	252m SW	Brick Works	1955	933903
F	253m E	Refuse Heap	1851	828768
G	253m SW	Brick Works	1938	987727
M	256m NE	Railway Building	1851	819909
F	261m E	Unspecified Heap	1925	973338
M	267m NE	Railway Building	1891 - 1906	850417
A	270m NW	Lime Kilns	1851	805536
M	270m NE	Railway Building	1851	863806
F	272m E	Unspecified Heap	1906	957262
F	273m E	Unspecified Heap	1938	959829
N	277m SW	Unspecified Commercial/Industrial	1975	796697
N	277m SW	Unspecified Works	1966	907728
F	311m E	Unspecified Heap	1891 - 1906	888571
F	320m E	Unspecified Heap	1938	975807
F	330m E	Unspecified Old Shaft	1891	806156
F	340m E	Coal Pit	1851	808455
9	342m S	Unspecified Factory	1966	821341
O	351m E	Refuse Heap	1947	828769
P	351m W	Unspecified Works	1966	830188
Q	352m SE	Unspecified Warehouse	1975	807172
O	356m E	Refuse Dump	1955	806807
A	358m W	Railway Building	1891	819906
R	364m SW	Unspecified Factory	1975	889546
R	364m SW	Unspecified Factory	1990	928277

ID	Location	Land use	Dates present	Group ID
S	364m E	Disused Colliery	1906	822317
R	366m SW	Unspecified Factory	1966	891030
S	367m E	Colliery	1851	937956
T	368m SW	Unspecified Warehouse	1975	855684
T	368m SW	Unspecified Warehouse	1990	963868
L	369m SW	Unspecified Depot	1966	818271
L	369m SW	Unspecified Commercial/Industrial	1975	796698
S	371m E	Unspecified Ground Workings	1906	943178
A	372m W	Unspecified Ground Workings	1906 - 1925	864120
O	373m E	Unspecified Ground Workings	1966	799822
S	374m E	Unspecified Ground Workings	1925	980473
S	374m E	Unspecified Ground Workings	1947 - 1955	958639
S	376m E	Cuttings	1990	795646
S	380m E	Unspecified Works	1966	950790
13	382m E	Railway Sidings	1891	906767
U	406m E	Railway Sidings	1891	853428
U	413m E	Railway Sidings	1906	972574
V	417m W	Unspecified Ground Workings	1891	799814
W	418m NW	Cuttings	1925	875713
X	418m S	Coal Pits	1851	802130
W	418m NW	Cuttings	1891	919648
V	419m W	Unspecified Heap	1955	803337
W	421m NW	Cuttings	1938	968970
W	422m NW	Cuttings	1906 - 1925	901480
W	423m N	Cuttings	1990	848594
W	423m N	Cuttings	1966 - 1975	977176
W	424m NW	Cuttings	1955	913990
U	427m E	Unspecified Heap	1925	916108

ID	Location	Land use	Dates present	Group ID
U	427m E	Refuse Heap	1906	922796
U	427m E	Unspecified Heap	1947	952651
W	427m N	Cuttings	1990	857748
15	435m NE	Garage	1955	844119
U	437m E	Unspecified Heap	1955	896043
W	437m N	Cuttings	1966 - 1975	868854
W	437m N	Cuttings	1990	944471
U	440m E	Refuse Heap	1966	857891
X	440m S	Coal Pits	1851	802131
Z	447m NE	Disused Pottery	1906	827372
18	452m NW	Unspecified Ground Workings	1955	799815
AA	462m SW	Colliery	1891	798239
19	464m SE	Unspecified Depot	1990	818270
S	466m E	Coal Pit	1851	808454
20	472m NE	Brick Works	1955	850733
21	473m S	Unspecified Heap	1966	803345
AC	481m N	Cuttings	1891	933054
Z	484m NE	Pottery	1851	818630
U	484m E	Refuse Heap	1990	962218
AC	489m N	Cuttings	1990	977177
AA	495m SW	Unspecified Heap	1906 - 1925	924490
AA	495m SW	Unspecified Heap	1938	960005
AA	496m SW	Unspecified Heap	1955	909535
AA	498m SW	Unspecified Heap	1925	930091

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	45

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 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 14**

ID	Location	Land use	Dates present	Group ID
B	28m SE	Tanks	1956 - 1993	138247
D	38m SW	Unspecified Tank	1972	128162
D	39m SW	Unspecified Tank	1956	135757
D	40m SW	Unspecified Tank	1956	140369
B	71m SE	Tanks	1984 - 1987	135231
B	72m SE	Unspecified Tank	1956 - 1969	128237
B	72m SE	Unspecified Tank	1956 - 1969	129744
B	72m SE	Tanks	1956 - 1977	149041
B	72m SE	Tanks	1956 - 1987	133265
B	73m SE	Unspecified Tank	1956 - 1969	148629
B	75m SE	Tanks	1956 - 1987	128398
B	75m SE	Unspecified Tank	1956 - 1969	137571
C	102m W	Unspecified Tank	1892 - 1927	132051
C	115m NW	Gas Works	1892 - 1907	127710
C	120m W	Gas Works	1892 - 1907	134205
C	123m W	Unspecified Tank	1927	113273
B	136m SE	Tanks	1984 - 1994	138798
B	143m SE	Tanks	1984 - 1994	128882
C	159m W	Unspecified Tank	1892 - 1927	132472
C	165m W	Unspecified Tank	1927	113272
C	165m W	Gasometer	1892 - 1907	129666

ID	Location	Land use	Dates present	Group ID
G	165m SW	Unspecified Tank	1969	112557
C	199m W	Unspecified Tank	1927	113270
C	199m W	Gasometer	1892 - 1907	139074
C	200m W	Gasometer	1907	108454
B	206m SE	Unspecified Tank	1892	112554
G	217m SW	Unspecified Tank	1956	112561
B	234m SE	Tanks	1968 - 1994	140269
B	234m SE	Tanks	1968 - 1994	149066
B	275m SE	Unspecified Tank	1977	112556
B	279m SE	Unspecified Tank	1984 - 1987	134558
B	279m SE	Tanks	1994	105834
B	306m SE	Unspecified Tank	1968 - 1969	148531
10	355m SE	Unspecified Tank	1994	112555
R	417m SW	Unspecified Tank	1980	112549
R	422m SW	Unspecified Tank	1980	112548
R	424m SW	Unspecified Tank	1980	112547
R	428m SW	Unspecified Tank	1980	112546
Y	440m SE	Unspecified Tank	1984 - 1987	137805
Y	441m SE	Tanks	1994	105836
Q	456m S	Unspecified Tank	1968 - 1987	140637
R	468m SW	Cooling Tank	1956	137956
AB	470m SE	Unspecified Tank	1977 - 1994	126529
AB	477m SE	Unspecified Tank	1977 - 1994	126456
Z	499m NE	Tanks	1892 - 1907	144883

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	30

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 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 14**

ID	Location	Land use	Dates present	Group ID
B	93m SE	Electricity Substation	1968 - 1994	71388
B	93m SE	Electricity Substation	1984 - 1987	80851
C	115m NW	Gas Works	1892 - 1907	71623
C	120m W	Gas Works	1892 - 1907	84990
B	136m SE	Electricity Substation	1956	70815
C	141m W	Electricity Substation	1956 - 1972	83065
C	141m W	Electricity Substation	1956 - 1969	68329
C	145m W	Electricity Substation	1994	73635
C	145m W	Electricity Substation	1994	83855
C	165m W	Gasometer	1892 - 1907	73034
G	185m W	Electricity Substation	1956 - 1972	69114
C	199m W	Gasometer	1892 - 1907	74800
C	200m W	Gasometer	1907	59647
G	272m W	Electricity Substation	1980 - 1994	71233
8	333m SW	Electricity Substation	1980 - 1994	68904
11	373m S	Electricity Substation	1956 - 1994	71591
12	376m W	Gas Governor	1994	72555
R	385m SW	Electricity Substation	1980 - 1994	73322
R	424m SW	Electricity Substation	1980	64974
R	425m SW	Electricity Substation	1956	71864
P	426m W	Electricity Substation	1980 - 1994	79598

ID	Location	Land use	Dates present	Group ID
R	426m SW	Electricity Substation	1956	69520
14	427m N	Electricity Substation	1977 - 1993	76708
X	433m S	Electricity Substation	1994	65487
16	436m NW	Electricity Substation	1972 - 1994	73774
X	437m S	Gas Governor	1994	83905
17	442m W	Electricity Substation	1956 - 1994	76846
W	486m N	Electricity Substation	1954	72510
W	487m N	Electricity Substation	1954 - 1997	65301
AB	494m SE	Electricity Substation	1977 - 1987	66813

This data is sourced from Ordnance Survey / Groundsure.

1.4 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, 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'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	0

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 un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

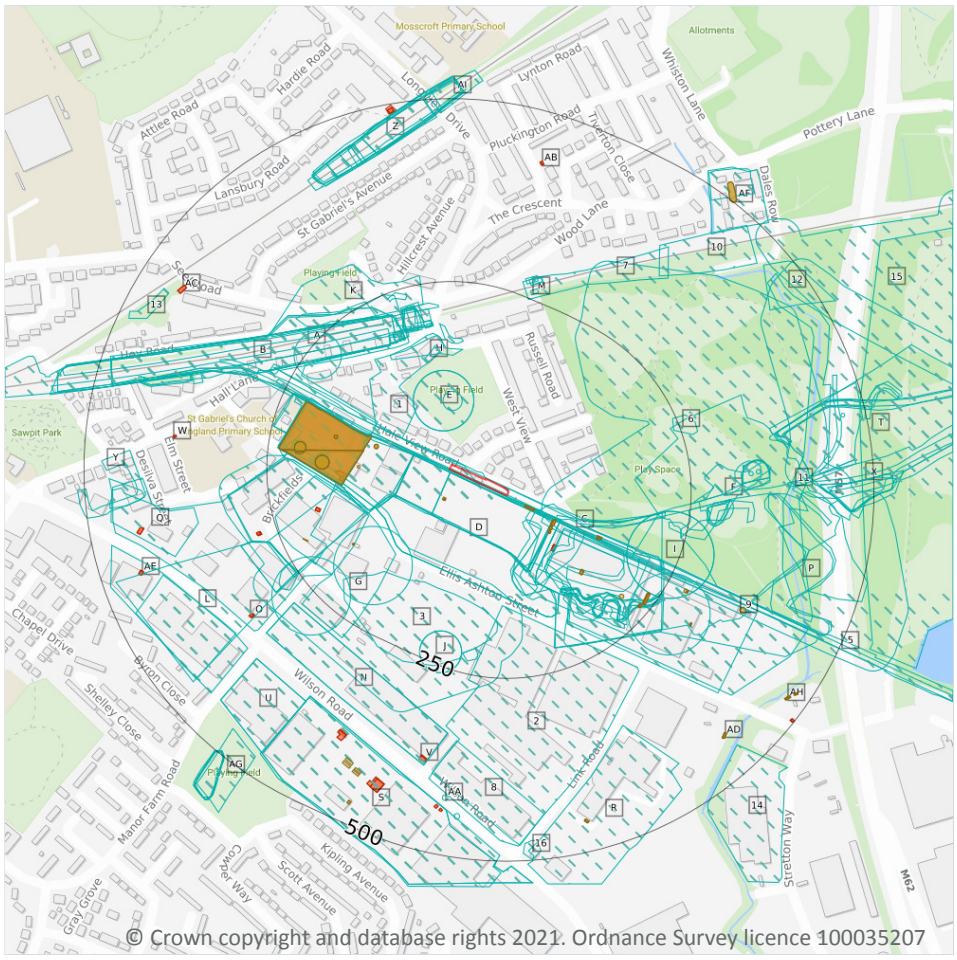
1.6 Historical military land

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



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Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

2.1 Historical industrial land uses

Records within 500m	194

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 26**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Railway Sidings**	**1891**	**924318**
B	**On site**	**Railway Sidings**	**1955**	**905446**
C	**On site**	**Railway Sidings**	**1851**	**959646**

ID	Location	Land Use	Date	Group ID
D	1m SW	Unspecified Factory	1975	969058
D	1m SW	Unspecified Works	1990	950861
D	1m SW	Unspecified Works	1966	873615
A	3m SW	Pottery	1906	818628
D	3m SW	Electric Lamp Works	1925	851119
D	3m SW	Electric Lamp Works	1906	851119
A	3m SW	Electric Lamp Works	1955	872339
D	4m SW	Electric Lamp Works	1938	851119
D	4m SW	Electric Lamp Works	1925	846896
C	39m SE	Iron Works	1891	846158
C	42m SE	Unspecified Ground Workings	1906	969063
C	45m SE	Pits	1851	794106
E	47m N	Unspecified Quarry	1925	850005
E	47m N	Unspecified Quarry	1906	850005
C	47m SE	Railway Sidings	1955	896484
F	48m E	Unspecified Disused Workings	1966	842253
A	52m W	Unspecified Works	1938	978330
A	53m NW	Unspecified Commercial/Industrial	1975	929619
A	53m NW	Unspecified Factory	1966	969058
C	58m SE	Railway Sidings	1906	916677
C	71m SE	Timber Yard and Saw Mill	1955	826725
C	73m SE	Iron Works	1906	889004
C	74m SE	Mineral Railway Sidings	1938	834012
E	74m N	Unspecified Quarry	1938	914467
1	77m NW	Unspecified Quarry	1891	891708
C	81m SE	Unspecified Depot	1990	910233
C	90m SE	Unspecified Mill	1966	810244
C	91m SE	Unspecified Depot	1975	961971

ID	Location	Land Use	Date	Group ID
C	96m SE	Unspecified Ground Workings	1891	960123
G	103m SW	Unspecified Works	1966	978443
G	115m SW	Unspecified Tank	1966	904633
B	117m NW	Railway Sidings	1966	894061
A	118m W	Gas Works	1891	802198
A	119m NW	Mineral Railway Sidings	1925	834017
A	119m W	Chair Making Works	1925	932280
A	120m W	Chair Making Works	1925	986489
A	120m W	Unspecified Commercial/Industrial	1906	920735
G	123m SW	Unspecified Warehouse	1990	807171
G	127m SW	Chair Making Works	1938	866159
G	127m SW	Brick Fields	1975	832437
G	129m SW	Unspecified Ground Workings	1906	799819
H	143m N	Unspecified Quarry	1966	978250
C	146m SE	Unspecified Ground Workings	1925	954430
C	147m SE	Unspecified Ground Workings	1938	954430
C	147m SE	Unspecified Ground Workings	1938	954430
C	149m SE	Unspecified Ground Workings	1955	990672
C	149m SE	Unspecified Ground Workings	1925	954430
H	149m N	Unspecified Quarry	1955	853733
2	151m S	Unspecified Works	1975	875478
3	152m SW	Unspecified Pit	1966	845345
C	156m SE	Unspecified Ground Workings	1906	904043
G	156m W	Chair Making Works	1955	990065
A	165m W	Unspecified Tank	1925	977147
A	165m W	Unspecified Tank	1906	977147
A	165m W	Unspecified Tank	1938	883928
H	166m N	Unspecified Ground Workings	1955	799818

ID	Location	Land Use	Date	Group ID
A	166m W	Gasometer	1891	809737
A	167m W	Unspecified Tank	1925	939112
F	174m E	Colliery	1851	897691
I	178m E	Unspecified Quarry	1947	864888
I	178m E	Unspecified Quarry	1925	921136
B	183m N	Railway Sidings	1975	894061
B	183m N	Railway Sidings	1990	909884
H	183m N	Railway Building	1975	949545
H	183m N	Railway Building	1966	949545
B	183m NW	Railway Sidings	1925	856833
B	183m NW	Railway Sidings	1906	899919
H	183m N	Railway Building	1891	962629
H	184m N	Railway Building	1990	846068
H	188m N	Railway Building	1955	921171
H	189m N	Railway Station	1891	847138
H	190m N	Railway Station	1925	963563
H	190m N	Railway Building	1891	819912
H	191m N	Railway Station	1966	901957
H	192m N	Railway Station	1938	890275
H	192m N	Railway Station	1925	983933
H	192m N	Railway Station	1906	983933
H	195m N	Railway Station	1955	890275
B	195m NW	Railway Sidings	1925	976082
B	196m N	Railway Sidings	1938	856833
A	198m W	Gasometer	1891	809738
A	198m W	Unspecified Tank	1938	909229
A	198m W	Unspecified Tank	1925	950957
A	199m W	Unspecified Tank	1925	950957

ID	Location	Land Use	Date	Group ID
A	199m W	Unspecified Tank	1906	950957
G	203m SW	Unspecified Tank	1966	904633
J	204m SW	Unspecified Quarry	1975	908063
J	204m SW	Unspecified Quarry	1990	854655
4	204m NW	Coal Wharf	1906	794091
B	212m NW	Railway Sidings	1925	981614
J	213m S	Unspecified Pit	1966	960973
H	215m N	Railway Station	1851	961279
K	217m N	Sandstone Flags and Slate Quarry	1851	821266
C	219m SE	Unspecified Quarry	1906	934563
F	223m E	Unspecified Ground Workings	1966	799823
5	227m SE	Railway Sidings	1906	936496
K	227m NW	Unspecified Ground Workings	1955	799817
H	234m N	Unspecified Ground Workings	1955	799816
6	241m E	Unspecified Heap	1966	803336
F	241m E	Refuse Heap	1851	828767
7	249m NE	Railway Sidings	1891	979851
G	250m SW	Unspecified Pit	1966	839702
L	252m SW	Brick Works	1955	933903
F	253m E	Refuse Heap	1851	828768
G	253m SW	Brick Works	1938	987727
G	253m SW	Brick Works	1938	987727
M	256m NE	Railway Building	1851	819909
F	261m E	Unspecified Heap	1925	973338
M	267m NE	Railway Building	1906	850417
M	268m NE	Railway Building	1891	850417
B	270m NW	Lime Kilns	1851	805536
M	270m NE	Railway Building	1851	863806

ID	Location	Land Use	Date	Group ID
F	272m E	Unspecified Heap	1906	957262
F	273m E	Unspecified Heap	1938	959829
F	273m E	Unspecified Heap	1938	959829
N	277m SW	Unspecified Commercial/Industrial	1975	796697
N	277m SW	Unspecified Works	1966	907728
F	311m E	Unspecified Heap	1891	888571
F	319m E	Unspecified Heap	1906	888571
F	320m E	Unspecified Heap	1938	975807
F	320m E	Unspecified Heap	1938	975807
F	330m E	Unspecified Old Shaft	1891	806156
F	340m E	Coal Pit	1851	808455
8	342m S	Unspecified Factory	1966	821341
P	351m E	Refuse Heap	1947	828769
Q	351m W	Unspecified Works	1966	830188
R	352m SE	Unspecified Warehouse	1975	807172
P	356m E	Refuse Dump	1955	806807
B	358m W	Railway Building	1891	819906
10	358m NE	Railway Sidings	1891	979851
S	364m SW	Unspecified Factory	1975	889546
S	364m SW	Unspecified Factory	1990	928277
T	364m E	Disused Colliery	1906	822317
S	366m SW	Unspecified Factory	1966	891030
T	367m E	Colliery	1851	937956
U	368m SW	Unspecified Warehouse	1975	855684
U	368m SW	Unspecified Warehouse	1990	963868
L	369m SW	Unspecified Depot	1966	818271
L	369m SW	Unspecified Commercial/Industrial	1975	796698
T	371m E	Unspecified Ground Workings	1906	943178

ID	Location	Land Use	Date	Group ID
B	372m W	Unspecified Ground Workings	1906	864120
P	373m E	Unspecified Ground Workings	1966	799822
T	374m E	Unspecified Ground Workings	1925	980473
T	374m E	Unspecified Ground Workings	1947	958639
B	374m W	Unspecified Ground Workings	1925	864120
T	376m E	Cuttings	1990	795646
T	377m E	Unspecified Ground Workings	1955	958639
T	380m E	Unspecified Works	1966	950790
11	382m E	Railway Sidings	1891	906767
X	406m E	Railway Sidings	1891	853428
X	413m E	Railway Sidings	1906	972574
Y	417m W	Unspecified Ground Workings	1891	799814
Z	418m NW	Cuttings	1925	875713
AA	418m S	Coal Pits	1851	802130
Z	418m NW	Cuttings	1891	919648
Y	419m W	Unspecified Heap	1955	803337
Z	421m NW	Cuttings	1938	968970
Z	422m NW	Cuttings	1925	901480
Z	422m NW	Cuttings	1906	901480
Z	423m N	Cuttings	1975	977176
Z	423m N	Cuttings	1990	848594
Z	423m N	Cuttings	1966	977176
Z	424m NW	Cuttings	1955	913990
X	427m E	Unspecified Heap	1947	952651
X	427m E	Unspecified Heap	1925	916108
X	427m E	Refuse Heap	1906	922796
Z	427m N	Cuttings	1990	857748
12	435m NE	Garage	1955	844119

ID	Location	Land Use	Date	Group ID
X	437m E	Unspecified Heap	1955	896043
Z	437m N	Cuttings	1975	868854
Z	437m N	Cuttings	1990	944471
Z	437m N	Cuttings	1966	868854
X	440m E	Refuse Heap	1966	857891
AA	440m S	Coal Pits	1851	802131
AF	447m NE	Disused Pottery	1906	827372
13	452m NW	Unspecified Ground Workings	1955	799815
AG	462m SW	Colliery	1891	798239
14	464m SE	Unspecified Depot	1990	818270
T	466m E	Coal Pit	1851	808454
15	472m NE	Brick Works	1955	850733
16	473m S	Unspecified Heap	1966	803345
AI	481m N	Cuttings	1891	933054
AF	484m NE	Pottery	1851	818630
X	484m E	Refuse Heap	1990	962218
AI	489m N	Cuttings	1990	977177
AG	495m SW	Unspecified Heap	1925	924490
AG	495m SW	Unspecified Heap	1906	924490
AG	495m SW	Unspecified Heap	1938	960005
AG	495m SW	Unspecified Heap	1938	960005
AG	496m SW	Unspecified Heap	1955	909535
AG	498m SW	Unspecified Heap	1925	930091

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	105

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 26**

ID	Location	Land Use	Date	Group ID
C	28m SE	Tanks	1988	138247
C	29m SE	Tanks	1969	138247
C	29m SE	Tanks	1956	138247
C	29m SE	Tanks	1977	138247
C	29m SE	Tanks	1956	138247
C	30m SE	Tanks	1993	138247
D	38m SW	Unspecified Tank	1972	128162
D	39m SW	Unspecified Tank	1956	135757
D	40m SW	Unspecified Tank	1956	140369
C	71m SE	Tanks	1984	135231
C	71m SE	Tanks	1987	135231
C	72m SE	Unspecified Tank	1959	128237
C	72m SE	Unspecified Tank	1969	128237
C	72m SE	Unspecified Tank	1956	128237
C	72m SE	Unspecified Tank	1959	129744
C	72m SE	Unspecified Tank	1969	129744
C	72m SE	Unspecified Tank	1956	129744
C	72m SE	Tanks	1956	149041
C	72m SE	Tanks	1977	149041
C	72m SE	Tanks	1968	149041
C	72m SE	Tanks	1984	133265
C	72m SE	Tanks	1987	133265
C	73m SE	Unspecified Tank	1959	148629

ID	Location	Land Use	Date	Group ID
C	73m SE	Unspecified Tank	1969	148629
C	73m SE	Unspecified Tank	1956	148629
C	73m SE	Tanks	1956	133265
C	73m SE	Tanks	1977	133265
C	73m SE	Tanks	1968	133265
C	75m SE	Tanks	1984	128398
C	75m SE	Tanks	1987	128398
C	75m SE	Unspecified Tank	1959	137571
C	75m SE	Tanks	1956	128398
C	75m SE	Tanks	1977	128398
C	75m SE	Tanks	1968	128398
C	75m SE	Unspecified Tank	1969	137571
C	75m SE	Unspecified Tank	1956	137571
A	102m W	Unspecified Tank	1892	132051
A	102m W	Unspecified Tank	1907	132051
A	102m W	Unspecified Tank	1927	132051
A	115m NW	Gas Works	1892	127710
A	115m NW	Gas Works	1907	127710
A	120m W	Gas Works	1892	134205
A	120m W	Gas Works	1907	134205
A	123m W	Unspecified Tank	1927	113273
C	136m SE	Tanks	1984	138798
C	136m SE	Tanks	1987	138798
C	137m SE	Tanks	1994	138798
C	143m SE	Tanks	1994	128882
C	144m SE	Tanks	1984	128882
C	144m SE	Tanks	1987	128882
A	159m W	Unspecified Tank	1892	132472

ID	Location	Land Use	Date	Group ID
A	159m W	Unspecified Tank	1907	132472
A	159m W	Unspecified Tank	1927	132472
A	165m W	Gasometer	1892	129666
A	165m W	Gasometer	1907	129666
A	165m W	Unspecified Tank	1927	113272
G	165m SW	Unspecified Tank	1969	112557
A	199m W	Gasometer	1892	139074
A	199m W	Gasometer	1907	139074
A	199m W	Unspecified Tank	1927	113270
A	200m W	Gasometer	1907	108454
C	206m SE	Unspecified Tank	1892	112554
G	217m SW	Unspecified Tank	1956	112561
C	234m SE	Tanks	1984	140269
C	234m SE	Tanks	1984	149066
C	234m SE	Tanks	1987	149066
C	234m SE	Tanks	1987	140269
C	234m SE	Tanks	1994	149066
C	234m SE	Tanks	1994	140269
C	235m SE	Tanks	1977	149066
C	235m SE	Tanks	1968	149066
C	235m SE	Tanks	1969	140269
C	235m SE	Tanks	1977	140269
C	235m SE	Tanks	1968	140269
C	275m SE	Unspecified Tank	1977	112556
C	279m SE	Unspecified Tank	1984	134558
C	279m SE	Unspecified Tank	1987	134558
C	279m SE	Tanks	1994	105834
C	306m SE	Unspecified Tank	1968	148531

ID	Location	Land Use	Date	Group ID
C	306m SE	Unspecified Tank	1969	148531
9	355m SE	Unspecified Tank	1994	112555
S	417m SW	Unspecified Tank	1980	112549
S	422m SW	Unspecified Tank	1980	112548
S	424m SW	Unspecified Tank	1980	112547
S	428m SW	Unspecified Tank	1980	112546
AD	440m SE	Unspecified Tank	1984	137805
AD	440m SE	Unspecified Tank	1987	137805
AD	441m SE	Tanks	1994	105836
R	456m S	Unspecified Tank	1969	140637
R	456m S	Unspecified Tank	1984	140637
R	456m S	Unspecified Tank	1987	140637
R	456m S	Unspecified Tank	1977	140637
R	456m S	Unspecified Tank	1968	140637
S	468m SW	Cooling Tank	1956	137956
S	469m SW	Cooling Tank	1956	137956
AH	470m SE	Unspecified Tank	1984	126529
AH	470m SE	Unspecified Tank	1987	126529
AH	471m SE	Unspecified Tank	1994	126529
AH	472m SE	Unspecified Tank	1977	126529
AH	477m SE	Unspecified Tank	1984	126456
AH	477m SE	Unspecified Tank	1987	126456
AH	478m SE	Unspecified Tank	1994	126456
AH	478m SE	Unspecified Tank	1977	126456
AF	499m NE	Tanks	1892	144883
AF	499m NE	Tanks	1907	144883

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	79

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 26**

ID	Location	Land Use	Date	Group ID
C	93m SE	Electricity Substation	1994	71388
C	93m SE	Electricity Substation	1984	80851
C	93m SE	Electricity Substation	1987	80851
C	93m SE	Electricity Substation	1969	71388
C	93m SE	Electricity Substation	1977	71388
C	93m SE	Electricity Substation	1968	71388
A	115m NW	Gas Works	1892	71623
A	115m NW	Gas Works	1907	71623
A	120m W	Gas Works	1892	84990
A	120m W	Gas Works	1907	84990
C	136m SE	Electricity Substation	1956	70815
C	136m SE	Electricity Substation	1956	70815
A	141m W	Electricity Substation	1956	83065
A	141m W	Electricity Substation	1969	68329
A	141m W	Electricity Substation	1956	68329
A	144m W	Electricity Substation	1972	83065
A	145m W	Electricity Substation	1994	73635
A	145m W	Electricity Substation	1994	83855
A	165m W	Gasometer	1892	73034
A	165m W	Gasometer	1907	73034
G	185m W	Electricity Substation	1969	69114
G	185m W	Electricity Substation	1956	69114
G	185m W	Electricity Substation	1972	69114

ID	Location	Land Use	Date	Group ID
G	185m W	Electricity Substation	1956	69114
A	199m W	Gasometer	1892	74800
A	199m W	Gasometer	1907	74800
A	200m W	Gasometer	1907	59647
G	272m W	Electricity Substation	1980	71233
G	272m W	Electricity Substation	1980	71233
G	273m W	Electricity Substation	1994	71233
G	273m W	Electricity Substation	1994	71233
O	333m SW	Electricity Substation	1980	68904
O	333m SW	Electricity Substation	1980	68904
O	335m SW	Electricity Substation	1994	68904
O	335m SW	Electricity Substation	1994	68904
V	373m S	Electricity Substation	1980	71591
V	373m S	Electricity Substation	1980	71591
V	374m S	Electricity Substation	1956	71591
V	374m S	Electricity Substation	1994	71591
V	374m S	Electricity Substation	1994	71591
V	374m S	Electricity Substation	1956	71591
W	376m W	Gas Governor	1994	72555
W	376m W	Gas Governor	1994	72555
S	385m SW	Electricity Substation	1980	73322
S	385m SW	Electricity Substation	1980	73322
S	387m SW	Electricity Substation	1994	73322
S	387m SW	Electricity Substation	1994	73322
S	424m SW	Electricity Substation	1980	64974
S	424m SW	Electricity Substation	1980	64974
S	425m SW	Electricity Substation	1956	71864
Q	426m W	Electricity Substation	1980	79598

ID	Location	Land Use	Date	Group ID
Q	426m W	Electricity Substation	1980	79598
S	426m SW	Electricity Substation	1956	69520
Q	427m W	Electricity Substation	1994	79598
AB	427m N	Electricity Substation	1988	76708
AB	427m N	Electricity Substation	1993	76708
AB	428m N	Electricity Substation	1977	76708
AA	433m S	Electricity Substation	1994	65487
AA	433m S	Electricity Substation	1994	65487
AC	436m NW	Electricity Substation	1994	73774
AC	436m NW	Electricity Substation	1972	73774
AC	436m NW	Electricity Substation	1994	73774
AA	437m S	Gas Governor	1994	83905
AA	437m S	Gas Governor	1994	83905
AE	442m W	Electricity Substation	1980	76846
AE	442m W	Electricity Substation	1980	76846
AE	442m W	Electricity Substation	1956	76846
AE	442m W	Electricity Substation	1994	76846
AE	442m W	Electricity Substation	1994	76846
AE	442m W	Electricity Substation	1956	76846
Z	486m N	Electricity Substation	1954	72510
Z	487m N	Electricity Substation	1954	65301
Z	487m N	Electricity Substation	1974	65301
Z	487m N	Electricity Substation	1997	65301
Z	487m N	Electricity Substation	1994	65301
Z	487m N	Electricity Substation	1994	65301
AH	494m SE	Electricity Substation	1984	66813
AH	494m SE	Electricity Substation	1987	66813
AH	495m SE	Electricity Substation	1977	66813

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.

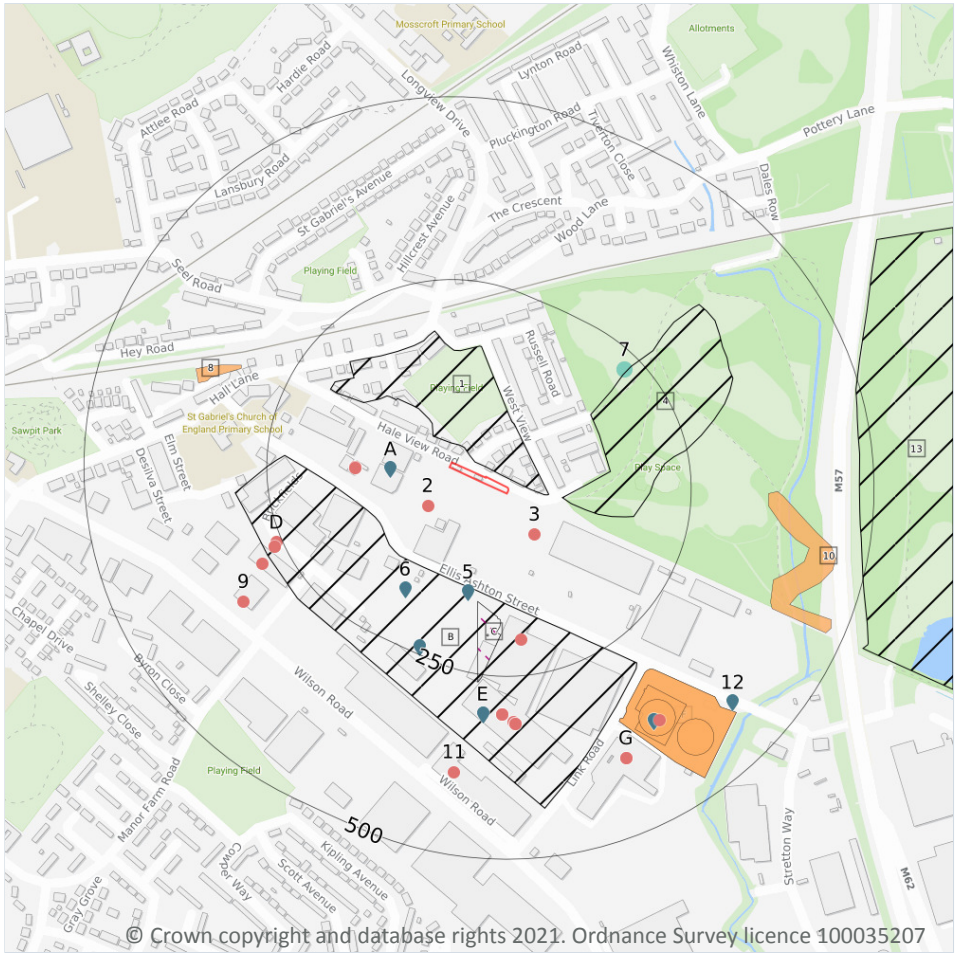
2.5 Historical garages

Records within 500m	0

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'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



Site Outline

Search buffers in metres (m)

- Historical landfill (EA/NRW)
- Historical landfill (BGS)
- Historical landfill (LA/OS)
- Historical waste sites
- Licensed waste sites
- 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	1

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.

