

CCG-C-23-14026

**COMBINED PHASE I – II GEOENVIRONMENTAL REPORT
FOR LAND OFF JAMES WILLIAM STREET
(FORMERLY HARWOOD STREET)
LITTLEBOROUGH
ROCHDALE
OL15 8NA
AUGUST 2023**

Prepared for:

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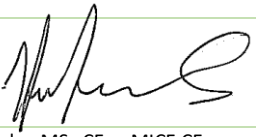
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1.0 INTRODUCTION

CC GEOTECHNICAL LIMITED (CCG) is providing consultancy services to **MR & MRS. B ROGERSON** (the *Client*) in connection with the proposed redevelopment of land off James William Street (formerly Harwood Street), Littleborough, Rochdale, OL15 8NA.

Following the demolition of existing on-site structures (garages) and subsequent site clearance works, it is understood that the site is to be redeveloped for residential use by the construction of c. 9nr residential dwellings, each constructed in traditional brick elevations under pitched roofs and with off-road car parking and front and rear private gardens. External works will include together with associated newly created access road.

The existing and proposed layouts of the site are as shown on **MR & MRS. B ROGERSON** drawings contained herein.

The proposed development falls within the administrative jurisdiction of **ROCHDALE BOROUGH COUNCIL** and administered under Planning Application Reference No. 19/00542/OUT.

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

The findings of these studies and investigations are discussed hereunder.

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

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 artificial 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 undertaking of a site walkover
- 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 controlled waters
- 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
- The provision of information and interpretative comment on ground conditions in relation to foundation selection / design / construction, and the design of associated infrastructure.

3.0 SITE DATA

3.1 Site Location

The site comprises an irregular shaped parcel of partially developed land located off James William Street, Littleborough, OL15 8NA as shown on **CCG** Drawing No. CCG-C-23-+14026-1 and Aerial Plate No. CCG-C-23-14026-2 contained herein.

The **ORDNANCE SURVEY** co-ordinates for the approximate site centre are 392549, 416107. The approximate site centre stands at an

elevation of c. 104maOD.

3.2 Site Description & Walkover Observations

The site was visited in July 2023, on completion of a review of historical mapping and environmental data presented herein.

The site is situated within a residential context. It comprises an irregular shaped parcel of land which extending to the approximate dimensions of c. 97m x 63m (c. 4660m²), its long axis being on an approximate north – south alignment.

It is bound to the east by private gardens associated residential properties fronting on to Oliver Close and Starring Grove respectively, and to the south by residential properties fronting onto James Street and James William Street. Its western boundary adjoins a parcel of public amenity grassland beyond which lies a communal cemetery. Its northern boundary has an open aspect.

Permanent structures occupying the eastern section of the study site comprise a series of single storey garages (Gale Motors) constructed of traditional brick elevations under pitched roofing materials with associated hard paved parking facilities with a series of metal portable cabins (storage facilities) which are accessible *via* its James William Street frontage.

The surface topography across the site was seen to rise gently to the north from its southern boundary and rising sharply along its western boundary with surface cover comprising mixed perennial grasses and herbs with a line of mixed deciduous broad leaf species extending around the periphery, with lesser areas within the eastern section of the site comprising poorly maintained hard pavement cover (garage area).

A small, vegetated pond occupies the northern section of the site.

Given that the site is currently partially developed for commercial land use, it is assumed that buried services (*i.e., drains, water gas and electricity*) may extend beneath parts of the site.

At the time of undertaking the site walkover survey, there was no visual evidence of the presence of non-native / native invasive plant species within or adjoining the site boundary.

Vehicle / pedestrian access to the site via James William Street to the south.

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

Table 1: Summary of Walkover Observations

FEATURE	OBSERVATION
Current use of proposed development Land	Partially developed for commercial land uses, mainly vacant land
Context	Residential context
Surface & Topography	The surface topography across the site was seen to rise gently to the north from its southern boundary and rising sharply along its western boundary with surface cover comprising mixed perennial grasses and herbs with a line of mixed deciduous broad leaf species extending around the periphery, with lesser areas within the eastern section of the site comprising poorly maintained hard pavement cover (garage area). 1nr small, vegetated pool occupies the northern section of the site.
Dimensions	97m x 63m (c. 4660m ²); its long axis being on a northwest – southeast alignment
Access	Vehicle / pedestrian access to the site via James William Street to the south.
Buildings Adjacent to the Site	Residential to the S & E
Services	Given that the site is currently partially developed for commercial land use, it is assumed that buried services (<i>i.e., drains, water gas and electricity</i>) may extend beneath the site.
Material storage	None observed
Waste disposal	None observed
Other potential contamination	Hydrocarbons associated with on site parking facilities & garages

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 Reports (CMAPS-AAG-1110335-4165-200623) dated June 2023, as presented in Appendix K, along with accompanying historical mapping data.

Table 2: Historical Map Review

YEAR	SCALE	ON SITE	ADJACENT TO SITE	<250M
1851	1:10,560	Pond / Reservoir located in the W portion of the site	SW: Terraced properties, extending to New Road to the SE [not recognised in subsequent mapping data] Recognised as "Tenter Ground"	Much of the land surrounding the site is undeveloped / vacant land "Tenter Ground" located to the NW of the site c.130m SE: Dearnley Mill (Woolen) c.250m SW: Sandstone Quarry [not recognised in subsequent mapping data]
1891 1890-92	1:2,500 1:10,560	A second reservoir is located in the N portion of the site Chimney located towards the S portion of the site Unspecified properties located in E portion of the site, extending beyond the site boundary [later recognised as "Works"]	SW: Terraced properties no longer recognised [possibly Tenter Ground] E: Extension of unspecified properties [later recognised as "Works"]	c.50m SE: Dry Dock Mills (Woolen) with associated Reservoir c.70m SE: Terraced residential properties delineating New Road to the SE [extending to the NE/SW] c.70m N: Pond recognised c.70m SW: School, in close proximity to St. Andrew's Church and associated Grave Yard to the NW c.140m S: Reservoir c.160m NE: Bent's Farm c.180m NE: Ponds recognised c.240m NW: Starring Works (Fire Brick and Pipe)
1908	1:10,560	No significant change	No significant change	c.210m SW: St. Andrews Church [formerly located c.70m SW]
1910 1928	1:2,500 1:10,560	No significant change	No significant change	c.30m SE: Saw Mill c.40m E: Tanks
1930 1937-38 1938 1949-54	1:2,500 1:2,500 1:10,560 1:10,560	Chimney no longer recognised	No significant change	No significant change
1960 1961 1967-68	1:1,250 1:2,500 1:10,560	Small unspecified property recognised in W portion of the site	No significant change	No significant change
1971-74 1974-76 1976 1976-80	1:1,250 1:1,250 1:10,000 1:1,250	No significant change	No significant change	c.50m NE: Development of semi-detached residential properties [extending to the NW/SE] c.170m NE Electric Sub-Station c.210m NE: Tank
1984-88 1989 1988-92 1992-94 1994 2001 2003 2010	1:1,250 1:10,000 1:1,250 1:1,250 1:1,250 1:10,000 1:1,250 1:10,000	No significant change	No significant change	c.110m SE: Electric Sub-Station recognised
2023	1:10,000	Ponds no longer recognised	No significant change	No significant change

5.0 ENVIRONMENTAL SETTING

5.1 Geology

The geology of the site was researched by reference to the 1:50000 scale **BRITISH GEOLOGICAL SURVEY** (BGS) Sheet 076 Rochdale (2008) 1: 50,000 Scale Solid and Drift Editions and Croft, R.G *et al* (2010) 'Geology of the Rochdale district — a brief explanation of the geological map sheet 76 Rochdale', Memoirs of the Geological Survey of Great Britain, England, and Wales (Sheet - New Series). Her Majesty's Stationery Office, London.

The **BGS** superficial drift mapping data indicates that the site is underlain with natural drift deposits comprising diamicton (*boulder clay*) comprising gravel sand silt and clay deposits of glacial origin (*Pleistocene Epoch - Late Quaternary - Devensian Sub Age*).

The solid geology is documented to generally comprise the Pennine Lower Coal Measure Formations of the Pennine Coal Measures Group comprising dark grey interbedded argillaceous mudstone, siltstones, fluvial sandstones, and productive coal measure with the Great Arc Sandstone comprising grey fine to medium grained micaceous cross – ripple bedded sandstone sub-cropping to the west of the site, of the Upper Carboniferous Period (*Silesian Stage: Westphalian C/A: Langsettian Sub Age*).

The general dip of the solid geology within the local area is documented on the **BGS** solid mapping data to vary between the southwest and southeasterly. The angle of dip c. 1km north of the site is shown to be in the order of c. 8°.

The nearest geological line of weakness comprises the Lower Foot (Little) Coal Seam (*inferred*), extending on a north-south alignment, lies c.28m east of the study site with the Lower Mountain Coal (*inferred*) sub-cropping c. 37m west of the site.

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

As with many brownfield sites superficial made ground deposits of an unknown composition thickness and extent associated with the development of the site and its immediate environs may underlie the site.

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

Table 3: Summary of Geological Data from GroundSure Report

GEOLOGY		
Data	Distance	Comments
Artificial Ground	On Site	Artificial ground and/or reworked ground deposits associated with the development of the site & its immediate surroundings.
Superficial Deposits / Drift Geology	On Site	Diamicton of glacial origin
Permeability of Diamicton	Maximum Permeability	High
	Minimum Permeability	Low
Bedrock and Solid Geology	On Site	Pennine Lower Coal Measure Formations
Permeability of Bedrock: On Site	Maximum Permeability	Moderate
	Minimum Permeability	Low
Geological Lines of Weakness	On Site	No records
	<250m	28m E. Coal seam 37m W. Coal seam 51m SE. Landform 126m E. Coal seam 189m NE. Coal seam
Radon Affected Area	On Site	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
Radon Protection	On Site	No radon protective measures are necessary
MINING, GROUNDWORKINGS AND NATURAL CAVITIES		
Data	Distance	Comments
Natural cavities	<250m	No records
BritPits	<250m	No records
Surface ground workings	<250m	There are numerous records pertaining to the presence of surface ground workings within 250m of the site, those shown to be within 150m of the site are listed hereunder: Onsite: Reservoirs – 1890-1989 Onsite: Ponds – 19678 Onsite: Unspecified ground workings – 1968-1989 5m W. Unspecified pit 8m E. Pond 14m NW. Unspecified ground workings 47m N. Unspecified pit 78m – 85m W. Cemetery 79m NW. Refuse heap 117m S. Reservoirs 131m S. Pond 136m S. Pond 142m S. Reservoirs
Underground workings	<500m	304m NW. Unspecified shaft – 1908 310m NW. Old coal shaft 315m NW. Unspecified shaft 316m NW. Unspecified old shaft 325m NW. Unspecified old shaft 326m NW. Unspecified disused shaft 326m NW. Unspecified old shaft 364m NW. Old air shaft
Historical Mineral Planning Areas	<500m	2641m NW. Starring - Clay, coal Surface mineral working Valid 27/6/51 323m NW. Starring Clay, fireclay Mineral working is partly on the surface and partly underground Valid 20/12/51
Non-coal mining	<500m	No records
The Coal Authority non-coal mining	<500m	No records
Researched mining	<500m	No records
Mining record office plans	<500m	No records

BGS mine plans	<500m	No records
Coal mining	On Site	The site is located within a coal mining area as defined by the Coal Authority
Brine areas	<500m	No records
Gypsum areas	<500m	No records
Tin mining	<500m	No records
Clay mining	<500m	No records
Natural cavities	<500m	No records
Mining cavities	<500m	No records
Reported recent incidents	<500m	No records
Historical incidents	<500m	No records
National karst database	<500m	No records

HAZARDS		
Data	Distance	Comments
Maximum shrink swell clays	On site	Very Low
Maximum running sands	On site	Very Low
Maximum compressible deposits	On site	Negligible
Maximum collapsible deposits	On site	Very Low
Maximum landslides	On site	Very Low
Maximum ground dissolution of soluble rocks	On site	Negligible

5.2 Mining

The appended environmental data, **BGS** mapping data **COAL AUTHORITY GAZETTEER** confirm that application site falls within a **COAL AUTHORITY** defined Development High Risk Area. A coal mine risk assessment (CMRA) has been prepared for this site, see section 8.0 hereunder for a summary.

5.3 Hydrology and Hydrogeology

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

Table 4: Summary of GroundSure Environmental Report

HYDROGEOLOGY AND HYDROLOGY		
Aquifer within Superficial Drift Deposits (Diamicton)	On site	Diamicton: 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
Aquifer within Bedrock Deposits	On site	Pennine Lower Coal Measure Formations- 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
Groundwater Abstraction Licenses	<1000m	926m E. Status: Historical / Licence No: 2569002250
Surface Water Abstraction Licenses	<1000m	884m E. Status: Historical / Licence No: 2569002008
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	173m S. Inland river not influenced by normal tidal action 177m S. Inland river not influenced by normal tidal action 196m S. Inland river not influenced by normal tidal action
Surface water features	<250m	3nr
WFD Surface water body catchments	On Site	On site River Roch (Source to Spodden) GB112069064720 Roch Irk Medlock Irwell
WFD Surface water bodies	<250m	No records
WFD Groundwater bodies	<250m	On Site: Northern Manchester Carboniferous Aquifers. Overall rating: Good [2019]
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	1 in 30 years, 0.3m - 1.0m
	<50m	1 in 30 years, 0.3m - 1.0m
Groundwater flooding: Highest risk	On Site	Low
	<50m	Low

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

Table 5: Hydrogeological Interpretation

UNIT	PROPERTIES	HYDROGEOLOGICAL DESIGNATION
Made / Reworked Ground	If present, likely to be generally granular and permeable and will permit vertical and lateral transmission of groundwater.	Unproductive Aquifer
Diamicton	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
Pennine Lower Coal Measure Formations	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

6.0 FURTHER ENVIRONMENTAL DATA

Environmental data was researched using several sources including Environment Agency Maps and GroundSure Envirosight Report presented in Appendix K and is summarised in Table 6 hereunder.

Table 6: Further Environmental Data

POTENTIALLY CONTAMINATIVE USES IDENTIFIED FROM 1:10,000 SCALE MAPPING		
Data	Distance	Comments
Historical industrial land uses	<250m	There are numerous records pertaining to historical land uses being undertaken within the confines of the site (155), these within 100m are listed hereunder: Onsite: Unspecified mills – 1890 Onsite: Sawmills 1928-1949 Onsite: Unspecified ground working – 1976-1989 Onsite: Unspecified ground workings – 1968 8m W. Unspecified pit - 1928 11m E. Unspecified tank – 1938-1949 14m NW. Unspecified ground workings 1976 – 1989 47m N. Unspecified pit 50m SE. Unspecified commercial / industrial 50m SE. Unspecified mill 58m NW. Sanitary pipe works 78m W. Cemetery 79m NW. Refuse heap 85m W. Cemetery 92m SE. Woolen mill 94m S. Unspecified mill 100m S. Unspecified mill
Historical tanks	<250m	17m SE. Tanks 147m S. Unspecified tank 161m NE. Unspecified tank 171m S. Tanks 181m S. Unspecified tank 208m SE. Unspecified tank 242m SW. Unspecified tank
Historical energy features	<250m	99m SE. Electric Sub-Station 151m NE. Electric Sub-Station
Historical petrol stations	<250m	No records
Historical garages	<250m	No records
Historical military land	<250m	No records
Records of Current Industrial Land Use		
Data	Distance	Comments
Recent industrial land uses	<250m	80m E. Brookfield Engineering Co' 103m SE. Electric Sub-Station 153m NE. Electric Sub-Station 216m NE. Tank
Current or recent petrol stations	<250m	No records
Electricity cables	<250m	No records
Gas pipelines	<250m	No records
Sites determined as Contaminated Land	<250m	No records
Control of Major Accident Hazards (COMAH)	<250m	No records
Regulated explosive sites	<250m	No records
Hazardous substance storage/usage	<250m	No records
Historical licensed industrial activities (IPC)	<250m	No records
Licensed industrial activities (Part A(1))	<250m	No records

Licensed pollutant release (Part A(2)/B)	<250m	No records
Radioactive Substance Authorisations	<250m	No records
Licensed Discharges to controlled waters	<250m	No records
Pollutant release to surface waters (Red list)	<250m	No records
Pollutant release to public sewer	<250m	No records
List 1 Dangerous Substances	<250m	No records
List 2 Dangerous Substances	<250m	No records
Pollution Incidents (EA/NRW)	<250m	Onsite: Incident Date: 05/03/2001 - Incident Identification: 15 / Pollutant: Inert Materials and Wastes - Pollutant Description: Construction and Demolition Materials and Wastes
Pollution inventory substances	<250m	No records
Pollution inventory waste transfers	<250m	No records
Pollution inventory radioactive waste	<250m	No records
WASTE AND LANDFILL		
Data	Distance	Comments
Active or recent landfill	<250m	No records
Historical landfill (BGS records)	<250m	No records
Historical landfill (LA/mapping records)	<250m	No records
Historical landfill (EA/NRW records)	<250m	No records
Historical waste sites	<250m	No records
Licensed waste sites	<250m	No records
Waste exemptions	<250m	130m E. Reference No, WEX263458
ENVIRONMENTAL DESIGNATIONS		
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	208m NW. Merseyside and Greater Manchester Rochdale
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	None

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

A coal mining risk assessment (CMRA) report was prepared by **ADEPTUS CONSULTING** for the site and reported under Report Reference No. A190915-R03, dated February 2020.

The above referenced CMRA confirms that the site is located within a historical coal mining area where it is believed that coal at shallow depth (<30mbgl) may have been worked in the past using underground coal mining methods and therefore concluded by recommending that boreholes be sunk to a notional depth of c. 40mbgl. The purpose of the boreholes would be to probe for the presence / absence of mine related voids and/or disturbed ground associated with historical shallow coal mining activities.

Taking into account the above, a recent survey of the **BGS** historical borehole records, as listed on the freely available borehole inventory, was undertaken by **CCG**. The search confirmed that a borehole sunk on land located to the east of the site (c. 100m east, off New Road - A58), (**BGS** ID: 34813, **BGS** Ref' No. SD91NW5), which documents the underlying ground conditions to comprise natural drift deposits comprise alternating bands of sands and gravel, and diamicton to 31.7mbgl, overlying dark shale to 37.8mbgl, then the Woodhead Rock, comprising hard grey fine to coarse grained micaceous sandstone with a thin band (180mm) of black coaly shale to 82.3mbgl, before continuing in fine grained micaceous shale, proven to 83.52mbgl. A copy of the **BGS** borehole log, confirming the above descriptions, is contained in Appendix A.

Taking into account the above and given the prevailing alignments of the underlying coal seams (north - south alignments), it is

concluded that the study site is not at risk of surface instability and therefore no intrusive works associated with historical coal mining activities are proposed.

The findings of this report should be read in conjunction with the findings of the above referenced CMRA's, the **BGS** borehole records, and with **CCG** Notes on Limitations contained herein.

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 L.

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

- Following the demolition of existing on-site structures (garages) and subsequent site clearance works, it is understood that the site is to be redeveloped for residential land use by the construction of c. 9nr residential dwellings, each constructed of traditional brick elevations under pitched roofing materials together with associated newly created hard paved access / egress roadway and off-road car parking facilities and front and rear private gardens.

The existing and proposed layouts of the site are as shown on **Mr & Mrs. B ROGERSON** drawings contained herein.

- Drinking water will be from a mains supply.

In constructing the Preliminary Conceptual Model (PCM), **CCG** applied the guidance contained in CIRIA C552: 2001. This recommends use of a Risk Matrix which classifies risk based on the product of Probability of a source being present, and the Consequence of receptors being exposed to the source. Guidance tables setting out the classifications of probability and consequence together with a risk matrix are given in Tables 7-9 hereunder. In using this approach **CCG** generally recommends actual intrusive investigation of any Risk Classification of "Moderate" or over. In the case of residential housing, risk ratings of 'Low' may also warrant investigation.

Table 7: 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

9.2 Preliminary Conceptual Model

By application of the risk assessment methodology outlined above, the following PCM was constructed. There is very little evidence obtained from the desk study and site inspections of a significant risk of contamination being present on the site. The development of adjoining land to the southeast may have resulted in the deposition of some deleterious matter at the boundary of the site, although none was evident from site inspection. On the basis of the absence of specific indicators, a precautionary approach to development of a Preliminary Conceptual Model was adopted as summarised in the table hereunder:

Table 8: Preliminary Conceptual Model (PCM)

POLLUTANT LINKAGE	SOURCE	PATHWAY	RECEPTOR	PROBABILITY	CONSEQUENCE	RISK RATING
1	Broad spectrum of heavy metals, aggressive pH, hydrocarbons, PAH's in superficial soils associated with the historical	Soil and / or soil dust ingestion	Construction workers Future worker occupants	Likely	Medium	Moderate

	land uses and on-site remnants of historical demolition debris, in-filled pit, sawmills, mills, pits, tanks etc		Offsite receptors Flora			
2	Asbestos containing materials (ACM) in superficial soils associated with the historical land uses and on-site remnants of historical demolitions debris and in-filled pits etc.	Fibre Inhalation	Construction workers Future worker occupants Offsite receptors	Likely	Severe (ACM)	High
3	Inhalation of ground gases from onsite or offsite sources i.e., made ground soils, historical in-filled pits, infilled reservoirs	Inhalation	Future residents	Low	Medium	Moderate
4	pH & Sulphate attack on concrete	Future building	Future building	Likely	Mild	Moderate
5	Organic contamination in superficial soils associated with onsite garage facilities etc.	Direct contact with water mains	Potable water supply	Unlikely	Medium	Moderate

The contaminants of concern associated with those risks which require intrusive investigation were researched by reference to published industry profiles, and are summarised on Table 9 hereunder:

Table 9: Summary of Contaminants of Concern based on PCM

LINKAGE NO.	METALS	NON-METALS	ORGANICS	GASES	OTHERS
PL1, PL2, PL4, PL5	Cd, Cr (total & hexavalent), Ni, Cu, Zn, Pb, Hg, Se, Mo, Sb	As, sulphates, sulphides, boron, free cyanide	TPHCWG, PAH's, BTEX, Volatiles (by PID), SOM	-	pH Asbestos
PL3	-	-	-	CH ₄ , CO ₂ , CO, H ₂ S	-
PL1-PL5	Cd, Cr, Ni, Cu, Pb, Hg, Se, Zn	As, sulphates	TPHCWG, BTEX PAH's, Volatiles (by PID), SOM	CH ₄ , CO ₂ , CO, H ₂ S	pH Asbestos

9.3 Summary of Risks

The foregoing analysis identified several potential risks, and if present, these could adversely impact on human or environmental receptors. 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 exploratory boreholes to be excavated 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 enough soil and groundwater contamination data to reliably assess risks to human and environmental receptors, and to provide engineering parameters on which suitable foundation solutions could be selected.

11.0 FIELDWORK

11.1 Introduction

A programme of fieldwork investigation was undertaken in July / August 2023. The combined programme works comprised:

- The manual excavation and CAT scanning of 6nr borehole starter pits extending from GL-1.2mbgl
- The subsampling of borehole arisings for soil contamination analyses
- The advancement of 6nr borehole starter pit using light dynamic sampling methods
- The subsampling of borehole arisings for soil classification testing
- The installation of 50mm HDPE plain and slotted well-tube complete with non-lime pea gravel surround and bentonite seals together with associated headworks at 4nr borehole positions.

- The instigation of a gas – groundwater monitoring programme comprising 6nr rounds over a 3-month period.

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

The layout of the proposed investigation is as annotated on CCG Drawing No's. CCG-C-23-13707-3 'Site Investigation Plans' contained herein.

11.2 Borehole Drilling & Monitoring Installations

11.2.1 Light Dynamic Sampling Boreholes

In accordance with the ground investigation plan, 6nr boreholes were sunk using light dynamic sampling methods using associated 100mm diameter casings and tools.

The boreholes were positioned clear of overhead services and were scanned for buried services using a CAT cable avoidance scanner before and during hand excavation of 1.2m deep borehole starter pits.

Boring tools were decontaminated prior to commencement of fieldworks.

In this method of investigation samples of subsoils are recovered by driving and extracting a series of reducing diameter 1m long steel tubes. Standard penetration test's (SPT's) were undertaken at regular depth increments with hand shear vane (HSV) tests being undertaken in cohesive strata.

This method of sampling recovers relatively "undisturbed" soil profiles in Perspex tubes, which are used to line the steel tubes. The Perspex tubes were split and carefully logged and subsampled. Subsamples for potential chemical analysis were removed at appropriate positions from the profile and transferred to chilled amber glass jars and vials for laboratory analysis.

The logs of the light dynamic sampling boreholes, annotated with sampling details, SPT 'N' / HSV 'Cu(kN/m²) values and details of standpipe construction is presented in Appendix D.

11.2.3 Monitoring Installations

Standpipes comprising 50mm diameter HDPE plain and slotted well-tube set in bentonite and non-limestone pea gravel surround were installed at 4nr borehole positions. 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 D and summarised in the tabulation hereunder:

Table 10: Borehole Installation Details

BOREHOLE	DEPTH OF BOREHOLE (mbgl)	DEPTH OF STANDPIPE [mbgl]	RESPONSE ZONE	
			FROM [mbgl]	TO [mbgl]
WS01	5.0m	4.0m	0.5m	4.0m
WS02	5.0m	4.0m	0.5m	4.0m
WS04	5.0m	4.0m	0.5m	4.0m
WS06	5.0m	5.0m	0.7m	5.0m

The standpipe installations were periodically monitored for flow rate and composition of ground gas using a Geotechnical Instruments GA 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 monitoring instruments are given in Appendix E.

12.0 OBSERVED GROUND CONDITIONS

The stratigraphy of the boreholes was generally consistent with the documented geology. There was no evidence of significant made ground deposits being present on the site with the exception of a thin cover (0.3m) at WS02. The succession may be

generalised as tabulated hereunder:

Table 11: Observed Stratigraphy

Location	STRATIGRAPHY
WS01	Grassed topsoil overlying superficial made ground deposits comprising brown gravelly reworked clay deposits extending to 0.5mbgl. The sequence thereafter continues in natural drift deposits comprising brown firm boulder clay to 3.6mbgl, overlying medium dense clayey sands and gravel to 4.15mbgl, medium dense brown gravelly sand to 4.7mbgl, then firm brown boulder clay, thereafter, proven to 5mbgl. Monitored standing water level = 1.11mbgl
WS02	Grassed topsoil overlying superficial made ground deposits comprising brown gravelly sands extending to 0.55mbgl. The sequence thereafter continues in natural drift deposits comprising firm brown boulder clay, proven to 5mbgl Monitored standing water level = 2.3mbgl
WS03	Black bituminous paving overlying superficial made ground deposits comprising dark brown sand extending to 0.6mbgl. The sequence thereafter continues in natural drift deposits comprising soft becoming firm brown locally grey boulder clay, proven to 5mbgl
WS04	Black bituminous paving overlying made ground deposits comprising very loose very dark brown sand and gravel extending to 1.7mbgl. the sequence thereafter continues in natural drift deposits comprising loose brown very gravelly sand to 2mbgl, underlain with soft to firm becoming firm brown boulder clay, interbedded with thin medium dense sands, to 5mbgl, Monitored standing water level = 1.18mbgl
WS05	Made ground deposits comprising dark brown sands to 1.3mbgl, interbedded with brown reworked clay deposits. The sequence thereafter continues in natural drift deposits comprising loose locally medium dense brown very gravelly sand to 4.2mbgl, then soft to firm brown boulder clay, proven to 5mbgl
WS06	Grassed topsoil overlying made ground deposits comprising brown sand extending to 1mbgl. The sequence thereafter continues in natural drift deposits comprising firm brown boulder clay to 1.5mbgl, medium dense brown gravelly sands to 3.1mbgl, firm brown boulder clay to 3.5mbgl, medium dense brown gravelly sand to 4.4mbgl, then firm brown boulder clay, thereafter, proven to 5mbgl. Monitored standing water level = 3.7mbgl

There was no visual evidence of contamination and/or biodegradable materials affecting the made ground mass and/or natural drift deposits at any exploratory position.

12.2 Groundwater Regime

Slight seepages were reports at some exploratory sampling positions during fieldworks with monitored standing water levels being in the order of 1.11m, > 3.70mbgl during the ongoing gas – groundwater monitoring programme.

13.0 CONTAMINATION TESTING

13.1 Soil – Groundwater Contamination Analyses

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

- 6nr subsamples of made ground / superficial were analysed to a broad-spectrum suite of contaminants including metals, non-metals, heavy metals, speciated PAH's, hydrocarbons to the TPHCWG methodology.
- 6nr subsamples of made ground soils were screened for asbestos containing materials (ACM's)
- 6nr samples were analysed for soil pH and water-soluble sulphate content.
- Groundwater recovered from 1nr borehole position was analysed for a broad-spectrum suite of contaminants including metals, non-metals, heavy metals, speciated PAH's, hydrocarbons to the TPHCWG methodology.

The soil / groundwater contamination test results and certificates are presented in Appendix F.

13.2 Soil Classification Testing

The following programme of soil geotechnical testing was undertaken at the **UKAS** laboratory associated with **CCG**.

- Determination of soil moisture content in accordance with BS: 1377: Part 2: 1990
- Determination of Atterberg Limits in accordance with BS: 1377: Part 2: 1990
- Determination of Particle Size Distribution BS 1377-2:1990 (a)

The soil engineering test results are presented in Appendix I.

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 K, and since it is proposed that the site be redeveloped for residential use with associated landscaping, the assessment was based on criteria contained in publication LQM/CIEH S4UL's for Human Health Risk Assessment (2015) (**CCG** licence S4UL3233), applicable to "*Residential Land*" With plant up-take 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 2.5%, the assessment of the soil data is summarised in the tabulations hereunder, and presented on the worksheets in Appendix G.

14.2.1 Assessment of Metal Data

The assessment of the metal data is presented hereunder:

Table 12: Assessment of Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Cadmium	11	1.2		
Chromium	910	24		
Copper	2400	<1.8		
Lead	200	450	260 450	WS04 WS06
Mercury	1.2	0.6		
Nickel	180	45		
Zinc	3700	340		

The above assessment confirms the presence of Lead contaminants in soils recovered from 2nr borehole positions. 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 13: Assessment of Non-Metal Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Arsenic	37	38	38	WS08
Selenium	11	<1		
Total Cyanide	22	<1		

The above assessment confirms the presence of Arsenic in soils recovered from 1nr borehole position. 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 14: Assessment of PAH Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Naphthalene	5.6	2.3		
Acenaphthylene	420	2.1		
Acenaphthene	510	4.6		
Fluorene	400	6.1		
Phenanthrene	220	41		
Anthracene	5400	14		
Fluoranthene	560	100		
Pyrene	1200	84		
Benz(a)anthracene	11	42	42	WS04
Chrysene	22	35	35	WS04
Benzo(b)fluoranthene	3.3	52	11 52	WS04 WS06

Benzo(k)fluoranthene	93	22		
Benzo(a)pyrene	2.7	44	44	WS04
			9.3	WS06
Indeno(123-cd)pyrene	36	21		
Dibenzo(ah)anthracene	0.28	6.7	6.7	WS04
			1.3	WS06
Benzo(ghi)perylene	340	22		

The above assessment confirms the presence of some PAH contaminants in soils recovered from 2nr borehole positions. 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 15: Assessment of Hydrocarbon Data

Contaminant	LQM / CIEH S4UL (mg/kg)	Maximum (mg/kg)	Exceedances	
			(mg/kg)	Location
Aromatic EC5-EC7	140	<0.10		
Aromatic EC7-EC8	290	<0.10		
Aromatic EC8-EC10	11	<0.10		
Aromatic EC10-EC12	180	4.6		
Aromatic EC12-EC16	330	20		
Aromatic EC16-EC21	540	300		
Aromatic EC21-EC35	1500	980		
Aliphatic EC5-EC6	78	<0.10		
Aliphatic EC6-EC8	230	<0.10		
Aliphatic EC8-EC10	65	<0.10		
Aliphatic EC10-EC12	330	<1		
Aliphatic EC12-EC16	2400	25		
Aliphatic EC16-EC35	92000	1380		

The above assessment confirms that no soil contaminant exceeds its respective soil guideline criteria and therefore no risk to human health is indicated.

14.2.5 Assessment of BTEX Data

All BTEX compounds were reported to be below their limit of detection and therefore no risk to human health is indicated.

14.2.6 Assessment of Asbestos Data

Asbestos containing materials (ACM's) were not detected in any soil analysed and therefore no risk to human health is indicated.

14.2.7 Summary of Human Health Risk Assessment

The above human health risk assessment confirms the presence of elevated concentrations of:

- Lead at 2nr positions
- Arsenic at 1nr position
- Benz[a]anthracene at 1nr position
- Benzo[a]pyrene at 2nr positions
- Benzo[b]fluoranthene at 2nr positions
- Chrysene at 1nr position
- Dibenzo[ah]anthracene at 2nr positions

On this basis a potential risk to human health is indicated.

Exposure associated with the above contaminants are via the dermal contact and ingestion pathways and as such remedial design works will be required to break these pathways and mitigate such risks.

Taking into account the above, it is recommended that site levels in all new gardens / soft landscaping / cultivation are reduced by a minimum of 600mm, or to the surface of undisturbed natural drift deposits, whichever is the lesser, with site levels being

reconstructed by the placement of clean imported topsoil, placed under a strict validation regime comprising 1nr analyses per 50m³, with a minimum of 4nr analyses per source material.

In addition to the above, contractors must remain aware that disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination as far as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon **CCG** to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.

15.0 SPECIFICATION OF BURIED CONCRETE

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

Table 16: 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	190mg/l	Design Sulphate Class of DS-1 Class of AC-1s
Lowest pH result	6.6	
Intended Working Life	50 years	Adopt Design Chemical Classification of DC-1

Based on the foregoing soil 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.

Table 17: Design Chemical Class Based on Groundwater 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	61.4mg/l	Design Sulphate Class of DS-1 Class of AC-1s
Lowest pH result	7.4	
Intended Working Life	50 years	Adopt Design Chemical Classification of DC-1

Based on the foregoing groundwater 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.

16.0 CONTROLLED WATERS RISK ASSESSMENT

16.1 Assessment of Groundwater Metals, Non-Metals & Polycyclic Aromatic Hydrocarbon (PAH) Data

Groundwater recovered from WS01 was analysed for a broad range of contaminants including speciated PAH and TPH concentrations. The results were assessed against Environmental Quality Standards (AA-EQS) for freshwater as shown hereunder.

Table 18: Assessment of Groundwater Data

Contaminant	WS01 Result (ug/l)	AA-EQS (ug/l)
Naphthalene	<0.01	2.4
Lead	<0.2	20
Fluoranthene	<0.01	0.1
Phenanthrene	<0.01	-
Anthracene	<0.01	-
Acenaphthylene	<0.01	-
Pyrene	<0.01	-
Chrysene	<0.01	-
Fluorene	<0.01	-
Nickel	2.2	150
Indeno(123-cd)pyrene	<0.01	0.02
Benzo(ghi)perylene	<0.01	0.02
Copper	1.6	40
Benzo[a]pyrene	<0.01	0.05
Benzo[a]anthracene	<0.01	0.05
Benzo[k]fluoranthene	<0.01	0.03
Benzo[b]fluoranthene	<0.01	0.03
Boron	43	1000

Cyanide	<1.0	-
Arsenic	0.69	25
Mercury	<0.05	1
Selenium	0.7	-
Cadmium	0.05	5
pH	7.4	-
Sulphate	61.3	400000

The above assessment confirms that no contaminant exceeds its respective AA-EQS guideline criteria. Hence no risk to controlled waters is indicated

16.2 Assessment of Groundwater Hydrocarbon Data

Speciated hydrocarbon results were assessed by comparison with AA-EQS values for inland waters. In case of determinands not covered by AA-EQS values, results were compared to EQS Freshwater Criteria values or where no EQS Freshwater Criterion is available, then WHO guidelines for Drinking Water are adopted.

Table 19: Assessment of Groundwater Hydrocarbon Data

Contaminant	WS01 Result (ug/l)	AA-EQS (ug/l)	WHO (ug/l)
Aromatic EC5-EC7 (benzene)	<1.0	10	10
Aromatic EC7-EC8 (toluene)	<1.0	-	700
Aromatic EC8-EC10 (ethyl benzene)	<1.0	-	300
Aromatic EC10-EC12	<1.0	-	100
Aromatic EC12-EC16	<1.0	-	100
Aromatic EC16-EC21	<1.0	-	90
Aromatic EC21-EC35	<1.0	-	90
Aliphatic EC5-EC6	<1.0	-	15000
Aliphatic EC6-EC8	<1.0	-	15000
Aliphatic EC8-EC10	<1.0	-	300
Aliphatic EC10-EC12	<1.0	-	300
Aliphatic EC12-EC16	<1.0	-	300
Aliphatic EC16-EC21	<1.0	-	(300)*
Aliphatic EC21-EC35	<1.0	-	(300)*

The above assessment confirms that no contaminant exceeds its respective AA-EQS / WHO guideline criteria. Hence no risk to controlled waters and/or human health is indicated.

16.3 Summary of Controlled Waters Risk Assessment

The above controlled waters risk assessment confirms that no contaminant exceeds its respective AA-EQS / WHO guideline criteria. Hence no risk to controlled waters and/or human health is indicated.

17.0 ASSESSMENT OF RISK FROM GROUND GASES

Standpipes were constructed such that response zones were within permeable strata. Using the data gathered in the monitoring programme, a gas risk assessment was undertaken in accordance with the ground gas risk assessment methodology (See Appendix L) employed by **CCG**. The ground gas risk assessment methodology conforms to current UK guidance on the assessment of risks posed by ground gases.

The potential sources of gas identified in the desk study were generally considered as sources of “Low” generation potential, and high sensitivity, resulting in a programme of monitoring comprising of 6nr rounds distributed over a 3-month period.

A gas risk assessment was 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.

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

There are also 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 presented in Appendix E.

Table 20: Summary of Gas Monitoring Data

Position	WS01	WS02	WS04	WS06
No Monitoring Visits	6	6	6	6
Highest CH ₄ (%)	Nil	Nil	Nil	Nil
Highest CO ₂ (%)	<0.1	0.7	2.3	<0.1
Lowest O ₂ (%)	20.4	20.3	16.3	20.6
Highest H ₂ S (ppm)	Nil	Nil	Nil	Nil
Highest CO (ppm)	Nil	Nil	Nil	Nil
Highest Flow (l/hr)	<0.01	<0.01	<0.01	<0.01
Water Levels (m)	1.11	2.30	1.18	3.70
Highest PID response	0.0	0.0	0.0	0.0
Pressure Range (mb)	990 - 1004mbar			

After 6nr round of monitoring, a preliminary Gas Screening Value (GSV) of 0.0022l/hrs is calculated for CO₂.

Using these GSV values, 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, and based on this classification, gas protection measures are not required.

18.0 PRELIMINARY WASTE CLASSIFICATION

A waste classification exercise was undertaken in relation to potential offsite disposal of excavation arisings. The first stage entailed the assessment of the basic soil contamination data via the **HAZWASTE** online program. The output data from this basic assessment is provided in Appendix H. This program generates the baseline 'Hazardous / Non-Hazardous' classification of soils.

The appended **HAZWASTE** report classifies all soils at boreholes WS03 > WS05 to be 'Hazardous' by virtue of elevated concentrations of total hydrocarbon fractions (2100mg/kg > 3500mg/kg) and therefore surplus spoil generated from these positions for off-site disposal must be disposed at a suitable 'Hazardous' waste landfill facility.

The soils analysed for the remaining positions classify as being 'Non-Hazardous'.

Notwithstanding the above, should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.

19.0 NEW WATER MAINS SUPPLY

The specification for new water mains at this 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' published by UK Water Industry Research (UKWIR) January 2011.

The preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species (EC10-EC16 - EC16-EC40 aliphatic and aromatic hydrocarbons fractions are above the threshold concentrations specified by the UKWIR, indicating that PE-AL-PE mains may be deployed. Good practice requires that mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside.

Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure.

Notwithstanding the above preliminary assessment, the developer should contact the relevant water supply company (**UNITED UTILITIES**) to obtain concurrence with the recommendations given above and may be required to return a completed Risk Assessment.

20.0 POST INVESTIGATION CONCEPTUAL MODEL

Based on the findings of the investigation, a conceptual model could be constructed illustrating proven pollution linkages and summarising the conceptual remediation recommendations discussed above, as tabulated hereunder.

Table 21: Conceptual Model

Source	Pathway	Receptor	Remedial Options
The above human health risk assessment confirms the presence of elevated concentrations of: Lead at 2nr positions Arsenic at 1nr position Benz[a]anthracene at 1nr position Benzo[a]pyrene at 2nr positions Benzo[b]fluoranthene at 2nr positions Chrysene at 1nr position Dibenzo[ah]anthracene at 2nr positions hence a potential risk to human health is indicated.	Oral / dermal / ingestion	Construction workers Future occupants inc: adults & children	No remedial works required under areas of permanent hard standing. Site levels in gardens and cultivated landscaping to be reduced to 600mm below proposed finished garden levels, with site levels then being reconstructed by the placement of 600mm of clean imported topsoil, placed under a strict validation regime comprising a 1nr analyses per 50m³ with a minimum of 4nr analyses per material source. Where made ground remaining in place beyond 400mm, imported topsoil is to be placed on a suitable geotextile fabric such as 'Terram 1000, or similar. Cover thickness on all gardens / soft landscaping is to be independently validated by excavation and photography for inclusion in a Validation Report. Imported soils are to comply with the analysis criteria contained in Appendix G. In addition to the above, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.

21.0 FOUNDATIONS & FLOOR SLABS RECOMMENDATIONS

21.1 Introduction

Following the demolition of existing on-site structures (garages) and subsequent site clearance works, it is understood that the site is to be redeveloped for residential land use by the construction of c. 9nr residential dwellings, each constructed of traditional brick elevations under pitched roofing materials together with associated newly created hard paved access / egress roadway and off-road car parking facilities and front and rear private gardens.

The existing and proposed layouts of the site are as shown on **MR & MRS. B ROGERSON** drawings contained herein.

The prevailing ground conditions encountered at this site are seen to comprise made ground deposits generally comprising loose brown gravelly sands, locally reworked clay deposits extending to depths varying between 0.5m > 1.7mbgl. The sequence thereafter continues in natural drift deposits comprising firm becoming stiff brown diamicton locally interbedded with medium dense sands and gravel, to 5mbgl, and locally loose becoming medium dense gravelly sands underlain with soft becoming firm diamicton (WS05).

There was no visual evidence of contamination and/or biodegradable materials affecting the made ground mass and/or natural drift deposits at any exploratory position.

Monitored standing water levels are reported to be in the order of 1.11m > 3.7mbgl

21.3 Foundations & Ground Slabs

Taking into account the ground conditions encountered, and given the loads imposed, traditional strip (spread) foundations may be adopted for the proposed development with foundations depths for Plot No's 08 and 09 being adjusted given the variable depth and density of the underlying made ground deposits.

With regards Plots 01 > 05, and Plot 07, it is recommended that strip foundations be cast on the underlying natural firm varying to stiff brown diamicton and loose brown sand deposits. Foundations for or these plots may be set at a notional depth of 1.5mbgl with foundations being designed on an Allowable Bearing Pressure (ABP) of 80kN/m². For Plots 08 and 09 foundations should be extended to c. 1.7mbgl to achieve a similar ABP.

Given that foundations may span 2-differing founding strata, a potential for minor differential settlement may arise, and it is strongly recommended that all foundations incorporate a A393 steel reinforcement mesh within the bottom third. Strips should be not less than 250mm thick and should be formed in C35 concrete.

It is important that all foundation excavations be inspected by a competent ground engineer to ensure that the predicted ground conditions have been encountered, and to make suitable alterations if required.

The appended soil engineering test results confirm the clay strata is of 'Low – Intermediate' plasticity and hence 'Low – Intermediate' shrinkability. Should tree planting/removal be planned, then foundation depths may require adjustment to comply with the guidance contained in NHBC Standards Chapter 4.2.

Where placement of structural concrete does not immediately follow trench excavation, the clay formations should be protected by placement of blinding concrete to prevent deterioration.

With regards to Plot 06 'The Bungalow', given that this property is going to be placed within the footprint of the now in-filled reservoir, it is strongly recommended that this property is constructed on a piled foundation.

Piles would support a 450mm x 450mm reinforced concrete ground beam from which structural walls may be constructed. For the purposes of preliminary design, the structural carrying capacity of bottom driven piles may be taken as:

Table 21: Pile Carrying Capacity

Pile Diameter mm	Carrying Capacity kN
150	130
220	250

A piling layout and calculated pile loadings should be prepared and piling contractors must be required to provide dynamic installation set calculations corresponding to the actual loadings calculated to be imposed on each pile, and to provide pile installation records.

Given the variable depth of poor density of made ground and natural drift deposits it is strongly recommended that fully suspended passively vented block and beam floors incorporating gas protective measures be adopted for all new properties.

21.4 Excavations

Excavations may be undertaken by light hydraulic excavators. Excavations in excess of 1.2mbgl within sand deposits will require side support.

21.5 Groundwater Management

Slight seepages were reports at some exploratory sampling positions during fieldworks with monitored standing water levels being in the order of 1.11m, > 3.70mbgl during the ongoing gas – groundwater monitoring programme. Hence a prudent contractor would allow for pumping to maintain dry working conditions during foundation construction / service installations particularly during heavy and/or prolonged periods of precipitation.

22.0 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 22: Conclusions & Recommendations

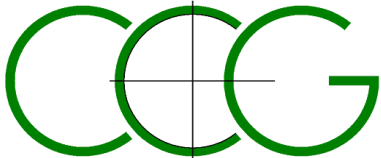
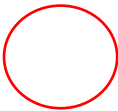
Soil Contamination	The above human health risk assessment confirms the presence of elevated concentrations of: - Lead at 2nr positions - Arsenic at 1nr position - Benz[a]anthracene at 1nr position - Benzo[a]pyrene at 2nr positions - Benzo[b]fluoranthene at 2nr positions - Chrysene at 1nr position - Dibenzo[ah]anthracene at 2nr positions hence a potential risk to human health is indicated. No remedial works required under areas of permanent hard standing. Site levels in gardens and cultivated landscaping to be reduced to 600mm below proposed finished garden levels, with site levels then being reconstructed by the placement of 600mm of clean imported topsoil, placed under a strict validation regime comprising a 1nr analyses per 50m³ with a minimum of 4nr analyses per material source. Where made ground remaining in place beyond 400mm, imported topsoil is to be placed on a suitable geotextile fabric such as 'Terram 1000, or similar. Cover thickness on all gardens / soft landscaping is to be independently validated by excavation and photography for inclusion in a Validation Report. Imported soils are to comply with the analysis criteria contained in Appendix G. In addition to the above, as with all developments, disturbance of the ground may uncover unanticipated features which may give rise to considerations of contamination insofar as the exposed conditions may have the potential to impact on receptors including inter alia humans, animals, controlled waters, or the fabric of buildings. Any such encounters will require the contractor to halt work, isolate the risk area, and summon CCG to site to determine the nature of the exposure and to determine an appropriate course of action. Any such incidents will be fully documented in a detailed site Remediation Report.
	The above controlled waters risk assessment confirms that no contaminant exceeds its respective AA-EQS / WHO guideline criteria. Hence no risk to controlled waters and/or human health is indicated.
	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.
	The preliminary findings indicate that the soil concentrations of pertinent hydrocarbon contaminant species (EC10-EC16 - EC16-EC40 aliphatic and aromatic hydrocarbons fractions are above the threshold concentrations specified by the UKWIR, indicating that PE-AL-PE mains may be deployed. Good practice requires that mains be laid in a remediated alignment comprising of clean granular fill extending to 600mm + pipe diameter and to 300mm below pipe underside.
	Pipes should be laid in accordance with BS EN 12201-2 'Plastic piping systems for water supply, and for drainage and sewerage under pressure. Notwithstanding the above preliminary assessment, the developer should contact the relevant water supply company (United Utilities) to obtain concurrence with the recommendations given above and may be required to return a completed Risk Assessment.
Water Mains	After 6nr rounds of monitoring, a Gas Screening Value (GSV) of 0.0022l/hrs is calculated for CO₂.
Gas Risk Assessment	Using these GSV values, 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 and based on this classification gas protection measures are not required.
Waste Classification	The appended Hazwaste report classifies all soils at boreholes WS03 > WS05 to be 'Hazardous' by virtue of elevated concentrations of total hydrocarbon fractions (2100mg/kg > 3500mg/kg) and therefore surplus spoil generated from these positions for off-site disposal must be disposed at a suitable 'Hazardous' waste landfill facility.
	The soils analysed for the remaining positions classify as being 'Non-Hazardous'. Notwithstanding the above, should be noted that the final decision on waste classification is at the discretion of the accepting landfill, and it is recommended that consultation with landfill operators be undertaken during the development of the waste management plan.
Foundations & Ground Floor Slabs	See Section 21.0 for full discussion
Excavations	Excavations may be undertaken by light hydraulic excavators. Excavations more than 1.2mbgl will require side support.
Groundwater Management	Slight seepages were reports at some exploratory sampling positions during fieldworks with monitored standing water levels being in the order of 1.11m, > 3.70mbgl during the ongoing gas – groundwater monitoring programme. Hence a prudent contractor would allow for pumping to maintain dry working conditions during foundation construction / service installations particularly during heavy and/or prolonged periods of precipitation.
Further Work	- Prepare Phase III Remediation Strategy Report - Prepare Phase IV Validation Report

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:
Mr & Mrs B. Rogerson

Project:
James William Street (formerly Harwood Street),

Title:
Aerial Photograph

Scale:
NTS

Issue:
01

Drawn by:
DG

Date:
July 2023

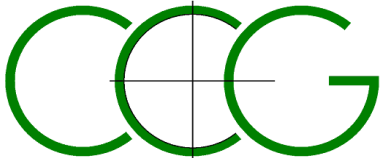
Project No.
CCG-C-23-14026

Drawing No.
01



DO NOT SCALE

Notes: Study Site



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

Client:
Mr & Mrs B. Rogerson

Project:
James William Street (formerly Harwood Street),
Littleborough, Rochdale, OL15 8NA

Title:
Aerial Photograph

Scale:
NTS

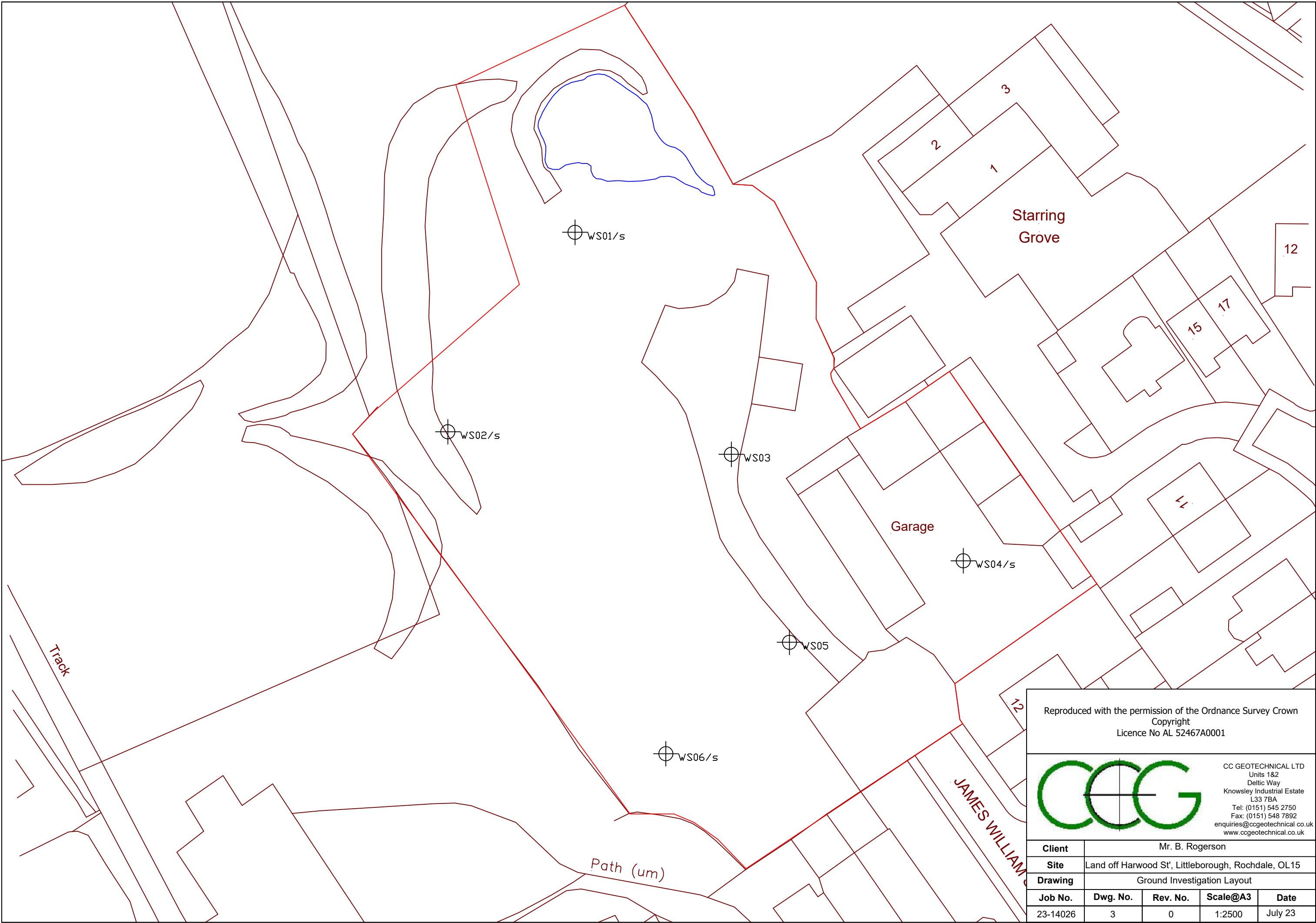
Issue:
01

Drawn by:
DG

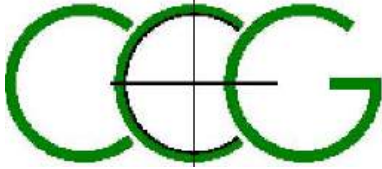
Date:
July 2023

Project No.
CCG-C-23-14026

Drawing No.
02

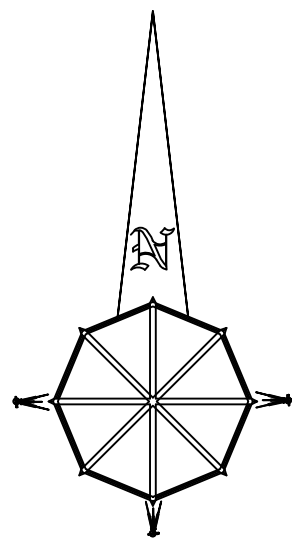


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CC GEOTECHNICAL LTD
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Deltic Way
Knowsley Industrial Estate
L33 7BA
Tel: (0151) 545 2750
Fax: (0151) 548 7892
enquiries@ccgeotechnical.co.uk
www.ccgeotechnical.co.uk

Client	Mr. B. Rogerson			
Site	Land off Harwood St', Littleborough, Rochdale, OL15			
Drawing	Ground Investigation Layout			
Job No.	Dwg. No.	Rev. No.	Scale@A3	Date
23-14026	3	0	1:2500	July 23



Proposed Site Layout
1:200



PLEASE NOTE

- DO NOT scale from this drawing, use figured dimensions only.
- All dimensions to be checked on site by the contractor.
- Please report any discrepancies to JHA Ltd immediately.
- All setting out dimensions are approximate. To be marked out on site for approval by JHA Ltd prior to construction.

NOTES:

02	16/08/23	Draft plot levels added	BR
01	14/08/23	Updated Site layout following client meeting	BR
Ref	Date	Revision	Initial

Issue:

PRELIMINARY ISSUE

Project / Client:

RESIDENTIAL DEVELOPMENT
TO HARWOOD ROAD
FOR
MR & MRS ROGERSON

Drawing Title:

PROPOSED SITE LAYOUT

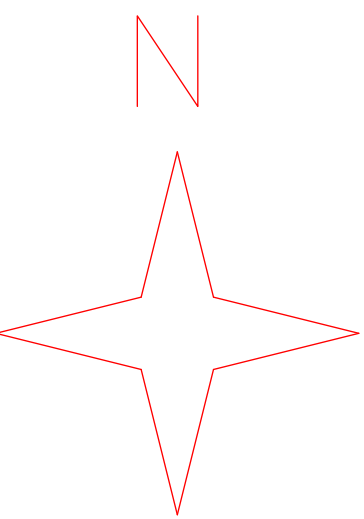
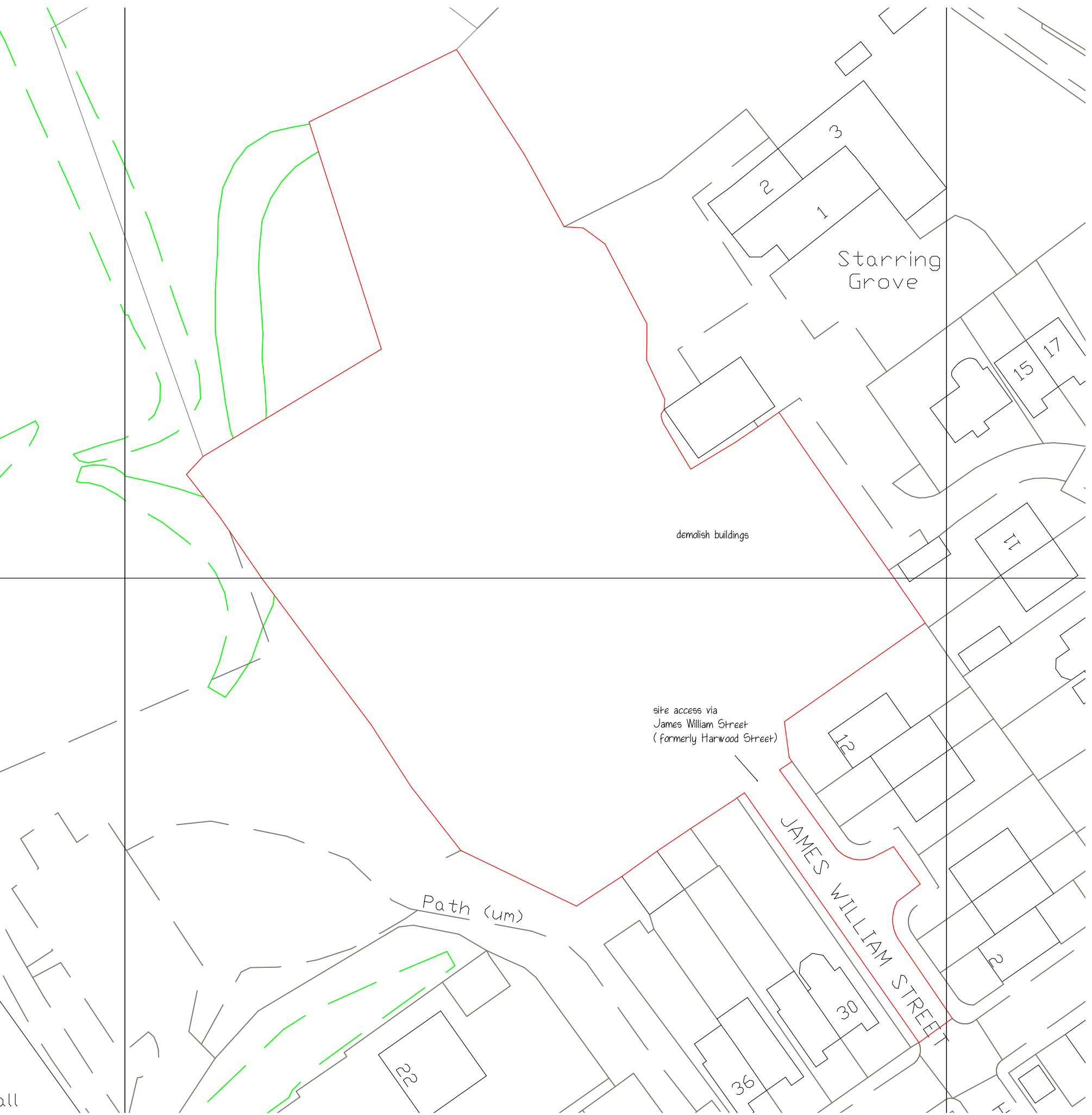


JHA Pulmann,
18A Bridge Street
Milnrow, Rochdale,
OL16 3ND

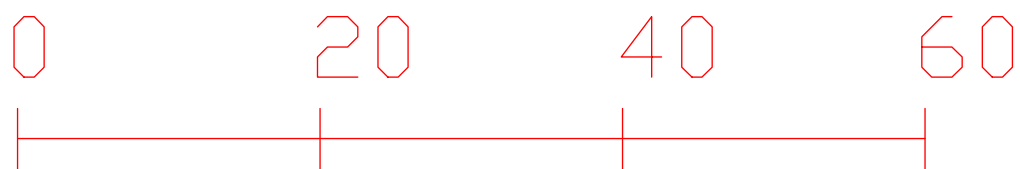
T 01302 364565
E enquiries@j-h-a.co.uk
W www.j-h-a.co.uk

Scale:	1:200	Date:	AUG 2023
Drawn By:	XXX	Checked By:	XXX

Drawing No:	M23/21/01	Sheet Size:	A1
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Proposed site plan 1:500



Metres

Dwg No. 2199.03a



NGR. C. 9266 1601

GEOLOGICAL SURVEY AND MUSEUM. BOREHOLES AND SHAFTS.