Features are displayed on the Waste and landfill map on **page 42**

ID	Location	Address	BGS Number	Risk	Waste Type
7	226m NE	West View Tip, Huyton Quarry, Liverpool, M'Side	197	No risk to aquifer	N/A

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	2

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

Features are displayed on the Waste and landfill map on **page 42**

ID	Location	Site address	Source	Data type
C	153m S	Refuse Tip	1967 mapping	Polygon
C	194m S	Refuse Tip	1969 mapping	Polygon

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

3.4 Historical landfill (EA/NRW records)

Records within 500m	4

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 42**

ID	Location	Details		
1	11m NE	Site Address: Huyton Quarry, Knowsley, Merseyside Licence Holder Address: -	Waste Licence: - Site Reference: GDO M087 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded 01/10/1971 Last Recorded: -
4	74m E	Site Address: West View Tip, Knowsley, Merseyside Licence Holder Address: -	Waste Licence: - Site Reference: GDO M194 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Hoyton with Roby Urban District Council Licence Holder: - First Recorded 31/01/1971 Last Recorded: 01/01/1978

ID	Location	Details		
B	121m SW	Site Address: Brickfields, Knowsley, Merseyside Licence Holder Address: -	Waste Licence: - Site Reference: GDO M209 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Tushingham Metallic Brick Works Licence Holder: Tushingham Metallic Brick Works First Recorded - Last Recorded: -
13	480m E	Site Address: Coalgate Lane Landfill Site, Ellis Ashton Street, Huyton, Knowsley, Merseyside Licence Holder Address: -	Waste Licence: - Site Reference: R13/01, GDO 017, GDO M019, GDO 020 Waste Type: Inert, Industrial, Commercial, Household, Liquid sludge Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Huyton Urban District Council and Merseyside County Council Licence Holder: Huyton Urban District Council and Merseyside County Council First Recorded 01/01/1972 Last Recorded: 01/01/1983

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

3.5 Historical waste sites

Records within 500m	**7**

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

Features are displayed on the Waste and landfill map on **page 42**

ID	Location	Address	Further Details	Date
F	308m SE	Site Address: N/A	Type of Site: Refuse Destructor Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1984
F	308m SE	Site Address: N/A	Type of Site: Refuse Destructor Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1987
8	315m NW	Site Address: N/A	Type of Site: Scrap Metal Yard Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1972

ID	Location	Address	Further Details	Date
F	325m SE	Site Address: N/A	Type of Site: Refuse Destructor Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1994
F	344m SE	Site Address: Ashton Street, Ashton Street, Huyton, LIVERPOOL, Merseyside	Type of Site: Waste Transfer Station Planning application reference: 98/00187 Description: Waste transfer station with car parking and skip storage area. An application (ref: 98/00187) for Outline Planning permission was submitted to Knowsley B.C. on 9th April 1998. Data source: Historic Planning Application Data Type: Point	-
10	355m E	Site Address: N/A	Type of Site: Refuse Dump Planning application reference: N/A Description: N/A Data source: Historic Mapping Data Type: Polygon	1947
F	396m SE	Site Address: Ellis Ashton Street, Huyton Waste Transfer Station, Ellis Ashton Street,Huyton, LIVERPOOL, Merseyside, L36 6BN	Type of Site: Waste Transfer Station (Alterations) Planning application reference: 98/00012 Description: Alterations to provide improved facilities for mixed and segregated waste, provision of storage areas and alterations to access roads. An application (ref: 98/00012) for Detailed Planning permission was submitted to Knowsley B.C. on 22nd January 1998 . Data source: Historic Planning Application Data Type: Point	-

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

3.6 Licensed waste sites

Records within 500m	**9**

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

Features are displayed on the Waste and landfill map on **page 42**

ID	Location	Details		
A	81m W	Site Name: Robcliffe Ltd Vechicle Dismantling Site Address: Units 1/2, Ellis Ashton Street, Huyton Industrial Estate, Liverpool, Merseyside, L36 6BJ Correspondence Address: -	Type of Site: ELV Facility Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ROB006 EPR reference: EA/EPR/XP3294CL/A001 Operator: Robcliffe Limited Waste Management licence No: 50292 Annual Tonnage: 2500	Issue Date: 26/08/2004 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
5	145m S	Site Name: Mainsway Ltd Site Address: Land/premises At, Ellis Ashton Street, Huyton, Merseyside, L36 6AH Correspondence Address: -	Type of Site: Household, Commercial & Industrial Waste T Stn Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MAI002 EPR reference: EA/EPR/ZP3294CU/A001 Operator: Mainsway Ltd Waste Management licence No: 50376 Annual Tonnage: 75000	Issue Date: 01/04/2005 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
6	177m SW	Site Name: Huyton Quarry Salvage Site Address: Huyton Industrial Estate, Ellis Ashton Street, Huyton, Liverpool, Merseyside, L36 6BW Correspondence Address: -	Type of Site: ELV Facility Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: WIL204 EPR reference: EA/EPR/FP3694CW/A001 Operator: Willis Peter James Waste Management licence No: 50354 Annual Tonnage: 2500	Issue Date: 10/08/2005 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Suspended
B	241m SW	Site Name: Mainsway Ltd Site Address: Ellis Ashton Street, Huyton, Merseyside, L36 6AH Correspondence Address: Keith Lewis, Pearl Environmental Ltd, 13, Middleton Road, Reddish, Stockport, SK5 6SG	Type of Site: Household, Commercial & Industrial Waste T Stn Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MAI002 EPR reference: - Operator: Mainsway Ltd Waste Management licence No: 50376 Annual Tonnage: 0	Issue Date: 01/04/2005 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

ID	Location	Details		
E	304m S	Site Name: Restart Recycling Ltd Site Address: Units 1-3 The Lombard Centre, Link Road, Huyton, Liverpool, Merseyside, L36 6AP Correspondence Address: -	Type of Site: 75kte WEEE Treatment Facility Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: RRL004 EPR reference: EA/EPR/AB3603LX/A001 Operator: Restart Recycling Limited Waste Management licence No: 400736 Annual Tonnage: 74999	Issue Date: 04/11/2013 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Revoked
E	304m S	Site Name: Link Recycling Limited Site Address: Unit 1, 2 & 3, The Lombard Centre, Link Road, Huyton, Merseyside, L36 6AP Correspondence Address: -	Type of Site: 75kte Materials Recycling Facility Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LRL101 EPR reference: EA/EPR/CB3806XX/A001 Operator: Link Recycling Limited Waste Management licence No: 402341 Annual Tonnage: 75000	Issue Date: 22/07/2015 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
F	370m SE	Site Name: Huyton Waste Transfer Station & Waste Reception Centre Site Address: Ellis Ashton Street, Huyton, Liverpool, Merseyside, L36 6BJ Correspondence Address: Huyton Waste Transfer Station, Ellis Ashton Street, Huyton, Liverpool, Merseyside, L36 6BJ	Type of Site: Special Waste Transfer Station Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MWA006 EPR reference: - Operator: Mersey Waste Holdings Ltd Waste Management licence No: 53645 Annual Tonnage: 6250	Issue Date: 15/09/1995 Effective Date: - Modified:: 22/03/2002 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified
F	370m SE	Site Name: Huyton W T S / H W R C Site Address: Ellis Ashton Street, Huyton, Liverpool, Merseyside, L36 6BJ Correspondence Address: Port Of Liverpool Buildings, 2nd Floor, Pierhead, Liverpool, Merseyside, L3 1BY	Type of Site: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MWA006 EPR reference: - Operator: Mersey Waste Holdings Ltd Waste Management licence No: 53645 Annual Tonnage: 6250	Issue Date: 15/09/1995 Effective Date: - Modified:: 20/07/2006 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified

ID	Location	Details		
12	420m SE	Site Name: Huyton Waste Transfer Station Site Address: Huyton W T S, Ellis Ashton Street, Huyton Ind Est, Liverpool, Merseyside, L36 6BN Correspondence Address: -	Type of Site: Household, Commercial & Industrial Waste T Stn Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: VEO092 EPR reference: EA/EPR/EP3695SH/V006 Operator: Veolia Environmental Services Merseyside & Halton Ltd Waste Management licence No: 53645 Annual Tonnage: 500000	Issue Date: 15/09/1995 Effective Date: 11/11/2009 Modified:: 15/05/2013 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified

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

3.7 Waste exemptions

Records within 500m	**27**

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 42**

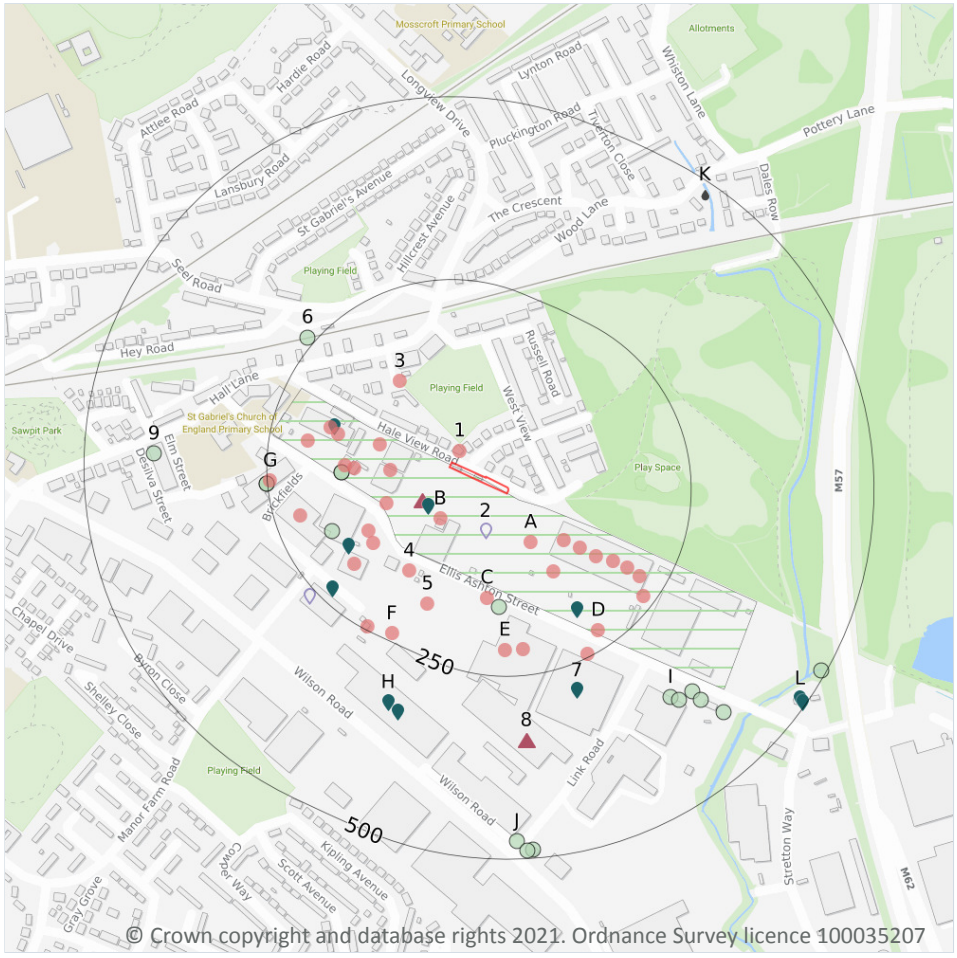
ID	Location	Site	Reference	Category	Sub-Category	Description
2	61m SW	ELLIS ASHTON STREET, LIVERPOOL, L36 6BW	WEX175096	Storing waste exemption	Not on a farm	Storage of waste in a secure place
3	68m SE	jk pallets ltd Ellis Ashton Street LIVERPOOL L36 6BN	EPR/SF0503XE/A001	Disposing of waste exemption	Non-Agricultural Waste Only	Burning waste in the open
A	129m W	Huyton Waste Transfer Station, Ellis Ashton Street, Huyton Industrial, Huyton, L36 6BN	WEX164263	Treating waste exemption	Not on a Farm	Preparatory treatments (baling, sorting, shredding etc)
A	129m W	Huyton Waste Transfer Station, Ellis Ashton Street, Huyton Industrial Estate, Huyton, L36 6BN	WEX164498	Treating waste exemption	Not on a Farm	Preparatory treatments (baling, sorting, shredding etc)
A	129m W	Huyton Waste Transfer Station, Ellis Ashton Street, Huyton Industrial Estate, Huyton, L36 6BN	WEX000883	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)

ID	Location	Site	Reference	Category	Sub-Category	Description
A	130m W	Locker Freight, Ellis Ashton Street, Liverpool, L36 6BN	WEX214211	Storing waste exemption	Not on a farm	Storage of waste in a secure place
A	130m W	Locker Freight, Ellis Ashton Street, Liverpool, L36 6BN	WEX214211	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
C	201m S	Carbon I.T Recycling Ltd, The Big Padlock, Unit 3, Office 10, L36 6BJ	WEX036881	Storing waste exemption	Not on a farm	Storage of waste in a secure place
D	259m SW	Unit 4 Brickfields LIVERPOOL L36 6HY	EPR/WF0608UM/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in a secure place
D	264m SW	4 Brickfields L36 6HY	EPR/WF0201GV/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in secure containers
D	264m SW	4 Brickfields L36 6HY	EPR/WF0201GV/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in a secure place
D	290m SW	UNIT 4, BRICKFIELDS, LIVERPOOL, L36 6HY	WEX148881	Storing waste exemption	Not on a farm	Storage of waste in secure containers
E	303m S	UNIT 1-3, LINK ROAD, HUYTON, LIVERPOOL, L36 6AP	WEX128635	Storing waste exemption	Not on a farm	Storage of waste in a secure place
E	303m S	UNIT 1-3, LINK ROAD, HUYTON, LIVERPOOL, L36 6AP	WEX128683	Storing waste exemption	Not on a farm	Storage of waste in a secure place
E	303m S	UNIT 1-3, LINK ROAD, HUYTON, LIVERPOOL, L36 6AP	WEX128624	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
E	303m S	UNIT 1-3, LINK ROAD, HUYTON, LIVERPOOL, L36 6AP	WEX128685	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
E	314m S	Unit 5 The Park Spring Lane South Malvern WR14 1AT	EA/EPR/VP3686WK/A001	Treating waste exemption	Non-Agricultural Waste Only	Repair or refurbishment of WEEE
E	316m S	Units 1-3 The Lombard Centre Link Road LIVERPOOL L36 6AP	EPR/DF0403GU/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in a secure place
E	316m S	Units 1-3 The Lombard Centre Link Road LIVERPOOL L36 6AP	EPR/DF0403GU/A001	Treating waste exemption	Non-Agricultural Waste Only	Recovery of textiles

ID	Location	Site	Reference	Category	Sub-Category	Description
E	316m S	Units 1-3 The Lombard Centre Link Road LIVERPOOL L36 6AP	EPR/DF0403GU/A001	Treating waste exemption	Non-Agricultural Waste Only	Preparatory treatments (baling, sorting, shredding etc)
E	316m S	Units 1-3 The Lombard Centre Link Road LIVERPOOL L36 6AP	EPR/DF0403GU/A001	Treating waste exemption	Non-Agricultural Waste Only	Recovery of scrap metal
9	337m SW	Unit 4, Wilson Business Centre, Wilson Road, Huyton Liverpook, L36 6AN	WEX116758	Storing waste exemption	Not on a farm	Storage of waste in a secure place
F	374m SE	Link Recycling LTD Ellis Ashton Street, Ellis Ashton Street, Liverpool, Liverpool, l366bj	WEX137630	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
11	388m S	11A-11B, WILSON ROAD, LIVERPOOL, L36 6AN	WEX246359	Storing waste exemption	Not on a farm	Storage of waste in a secure place
G	397m SE	UNIT 1 The Lombard Centre Link Road Huyton LIVERPOOL L36 6AP	EPR/ZH0814DE/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in a secure place
G	397m SE	Unit 1 & 2 The Lombard Centre Link Road Huyton Liverpool L36 6AP	EA/EPR/VP3686VG/A001	Treating waste exemption	Non-Agricultural Waste Only	Repair or refurbishment of WEEE
G	397m SE	UNIT 1 The Lombard Centre Link Road Huyton LIVERPOOL L36 6AP	EPR/GH0073JN/A001	Treating waste exemption	Non-Agricultural Waste Only	Treatment of waste toner cartridges by sorting, dismantling, cleaning or refilling

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

4 Current industrial land use



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Site Outline

Search buffers in metres (m)

- Recent industrial land uses
- Control of Major Accident Hazards
- Hazardous substance storage/usage
- Part A(1) industrial activities
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	34

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 51**

ID	Location	Company	Address	Activity	Category
1	19m NE	Depot	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
B	69m SW	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities
A	74m SE	Works	Merseyside, L36	Unspecified Works Or Factories	Industrial Features

ID	Location	Company	Address	Activity	Category
B	81m W	Robcliffe Ltd	Unit 1-2, Ellis Ashton Street, Liverpool, Merseyside, L36 6BJ	Vehicle Breakdown and Recovery Services	Personal, Consumer and Other Services
B	100m SW	Gas Governor	Merseyside, L36	Gas Features	Infrastructure and Facilities
A	100m SE	Link Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
B	100m W	Factory	Merseyside, L36	Unspecified Works Or Factories	Industrial Features
A	124m SE	Link Warehouses	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
A	124m SE	Link Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
B	130m W	Ellis Ashton Motor Company	F & A House, Ellis Ashton Street, Liverpool, Merseyside, L36 6BN	New Vehicles	Motoring
3	132m NW	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities
B	141m SW	Sand Hopper	Merseyside, L36	Hoppers and Silos	Farming
B	143m W	Knowsley Art Glass Ltd	Ellis Ashton Street, Liverpool, Merseyside, L36 6BN	Glass	Industrial Products
C	145m S	Mast	Merseyside, L36	Telecommunications Features	Infrastructure and Facilities
B	147m SW	Works	Merseyside, L36	Unspecified Works Or Factories	Industrial Features
A	149m SE	Link Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
4	151m SW	Works	Merseyside, L36	Unspecified Works Or Factories	Industrial Features
B	159m W	Locker Freight	Hale View Road, Liverpool, Merseyside, L36 6DD	Distribution and Haulage	Transport, Storage and Delivery
A	172m SE	Link Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
B	172m W	Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
5	182m SW	Scrap Yard	Merseyside, L36	Scrap Metal Merchants	Recycling Services

ID	Location	Company	Address	Activity	Category
B	186m SW	Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
A	193m SE	Link Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
B	197m W	Huyton Quarry	Merseyside, L36	Unspecified Quarries Or Mines	Extractive Industries
A	214m SE	Link Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
E	214m S	Big Padlock UK Ltd	Unit 3, Ellis Ashton Street, Liverpool, Merseyside, L36 6BJ	Container and Storage	Transport, Storage and Delivery
B	214m W	Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
E	215m S	Factory	Merseyside, L36	Unspecified Works Or Factories	Industrial Features
D	225m SE	Electricity Sub Station	Merseyside, L36	Electrical Features	Infrastructure and Facilities
A	233m SE	Tanks	Merseyside, L36	Tanks (Generic)	Industrial Features
F	240m SW	Depot	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
F	245m SW	Mainsway Ltd	Unit 18, Brickfields, Liverpool, Merseyside, L36 6HY	Construction and Tool Hire	Hire Services
D	245m SE	Link Warehouses	Merseyside, L36	Container and Storage	Transport, Storage and Delivery
G	246m W	Warehouse	Merseyside, L36	Container and Storage	Transport, Storage and Delivery

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0

Open, closed, under development and obsolete petrol stations.

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	1

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 51**

ID	Location	Company	Address	Operational status	Tier
A	**On site**	**Basf Printing Systems Ltd**	**Basf Printing Systems Ltd, Ellis Ashton Steet, Huyton, Liverpool, L36 6BN**	**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	2

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.

Features are displayed on the Current industrial land use map on **page 51**

ID	Location	Details	
B	60m SW	Application reference number: 99/00713/HSC Application status: Approved Application date: 22/10/1999 Address: Essex International Limited, Huyton Ind Est, Ellis Ashton Street, Huyton, Knowsley, Merseyside, England, L36 6BW	Details: Claim For Deemed Consent For The Storage Of Hazardous Substances Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
8	338m S	Application reference number: No Details Application status: Approved Application date: No Details Address: Lombard Shipping & Forwarding Ltd, Link Road, Huyton, Liverpool, Merseyside, England, L36 6AP	Details: No Details Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

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	2

Records of Part A(1) 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 51**

ID	Location	Details	
2	58m SW	Operator: CJ & LM DAVIES LTD Installation Name: THE VINNALS POULTRY SITE Process: INTENSIVE FARMING; > 40,000 POULTRY Permit Number: HP3630DX Original Permit Number: HP3630DX	EPR Reference: - Issue Date: 21/12/2016 Effective Date: 21/12/2016 Last date noted as effective: 26/10/2020 Status: SUPERCEDED
B	260m SW	Operator: LANGDAWE LTD Installation Name: RAPID PRECISION ENGINEERING - EPR/AP3704BM Process: SURFACE TREATING METALS AND PLASTICS; ELECTROLYTIC/CHEMICAL >30 CU M Permit Number: AP3704BM Original Permit Number: AP3704BM	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 26/10/2020 Status: DETERMINATION

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

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

Records within 500m	10

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 51**

ID	Location	Address	Details	
B	60m SW	Essex International, Ellis Ashton Street, Huyton Ind Est, L36 6BW	Process: Coating Processes Status: Historical Permit Permit Type: Part A2	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
B	167m W	Basf Coatings & Inks, 101 Tenth Avenue,Deeside Industrial Park, Deeside, Clwyd, CH5 2UA	Process: Manufacture of Coating Materials Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
B	176m SW	Cemex Ltd, Ellis Ashton Street, Huyton Industrial Estate, L36 6BJ	Process: Use of Bulk Cement Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

ID	Location	Address	Details	
D	185m SE	Knowsley Mbc, Link Rd, Knowsley, L36 6AP	Process: Timber Manufacture Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
B	231m SW	Rmc Concrete, Ellis Ashton Street, Huyton Industrial Estate, L36 6BW	Process: Use of Bulk Cement Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
7	285m S	Basf Ltd, Ellis Ashton St, Liverpool, L36 6BN	Process: Coating Processes Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
H	326m SW	Tricolour Printing Brickfields, Huyton Ind Est, Huyton, Liverpool, Merseyside, L33 6HY	Process: Printing Status: Revoked Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
H	333m SW	Bicc Connollys Ltd, Ellis Ashton St, Huyton, L36 6BW	Process: Coating Processes Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
L	488m SE	Tarmac (Concrete), Ellis Ashton Street, Huyton Industrial Estate, L36 6BJ	Process: Use of Bulk Cement Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified
L	494m SE	Tilcon Ltd, Ellis Ashton Street, Liverpool, L36 6BJ	Process: Perlite Processes Status: Historical 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	5

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

Features are displayed on the Current industrial land use map on **page 51**

ID	Location	Address	Details	
K	482m NE	MOLYNEUX DRIVE CSO 24009, 116 MOLYNEUX DRIVE, PRESCOT, MERSEYSIDE, L35 5DD`	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01KNW0002 Permit Version: 1 Receiving Water: PRESCOT BROOK	Status: REVOKED - UNSPECIFIED Issue date: 01/01/1995 Effective Date: 01/01/1995 Revocation Date: 25/01/2006
K	482m NE	MOLYNEUX DRIVE CSO 24009, 116 MOLYNEUX DRIVE, PRESCOT, MERSEYSIDE, L35 5DD`	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01KNW0021 Permit Version: 1 Receiving Water: -	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 01/04/1991 Revocation Date: 31/12/1994
K	482m NE	MOLYNEUX DRIVE CSO 24009, 116 MOLYNEUX DRIVE, PRESCOT, MERSEYSIDE, L35 5DD`	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 016993826 Permit Version: 2 Receiving Water: PRESCOT BROOK	Status: VARIED UNDER EPR 2010 Issue date: 18/06/2018 Effective Date: 18/06/2018 Revocation Date: -
K	482m NE	MOLYNEUX DRIVE CSO 24009, 116 MOLYNEUX DRIVE, PRESCOT, MERSEYSIDE, L35 5DD`	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 01KNW0021 Permit Version: 2 Receiving Water: PRESCOT BROOK	Status: CONSENT REVOKED OR REVISED - NEW CONSENT ISSUED (37(1)) Issue date: 01/01/1995 Effective Date: 01/01/1995 Revocation Date: 06/02/2006
K	482m NE	MOLYNEUX DRIVE CSO 24009, 116 MOLYNEUX DRIVE, PRESCOT, MERSEYSIDE, L35 5DD`	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 016993826 Permit Version: 1 Receiving Water: PRESCOT BROOK	Status: MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 07/02/2006 Effective Date: 07/02/2006 Revocation Date: 17/06/2018

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	17

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

Features are displayed on the Current industrial land use map on **page 51**

ID	Location	Details	
B	148m W	Incident Date: 17/08/2001 Incident Identification: 24888 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	148m W	Incident Date: 17/08/2001 Incident Identification: 24888 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
C	155m S	Incident Date: 25/02/2003 Incident Identification: 139343 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
B	183m SW	Incident Date: 19/06/2003 Incident Identification: 167274 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Other Atmospheric Pollutant or Effect	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
G	251m W	Incident Date: 12/09/2013 Incident Identification: 1158726 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
G	251m W	Incident Date: 12/09/2013 Incident Identification: 1158726 Pollutant: Specific Waste Materials Pollutant Description: Household Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
6	261m NW	Incident Date: 30/09/2001 Incident Identification: 33853 Pollutant: Oils and Fuel Pollutant Description: Gas and Fuel Oils	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
I	357m SE	Incident Date: 11/05/2004 Incident Identification: 235941 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 2 (Significant)
I	367m SE	Incident Date: 10/05/2001 Incident Identification: 5190 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)

ID	Location	Details	
I	370m SE	Incident Date: 08/09/2004 Incident Identification: 265261 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 2 (Significant)
I	387m SE	Incident Date: 06/11/2003 Incident Identification: 200290 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
9	404m W	Incident Date: 31/08/2001 Incident Identification: 28249 Pollutant: Specific Waste Materials Pollutant Description: Asbestos	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
I	420m SE	Incident Date: 13/05/2004 Incident Identification: 236347 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 2 (Significant)
J	475m S	Incident Date: 09/05/2001 Incident Identification: 4926 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
J	487m S	Incident Date: 25/06/2003 Incident Identification: 168695 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
J	489m S	Incident Date: 04/05/2001 Incident Identification: 4382 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
L	492m SE	Incident Date: 27/10/2015 Incident Identification: 1383783 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Food and Drink	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

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.

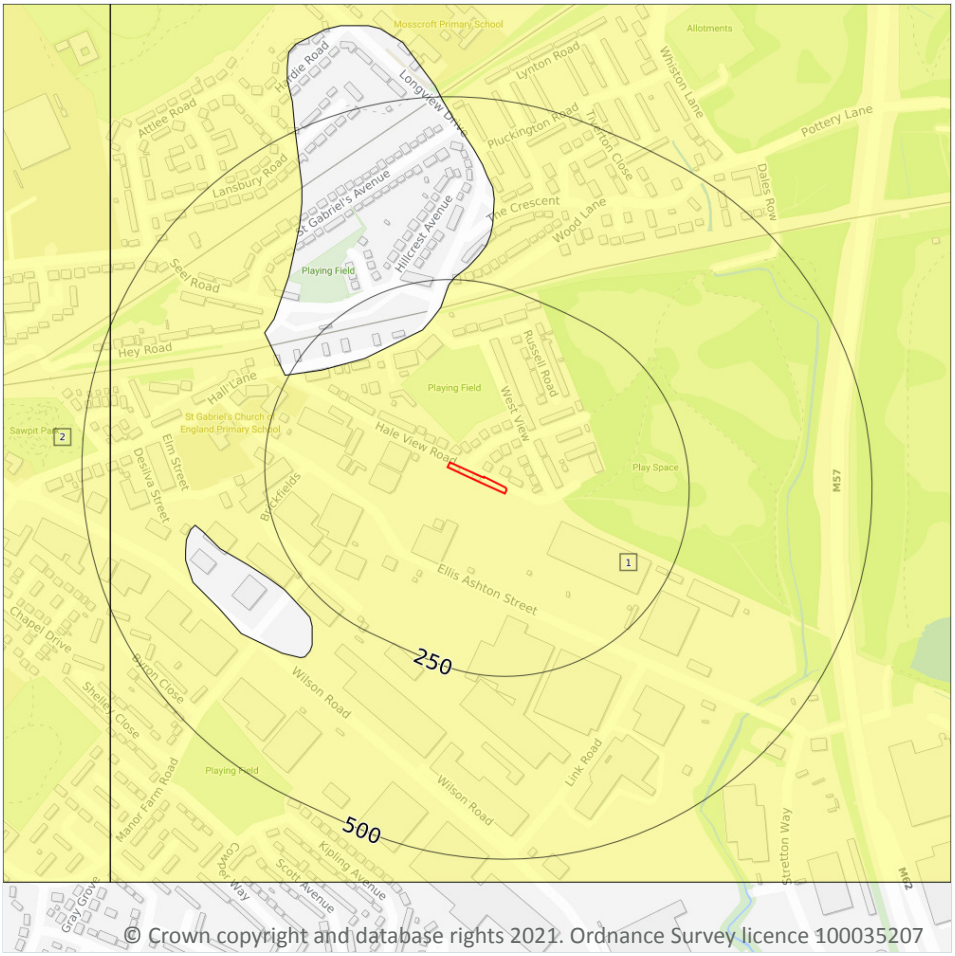
4.21 Pollution inventory radioactive waste

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



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Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive
- Unknown

5.1 Superficial aquifer

Records within 500m	2

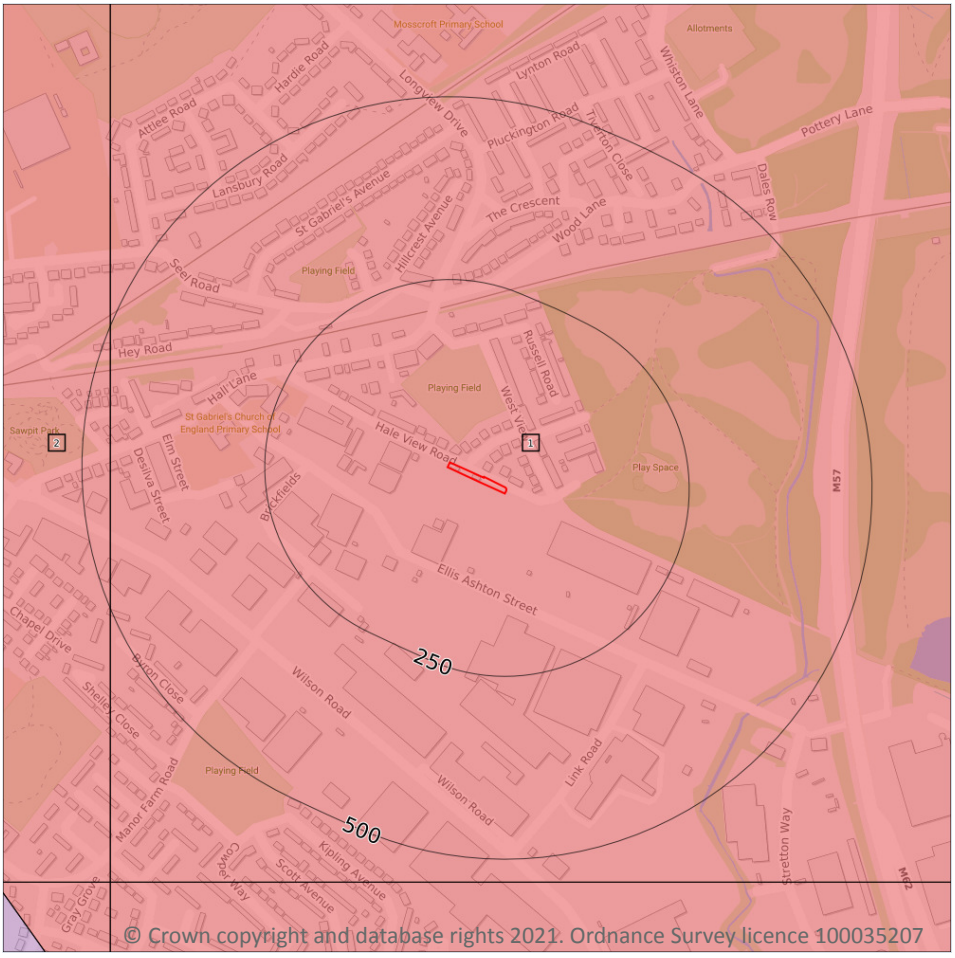
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 63**

ID	Location	Designation	Description
1	**On site**	**Secondary Undifferentiated**	**Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type**
2	461m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

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	2

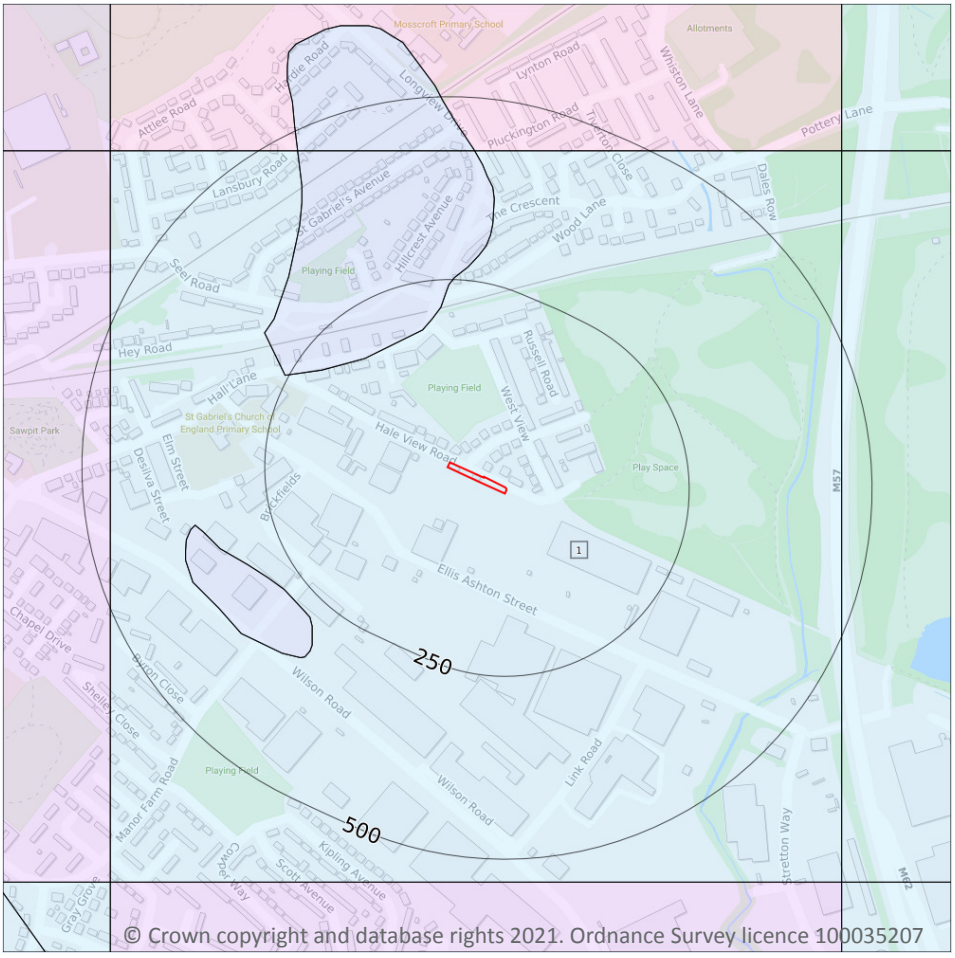
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 65**

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**
2	461m W	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 67**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Low Infiltration value: <40% Dilution value: 300-550mm/year**	**Vulnerability: Low Aquifer type: Secondary Thickness: <3m 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
- 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	0

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.

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

5.7 Surface water abstractions

Records within 2000m	3

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 69**

ID	Location	Details	
-	1781m SE	Status: Historical Licence No: 2569028018 Details: Spray Irrigation - Direct Direct Source: "Surface, Non-Tidal - North West Region" Point: "OCHRE & DOG CLOG BRKS, TARBOCK HALL FARM, TARBOCK, PRESCOT" Data Type: Line Name: T H CRITCHLEY & SON Easting: 346600 Northing: 389100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 13/05/1976 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1993 Version End Date: -
-	1781m SE	Status: Historical Licence No: 2569028018 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: OCHRE & DOG CLOG BRKS, TARBOCK HALL FARM, TARBOCK, PRESCOT Data Type: Line Name: T H CRITCHLEY & SON Easting: 346600 Northing: 389100	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 13/05/1976 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1993 Version End Date: -
-	1781m SE	Status: Historical Licence No: 2569028018 Details: Spray Irrigation - Direct Direct Source: Surface, Non-Tidal - North West Region Point: OCHRE AND DOG CLOG BROOKS TARBOCK HALL FARM PRESCOT Data Type: Line Name: T H CRITCHLEY & SON Easting: 346600 Northing: 389100	Annual Volume (m^3): 2098 Max Daily Volume (m^3): 636 Original Application No: - Original Start Date: 13/05/1976 Expiry Date: - Issue No: 100 Version Start Date: 01/04/1993 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m	0

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.

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.

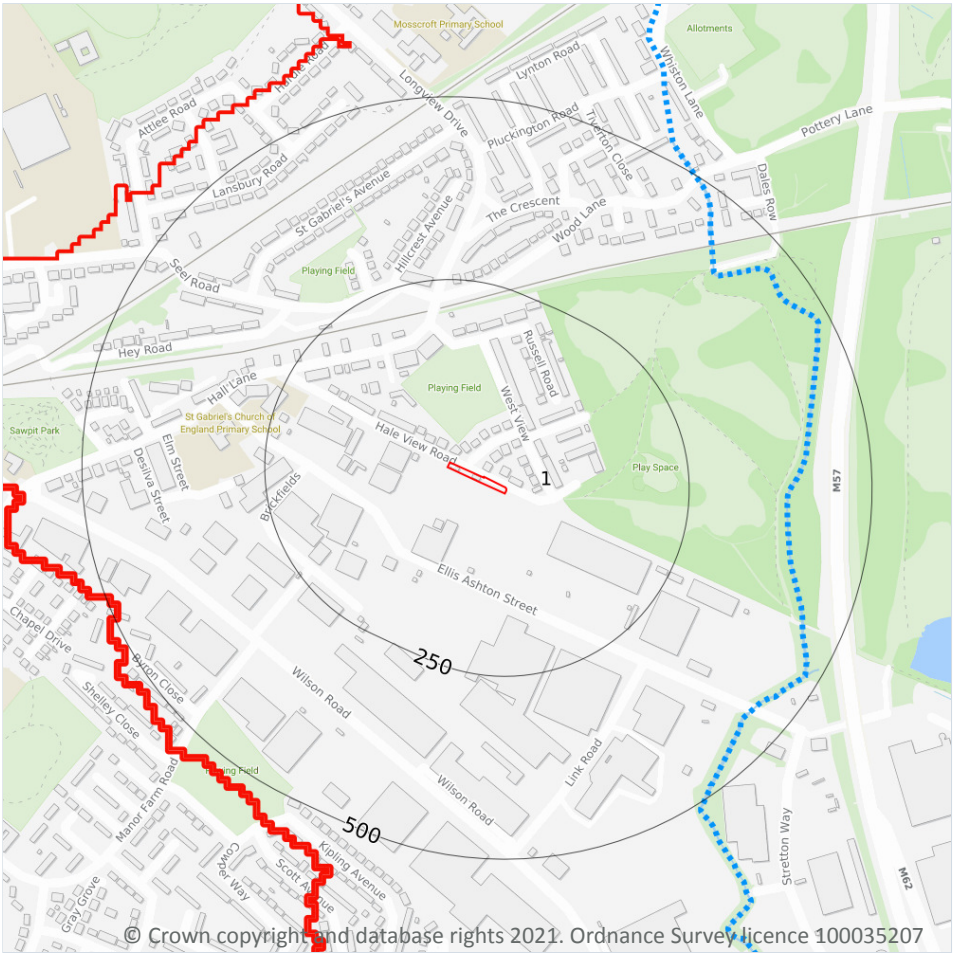
5.10 Source Protection Zones (confined aquifer)

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	0

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

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	0

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.

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 72**

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 72**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
2	385m E	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 78**

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 Ambiental 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	**Low**
Highest risk within 50m	**Low**

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 80**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations

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	2

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.

Features are displayed on the Environmental designations map on **page 81**

ID	Location	Name	Woodland Type
-	1532m SE	The Old Wood	Ancient & Semi-Natural Woodland
-	1618m SE	The Old Wood	Ancient & Semi-Natural Woodland

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	3

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

Features are displayed on the Environmental designations map on **page 81**

ID	Location	Name	Local Authority name
1	71m E	Merseyside and Greater Manchester	Knowsley
2	922m SE	Merseyside and Greater Manchester	Knowsley
3	1453m SW	Merseyside and Greater Manchester	Liverpool

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**
299m N	ALT NVZ	Surface Water	S642	Existing
1369m SW	Dittton Brook (Halewood to Mersey Estuary) NVZ	Surface Water	S640	Existing
1370m NW	ALT NVZ	Surface Water	S642	Existing

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

SSSI Impact Zones and Units

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 86**

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

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

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	0

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.

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

11.5 Conservation Areas

Records within 250m	0

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.

This data is sourced from English Heritage, 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 English Heritage, 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 English Heritage, 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	1

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 90**

ID	Location	Classification	Description
1	**On site**	**Urban**	**-**

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	2

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.

Features are displayed on the Agricultural designations map on **page 90**

ID	Location	Description	Reference	Application date
2	77m E	Selective Fell/Thin (Unconditional)	010/120/09-10	17/12/2009
3	110m E	Selective Fell/Thin (Unconditional)	010/120/09-10	17/12/2009

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment.

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	1

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 92**

ID	Location	Main Habitat	Other habitats
1	73m E	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.