Boring at Shilley, How.

Relio

County Lancashire

6 in. Map 8/SW.

SD91NW/5
County

6" Quarter Sheet

Kitt Laborough. (Lancashire Tannery)

Description.

THICKNESS.

Feet.

Inches.

DEPTH.

Feet.

Inches.

THICKNESS
Thicknes
metric

DEPTH

metric

Down to a level of 160 feet percussion drilling was employed and no cores preserved. Consequently the description of the strata above 160 feet is based entirely on the borer's record.

The heavy fine coal was no doubt present but would come up the tubes as waly sludge (D.A.W.).

SUPERFICIAL

Surface.

Sandy clay

Sand

Gravel and big boulders

Sand + gravel

Sandy clay

GLACIAL

103 ft. 3 in.

Sand + gravel

Clay and stones

Sand

Clay and stones with big boulders

Gravel

Loamy sand with beds of gravel

Gravel

Loamy sand

SHALE

48 ft. 6 in.

Dark shale

Strong sandy shale (with traces of coal according to Resident Engineer)

Sandstone

[Below this level cores available examined]

Hard grey massive falsebedded fengry sandstone

Rather soft coarse grey sandstone (water overflowing)

WOODHEAD HILL

ROCK

117 ft. 6 in.

Massive yellow coarse grained falsebedded sandstone

Hard micaceous sandy shale (broken)

Massive falsebedded grey

sandstone, fine bands rather coarse

Massive grey sandstone with occasional ferruginous cracks

Massive grey sandstone with specks of iron pyrites

Massive wavy grained sandstone; occasional wavy bands with waly fragments

SHALE

4 ft.

Fine black micaceous shale and shaly mudstone

SD91NW5

70 5

Trial boring at Stubby Brow, Littleborough.
Messrs J. Thom. Artesian Well Engineers, Paternost, Manchester.

LITTLEBOROUGH

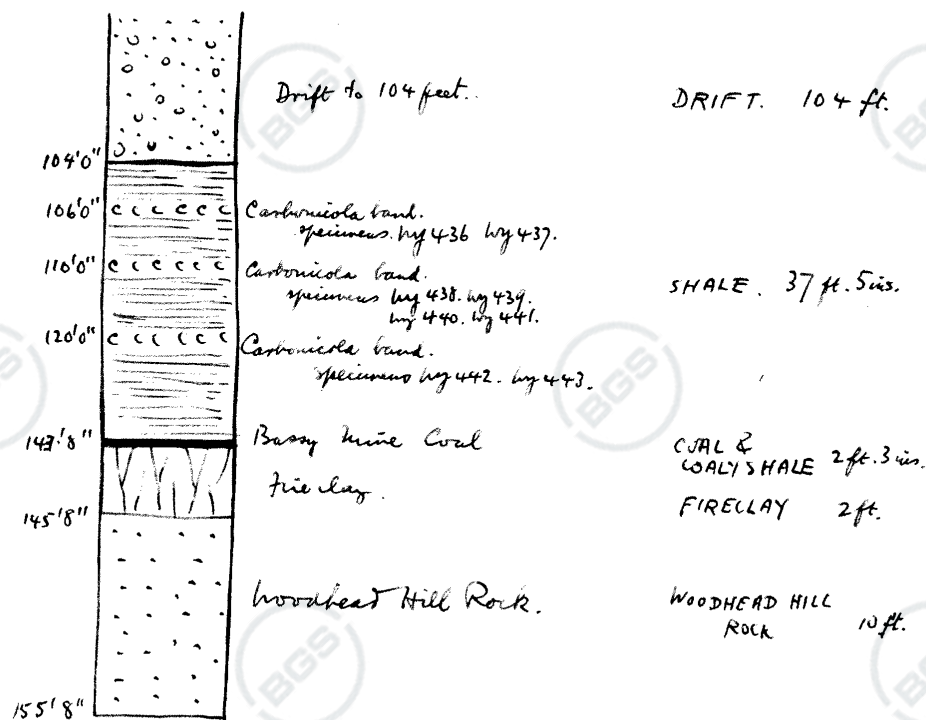
		Thickness (metres)	Depth
Surface	104' 0"		31.70
14' 6" Shale.	118' 6"	4.42	36.12
15' 0" Night shift.	133' 6"	4.57	40.69
7' 11" Shale.	141' 5"	2.41	43.10
3" Coaly shale.	141' 8"	0.08	43.18
2' 0" Shale.	143' 8"	0.61	43.79
2' 0" Sandy fireclay.	145' 8"	0.61	44.40
1' 8" Shaley sandstone.	147' 4"	0.51	44.91
1' 0" Sandy shale.	148' 4"	0.30	45.21
7' 4" Sandstone.	155' 8"	2.23	47.44

The above boring was a trial one made previously to the main boring given on page 2. to test the thickness of the drift. Cores of the shale between 110 feet & 120 feet yielded specimens of Carbonicola which were collected. My reading of the section is given on next sheet:—

(D. A. May).

SD91NW5

5



D.A. May.
July 1936.



JOHN THOM LTD.

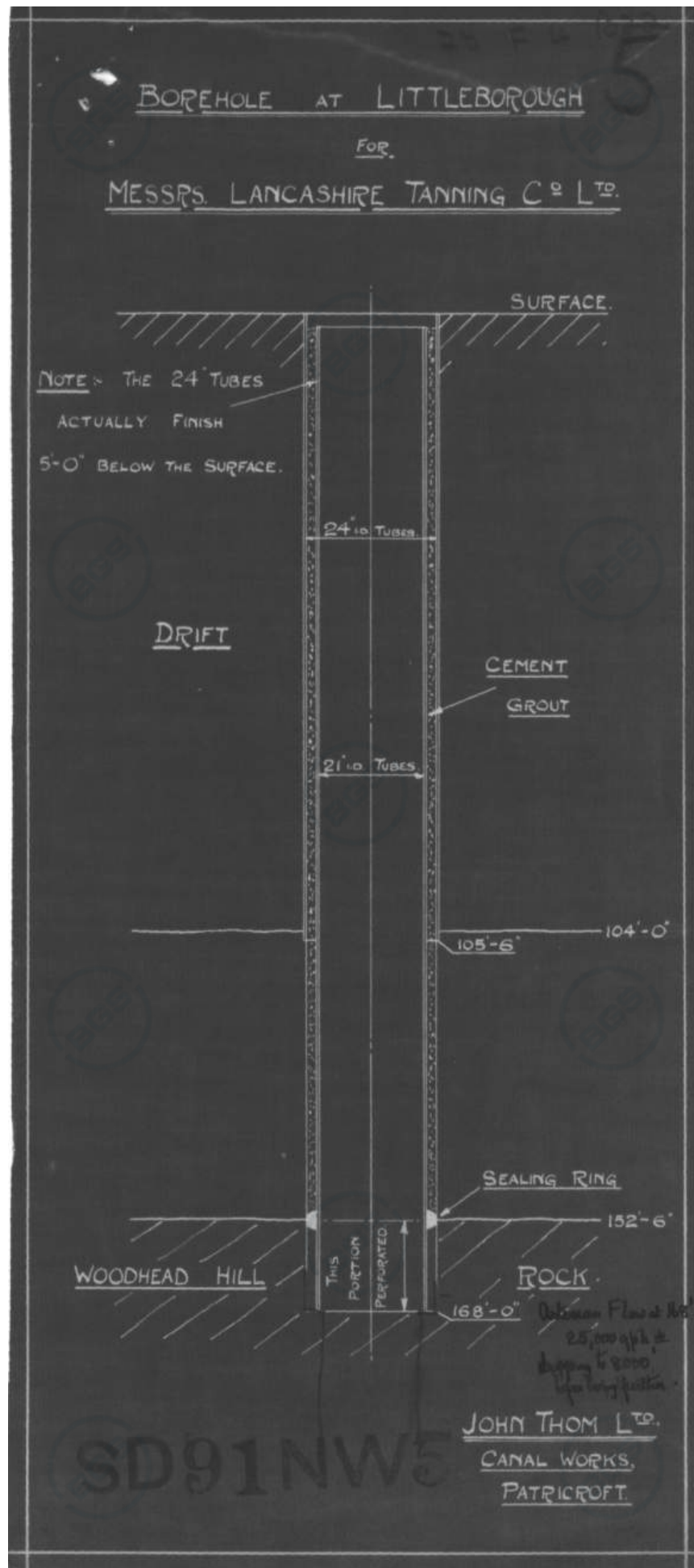
CONTINUATION

Journal of Borehole put down for

The Lancashire Tanning Co., at Littleborough.

Ft.	ins.		Ft.	ins.
	9	Surface		9
4	3	Sandy clay.	5	0
1	6	Sand.	6	6
5	0	Gravel and big boulders.	11	6
12	0	Sand and gravel.	23	6
10	0	Sandy clay.	33	6
8	6	Sand and gravel.	42	0
12	0	Clay and stones.	54	0
2	0	Sand.	56	0
10	0	Clay and stones with big boulders.	66	0
9	0	Gravel.	75	0
12	0	Loamy sand, beds of gravel.	87	0
2	0	Gravel.	89	0
15	0	Loamy sand.	104	0
20	0	Dark shale.	124	0
28	6	Strong sandy shale.	152	6
4	6	Milnrow, or Trough Edge 3/stone.	157	0
5	0	Coarse grey sandstone.	162	0
6	0	Soft sandstone, water overflowing.	168	0
28	0	Hard grey sandstone.	196	0
	10	Sandy shale. } Broken.	196	10
10	2	Grey sandstone.	207	0
30	3	Hard grey rock, broken.	237	3
	9	Broken grey rock, specks of Pyrites. }	238	0
32	0	Broken grey rock.	270	0
4	0	Broken dark shale.	274	0

TOTAL DEPTH 274 ft.



SL 91 NW 5

5

BORING FOR WATER.

Stubley Brook, LITTLEBOROUGH.

{ 1" map. Rochdale (76).
{ 6" map. Lancashire 81SW.

Made for the Lancashire Tanning Company
June to November, 1936.

Made & communicated by Messrs. J. Thom & Co. Artesian
Well Engineers, Patricroft, Manchester.

Site. On south side of the Halifax-Rochdale main
road, 120 yards west of Stubley Hall and about
1400 yards west-south-west of Littleborough Parish Church.

About 195 feet O.D.

Average yield 30,000 gallons per hour.

Water level	8 p.m. Thursday (Nov. 12)	After 2 days continuous pumping	15 feet down.
"	8 p.m. Friday (Nov. 13)	" 3 "	" 19.6 feet down.
"	8 p.m. Saturday (Nov. 14)	" 4 "	" 21.6 feet down.
"	8 p.m. Sunday (Nov. 15)	" 5 "	" 24.6 feet down.
"	10 a.m. Monday (Nov. 16)	" 5½ "	" 25.6 feet down.

Average yield 31,000 to 29,810 gallons per hour.
Overflow 3000 gallons per hour.

Visited and sited on 6" map. No further information N.B. O.D. 496 approx.

Attch. 4-58.

SD 9268 1598

SD 91/4
76/785

BORING FOR WATER.

Stabley Bow, LITTLEBOROUGH.

{ 1" map. Rochdale (76).
6" map. Lancashire 81SW.

Made for the Lancashire Tanning Company
June to November, 1936.

Made & communicated by Messrs. J. Thom & Co. Artesian
Well Engineers, Patricroft, Manchester.

Site. On south side of the Halifax-Rochdale main
road, 120 yards west of Stabley Hall and about
1400 yards west-south-west of Littleborough Parish Church.

About 495 feet O.D.

Average yield 30,000 gallons per hour.

Water level	8 p.m. Thursday (Nov. 12)	After 2 days continuous pumping 15 feet down.
"	8 p.m. Friday (Nov. 13)	" 3 " " 14.6 feet down.
"	8 p.m. Saturday (Nov. 14)	" 4 " " 21.6 feet down.
"	8 p.m. Sunday (Nov. 15)	" 5 " " 24.6 feet down.
"	10 a.m. Monday (Nov. 16)	" 5½ " " 25.6 feet down.

Average yield 31,000 to 24,810 gallons per hour.
Overflow 3000 gallons per hour.

Noted that the water was of good quality and was not of the max.

GEOLOGICAL SURVEY AND MUSEUM. BOREHOLES AND SHAFTS.

Boring at Stibley Brow.
Littleborough.

Folio

County Lancashire
6 in. Map 815W.

SD91/474
(2)

THICKNESS. DEPTH.
Feet. Inches. Feet. Inches.

Down to a level of 160 feet percussion drilling was employed and no cores preserved. Consequently the description of the strata above 160 feet is based entirely on the bore's record.

The heavy fine coal was no doubt present but would come up the tubes as waxy sludge (D.A.W.).

		ft.	ins.	ft.	ins.
SUPERFICIAL	Surface. - - - - -	-	9	-	9
	Sandy clay - - - - -	4	3	5	0
	Sand - - - - -	1	6	6	6
	Gravel and big boulders - - - - -	5	0	11	6
	Sand & gravel - - - - -	12	0	23	6
	Sandy clay - - - - -	10	0	33	6
	Sand & gravel - - - - -	8	6	42	0
	Clay and stones - - - - -	12	0	54	0
	Sand - - - - -	2	0	56	0
	Clay and stones with big boulders - - - - -	10	0	66	0
GLACIAL 103 ft. 3 ins.	Gravel - - - - -	9	0	75	0
	Loamy sand with bits of gravel - - - - -	12	0	87	0
	Gravel - - - - -	2	0	89	0
	Loamy sand - - - - -	15	0	104	0
SHALE 48 ft. 6 ins.	Dark shale - - - - -	20	0	124	0
	Strong sandy shale (with traces of coal according to Resident Engineer) - - - - -	28	6	152	6
	Sandstone - - - - -	7	6	160	0
	[Below this level cores available & examined]				
	Hard grey massive falsebedded flaggy sandstone - - - - -	2	0	162	0
WOODHEAD HILL ROCK 117 ft. 6 ins.	Rather soft coarse grey sandstone (water overflowing) - - - - -	6	0	168	0
	Massive yellow coarse grained falsebedded sandstone - - - - -	28	0	196	0
	Hard micaceous sandy shale (broken) - - - - -	0	10	196	10
	Massive falsebedded grey sandstone, fine band, rather coarse - - - - -	10	2	207	0
	Massive grey sandstone with occasional prominent coarser - - - - -	30	3	237	3
	Massive grey sandstone with specks of iron pyrites - - - - -	0	4	238	0
	Massive coarse grained sandstone; occasional coarse bands with waxy fragments - - - - -	32	0	270	0
SHALE 4 ft.	Fine black micaceous shale and clay sandstone - - - - -	4	0	274	0



JOHN THOM LTD.

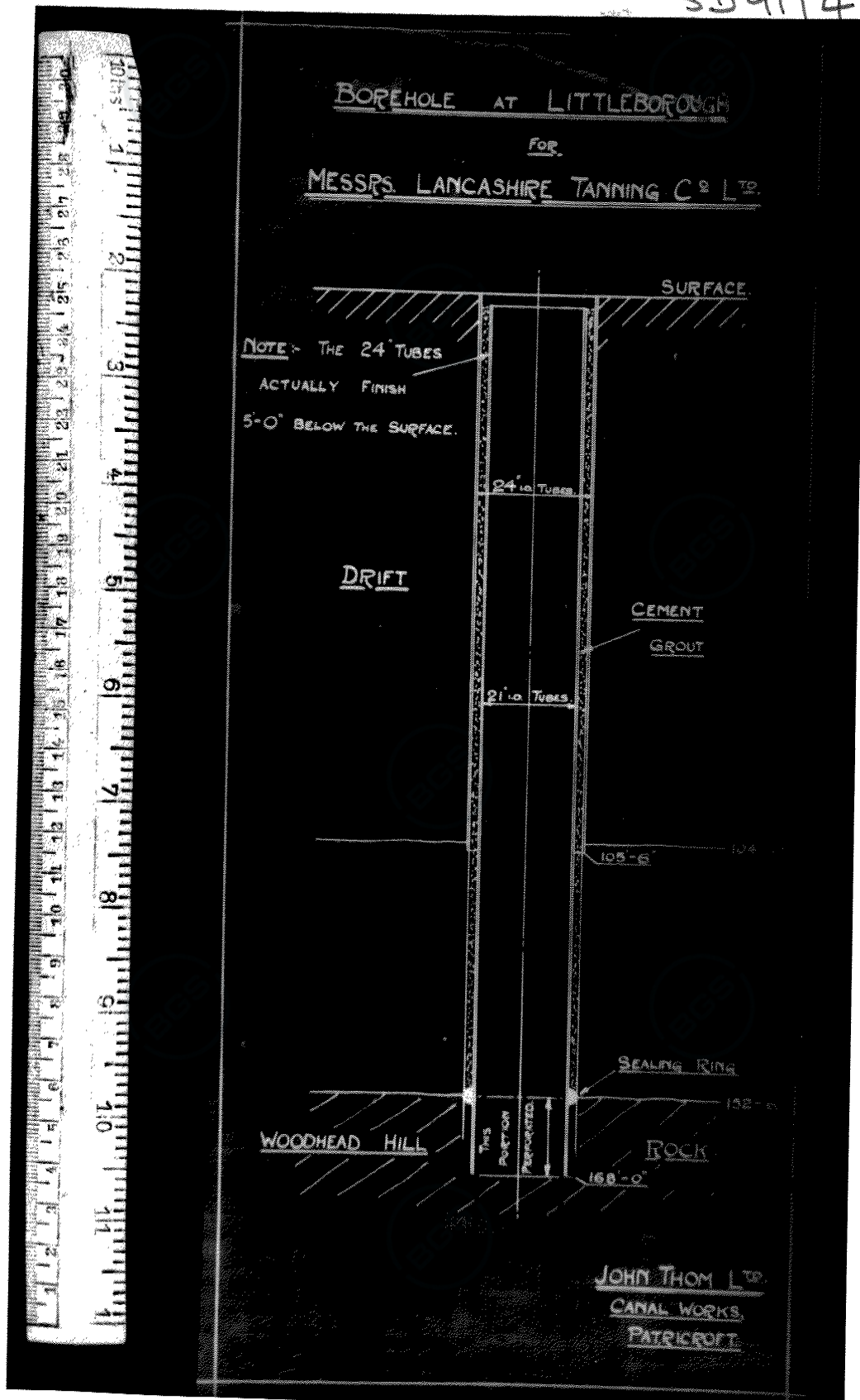
SD91/4
CONTINUATION
15

Journal of Borehole put down for
The Lancashire Tanning Co., at Littleborough.

Ft.	ins.		Ft.	ins.	
	9	Surface		9	
4	3	Sandy clay.	5	0	
1	6	Sand.	6	6	
5	0	Gravel and big boulders.	11	6	
12	0	Sand and gravel.	23	6	
10	0	Sandy clay.	33	6	
8	6	Sand and gravel.	42	0	
12	0	Clay and stones.	54	0	
2	0	Sand.	56	0	
10	0	Clay and stones with big boulders.	66	0	
9	0	Gravel.	75	0	
12	0	Loamy sand, beds of gravel.	87	0	
2	0	Gravel.	89	0	
15	0	Loamy sand.	104	0	
20	0	Dark shale.	124	0	
28	6	Strong sandy shale.	152	6	
4	6	Milnrow, or Trough Edge S/stone.	157	0	
5	0	Coarse grey sandstone.	162	0	
6	0	Soft sandstone, water overflowing.	168	0	
28	0	Hard grey sandstone.	196	0	
	10	Sandy shale. } Broken.	196	10	
10	2	Grey sandstone.	207	0	
30	3	Hard grey rock, broken.	237	3	
	9	Broken grey rock, specks of } Pyrites.	238	0	
32	0	Broken grey rock.	270	0	
4	0	Broken dark shale.	274	0	

TOTAL DEPTH 274 ft.

SD 91/4





SD 91/4

70/5

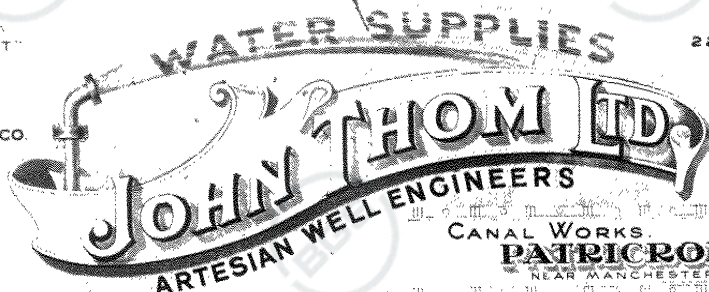
CONTRACTORS TO H.M. GOVERNMENT, THE WAR OFFICE, AND TO THE CROWN AGENTS FOR THE COLONIES

Telegraphic Address:
"THOM, PATRICROFT"

Telephone:
2261-2-3 ECCLES.

INCORPORATED IN
WILLIAM MATTHEWS & CO.

THE OFFICE
OF THE
MANAGEMENT OF THE
WATER SUPPLIES



June 9th. 1936.

D.A. Wray Esqr.
1, Crescent Road,
HALE, Cheshire.

Dear Sir,

re Littleborough.

We have received a report from our foreman stating that he is now in the rock. I will ring you up in the morning about 8-45 a.m., and if you will be good enough to come out to Littleborough, we will send a car to pick you up at the Station in Manchester.

Yours faithfully,

JOHN THOM LTD.

G. White

GW/TH

SD91/4

5

CONTRACTORS TO H.M. GOVERNMENT. THE WAR OFFICE. AND TO THE CROWN AGENTS FOR THE COLONIES

Telegraphic Address:
"THOM. PATRICROFT"

INCORPORATING
WILLIAM MATTHEWS & CO.

DIRECTORS
J. H. THOM, A.I.M., E. F. O. S.
M. D. B. THOM, (MANAGING DIRECTOR)

Telephone:
2261-2-3 ECCLES.

WATER SUPPLIES
JOHN THOM LTD.
ARTESIAN WELL ENGINEERS
CANAL WORKS.
PATRICROFT
NEAR MANCHESTER.

November 13th. 1936.

Dr. Wray,
Geological Survey Office,
270, Oxford Rd,
MANCHESTER. 13.

Dear Sir,

re Lancashire Tanning Co. Littleboro'

As promised by our Representative, Mr. White, we
have pleasure in attaching hereto journal of the Borehole
recently put down by us at the above site.

Yours faithfully,

JOHN THOM LTD.
[Signature]

ENC.

SD91/4

16/78

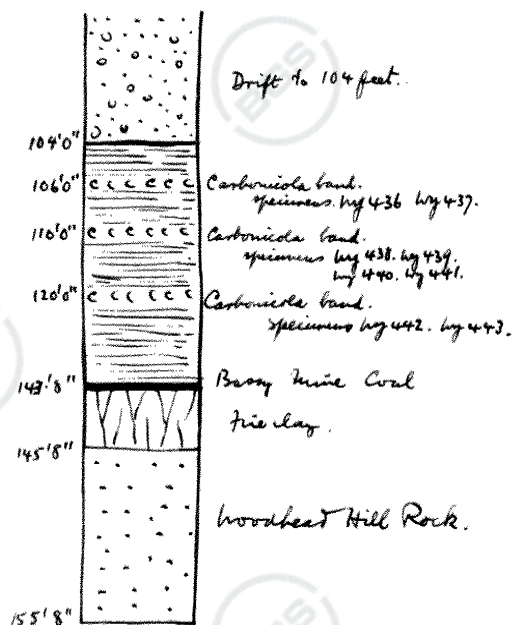
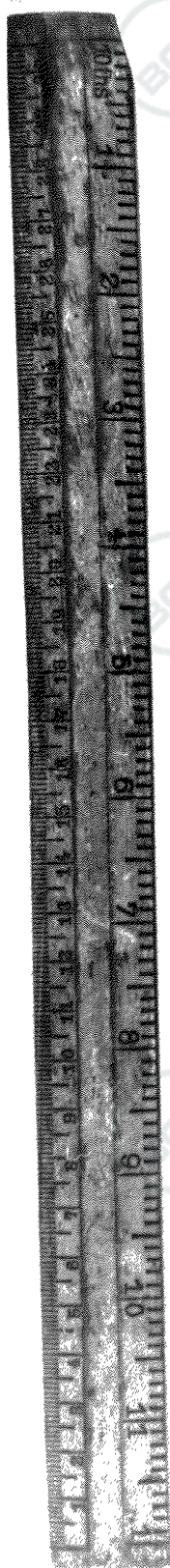
Trial boring at Stibley Brow, Littleborough.
Messrs. J. Thom. Artesian Well Engineers, Paternoster, Manchester.

LITTLEBOROUGH

Surface	104' 0"
14' 6" Shale.	118' 6"
15' 0" Night shift.	133' 6"
7' 11" Shale.	141' 5"
3" Coaly shale.	141' 8"
2' 0" Shale.	143' 8"
2' 0" Sandy fireclay.	145' 8"
1' 8" Shaley sandstone.	147' 4"
1' 0" Sandy shale.	148' 4"
7' 4" Sandstone.	155' 8"

The above boring was a trial one made previously to the main boring given on page 2. To test the thickness of the drift. Cores of the shale between 110 feet & 120 feet yielded specimens of Carbonicola which were collected. My reading of the section is given on next sheet:—
(P. A. May).

SD91/4
76/58



DRIFT. 104 ft.

SHALE. 37 ft. 5 in.

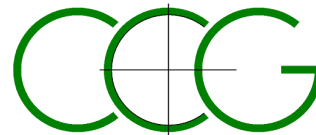
COAL &
COALY SHALE 2 ft. 3 in.

FIRECLAY 2 ft.

WOODHEAD HILL
ROCK 10 ft.

D.A. May.
July 1936.

APPENDIX B: SAMPLING METHODOLOGIES



SAMPLING, SAMPLE TRANSPORTATION, AND FIELD MONITORING PROTOCOLS

Soil, water and gas sampling and monitoring methodologies employed by **CC GEOTECHNICAL LTD** are presented hereunder.

SAMPLING OF SOIL FOR CHEMICAL ANALYSIS

Soil samples may be recovered from a variety of intrusive investigation methods including *inter alia* dynamic sampling boreholes, cable percussion boreholes, machine or manual excavation of trial pits.

All equipment which has the potential to introduce extraneous materials into soils – borehole casings, sampling drilling rods, borehole sampling tools, hand tools such as trowels and spades etc. – must be cleaned by jet washing before initial use and between sampling positions.

Cable Percussion Boreholes

In this method of investigation disturbed bulk and small disturbed samples are recovered at regular depth increments throughout the length of the borehole. Each bulk/small disturbed sample is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. Where possible, samples are immediately scanned by PID.

Light Dynamic Sampling Boreholes

In this method of investigation samples are recovered in relatively undisturbed 1m long Perspex liners. Each liner is uniquely labelled with the Project Name / Project No / Borehole No / Depth / Date. The liner tubes are sealed by air tight caps fitted at each end, and are temporarily stored out of sunlight. Where possible, samples are immediately split, scanned by PID, logged and subsampled. In the event that splitting and logging on site is not practicable, then the liners are immediately transported to the laboratory where they are immediately split, scanned by PID, logged and subsampled.

Trial Pits

Samples are to be taken from the bucket of an excavator and placed in appropriate airtight containers. Each container is uniquely labelled with the Project No / Trial Pit No / Depth / Date. The samples are then immediately placed in a cool box chilled by ice packs, and the boxes are sealed for transportation to the chemical laboratory.

Sampling Containers

Containers used to store soil samples are selected dependant on the required analysis. The testing laboratory will be consulted should there be any doubt as to the correct sampling container. Typically, a minimum of 1nr 1kg plastic tub, 1nr 500g plastic tub, 1nr 250g amber glass jar and 2nr glass vials are taken at each sample depth. Samples held on site awaiting same day courier collection are stored at 4°C in a cool box. Only in circumstances where same day collection cannot be arranged are samples held overnight, and in this event all samples are refrigerated at 4 °C either on site (if a refrigerator is available) or at CC GEOTECHNICAL soil laboratory. Courier collection is then arranged for immediate pick up the following day.

Chain of Custody records

A Chain of Custody Record (CoC) is to be sent with each batch of samples submitted to the testing laboratory. A copy of the CoC will be made available for inspection by the client, their agents, or any requesting regulatory authority.

HEADSPACE ANALYSES

Duplicate subsamples of all soil samples selected for laboratory analysis may be taken for headspace analyses.

Headspace analysis is undertaken using a MiniRae 2000 Photo Ionisation Detector (PID). In the test method, an amber glass jar is half filled with soil, and the lid is sealed with aluminium foil secured by an elastic band. The jar and contents are agitated for 30 seconds and left for a minimum of 30 minutes out of direct sunlight for the headspace to achieve equilibrium. The PID then pierces the seal and the maximum reading is recorded. Prevailing weather conditions and ambient air temperature are also recorded.

The PID headspace results are recorded on the exploratory borehole or trial pit logs.

PID headspace data is then used to inform the chemical testing schedule for volatile organic compounds analyses.

SAMPLING OF GROUNDWATER FOR CHEMICAL ANALYSIS

Groundwater is sampled from standpipes or piezometers installed during borehole drilling. On completion of the construction of the standpipe, the installation is initially developed by removing up to 10 x the internal volume of the

installation. The volume of water purged is recorded. The installation is then typically left for a week for hydraulic equilibrium to be restored.

Prior to sampling the standpipe, the depth to the water table, and the depth to the base of the installation are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

A minimum of 3 x the installation volume is then removed. The pH of the water is then monitored and the sample is taken when the change in pH between any two consecutive extracts is less than 10%. The volume of water removed is recorded.

A sample comprises of a minimum of 3 litres. Two litres are taken in amber glass bottles, and one litre in a plastic bottle.

To avoid cross-contamination one bailer is used per position.

The samples are uniquely labelled with Project Name / Project No / Borehole No / Depth / Date Sampled. They are placed in a cool box chilled by ice packs, and the containers are sealed for transportation to the laboratory.

Once the samples are received in the **CC GEOTECHNICAL LTD** laboratory, the samples are stored in a refrigerator and returned to the cool boxes once collected.

Water taken from the installations are taken back to the **CC GEOTECHNICAL LTD** laboratory and disposed.

Other data recorded in the sampling comprises:

- Volume of water removed during development of well
- Volume of water removed during purging of the well
- Results of on-site pH analyses
- Sample appearance – colour, suspended solids

MONITORING OF GAS

Prior to embarking on a gas-monitoring round, all equipment is checked for functionality and the calibration status is confirmed.

At the commencement of the monitoring round, the prevailing weather conditions, air temperature, barometric pressure and direction of movement of barometric pressure are recorded.

The flow meter is first attached to the standpipe valve, and the flow rate is measured (peak and steady flow) for 1 minute. The results are recorded in l.hr^{-1} . The flow meter tube is protected from the effects of wind by aligning the exhaust downwind.

Following measurement of borehole flow rate, the installation is left for a minimum of 10 minutes for the headspace to restore equilibrium.

Once the gas in the installation has regained equilibrium, the gas analyser is connected and monitoring commences. The peak and steady state readings for CH_4 , CO_2 , CO , H_2S and CO are recorded. The steady state is monitored for a minimum of one minute, and possibly up to a maximum of 10 minutes where fluctuations continue.

When the monitoring is complete, the depth to the water table, and the depth to the base of the well are monitored using an electronic dipmeter. In circumstances where free phase product is suspected to be present, then an 'Interface Meter' is used to determine the free phase film thickness.

APPENDIX C: COAL AUTHORITY PERMIT TO DRILL



The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 27076

Name and Address of Permit Holder:

*BDR Motors
8 Calliards Road
Littleborough
Rochdale
OL16 2SR*

Site Location:

*Land at
James William Street
Littleborough
OL15 8LY*

This certificate hereby grants the above named Permit Holder a Permit to carry out:-

Ground investigation by three boreholes to 35m to determine presence of shallow mine workings

within the Authority's interests at the identified site location above as shown on the Grant Permit Boundary (overleaf) for the period of **12 months** from the granted date shown below. *The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Permit Holder's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.*

Conditions:

- *Manned entry (i.e. into mine entries/workings) is strictly prohibited.*
- *Water flush*
- *Gas Monitoring CO, CH₄, CO₂, O₂, H₂S at borehole and rig*
- *Operators undertaking the work must be in possession of this certificate and the Permit boundary plan at the time of works*
- *Appropriate borehole sealing without delay and to withstand site level changes*

Signed: Paul Hobson Granted Date: 03 August 2023

For and on behalf of The Coal Authority

Nominated Representative: Paul Hobson, Permitting Manager;

The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG

Tel: 01623 637450; E-Mail: permissions@coal.gov.uk



The Coal
Authority

Granted Permit Boundary

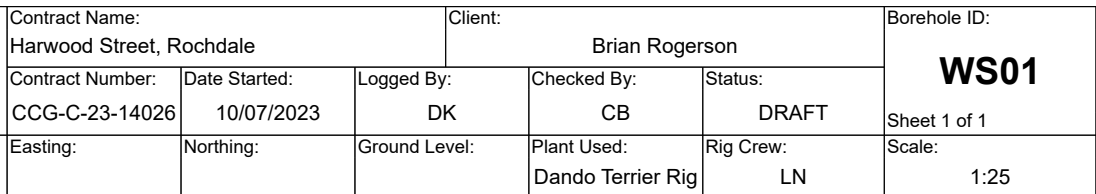
Permit Ref: 27076

Permit Boundary:



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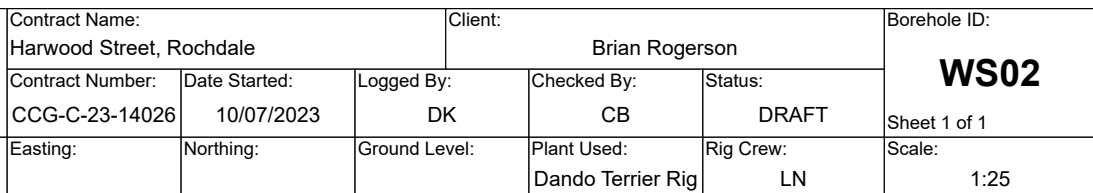
APPENDIX D: BOREHOLE LOGS



Samples & In Situ Testing	Strata Details	Groundwater
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Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation
0.00 - 1.00	U			(0.30)		Grassed TOPSOIL			
0.50	ES			0.30		Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular sandstone and brick (MADE GROUND)			
				0.50		Brown slightly sandy slightly gravelly silty CLAY with inclusions of sandstone cobbles. Gravel is fine to coarse sub-angular sandstone			
				0.75		Brown slightly sandy slightly gravelly silty CLAY with occasional pockets of sand. Gravel is fine to coarse sub-angular sandstone			
1.00 - 2.00	U	SPT(S)N=12 (2,2/3,3,3,3)		1.00		Firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular sandstone	1		
		HVP=110							
2.00 - 3.00	U	SPT(S)N=11 (1,2/3,3,2,3)		(2.60)			2		
		HVP=110							
		HVP=110							
3.00 - 4.00	U	SPT(S)N=12 (1,2/3,3,3,3)		3.60		Medium dense brown very clayey sandy GRAVEL. Gravel is fine to coarse sub-rounded sandstone			
				(0.55)					
4.00 - 5.00	U	SPT(S)17 (4,4/5,6,6,)		4.15		Medium dense brown gravelly silty fine to medium grained SAND. Gravel is fine to medium sub-rounded sandstone	4		
				(0.55)					
		HVP=70		4.70		Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-rounded sandstone			
		SPT(S)N=36 (5,5/8,10,10,8)		(0.30)					
				5.00		End of Borehole at 5.00m	5		

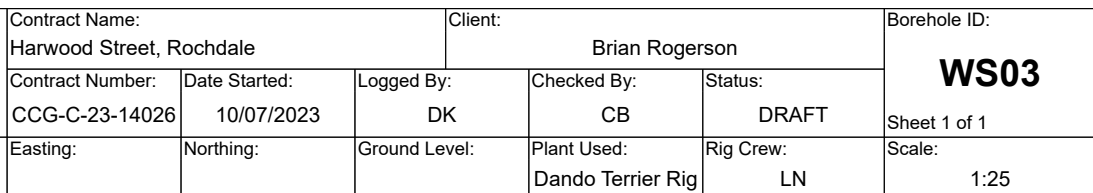
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit					
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.00	PLAIN		1.11			0		Monitored SWL
					1.00	4.00	SLOTTED							
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Samples & In Situ Testing	Strata Details	Groundwater
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Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/Installation
0.00 - 1.00	U			0.10		Grassed TOPSOIL		
				(0.45)		Brown slightly gravelly silty fine to medium grained SAND with inclusions of rootlets. Gravel is fine to coarse sub-angular sandstone, brick and mudstone (MADE GROUND)		
0.50	ES			0.55		Soft to firm becoming firm brown slightly sandy slightly gravelly silty CLAY		
1.00 - 2.00	U	SPT(S)N=9 (1,2/2,2,2,3)					1	
		HVP=110						
2.00 - 3.00	U	SPT(S)N=11 (2,2/3,3,2,3)					2	
		HVP=30						
		HVP=45						
		HVP=60		(4.45)				
3.00 - 4.00	U	SPT(S)N=12 (2,3/3,3,3,3)					3	
		HVP=60						
		HVP=80						
		HVP=100						
4.00 - 5.00	U	SPT(S)14 (2,3/4,5,5,)					4	
		HVP=110						
		HVP=100						
		HVP=100						
		SPT(S)N=16 (3,4/4,4,4,4)		5.00		End of Borehole at 5.00m	5	

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit					
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	0.50	PLAIN	50	2.30			0		Monitored SWL
					0.50	4.00	SLOTTED	50						
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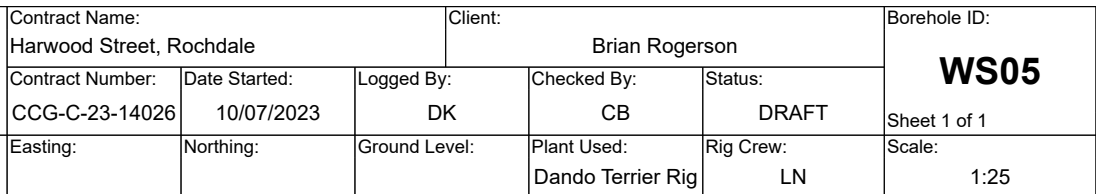


Samples & In Situ Testing	Strata Details	Groundwater
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Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.00 - 1.00	U					TARMAC		
0.50	ES			0.20 (0.40)		Dark brown slightly gravelly silty fine to coarse grained SAND. Gravel is fine to coarse sub-angular brick, sandstone and cinders (MADE GROUND)		
				0.60 (0.60)		Greyish brown slightly gravelly slightly sandy silty CLAY. Gravel is fine to coarse sub-angular to sub-rounded sandstone and mudstone		
1.00 - 2.00	U	SPT(S)N=7 (1,2/1,2,2,2)		1.20		Soft becoming firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to sub-rounded sandstone	1	
		HVP=110						
2.00 - 3.00	U	SPT(S)N=11 (2,2/3,2,3,3)					2	
		HVP=100						
		HVP=100						
		HVP=100						
3.00 - 4.00	U	SPT(S)N=11 (2,2/2,3,3,3)		(3.80)			3	
		HVP=80						
4.00 - 5.00	U	SPT(S)10 (3,3/3,4,,3)					4	
		HVP=100						
		HVP=100						
		HVP=100						
		SPT(S)8 (2,3/3,3,2,)		5.00		End of Borehole at 5.00m	5	

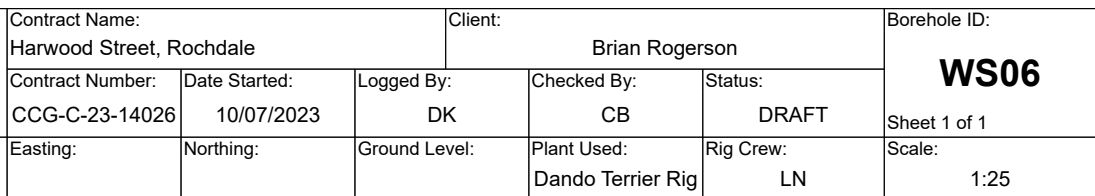
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks: 1 hour hand excavating 1.20mbgl service avoidance pit Water Strikes <table><tr><th>Strike (m)</th><th>Casing (m)</th><th>Sealed (m)</th><th>Time (mins)</th><th>Rose to (m)</th><th>Remarks</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks						
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks																
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)													

	Contract Name: Harwood Street, Rochdale			Client: Brian Rogerson			Borehole ID: WS04					
	Contract Number: CCG-C-23-14026		Date Started: 10/07/2023		Logged By: DK		Checked By: CB		Status: DRAFT			
	Easting:		Northing:		Ground Level:		Plant Used: Dando Terrier Rig		Rig Crew: LN			
Dynamic Sampling Borehole Log										Sheet 1 of 1		
										Scale: 1:25		
Weather:				Termination:				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	B			0.20		TARMAC						
0.50	ES			0.45		Dark brown very gravelly silty SAND. Gravel is fine to coarse angular to sub-angular brick, concrete and cinders (MADE GROUND)						
0.60	B					Dark brown very gravelly silty SAND. Gravel is fine to coarse angular to sub-rounded brick, concrete, sandstone and quartz (MADE GROUND)						
1.00 - 2.00	U	SPT(S)N=3 (1,2/1,0,1,1)		(1.05)							1	
				1.50		Black very gravelly silty SAND. Gravel is fine to coarse sub-angular coal, cinders and sandstone (MADE GROUND)						
				1.70		Brown very gravelly silty fine to medium grained SAND. Gravel is fine to coarse sub-angular sandstone						
2.00 - 3.00	U	SPT(S)7 (2,2/2,2,3)		(0.30)								
				2.00		Soft to firm becoming firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular sandstone					2	
		HVP=110										
		HVP=110										
3.00 - 4.00	U	SPT(S)N=12 (3,3/3,3,3,3)		(2.00)							3	
		HVP=110										
		HVP=110										
4.00 - 5.00	U	SPT(S)N=11 (2,3/3,3,2,3)		4.00		Medium dense brown gravelly silty fine to medium grained SAND. Gravel is fine to medium sub-rounded sandstone					4	
				4.15		Firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular sandstone						
		HVP=110										
		HVP=110										
		HVP=110										
		SPT(S)11 (3,4/4,4,3,)		(0.85)								
				5.00		End of Borehole at 5.00m					5	
Start & End of Shift Observations			Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit			
Chiselling					Installation				Water Strikes			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)
				0.00	0.50	PLAIN	50	1.18			0	
				0.50	4.00	SLOTTED	50					
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com												



Samples & In Situ Testing	Strata Details	Groundwater
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Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks: 1 hour hand excavating 1.20mbgl service avoidance pit					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
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Weather:	Termination:	SPT Hammer: N/R, Energy Ratio: N/R
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Samples & In Situ Testing			Strata Details				Groundwater		
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation	
0.00 - 1.00	U	SPT(S)N=28 (7,6/10,6,6,6)		(0.30)		Grassed TOPSOIL	1		
0.50	ES			0.30		Brown slightly gravelly silty fine to medium grained SAND with inclusions of rootlets. Gravel is fine to coarse sub-angular brick, sandstone and mudstone (MADE GROUND)			
1.00 - 2.00	U			1.00		Firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular sandstone and coal			
-2.00 - 3.00	U	SPT(S)8 (2,2/3,3,2,)		(0.50)		Medium dense brown very gravelly slightly silty fine to medium grained SAND. Gravel is fine to coarse angular to sub-rounded sandstone and mudstone	2		
				1.50					
-3.00 - 4.00	U	SPT(S)N=11 (3,2/2,2,3,4)		(1.60)		Firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium sub-angular sandstone and coal	3		
				3.10					
				3.50					
-4.00 - 5.00	U	SPT(S)N=11 (3,3/3,2,3,3)		(0.90)		Medium dense brown very gravelly slightly silty fine to medium grained SAND. Gravel is fine to coarse angular to sub-rounded sandstone and mudstone	4		
				4.40					
				HVP=50	(0.60)				
				HVP=40	5.00				
						End of Borehole at 5.00m	5		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	1 hour hand excavating 1.20mbgl service avoidance pit					
									Water Strikes					
Chiselling					Installation				Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	3.70			0		Monitored SWL
					0.00 0.70	0.70 5.00	PLAIN SLOTTED							
CC GEOTECHNICAL LTD 0151 545 2750 www.ccgeotechnical.com														

APPENDIX E: GAS – GROUNDWATER MONITORING RESULTS

GAS AND WATER MONITORING RESULTS



	Date:	04-Aug-23	15-Aug-23	31-Aug-23	26-Sep-23	09-Oct-23	25-Oct-23						
	Visit Number	1	2	3	4	5	6						
	Atmos Press mb	999	991	990	993	1004	998						
	Pressure Trend	Steady	Steady	Steady	Steady	Steady	Steady						
	Air Temp °C	17	17	13	16	16	5						
	Cloud cover	Overcast	High white cloud	Overcast	Overcast	Overcast	High white clouds						
	Wind velocity	Light breeze	Breezy	Light breeze	Windy	Light breeze	Light breeze						
	Precipitation	Dry	Dry	Dry	Dry	Rain	Dry						
	State of Ground	Dry	Dry	Dry	Dry	Wey	Dry						
WS01	CH4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO2 (%):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	O2 (%):	20.3	20.4	20.5	20.5	20.6	20.5						
	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						
WS02	Water Level (mbgl):	1.11	1.10	1.18	1.20	1.19	1.12						
	CH4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO2 (%):	0.6	0.7	0.7	0.5	0.2	0.4						
	O2 (%):	20.3	20.1	20.1	20.0	20.4	20.1						
	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						
WS04	Flow (l/hr):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	Water Level (mbgl):	2.30	2.27	2.34	2.05	2.00	1.96						
	CH4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO2 (%):	2.2	2.2	2.3	2.1	1.8	2.2						
	O2 (%):	16.8	16.3	16.4	16.5	17.1	16.7						
	H2S (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO (ppm):	Nil	Nil	Nil	Nil	Nil	Nil						
WS06	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):	1.18	1.18	1.36	1.16	1.18	1.12						
	CH4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO2 (%):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	O2 (%):	20.7	20.6	20.6	20.7	20.8	20.6						
	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):	3.70	3.64	3.74	Dry	Dry	Dry						
	CH4 (%):	Nil	Nil	Nil	Nil	Nil	Nil						
	CO2 (%):	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
	O2 (%):	20.7	20.6	20.6	20.7	20.8	20.6						

CCG-CMS-FO-129

Issue 2

Job No: CCG-C-23-14026

Site: James William Street, Littleborough

Instrument:

GFM436

Cross Gas Effects									
Applied Gas (ppm)		Instrument Readings (ppm)							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:	HEX		
H2S	1500	1500		0		0			
CO	1000	70		1000		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		1013	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	-30.6	Accept ± 3.0	-423	-435	Accept ± 50
-3	-3.0	Accept ± 1.0	-17	-18	Accept ± 6.0
0	0.0	Accept ± 0.0	0	0	Accept ± 0.5
3	3.0	Accept ± 0.5	14	13	Accept ± 3.0
30	30.4	Accept ± 3.0	318	325	Accept ± 50
60	59.6	Accept ± 6.0	968	955	Accept ± 130
90	90.1	Accept ± 9.0	1925	1956	Accept ± 250

Temperature Checks		
Calibration Temperature	Instrument Temperature Reading $^{\circ}\text{C}$	
Applied Temperature $^{\circ}\text{C}$		
-10	-10.0	Accept ± 2.0
0	0.0	Accept ± 1.0
30	30.0	Accept ± 1.0
60	60.0	Accept ± 1.0
100	100.0	Accept ± 1.0

Technician:
<i>Jack Rutland</i>

Date Tested:
<i>13/02/2023</i>

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, BS EN ISO14001:2015, BS EN ISO45001:2018 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, BS EN ISO14001:2015, BS EN ISO45001:2018.

TEST DATE AND CONDITIONS			
Date	13.2.23		
Atmospheric Pressure	1013	mB	
Ambient Temperature	19.7	°C	
EnviroNics Serial No.	50889		

GAS DATA LTD
Unit 4
Fairfield Court
Seven Stars Estate
Coventry
CV3 4LJ
UK
+44 (0)24 7630 3311



GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS			
SO Number	Instrument Type	Instrument Serial Number + SW Version	Job Number(s)
333566	GFM436	12667 G436-27/10	123929

Calibration Technician *[Signature]*

Date 13.2.23

Inspection Technician *[Signature]*

Date 14.2.23

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable (NA)		INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P		Instrument		✓
	Keyboard Test (All Keys)	P		Leather Case		✓
	Backlight	P		Instrument Strap		✓
	Clock Set / Running	P		AC Battery Charger (UK)		✓
	Comms Test	P		AC Battery Charger (EURO)		X
	Pump Flow Test (In & Out)	P		AC Battery Charger (US)		X
	Overall Leak Test (30mB)	n/a		AC Battery Charger (AUS)		X
	Battery Charge Test	P		Gas Sample Pipe - (new issue)		✓
	Service Date set to?	13.2.24		Flow Sample Pipe - (new issue)		✓
Channel Tests	Data Logging Enabled?	P		Hard Carry Case		✓
	Verify CH4/LEL/Hexane/PID	P		Spares Pot		✓
	Verify CO2	P		Allen Key		✓
	Verify O2	P		Temperature Probe		X
	Verify H2S	P		Vane Anemometer		X
	Verify CO	P		USB Cable		✓
	Verify LEL	P		USB Memory stick		✓
	Verify 1 st Option Gas	N/A		SM V5 Software	Ver 605	✓
	Verify Atmospheric pressure	P		Internal Filter Pack	Qty	X
	Verify differential pressure	P		External Filter Pack	Qty	X
	Verify flow	P		Field Guide		X
	Verify temperature probe input	P		Extra Items: Sample Tube		
	Verify vane anemometer input	P				
DataBase Checks	Jobcard(s) completed and signed	P		Comments:		
	Jobcard(s) booked off database	P				
	Calibration certificate completed	P				
	Complete & print QI record	n/a				
Label Checks	No. of Calibration label fitted	GDC	11750			
	MCERTS label displayed	N/A				
	Warranty label fitted	P				
H2S Range	H2S Range from Sales Order	5000	ppm			
	H2S Range from Cal Cert	5000	ppm			
	Over-range value correct?	P				



CUSTOMER: CC Geotechnical Ltd

FIRMWARE: 5.12
UPGRADED TO: 6.1

ITEMS RECEIVED	Received	RTN?
Instrument	YES	
Rubber Boot	YES	
Battery Charger	yes	
Charging Cradle	yes	
Operation Manual		
Quick Start Guide		
Spares Kit		
Comms Cable		
Probe FLEXI		
Peli Case		
Tubing		
Regulator		
Software (Memory Stick)		
PLASTIC CASE	YES	
silver case		
SIGNED:		

TESTS	Pre Service	Post Service
Charger Test		OK
Battery charge Test		OK
Lamp Test		OK
Air Flow Test ≥ 220ml/min		269ml/min
Block Flow Test ≤ 15ml/min		10ml/min
Moisture Sensitivity = 0.0ppm		0.00ppm
Switch Test		OK
Sensor Test		OK
Alarm Test		OK
PC Comms Test		OK
Datalog Test		OK
Display Test		OK
Physical Inspection		OK
PAT Test		OK
Firmware Upgrade		OK
Software Upgrade (usb)	N/A	
Function Test		OK
Run time		39hrs51mins

Firmware upgraded to latest version V6.1
Replaced LT stack, sensor seal, inlet/outlet filters and PTFE filter as per service
Cleaned lamp with aluminium oxide
Flow rate 269ml/min, Block 10ml/min
Instrument calibrated and bump tested
Power supply PAT tested, Charging cradle function tested

DATE: 24-May-22

CALIBRATION CERTIFICATE NO: 73754

ISSUED BY: SHAWCITY LIMITED
DATE: 24-May-22

APPROVED SIGNATORY: 

NAME: Joe Herbert

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	WO347195-1	100 ppm	100 ppm
Isobutylene	WO188023-1	5000ppm	5000ppm

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 $\pm 2\%$
The results indicate that the instrument conforms to the applicable parts of the published specification.

HEALTH & SAFETY, OCCUPATIONAL HYGIENE AND ENVIRONMENTAL MONITORING INSTRUMENTS

APPENDIX F: SOIL – GROUNDWATER CONTAMINATION REPORT

Tony Gerrard
CC Geotechnical
Unit 1-2 Deltic Place
Deltic Way
Knowsley Industrial Estate
Liverpool
L33 7BU

t: 0151 545 2750

e: tony.gerrard@ccgeotechnical.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 23-44627

Project / Site name:	Harwood Street Littleborough	Samples received on:	13/07/2023
Your job number:	CCG-C-23-14026	Samples instructed on/ Analysis started on:	13/07/2023
Your order number:	CCG-PO-15168	Analysis completed by:	19/07/2023
Report Issue Number:	1	Report issued on:	19/07/2023
Samples Analysed:	6 soil samples		


Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-44627

Project / Site name: Harwood Street Littleborough

Your Order No: CCG-PO-15168

Lab Sample Number				2745897	2745898	2745899	2745900	2745901
Sample Reference				WS01	WS02	WS03	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	0.50	0.50
Date Sampled				10/07/2023	10/07/2023	10/07/2023	10/07/2023	10/07/2023
Time Taken				0900	1000	1100	1200	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	32	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	22	6	15	6.8
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MWI	MWI	MWI	MWI	MWI

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	6.6	8.5	8.2	8.1
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.044	0.028	0.09	0.141	0.032
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	66	76	320	390	110
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.033	0.038	0.16	0.19	0.053
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	33.1	38.1	161	193	53.1
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	2.2	19	1.3
Organic Matter (automated)	%	0.1	MCERTS	2.9	2.9	9.5	10	8.9

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	2.3	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.56	2.1	0.42
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.07	0.16	4.6	0.1
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.05	0.17	6.1	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.3	0.4	0.71	41	0.62
Anthracene	mg/kg	0.05	MCERTS	0.07	0.08	0.26	14	0.15
Fluoranthene	mg/kg	0.05	MCERTS	0.45	0.65	1.4	100	1.2
Pyrene	mg/kg	0.05	MCERTS	0.36	0.58	1.6	84	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.21	0.29	0.68	42	0.54
Chrysene	mg/kg	0.05	MCERTS	0.24	0.3	0.91	35	0.67
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.31	0.37	< 0.05	52	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.09	0.11	< 0.05	22	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.23	0.32	0.97	44	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.12	0.17	< 0.05	21	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	6.7	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.15	0.23	< 0.05	22	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.53	3.62	7.41	501	5.01
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Analytical Report Number: 23-44627

Project / Site name: Harwood Street Littleborough

Your Order No: CCG-PO-15168

Lab Sample Number				2745897	2745898	2745899	2745900	2745901
Sample Reference				WS01	WS02	WS03	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.50	0.50	0.50
Date Sampled				10/07/2023	10/07/2023	10/07/2023	10/07/2023	10/07/2023
Time Taken				0900	1000	1100	1200	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.4	2.6	3	9.1	3.8
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	10	4.6	24	7.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.5	0.8	0.6	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	0.4	0.2	1.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	24	21	24	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	35	25	27	160	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	41	56	17	260	41
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	1.5	0.88	0.88	5.3	1.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	40	25	24	45	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	160	100	52	340	170

Monoaromatics & Oxygenates ~

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	25	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	20	180	15
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	14	16	370	1200	270
TPH-CWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	< 10	< 10	200	420	280

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.6	4.6
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	7.7	20	15
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	46	300	49
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	15	29	850	980	770
TPH-CWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	< 10	12	560	320	670
TPH Total C5 - C40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	45	77	2100	3500	2100

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-44627

Project / Site name: Harwood Street Littleborough

Your Order No: CCG-PO-15168

Lab Sample Number				2745902
Sample Reference				WS06
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				10/07/2023
Time Taken				1400
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	22
Total mass of sample received	kg	0.001	NONE	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MWI

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.096
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	97
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.048
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	48.4
Sulphide	mg/kg	1	MCERTS	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	6.4

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.91
Acenaphthylene	mg/kg	0.05	MCERTS	0.51
Acenaphthene	mg/kg	0.05	MCERTS	1.5
Fluorene	mg/kg	0.05	MCERTS	1.3
Phenanthrene	mg/kg	0.05	MCERTS	17
Anthracene	mg/kg	0.05	MCERTS	2.4
Fluoranthene	mg/kg	0.05	MCERTS	25
Pyrene	mg/kg	0.05	MCERTS	20
Benzo(a)anthracene	mg/kg	0.05	MCERTS	9
Chrysene	mg/kg	0.05	MCERTS	11
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	11
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	4.2
Benzo(a)pyrene	mg/kg	0.05	MCERTS	9.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	5.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.3
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	6.4

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	126
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Analytical Report Number: 23-44627

Project / Site name: Harwood Street Littleborough

Your Order No: CCG-PO-15168

Lab Sample Number				2745902
Sample Reference				WS06
Sample Number				None Supplied
Depth (m)				0.50
Date Sampled				10/07/2023
Time Taken				1400
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Heavy Metals / Metalloids				
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	5.6
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	38
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	84
Lead (aqua regia extractable)	mg/kg	1	MCERTS	450
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	4.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	140

Monoaromatics & Oxygenates ~

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	2.3
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	36
TPH-CWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	43

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	2.2
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	3
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	37
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	100
TPH-CWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	73
TPH Total C5 - C40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	300

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-44627

Project / Site name: Harwood Street Littleborough

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2745897	WS01	None Supplied	0.5	Brown clay and loam with gravel and vegetation.
2745898	WS02	None Supplied	0.5	Brown clay and sand with gravel.
2745899	WS03	None Supplied	0.5	Brown loam and sand with vegetation and stones.
2745900	WS04	None Supplied	0.5	Brown loam and sand with gravel.
2745901	WS05	None Supplied	0.5	Brown loam and clay with gravel and plastic.
2745902	WS06	None Supplied	0.5	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 23-44627

Project / Site name: Harwood Street Littleborough

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 23-44627

Project / Site name: Harwood Street Littleborough

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

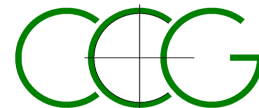
Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

~ - Quality control surrogate recovery outside of limits, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

APPENDIX G: SOIL CONTAMINATION SUMMARY TABLES

SOIL ASSESSMENT CRITERIA FOR RESIDENTIAL LAND USE (WITH HOMEGROWN PRODUCE)

(Updated: January 2023)



Contaminant	Assessment Criteria for Residential at 1% SOM (mg/kg)	Assessment Criteria for Residential at 2.5% SOM (mg/kg)	Assessment Criteria for Residential at 6% SOM (mg/kg)
Metals			
Arsenic	37	37	37
Boron	290	290	290
Cadmium	11	11	11
Chromium III	910	910	910
Chromium VI	6	6	6
Copper	2400	2400	2400
*Lead	200	200	200
Mercury	1.2	1.2	1.2
Nickel	130	130	130
Selenium	250	250	250
Vanadium	410	410	410
Zinc	3700	3700	3700
Non-Metals			
Phenol	120	200	380
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Anthracene	2400	5400	11000
Benz[a]anthracene	7.2	11	13
Benzo[a]pyrene	2.2	2.7	3.0
Benzo[b]fluoranthene	2.6	3.3	3.7
Benzo[ghi]perylene	320	340	350
Benzo[k]fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz[ah]anthracene	0.24	0.28	0.3
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno[123-cd]pyrene	27	36	41
Naphthalene	2.3	5.6	13
Phenanthrene	95	220	440
Pyrene	620	1200	2000
Coal Tar [Bap as surrogate marker]	0.79	0.98	1.1
Petroleum Hydrocarbons			
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130	330	760
Aliphatic EC >12-16	1100	2400	4300
Aliphatic EC >16-35	65000	92000	110000
Aliphatic EC >35-44	65000	92000	110000
Aromatic EC 5-7 (Benzene)	70	140	300
Aromatic EC >7-8 (Toluene)	130	290	660
Aromatic EC >8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260	540	930
Aromatic EC >21-35	1100	1500	1700
Aromatic EC >35-44	1100	1500	1700
Aliphatic – Aromatic EC >44-70	1600	1800	1900
Other			
Asbestos Containing Materials (ACM)	No Detection	No Detection	No Detection

Copyright: Land Quality Management Limited (LQM)

The above is based on criteria contained in publication LQM/CIEH S4UL's for Human Health Risk Assessment (2015) (CCG Licence No. S4UL3233), applicable to the "Residential" land use (with home grown produce) scenario for soil organic matter (SOM) content of 1% - 6%.