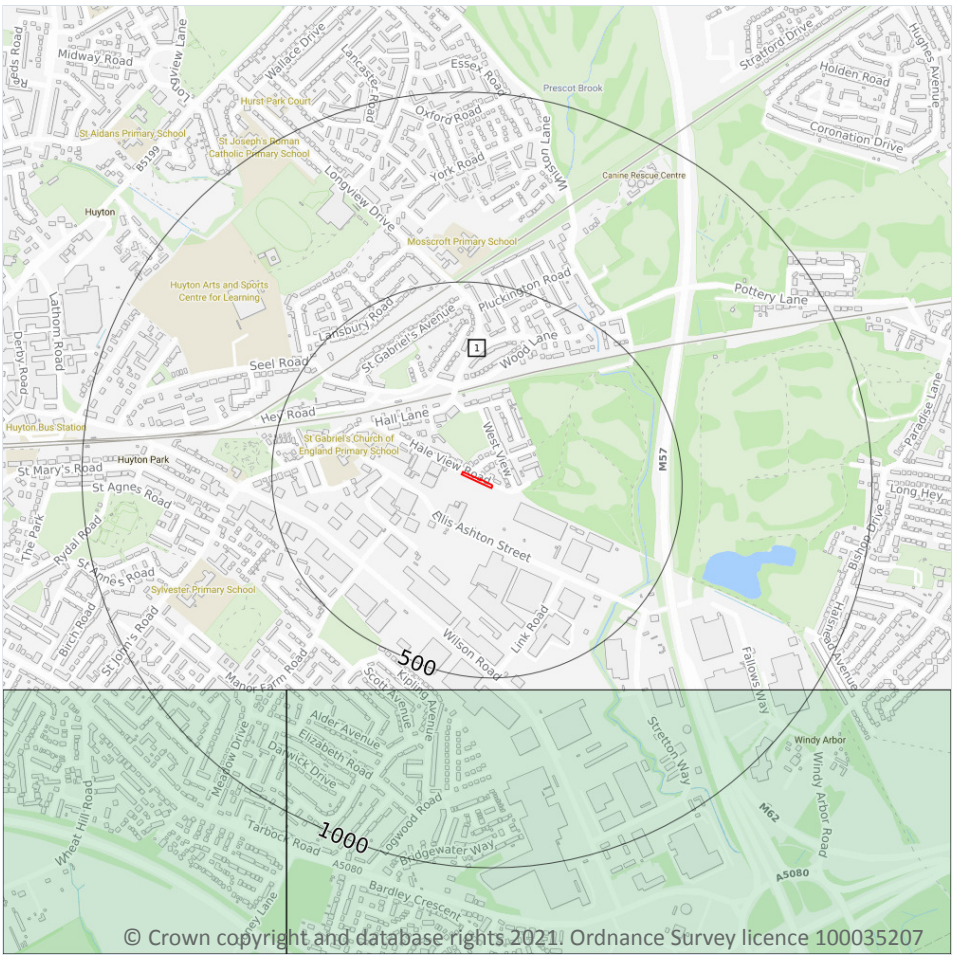
13.4 Limestone Pavement Orders

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



Site Outline

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

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 94**

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.

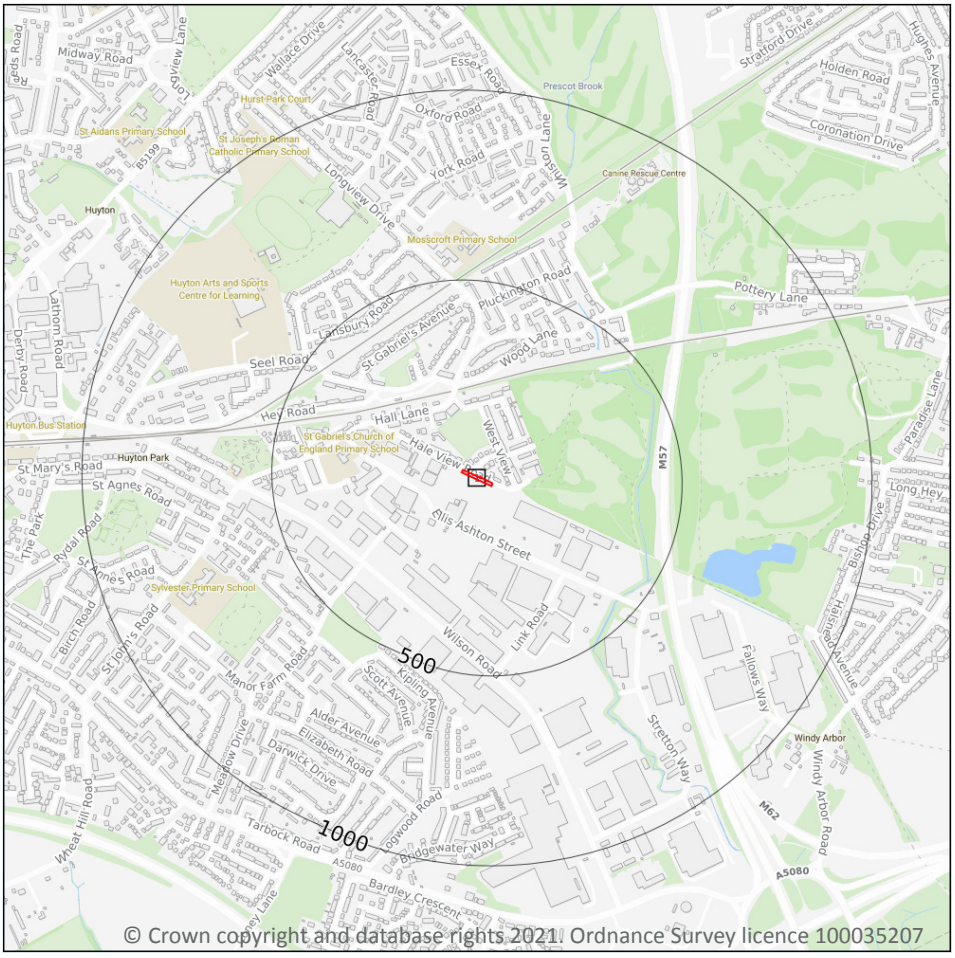
14.6 Bedrock faults and other linear features (10k)

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 98**

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.

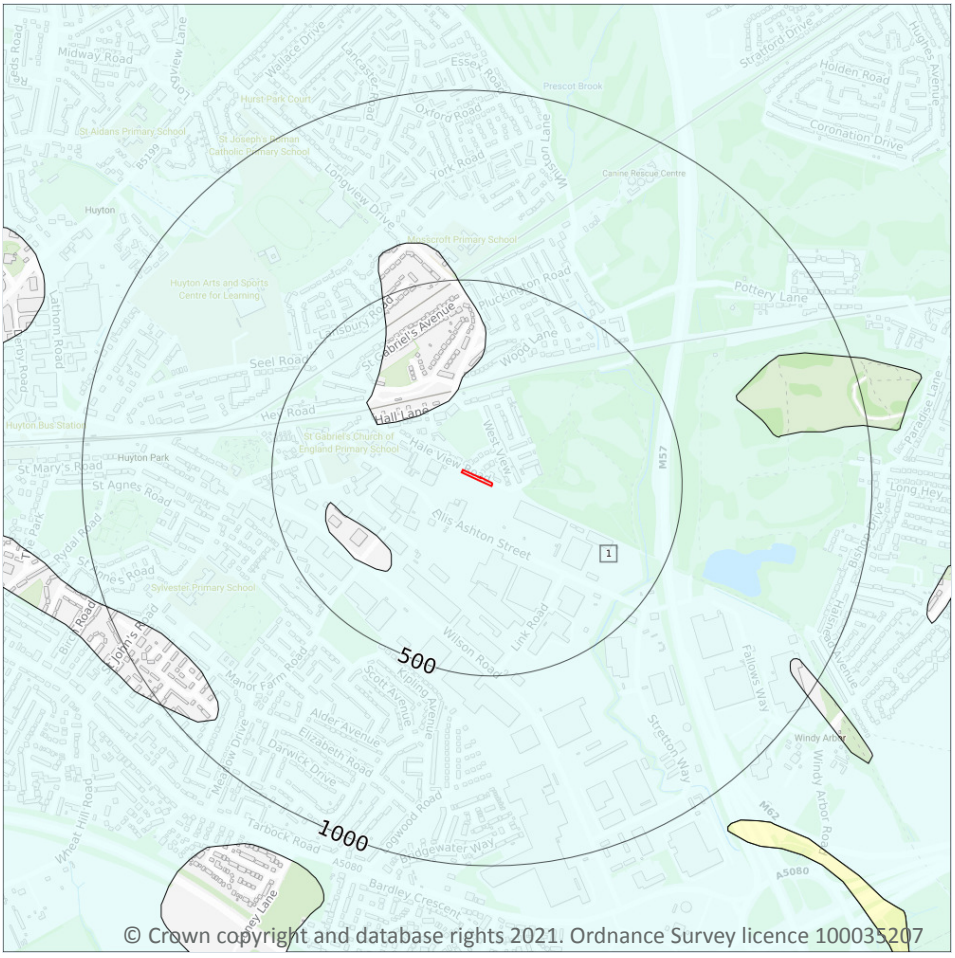
15.3 Artificial ground permeability (50k)

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	1

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 100**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TILLD-DMTN**	**TILL, DEVENSIAN**	**DIAMICTON**

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1

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).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**High**	**Low**

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.

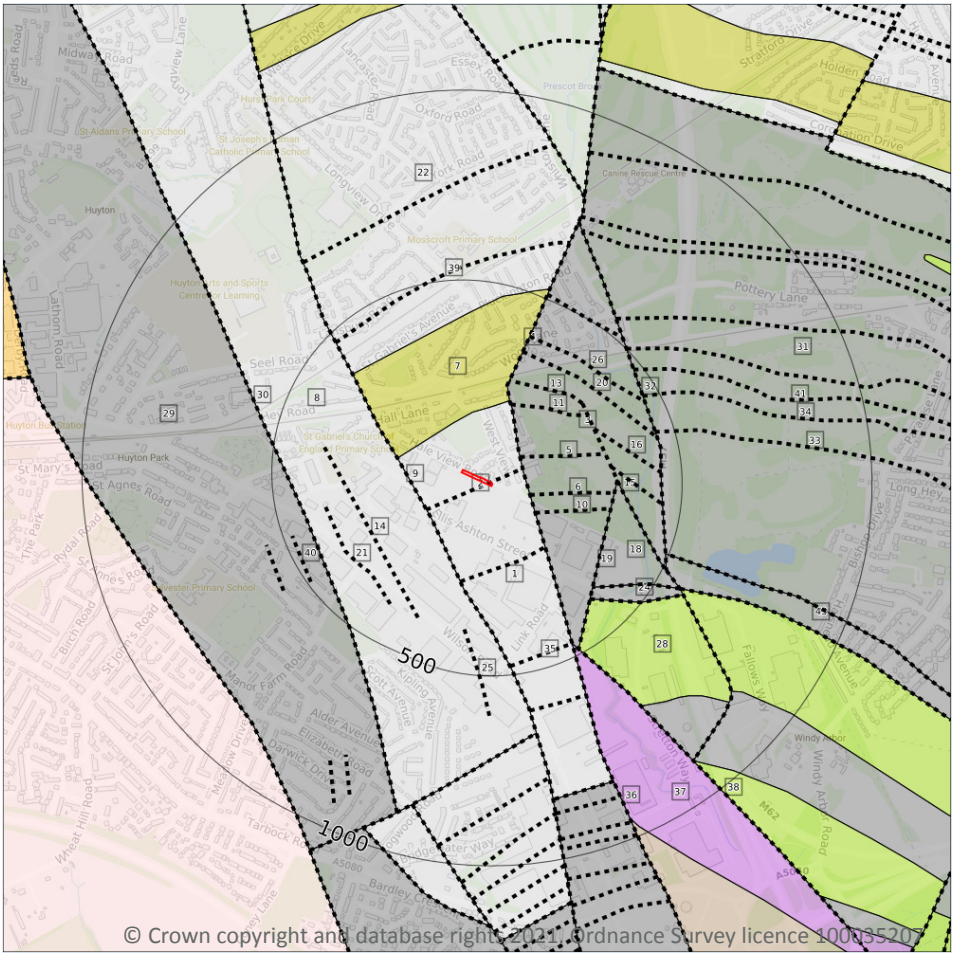
15.7 Landslip permeability (50k)

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	12

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 102**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**PLCM-MDSS**	**PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE**	**WESTPHALIAN**
3	87m E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

ID	Location	LEX Code	Description	Rock age
7	118m NW	PLCM-SDST	PENNINE LOWER COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
8	129m SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
18	319m E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
22	358m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
24	377m SE	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
28	395m SE	PMCM-SDST	PENNINE MIDDLE COAL MEASURES FORMATION - SANDSTONE	WESTPHALIAN
29	425m W	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
31	445m E	PMCM-MDSS	PENNINE MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
37	466m SE	ETM-MDSC	ETRURIA FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE	WESTPHALIAN
43	492m E	PMCM-MDSS	PENNINE MIDDLE 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	**1**

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**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	31

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 102**

ID	Location	Category	Description
2	**On site**	**ROCK**	**Coal seam, inferred**
4	87m E	FAULT	Fault, inferred, displacement unknown
5	101m NE	ROCK	Coal seam, inferred
6	103m E	ROCK	Coal seam, inferred
9	129m SW	FAULT	Fault, inferred
10	135m SE	ROCK	Coal seam, inferred
11	208m NE	ROCK	Coal seam, inferred
12	209m SE	ROCK	Coal seam, inferred
13	265m NE	ROCK	Coal seam, inferred
14	285m SW	FAULT	Fault, inferred
15	304m NE	FAULT	Fault, observed
16	305m NE	ROCK	Coal seam, inferred
17	317m E	ROCK	Coal seam, inferred
19	319m E	FAULT	Fault, inferred
20	347m NE	ROCK	Coal seam, inferred
21	357m SW	FAULT	Fault, inferred, displacement unknown
23	377m SE	FOSSIL_HORIZON	Marine band
25	384m S	ROCK	Coal seam, inferred
26	392m NE	ROCK	Coal seam, inferred
27	395m SE	ROCK	Coal seam, inferred
30	425m W	FOSSIL_HORIZON	Marine band
32	445m E	FAULT	Fault, observed
33	450m E	ROCK	Coal seam, inferred

ID	Location	Category	Description
34	459m NE	ROCK	Coal seam, inferred
35	462m S	ROCK	Coal seam, inferred
36	466m SE	FAULT	Fault, inferred
38	466m SE	FAULT	Fault, inferred
39	466m NW	ROCK	Coal seam, inferred
40	476m W	ROCK	Coal seam, inferred
41	478m NE	ROCK	Coal seam, inferred
42	492m E	FOSSIL_HORIZON	Marine band

This data is sourced from the British Geological Survey.

16 Boreholes

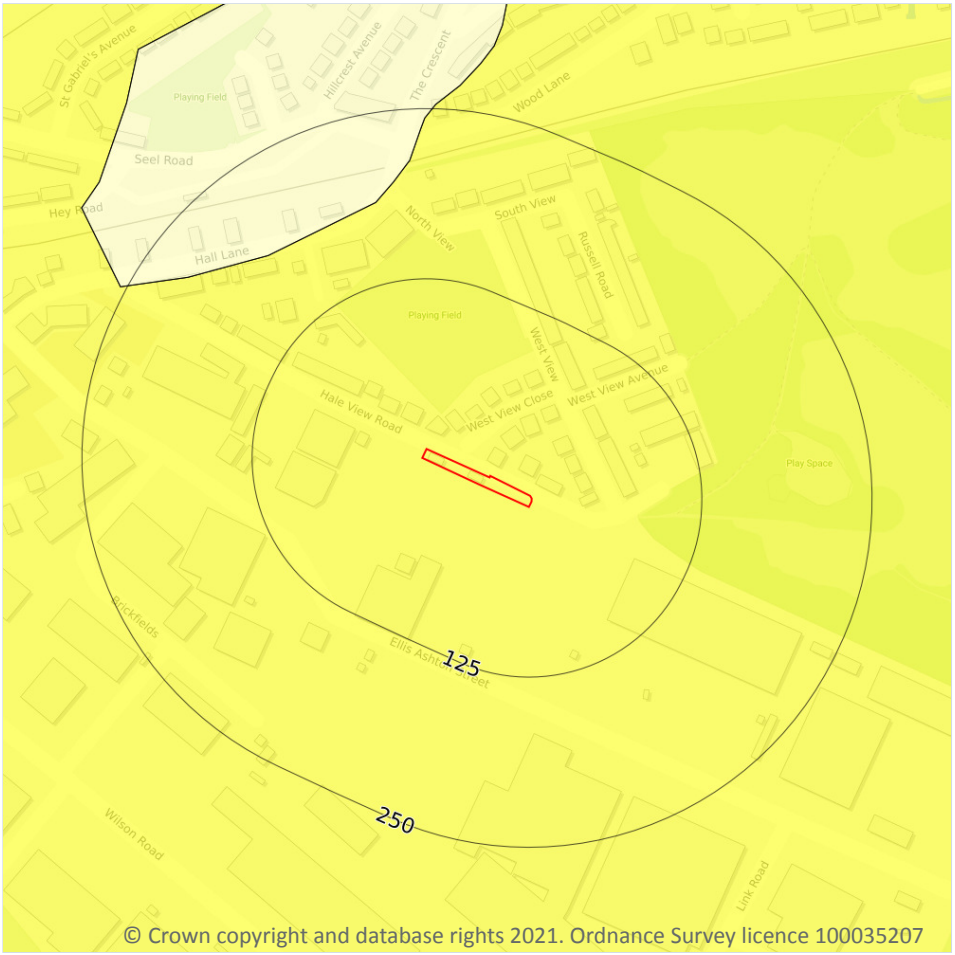
16.1 BGS Boreholes

Records within 250m	0

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.

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



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Site Outline

Search buffers in metres (m)

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

17.1 Shrink swell clays

Records within 50m	1

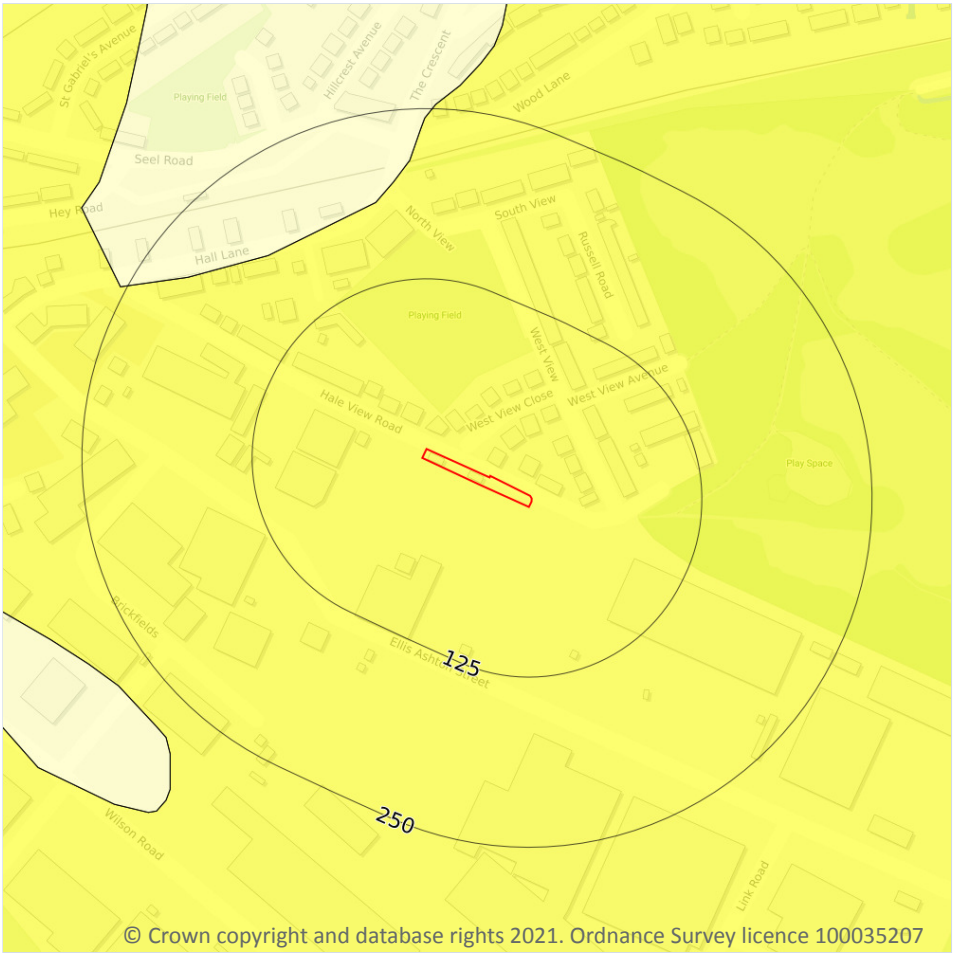
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 107**

Location	Hazard rating	Details
On site	**Very low**	**Ground conditions predominantly low plasticity.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

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

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 108**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits

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Site Outline

Search buffers in metres (m)

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

17.3 Compressible deposits

Records within 50m	1

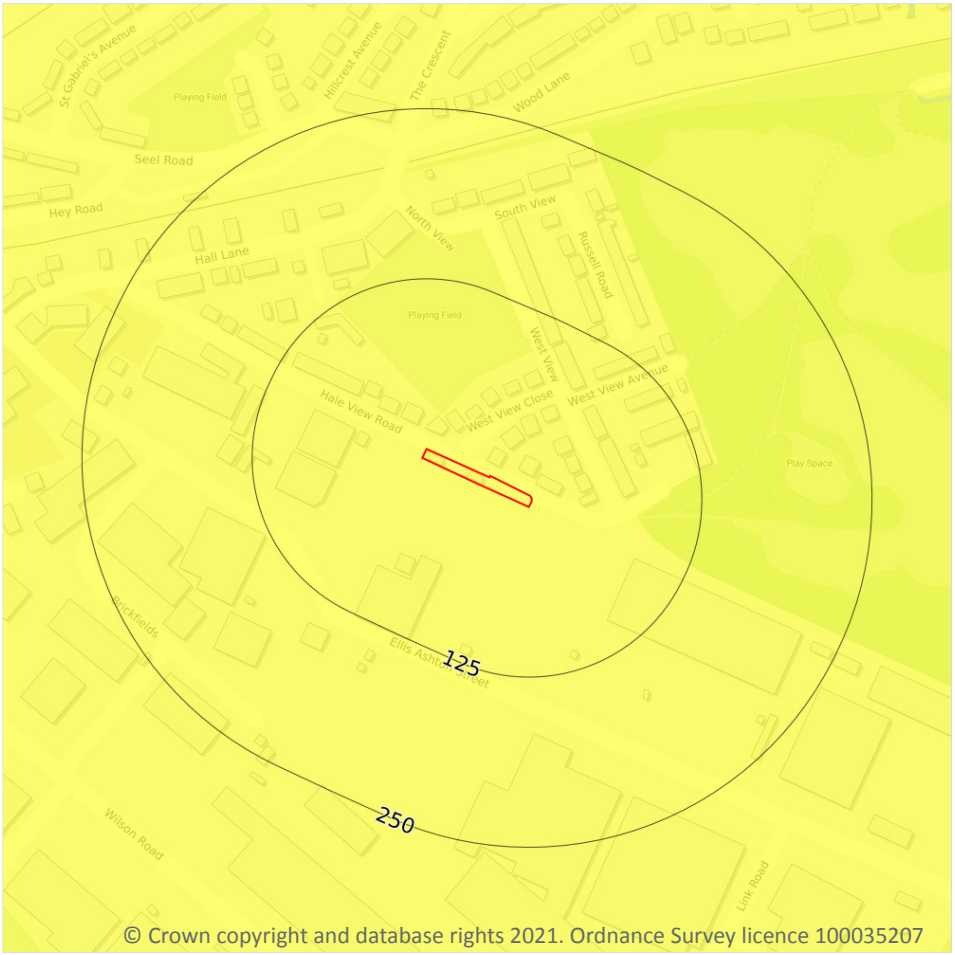
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 109**

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



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Site Outline

Search buffers in metres (m)

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

17.4 Collapsible deposits

Records within 50m	1

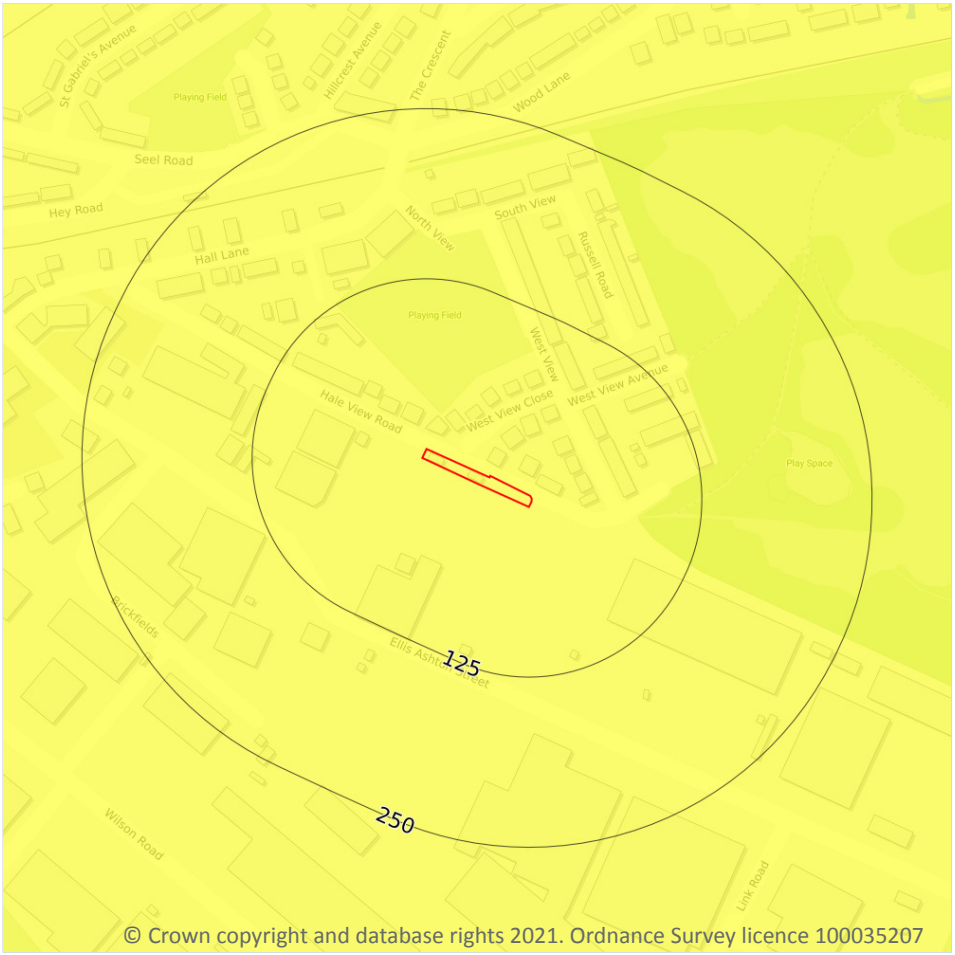
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 110**

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

This data is sourced from the British Geological Survey.

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

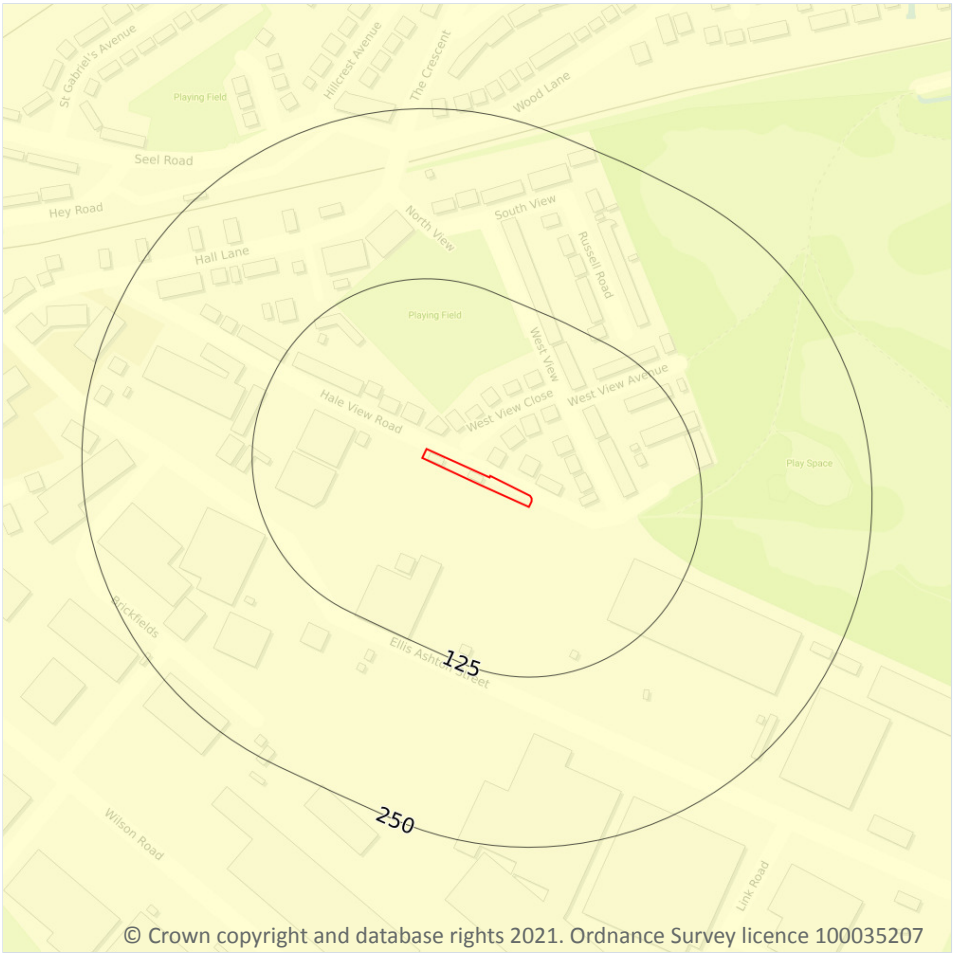
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 111**

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



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Site Outline

Search buffers in metres (m)

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

17.6 Ground dissolution of soluble rocks

Records within 50m	1

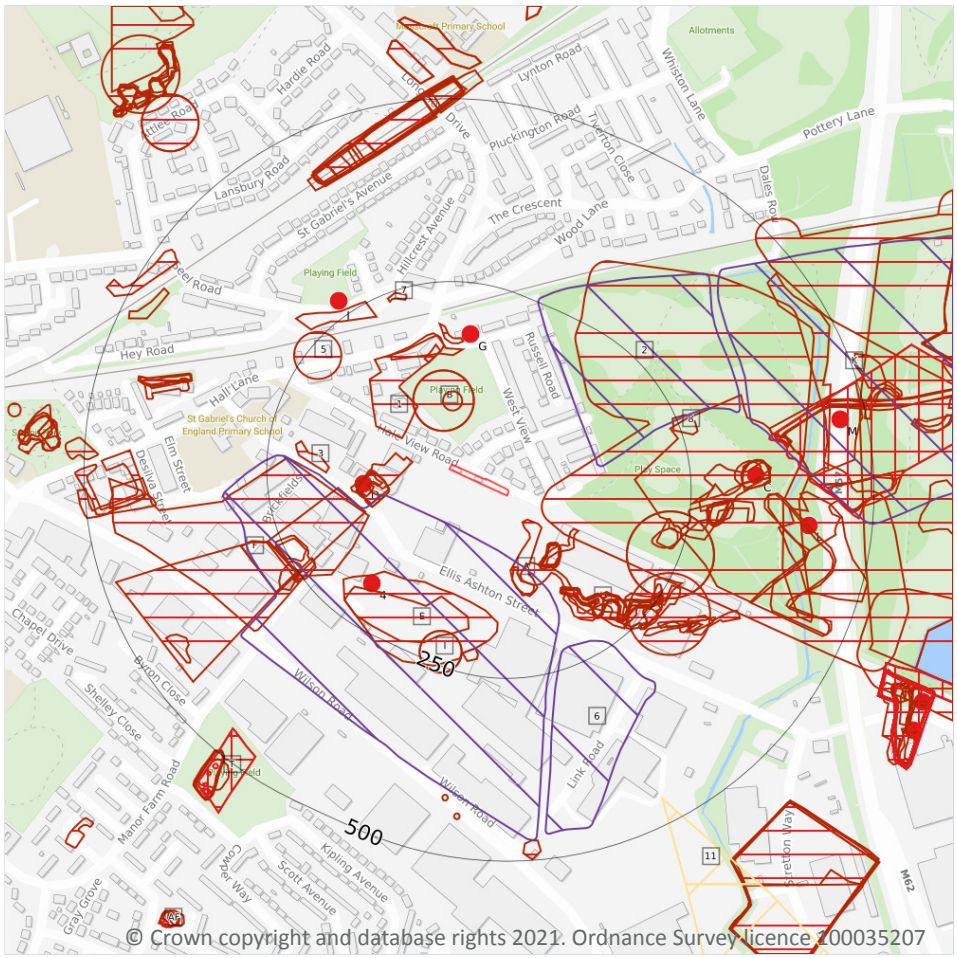
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 112**

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 Peter Brett Associates (PBA).

18.2 BritPits

Records within 500m	7

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 114**

ID	Location	Details	Description
D	119m W	Name: Huyton Quarry Pottery Address: Huyton Quarry, HUYTON-WITH-ROBY, Merseyside Commodity: Clay & Shale Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
G	179m N	Name: Huyton Quarry Station Address: Huyton Quarry, HUYTON-WITH-ROBY, Merseyside Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
4	189m SW	Name: Huyton Quarry Brickworks Address: Huyton Quarry, HUYTON-WITH-ROBY, Merseyside Commodity: Clay & Shale Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
J	271m NW	Name: Huyton Quarry Address: Huyton Quarry, HUYTON-WITH-ROBY, Merseyside Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
C	339m E	Name: Huyton Hey Colliery Address: Huyton Quarry, HUYTON-WITH-ROBY, Merseyside Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

ID	Location	Details	Description
L	412m E	Name: Huyton Hey Colliery Address: Huyton Quarry, HUYTON-WITH-ROBY, Merseyside Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
M	463m E	Name: Ridings Colliery Address: Whiston Lane Ends, Whiston, PRESCOT, Merseyside Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	54

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 114**

ID	Location	Land Use	Year of mapping	Mapping scale
A	42m SE	Unspecified Ground Workings	1906	1:10560
B	47m N	Unspecified Quarry	1925	1:10560
B	47m N	Unspecified Quarry	1906	1:10560
C	48m E	Unspecified Disused Workings	1966	1:10560
D	52m W	Ponds	1891	1:10560
B	74m N	Unspecified Quarry	1938	1:10560
1	77m NW	Unspecified Quarry	1891	1:10560
D	87m W	Pond	1925	1:10560
A	87m SE	Pond	1925	1:10560
D	88m W	Pond	1925	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
A	89m SE	Pond	1955	1:10560
A	90m SE	Pond	1938	1:10560
A	91m SE	Pond	1925	1:10560
D	94m W	Pond	1906	1:10560
A	96m SE	Unspecified Ground Workings	1891	1:10560
A	98m S	Ponds	1955	1:10560
F	127m SW	Brick Fields	1975	1:10000
F	129m SW	Unspecified Ground Workings	1906	1:10560
G	143m N	Unspecified Quarry	1966	1:10560
H	146m SE	Unspecified Ground Workings	1925	1:10560
H	147m SE	Unspecified Ground Workings	1938	1:10560
H	147m SE	Unspecified Ground Workings	1938	1:10560
H	149m SE	Unspecified Ground Workings	1955	1:10560
H	149m SE	Unspecified Ground Workings	1925	1:10560
G	149m N	Unspecified Quarry	1955	1:10560
E	152m SW	Unspecified Pit	1966	1:10560
H	156m SE	Unspecified Ground Workings	1906	1:10560
E	163m SW	Pond	1966	1:10560
3	165m W	Ponds	1966	1:10560
G	166m N	Unspecified Ground Workings	1955	1:10560
C	174m E	Colliery	1851	1:10560
H	178m E	Unspecified Quarry	1947	1:10560
H	178m E	Unspecified Quarry	1925	1:10560
I	204m SW	Unspecified Quarry	1975	1:10000
I	204m SW	Unspecified Quarry	1990	1:10000
5	204m NW	Coal Wharf	1906	1:10560
H	207m E	Pond	1955	1:10560
I	213m S	Unspecified Pit	1966	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
H	214m E	Pond	1851	1:10560
H	214m SE	Pond	1891	1:10560
H	219m SE	Unspecified Quarry	1906	1:10560
F	222m SW	Pond	1925	1:10560
F	223m SW	Ponds	1925	1:10560
C	223m E	Unspecified Ground Workings	1966	1:10560
F	223m SW	Pond	1925	1:10560
J	227m NW	Unspecified Ground Workings	1955	1:10560
H	233m SE	Pond	1891	1:10560
H	234m SE	Pond	1906	1:10560
7	234m N	Unspecified Ground Workings	1955	1:10560
8	241m E	Unspecified Heap	1966	1:10560
C	241m E	Refuse Heap	1851	1:10560
H	244m SE	Pond	1925	1:10560
H	247m SE	Ponds	1955	1:10560
F	250m SW	Unspecified Pit	1966	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	39

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 114**

ID	Location	Land Use	Year of mapping	Mapping scale
C	330m E	Unspecified Old Shaft	1891	1:10560
M	364m E	Disused Colliery	1906	1:10560
T	462m SW	Colliery	1891	1:10560
T	514m SW	Unspecified Old Shafts	1947	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
T	528m SW	Unspecified Old Shafts	1947	1:10560
T	543m SW	Unspecified Old Shafts	1947	1:10560
T	549m SW	Unspecified Old Shaft	1925	1:10560
T	549m SW	Unspecified Old Shaft	1906	1:10560
AA	567m SE	Disused Colliery	1947	1:10560
AA	567m SE	Disused Colliery	1925	1:10560
W	569m SE	Old Colliery	1947	1:10560
W	569m SE	Old Colliery	1925	1:10560
W	569m SE	Old Colliery	1906	1:10560
W	569m SE	Old Colliery	1891	1:10560
W	572m SE	Old Colliery	1947	1:10560
W	594m SE	Unspecified Disused Mine	1966	1:10560
W	635m SE	Unspecified Old Shaft	1947	1:10560
W	635m SE	Unspecified Old Shaft	1925	1:10560
W	636m SE	Unspecified Old Shaft	1947	1:10560
W	638m SE	Unspecified Disused Shaft	1966	1:10560
-	640m E	Colliery	1891	1:10560
-	727m E	Colliery	1891	1:10560
AF	729m SW	Unspecified Old Shaft	1925	1:10560
AF	729m SW	Unspecified Old Shaft	1906	1:10560
-	740m E	Disused Colliery	1906	1:10560
-	746m E	Unspecified Disused Mine	1966	1:10560
-	759m E	Unspecified Old Shaft	1925	1:10560
-	804m E	Unspecified Old Shaft	1947	1:10560
-	845m E	Unspecified Shafts	1891	1:10560
-	853m E	Unspecified Old Shafts	1947	1:10560
-	853m E	Unspecified Old Shafts	1925	1:10560
-	854m E	Unspecified Old Shaft	1947	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
-	855m E	Unspecified Disused Shaft	1966	1:10560
-	857m E	Unspecified Old Shafts	1947	1:10560
-	857m E	Unspecified Old Shafts	1925	1:10560
-	858m E	Unspecified Old Shaft	1947	1:10560
-	861m E	Unspecified Disused Shaft	1966	1:10560
-	982m SE	Old Colliery	1891	1:10560
-	992m E	Old Colliery	1906	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	**4**

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.