*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.



METALS DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 23-14026

Site name: Harwood Street Littleborough

Prepared by: TG

Authorised by: CB

Proposed land use: Residential with plant uptake

SOM % used: 2.5

 = Threshold exceeded

 = Below Limit of detection

n/t = Not tested

Contaminants			Metals							
			Cadmium	Chromium III	Chromium VI	Copper	Lead	Mercury (elemental)	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	1.2	180	3700
Sample Location	Sample Depth (m)	Sample type								
WS01	0.50	Soil	0.7	24	< 1.8	35	41	< 0.3	40	160
WS02	0.50	Soil	0.4	24	< 1.8	25	56	< 0.3	25	100
WS03	0.50	Soil	0.2	21	< 1.8	27	17	< 0.3	24	52
WS04	0.50	Soil	1.2	24	< 1.8	160	260	< 0.3	45	340
WS05	0.50	Soil	< 0.2	20	< 1.8	33	41	< 0.3	22	170
WS06	0.50	Soil	< 0.2	24	< 1.8	84	450	0.6	28	140
Human Health Risk Assessment (GAC)			11	910	6	2400	200	1.2	180	3700



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

Job number: **23-14026**

Site name: **Harwood Street Littleborough**

Prepared by: **TG**

Authorised by: **CB**

Proposed land use: **Residential with plant uptake**

SOM % used: **2.5**

 = **Threshold exceeded**

 = **Below Limit of detection**

n/t = **Not tested**

			Semi/non-metals			Inorganics		Other	
Contaminants			Arsenic	Boron	Selenium	Cyanide (free)	Sulphate (water soluble)	Sulphate (water soluble)	
Units			mg/kg	mg/kg	mg/kg	mg/kg	g/l	mg/l	
Limit of Detection			1.0	0.5	1.0	1.0	0.02	20.0	0.1
Human Health Risk Assessment (GAC)			37	290	250	22	NA	NA	NA
Sample Location	Sample Depth (m)	Sample type							
WS01	0.50	Soil	13	0.4	< 1.0	< 1.0	0.033	n/t	7.8
WS02	0.50	Soil	10	0.5	< 1.0	< 1.0	0.038	n/t	6.6
WS03	0.50	Soil	4.6	0.8	< 1.0	< 1.0	0.16	n/t	8.5
WS04	0.50	Soil	24	0.6	< 1.0	< 1.0	0.19	n/t	8.2
WS05	0.50	Soil	7.1	0.4	< 1.0	< 1.0	0.053	n/t	8.1
WS06	0.50	Soil	38	0.6	< 1.0	< 1.0	0.048	n/t	7.3
Human Health Risk Assessment (GAC)			37	290	11	22	NA	NA	NA



SPECIATED PAH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 23-14026

Site name: Harwood Street Littleborough

Prepared by: TG

Authorised by: CB

Proposed land use: Residential with plant uptake

SOM % used: 2.5

 = Threshold exceeded = Below Limit of detection

n/t = Not tested

Contaminants

PAH's

			Acenaphthene	Acenaphthylene	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)			510	420	5400	11	2.7	3.3	340	93	22	0.28	560	400	36	5.6	220	1200	NA
Sample Location	Sample Depth (m)	Sample type																	
WS01	0.50	Soil	< 0.05	< 0.05	0.07	0.21	0.23	0.31	0.15	0.09	0.24	< 0.05	0.45	< 0.05	0.12	< 0.05	0.3	0.36	2.53
WS02	0.50	Soil	0.07	< 0.05	0.08	0.29	0.32	0.37	0.23	0.11	0.3	< 0.05	0.65	0.05	0.17	< 0.05	0.4	0.58	3.62
WS03	0.50	Soil	0.16	0.56	0.26	0.68	0.97	< 0.05	< 0.05	< 0.05	0.91	< 0.05	1.4	0.17	< 0.05	< 0.05	0.71	1.6	7.41
WS04	0.50	Soil	4.6	2.1	14	42	44	52	22	22	35	6.7	100	6.1	21	2.3	41	84	501
WS05	0.50	Soil	0.1	0.42	0.15	0.54	< 0.05	< 0.05	< 0.05	< 0.05	0.67	< 0.05	1.2	< 0.05	< 0.05	< 0.05	0.62	1.3	5.01
WS06	0.50	Soil	1.5	0.51	2.4	9	9.3	11	6.4	4.2	11	1.3	25	1.3	5.4	0.91	17	20	126
Human Health Risk Assessment (GAC)			510	420	11	11	2.7	3.3	340	93	22	0.28	560	400	36	5.6	220	1200	NA



SPECIATED TPH'S DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: 23-14026

Site name: Harwood Street Littleborough

Prepared by: TG

Authorised by: CB

Proposed land use: Residential with plant uptake

SOM % used: 2.5

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

			Speciated TPH's															
			Aromatics							Aliphatics								
Contaminants			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)			140	290	83	180	330	540	1500	1500	78	230	65	330	2400	92000	92000	NA
Sample Location	Sample Depth (m)	Sample type																
WS01	0.50	Soil	< 0.10	< 0.10	< 0.10	< 1.0	< 2.0	< 10	15	< 10	< 0.10	< 0.10	< 0.10	< 1.0	< 2.0	14	< 10	45
WS02	0.50	Soil	< 0.10	< 0.10	< 0.10	< 1.0	< 2.0	< 10	29	12	< 0.10	< 0.10	< 0.10	< 1.0	< 2.0	16	< 10	77
WS03	0.50	Soil	< 0.10	< 0.10	< 0.10	< 1.0	7.7	46	850	560	< 0.10	< 0.10	< 0.10	< 1.0	< 2.0	390	200	2100
WS04	0.50	Soil	< 0.10	< 0.10	< 0.10	1.6	20	300	980	320	< 0.10	< 0.10	< 0.10	< 1.0	25	1380	420	3500
WS05	0.50	Soil	< 0.10	< 0.10	< 0.10	4.6	15	49	770	670	< 0.10	< 0.10	< 0.10	< 1.0	< 2.0	285	280	2100
WS06	0.50	Soil	< 0.10	< 0.10	< 0.10	2.2	3	37	100	73	< 0.10	< 0.10	< 0.10	< 1.0	2.3	36	43	300
Human Health Risk Assessment (GAC)			140	290	11	180	330	540	1500	1500	78	230	65	330	2400	92000	92000	NA



BTEX DATA SUMMARY AND RISK ASSESSMENT SHEET

Job number: **23-14026**

Site name: **Harwood Street**

Littleborough

Prepared by: **TG**

Authorised by: **CB**

Proposed land use: **Residential with plant uptake**

SOM % used: **2.5**

 = **Threshold exceeded**

 = **Below Limit of detection**

n/t = **Not tested**

			BTEX			
Contaminants			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)			170	290000	110000	130000
Sample Location	Sample Depth (m)	Sample type				
WS01	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS02	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS03	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS04	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS05	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
WS06	0.50	Soil	< 5.0	< 5.0	< 5.0	< 5.0
Human Health Risk Assessment (GAC)			170	11	110000	130000

APPENDIX H: PRELIMINARY WASTE CLASSIFICATION REPORT



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



SPT68-7A68Q-OJ6ZD

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

Harwood Street Littleborough

Description/Comments

Project

Harwood Street Littleborough

Site

Harwood Street Littleborough

Classified by

Name: **Tony Gerrard**
Date: **19 Jul 2023 11:47 GMT**
Telephone: **0151 545 2750**

Company: **CC Geotechnical Ltd**

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

-

Course

Hazardous Waste Classification

Date

-

Purpose of classification

2 - Material Characterisation

Address of the waste

Harwood Street Littleborough

Post Code N/A

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Spoil generated during site prep' works

Description of the specific process, sub-process and/or activity that created the waste

Spoil generated during site prep' works

Description of the waste

Granular MG



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01	0.50	Non Hazardous		3
2	WS02	0.50	Non Hazardous		8
3	WS03	0.50	Hazardous	HP 3(i), HP 7, HP 11	13
4	WS04	0.50	Hazardous	HP 3(i), HP 7, HP 11	18
5	WS05	0.50	Hazardous	HP 3(i), HP 7, HP 11	23
6	WS06	0.50	Non Hazardous		28

Related documents

#	Name	Description
1	CCG SOIL A 2020	waste stream template used to create this Job

Report

Created by: Tony Gerrard

Created date: 19 Jul 2023 11:47 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	33
Appendix B: Rationale for selection of metal species	36
Appendix C: Version	37



Classification of sample: WS01

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS01** LoW Code: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth: **0.50 m** Chapter: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Entry:

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				13 mg/kg	1.32	17.164 mg/kg	0.00172 %			
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.8 mg/kg	0.00008 %			
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24 mg/kg	1.462	35.077 mg/kg	0.00351 %			
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				35 mg/kg	1.126	39.406 mg/kg	0.00394 %			
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead chromate }			1	41 mg/kg	1.56	63.952 mg/kg	0.0041 %			
	082-004-00-2	231-846-0	7758-97-6								
6	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel chromate }				40 mg/kg	2.976	119.051 mg/kg	0.0119 %			
	028-035-00-7	238-766-5	14721-18-7								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
9	zinc { zinc chromate }				160 mg/kg	2.774	443.863 mg/kg	0.0444 %			
	024-007-00-3	236-878-9	13530-65-9								
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	boron { diboron trioxide; boric oxide }				0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %			
	005-008-00-8	215-125-8	1303-86-2								
13	pH				7.8 pH		7.8 pH	7.8 pH			
			PH								
14	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
15	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-052-00-2	202-049-5	91-20-3								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	acenaphthylene	205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
17	acenaphthene	201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
18	fluorene	201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
19	phenanthrene	201-581-5	85-01-8		0.3 mg/kg		0.3 mg/kg	0.00003 %		
20	anthracene	204-371-1	120-12-7		0.07 mg/kg		0.07 mg/kg	0.000007 %		
21	fluoranthene	205-912-4	206-44-0		0.45 mg/kg		0.45 mg/kg	0.000045 %		
22	pyrene	204-927-3	129-00-0		0.36 mg/kg		0.36 mg/kg	0.000036 %		
23	benzo[a]anthracene	601-033-00-9	200-280-6		0.21 mg/kg		0.21 mg/kg	0.000021 %		
24	chrysene	601-048-00-0	205-923-4		0.24 mg/kg		0.24 mg/kg	0.000024 %		
25	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.31 mg/kg		0.31 mg/kg	0.000031 %		
26	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.09 mg/kg		0.09 mg/kg	0.000009 %		
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.23 mg/kg		0.23 mg/kg	0.000023 %		
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.12 mg/kg		0.12 mg/kg	0.000012 %		
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
30	benzo[ghi]perylene	205-883-8	191-24-2		0.15 mg/kg		0.15 mg/kg	0.000015 %		
31	benzene	601-020-00-8	200-753-7		0.005 mg/kg		0.005 mg/kg	0.0000005 %		
32	toluene	601-021-00-3	203-625-9		0.005 mg/kg		0.005 mg/kg	0.0000005 %		
33	ethylbenzene	601-023-00-4	202-849-4		0.005 mg/kg		0.005 mg/kg	0.0000005 %		
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		0.005 mg/kg		0.005 mg/kg	0.0000005 %		
35	TPH (C6 to C40) petroleum group		TPH		45 mg/kg		45 mg/kg	0.0045 %		
36	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
37	polychlorobiphenyls; PCB	602-039-00-4	215-648-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	asbestos	650-013-00-6	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
39	antimony { antimony trioxide }	051-005-00-X	215-175-0		3.4 mg/kg	1.197	4.07 mg/kg	0.000407 %		
40	beryllium { beryllium oxide }	004-003-00-8	215-133-1		<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
41	manganese { manganese sulphate }				<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7							
42	molybdenum { molybdenum(VI) oxide }				1.5 mg/kg	1.5	2.25 mg/kg	0.000225 %		
	042-001-00-9	215-204-7	1313-27-5							
43	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
44	tetrachloroethylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
45	carbon tetrachloride; tetrachloromethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
46	trichloroethylene; trichloroethene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
47	vinyl chloride; chloroethylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
48	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3							
49	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9							
50	hexachlorocyclohexanes, including lindane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1							
51	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1							
52	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8							
53	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
54	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
55	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
56	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
57	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
58	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
59	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
60	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
61	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
62	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
63	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
64	1,2,3,6,7,8-HxCDD		57653-85-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
65	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
66	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	OCDD		3268-87-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	2,3,7,8-TeCDF		51207-31-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	1,2,3,7,8-PeCDF		57117-41-6		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	2,3,4,7,8-PeCDF		57117-31-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
79	diesel petroleum group		68334-30-5; 68476-34-6; 94114-59-7; 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0762 %		

Key	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk



Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 5.0e-07%)

toluene: (conc.: 5.0e-07%)

ethylbenzene: (conc.: 5.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 5.0e-07%)

TPH (C6 to C40) petroleum group: (conc.: 0.0045%)



Classification of sample: WS02

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **WS02** LoW Code: Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**
Sample Depth: **0.50 m** Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**

Hazard properties

None identified

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				10 mg/kg	1.32	13.203 mg/kg	0.00132 %			
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.457 mg/kg	0.0000457 %			
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24 mg/kg	1.462	35.077 mg/kg	0.00351 %			
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				25 mg/kg	1.126	28.147 mg/kg	0.00281 %			
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead chromate }			1	56 mg/kg	1.56	87.35 mg/kg	0.0056 %			
	082-004-00-2	231-846-0	7758-97-6								
6	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel chromate }				25 mg/kg	2.976	74.407 mg/kg	0.00744 %			
	028-035-00-7	238-766-5	14721-18-7								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
9	zinc { zinc chromate }				100 mg/kg	2.774	277.415 mg/kg	0.0277 %			
	024-007-00-3	236-878-9	13530-65-9								
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	boron { triboron trioxide; boric oxide }				0.5 mg/kg	3.22	1.61 mg/kg	0.000161 %			
	005-008-00-8	215-125-8	1303-86-2								
13	pH				6.6 pH		6.6 pH	6.6 pH			
			PH								
14	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	604-001-00-2	203-632-7	108-95-2								
15	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-052-00-2	202-049-5	91-20-3								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	acenaphthylene	205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
17	acenaphthene	201-469-6	83-32-9		0.07 mg/kg		0.07 mg/kg	0.000007 %			
18	fluorene	201-695-5	86-73-7		0.05 mg/kg		0.05 mg/kg	0.000005 %			
19	phenanthrene	201-581-5	85-01-8		0.4 mg/kg		0.4 mg/kg	0.00004 %			
20	anthracene	204-371-1	120-12-7		0.08 mg/kg		0.08 mg/kg	0.000008 %			
21	fluoranthene	205-912-4	206-44-0		0.65 mg/kg		0.65 mg/kg	0.000065 %			
22	pyrene	204-927-3	129-00-0		0.58 mg/kg		0.58 mg/kg	0.000058 %			
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.29 mg/kg		0.29 mg/kg	0.000029 %			
24	chrysene	601-048-00-0	205-923-4	218-01-9	0.3 mg/kg		0.3 mg/kg	0.00003 %			
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.37 mg/kg		0.37 mg/kg	0.000037 %			
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.11 mg/kg		0.11 mg/kg	0.000011 %			
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.32 mg/kg		0.32 mg/kg	0.000032 %			
28	indeno[123-cd]pyrene	205-893-2	193-39-5		0.17 mg/kg		0.17 mg/kg	0.000017 %			
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
30	benzo[ghi]perylene	205-883-8	191-24-2		0.23 mg/kg		0.23 mg/kg	0.000023 %			
31	benzene	601-020-00-8	200-753-7	71-43-2	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
32	toluene	601-021-00-3	203-625-9	108-88-3	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
35	TPH (C6 to C40) petroleum group		TPH		77 mg/kg		77 mg/kg	0.0077 %			
36	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
37	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
38	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
39	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	2.6 mg/kg	1.197	3.112 mg/kg	0.000311 %			
40	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %			<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
41	manganese { manganese sulphate }				<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7							
42	molybdenum { molybdenum(VI) oxide }				0.88 mg/kg	1.5	1.32 mg/kg	0.000132 %		
	042-001-00-9	215-204-7	1313-27-5							
43	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
44	tetrachloroethylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
45	carbon tetrachloride; tetrachloromethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
46	trichloroethylene; trichloroethene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
47	vinyl chloride; chloroethylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
48	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3							
49	chlordan (ISO); 1,2,4,5,6,7,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9							
50	hexachlorocyclohexanes, including lindane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1							
51	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1							
52	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8							
53	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
54	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
55	chlordecone (ISO); perchloropentacyclo[5.3.0.02,6.03,9.04,8]decan-5-one; decachloropentacyclo[5.2.1.02,6.03,9.05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
56	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
57	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
58	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
59	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
60	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
61	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
62	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
63	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
64	1,2,3,6,7,8-HxCDD		57653-85-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
65	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
66	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	OCDD		3268-87-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	2,3,7,8-TeCDF		51207-31-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	1,2,3,7,8-PeCDF		57117-41-6		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	2,3,4,7,8-PeCDF		57117-31-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
79	diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0582 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk



Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 5.0e-07%)

toluene: (conc.: 5.0e-07%)

ethylbenzene: (conc.: 5.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 5.0e-07%)

TPH (C6 to C40) petroleum group: (conc.: 0.0077%)



Classification of sample: WS03

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:
WS03	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
	17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.21%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.21%)

Hazard properties (substances considered hazardous until shown otherwise)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 5.0e-07%)

toluene: (conc.: 5.0e-07%)

ethylbenzene: (conc.: 5.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 5.0e-07%)

TPH (C6 to C40) petroleum group: (conc.: 0.21%)

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	 arsenic { arsenic trioxide }				4.6 mg/kg	1.32	6.073 mg/kg	0.000607 %		
	033-003-00-0	215-481-4	1327-53-3							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %			
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		21 mg/kg	1.462	30.693 mg/kg	0.00307 %			
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	27 mg/kg	1.126	30.399 mg/kg	0.00304 %			
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	17 mg/kg	1.56	26.517 mg/kg	0.0017 %			
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7	24 mg/kg	2.976	71.43 mg/kg	0.00714 %			
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9	52 mg/kg	2.774	144.256 mg/kg	0.0144 %			
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
12	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	0.8 mg/kg	3.22	2.576 mg/kg	0.000258 %			
13	pH		PH		8.5 pH		8.5 pH	8.5 pH			
14	phenol	604-001-00-2	203-632-7	108-95-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
15	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
16	acenaphthylene	205-917-1	208-96-8		0.56 mg/kg		0.56 mg/kg	0.000056 %			
17	acenaphthene	201-469-6	83-32-9		0.16 mg/kg		0.16 mg/kg	0.000016 %			
18	fluorene	201-695-5	86-73-7		0.17 mg/kg		0.17 mg/kg	0.000017 %			
19	phenanthrene	201-581-5	85-01-8		0.71 mg/kg		0.71 mg/kg	0.000071 %			
20	anthracene	204-371-1	120-12-7		0.26 mg/kg		0.26 mg/kg	0.000026 %			
21	fluoranthene	205-912-4	206-44-0		1.4 mg/kg		1.4 mg/kg	0.00014 %			
22	pyrene	204-927-3	129-00-0		1.6 mg/kg		1.6 mg/kg	0.00016 %			
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.68 mg/kg		0.68 mg/kg	0.000068 %			
24	chrysene	601-048-00-0	205-923-4	218-01-9	0.91 mg/kg		0.91 mg/kg	0.000091 %			
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.97 mg/kg		0.97 mg/kg	0.000097 %			



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
28	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
30	benzo[ghi]perylene	205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzene	601-020-00-8	200-753-7	71-43-2	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
32	toluene	601-021-00-3	203-625-9	108-88-3	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
35	TPH (C6 to C40) petroleum group		TPH		2100 mg/kg		2100 mg/kg	0.21 %		
36	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
37	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
39	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	3 mg/kg	1.197	3.591 mg/kg	0.000359 %		
40	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %		<LOD
41	manganese { manganese sulphate }	025-003-00-4	232-089-9	7785-87-7	<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
42	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5	0.88 mg/kg	1.5	1.32 mg/kg	0.000132 %		
43	1,1-dichloroethane and 1,2-dichloroethane (combined)	203-458-1, 200-863-5	107-06-2, 75-34-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
44	tetrachloroethylene	602-028-00-4	204-825-9	127-18-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
45	carbon tetrachloride; tetrachloromethane	602-008-00-5	200-262-8	56-23-5	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
46	trichloroethylene; trichloroethene	602-027-00-9	201-167-4	79-01-6	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
47	vinyl chloride; chloroethylene	602-023-00-7	200-831-0	75-01-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
48	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane	602-045-00-7	200-024-3	50-29-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
49	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan	602-047-00-8	200-349-0	57-74-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
50	hexachlorocyclohexanes, including lindane	602-043-00-6	210-168-9, 200-401-2,	58-89-9, 319-84-6,	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		206-270-8, 206-271-3	319-85-7, 608-73-1							
51	dieldrin (ISO) 602-049-00-9	200-484-5	60-57-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
52	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene 602-051-00-X	200-775-7	72-20-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
53	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene 602-046-00-2	200-962-3	76-44-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
54	hexachlorobenzene 602-065-00-6	204-273-9	118-74-1		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
55	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one 606-019-00-6	205-601-3	143-50-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
56	aldrin (ISO) 602-048-00-3	206-215-8	309-00-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
57	pentachlorobenzene 602-074-00-5	210-172-0	608-93-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
58	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex 602-077-00-1	219-196-6	2385-85-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
59	camphechlor (ISO); toxaphene 602-044-00-1	232-283-3	8001-35-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
60	hexabromobiphenyl 252-994-2	36355-01-8			<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
61	2,3,7,8-TeCDD 217-122-7	1746-01-6			<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
62	1,2,3,7,8-PeCDD 40321-76-4				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
63	1,2,3,4,7,8-HxCDD 39227-28-6				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
64	1,2,3,6,7,8-HxCDD 57653-85-7				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
65	1,2,3,7,8,9-HxCDD 19408-74-3				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
66	1,2,3,4,6,7,8-HpCDD 35822-46-9				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	OCDD 3268-87-9				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	2,3,7,8-TeCDF 51207-31-9				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	1,2,3,7,8-PeCDF 57117-41-6				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	2,3,4,7,8-PeCDF 57117-31-4				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	1,2,3,4,7,8-HxCDF 70648-26-9				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,6,7,8-HxCDF 57117-44-9				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,7,8,9-HxCDF 72918-21-9				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	2,3,4,6,7,8-HxCDF 60851-34-5				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	1,2,3,4,6,7,8-HpCDF 67562-39-4				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
76	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
79	diesel petroleum group		68334-30-5; 68476-34-6; 94114-59-7; 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened		8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.243 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Classification of sample: WS04

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:	
WS04	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 03 * (Soil and stones containing hazardous substances)
0.50 m		

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.35%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.35%)

Hazard properties (substances considered hazardous until shown otherwise)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 5.0e-07%)

toluene: (conc.: 5.0e-07%)

ethylbenzene: (conc.: 5.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 5.0e-07%)

TPH (C6 to C40) petroleum group: (conc.: 0.35%)

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				24 mg/kg	1.32	31.688 mg/kg	0.00317 %		
	033-003-00-0	215-481-4	1327-53-3							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
2	cadmium { cadmium oxide }				1.2 mg/kg	1.142	1.371 mg/kg	0.000137 %		
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24 mg/kg	1.462	35.077 mg/kg	0.00351 %		
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				160 mg/kg	1.126	180.142 mg/kg	0.018 %		
	029-002-00-X	215-270-7	1317-39-1							
5	lead { lead chromate }			1	260 mg/kg	1.56	405.552 mg/kg	0.026 %		
	082-004-00-2	231-846-0	7758-97-6							
6	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
7	nickel { nickel chromate }				45 mg/kg	2.976	133.932 mg/kg	0.0134 %		
	028-035-00-7	238-766-5	14721-18-7							
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
9	zinc { zinc chromate }				340 mg/kg	2.774	943.21 mg/kg	0.0943 %		
	024-007-00-3	236-878-9	13530-65-9							
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
12	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2							
13	pH		PH		8.2 pH		8.2 pH	8.2 pH		
14	phenol				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2							
15	naphthalene				2.3 mg/kg		2.3 mg/kg	0.00023 %		
	601-052-00-2	202-049-5	91-20-3							
16	acenaphthylene				2.1 mg/kg		2.1 mg/kg	0.00021 %		
		205-917-1	208-96-8							
17	acenaphthene				4.6 mg/kg		4.6 mg/kg	0.00046 %		
		201-469-6	83-32-9							
18	fluorene				6.1 mg/kg		6.1 mg/kg	0.00061 %		
		201-695-5	86-73-7							
19	phenanthrene				41 mg/kg		41 mg/kg	0.0041 %		
		201-581-5	85-01-8							
20	anthracene				14 mg/kg		14 mg/kg	0.0014 %		
		204-371-1	120-12-7							
21	fluoranthene				100 mg/kg		100 mg/kg	0.01 %		
		205-912-4	206-44-0							
22	pyrene				84 mg/kg		84 mg/kg	0.0084 %		
		204-927-3	129-00-0							
23	benzo[a]anthracene				42 mg/kg		42 mg/kg	0.0042 %		
	601-033-00-9	200-280-6	56-55-3							
24	chrysene				35 mg/kg		35 mg/kg	0.0035 %		
	601-048-00-0	205-923-4	218-01-9							
25	benzo[b]fluoranthene				52 mg/kg		52 mg/kg	0.0052 %		
	601-034-00-4	205-911-9	205-99-2							
26	benzo[k]fluoranthene				22 mg/kg		22 mg/kg	0.0022 %		
	601-036-00-5	205-916-6	207-08-9							
27	benzo[a]pyrene; benzo[def]chrysene				44 mg/kg		44 mg/kg	0.0044 %		
	601-032-00-3	200-028-5	50-32-8							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
28	indeno[123-cd]pyrene	205-893-2	193-39-5		21 mg/kg		21 mg/kg	0.0021 %		
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	6.7 mg/kg		6.7 mg/kg	0.00067 %		
30	benzo[ghi]perylene	205-883-8	191-24-2		22 mg/kg		22 mg/kg	0.0022 %		
31	benzene	601-020-00-8	200-753-7	71-43-2	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
32	toluene	601-021-00-3	203-625-9	108-88-3	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
35	TPH (C6 to C40) petroleum group		TPH		3500 mg/kg		3500 mg/kg	0.35 %		
36	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
37	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
39	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	9.1 mg/kg	1.197	10.894 mg/kg	0.00109 %		
40	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %		<LOD
41	manganese { manganese sulphate }	025-003-00-4	232-089-9	7785-87-7	<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
42	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5	5.3 mg/kg	1.5	7.951 mg/kg	0.000795 %		
43	1,1-dichloroethane and 1,2-dichloroethane (combined)	203-458-1, 200-863-5	107-06-2, 75-34-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
44	tetrachloroethylene	602-028-00-4	204-825-9	127-18-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
45	carbon tetrachloride; tetrachloromethane	602-008-00-5	200-262-8	56-23-5	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
46	trichloroethylene; trichloroethene	602-027-00-9	201-167-4	79-01-6	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
47	vinyl chloride; chloroethylene	602-023-00-7	200-831-0	75-01-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
48	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane	602-045-00-7	200-024-3	50-29-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
49	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan	602-047-00-8	200-349-0	57-74-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
50	hexachlorocyclohexanes, including lindane	602-043-00-6	210-168-9, 200-401-2,	58-89-9, 319-84-6,	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
		206-270-8, 206-271-3	319-85-7, 608-73-1								
51	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-049-00-9	200-484-5	60-57-1								
52	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-051-00-X	200-775-7	72-20-8								
53	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-046-00-2	200-962-3	76-44-8								
54	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-065-00-6	204-273-9	118-74-1								
55	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	606-019-00-6	205-601-3	143-50-0								
56	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-048-00-3	206-215-8	309-00-2								
57	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-074-00-5	210-172-0	608-93-5								
58	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-077-00-1	219-196-6	2385-85-5								
59	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-044-00-1	232-283-3	8001-35-2								
60	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		252-994-2	36355-01-8								
61	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
		217-122-7	1746-01-6								
62	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			40321-76-4								
63	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			39227-28-6								
64	1,2,3,6,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			57653-85-7								
65	1,2,3,7,8,9-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			19408-74-3								
66	1,2,3,4,6,7,8-HpCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			35822-46-9								
67	OCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			3268-87-9								
68	2,3,7,8-TeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			51207-31-9								
69	1,2,3,7,8-PeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			57117-41-6								
70	2,3,4,7,8-PeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			57117-31-4								
71	1,2,3,4,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			70648-26-9								
72	1,2,3,6,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			57117-44-9								
73	1,2,3,7,8,9-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			72918-21-9								
74	2,3,4,6,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			60851-34-5								
75	1,2,3,4,6,7,8-HpCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %			<LOD
			67562-39-4								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
76	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
79	diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9							
Total:								0.562 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Classification of sample: WS05

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:
WS05	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
	17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.21%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.21%)

Hazard properties (substances considered hazardous until shown otherwise)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 5.0e-07%)

toluene: (conc.: 5.0e-07%)

ethylbenzene: (conc.: 5.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 5.0e-07%)

TPH (C6 to C40) petroleum group: (conc.: 0.21%)

Determinands

Moisture content: **0% No Moisture Correction applied (MC)**

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	 arsenic { arsenic trioxide }				7.1 mg/kg	1.32	9.374 mg/kg	0.000937 %		
	033-003-00-0	215-481-4	1327-53-3							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %			<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		20 mg/kg	1.462	29.231 mg/kg	0.00292 %			
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	33 mg/kg	1.126	37.154 mg/kg	0.00372 %			
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	41 mg/kg	1.56	63.952 mg/kg	0.0041 %			
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %			<LOD
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7	22 mg/kg	2.976	65.478 mg/kg	0.00655 %			
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9	170 mg/kg	2.774	471.605 mg/kg	0.0472 %			
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5			<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %			<LOD
12	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %			
13	pH		PH		8.1 pH		8.1 pH	8.1 pH			
14	phenol	604-001-00-2	203-632-7	108-95-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
15	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
16	acenaphthylene	205-917-1	208-96-8		0.42 mg/kg		0.42 mg/kg	0.000042 %			
17	acenaphthene	201-469-6	83-32-9		0.1 mg/kg		0.1 mg/kg	0.00001 %			
18	fluorene	201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
19	phenanthrene	201-581-5	85-01-8		0.62 mg/kg		0.62 mg/kg	0.000062 %			
20	anthracene	204-371-1	120-12-7		0.15 mg/kg		0.15 mg/kg	0.000015 %			
21	fluoranthene	205-912-4	206-44-0		1.2 mg/kg		1.2 mg/kg	0.00012 %			
22	pyrene	204-927-3	129-00-0		1.3 mg/kg		1.3 mg/kg	0.00013 %			
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.54 mg/kg		0.54 mg/kg	0.000054 %			
24	chrysene	601-048-00-0	205-923-4	218-01-9	0.67 mg/kg		0.67 mg/kg	0.000067 %			
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
28	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
30	benzo[ghi]perylene	205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
31	benzene	601-020-00-8	200-753-7	71-43-2	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
32	toluene	601-021-00-3	203-625-9	108-88-3	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	0.005 mg/kg		0.005 mg/kg	0.0000005 %			
35	TPH (C6 to C40) petroleum group		TPH		2100 mg/kg		2100 mg/kg	0.21 %			
36	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
37	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
38	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
39	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	3.8 mg/kg	1.197	4.549 mg/kg	0.000455 %			
40	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %			<LOD
41	manganese { manganese sulphate }	025-003-00-4	232-089-9	7785-87-7	<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %			<LOD
42	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5	1.3 mg/kg	1.5	1.95 mg/kg	0.000195 %			
43	1,1-dichloroethane and 1,2-dichloroethane (combined)	203-458-1, 200-863-5	107-06-2, 75-34-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
44	tetrachloroethylene	602-028-00-4	204-825-9	127-18-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
45	carbon tetrachloride; tetrachloromethane	602-008-00-5	200-262-8	56-23-5	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
46	trichloroethylene; trichloroethene	602-027-00-9	201-167-4	79-01-6	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
47	vinyl chloride; chloroethylene	602-023-00-7	200-831-0	75-01-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
48	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane	602-045-00-7	200-024-3	50-29-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
49	chlordan (ISO); 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan	602-047-00-8	200-349-0	57-74-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
50	hexachlorocyclohexanes, including lindane	602-043-00-6	210-168-9, 200-401-2,	58-89-9, 319-84-6,	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
		206-270-8, 206-271-3	319-85-7, 608-73-1							
51	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1							
52	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8							
53	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
54	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
55	chlordecone (ISO); perchloropentacyclo[5,3,0,02,6,03,9,04,8]decan-5-one; decachloropentacyclo[5,2,1,02,6,03,9,05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
56	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
57	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
58	dodecachloropentacyclo[5.2.1.02.6.03.9.05.8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
59	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
60	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
61	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
62	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
63	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							
64	1,2,3,6,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57653-85-7							
65	1,2,3,7,8,9-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			19408-74-3							
66	1,2,3,4,6,7,8-HpCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			35822-46-9							
67	OCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			3268-87-9							
68	2,3,7,8-TeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			51207-31-9							
69	1,2,3,7,8-PeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57117-41-6							
70	2,3,4,7,8-PeCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57117-31-4							
71	1,2,3,4,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			70648-26-9							
72	1,2,3,6,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			57117-44-9							
73	1,2,3,7,8,9-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			72918-21-9							
74	2,3,4,6,7,8-HxCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			60851-34-5							
75	1,2,3,4,6,7,8-HpCDF				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			67562-39-4							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
76	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
79	diesel petroleum group		68334-30-5; 68476-34-6; 94114-59-7; 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened		8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.278 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Classification of sample: WS06

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS06	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				38 mg/kg	1.32	50.172	mg/kg	0.00502 %		
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24 mg/kg	1.462	35.077	mg/kg	0.00351 %		
		215-160-9	1308-38-9								
4	copper { dicopper oxide; copper (I) oxide }				84 mg/kg	1.126	94.575	mg/kg	0.00946 %		
	029-002-00-X	215-270-7	1317-39-1								
5	lead { lead chromate }			1	450 mg/kg	1.56	701.917	mg/kg	0.045 %		
	082-004-00-2	231-846-0	7758-97-6								
6	mercury { mercury dichloride }				0.6 mg/kg	1.353	0.812	mg/kg	0.0000812 %		
	080-010-00-X	231-299-8	7487-94-7								
7	nickel { nickel chromate }				28 mg/kg	2.976	83.335	mg/kg	0.00833 %		
	028-035-00-7	238-766-5	14721-18-7								
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
9	zinc { zinc chromate }				140 mg/kg	2.774	388.381	mg/kg	0.0388 %		
	024-007-00-3	236-878-9	13530-65-9								
10	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
	006-007-00-5										
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8 mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	boron { diboron trioxide; boric oxide }				0.6 mg/kg	3.22	1.932	mg/kg	0.000193 %		
	005-008-00-8	215-125-8	1303-86-2								
13	pH				7.3 pH		7.3	pH	7.3 pH		
			PH								
14	phenol				<0.1 mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	604-001-00-2	203-632-7	108-95-2								
15	naphthalene				0.91 mg/kg		0.91	mg/kg	0.000091 %		
	601-052-00-2	202-049-5	91-20-3								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	acenaphthylene	205-917-1	208-96-8		0.51 mg/kg		0.51 mg/kg	0.000051 %		
17	acenaphthene	201-469-6	83-32-9		1.5 mg/kg		1.5 mg/kg	0.00015 %		
18	fluorene	201-695-5	86-73-7		1.3 mg/kg		1.3 mg/kg	0.00013 %		
19	phenanthrene	201-581-5	85-01-8		17 mg/kg		17 mg/kg	0.0017 %		
20	anthracene	204-371-1	120-12-7		2.4 mg/kg		2.4 mg/kg	0.00024 %		
21	fluoranthene	205-912-4	206-44-0		25 mg/kg		25 mg/kg	0.0025 %		
22	pyrene	204-927-3	129-00-0		20 mg/kg		20 mg/kg	0.002 %		
23	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	9 mg/kg		9 mg/kg	0.0009 %		
24	chrysene	601-048-00-0	205-923-4	218-01-9	11 mg/kg		11 mg/kg	0.0011 %		
25	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	11 mg/kg		11 mg/kg	0.0011 %		
26	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	4.2 mg/kg		4.2 mg/kg	0.00042 %		
27	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	9.3 mg/kg		9.3 mg/kg	0.00093 %		
28	indeno[123-cd]pyrene	205-893-2	193-39-5		5.4 mg/kg		5.4 mg/kg	0.00054 %		
29	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	1.3 mg/kg		1.3 mg/kg	0.00013 %		
30	benzo[ghi]perylene	205-883-8	191-24-2		6.4 mg/kg		6.4 mg/kg	0.00064 %		
31	benzene	601-020-00-8	200-753-7	71-43-2	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
32	toluene	601-021-00-3	203-625-9	108-88-3	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
33	ethylbenzene	601-023-00-4	202-849-4	100-41-4	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
34	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	0.005 mg/kg		0.005 mg/kg	0.0000005 %		
35	TPH (C6 to C40) petroleum group		TPH		300 mg/kg		300 mg/kg	0.03 %		
36	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
37	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
38	asbestos	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
39	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4	5.6 mg/kg	1.197	6.704 mg/kg	0.00067 %		
40	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9	<0.1 mg/kg	2.775	<0.278 mg/kg	<0.0000278 %		<LOD



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
41	manganese { manganese sulphate }				<0.1 mg/kg	2.749	<0.275 mg/kg	<0.0000275 %		<LOD
	025-003-00-4	232-089-9	7785-87-7							
42	molybdenum { molybdenum(VI) oxide }				4.6 mg/kg	1.5	6.901 mg/kg	0.00069 %		
	042-001-00-9	215-204-7	1313-27-5							
43	1,1-dichloroethane and 1,2-dichloroethane (combined)				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		203-458-1, 200-863-5	107-06-2, 75-34-3							
44	tetrachloroethylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-028-00-4	204-825-9	127-18-4							
45	carbon tetrachloride; tetrachloromethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-008-00-5	200-262-8	56-23-5							
46	trichloroethylene; trichloroethene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	602-027-00-9	201-167-4	79-01-6							
47	vinyl chloride; chloroethylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-023-00-7	200-831-0	75-01-4							
48	DDT (ISO); clofenotane (INN); dicophane; 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane; dichlorodiphenyltrichloroethane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-045-00-7	200-024-3	50-29-3							
49	chlordan (ISO); 1,2,4,5,6,7,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-047-00-8	200-349-0	57-74-9							
50	hexachlorocyclohexanes, including lindane				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-043-00-6	210-168-9, 200-401-2, 206-270-8, 206-271-3	58-89-9, 319-84-6, 319-85-7, 608-73-1							
51	dieldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-049-00-9	200-484-5	60-57-1							
52	endrin (ISO); 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4:5,8-dimethanonaphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-051-00-X	200-775-7	72-20-8							
53	heptachlor (ISO); 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-046-00-2	200-962-3	76-44-8							
54	hexachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-065-00-6	204-273-9	118-74-1							
55	chlordecone (ISO); perchloropentacyclo[5.3.0.02,6.03,9.04,8]decan-5-one; decachloropentacyclo[5.2.1.02,6.03,9.05,8]decan-4-one				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	606-019-00-6	205-601-3	143-50-0							
56	aldrin (ISO)				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-048-00-3	206-215-8	309-00-2							
57	pentachlorobenzene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-074-00-5	210-172-0	608-93-5							
58	dodecachloropentacyclo[5.2.1.02,6.03,9.05,8]decane; mirex				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-077-00-1	219-196-6	2385-85-5							
59	camphechlor (ISO); toxaphene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	602-044-00-1	232-283-3	8001-35-2							
60	hexabromobiphenyl				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		252-994-2	36355-01-8							
61	2,3,7,8-TeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
		217-122-7	1746-01-6							
62	1,2,3,7,8-PeCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			40321-76-4							
63	1,2,3,4,7,8-HxCDD				<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
			39227-28-6							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
64	1,2,3,6,7,8-HxCDD		57653-85-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
65	1,2,3,7,8,9-HxCDD		19408-74-3		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
66	1,2,3,4,6,7,8-HpCDD		35822-46-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
67	OCDD		3268-87-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
68	2,3,7,8-TeCDF		51207-31-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
69	1,2,3,7,8-PeCDF		57117-41-6		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
70	2,3,4,7,8-PeCDF		57117-31-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
71	1,2,3,4,7,8-HxCDF		70648-26-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
72	1,2,3,6,7,8-HxCDF		57117-44-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
73	1,2,3,7,8,9-HxCDF		72918-21-9		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
74	2,3,4,6,7,8-HxCDF		60851-34-5		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
75	1,2,3,4,6,7,8-HpCDF		67562-39-4		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
76	1,2,3,4,7,8,9-HpCDF		55673-89-7		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
77	OCDF		39001-02-0		<0.1 ng/kg		<1.0e-07 mg/kg	<1.0e-11 %		<LOD
78	petrol (gasoline) petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
79	diesel petroleum group		68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
80	heavy/residual fuel oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
81	crude oils petroleum group				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
82	kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened	232-366-4; 265-184-9; 294-799-5	8008-20-6; 64742-81-0; 91770-15-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.155 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Concentrations too low to be considered flammable risk



Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 5.0e-07%)

toluene: (conc.: 5.0e-07%)

ethylbenzene: (conc.: 5.0e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

xylene: (conc.: 5.0e-07%)

TPH (C6 to C40) petroleum group: (conc.: 0.03%)



Appendix A: Classifier defined and non GB MCL determinands

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410



■ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

■ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

■ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **1,1-dichloroethane and 1,2-dichloroethane (combined)** (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane
Data source: N/a
Data source date: 14 Oct 2016
Hazard Statements: Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 1B; H350 , Aquatic Chronic 3; H412

■ **hexabromobiphenyl** (EC Number: 252-994-2, CAS Number: 36355-01-8)

Description/Comments:
Data source: POP specific threshold from ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004).
Data source date: 01 Jul 2013
Hazard Statements: POP >= 0.005 %

■ **2,3,7,8-TeCDD** (EC Number: 217-122-7, CAS Number: 1746-01-6)

Description/Comments: 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=1)

■ **1,2,3,7,8-PeCDD** (CAS Number: 40321-76-4)

Description/Comments: 1,2,3,7,8-pentachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=1)

■ **1,2,3,4,7,8-HxCDD** (CAS Number: 39227-28-6)

Description/Comments: 1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)



▪ **1,2,3,6,7,8-HxCDD** (CAS Number: 57653-85-7)

Description/Comments: 1,2,3,6,7,8-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **1,2,3,7,8,9-HxCDD** (CAS Number: 19408-74-3)

Description/Comments: 1,2,3,7,8,9-hexachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **1,2,3,4,6,7,8-HpCDD** (CAS Number: 35822-46-9)

Description/Comments: 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

▪ **OCDD** (CAS Number: 3268-87-9)

Description/Comments: octachlorodibenzo-p-dioxin
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.0003)

▪ **2,3,7,8-TeCDF** (CAS Number: 51207-31-9)

Description/Comments: 2,3,7,8-tetrachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **1,2,3,7,8-PeCDF** (CAS Number: 57117-41-6)

Description/Comments: 1,2,3,7,8-pentachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.03)

▪ **2,3,4,7,8-PeCDF** (CAS Number: 57117-31-4)

Description/Comments: 2,3,4,7,8-pentachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.3)

▪ **1,2,3,4,7,8-HxCDF** (CAS Number: 70648-26-9)

Description/Comments: 1,2,3,4,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **1,2,3,6,7,8-HxCDF** (CAS Number: 57117-44-9)

Description/Comments: 1,2,3,6,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **1,2,3,7,8,9-HxCDF** (CAS Number: 72918-21-9)

Description/Comments: 1,2,3,7,8,9-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)

▪ **2,3,4,6,7,8-HxCDF** (CAS Number: 60851-34-5)

Description/Comments: 2,3,4,6,7,8-hexachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.1)



■ **1,2,3,4,6,7,8-HpCDF** (CAS Number: 67562-39-4)

Description/Comments: 1,2,3,4,6,7,8-heptachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

■ **1,2,3,4,7,8,9-HpCDF** (CAS Number: 55673-89-7)

Description/Comments: 1,2,3,4,7,8,9-heptachlorodibenzofuran
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.01)

■ **OCDF** (CAS Number: 39001-02-0)

Description/Comments: octachlorodibenzo[b,d]furan
Data source: ATP1 (Regulation (EU) 756/2010) to POPs Regulation (Regulation (EC) 850/2004)
Data source date: 24 Aug 2010
Hazard Statements: PCDD/PCDF (TEF=0.0003)

■ **petrol (gasoline) petroleum group**

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 1; H224 , Skin Irrit. 2; H315 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , STOT SE 3; H336 , Asp. Tox. 1; H304 , Aquatic Chronic 2; H411

■ **diesel petroleum group** (CAS Number: 68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Acute Tox. 4; H332 , Carc. 2; H351 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Aquatic Chronic 2; H411

■ **heavy/residual fuel oils petroleum group**

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Muta. 1B; H340 , Carc. 1B; H350 , Acute Tox. 4; H332 , Repr. 2; H361d , STOT RE 2; H373 , Aquatic Chronic 2; H411

■ **crude oils petroleum group**

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 2; H225 , Carc. 1B; H350 , Eye Irrit. 2; H319 , Asp. Tox. 1; H304 , STOT RE 2; H373 , STOT SE 3; H336 , Aquatic Chronic 2; H411

■ **kerosine petroleum group including kerosine (petroleum); kerosine (petroleum) hydrosulphurised; kerosine (petroleum) sweetened** (EC Number: 232-366-4; 265-184-9; 294-799-5, CAS Number: 8008-20-6; 64742-81-0; 91770-15-9)

Description/Comments: Review of ECHA Registered Substances database; Concawe report: hazard classification and labelling of petroleum substances in the European Economic Area - 2012; REACH compliant SDS from Total, Petrobras; Petrochem; Shell; ESS
Data source: <http://echa.europa.eu/information-on-chemicals/registered-substances>;
Hazard classification and labelling of petroleum substances in the European Economic Area - 2012 (CONCAWE); SDS: company websites
Data source date: 21 Jan 2014
Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Asp. Tox. 1; H304 , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)



copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulposelenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulposelenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

manganese {manganese sulphate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021

HazWasteOnline Classification Engine Version: 2023.199.5686.10472 (18 Jul 2023)

HazWasteOnline Database: 2023.199.5686.10472 (18 Jul 2023)



This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK:

2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

APPENDIX I: SOIL CLASSIFICATION REPORT

Units 1 & 2
Deltic Place
Deltic Way
Knowsley Industrial Estate
Liverpool
L33 7BU

Telephone: (0151) 545 2750
Fax: (0151) 548 7892
Email: enquiries@ccgeotechnical.com
www.ccgeotechnical.com



LABORATORY REPORT

CONTRACT NUMBER: CCG-C-23-14026

CONTRACT TITLE: JAMES STREET / HARWOOD STREET, LITTLEBOROUGH

CLIENT: BRIAN ROGERSON

DATE RECEIVED: 27/07/23
DATE COMMENCED: 27/07/23
DATE COMPLETED: 08/08/23
REPORT DATE: 11/08/23

Test Description	Qty
Determination of Moisture Content BS 1377-2:1990 (a)	9
Determination of Liquid & Plastic Limits BS 1377-2:1990 (a)	9
Particle Size Distribution BS 1377-2:1990 (a)	3

Notes: Observations and interpretations are not accredited by UKAS
All testing undertaken at laboratory permanent facilities
denotes non-accredited test
a denotes UKAS accredited test
s denotes test undertaken by approved subcontractor
Test results only relate to the samples tested

This report is issued in accordance with the requirements of the United Kingdom Accreditation Services and EN ISO/IEC 17025:2017. The results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories: Chris Bolan (Managing Director) – Daniel Kerfoot (Laboratory Manager)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Shear Strength (kN/m ²)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
WS01	WS	1.20	1.20	14	-	-	-	34	15	19	71	CL	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse subangular sandstone. (BS1377Pt2:3.2,4.4,5)
WS01	WS	2.40	2.40	17	-	-	-	38	16	22	89	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse subangular sandstone. (BS1377Pt2:3.2,4.4,5)
WS02	WS	1.50	1.50	19	-	-	-	43	18	25	92	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular sandstone. (BS1377Pt2:3.2,4.4,5)
WS02	WS	2.70	2.70	21	-	-	-	34	16	18	90	CL	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular sandstone. (BS1377Pt2:3.2,4.4,5)
WS03	WS	1.20	1.20	23	-	-	-	40	19	21	95	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular sandstone. (BS1377Pt2:3.2,4.4,5)
WS03	WS	2.30	2.30	18	-	-	-	40	17	23	90	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular sandstone. (BS1377Pt2:3.2,4.4,5)
WS04	WS	2.30	2.30	16	-	-	-	34	14	20	77	CL	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse subangular sandstone. (BS1377Pt2:3.2,4.4,5)
WS05	WS	1.50	1.50	-	-	-	-	-	-	-	-	-	Y	Light brown very sandy silty GRAVEL. Gravel is fine to coarse subangular to subrounded sandstone and mudstone. (BS1377Pt2:9.2)
WS05	WS	2.30	2.30	-	-	-	-	-	-	-	-	-	Y	Brown very sandy silty GRAVEL. Gravel is fine to coarse subangular to subrounded sandstone, mudstone, granite, coal. (BS1377Pt2:9.2)
WS06	WS	1.20	1.20	21	-	-	-	39	17	22	87	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse subangular sandstone and coal. (BS1377Pt2:3.2,4.4,5)

SITE: JAMES ST / HARWOOD ST, LITTLEBOROUGH (CCG-C-23-14026) DATE: 11.08.23
 CLIENT: BRIAN ROGERSON

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample

CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic

(* Denotes Hand Shear Vane test result)

Sample description not accredited by UKAS



SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Shear Strength (kN/m ²)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
WS06	WS	1.90	1.20	-	-	-	-	-	-	-	-	-	Y	Brown very sandy silty GRAVEL. Gravel is fine to coarse subangular to subrounded mudstone and sandstone. (BS1377Pt2:9.2)
WS06	WS	3.30	3.30	18	-	-	-	38	18	20	88	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular sandstone and coal. (BS1377Pt2:3.2,4,4,5)

SITE: JAMES ST / HARWOOD ST, LITTLEBOROUGH (CCG-C-23-14026) **DATE:** 11.08.23
CLIENT: BRIAN ROGERSON

Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample

CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic

(* Denotes Hand Shear Vane test result)

Sample description not accredited by UKAS





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PARTICLE SIZE DISTRIBUTION

Job Ref

CCG-C-23-14026

Borehole/Pit No.

WS05

Site Name

JAMES ST / HARWOOD ST, LITTLEBOROUGH

Sample No.

1

Specimen
Description

Light brown very sandy silty GRAVEL

Depth, m

1.50

Specimen
Reference

Specimen
Depth

m

Sample Type

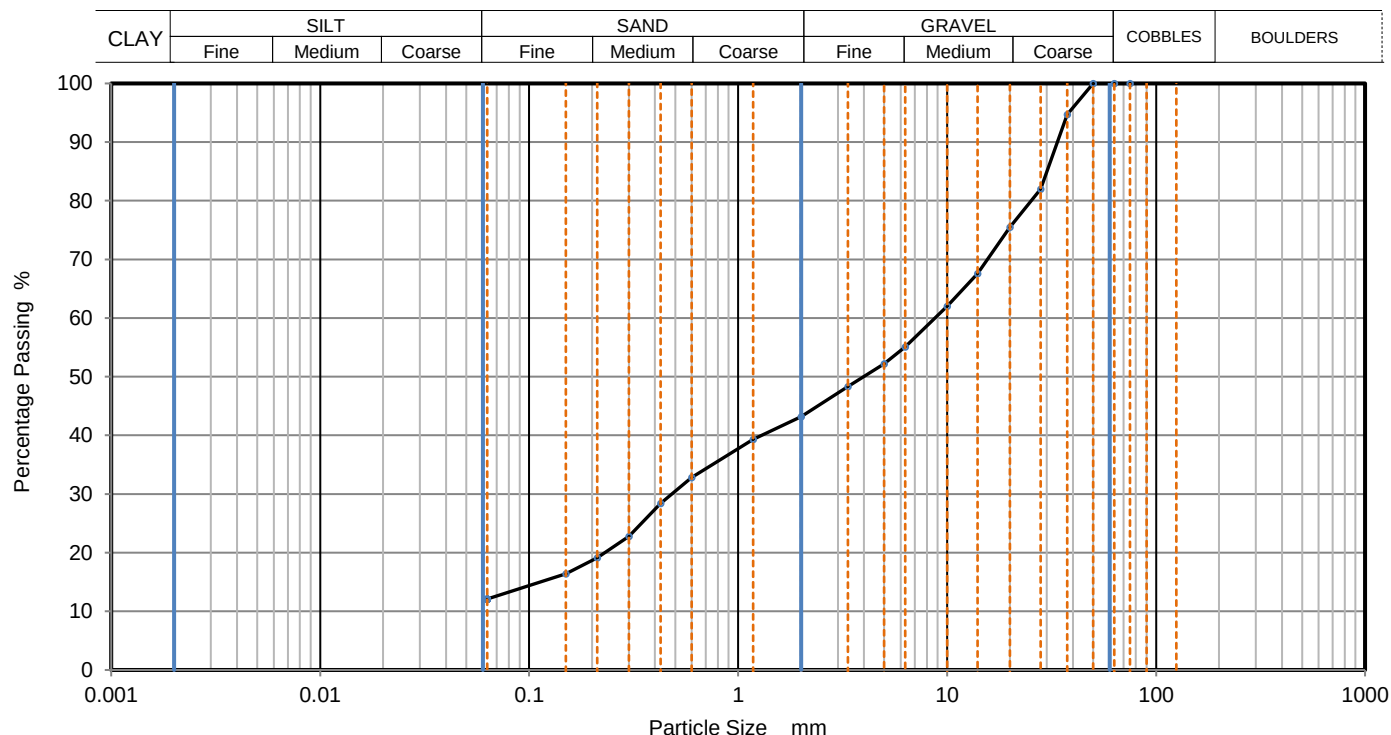
WS

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CCGL202308110



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	95		
28	82		
20	76		
14	68		
10	62		
6.3	55		
5	52		
3.35	48		
2	43		
1.18	39		
0.6	33		
0.425	28		
0.3	23		
0.212	19		
0.15	16		
0.063	12		

Dry Mass of sample, g

Sample Proportions	% dry mass
Very coarse	0
Gravel	57
Sand	31
Fines <0.063mm	12

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator

Checked

Approved

Sheet printed

Fig 1

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Sheet



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PARTICLE SIZE DISTRIBUTION

Job Ref

CCG-C-23-14026

Borehole/Pit No.

WS05

Site Name

JAMES ST / HARWOOD ST, LITTLEBOROUGH

Sample No.

1

Specimen
Description

Brown very sandy silty GRAVEL

Depth, m

2.30

Specimen
Reference

Specimen
Depth

m

Sample Type

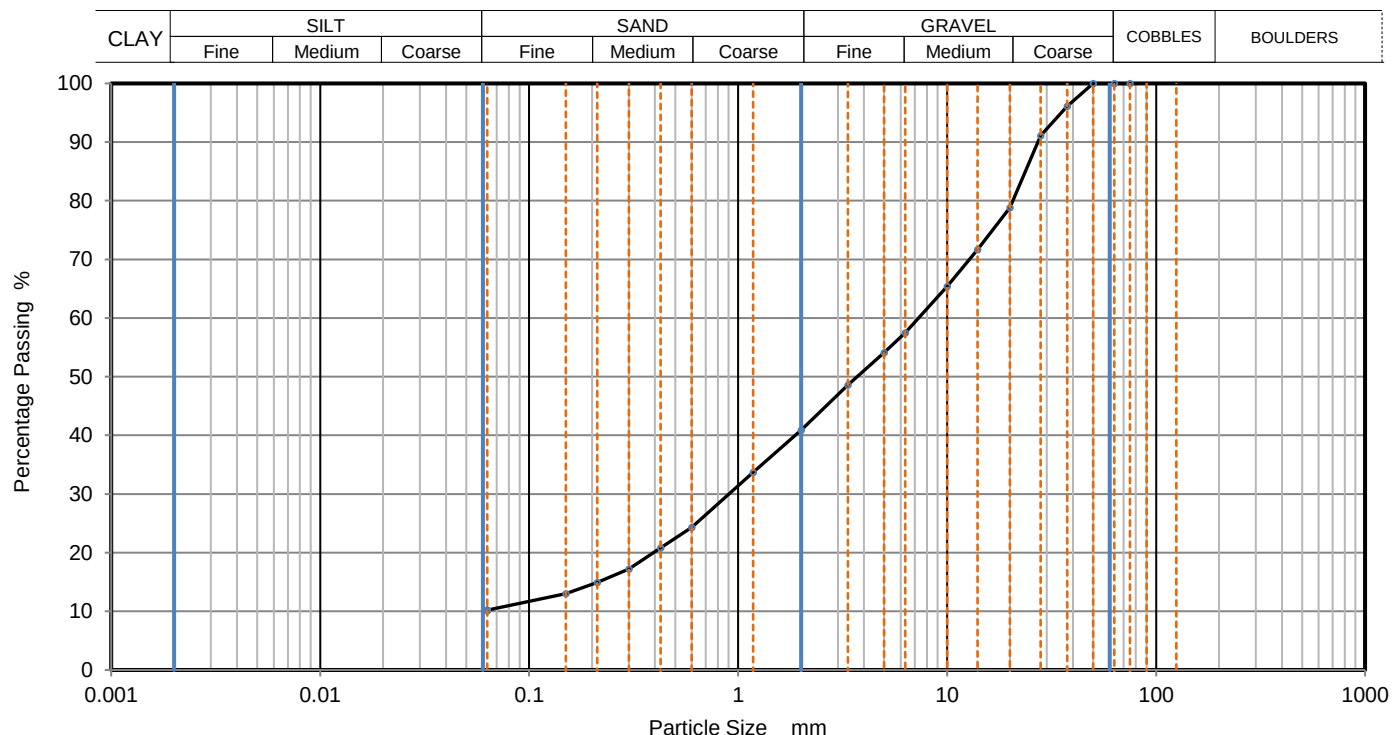
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Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CCGL202308111



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	96		
28	91		
20	79		
14	72		
10	65		
6.3	58		
5	54		
3.35	49		
2	41		
1.18	34		
0.6	24		
0.425	21		
0.3	17		
0.212	15		
0.15	13		
0.063	10		

Dry Mass of sample, g

Sample Proportions	% dry mass
Very coarse	0
Gravel	59
Sand	31
Fines <0.063mm	10

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator

Checked

Approved

Sheet printed

Fig 1

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Sheet



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PARTICLE SIZE DISTRIBUTION

Job Ref

CCG-C-23-14026

Borehole/Pit No.