Features are displayed on the Mining, ground workings and natural cavities map on **page 114**

ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
E	68m SW	Huyton	Clay, shale, bricks	Surface mineral working	Valid	31/5/48,12/5/50
2	127m E	Whiston	Clay, shale, bricks	Surface mineral working	Valid	7/7/47,25/9/52
6	223m S	Huyton	Clay, shale, bricks	Surface mineral working	Valid	31/5/48,12/5/50
K	345m E	Whiston	Clay, shale, bricks	Surface mineral working	Valid	7/7/47,25/9/52

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	2

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).

Features are displayed on the Mining, ground workings and natural cavities map on **page 114**

ID	Location	Name	Commodity	Class	Likelihood
11	466m SE	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
15	585m SE	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

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 Peter Brett Associates (PBA).

18.8 JPB mining areas

Records on site	0

Areas which could be affected by former coal 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

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

Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

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 123**

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 km^2. 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 km^2; 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**
On site	**15 - 25 mg/kg**	**No data**	**300 - 600 mg/kg**	**240 - 360 mg/kg**	**2.2 - 3.0 mg/kg**	**90 - 120 mg/kg**	**15 - 30 mg/kg**
31m S	15 - 25 mg/kg	No data	200 - 300 mg/kg	120 - 240 mg/kg	1.8 - 2.2 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
45m S	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	90 - 120 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 km^2).

This data is sourced from the British Geological Survey.

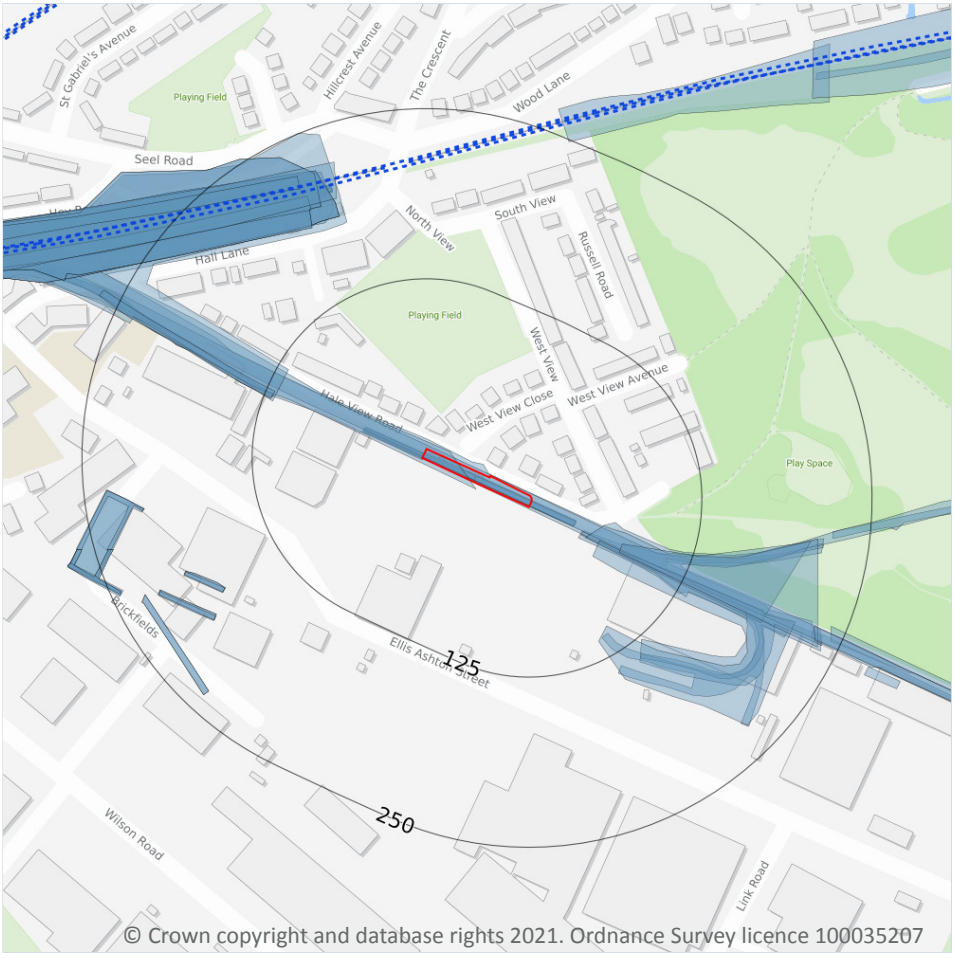
20.3 BGS Measured Urban Soil Chemistry

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 km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects



Site Outline
Search buffers in metres (m)
Crossrail 1 Stations
Crossrail 1 Route
Crossrail 1 Worksites
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	47

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 126**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1956**	**2500**
On site	**Mineral Railway Sidings**	**1956**	**1250**
On site	**Mineral Railway Sidings**	**1969**	**2500**
On site	**Railway Sidings**	**1891**	**10560**
On site	**Railway Sidings**	**1851**	**10560**
On site	**Railway Sidings**	**1955**	**10560**
43m SE	Mineral Railway Sidings	1907	2500
44m SE	Mineral Railway Sidings	1892	2500
47m SE	Railway Sidings	1955	10560
58m SE	Railway Sidings	1906	10560
74m SE	Mineral Railway Sidings	1938	10560
117m NW	Railway Sidings	1966	10560
118m NW	Railway Sidings	1907	2500
118m NW	Railway Sidings	1927	2500
119m NW	Mineral Railway Sidings	1925	10560
173m SW	Railway Sidings	1959	2500
173m SW	Railway Sidings	1956	2500

Location	Land Use	Year of mapping	Mapping scale
174m SW	Railway Sidings	1956	1250
183m N	Railway Sidings	1975	10000
183m N	Railway Sidings	1990	10000
183m NW	Railway Sidings	1925	10560
183m NW	Railway Sidings	1906	10560
190m SW	Railway Sidings	1959	2500
190m SW	Railway Sidings	1956	2500
191m SW	Railway Sidings	1956	1250
195m NW	Railway Sidings	1925	10560
196m N	Railway Sidings	1938	10560
199m NW	Railway Sidings	1956	2500
200m NW	Railway Sidings	1956	1250
200m NW	Railway Sidings	1959	2500
200m NW	Railway Sidings	1969	2500
208m W	Railway Sidings	1959	2500
208m W	Railway Sidings	1956	2500
208m W	Railway Sidings	1956	1250
212m NW	Railway Sidings	1959	2500
212m NW	Railway Sidings	1969	2500
212m NW	Railway Sidings	1925	10560
222m E	Railway	1891	-
225m SW	Railway Sidings	1959	2500
225m SW	Railway Sidings	1956	2500
227m SE	Railway Sidings	1906	10560
227m SE	Mineral Railway Sidings	1907	2500
237m W	Railway Sidings	1956	1250
237m W	Railway Sidings	1964	1250
238m SE	Railway	1891	-

Location	Land Use	Year of mapping	Mapping scale
240m SW	Railway Sidings	1969	2500
249m NE	Railway Sidings	1891	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	4

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

Features are displayed on the Railway infrastructure and projects map on **page 126**

Location	Name	Type
205m N	Liverpool to Manchester Lines	rail
208m N	Not given	Multi Track
209m N	Liverpool to Manchester Lines	rail
211m N	Not given	Multi Track

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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Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1892**

Scale: 1:2,500

Printed at: 1:2,500

N
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Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1907**

Scale: 1:2,500

Printed at: 1:2,500

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Site Details:

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Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1927**

Scale: 1:2,500

Printed at: 1:2,500

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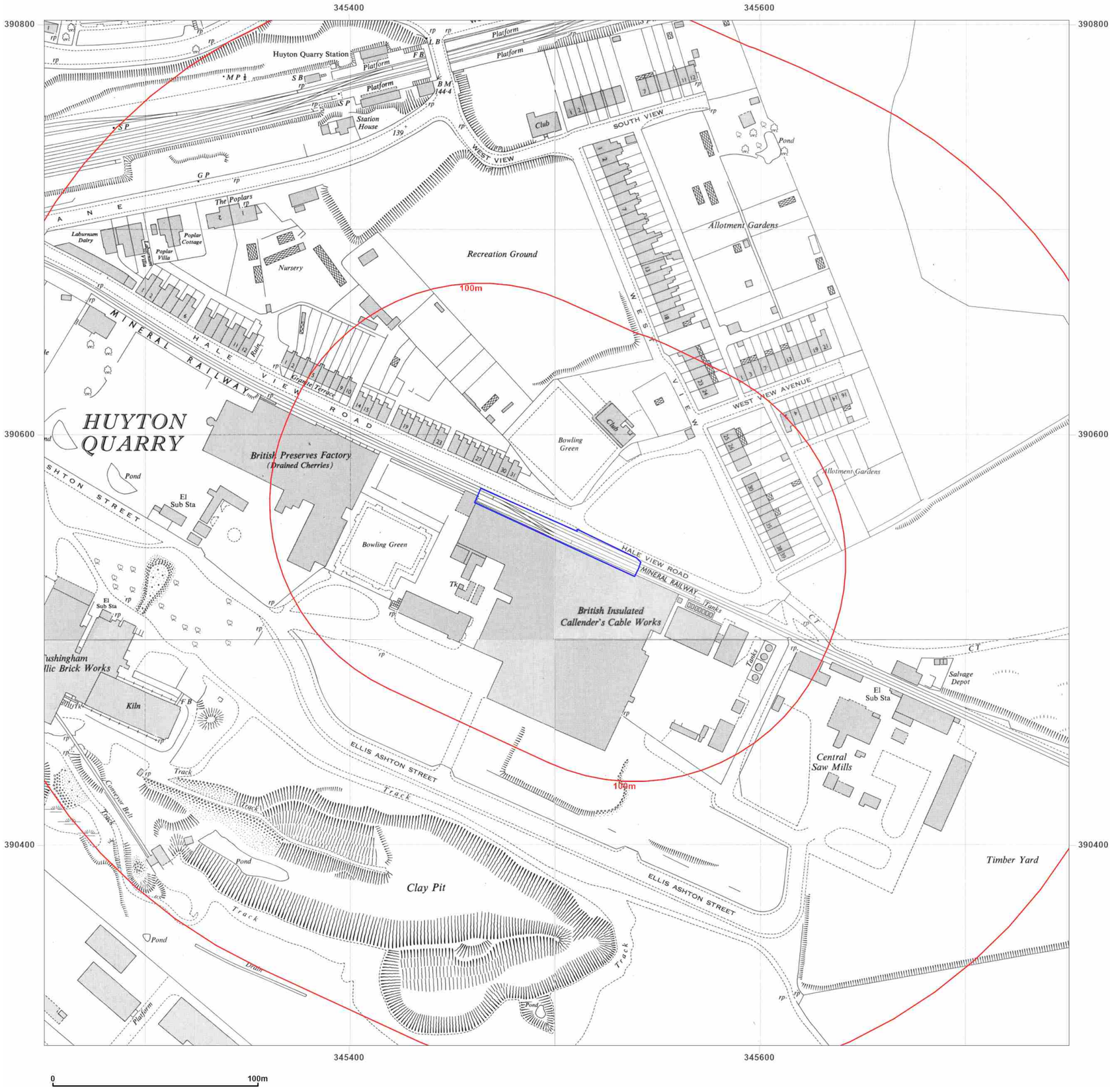

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1956**

Scale: 1:1,250

Printed at: 1:2,000

N
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Revised 1956
Edition N/A
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Surveyed 1956
Revised 1956
Edition N/A
Copyright N/A
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Revised 1956
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Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1956**

Scale: 1:2,500

Printed at: 1:2,500

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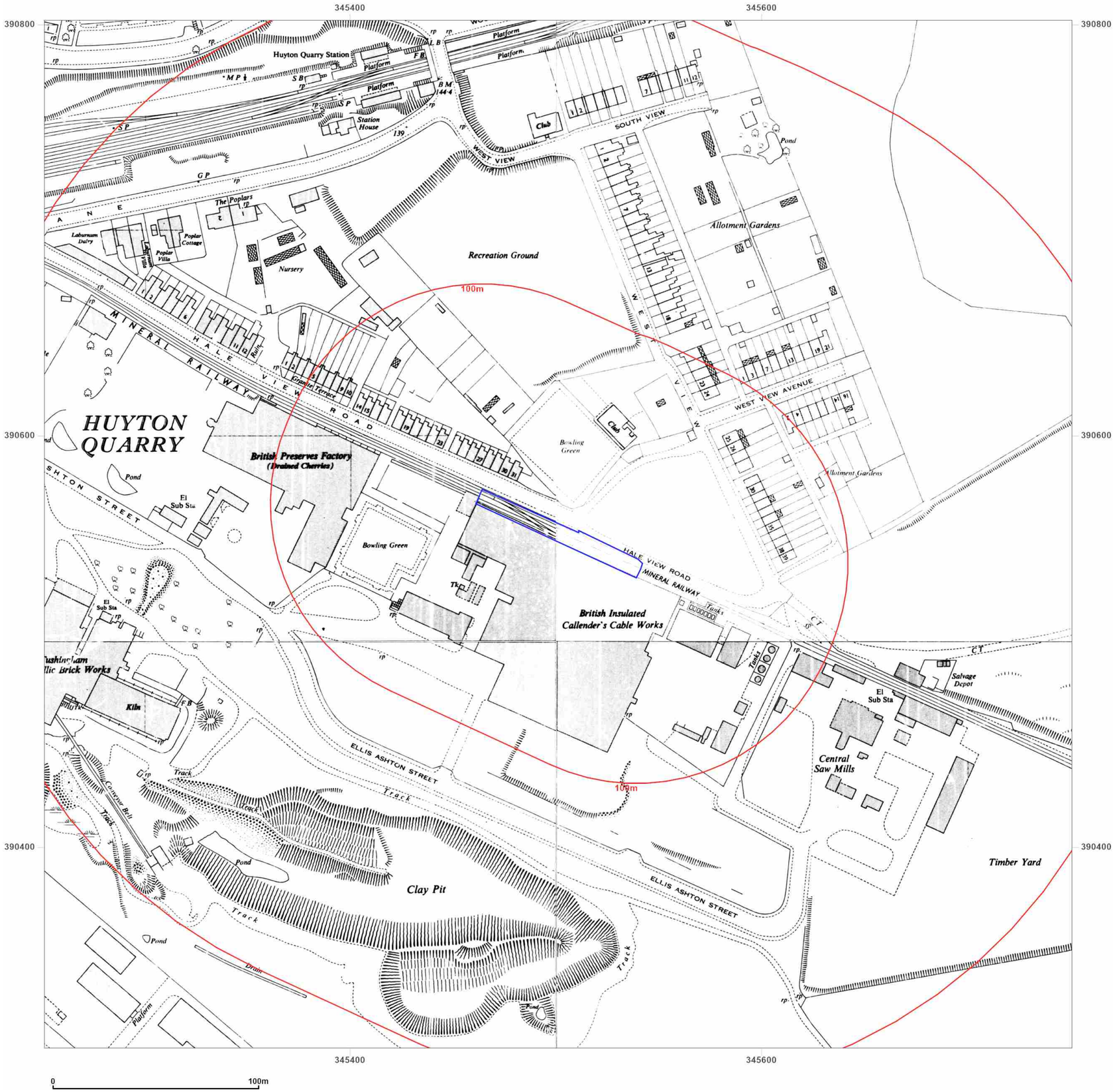

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1957**

Scale: 1:1,250

Printed at: 1:2,000

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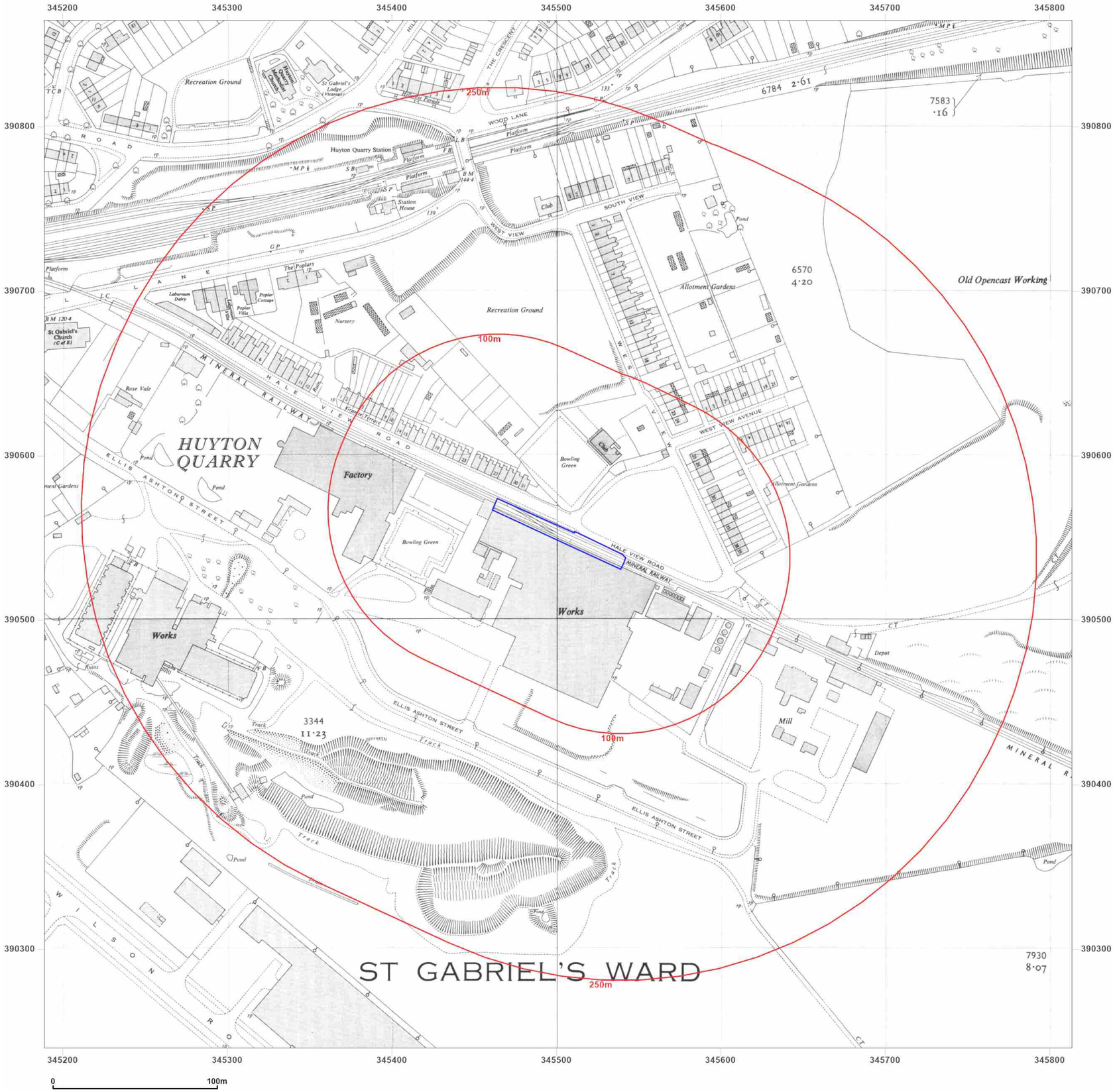

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1959**

Scale: 1:2,500

Printed at: 1:2,500

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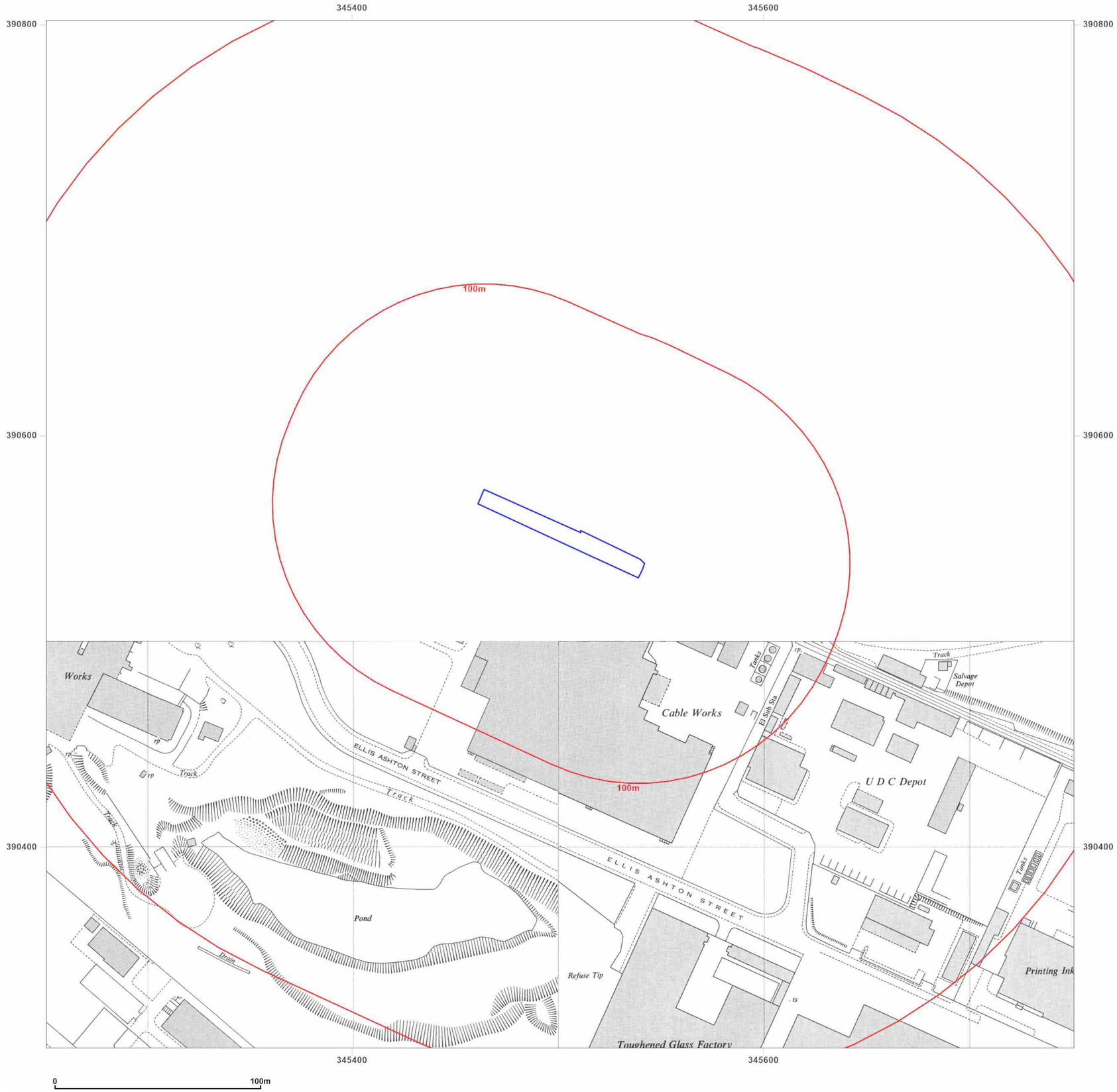

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1964-1968**

Scale: 1:1,250

Printed at: 1:2,000

N
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Client Ref: 4165
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Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1969**

Scale: 1:2,500

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Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1970**

Scale: 1:2,500

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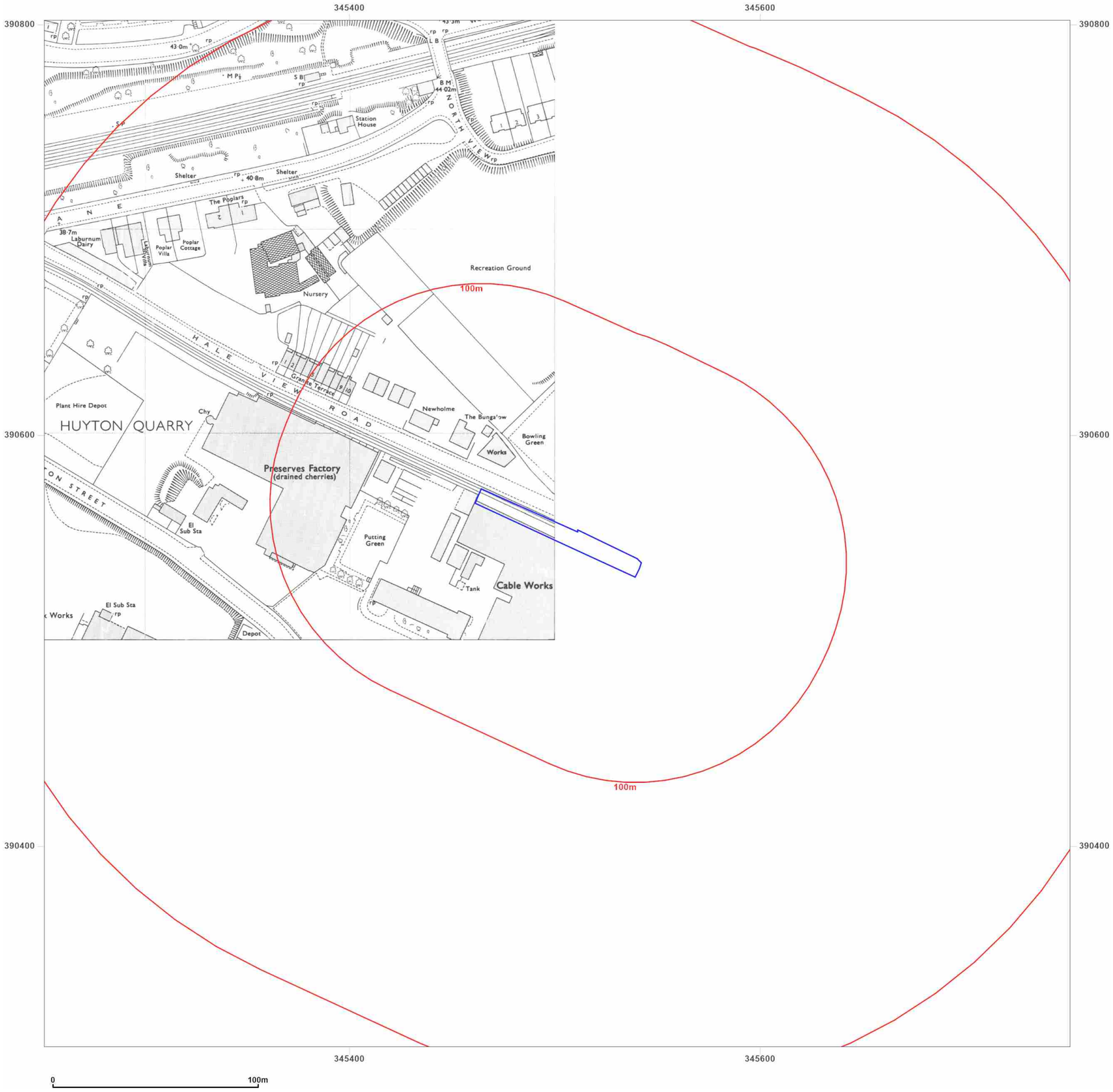

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1972**

Scale: 1:1,250

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Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1975-1980**

Scale: 1:1,250

Printed at: 1:2,000

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Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1956
Revised 1976
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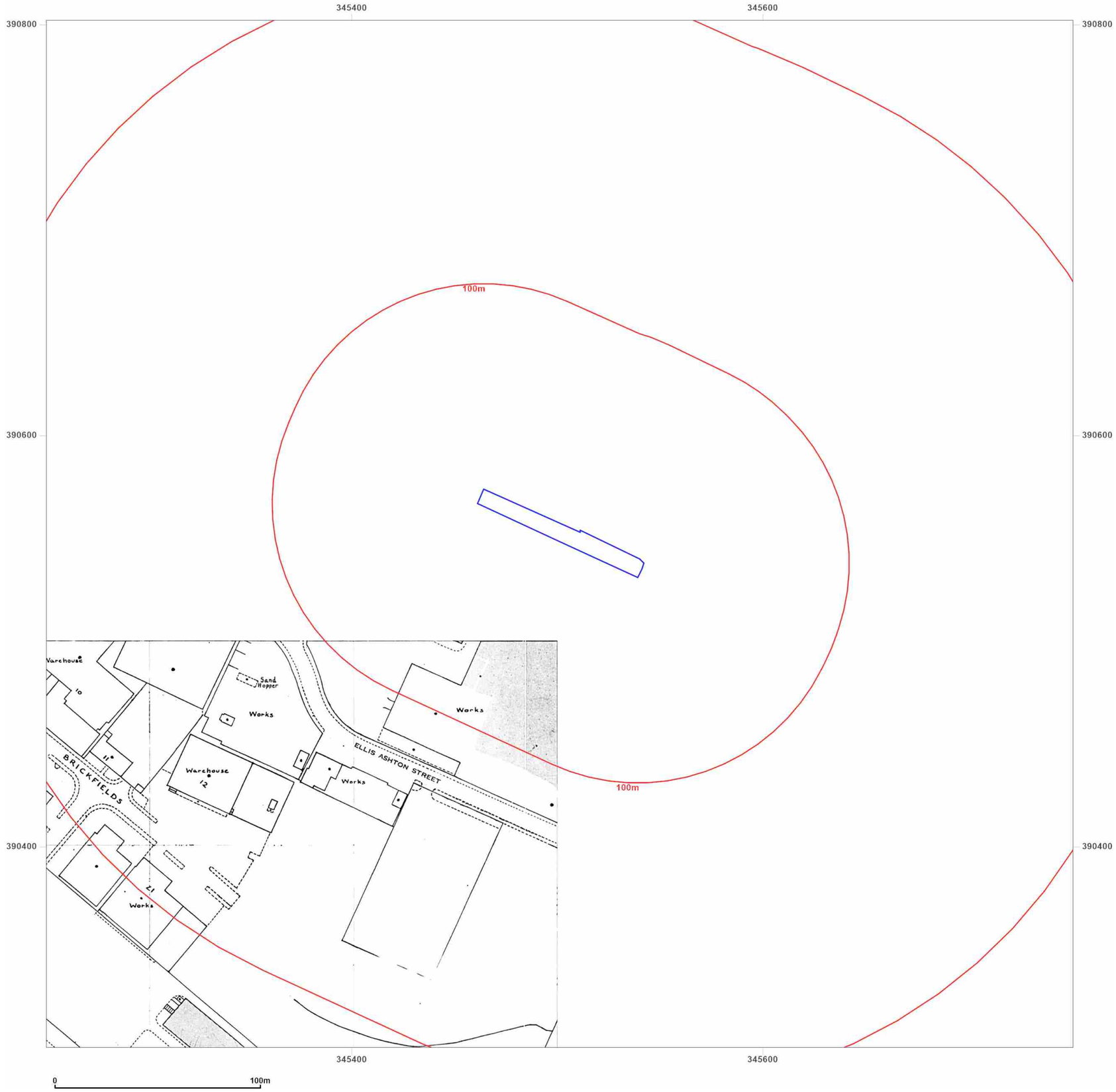

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1980**

Scale: 1:1,250

Printed at: 1:2,000

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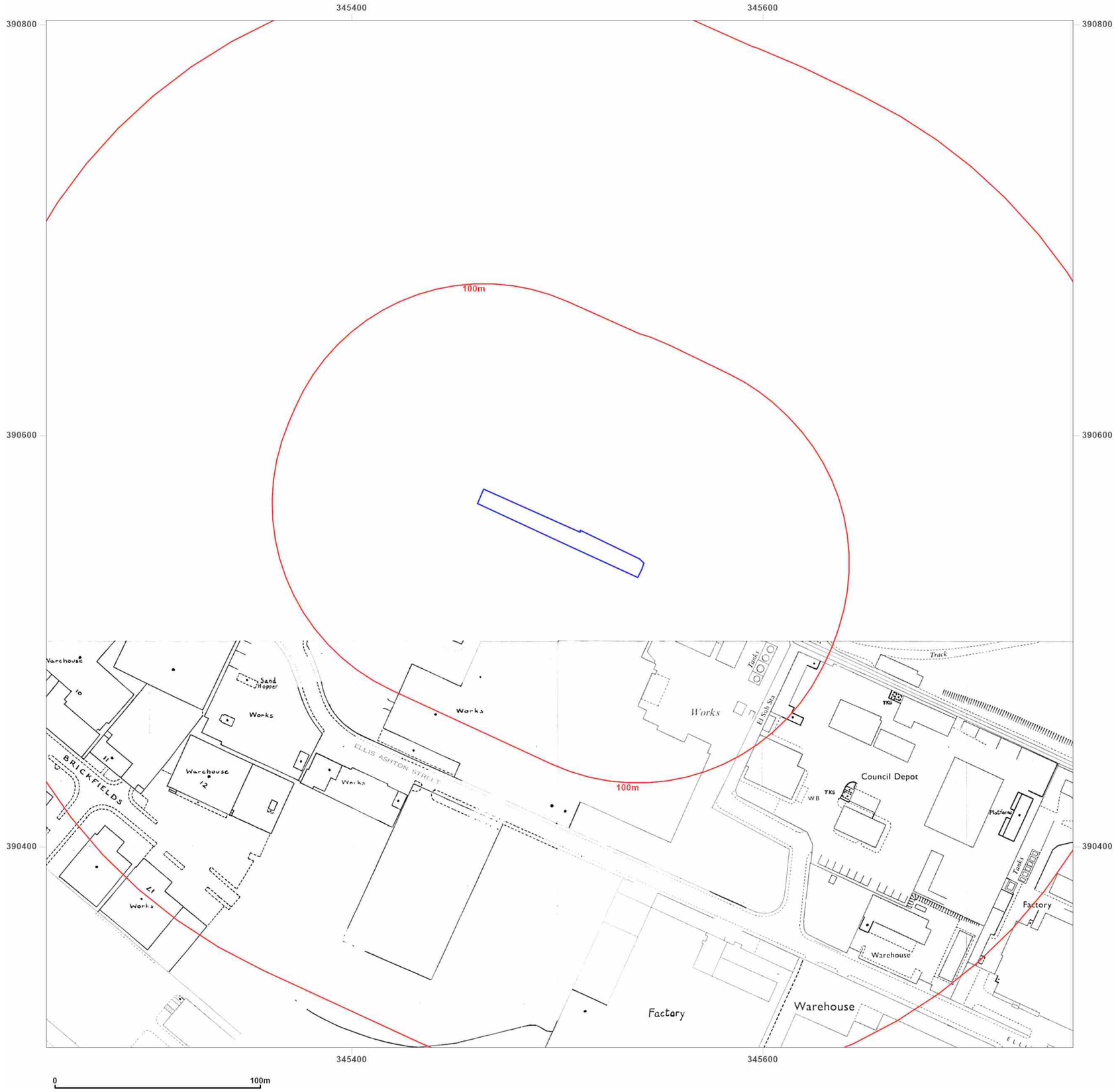

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1980-1984**

Scale: 1:1,250

Printed at: 1:2,000

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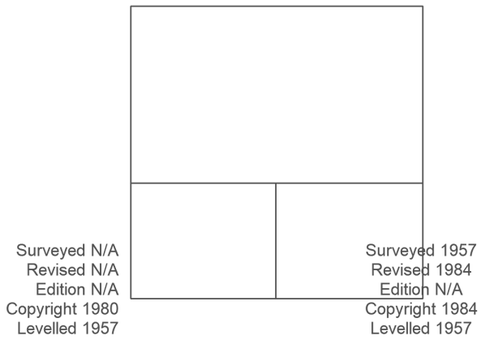

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Client Ref: 4165
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Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1987-1988**