WS06

Site Name

JAMES ST / HARWOOD ST, LITTLEBOROUGH

Sample No.

1

Specimen
Description

Brown very sandy silty GRAVEL

Depth, m

1.90

Specimen
Reference

Specimen
Depth

m

Sample Type

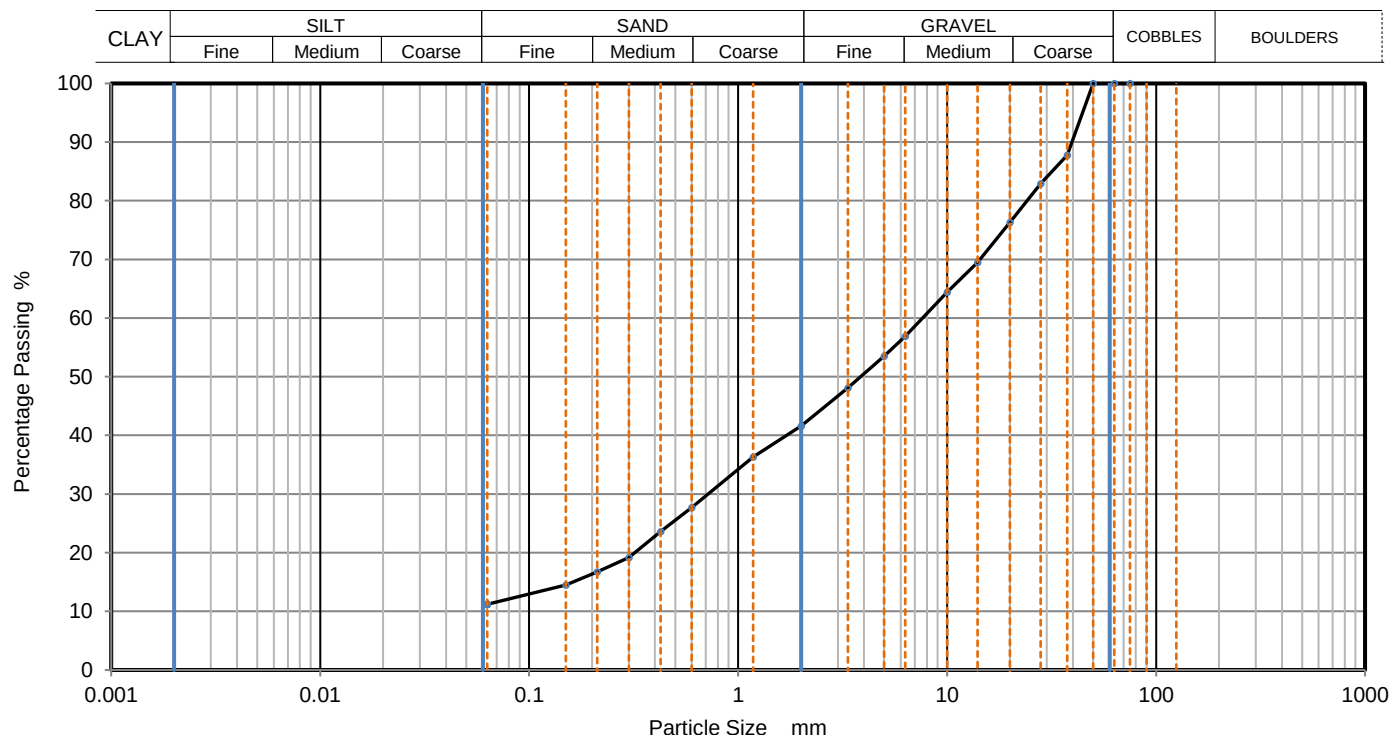
WS

Test Method

BS1377:Part 2:1990, clause 9.2

KeyLAB ID

CCGL202308112



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	88		
28	83		
20	76		
14	70		
10	64		
6.3	57		
5	54		
3.35	48		
2	42		
1.18	36		
0.6	28		
0.425	24		
0.3	19		
0.212	17		
0.15	15		
0.063	11		

Dry Mass of sample, g

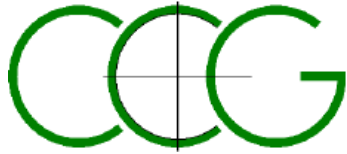
Sample Proportions	% dry mass
Very coarse	0
Gravel	58
Sand	31
Fines <0.063mm	11

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

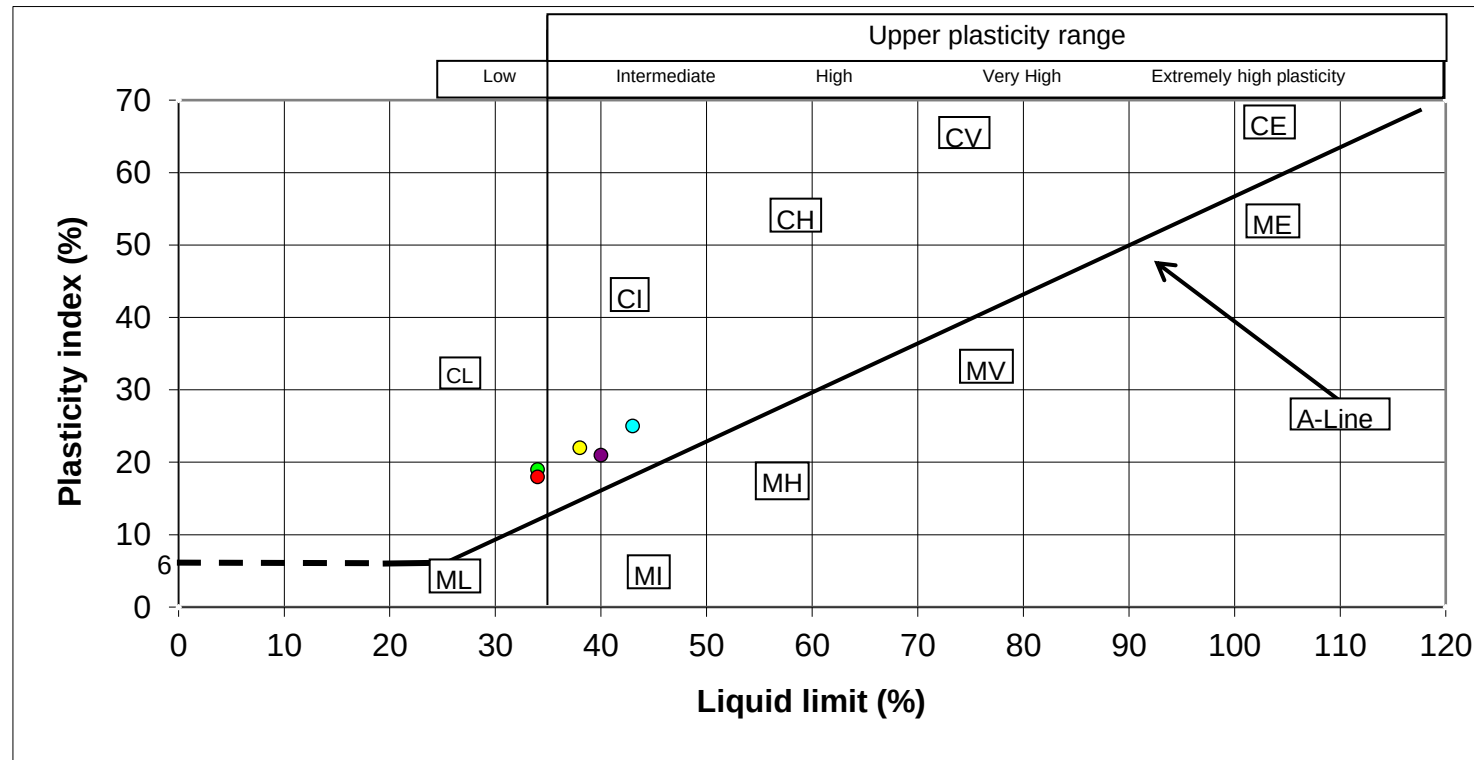
Operator	Checked	Approved	Sheet printed	Fig 1 Sheet
JE	DK	DK	11/08/2023 12:12	



ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.

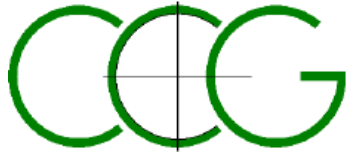


BH	Sample Depth	Liquid limit	Plasticity index
WS01	1.20	34.0	19.0
WS01	2.40	38.0	22.0
WS02	1.50	43.0	25.0
WS02	2.70	34.0	18.0
WS03	1.20	40.0	21.0



APPROVED BY	DK
-------------	----

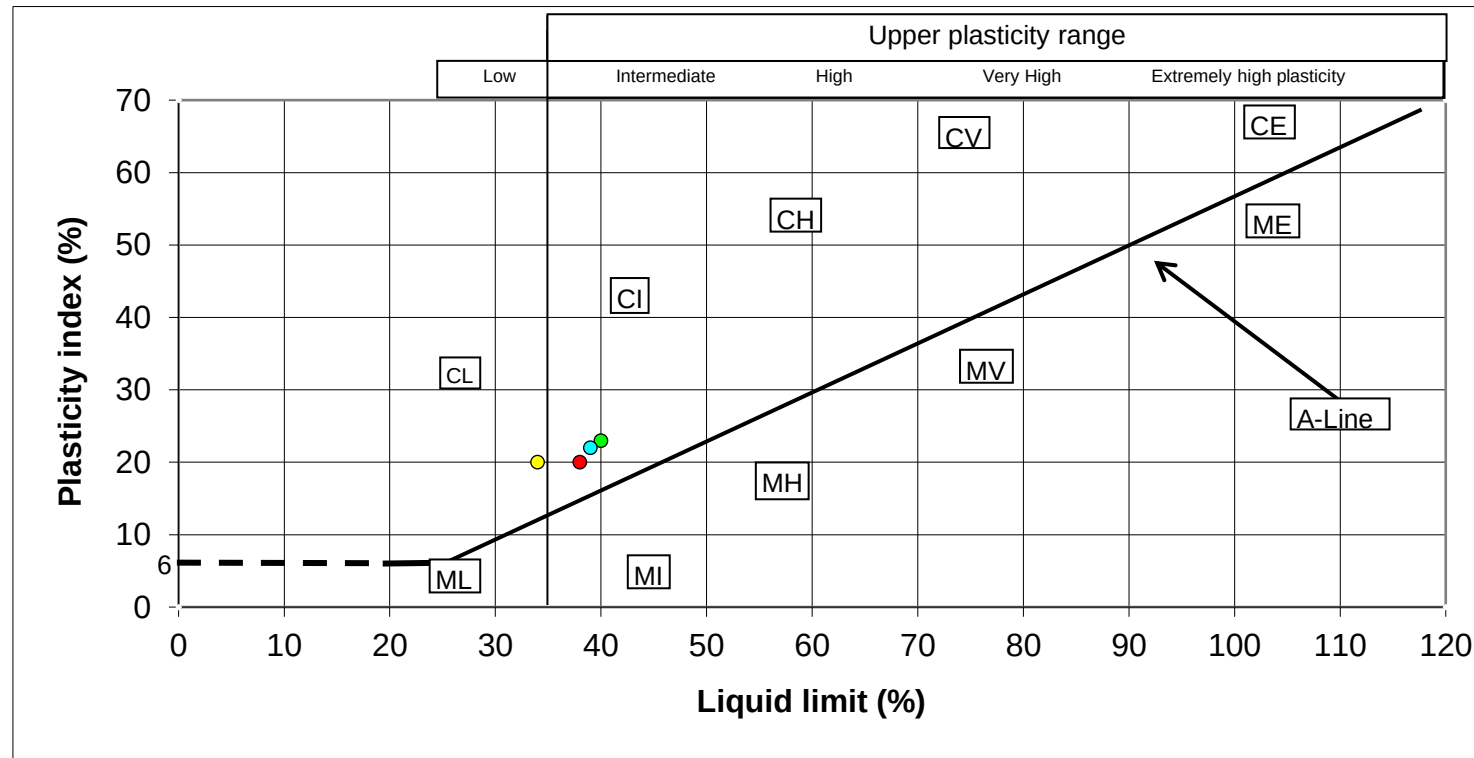
CLIENT: BRIAN ROGERSON	SITE: JAMES ST / HARWOOD ST, LITTLEBOROUGH (CCG-C-23-14026)
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ATTERBERG TEST RESULT SHEET

BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS03	1.30	40.0	23.0
WS04	2.30	34.0	20.0
WS06	1.20	39.0	22.0
WS06	3.30	38.0	20.0



APPROVED BY DK

CLIENT: BRIAN ROGERSON SITE: JAMES ST / HARWOOD ST, LITTLEBOROUGH (CCG-C-23-14026)

APPENDIX J: SITE PHOTOGRAPHS



1. Access to study site from James William St'.
2. Garage and used car / vans located within southeastern section of the site





3. As Figure 2 above.
4. Garage area showing poorly maintained pavement cover and metal portable cabins





- 5. Pedestrian pathway extending along the eastern site boundary
- 6. Northern section of the study site containing wood cladded outbuilding beneath tree canopy





- 7. Southern section of the study site showing tree lined embankment, extending along western site boundary
- 8. Southern section of the site





9. Wood cladded out building located within northern section of the site
10. Mound of excavated earth located close to the above out building





- 11. Tree lined pond located within northern section of the site
- 12. As above





- 13. Study site as seen from its northern boundary
- 14. As above





- 15. Garage located within southeastern section of the site
- 16. Metal portable cabins within garage area



APPENDIX K: ENVIRONMENTAL REPORT & HISTORICAL MAPPING



Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: County Series

Map date: 1891

Scale: 1:2,500

Printed at: 1:2,500



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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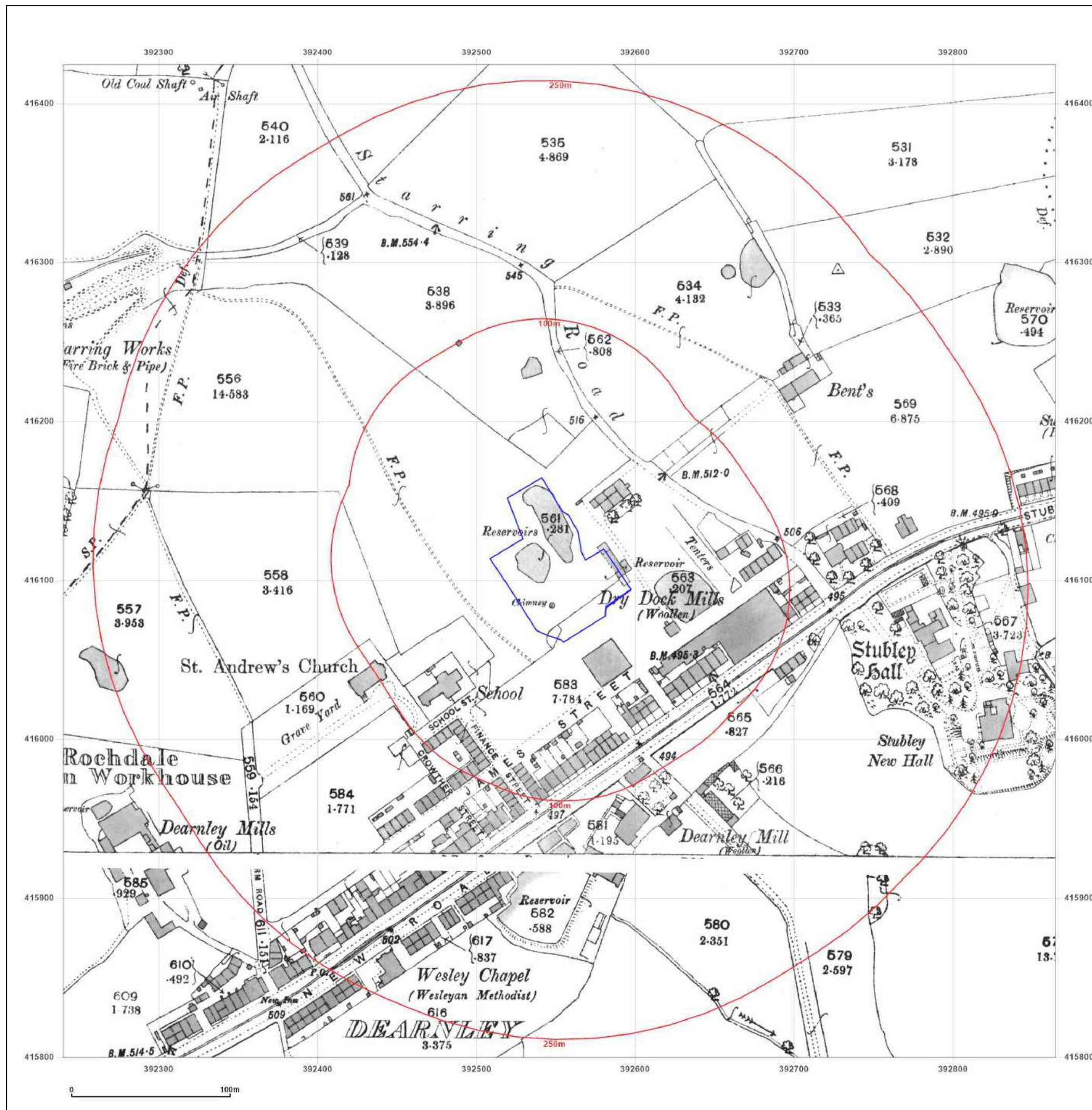


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www.centremapslive.com
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Production date: 20 June 2023

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





Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: County Series

Map date: 1910

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1910
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A



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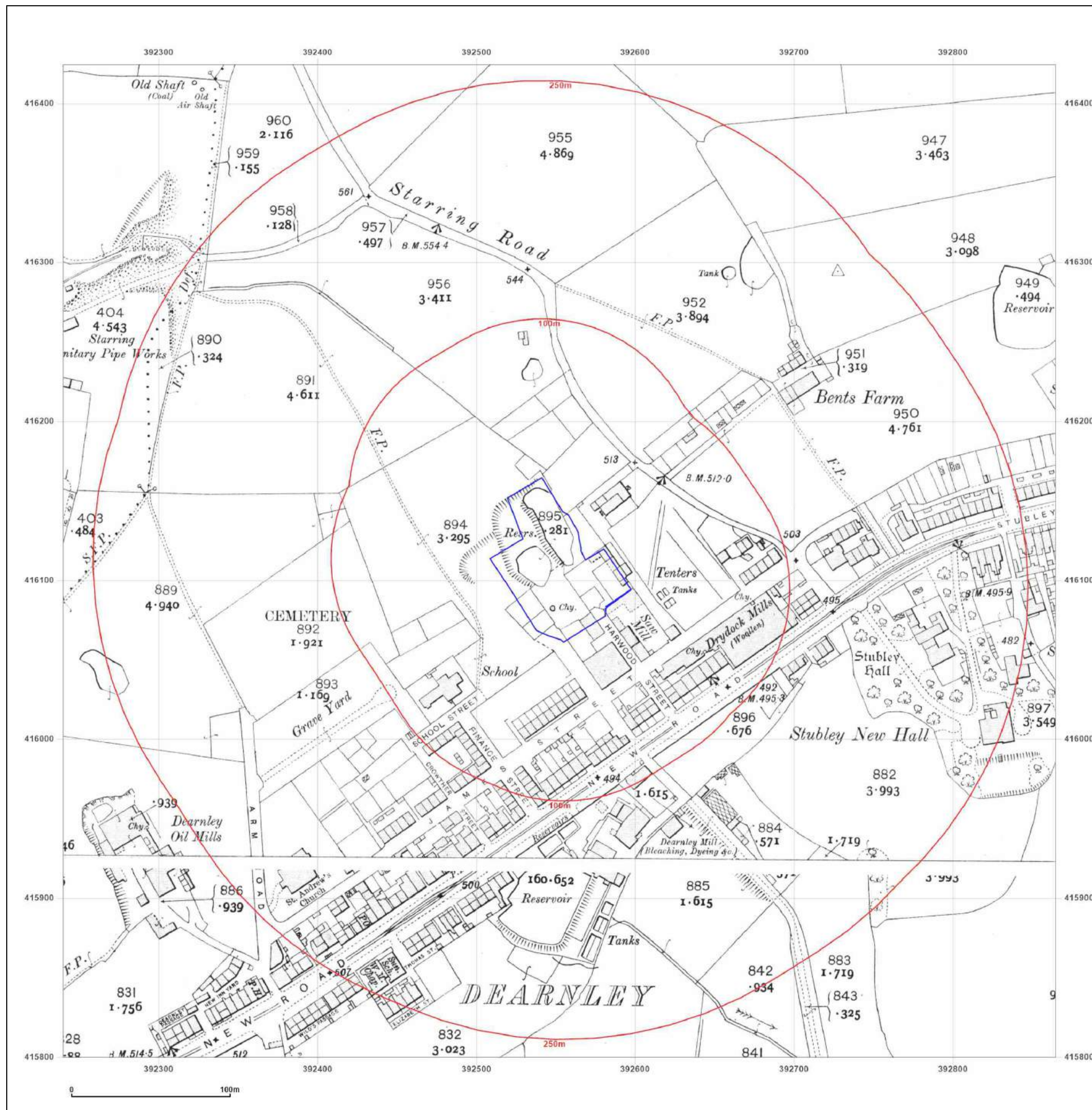


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Production date: 20 June 2023

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





Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: County Series

Map date: 1930

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1930
Revised 1930
Edition N/A
Copyright N/A
Levelled N/A



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Groundsure Insights
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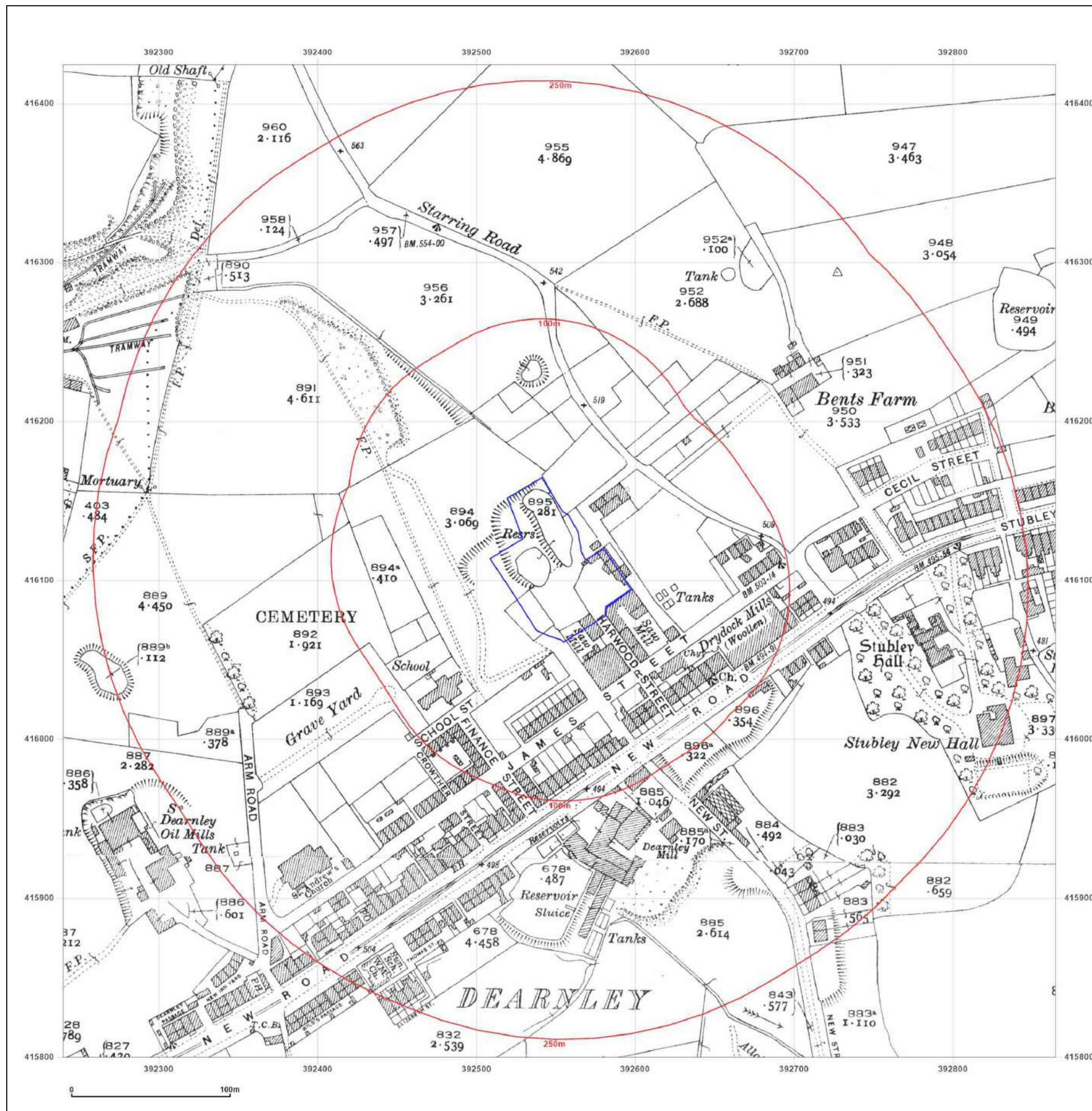


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Production date: 20 June 2023

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





Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: County Series

Map date: 1937-1938

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1937
Revised 1937
Edition N/A
Copyright N/A
Levelled N/A

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



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Groundsure Insights
www.groundsure.com

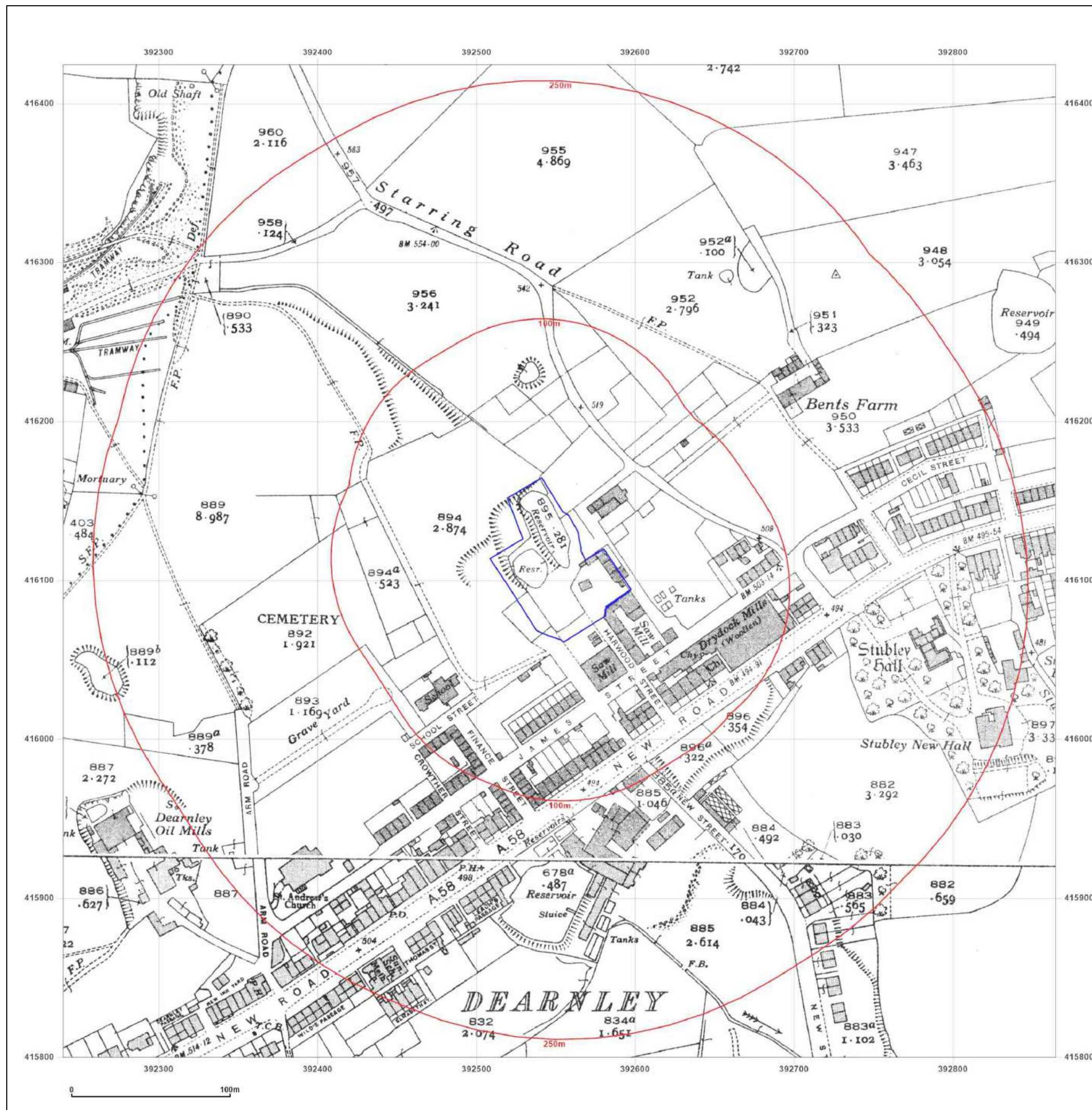


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Production date: 20 June 2023