Scale: 1:1,250

Printed at: 1:2,000

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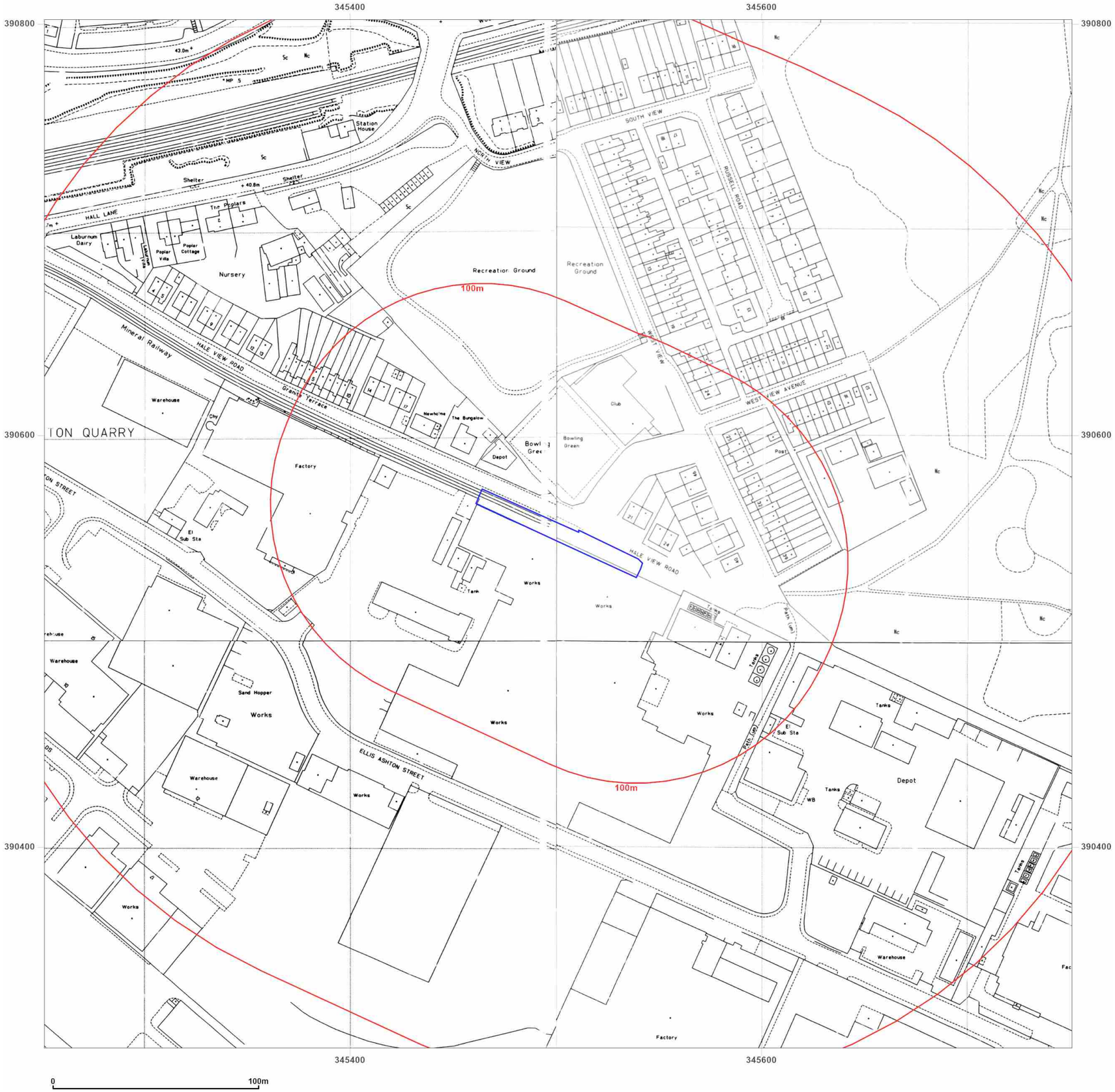

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1993**

Scale: 1:1,250

Printed at: 1:2,000

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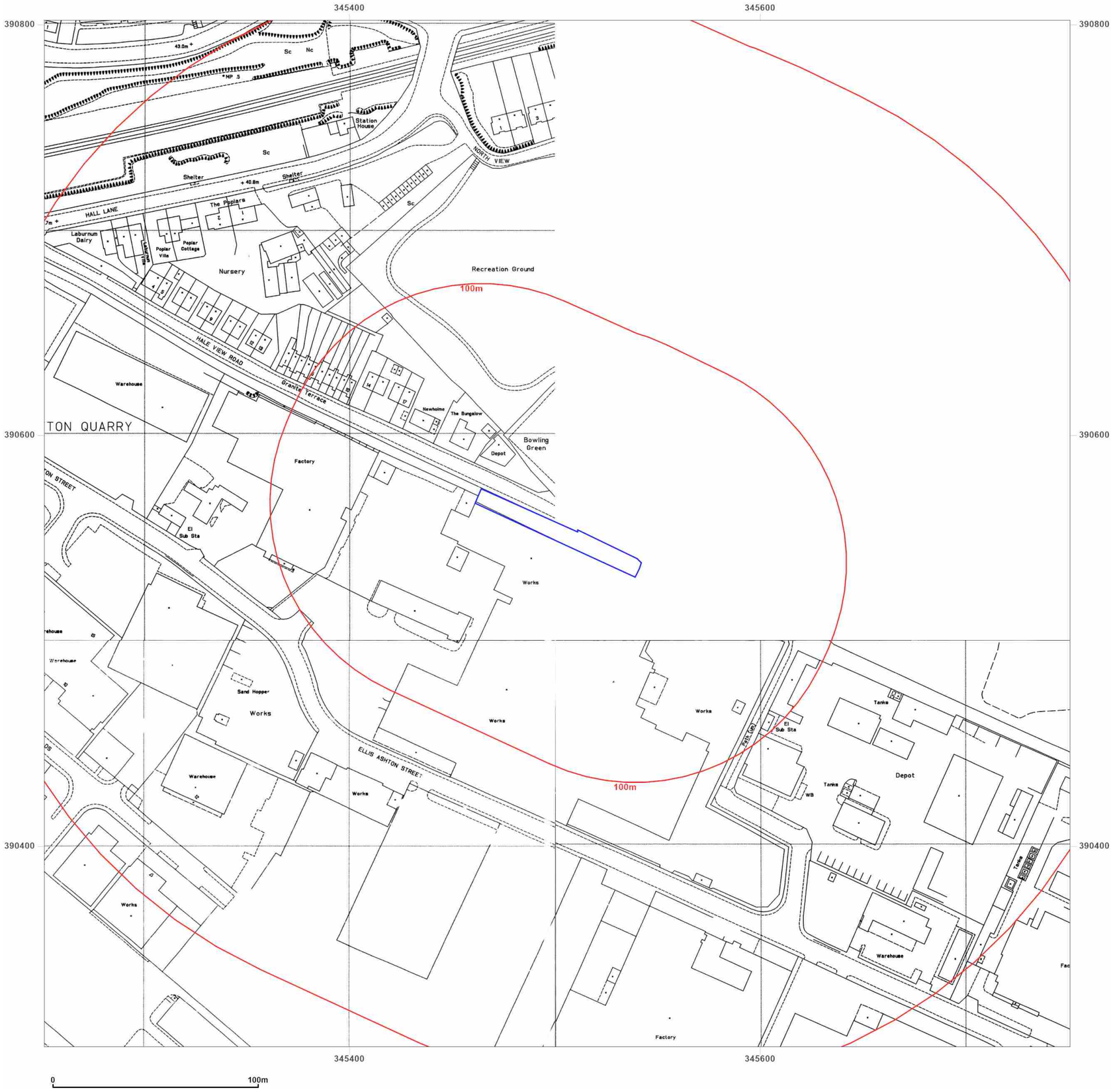

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,000

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Edition N/A
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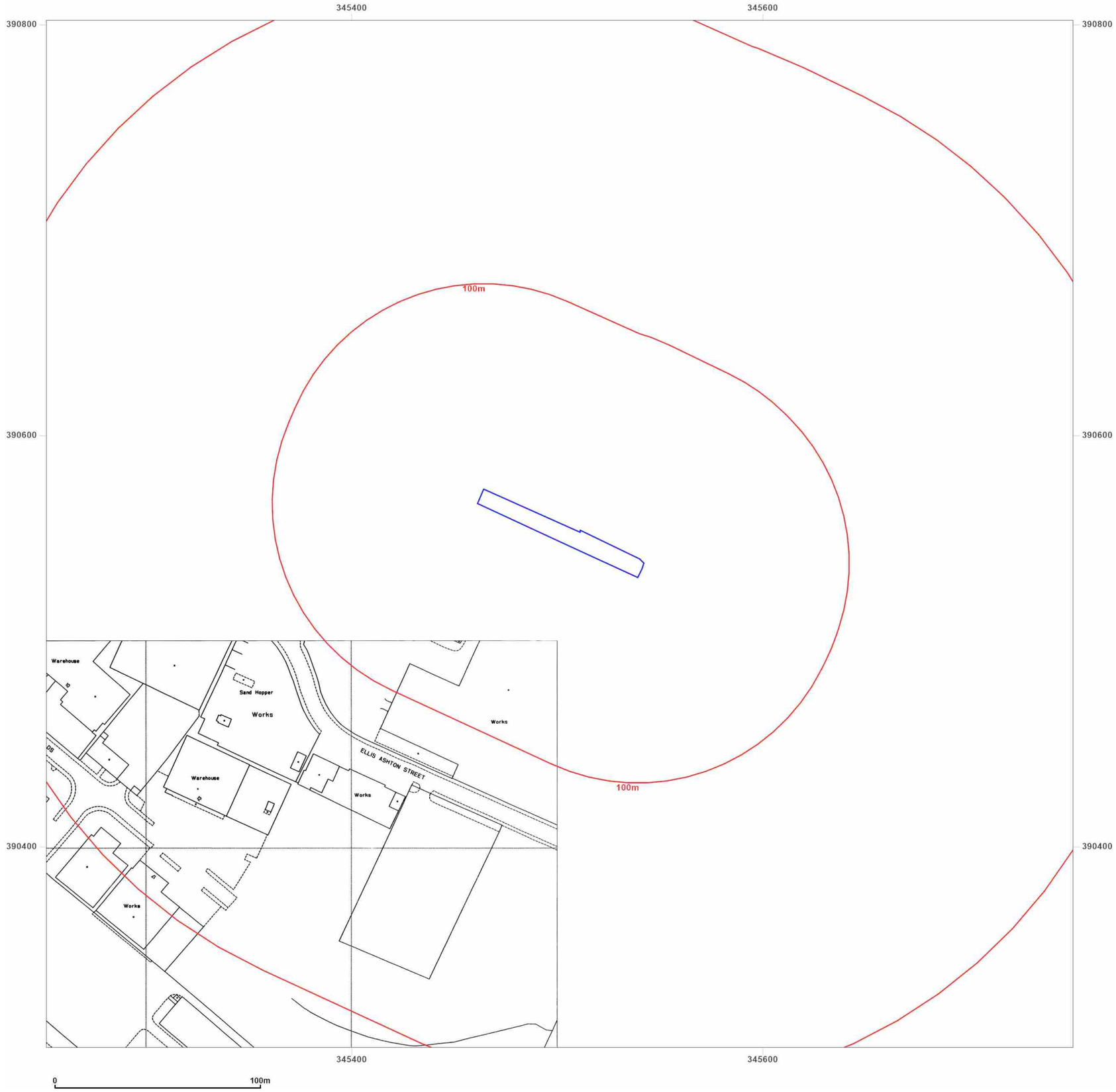

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,000

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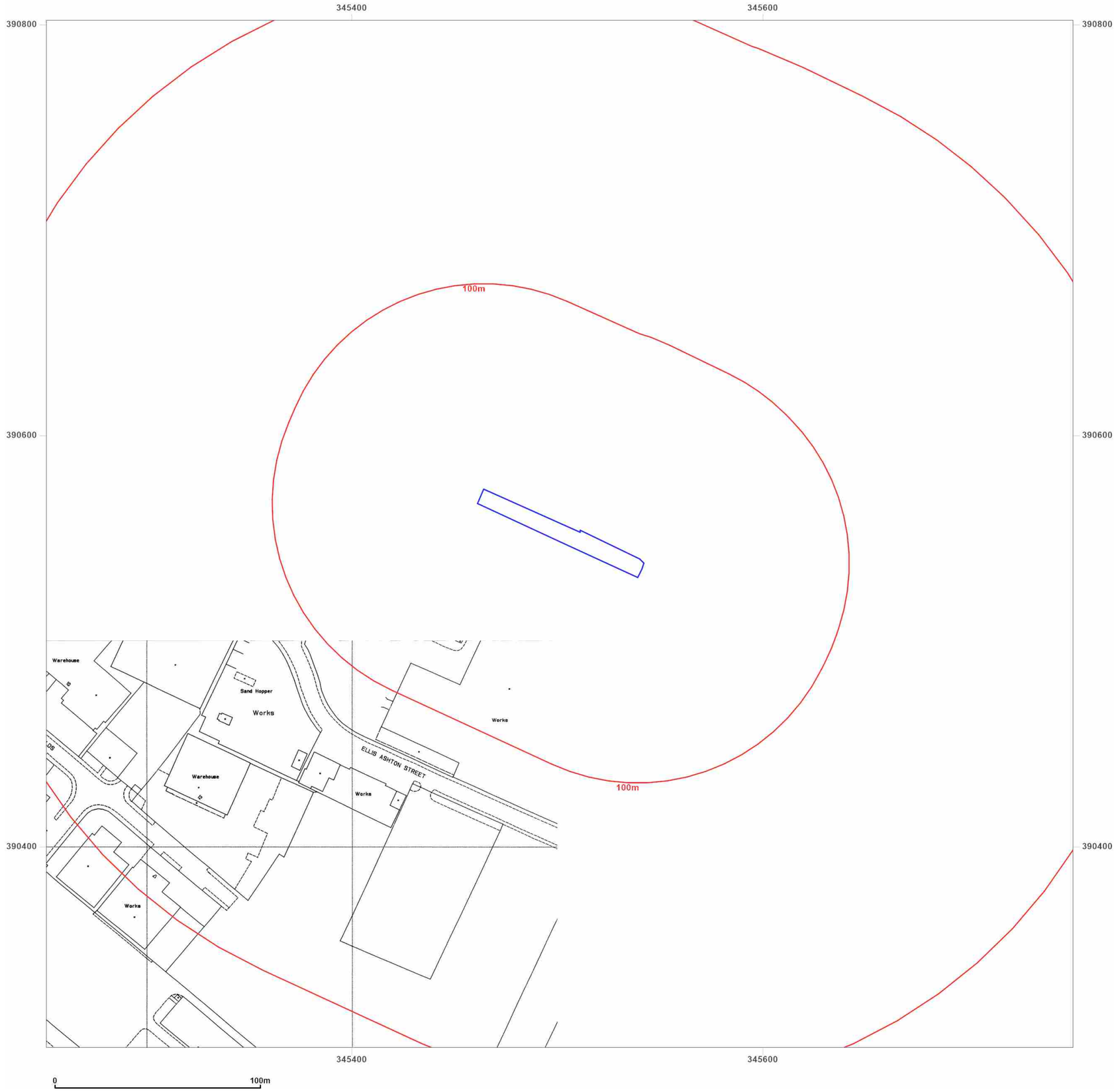

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1994**

Scale: 1:1,250

Printed at: 1:2,000

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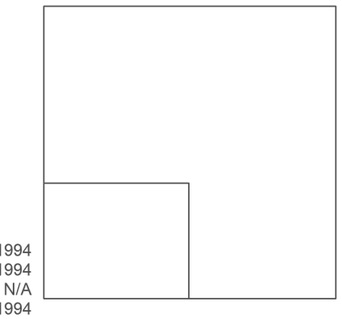

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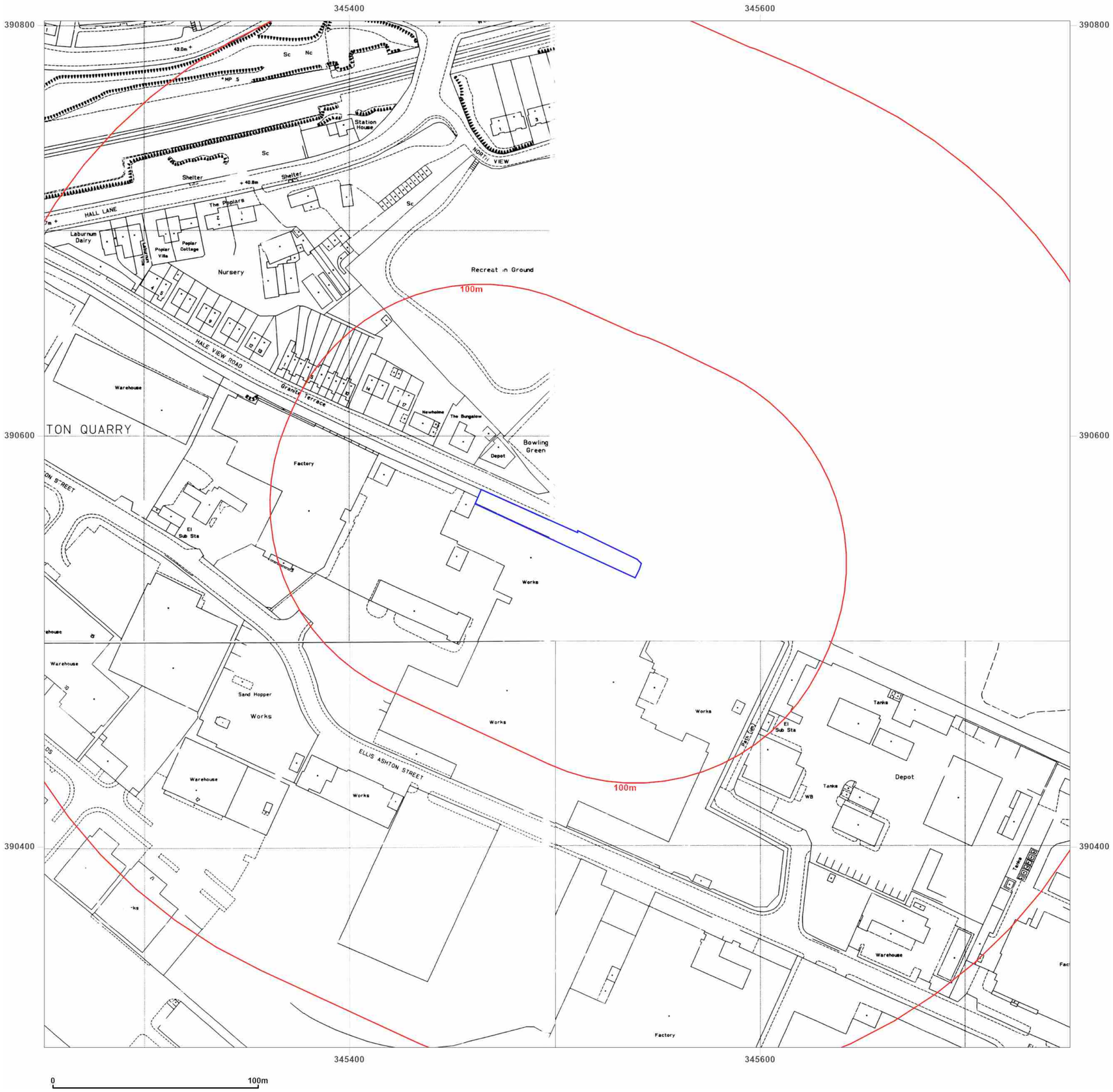
Production date: 24 March 2021

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1993-1994**

Scale: 1:1,250

Printed at: 1:2,000

N
W E
S

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

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

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

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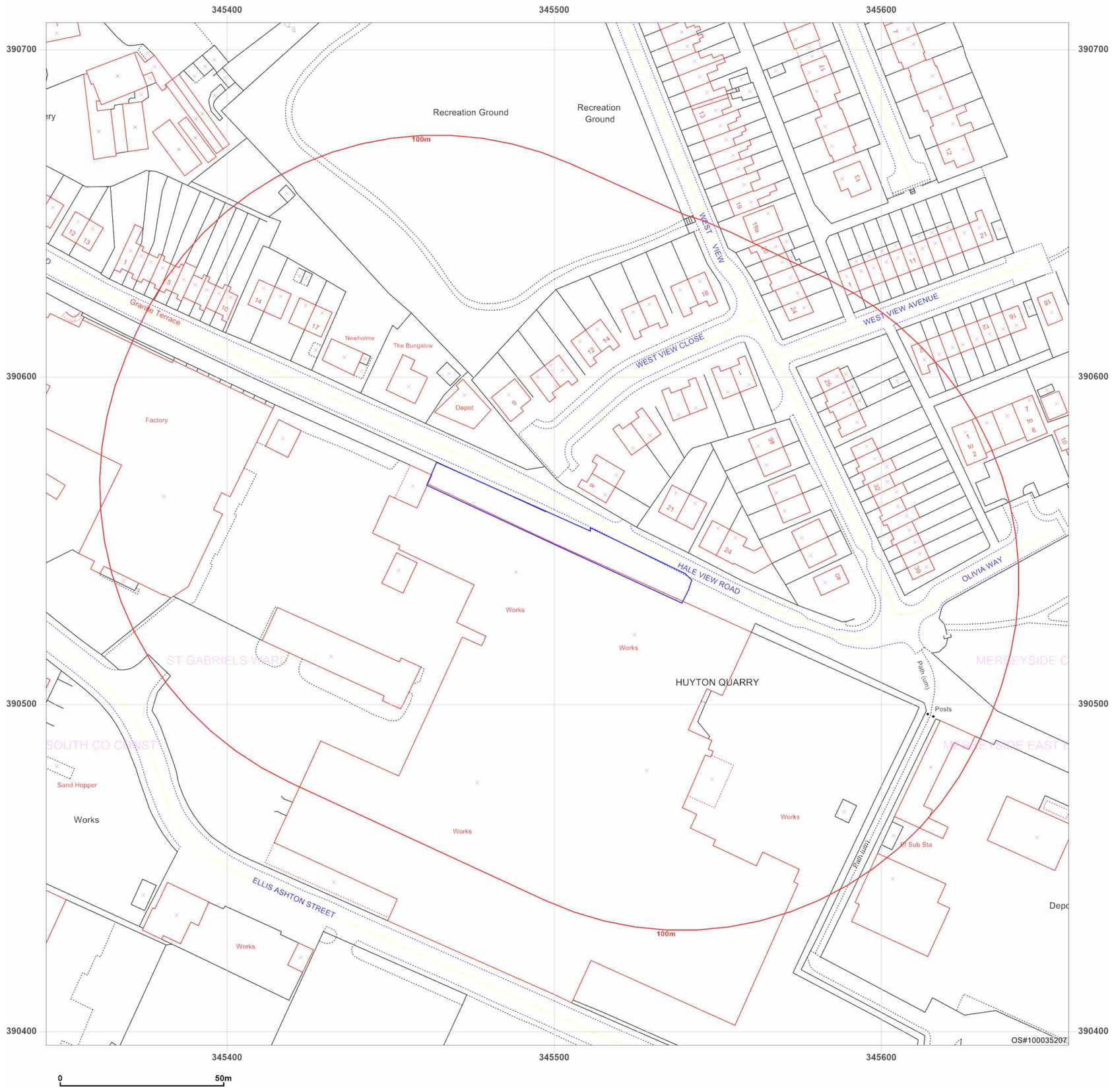
Production date: 24 March 2021

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: LandLine

Map date: **2003**

Scale: 1:1,250

Printed at: 1:1,250

N
W E
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2003

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Production date: 24 March 2021

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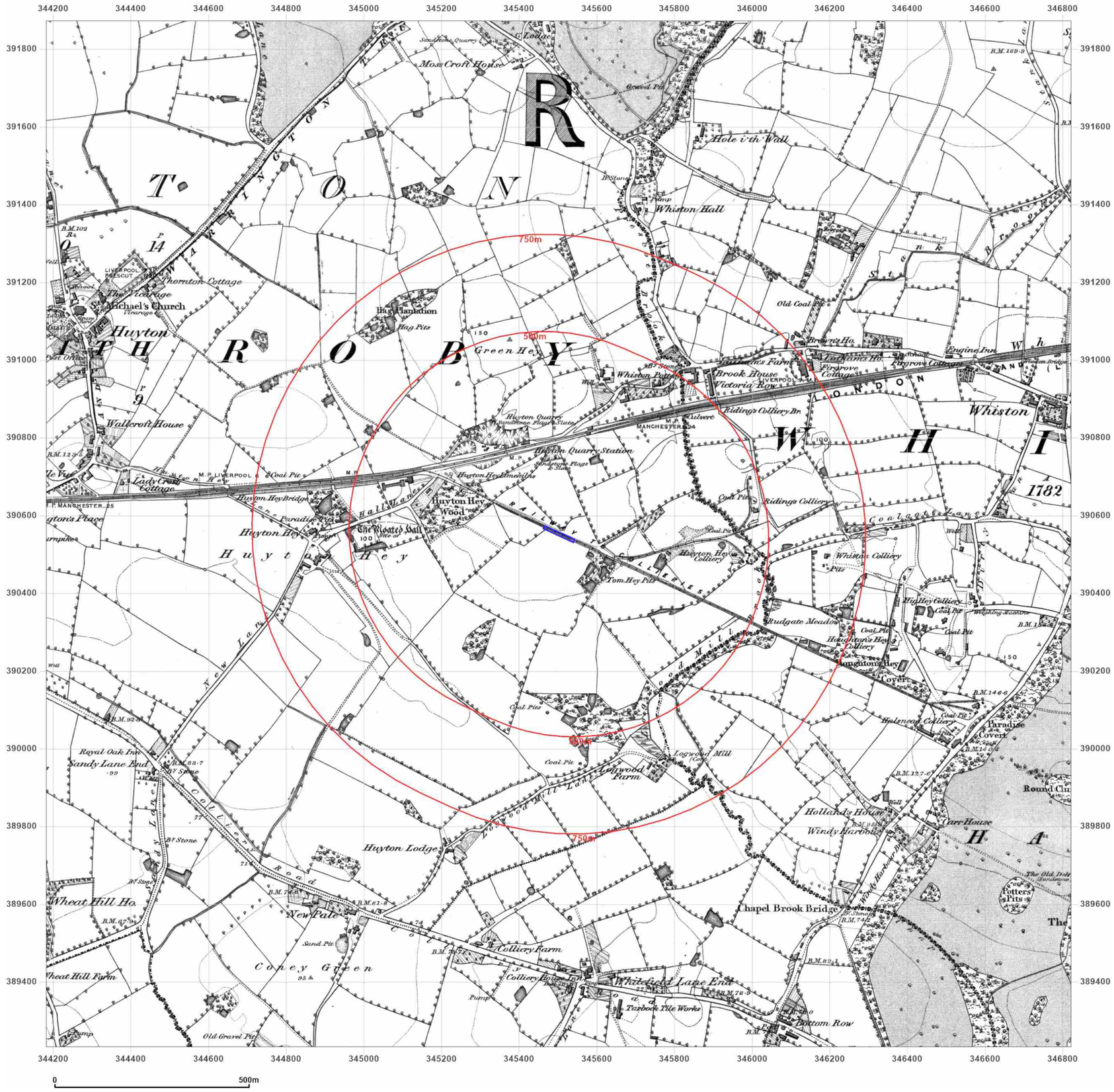

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1850**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1847
Revised N/A
Edition 1850
Copyright N/A
Levelled N/A

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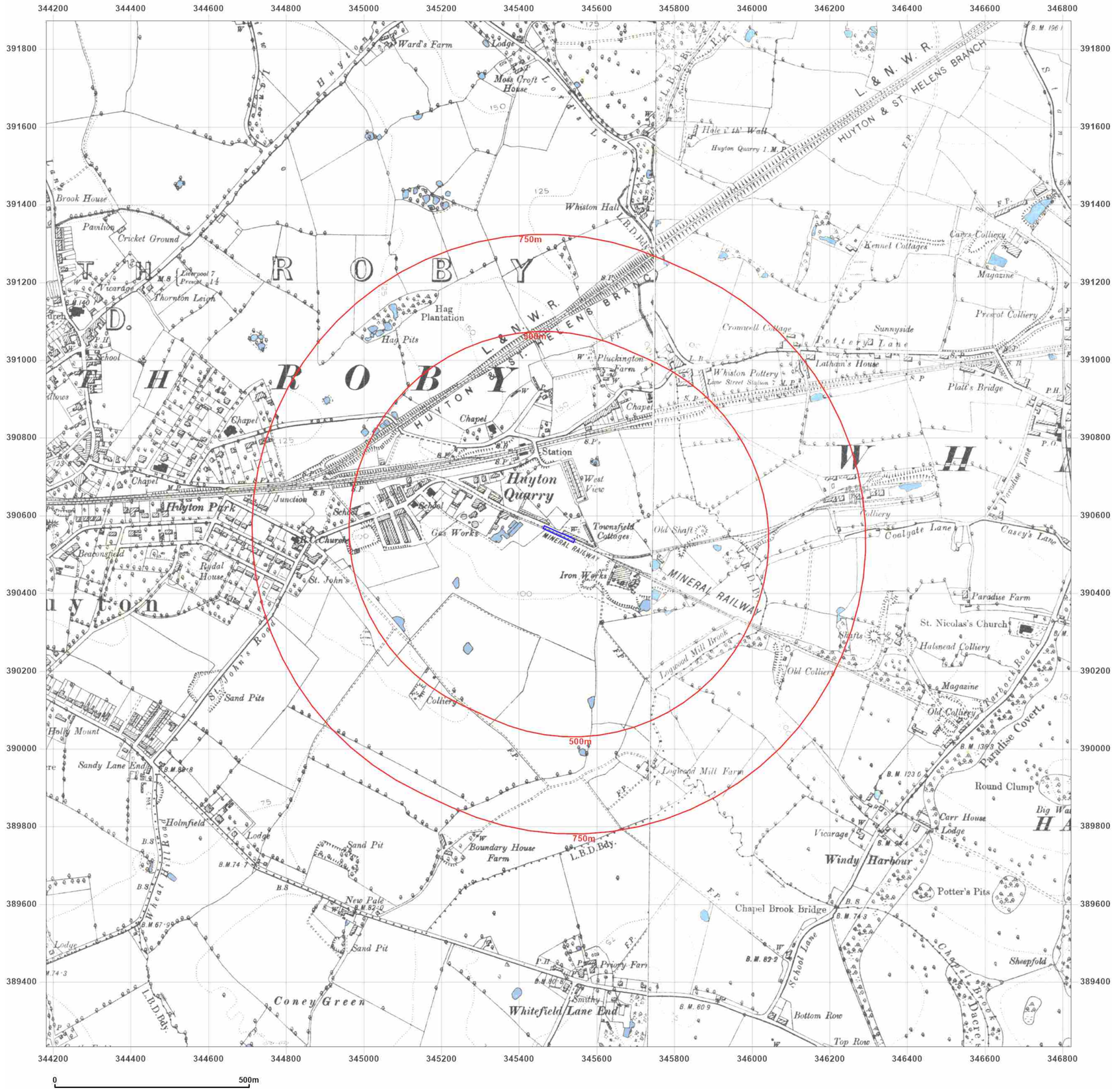

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1891**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

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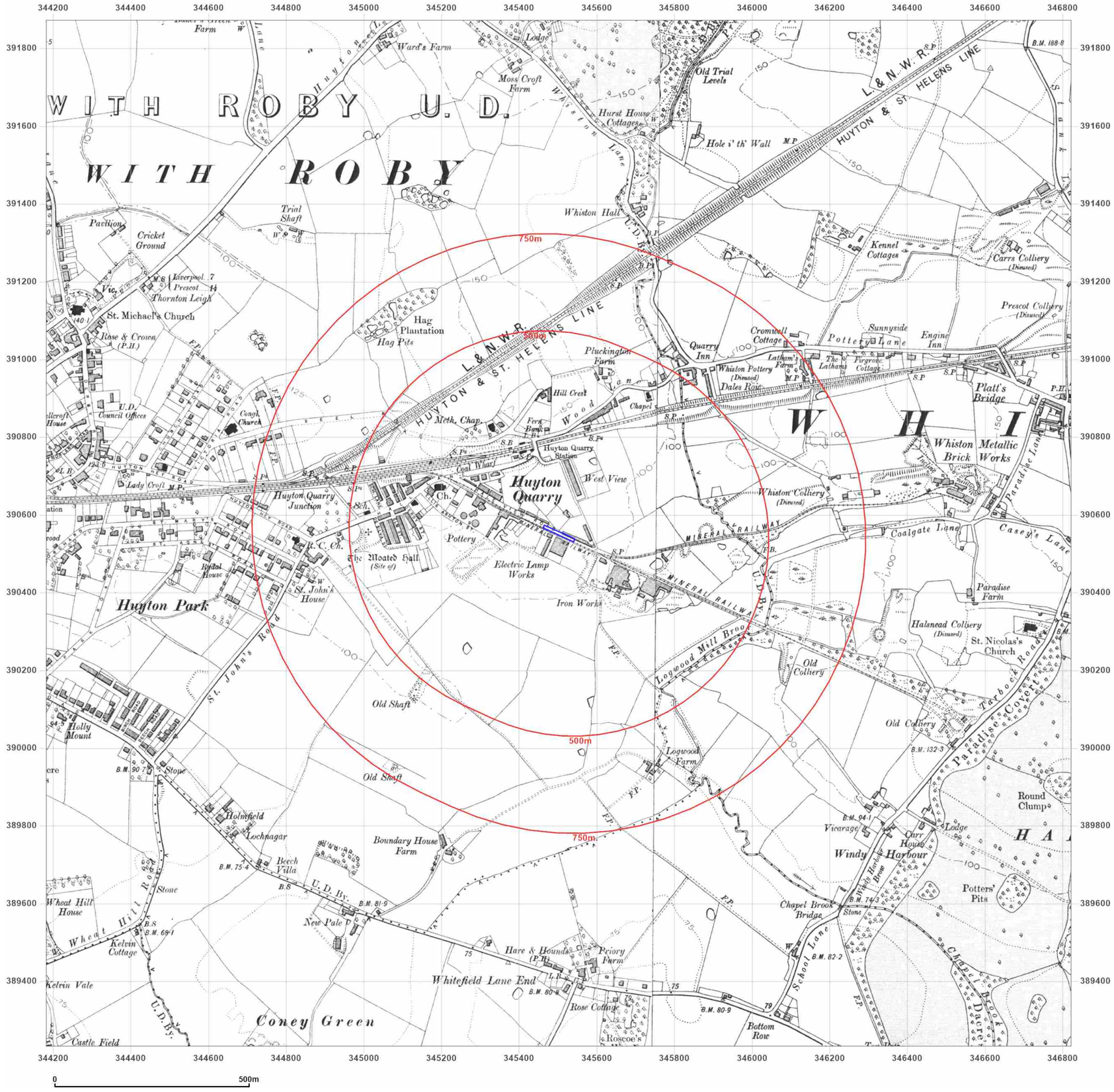

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1906**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1891
Revised 1906
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1906
Edition N/A
Copyright N/A
Levelled N/A

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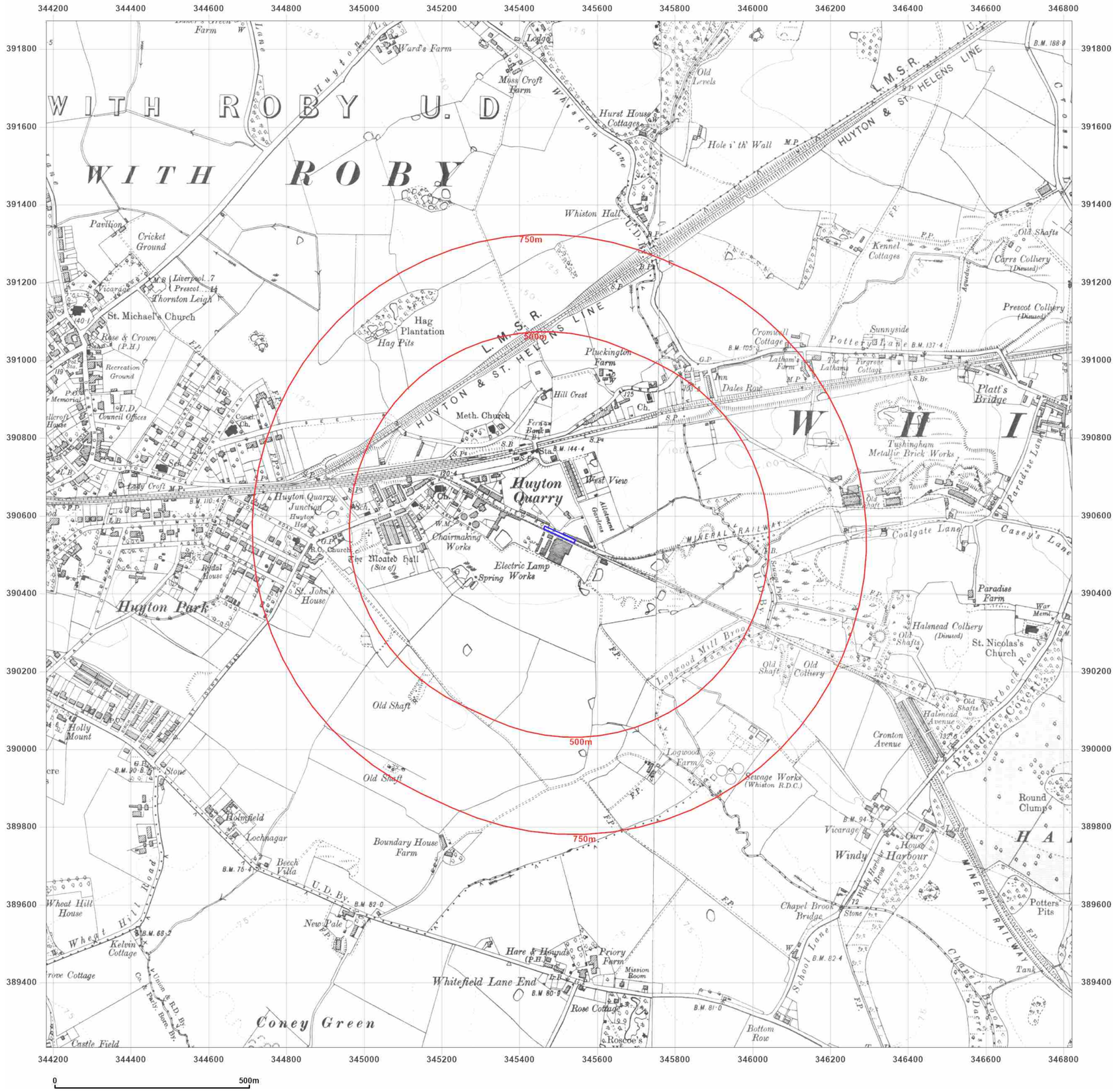

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1925**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1848
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1846
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

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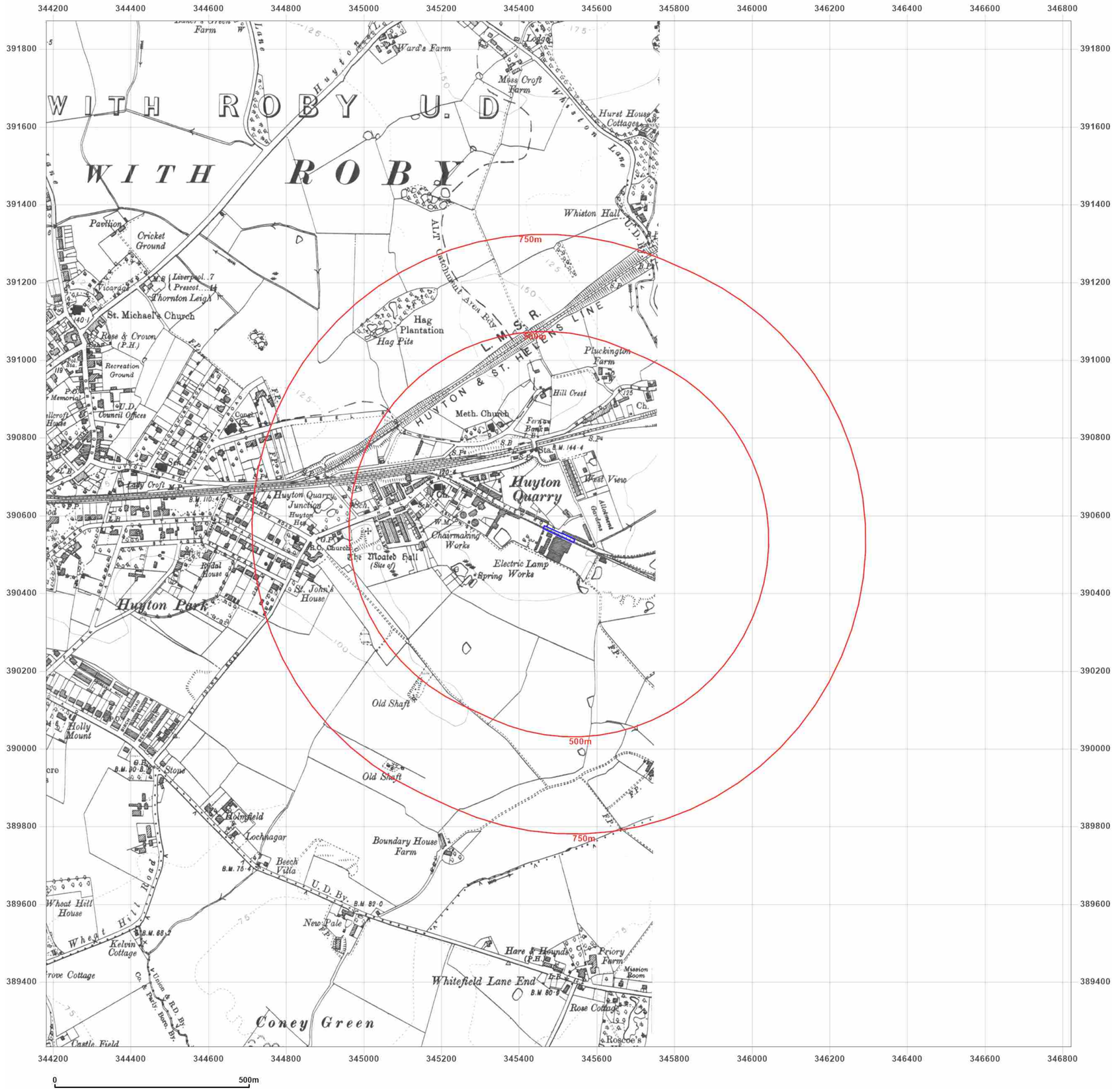

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1925**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1848
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

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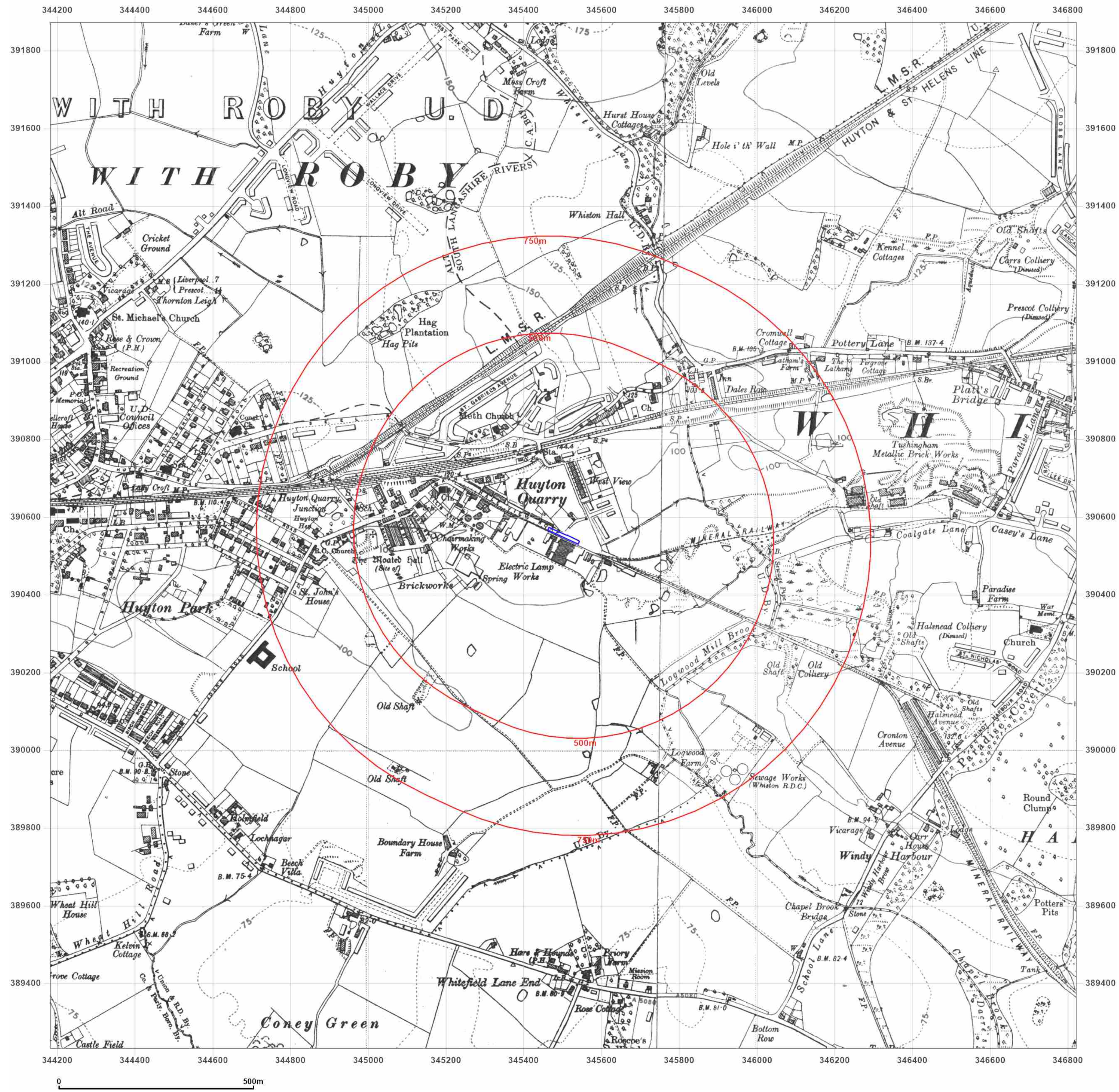

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1848
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

Surveyed 1846
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

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Production date: 24 March 2021

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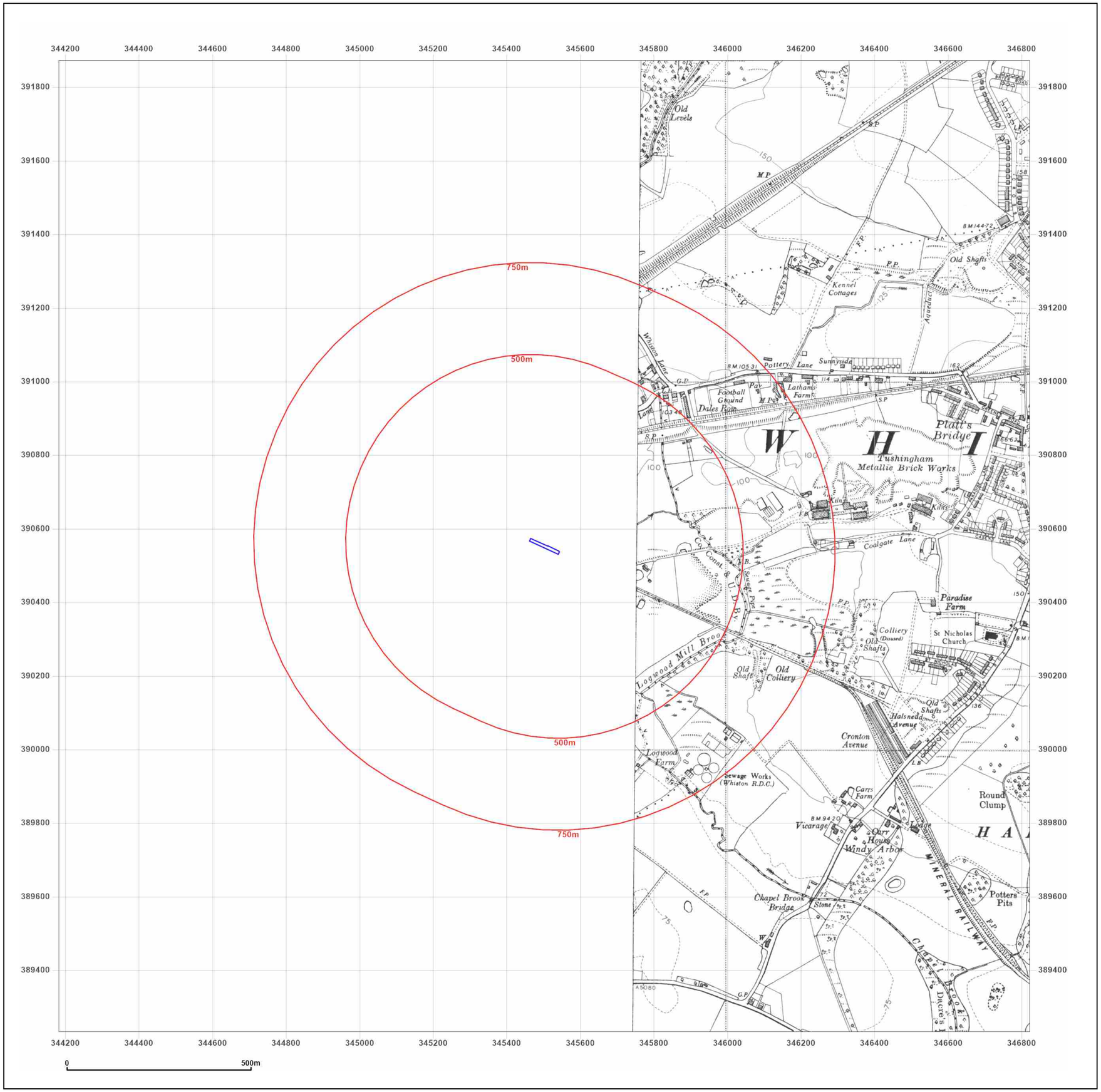

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: County Series

Map date: **1947**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1846
Revised 1947
Edition N/A
Copyright N/A
Levelled N/A

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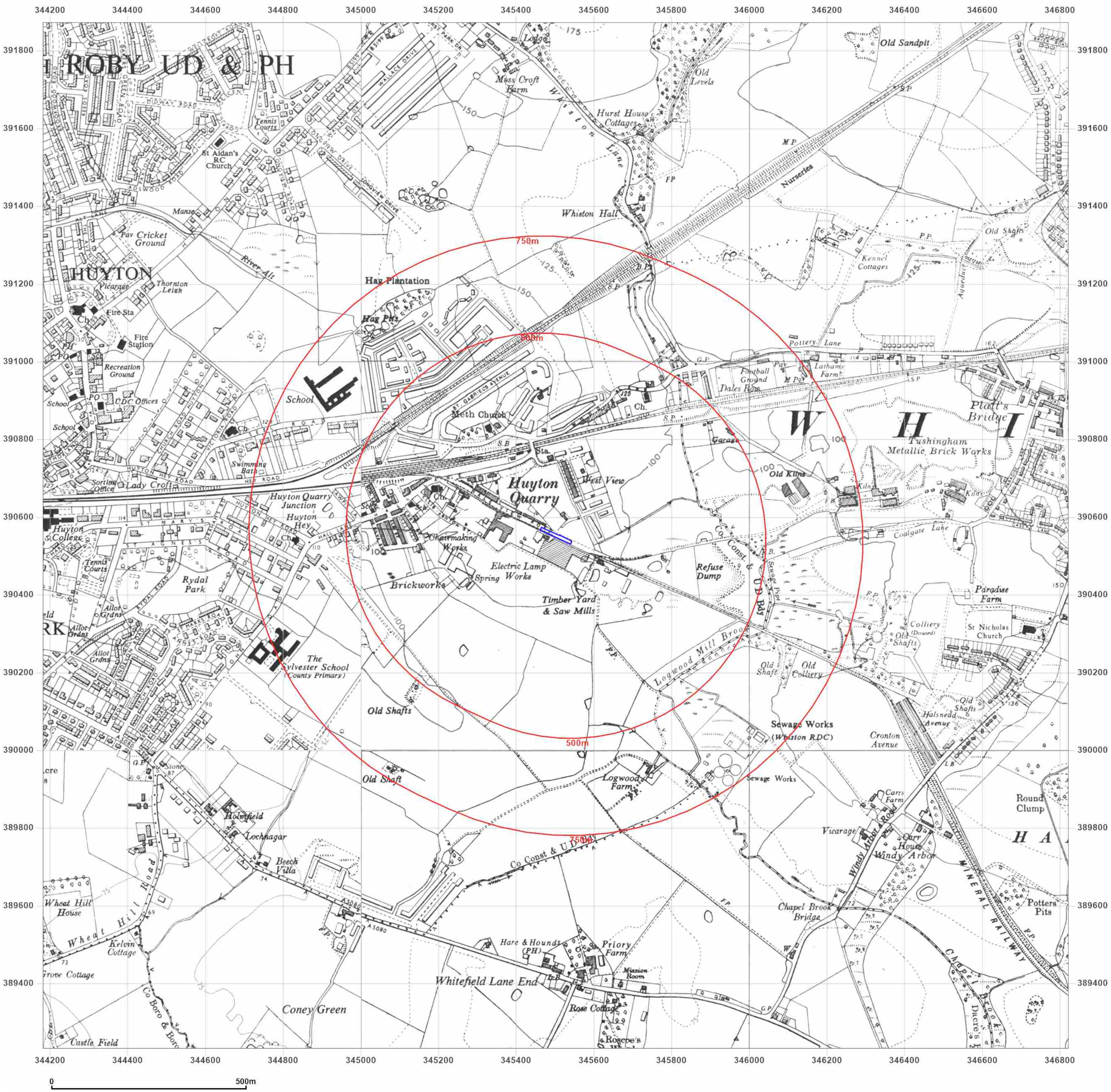

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: Provisional

Map date: **1955-1956**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1954
Revised 1955
Edition N/A
Copyright 1956
Levelled N/A

Surveyed 1947
Revised 1955
Edition 1956
Copyright N/A
Levelled N/A

Surveyed 1954
Revised 1955
Edition N/A
Copyright 1956
Levelled N/A

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

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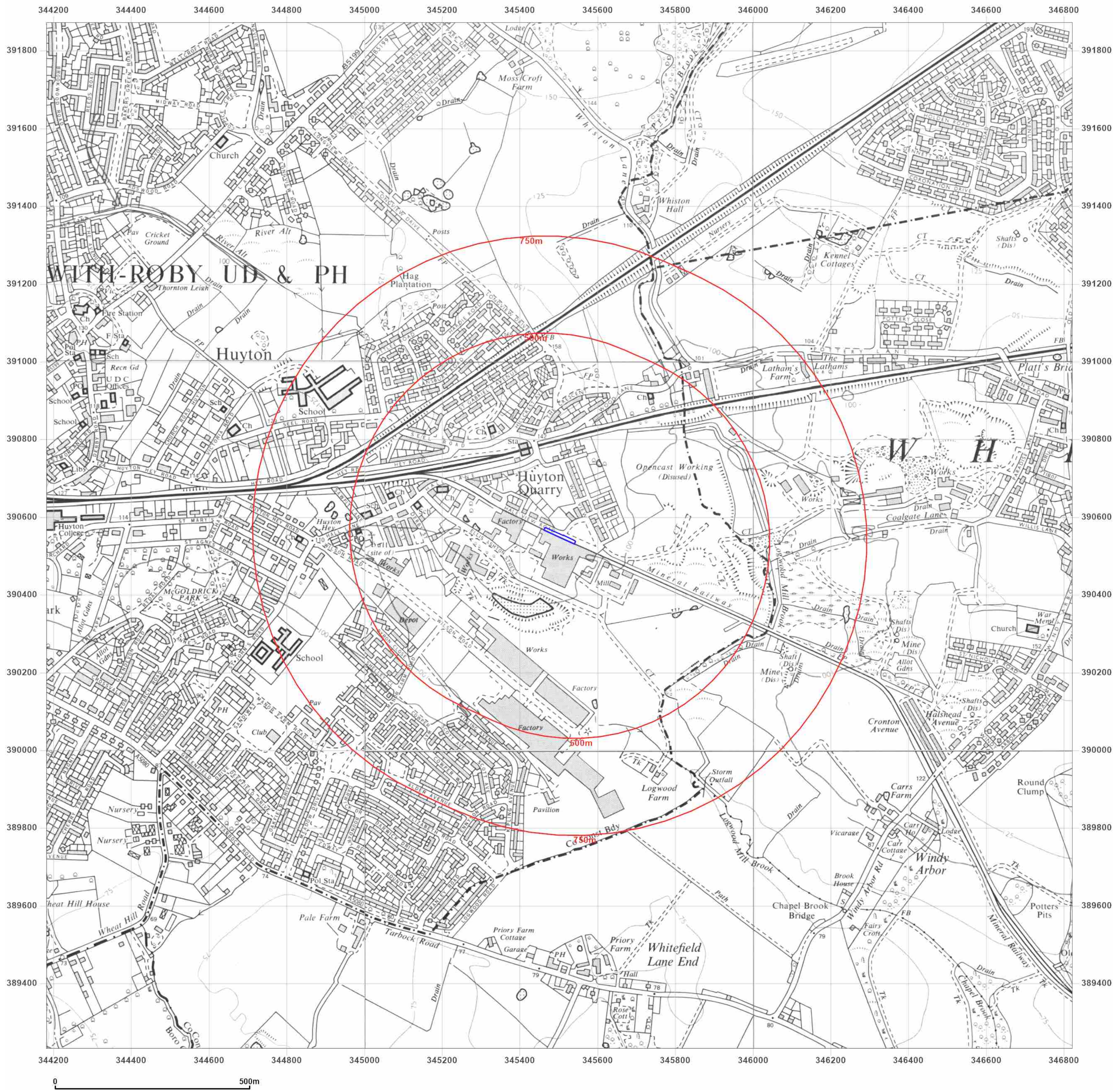

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: Provisional

Map date: **1965-1967**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

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

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

Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

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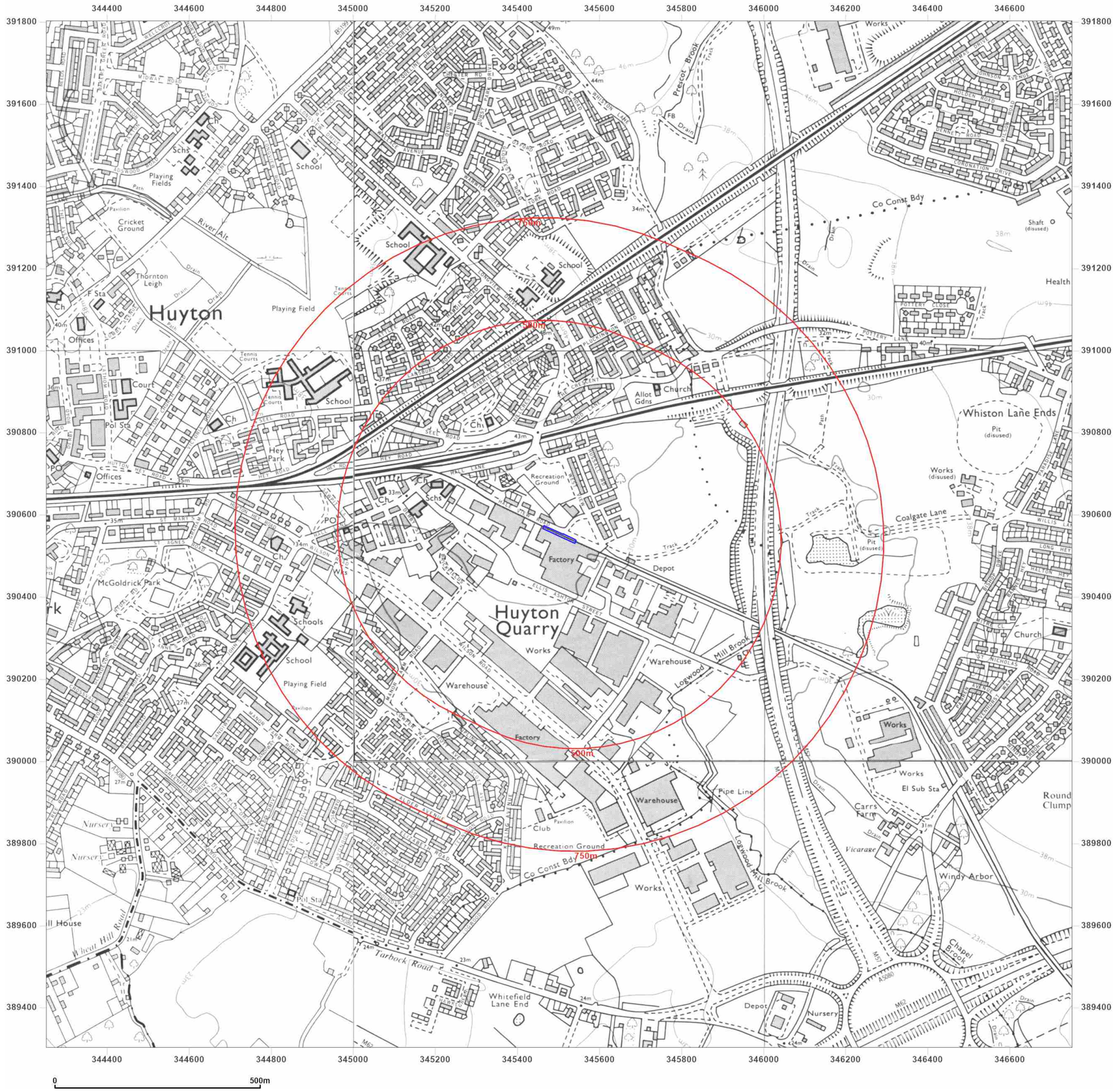

CCG

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1974-1978**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1975
Revised 1977
Edition N/A
Copyright 1978
Levelled 1955

Surveyed 1975
Revised 1978
Edition N/A
Copyright 1978
Levelled 1964

Surveyed 1973
Revised 1974
Edition N/A
Copyright 1974
Levelled 1955

Surveyed 1975
Revised 1977
Edition N/A
Copyright 1977
Levelled 1964

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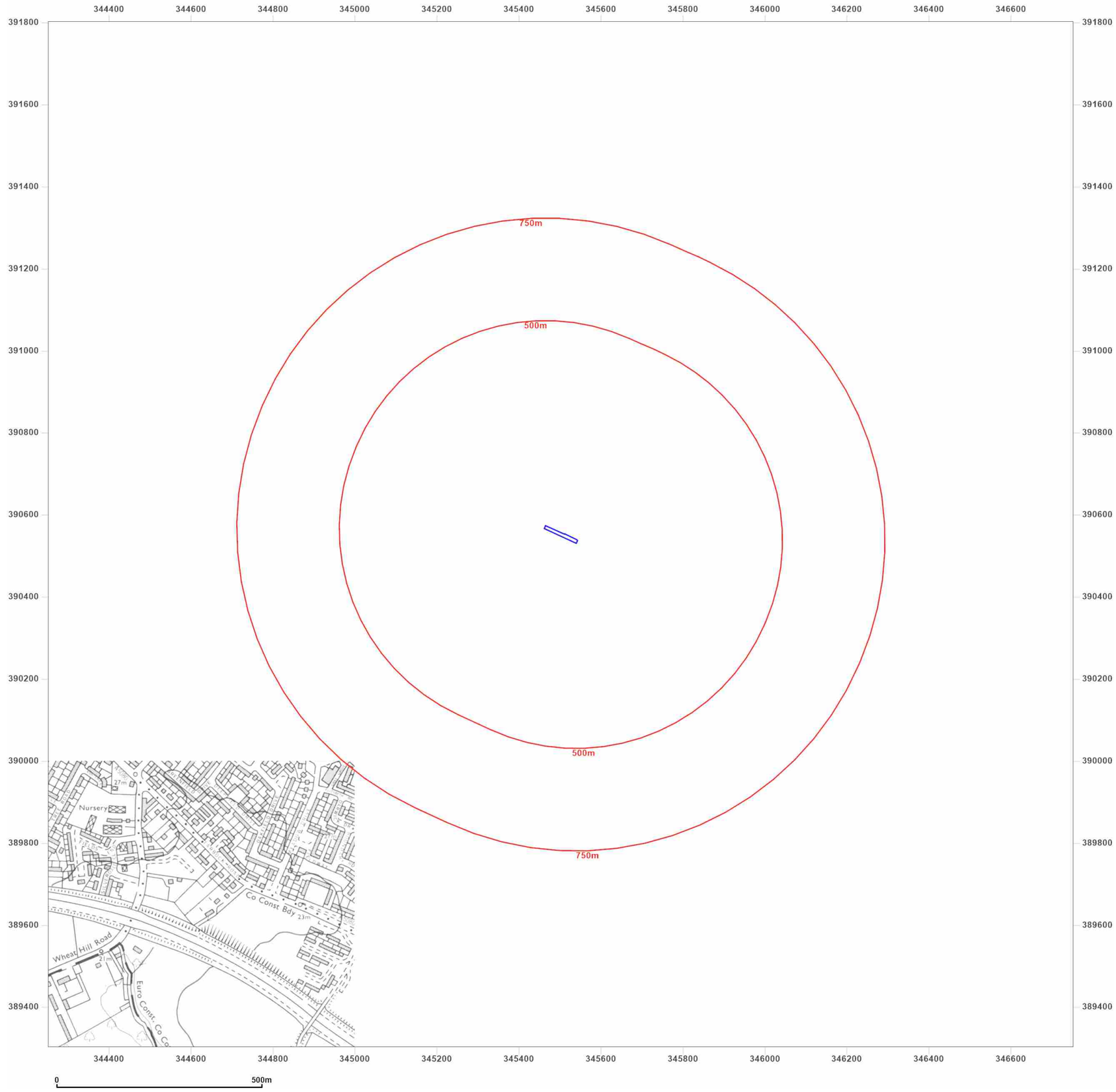


Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

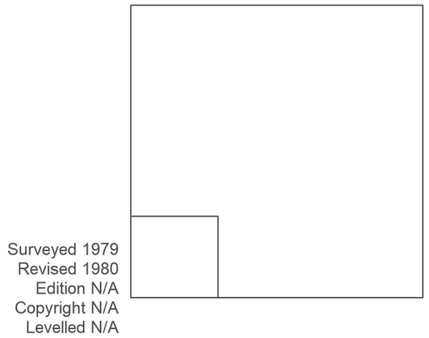
Map Name: National Grid

Map date: **1980**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S



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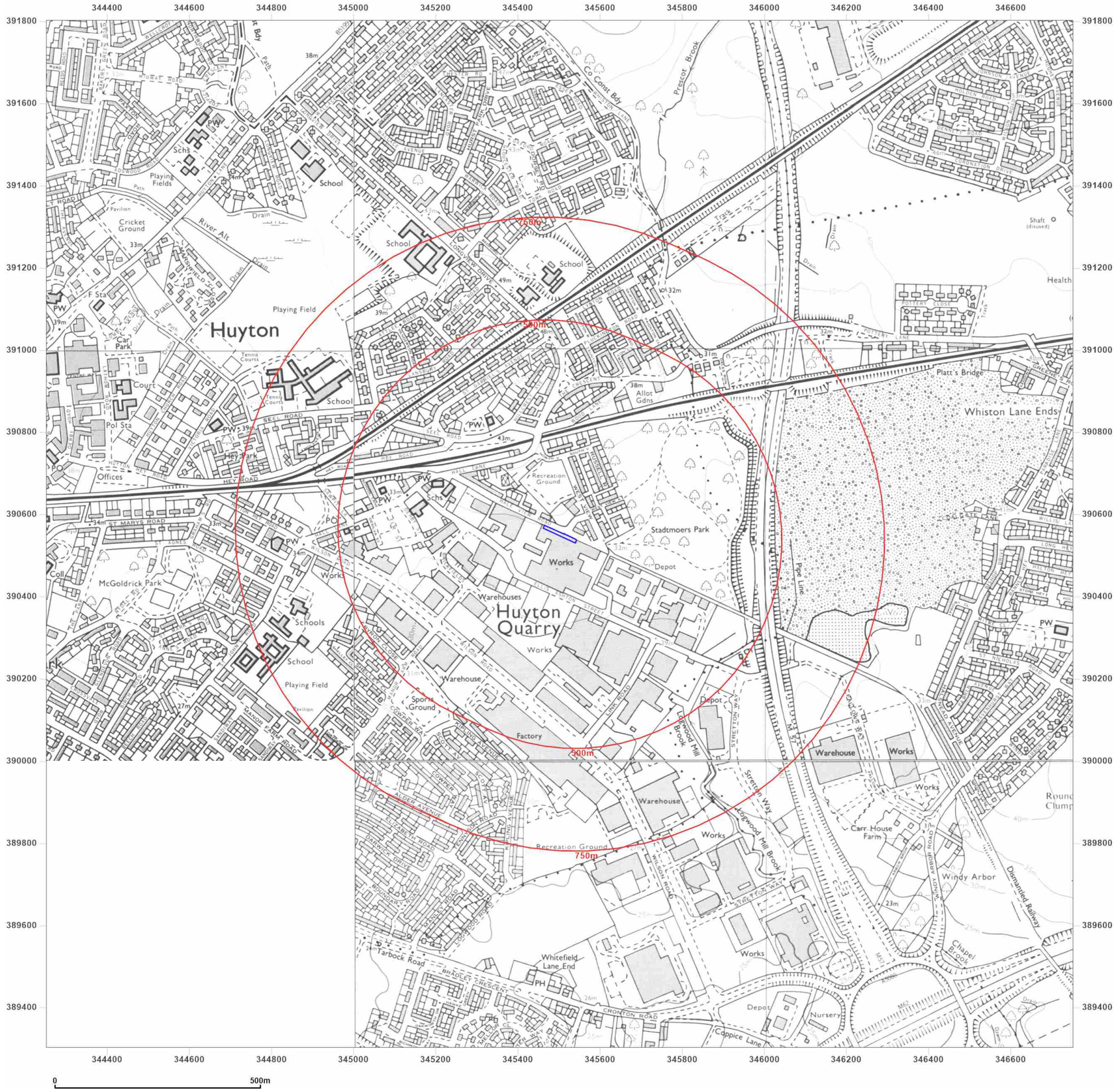

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: **1989-1990**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

Surveyed 1987
Revised 1989
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1989
Revised 1990
Edition N/A
Copyright N/A
Levelled N/A

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

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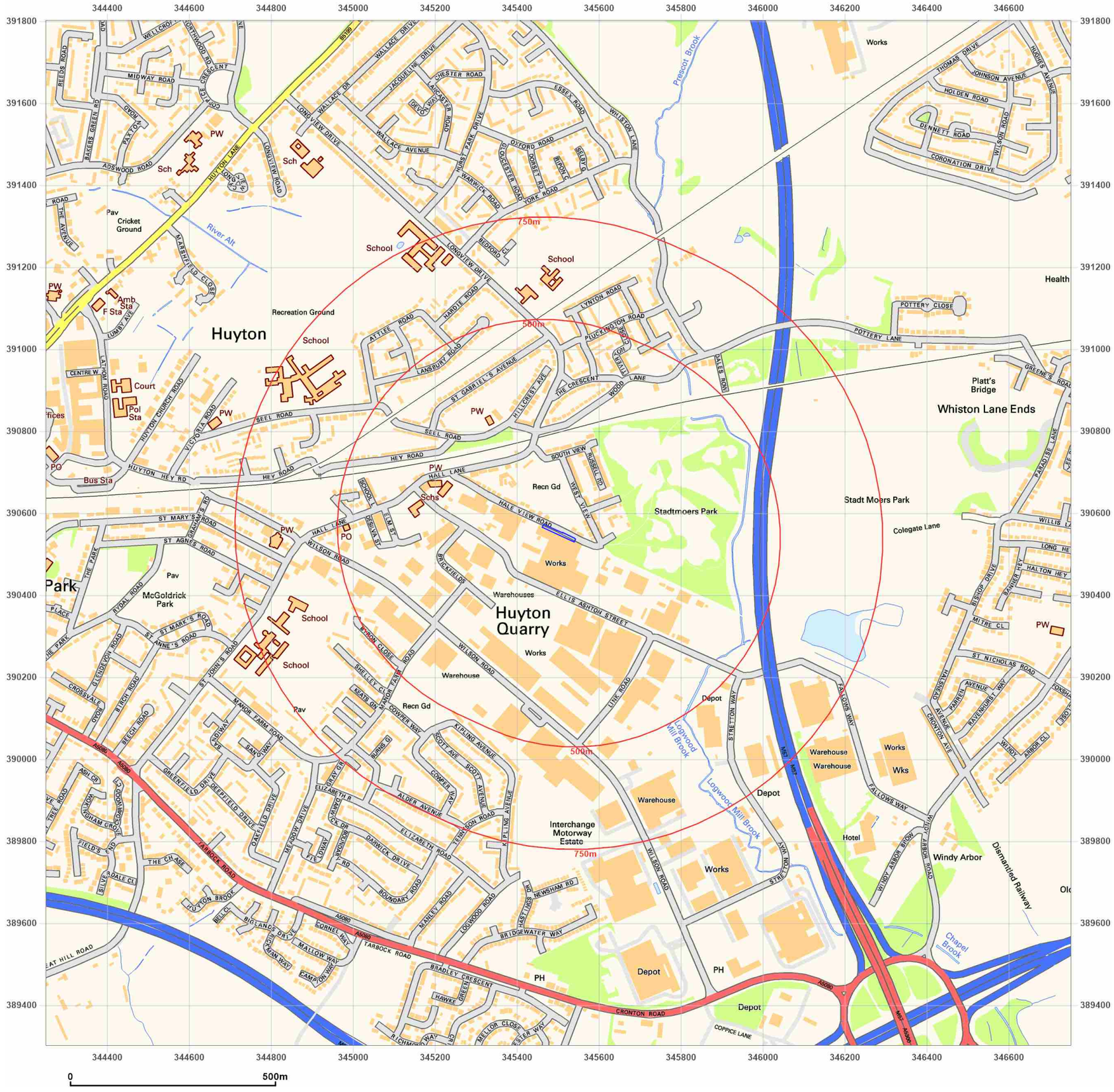

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2001

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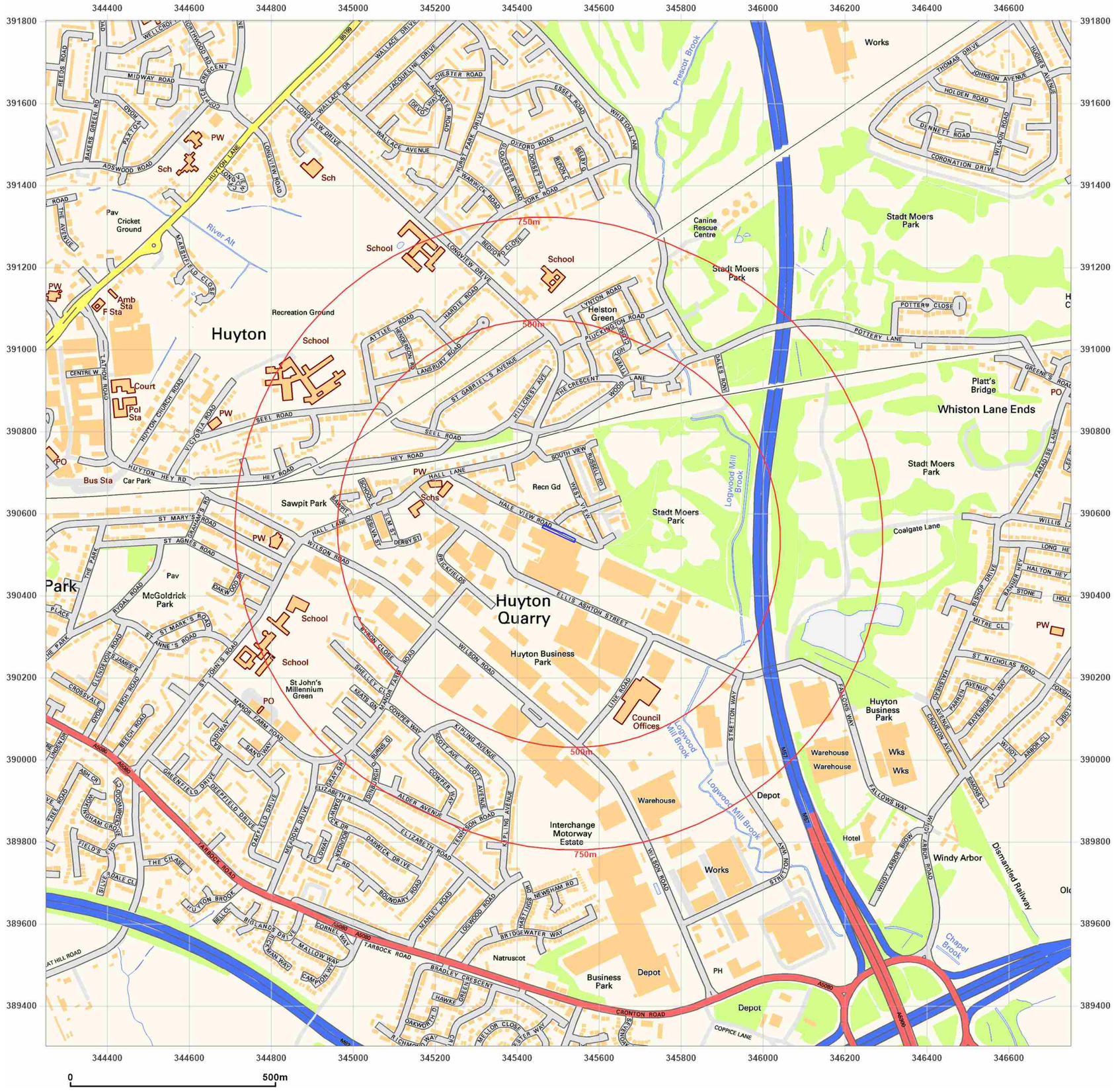

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

N
W E
S

2010

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Production date: 24 March 2021

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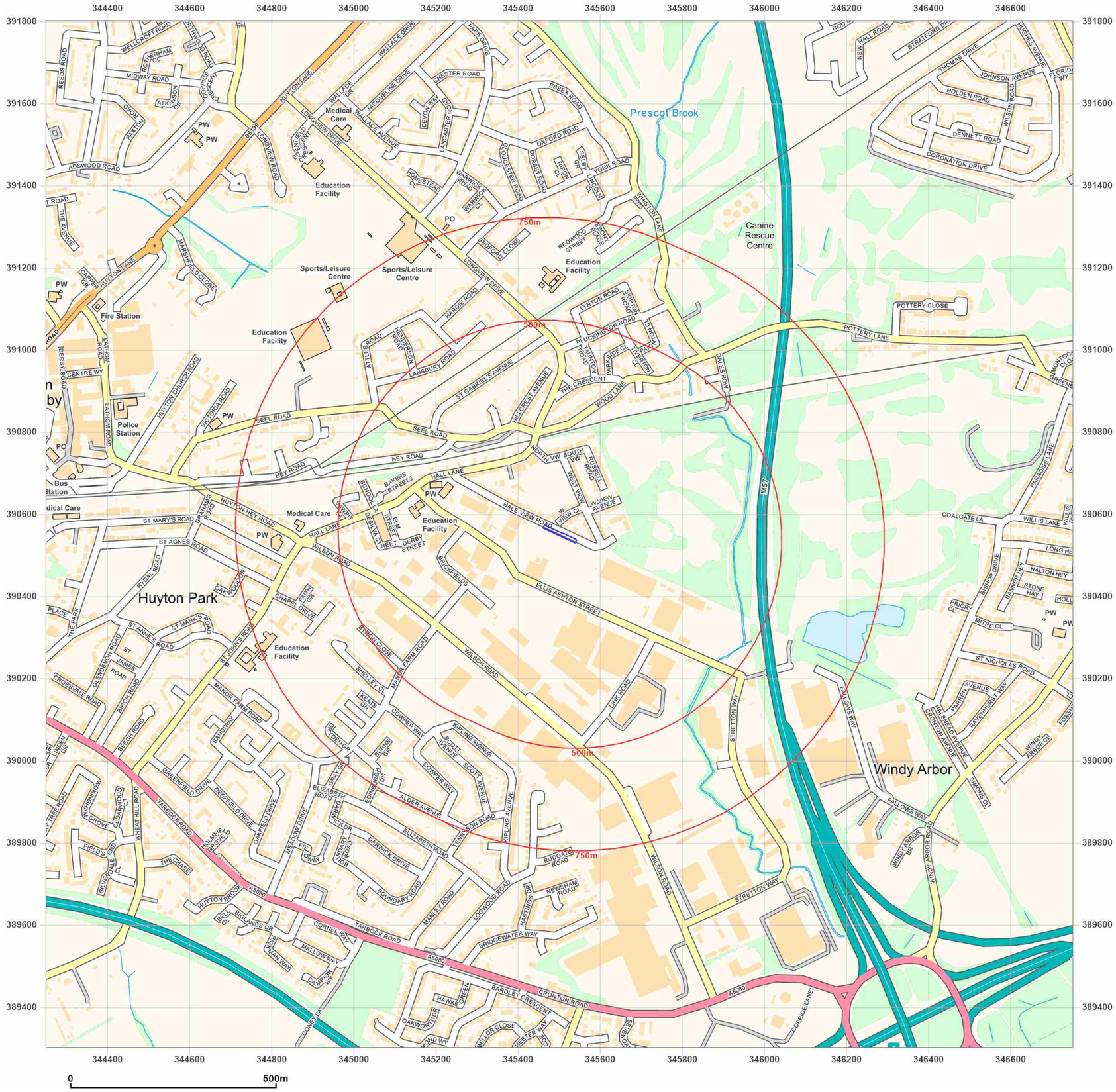

Site Details:

Hale View Road

Client Ref: 4165
Report Ref: CMAPS-AAG-949218-4165-240321HIS
Grid Ref: 345501, 390552

Map Name: National Grid

Map date: 2021

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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2021

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APPENDIX D

SAMPLING METHODOLOGY

APPENDIX E

DYNAMIC SAMPLING BOREHOLE LOGS

Contract Name:	Client:	Borehole ID:
Hale View Road, Huyton	Mr Jason Barton	**WS1**

Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
CCG-C-21-12234	17/05/2021	PMC	CB	FINAL	

Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:	Scale:
				Dando Terrier Rig	NW/SH	1:25

Weather: | Termination: Sampling refusal - bedrock | SPT Hammer: N/R, Energy Ratio: N/R

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation
				(0.30)		Dark brown very gravelly silty SAND. Gravel is fine to medium sub-angular coal, cinders and sandstone (MADE GROUND)			
0.20	ES			0.30		Reddish brown very sandy slightly silty GRAVEL. Gravel is fine to coarse angular to sub-angular sandstone			
0.50	B			(0.60)					
				0.90		Locally very soft varying to firm to stiff greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular mudstone and coal			
		SPT(S)N=0 (2,1/0,0,0,0)					1		
		HVP=30							
1.20	ES								
		HVP=60							
1.50	D	HVP=80							
				(1.90)					
		SPT(S)N=17 (3,4/3,3,4,7)					2		
		HVP=20							
2.50	D	HVP=90							
		HVP=100		2.80		Grey MUDSTONE. Completely weathered and recovered as slightly sandy very gravelly CLAY			
		SPT(C)N=98 (10,13/19,23,27,29)					3		
				(1.20)					
		SPT(C)100 (25 for 65mm/100 for 155mm)		4.00		End of Borehole at 4.00m	4		
							5		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	1.00	PLAIN	
1.00	3.20	SLOTTED	

Remarks:

Hand dug service clearance excavation GL-1.0mbgl
Borehole advanced by dynamic sampling

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name:	Client:	Borehole ID:
Hale View Road, Huyton	Mr Jason Barton	**WS2**

Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
CCG-C-21-12234	17/05/2021	PMC	CB	FINAL	

Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:	Scale:
				Dando Terrier Rig	NW/SH	1:25

Weather:

Termination: Sampling refusal - bedrock

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.40)		Dark brown very sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular cinders and coal (MADE GROUND)		
0.30	ES			0.40		Reddish brown very sandy slightly silty GRAVEL. Gravel is fine to coarse angular to sub-angular sandstone		
0.60	ES			(0.50)				
				0.90		Firm greyish brown slightly gravelly sandy silty CLAY. Gravel is fine to medium sub-angular mudstone		
1.20	D	HVP=60 HVP=60		(0.50)				
				1.40		Stiff light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular mudstone		
1.80	D	HVP=110 HVP=110		(0.70)				
				2.10		Light brown slightly sandy slightly gravelly silty friable CLAY. Gravel is fine to medium sub-angular mudstone. Possibly tending to weathered mudstone		
				(0.90)				
3.00	D			3.00		End of Borehole at 3.00m		

1 2 3 4 5

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Hand dug service clearance excavation GL-1.0mbgl
Borehole advanced by dynamic sampling

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name:	Client:	Borehole ID:
Hale View Road, Huyton	Mr Jason Barton	**WS3**

Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
CCG-C-21-12234	17/05/2021	PMC	CB	FINAL	

Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:	Scale:
				Dando Terrier Rig	NW/SH	1:25

Weather:

Termination: Sampling refusal - bedrock

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.50)		Dark grey sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular coal and cinders (MADE GROUND)		
0.40	ES			0.50		Stiff brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular sandstone and coal		
		HVP=80		(0.50)				
0.80	B	HVP=80		1.00		Stiff light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular mudstone and coal		
		HVP=100						
1.50	D			(1.00)				
		HVP=100						
1.80	ES			2.00		Light brown slightly sandy slightly gravelly silty friable CLAY. Gravel is fine to medium sub-angular mudstone. Possibly tending to weathered mudstone		
				(0.60)				
2.60	D			2.60		Brownish grey MUDSTONE. Completely weathered and recovered as slightly sandy very gravelly CLAY		
				(0.40)				
				3.00		End of Borehole at 3.00m		

1 2 3 4 5

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:

Hand dug service clearance excavation GL-1.0mbgl
Borehole advanced by dynamic sampling

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	0.50	PLAIN	
0.50	3.00	SLOTTED	

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name:	Client:	Borehole ID:
Hale View Road, Huyton	Mr Jason Barton	**WS4**

Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
CCG-C-21-12234	17/05/2021	PMC	CB	FINAL	

Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:	Scale:
				Dando Terrier Rig	NW/SH	1:25

Weather: | Termination: Sampling refusal - bedrock | SPT Hammer: N/R, Energy Ratio: N/R

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation
				(0.80)		Dark brown very gravelly silty SAND. Gravel is fine to coarse sub-angular coal, cinders and concrete (MADE GROUND)			
0.50	ES			0.80					
		HVP=90				Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular to sub-rounded sandstone			
		SPT(S)N=4 (2,1/1,1,1,1)		1.00			1		
1.10	B					Loose brown very gravelly slightly silty fine to medium grained cobbly SAND varying to very sandy cobbly GRAVEL. Gravel is fine to medium sub-angular sandstone			
				(1.10)					
1.90	ES								
		SPT(S)N=13 (2,3/4,2,3,4)					2		
				2.10		Medium dense brownish grey very clayey slightly sandy GRAVEL. Gravel is fine to coarse angular to sub-angular mudstone			
				2.30		Medium dense brownish grey slightly gravelly slightly silty fine to medium grained SAND. Gravel is fine to medium sub-angular mudstone			
				2.50		Grey MUDSTONE. Completely weathered and recovered as slightly sandy very gravelly CLAY			
2.70	B								
		SPT(S)N=36 (5,7/0,10,11,15)					3		
				(1.50)					
		SPT(S)50 (25 for 80mm/50 for 10mm)		4.00		End of Borehole at 4.00m	4		
							5		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	1.00	PLAIN	
1.00	2.50	SLOTTED	

Remarks:

Hand dug service clearance excavation GL-1.0mbgl
Borehole advanced by dynamic sampling

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name:	Client:	Borehole ID:
Hale View Road, Huyton	Mr Jason Barton	**WS5**

Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
CCG-C-21-12234	18/05/2021	PMC	CB	FINAL	

Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:	Scale:
				Dando Terrier Rig	NW/SH	1:25

Weather:

Termination: Sampling refusal - bedrock

Samples & In Situ Testing			Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation
				(0.60)		Dark brown very gravelly very silty SAND. Gravel is fine to coarse angular to sub-angular coal, cinders and sandstone (MADE GROUND)			
0.40	ES			0.60					
				(0.40)		Reddish brown very sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular sandstone			
0.90	B			1.00			1		
1.20	D	HVP=90		(0.40)		Stiff brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular sandstone, mudstone and coal			
				1.40					
		HVP=100				Stiff light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular mudstone			
1.70	D	HVP=110		(0.60)					
				2.00			2		
2.40	D			(1.00)		Light brown slightly sandy gravelly silty friable CLAY. Gravel is fine to medium sub-angular mudstone. Possibly tending to weathered mudstone			
3.00	D			3.00			3		
						End of Borehole at 3.00m			
							4		
							5		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Hand dug service clearance excavation GL-1.0mbgl
Borehole advanced by dynamic sampling

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name:	Client:	Borehole ID:
Hale View Road, Huyton	Mr Jason Barton	**WS6**

Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
CCG-C-21-12234	18/05/2021	PMC	CB	FINAL	

Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:	Scale:
				Dando Terrier Rig	NW/SH	1:25

Weather:

Termination: Sampling refusal - bedrock

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.40)		Brown very gravelly silty SAND. Gravel is fine to medium sub-angular sandstone, coal and cinders (MADE GROUND)		
0.30	ES			0.40				
				(0.60)		Reddish brown silty gravelly SAND. Gravel is fine to medium sub-angular sandstone		
0.70	B			1.00		End of Borehole at 1.00m		

1 2 3 4 5

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Hand dug service clearance excavation GL-1.0mbgl
Borehole advanced by dynamic sampling

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Contract Name:	Client:	Borehole ID:
Hale View Road, Huyton	Mr Jason Barton	**WS7**

Contract Number:	Date Started:	Logged By:	Checked By:	Status:	Sheet 1 of 1
CCG-C-21-12234	18/05/2021	PMC	CB	FINAL	

Dynamic Sampling Borehole Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:	Scale:
				Dando Terrier Rig	NW/SH	1:25

Weather: | Termination: Sampling refusal - bedrock | SPT Hammer: N/R, Energy Ratio: N/R

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						Dark brown very sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular mudstone, coal, brick and cinders (MADE GROUND)		
0.40	ES			(1.00)				
0.60	B							
		SPT(S)N=6 (1,2/2,1,2,1)		1.00		Reddish brown sandy slightly silty GRAVEL. Gravel is fine to coarse angular to sub-angular sandstone		
1.10	ES			1.20		Firm grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular mudstone		
1.50	D	HVP=60		(0.80)				
		HVP=70						
		SPT(S)N=50 (0,10/50 for 295mm)		2.00		Very dense brown very clayey gravelly fine to medium grained SAND. Gravel is fine to coarse sub-angular sandstone		
2.20	D			(0.30)				
				2.30		Brownish grey MUDSTONE. Completely weathered and recovered as slightly sandy gravelly CLAY		
2.50	ES			(0.70)				
2.80	D							
		SPT(C)100 (25 for 105mm/100 for 215mm)		3.00		End of Borehole at 3.00m		

1 2 3 4 5

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
Hand dug service clearance excavation GL-1.0mbgl
Borehole advanced by dynamic sampling

Chiselling			
From (m)	To (m)	Duration	Remarks

Installation			
Top (m)	Base (m)	Type	Dia (mm)
0.00	0.50	PLAIN	
0.50	2.30	SLOTTED	

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
1.70			0		

APPENDIX F

GAS & GROUNDWATER MONITORING DATA

GAS AND WATER MONITORING RESULTS

	Date:	25.05.21	10.06.21	24.06.21	09.07.21	23.07.21	17.08.21						
	Visit Number	1	2	3	4	5	6						
	Atmos Press mb	995	1014	1022	1021	1019	1014						
	Pressure Trend	Rising	Steady	Steady	Steady	Falling	Steady						
	Air Temp °C	11	19	16	20	19	16						
	Cloud cover	Clear	Clear	Overcast	Slightly Overcast	Slightly Overcast	Overcast						
	Wind velocity	Light Breeze	Light Breeze	Light Breeze	Light Breeze	Light Breeze	Moderate Wind						
	Precipitation	Dry	Dry	Dry	Dry	Dry	Dry						
	State of Ground	Dry	Dry	Dry	Dry	Dry	Dry						
WS1	CH4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO2 (%):	0.1	0.1	0.1	0.1	0.1	0.1						
	O2 (%):	19.7	20.3	20.4	20.4	20.5	20.2						
	H2S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	PID (ppm):	0.0	0.0	0.0	0.0	0.0	0.0						
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	Water Level (mbgl):	1.20	1.54	1.57	1.58	1.60	1.28						
WS3	CH_4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO_2 (%):	1.2	1.3	1.1	1.1	1.0	1.2						
	O_2 (%):	19.4	19.5	19.4	19.5	19.6	19.4						
	H_2S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	PID (ppm):	0.0	0.0	0.0	0.0	0.0	0.0						
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	Water Level (mbgl):	2.01	2.08	2.10	2.12	2.13	1.77						
WS4	CH_4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO_2 (%):	2.5	3.3	3.0	3.1	3.0	3.0						
	O_2 (%):	17.9	16.8	17.2	17.1	17.3	17.0						
	H_2S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	PID (ppm):	0.0	0.0	0.0	0.0	0.0	0.0						
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	Water Level (mbgl):	2.04	2.16	2.19	2.23	2.25	2.14						
WS7	CH4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO2 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	O2 (%):	19.6	20.4	20.5	20.4	20.5	20.3						
	H2S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	PID (ppm):	0.0	0.0	0.0	0.0	0.0	0.0						
	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	Water Level (mbgl):	1.15	1.37	1.38	1.40	1.43	1.21						

CCG-CMS-FO-129

Issue 2 | Job No: CCG-C-21-12234 | Site: Hale View Road, Huyton

Instrument: GFM436

TEST DATE AND CONDITIONS		
Date	09/03/2021	
Atmospheric Pressure	1001	mB
Ambient Temperature	22.3	°C
Environics Serial No.	5089	

GAS DATA LTD
Unit 4, Fairfield Court
Seven Stars Estate
Wheler Rd
Coventry
CV3 4LJ
Tel 02476303311 Fax 02476307711

GFM436 Final Inspection & Calibration Check Certificate

Customer	C C Geotechnical
Certificate Number	122336
Order Number	327973

Serial Number	12667
Software Version	G436-00.0027/0010

Recalibration DUE Date
09/03/22

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	450	*Accept > 200 cc/min*	Pump Flow @ -200mB	300	*Accept > 200 cc/min*
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
	CH_4		CO_2		O_2	
	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
Sensor	59.7	60	40	40	20.9	20.9
	Accept ±3.0		*Accept ±3.0*		*Accept ±0.5*	
	5	5	4.9	5	6	6
	Accept ±0.3		*Accept ±0.3*		*Accept ±0.3*	
Zero Reading 100% N2	0	0	0	0	0	0
	Accept ±0.0		*Accept ±0.0*		*Accept ±0.1*	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings *(ppm)*			
Gas Type	Range *(ppm)*		Zero Reading		Instrument Gas Reading	
H2S	5000	*1500*	0	*Accept ±0.0*	1500	*Accept ±5.0*
CO	2000	*1000*	0	*Accept ±0.0*	999	*Accept ±5.0*
Hexane	*2.0%*	2.0%	0	*Accept ±0.0*	1.99	*Accept ±10.0*

Cross Gas Effects									
Applied Gas *(ppm)*		Instrument Readings *(ppm)*							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:			
H2S	*1500*	1500		0		0			
CO	*1000*	40		999		0			
Hexane	*2.0%*	0		0		1.99			

Pressure Checks			
Atmospheric Pressure [AP] *(mB)*			
Current Atmospheric Pressure (mB)		Instrument Atmospheric Pressure Reading (mB)	
AP Open Ports		1001	*Accept ±2.0*
AP Port (Internal)	*+800 mB*	800	*Accept ±5.0*
	+1200mb	1200	*Accept ±5.0*

Flow Checks					
Borehole Flow			Differential Pressure		
Applied Reading *(l/h)*	Instrument Reading *(l/h)*		Applied Pressure *(Pa)*	Instrument Reading *(Pa)*	
-30	-30	*Accept ±3.0*	*-476*	-484	*Accept ±50*
-3	-3	*Accept ±1.0*	*-17*	-17	*Accept ±6.0*
0	0	*Accept ±0.0*	*0*	0	*Accept ±0.5*
3	3	*Accept ±0.5*	*13*	12	*Accept ±3.0*
30	29.7	*Accept ±3.0*	*314*	312	*Accept ±50*
60	59.5	*Accept ±6.0*	*962*	953	*Accept ±130*
90	90.6	*Accept ±9.0*	*1915*	1951	*Accept ±250*

Temperature Checks		
Calibration Temperature	Instrument Temperature Reading °C	
Applied Temperature °C		
-10	-10	*Accept ±2.0*
0	0	*Accept ±1.0*
30	30	*Accept ±1.0*
60	60	*Accept ±1.0*
100	100	*Accept ±1.0*

Technician:	Date Tested:
Les Treece	*10/03/2021*

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2015. Certificate NQA 8374. Valid until 21/03/2022

shawcity
Life-saving solutions

CERTIFICATE OF CALIBRATION
Phocheck Tiger

CALIBRATION CERTIFICATE NO: 71067

ISSUED BY: SHAWCITY LIMITED
DATE: 01-Jun-21

APPROVED SIGNATORY:

NAME: Dave Godfrey

CUSTOMER: CC Geotechnical Ltd
INSTRUMENT: PhoCheck Tiger
SERIAL NUMBER: T-110194

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Isobutylene	WO297301-1	100 ppm	100 ppm
Isobutylene	WO188023-1	5000 ppm	5000 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2 %
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
www.shawcity.co.uk
Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

APPENDIX G

CHEMICAL ANALYSIS REPORTING

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618

cs@elab-uk.co.uk
info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	21-33972
Issue:	1b
Date of Issue:	04/06/2021
Contact:	Paul McFadden
Customer Details:	CC Geotechnical Ltd Unit 1 & 2 Deltic Place Deltic Way Liverpool MersevsideL33 7BA
Quotation No:	Q14-00045
Order No:	Not Supplied
Customer Reference:	CCG-C-21-12234
Date Received:	27/05/2021
Date Approved:	04/06/2021
Details:	Hale View Road, Huyton
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

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Sample Summary

Report No.: 21-33972, issue number 1b

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
238897	WS1 0.20	17/05/2021	27/05/2021	Sandy loam	
238898	WS1 1.20	17/05/2021	27/05/2021	Silty clayey loam	
238899	WS2 0.30	17/05/2021	27/05/2021	Loamy sand	
238900	WS3 0.40	17/05/2021	27/05/2021	Loamy sand	
238901	WS4 0.50	17/05/2021	27/05/2021	Loamy sand	
238902	WS4 1.90	17/05/2021	27/05/2021	Loamy sand	
238903	WS6 0.30	18/05/2021	27/05/2021	Sandy loam	
238904	WS7 0.40	18/05/2021	27/05/2021	Loamy sand	
238905	WS7 2.50	18/05/2021	27/05/2021	Silty loam	

Results Summary

Report No.: 21-33972, issue number 1b

			ELAB Reference	238897	238898	238899	238900	238901	238902	238903
			Customer Reference							
			Sample ID							
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS1	WS1	WS2	WS3	WS4	WS4	WS6
			Sample Depth (m)	0.20	1.20	0.30	0.40	0.50	1.90	0.30
			Sampling Date	17/05/2021	17/05/2021	17/05/2021	17/05/2021	17/05/2021	17/05/2021	18/05/2021
Determinand	**Codes**	**Units**	**LOD**							
Soil sample preparation parameters										
Material removed	N	%	0.1	37.8	< 0.1	33.9	54.4	38.8	19.0	43.5
Description of Inert material removed	N		0	Stones,clinker	None	Stones,clinker	Stones,clinker	Stones,clinker	Stones	Stones,clinker
Metals										
Arsenic	M	mg/kg	1	18.8	n/t	37.6	11.3	60.8	n/t	22.1
Cadmium	M	mg/kg	0.5	< 0.5	n/t	0.9	0.7	1.1	n/t	0.8
Chromium	M	mg/kg	5	25.9	n/t	25.1	29.6	23.5	n/t	25.6
Copper	M	mg/kg	5	103	n/t	239	73.8	532	n/t	161
Lead	M	mg/kg	5	129	n/t	227	160	349	n/t	248
Mercury	M	mg/kg	0.5	< 0.5	n/t	3.1	2.7	3.7	n/t	3.3
Nickel	M	mg/kg	5	40.8	n/t	60.5	59.1	69.8	n/t	33.9
Selenium	M	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	2.2	n/t	< 1.0
Zinc	M	mg/kg	5	106	n/t	246	151	354	n/t	202
Anions										
Water Soluble Sulphate	M	g/l	0.02	< 0.02	n/t	0.03	< 0.02	0.10	n/t	0.13
Water Soluble Sulphate	M	mg/l	20	n/t	21	n/t	n/t	n/t	< 20	n/t
Inorganics										
Free Cyanide	N	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	n/t	< 0.8	< 0.8	< 0.8	n/t	< 0.8
Total Sulphide	N	mg/kg	2	< 2	n/t	< 2	< 2	< 2	n/t	< 2
Acid Soluble Sulphate (SO4)	U	%	0.02	0.03	n/t	0.06	0.03	0.12	n/t	0.12
Water Soluble Boron	N	mg/kg	0.5	0.9	n/t	0.7	< 0.5	0.7	n/t	0.5
Miscellaneous										
pH	M	pH units	0.1	8.2	7.1	7.5	8.1	7.1	7.0	9.2
Soil Organic Matter	U	%	0.1	4.4	n/t	6.5	8.2	7.8	n/t	3.1
Phenols										
Phenol	M	mg/kg	1	< 1	n/t	< 1	< 1	< 1	n/t	< 1
M,P-Cresol	N	mg/kg	1	< 1	n/t	< 1	< 1	< 1	n/t	< 1
O-Cresol	N	mg/kg	1	< 1	n/t	< 1	< 1	< 1	n/t	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	n/t	< 1	< 1	< 1	n/t	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	n/t	< 1	< 1	< 1	n/t	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	n/t	< 1	< 1	< 1	n/t	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	n/t	< 5	< 5	< 5	n/t	< 5
Polyaromatic hydrocarbons										
Naphthalene	M	mg/kg	0.1	0.8	n/t	0.6	0.5	0.3	n/t	0.5
Acenaphthylene	M	mg/kg	0.1	1.2	n/t	0.3	0.8	0.2	n/t	< 0.1
Acenaphthene	M	mg/kg	0.1	2.7	n/t	0.5	0.6	0.2	n/t	0.2
Fluorene	M	mg/kg	0.1	2.1	n/t	0.3	0.4	< 0.1	n/t	< 0.1
Phenanthrene	M	mg/kg	0.1	26.2	n/t	4.0	3.5	0.7	n/t	1.1
Anthracene	M	mg/kg	0.1	8.0	n/t	1.7	2.0	0.6	n/t	0.3
Fluoranthene	M	mg/kg	0.1	46.3	n/t	13.6	16.5	3.9	n/t	1.5
Pyrene	M	mg/kg	0.1	43.3	n/t	11.8	15.0	5.1	n/t	1.5
Benzo(a)anthracene	M	mg/kg	0.1	25.2	n/t	7.1	9.2	2.4	n/t	0.7
Chrysene	M	mg/kg	0.1	26.0	n/t	8.2	9.4	2.4	n/t	0.9
Benzo(b)fluoranthene	M	mg/kg	0.1	24.8	n/t	8.5	8.7	2.2	n/t	0.8
Benzo(k)fluoranthene	M	mg/kg	0.1	21.9	n/t	7.3	8.4	2.1	n/t	0.6
Benzo(a)pyrene	M	mg/kg	0.1	26.8	n/t	8.3	9.7	1.6	n/t	0.8
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	23.3	n/t	8.5	8.3	2.1	n/t	1.2
Dibenzo(a,h)anthracene	M	mg/kg	0.1	4.8	n/t	2.0	2.0	0.8	n/t	0.4
Benzo[g,h,i]perylene	M	mg/kg	0.1	20.6	n/t	6.6	7.4	1.4	n/t	0.8
Total PAH(16)	M	mg/kg	0.4	304	n/t	89.3	102	26.3	n/t	11.5

Results Summary

Report No.: 21-33972, issue number 1b

			ELAB Reference	238897	238898	238899	238900	238901	238902	238903
			Customer Reference							
			Sample ID							
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	WS1	WS1	WS2	WS3	WS4	WS4	WS6
			Sample Depth (m)	0.20	1.20	0.30	0.40	0.50	1.90	0.30
			Sampling Date	17/05/2021	17/05/2021	17/05/2021	17/05/2021	17/05/2021	17/05/2021	18/05/2021
Determinand	**Codes**	**Units**	**LOD**							
BTEX										
Benzene	M	ug/kg	10	< 10.0	n/t	< 10.0	< 10.0	< 10.0	n/t	< 10.0
Toluene	M	ug/kg	10	< 10.0	n/t	< 10.0	< 10.0	< 10.0	n/t	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	n/t	< 10.0	< 10.0	< 10.0	n/t	< 10.0
Xylenes	M	ug/kg	10	< 10.0	n/t	< 10.0	< 10.0	< 10.0	n/t	< 10.0
TPH CWG										
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	7.0	n/t	1.9	1.6	< 1.0	n/t	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	18.3	n/t	10.6	7.3	3.7	n/t	1.2
>C21-C35 Aliphatic	N	mg/kg	1	472	n/t	155	209	55.1	n/t	30.7
>C35-C40 Aliphatic	N	mg/kg	1	294	n/t	77.4	168	33.9	n/t	1.8
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	n/t	< 0.01	< 0.01	< 0.01	n/t	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	1.6	n/t	< 1.0	< 1.0	< 1.0	n/t	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	16.1	n/t	11.5	5.0	4.8	n/t	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	366	n/t	187	139	51.4	n/t	12.2
>C35-C40 Aromatic	N	mg/kg	1	192	n/t	60.3	82.4	9.1	n/t	2.5
Total (>C5-C40) Ali/Aro	N	mg/kg	1	1370	n/t	503	612	158	n/t	48.4
PCB (ICES 7 congeners)										
PCB 28	M	mg/kg	0.01	< 0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01
PCB 52	M	mg/kg	0.01	< 0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01
PCB 101	M	mg/kg	0.01	< 0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01
PCB 118	M	mg/kg	0.01	< 0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01
PCB 153	M	mg/kg	0.01	< 0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01
PCB 138	M	mg/kg	0.01	< 0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01
PCB 180	M	mg/kg	0.01	< 0.01	n/t	n/t	< 0.01	n/t	n/t	< 0.01
PCB (Total of 7 Congeners)	M	mg/kg	0.03	< 0.03	n/t	n/t	< 0.03	n/t	n/t	< 0.03

Results Summary

Report No.: 21-33972, issue number 1b

			ELAB Reference	238904	238905
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	WS7	WS7
			Sample Depth (m)	0.40	2.50
			Sampling Date	18/05/2021	18/05/2021
Determinand	**Codes**	**Units**	**LOD**		
Soil sample preparation parameters					
Material removed	N	%	0.1	37.3	< 0.1
Description of Inert material removed	N		0	Stones,clinker	None
Metals					
Arsenic	M	mg/kg	1	83.7	n/t
Cadmium	M	mg/kg	0.5	0.8	n/t
Chromium	M	mg/kg	5	31.9	n/t
Copper	M	mg/kg	5	592	n/t
Lead	M	mg/kg	5	736	n/t
Mercury	M	mg/kg	0.5	134	n/t
Nickel	M	mg/kg	5	95.9	n/t
Selenium	M	mg/kg	1	< 1.0	n/t
Zinc	M	mg/kg	5	522	n/t
Anions					
Water Soluble Sulphate	M	g/l	0.02	0.12	n/t
Water Soluble Sulphate	M	mg/l	20	n/t	20
Inorganics					
Free Cyanide	N	mg/kg	1	< 1.0	n/t
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	n/t
Total Sulphide	N	mg/kg	2	< 2	n/t
Acid Soluble Sulphate (SO4)	U	%	0.02	0.09	n/t
Water Soluble Boron	N	mg/kg	0.5	0.6	n/t
Miscellaneous					
pH	M	pH units	0.1	7.4	7.4
Soil Organic Matter	U	%	0.1	9.3	n/t
Phenols					
Phenol	M	mg/kg	1	< 1	n/t
M,P-Cresol	N	mg/kg	1	< 1	n/t
O-Cresol	N	mg/kg	1	< 1	n/t
3,4-Dimethylphenol	N	mg/kg	1	< 1	n/t
2,3-Dimethylphenol	M	mg/kg	1	< 1	n/t
2,3,5-trimethylphenol	M	mg/kg	1	< 1	n/t
Total Monohydric Phenols	N	mg/kg	5	< 5	n/t
Polyaromatic hydrocarbons					
Naphthalene	M	mg/kg	0.1	0.6	n/t
Acenaphthylene	M	mg/kg	0.1	0.3	n/t
Acenaphthene	M	mg/kg	0.1	0.4	n/t
Fluorene	M	mg/kg	0.1	0.1	n/t
Phenanthrene	M	mg/kg	0.1	1.4	n/t
Anthracene	M	mg/kg	0.1	0.4	n/t
Fluoranthene	M	mg/kg	0.1	2.0	n/t
Pyrene	M	mg/kg	0.1	1.7	n/t
Benzo(a)anthracene	M	mg/kg	0.1	1.1	n/t
Chrysene	M	mg/kg	0.1	1.2	n/t
Benzo(b)fluoranthene	M	mg/kg	0.1	0.8	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	0.8	n/t
Benzo(a)pyrene	M	mg/kg	0.1	1.0	n/t
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	1.0	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	0.5	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.9	n/t
Total PAH(16)	M	mg/kg	0.4	14.5	n/t

Results Summary

Report No.: 21-33972, issue number 1b

			ELAB Reference	238904	238905
			Customer Reference		
			Sample ID		
			Sample Type	SOIL	SOIL
			Sample Location	WS7	WS7
			Sample Depth (m)	0.40	2.50
			Sampling Date	18/05/2021	18/05/2021
Determinand	**Codes**	**Units**	**LOD**		
BTEX					
Benzene	M	ug/kg	10	< 10.0	n/t
Toluene	M	ug/kg	10	< 10.0	n/t
Ethylbenzene	M	ug/kg	10	< 10.0	n/t
Xylenes	M	ug/kg	10	< 10.0	n/t
TPH CWG					
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	n/t
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	n/t
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	n/t
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	n/t
>C16-C21 Aliphatic	N	mg/kg	1	1.9	n/t
>C21-C35 Aliphatic	N	mg/kg	1	28.0	n/t
>C35-C40 Aliphatic	N	mg/kg	1	9.1	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	n/t
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	n/t
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	n/t
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	n/t
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	n/t
>C21-C35 Aromatic	N	mg/kg	1	13.5	n/t
>C35-C40 Aromatic	N	mg/kg	1	6.2	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	58.7	n/t
PCB (ICES 7 congeners)					
PCB 28	M	mg/kg	0.01	n/t	n/t
PCB 52	M	mg/kg	0.01	n/t	n/t
PCB 101	M	mg/kg	0.01	n/t	n/t
PCB 118	M	mg/kg	0.01	n/t	n/t
PCB 153	M	mg/kg	0.01	n/t	n/t
PCB 138	M	mg/kg	0.01	n/t	n/t
PCB 180	M	mg/kg	0.01	n/t	n/t
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t

Results Summary

Report No.: 21-33972, issue number 1b

			ELAB Reference	238897	238900	238903
			Customer Reference			
			Sample ID			
			Sample Type	SOIL	SOIL	SOIL
			Sample Location	WS1	WS3	WS6
			Sample Depth (m)	0.20	0.40	0.30
			Sampling Date	17/05/2021	17/05/2021	18/05/2021
Determinand	**Codes**	**Units**	**LOD**			
VOC						
Heptane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
cis-1,2-dichloroethene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,2,2-Tetrachloroetha	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-dibromoethane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
p-cymene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1-2-3 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1-2-4 - Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0	< 10.0

Tests marked N are not UKAS accredited.

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Results Summary

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Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
238897	0.20	WS1	Brown sandy soil, clinker/road-stone, sandstone, stones	No asbestos detected	n/t	n/t	n/t	n/t
238899	0.30	WS2	Brown sandy soil, clinker, stones	No asbestos detected	n/t	n/t	n/t	n/t
238900	0.40	WS3	Dark-brown sandy soil, stones, road-stone, plant-material	No asbestos detected	n/t	n/t	n/t	n/t
238901	0.50	WS4	Dark-brown sandy soil, clinker	No asbestos detected	n/t	n/t	n/t	n/t
238903	0.30	WS6	Brown sandy soil, stones, clinker	No asbestos detected	n/t	n/t	n/t	n/t
238904	0.40	WS7	Brown sandy soil, clinker, stones, slate	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

Report No.: 21-33972, issue number 1b

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Free cyanide	N	As submitted sample	02/06/2021	107	Colorimetry
Sulphide	N	As submitted sample	02/06/2021	109	Colorimetry
Hexavalent chromium	N	As submitted sample	01/06/2021	110	Colorimetry
pH	M	Air dried sample	02/06/2021	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	01/06/2021	115	Ion Chromatography
PCB (ICES 7 congeners)	M	Air dried sample	28/05/2021	120	GC-MS
Phenols in solids	M	As submitted sample	01/06/2021	121	HPLC
PAH (GC-FID)	M	As submitted sample	28/05/2021	133	GC-FID
Water soluble anions	M	Air dried sample	28/05/2021	172	Ion Chromatography
Low range Aliphatic hydrocarbons soil	N	As submitted sample	28/05/2021	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	28/05/2021	181	GC-MS
VOC in solids	M	As submitted sample	28/05/2021	181	GC-MS
BTEX in solids	M	As submitted sample	28/05/2021	181A	GC-MS
Water soluble boron	N	Air dried sample	01/06/2021	202	Colorimetry
Aliphatic hydrocarbons in soil	N	As submitted sample	28/05/2021	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	01/06/2021	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	28/05/2021	214	GC-FID
Asbestos identification	U	Air dried sample	03/06/2021	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	28/05/2021	300	ICPMS
Soil organic matter	U	Air dried sample	04/06/2021	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited

Report Information

Report No.: 21-33972, issue number 1b

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618

cs@elab-uk.co.uk
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UKAS TESTING 2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	21-34288
Issue:	1
Date of Issue:	22/06/2021
Contact:	Paul McFadden
Customer Details:	CC Geotechnical Ltd Unit 1 & 2 Deltic Place Deltic Way Liverpool MersevsideL33 7BA
Quotation No:	Q14-00045
Order No:	Not Supplied
Customer Reference:	CCG-C-21-12234
Date Received:	15/06/2021
Date Approved:	22/06/2021
Details:	Hale View Road, Huyton
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

This report may only be reproduced in full

Sample Summary

Report No.: 21-34288, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
240688	WS1 1.54	10/06/2021	15/06/2021		
240689	WS7 1.37	10/06/2021	15/06/2021		

Results Summary

Report No.: 21-34288, issue number 1

			ELAB Reference	240688	240689
			Customer Reference		
			Sample ID		
			Sample Type	WATER	WATER
			Sample Location	WS1	WS7
			Sample Depth (m)	1.54	1.37
			Sampling Date	10/06/2021	10/06/2021
Determinand	**Codes**	**Units**	**LOD**		
Dissolved Metals					
Arsenic	U	ug/l	5	< 5	< 5
Boron	N	ug/l	5	132	317
Calcium	U	ug/l	100	75800	112000
Cadmium	U	ug/l	1	< 1	2
Chromium	U	ug/l	5	< 5	< 5
Copper	U	ug/l	0.5	1.4	2.9
Mercury	U	ug/l	0.1	< 0.1	< 0.1
Magnesium	U	ug/l	100	24000	73300
Nickel	U	ug/l	5	< 5	31
Lead	U	ug/l	1	< 1	< 1
Selenium	U	ug/l	5	< 5	< 5
Zinc	U	ug/l	5	< 5	161
Anions					
Sulphate	U	mg/l	0.5	33.3	423
Inorganics					
Free Cyanide	N	ug/l	5	< 5	< 5
Hexavalent Chromium	U	ug/l	100	< 100	< 100
Miscellaneous					
Dissolved organic carbon	N	mg/l	1.5	22	21
Hardness (CaCO3)	N	mg/l CaCO3	0.1	288	581
pH	U	pH units	0.1	7.7	6.7
Phenols					
Phenol	N	ug/l	1	< 1	< 1
M,P-Cresol	N	ug/l	1	< 1	< 1
O-Cresol	N	ug/l	1	< 1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1	< 1
2,3,5-trimethylphenol	N	ug/l	1	< 1	< 1
Total Monohydric Phenols	N	ug/l	1	< 1	< 1
Polyaromatic hydrocarbons					
Naphthalene GCMS	N	ug/l	0.01	0.01	< 0.01
Acenaphthylene GCMS	N	ug/l	0.01	< 0.01	< 0.01
Acenaphthene GCMS	N	ug/l	0.01	< 0.01	< 0.01
Fluorene GCMS	N	ug/l	0.01	< 0.01	< 0.01
Phenanthrene GCMS	N	ug/l	0.01	0.01	< 0.01
Anthracene GCMS	N	ug/l	0.01	< 0.01	< 0.01
Fluoranthene GCMS	N	ug/l	0.01	0.02	< 0.01
Pyrene GCMS	N	ug/l	0.01	0.03	< 0.01
Benzo (a) anthracene GCMS	N	ug/l	0.01	0.01	< 0.01
Chrysene GCMS	N	ug/l	0.01	0.02	< 0.01
Benzo (b) fluoranthene GCMS	N	ug/l	0.01	0.02	< 0.01
Benzo (k) fluoranthene GCMS	N	ug/l	0.01	0.01	< 0.01
Benzo (a) pyrene GCMS	N	ug/l	0.01	0.01	< 0.01
Indeno (1,2,3-cd) pyrene GCMS	N	ug/l	0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene GCMS	N	ug/l	0.01	< 0.01	< 0.01
Benzo(ghi)perylene GCMS	N	ug/l	0.01	< 0.01	< 0.01
Total PAH(16) GCMS	N	ug/l	0.01	0.18	0.05

Results Summary

2683

Report No.: 21-34288, issue number 1

			ELAB Reference	240688	240689
			Customer Reference		
			Sample ID		
			Sample Type	WATER	WATER
			Sample Location	WS1	WS7
			Sample Depth (m)	1.54	1.37
			Sampling Date	10/06/2021	10/06/2021
Determinand	**Codes**	**Units**	**LOD**		
BTEX					
Benzene	N	ug/l	1	< 1.00	< 1.00
Toluene	N	ug/l	1	< 1.00	< 1.00
Ethylbenzene	N	ug/l	1	< 1.00	< 1.00
Xylenes	N	ug/l	1	< 1.00	< 1.00
MTBE	N	ug/l	1	< 1.00	< 1.00
TPH CWG					
>C5-C6 Aliphatic	N	ug/l	1	< 1.0	< 1.0
>C6-C8 Aliphatic	N	ug/l	1	< 1.0	< 1.0
>C8-C10 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C10-C12 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C12-C16 Aliphatic	N	ug/l	5	< 5.0	< 5.0
>C16-C21 Aliphatic	N	ug/l	5	8.4	< 5.0
>C21-C35 Aliphatic	N	ug/l	5	374	47.9
>C35-C40 Aliphatic	N	ug/l	5	42.6	24.5
Total (>C5-C40) Aliphatic	N	ug/l	5	425	72.4
>C5-C7 Aromatic	N	ug/l	1	< 1.0	< 1.0
>C7-C8 Aromatic	N	ug/l	1	< 1.0	< 1.0
>C8-C10 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C10-C12 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C12-C16 Aromatic	N	ug/l	5	< 5.0	< 5.0
>C16-C21 Aromatic	N	ug/l	5	10.0	< 5.0
>C21-C35 Aromatic	N	ug/l	5	360	< 5.0
>C35-C40 Aromatic	N	ug/l	5	54.8	< 5.0
Total (>C5-C40) Aromatic	N	ug/l	5	425	< 5.0
Total (>C5-C40) Ali/Aro	N	ug/l	5	850	72.4

Method Summary

Report No.: 21-34288, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Water					
Aliphatic/Aromatic hydrocarbons in water	N		22/06/2021		GC-FID
Aromatic hydrocarbons in water	N		22/06/2021		GC-FID
Phenols in waters	N		16/06/2021		HPLC
Dissolved organic carbon	N		18/06/2021	102	IR
pH of waters	U		16/06/2021	113	Electromeric
Chromium Hexavalent in waters	U		17/06/2021	123	Colorimetry
Cyanide in waters	N		17/06/2021	132	Colorimetry
PAHs and/or PCBs in waters	N		16/06/2021	135	GC-MS
BTEX in waters	N		22/06/2021	200	GC-MS
Low range Aliphatic hydrocarbons water	N		22/06/2021	200	GC-MS
Low range Aromatic hydrocarbons water	N		22/06/2021	200	GC-MS
Aliphatic hydrocarbons in water	N		16/06/2021	215	GC-FID
Aromatic hydrocarbons in water	N		16/06/2021	215	GC-FID
Anions	U		16/06/2021	270	Ion Chromatography
Dissolved metals by ICP in waters	U		16/06/2021	301	ICPMS
Hardness in waters	N		17/06/2021	APHA	ICPMS

Tests marked N are not UKAS accredited

Report Information

Report No.: 21-34288, issue number 1

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Deviation Codes

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Sample Retention and Disposal

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All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

APPENDIX H

HUMAN HEALTH RISK ASSESSMENT

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

METALS DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 12234
Site name: Hale View Road

Prepared by: PMC
Authorised by: PMC
Proposed land use: Residential with plant uptake
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

Contaminants			Metals							
			Cadmium	Chromium III	Chromium VI	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.5	5.0	0.8	5.0	5.0	0.5	5.0	5.0
Human Health Risk Assessment (GAC)			11	910	6	2400	200	40	180	3700
Sample Location	Sample Depth (m)	Sample type								
WS1	0.20	SOIL	< 0.5	25.9	< 0.8	103	129	< 0.5	40.8	106
WS1	1.20	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
WS2	0.30	SOIL	0.9	25.1	< 0.8	239	227	3.1	60.5	246
WS3	0.40	SOIL	0.7	29.6	< 0.8	73.8	160	2.7	59.1	151
WS4	0.50	SOIL	**1.1**	23.5	< 0.8	532	349	3.7	69.8	354
WS4	1.90	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
WS6	0.30	SOIL	0.8	25.6	< 0.8	161	248	3.3	33.9	202
WS7	0.40	SOIL	0.8	**31.9**	< 0.8	**592**	**736**	**134**	**95.9**	**522**
WS7	2.50	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
Human Health Risk Assessment (GAC)			11	910	6	2400	200	40	180	3700

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SEMI-METALS, NON-METALS, INORGANICS AND OTHER DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 12234
Site name: Hale View Road

Prepared by: PMC
Authorised by: PMC
Proposed land use: Residential with plant uptake
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

Contaminants			Arsenic	Boron	Selenium	Cyanide (free)	Sulphate (water soluble)	Sulphate (water soluble)	pH (units)	Soil Organic Matter %
			Semi/non-metals			Inorganics			Other	
Units			mg/kg	mg/kg	mg/kg	mg/kg	g/l	mg/l	units	units
Limit of Detection			1.0	0.5	1.0	1.0	0.02	20.0	0.1	0.1
Human Health Risk Assessment (GAC)			37	290	250	22	NA	NA	NA	NA
Sample Location	Sample Depth (m)	Sample type								
WS1	0.20	SOIL	18.8	**0.9**	< 1.0	< 1.0	< 0.02	n/t	8.2	4.4
WS1	1.20	SOIL	n/t	n/t	n/t	n/t	n/t	21	7.1	n/t
WS2	0.30	SOIL	37.6	0.7	< 1.0	< 1.0	0.03	n/t	7.5	6.5
WS3	0.40	SOIL	11.3	< 0.5	< 1.0	< 1.0	< 0.02	n/t	8.1	8.2
WS4	0.50	SOIL	60.8	0.7	**2.2**	< 1.0	0.10	n/t	7.1	7.8
WS4	1.90	SOIL	n/t	n/t	n/t	n/t	n/t	< 20	7	n/t
WS6	0.30	SOIL	22.1	0.5	< 1.0	< 1.0	0.13	n/t	**9.2**	3.1
WS7	0.40	SOIL	**83.7**	0.6	< 1.0	< 1.0	0.12	n/t	7.4	**9.3**
WS7	2.50	SOIL	n/t	n/t	n/t	n/t	n/t	20	7.4	n/t
Human Health Risk Assessment (GAC)			37	290	11	22	NA	NA	NA	NA

CC GEOTECHNICAL LIMITED

Consulting Geotechnical and Geoenvironmental Engineers

SPECIATED PAH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 12234
Site name: Hale View Road

Prepared by: PMC
Authorised by: PMC
Proposed land use: Residential with plant uptake
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

Contaminants			PAH's																
			Acenapthene	Acenapthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[ghi]perylene	Benzo[k]fluoranthene	Chrysene	Dibenzo[ah]anthracene	fluoranthene	fluorene	Indeno[123-cd]pyrene	Napthalene	Pheanthrene	Pyrene	Total PAH's
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4
Human Health Risk Assessment (GAC)			210	170	2400	7.2	2.2	2.6	320	77	15	0.24	280	170	27	2.3	95	620	NA
Sample Location	Sample Depth (m)	Sample type																	
WS1	0.20	SOIL	**2.7**	**1.2**	**8**	**25.2**	**26.8**	**24.8**	**20.6**	**21.9**	**26**	**4.8**	**46.3**	**2.1**	**23.3**	**0.8**	**26.2**	**43.3**	**0**
WS1	1.20	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	**0**
WS2	0.30	SOIL	0.5	0.3	1.7	7.1	8.3	8.5	6.6	7.3	8.2	2	13.6	0.3	8.5	0.6	4	11.8	**0**
WS3	0.40	SOIL	0.6	0.8	2	9.2	9.7	8.7	7.4	8.4	9.4	2	16.5	0.4	8.3	0.5	3.5	15	**0**
WS4	0.50	SOIL	0.2	0.2	0.6	2.4	1.6	2.2	1.4	2.1	2.4	0.8	3.9	< 0.1	2.1	0.3	0.7	5.1	**0**
WS4	1.90	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	**0**
WS6	0.30	SOIL	0.2	< 0.1	0.3	0.7	0.8	0.8	0.8	0.6	0.9	0.4	1.5	< 0.1	1.2	0.5	1.1	1.5	**0**
WS7	0.40	SOIL	0.4	0.3	0.4	1.1	1	0.8	0.9	0.8	1.2	0.5	2	0.1	1	0.6	1.4	1.7	**0**
WS7	2.50	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	**0**
Human Health Risk Assessment (GAC)			210	170	11	7.2	2.2	2.6	320	77	15	0.24	280	170	27	2.3	95	620	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

SPECIATED TPH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 12234
Site name: Hale View Road

Prepared by: PMC
Authorised by: PMC
Proposed land use: Residential with plant uptake
SOM % used: 1.0

= Threshold exceeded
= Below Limit of detection
n/t = Not tested

Contaminants			Speciated TPH's															
			Aromatics								Aliphatics							
			EC5-7	EC7-8	EC8-10	EC10-12	EC12-16	EC16-21	EC21-35	EC35-44	EC5-6	EC6-8	EC8-10	EC10-12	EC12-16	EC16-35	EC35-44	TOTAL TPH'S
Units			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit of Detection			0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0	0.01	0.01	1.0	1.0	1.0	1.0	1.0	1.0
Human Health Risk Assessment (GAC)			70	130	34	74	140	260	1100	1100	42	100	27	130	1100	65000	65000	NA
Sample Location	Sample Depth (m)	Sample type																
WS1	0.20	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	**1.6**	**16.1**	**366**	**192**	< 0.01	< 0.01	< 1.0	< 1.0	**7**	**490.3**	**294**	**1370**
WS1	1.20	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
WS2	0.30	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	11.5	187	60.3	< 0.01	< 0.01	< 1.0	< 1.0	1.9	165.6	77.4	503
WS3	0.40	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	5	139	82.4	< 0.01	< 0.01	< 1.0	< 1.0	1.6	216.3	168	612
WS4	0.50	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	4.8	51.4	9.1	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	58.8	33.9	158
WS4	1.90	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
WS6	0.30	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	12.2	2.5	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	31.9	1.8	48.4
WS7	0.40	SOIL	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	13.5	6.2	< 0.01	< 0.01	< 1.0	< 1.0	< 1.0	29.9	9.1	58.7
WS7	2.50	SOIL	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t	n/t
Human Health Risk Assessment (GAC)			70	130	11	74	140	260	1100	1100	42	100	27	130	1100	65000	65000	NA

CC GEOTECHNICAL LIMITED
Consulting Geotechnical and Geoenvironmental Engineers

BTEX DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 12234
Site name: Hale View Road

Prepared by: PMC
Authorised by: PMC
Proposed land use: Residential with plant uptake
SOM % used: 1.0

	=	Threshold exceeded
	=	Below Limit of detection
n/t	=	Not tested

Contaminants			BTEX			
			Benzene	Toluene	Ethylbenzene	Total Xylenes
Units			µg/kg	µg/kg	µg/kg	µg/kg
Limit of Detection			10	10	10	10
Human Health Risk Assessment (GAC)			87	130000	48000	56000
Sample Location	Sample Depth (m)	Sample type				
WS1	0.20	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS1	1.20	SOIL	n/t	n/t	n/t	n/t
WS2	0.30	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS3	0.40	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS4	0.50	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS4	1.90	SOIL	n/t	n/t	n/t	n/t
WS6	0.30	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS7	0.40	SOIL	< 10.0	< 10.0	< 10.0	< 10.0
WS7	2.50	SOIL	n/t	n/t	n/t	n/t
Human Health Risk Assessment (GAC)			87	11	48000	56000

CC GEOTECHNICAL LIMITED

Consulting Geotechnical and Geoenvironmental Engineers

ASBESTOS ASSESSMENT SHEET

Job number: 12234
Site name: Hale View Road
Prepared by: PMC
Authorised by: PMC

Sample Location	Sample Depth (m)	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)	Assessment
WS1	0.20	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS2	0.30	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS3	0.40	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS4	0.50	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS6	0.30	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected
WS7	0.40	No asbestos detected	n/t	n/t	n/t	n/t	No asbestos detected

APPENDIX I

CONTROLLED WATERS RISK ASSESSMENT

CONTROLLED WATERS RISK ASSESSMENT
CCG-C-21-12234 HALE VIEW ROAD

				Sample Type	WATER	WATER
				Sample Location	WS1	WS7
				Sample Depth (mbgl)	1.54	1.37
Determinand	**Group**	**Freshwater AA EQS (ug/l)**	**Units**	**LOD**		
Dissolved Metals						
Arsenic	DISSMETALS	50	ug/l	5	< 5	< 5
Boron	DISSMETALS	2000	ug/l	5	132	317
Calcium	DISSMETALS		ug/l	100	75800	112000
Cadmium	DISSMETALS	Hardness Dependant. 0.08, 0.09, 0.15, **0.25**	ug/l	1	< 1	2
Chromium	DISSMETALS	4.7	ug/l	5	< 5	< 5
Copper	DISSMETALS	Hardness Dependant. 1 , 6, 10, **28**, 1 (bioav)	ug/l	5	1.4	2.9
Mercury	DISSMETALS		ug/l	0.1	< 0.1	< 0.1
Magnesium	DISSMETALS		ug/l	100	24000	73300
Nickel	DISSMETALS	20	ug/l	5	< 5	31
Lead	DISSMETALS	1.2 (bioav)	ug/l	1	< 1	< 1
Selenium	DISSMETALS		ug/l	5	< 5	< 5
Zinc	DISSMETALS	Hardness Dependant. **125**, 75, 50, 8, 10.9 (bioav)	ug/l	5	< 5	161
Anions						
Sulphate	ANIONS		ug/l	500	33300	423000
Inorganics						
Free Cyanide	INORGANICS		ug/l	5	< 5	< 5
Hexavalent Chromium	INORGANICS		ug/l	100	< 100	< 100
Miscellaneous						
Hardness (CaCO3)	MISC		mg/l CaCO3	0.1	288	581
pH	MISC		pH units	0.1	7.7	6.7
Polyaromatic hydrocarbons						
Naphthalene	PAH	2	ug/l	0.01	0.01	< 0.01
Acenaphthylene	PAH		ug/l	0.01	< 0.01	< 0.01
Acenaphthene	PAH		ug/l	0.01	< 0.01	< 0.01
Fluorene	PAH		ug/l	0.01	< 0.01	< 0.01
Phenanthrene	PAH		ug/l	0.01	0.01	< 0.01
Anthracene	PAH	0.1	ug/l	0.01	< 0.01	< 0.01
Fluoranthene	PAH	0.0063	ug/l	0.01	0.02	< 0.01
Pyrene	PAH		ug/l	0.01	0.03	< 0.01
Benzo (a) anthracene	PAH		ug/l	0.01	0.01	< 0.01
Chrysene	PAH		ug/l	0.01	0.02	< 0.01
Benzo (b) fluoranthene	PAH		ug/l	0.01	0.02	< 0.01
Benzo (k) fluoranthene	PAH		ug/l	0.01	0.01	< 0.01
Benzo (a) pyrene	PAH	0.00017	ug/l	0.01	0.01	< 0.01
Indeno (1,2,3-cd) pyrene	PAH		ug/l	0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	PAH		ug/l	0.01	< 0.01	< 0.01
Benzo(ghi)perylene	PAH		ug/l	0.01	< 0.01	< 0.01
Total PAH(16)	PAH		ug/l	0.01	0.18	0.05
TPH CWG						
>C5-C6 Aliphatic	TPHCWG		ug/l	1	< 1.0	< 1.0
>C6-C8 Aliphatic	TPHCWG		ug/l	1	< 1.0	< 1.0
>C8-C10 Aliphatic	TPHCWG		ug/l	5	< 5.0	< 5.0
>C10-C12 Aliphatic	TPHCWG		ug/l	5	< 5.0	< 5.0
>C12-C16 Aliphatic	TPHCWG		ug/l	5	< 5.0	< 5.0
>C16-C21 Aliphatic	TPHCWG		ug/l	5	8.4	< 5.0
>C21-C35 Aliphatic	TPHCWG		ug/l	5	374	47.9
>C35-C40 Aliphatic	TPHCWG		ug/l	5	42.6	24.5
Total (>C5-C40) Aliphatic	TPHCWG		ug/l	5	425	72.4
>C5-C7 Aromatic	TPHCWG		ug/l	1	< 1.0	< 1.0
>C7-C8 Aromatic	TPHCWG		ug/l	1	< 1.0	< 1.0
>C8-C10 Aromatic	TPHCWG		ug/l	5	< 5.0	< 5.0
>C10-C12 Aromatic	TPHCWG		ug/l	5	< 5.0	< 5.0
>C12-C16 Aromatic	TPHCWG		ug/l	5	< 5.0	< 5.0
>C16-C21 Aromatic	TPHCWG		ug/l	5	10.0	< 5.0
>C21-C35 Aromatic	TPHCWG		ug/l	5	360	< 5.0
>C35-C40 Aromatic	TPHCWG		ug/l	5	54.8	< 5.0
Total (>C5-C40) Aromatic	TPHCWG		ug/l	5	425	< 5.0
Total (>C5-C40) Ali/Aro	TPHCWG		ug/l	5	850	72.4

APPENDIX J

RISK ASSESSMENT METHODOLOGY

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:

(a) Significant harm is being caused or there is a significant possibility of such harm being caused;
or
(b) 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"*.

In order 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. With the exception of situations of very high pollution risk, Part IIA places contaminated land responsibility on thee 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 as a whole 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 satisfactory 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 comes into contact with, 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 in order 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 it must be decided whether Generic Assessment Criteria (GAC) are suitable for assessing the risk posed by observed contaminantion 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 unnacceptable 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 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.

Where the Environment Agency have published an SGV for a contaminant, this will be used in the GQRA. For contaminants where an SGV has not been published and an S4UL has been published by LQM/CIEH S4UL`s, then this S4UL will be used.

Where an SGV or an S4UL is not available, and a DEFRA C4SL is available, then this C4SL will be used. In house derived GAC's will only be used for contaminants where there is no SGV or LQM S4UL or DEFRA C4SL.

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 alrerady obtained.

If DQRA reveals that unnacceptable 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 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 devloped 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 quantative techniques vary considerably, therefore GQRA and DQRA for human health, controlled waters and ground gas must be undertaken seperately. The risk assessment methodologies where quantative assessment is used for risks to human health, risks to controlled waters and risks posed by ground gas, if relevant, are described hereunder.

BACKGROUND INFROMATION, 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

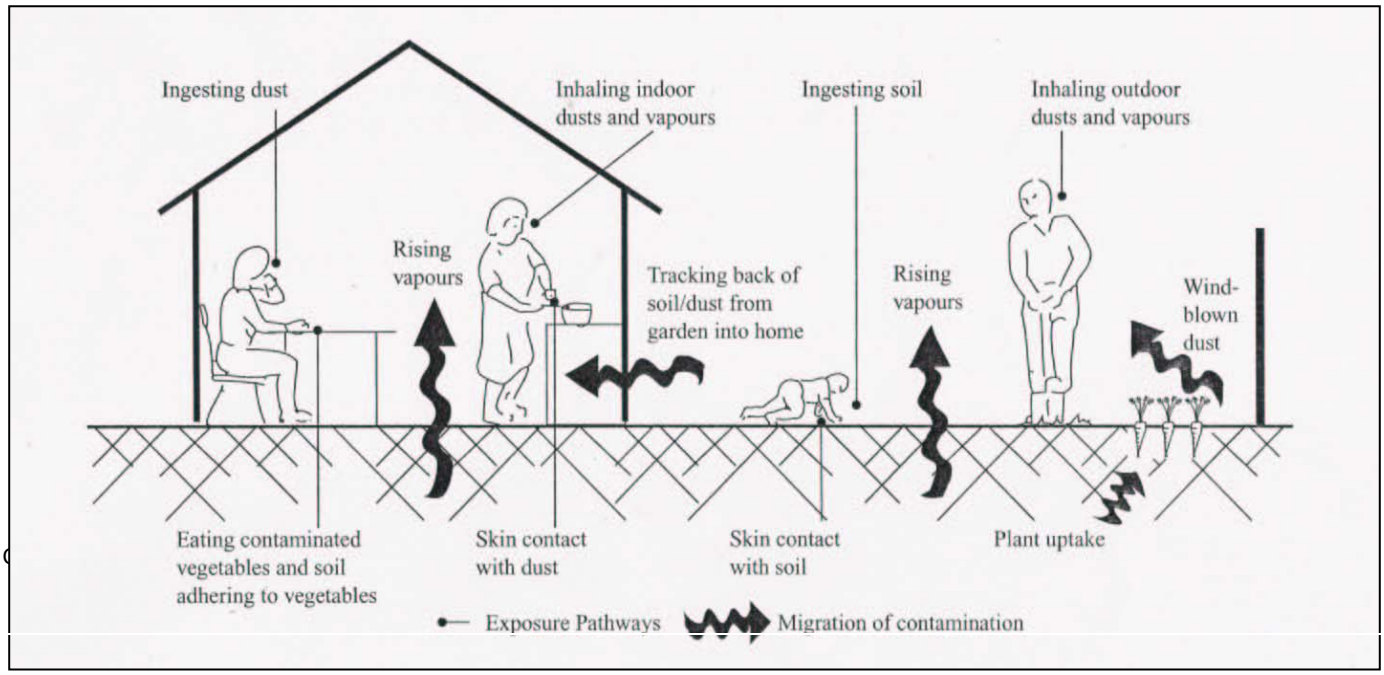
Other guidance/software used in spatial / statistical assessment is provided in:

- 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 1.06".

The CLEA model has been developed to calculate an estimated tolerable daily soil intake (TDSI) for site users given a set 'default' exposure pathways. 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 2mbgl 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 with regard to 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 different kinds of workplace and work-related activities. This generic scenario assumes a typical commercial or light industrial property consisting of a threestorey building at which employees spend most time indoors and are involved in officebased or relatively light physical work.

Human Health Risk Assessment Methodolgy

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

- Tier 1 Preliminary Risk Assessmnent
- 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 Conceptuel Model. Tier 2 and Tier 3 Quantitative Risk Assessments are undertaken in order to develop and refine the Preliminary Conceptual Model aiding a more detailed assessment of the risk posed by contaminants revelaed 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 herunder.

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

GAC`s are derived on the basis of 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 also 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 Quanatative 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 v1.06 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, Aromatci 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 analyses 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 Assessement 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. Inorder 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).

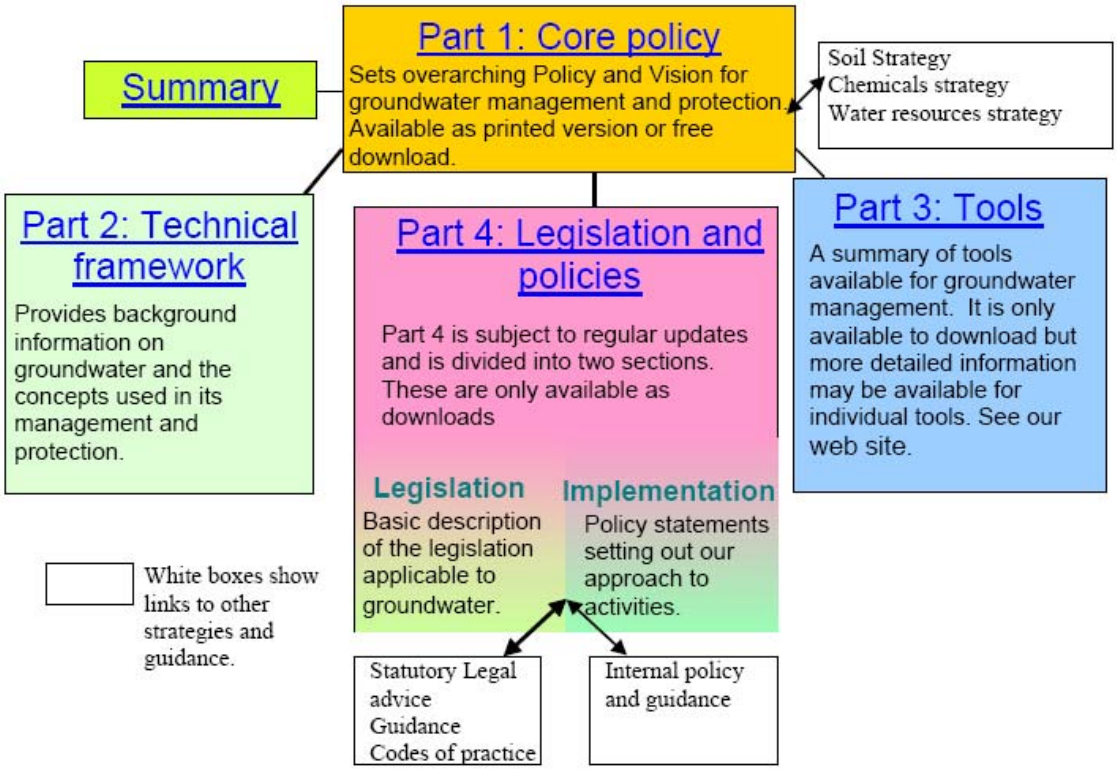
Environment Agency Guidance

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 sufficient to impact on the receptor, ignoring dilution, dispersion and attenuation along the pathway. The "pore water" concentration is determined from:

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

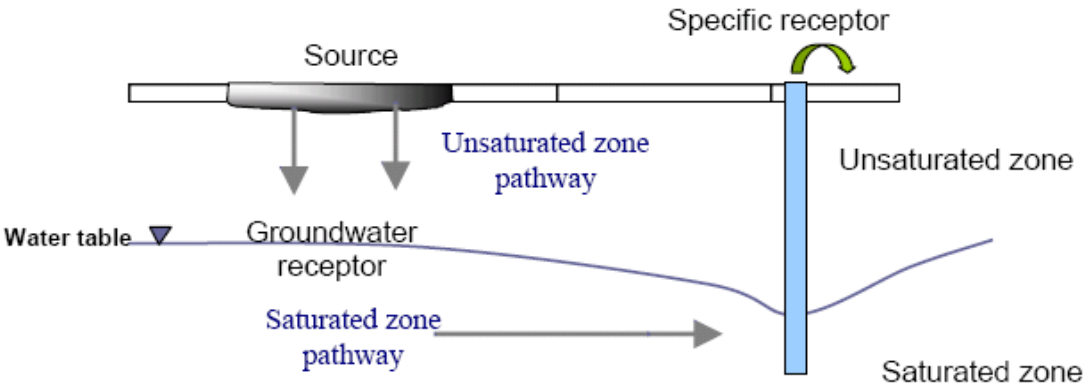
- **Level 2** considers dilution by the receiving groundwater or surface water body and whether this is sufficient to reduce contaminant concentrations to acceptable levels. The remedial target is defined as the target concentration multiplied by a dilution factor (DF).

- **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 sufficient 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 Substnaces Directive (76/464/EEC and Daughter Directives)
   – The Surface Waters(Abstraction for Drinking Water Classification) Reguslations 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 determine if the materials are suitable for thair 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

Background

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 odouriser is added to permit detection of leaks. Typically 90% CH_4, but 1 to 27% C_2-C_4 alkanes, May 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 dredgings.	
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" (Stythe 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

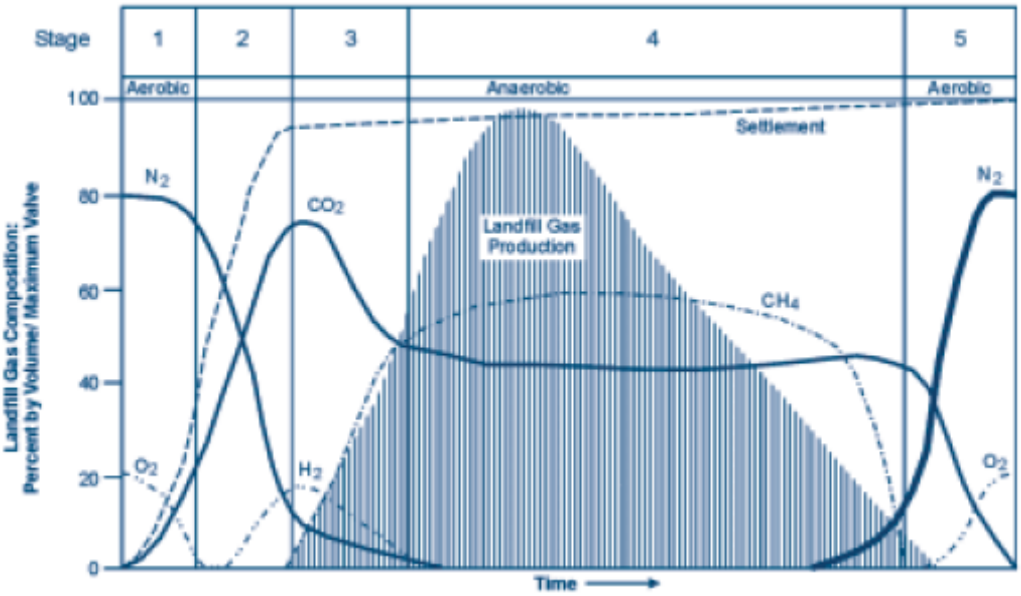
is no simple indicator of the presence of the gas until such a time as explosive limits are reached and an incident occurs. Methane is lighter than air and has a low toxicity. However, at high concentrations it can result in asphyxiation due to oxygen displacement.

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

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There are many factors that influence the migration of ground gases which can effect 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 similar to 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 2015) *"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 assesments 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 Assessmnent
- 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.

<u>Tier 1 Preliminary Risk Assessment</u>
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 a 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 Quantitiative 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:

$$\textbf{GSV}\ (\text{l/hr}) = \frac{[\text{gas well gas concentration (\%v/v)}]\ \mathbf{x}\ [\text{gas well flow rate (l/hr)}]}{100}$$

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 herunder:

Traffic Light	Methane[1]		Carbon Dioxide[2]	
	Typical max concentration[3] (% by volume)	Gas screening value[2,4] (litres/hour)	Typical max concentration[3] (% 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:
1. 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;
2. 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 particular gas being considered;
3. The Typical Maximum Concentration can be exceeded in certain circumstances should the Conceptual Site Model indicate it is safe to do so;
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account 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 BS84845:2007, which supersedes the guidance included within CIRIA C665, is used for selection of gas protection measures.

BS8485:2015 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 BS8485:2015 Table 2 as presented hereunder:

Characteristic gas situation, CS	NHBC traffic light	Required gas protection			
		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 housing[1]. 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.

BS8485:2015 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:
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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]	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.*
Subfloor ventilation with active abstraction/pressurization (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.)[A]		2.5	*There have to 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.*
Ventilated car park (basement or undercroft)		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 have to 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 hand held 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			
A) It is possible to test ventilation systems by installing monitoring probes for post installation validation. *B) 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* *C) Polymeric Materials> 1200 g (proportional to thickness) but their physical properties mean that they are more robust and resistant to damage.*			

BS8485:2015 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 sufficient.

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 K

NOTES ON LIMITATIONS

Notes on Limitations
For
Geoenvironmental and Geotechnical Consultancy Services

General

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2. the consequences of use of this document by any party with whom an agreement has not been executed.

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 brief 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 sufficient 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, a number of 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 actually 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 site which have not been disclosed by this investigation, and which have therefore not been taken into account 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.

CC GEOTECHNICAL LIMITED

Geotechnical Investigations ✦ Concrete & Highways Testing
Contamination Land Studies ✦ Structural Investigations
Soils and Materials Testing ✦ Flood Risk Assessments
Landfill Gas Studies ✦ Ecological Surveys

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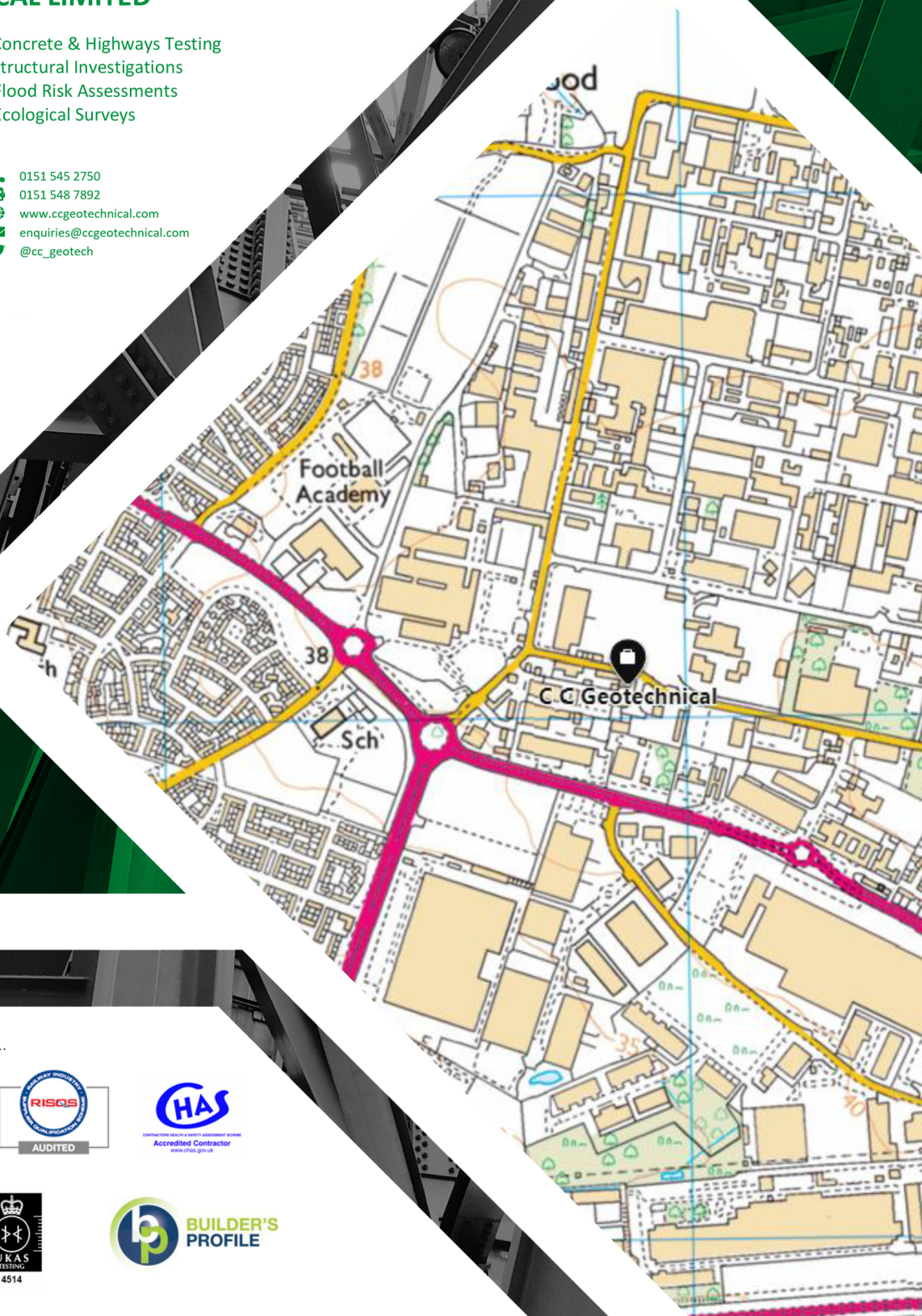

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