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



Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name:	National Grid
------------------	---------------

Map date: 1960

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1959
Revised 1959
Edition N/A
Copyright 1960
Levelled 1957

Surveyed 1959
Revised 1959
Edition N/A
Copyright 1960
Levelled 1957

Surveyed 1959
Revised 1959
Edition N/A
Copyright 1960
Levelled 1956

Surveyed 1959
Revised 1959
Edition N/A
Copyright 1960
Levelled 1956



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Production date: 20 June 2023

Map legend available at:
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Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 1961

Scale: 1:2,500

Printed at: 1:2,500



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Edition 1961
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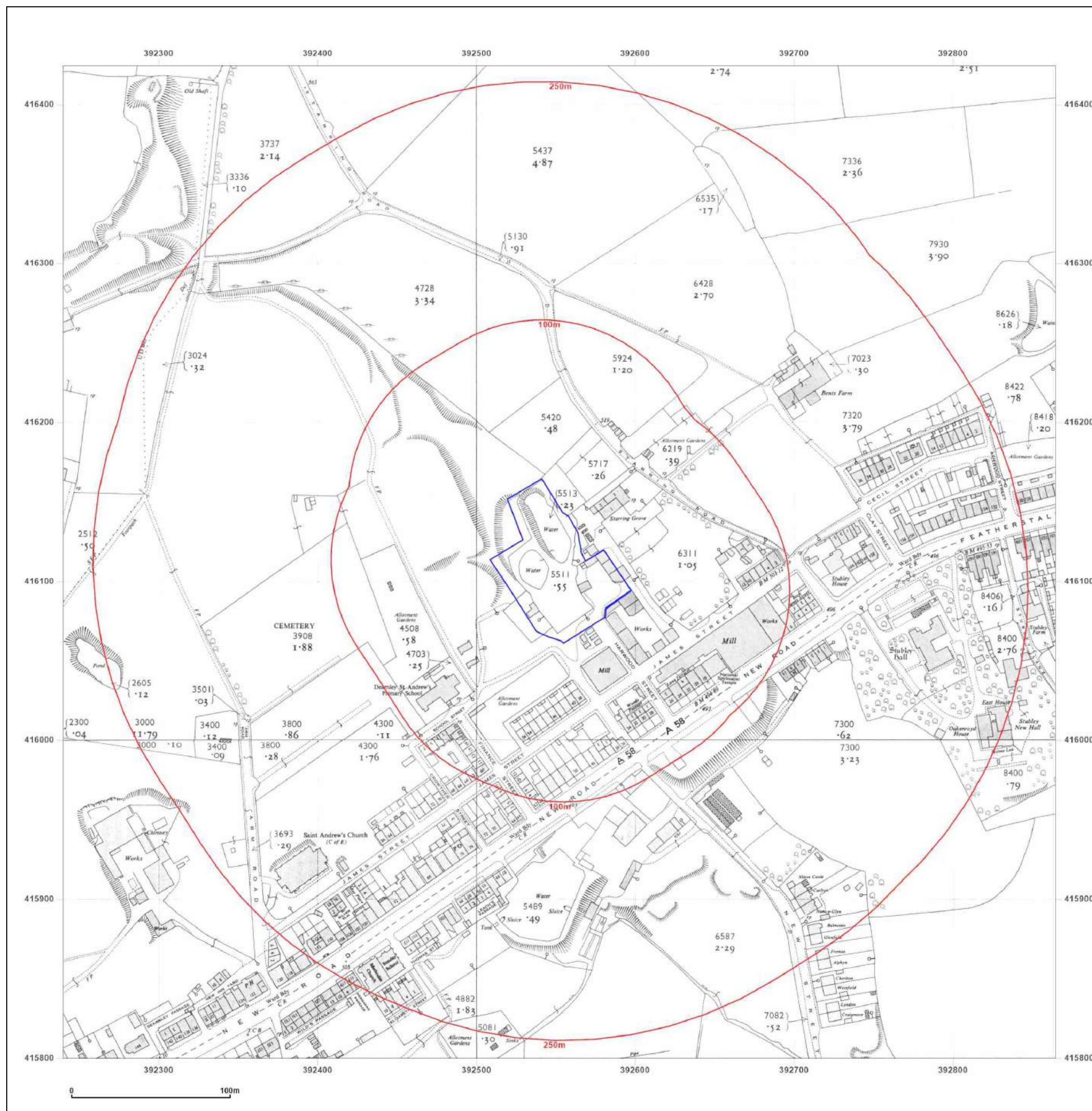


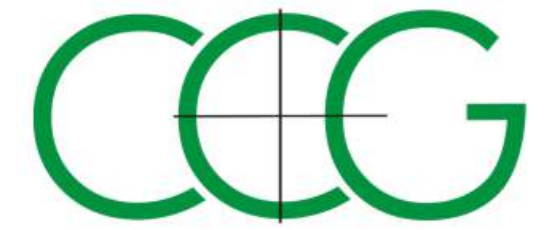
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Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name:	National Grid
------------------	---------------

Map date: 1971-1974

Scale: 1:1,250

Printed at: 1:2,000



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Edition N/A
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Surveyed 1959
Revised 1971
Edition N/A
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Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 1974-1976

Scale: 1:1,250

Printed at: 1:2,000



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Site Details:

Harwood Street Garage
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OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 1976-1980

Scale: 1:1,250

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Site Details:

Harwood Street Garage
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OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 1978-1980

Scale: 1:1,250

Printed at: 1:2,000



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Site Details:

Harwood Street Garage
Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 1992-1994

Scale: 1:1,250

Printed at: 1:2,000



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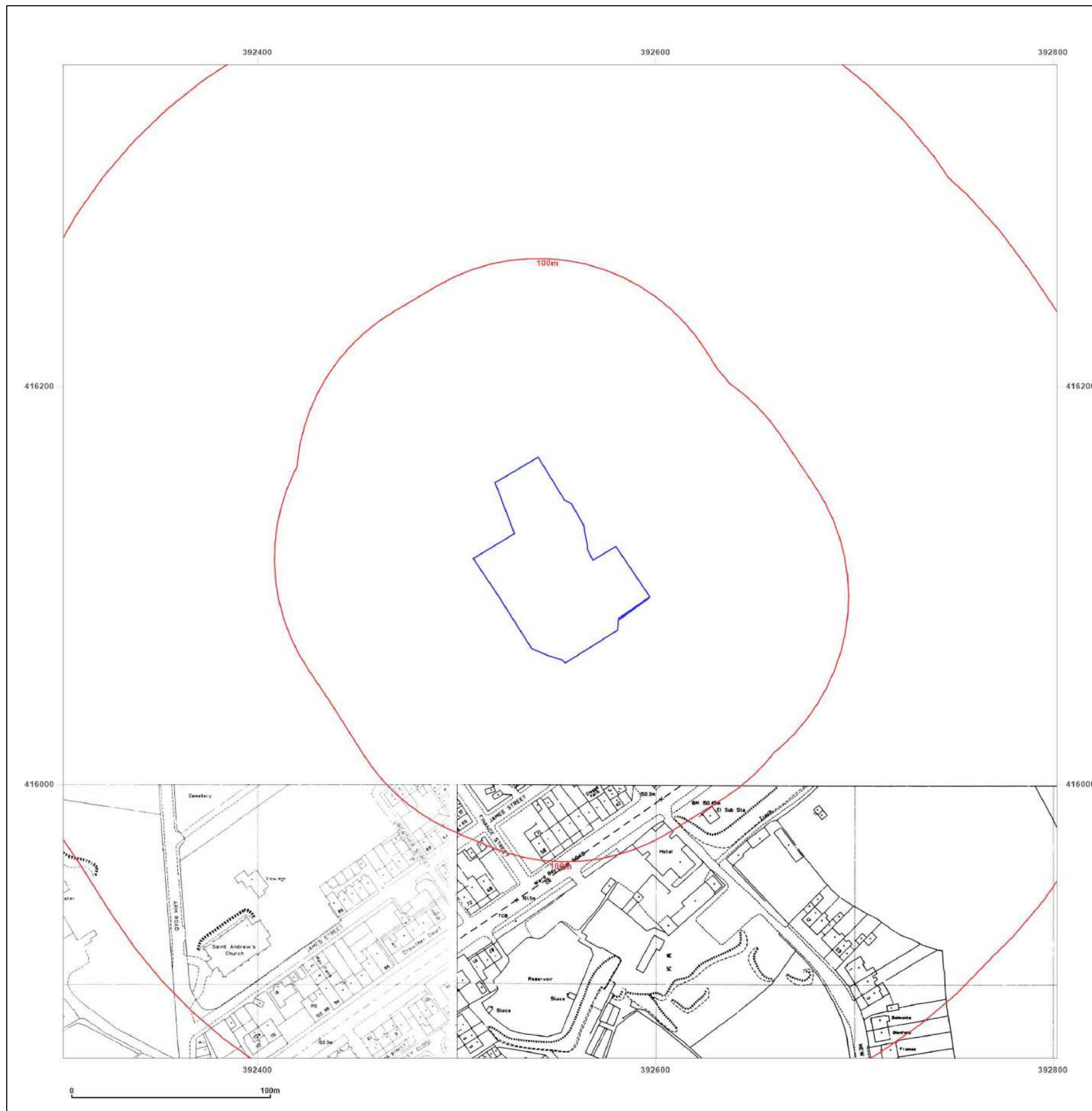


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Site Details:

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OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 1994

Scale: 1:1,250

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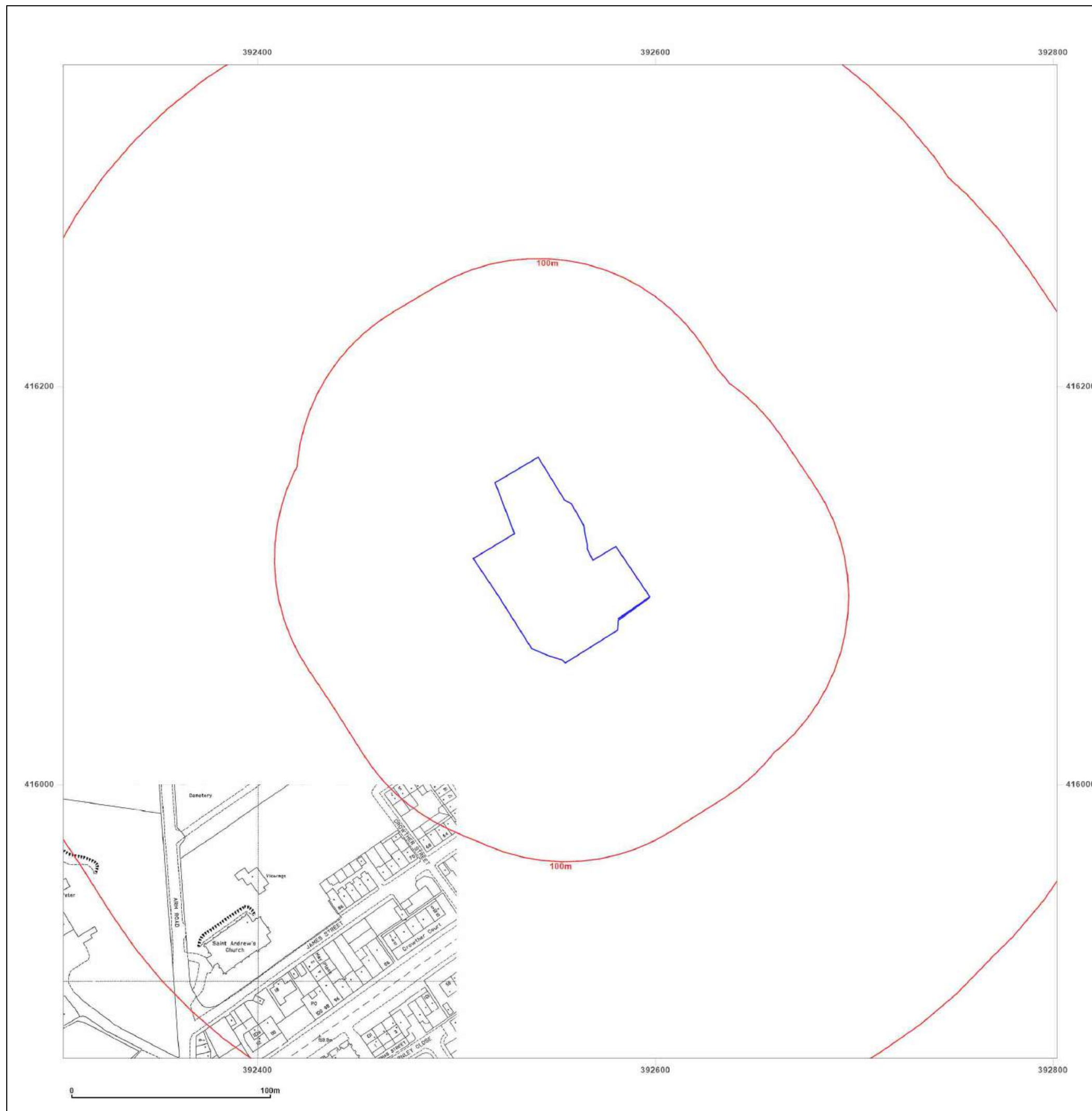


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Site Details:

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OL15 8NA

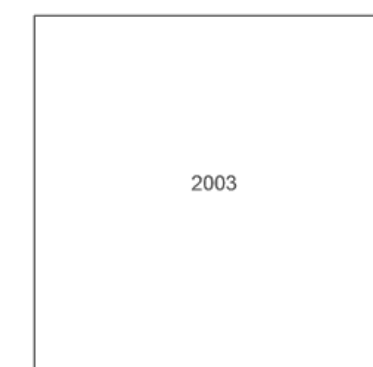
Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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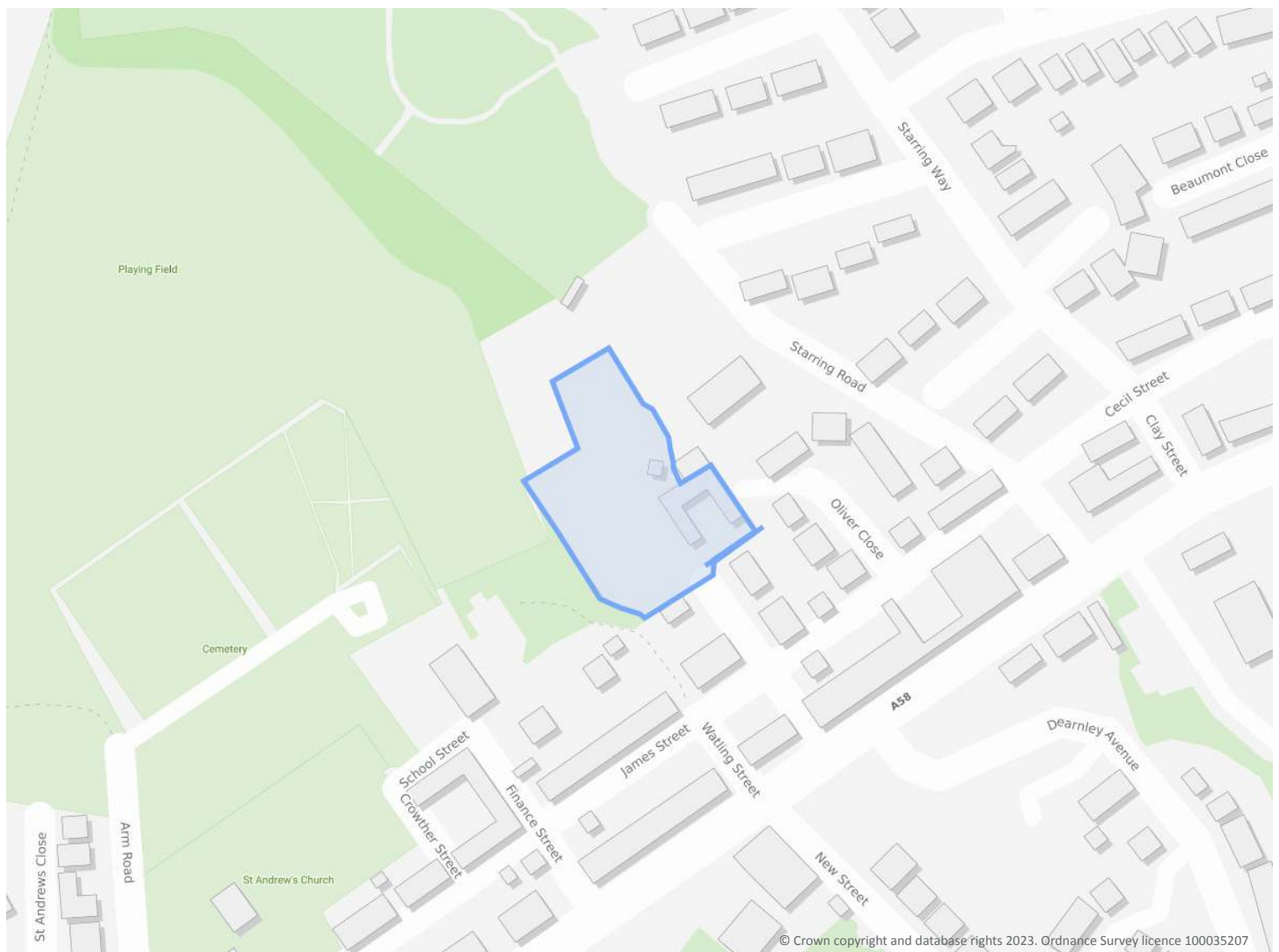
Harwood Street Garage Harwood Street, Littleborough, OL15 8NA

Order Details

Date: 20/06/2023
Your ref: CMAPS-AAG-1110335-4165-200623
Our Ref: CMAPS-AAG-1110335-4165-200623EDRGEO

Site Details

Location: 392549 416107
Area: 0.46 ha
Authority: [Rochdale Metropolitan Borough Council](#) ↗



Summary of findings

[p. 2 >](#) **Aerial image**

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#) groundsure.com/insightuserguide ↗

Contact us with any questions at:

info@groundsure.com ↗

01273 257 755

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	6	7	34	108	-
21 >	1.2 >	Historical tanks >	0	2	7	18	-
23 >	1.3 >	Historical energy features >	0	0	3	11	-
23	1.4	Historical petrol stations	0	0	0	0	-
24	1.5	Historical garages	0	0	0	0	-
24	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
25 >	2.1 >	Historical industrial land uses >	7	9	48	150	-
33 >	2.2 >	Historical tanks >	0	3	14	25	-
35 >	2.3 >	Historical energy features >	0	0	5	21	-
36	2.4	Historical petrol stations	0	0	0	0	-
36	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
37	3.1	Active or recent landfill	0	0	0	0	-
37	3.2	Historical landfill (BGS records)	0	0	0	0	-
38	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
38 >	3.4 >	Historical landfill (EA/NRW records) >	0	0	0	1	-
38	3.5	Historical waste sites	0	0	0	0	-
38	3.6	Licensed waste sites	0	0	0	0	-
39 >	3.7 >	Waste exemptions >	0	0	1	1	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
40 >	4.1 >	Recent industrial land uses >	0	0	4	-	-
41	4.2	Current or recent petrol stations	0	0	0	0	-
41	4.3	Electricity cables	0	0	0	0	-
41	4.4	Gas pipelines	0	0	0	0	-
41	4.5	Sites determined as Contaminated Land	0	0	0	0	-



41	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
42	4.7	Regulated explosive sites	0	0	0	0	-
42	4.8	Hazardous substance storage/usage	0	0	0	0	-
42	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
42	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
42	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
43 >	4.12 >	Radioactive Substance Authorisations >	0	0	0	2	-
43 >	4.13 >	Licensed Discharges to controlled waters >	0	0	0	4	-
44	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
44	4.15	Pollutant release to public sewer	0	0	0	0	-
44	4.16	List 1 Dangerous Substances	0	0	0	0	-
45	4.17	List 2 Dangerous Substances	0	0	0	0	-
45 >	4.18 >	Pollution Incidents (EA/NRW) >	1	0	0	6	-
46	4.19	Pollution inventory substances	0	0	0	0	-
46	4.20	Pollution inventory waste transfers	0	0	0	0	-
46	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
47 >	5.1 >	Superficial aquifer >	Identified (within 500m)				
49 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
50 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
51	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
51	5.5	Groundwater vulnerability- local information	None (within 0m)				
52 >	5.6 >	Groundwater abstractions >	0	0	0	0	6
54 >	5.7 >	Surface water abstractions >	0	0	0	0	33
62 >	5.8 >	Potable abstractions >	0	0	0	0	3
63	5.9	Source Protection Zones	0	0	0	0	-
63	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
65 >	6.1 >	Water Network (OS MasterMap) >	0	0	4	-	-



66 >	6.2 >	Surface water features >	0	0	3	-	-
66 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
67 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
67 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
68	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
68	7.2	Historical Flood Events	0	0	0	-	-
68	7.3	Flood Defences	0	0	0	-	-
69	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
69	7.5	Flood Storage Areas	0	0	0	-	-
70	7.6	Flood Zone 2	None (within 50m)				
70	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
71 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
73 >	9.1 >	Groundwater flooding >	Low (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
74 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	0	0	2
75	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
75 >	10.3 >	Special Areas of Conservation (SAC) >	0	0	0	0	2
76	10.4	Special Protection Areas (SPA)	0	0	0	0	0
76	10.5	National Nature Reserves (NNR)	0	0	0	0	0
76	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
76 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	6
77	10.8	Biosphere Reserves	0	0	0	0	0
77	10.9	Forest Parks	0	0	0	0	0
77	10.10	Marine Conservation Zones	0	0	0	0	0
77 >	10.11 >	Green Belt >	0	0	1	0	0
78	10.12	Proposed Ramsar sites	0	0	0	0	0

78	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
78	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
78	10.15	Nitrate Sensitive Areas	0	0	0	0	0
79	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
80 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
81 >	10.18 >	SSSI Units >	0	0	0	0	2
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
83	11.1	World Heritage Sites	0	0	0	-	-
84	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
84	11.3	National Parks	0	0	0	-	-
84 >	11.4 >	Listed Buildings >	0	0	3	-	-
85	11.5	Conservation Areas	0	0	0	-	-
85	11.6	Scheduled Ancient Monuments	0	0	0	-	-
85	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
86 >	12.1 >	Agricultural Land Classification >	Grade 4 (within 250m)				
87 >	12.2 >	Open Access Land >	0	0	2	-	-
87	12.3	Tree Felling Licences	0	0	0	-	-
87	12.4	Environmental Stewardship Schemes	0	0	0	-	-
88	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
89 >	13.1 >	Priority Habitat Inventory >	0	1	4	-	-
90	13.2	Habitat Networks	0	0	0	-	-
90	13.3	Open Mosaic Habitat	0	0	0	-	-
90	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
91 >	14.1 >	10k Availability >	Identified (within 500m)				
92 >	14.2 >	Artificial and made ground (10k) >	0	1	3	15	-
94 >	14.3 >	Superficial geology (10k) >	1	0	1	5	-

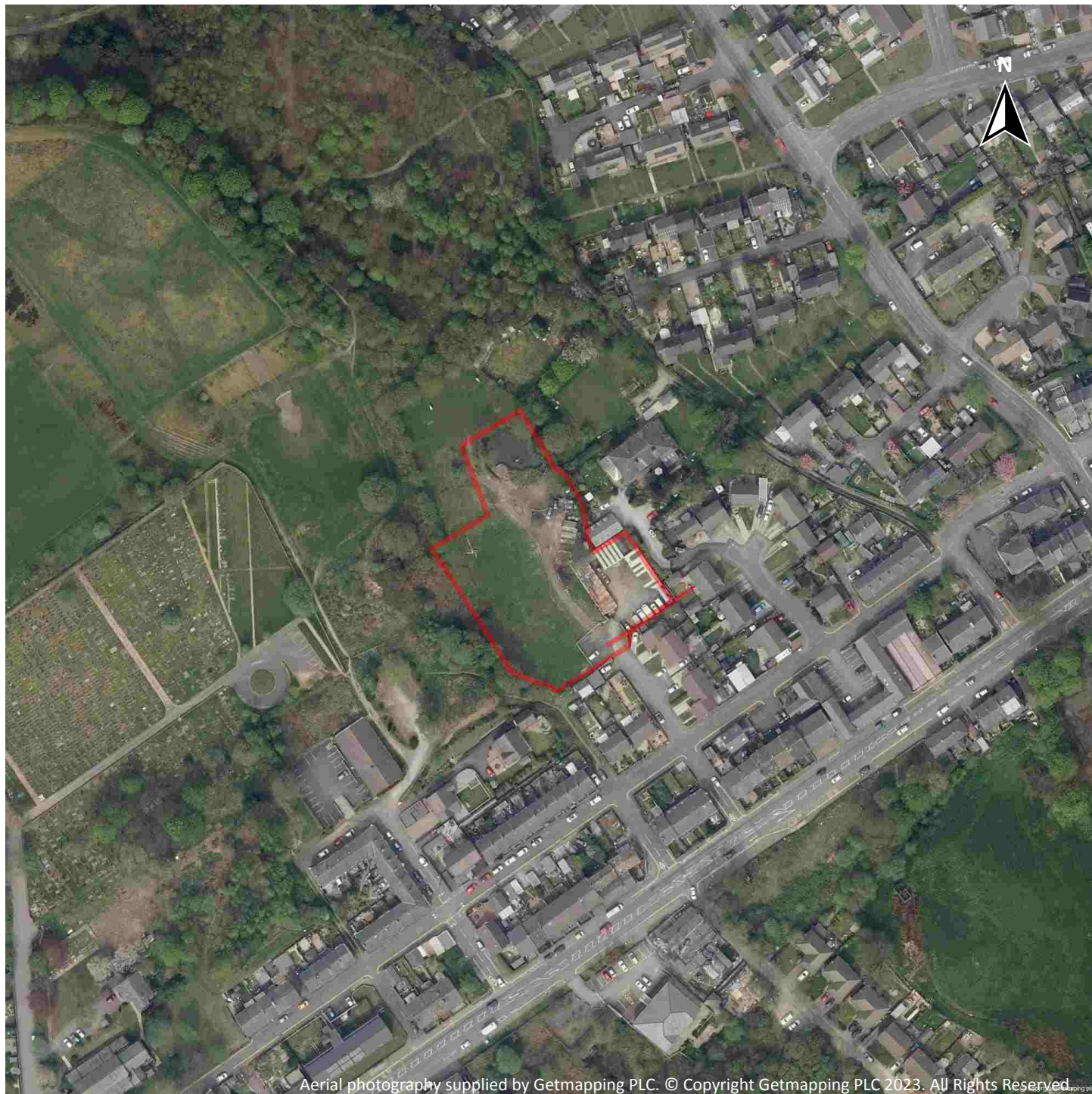
95	14.4	Landslip (10k)	0	0	0	0	-
96 >	14.5 >	Bedrock geology (10k) >	3	0	4	8	-
97 >	14.6 >	Bedrock faults and other linear features (10k) >	2	3	2	5	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
99 >	15.1 >	50k Availability >	Identified (within 500m)				
100	15.2	Artificial and made ground (50k)	0	0	0	0	-
100	15.3	Artificial ground permeability (50k)	0	0	-	-	-
101 >	15.4 >	Superficial geology (50k) >	1	0	1	5	-
102 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
102	15.6	Landslip (50k)	0	0	0	0	-
102	15.7	Landslip permeability (50k)	None (within 50m)				
103 >	15.8 >	Bedrock geology (50k) >	1	0	4	7	-
104 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
104 >	15.10 >	Bedrock faults and other linear features (50k) >	0	2	3	5	-
Page	Section	Boreholes >	On site	0-50m	50-250m	250-500m	500-2000m
106 >	16.1 >	BGS Boreholes >	0	0	2	-	-
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 >	Low (within 50m)				
113 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
115 >	18.1 >	BritPits >	0	0	0	3	-
116 >	18.2 >	Surface ground workings >	11	5	37	-	-
118 >	18.3 >	Underground workings >	0	0	0	8	12
119	18.4	Underground mining extents	0	0	0	0	-
120 >	18.5 >	Historical Mineral Planning Areas >	0	0	0	2	-



120	18.6	Non-coal mining	0	0	0	0	0
120	18.7	JPB mining areas	None (within 0m)				
120	18.8	The Coal Authority non-coal mining	0	0	0	0	-
121	18.9	Researched mining	0	0	0	0	-
121	18.10	Mining record office plans	0	0	0	0	-
121	18.11	BGS mine plans	0	0	0	0	-
121 >	18.12 >	Coal mining >	Identified (within 0m)				
122	18.13	Brine areas	None (within 0m)				
122	18.14	Gypsum areas	None (within 0m)				
122	18.15	Tin mining	None (within 0m)				
122	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
123	19.1	Natural cavities	0	0	0	0	-
123	19.2	Mining cavities	0	0	0	0	0
123	19.3	Reported recent incidents	0	0	0	0	-
123	19.4	Historical incidents	0	0	0	0	-
124	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
125 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
127 >	21.1 >	BGS Estimated Background Soil Chemistry >	1	1	-	-	-
127	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
127	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects >	On site	0-50m	50-250m	250-500m	500-2000m
128	22.1	Underground railways (London)	0	0	0	-	-
128	22.2	Underground railways (Non-London)	0	0	0	-	-
129	22.3	Railway tunnels	0	0	0	-	-
129 >	22.4 >	Historical railway and tunnel features >	0	0	5	-	-
129	22.5	Royal Mail tunnels	0	0	0	-	-

130	22.6	Historical railways	0	0	0	-	-
130	22.7	Railways	0	0	0	-	-
130	22.8	Crossrail 1	0	0	0	0	-
130	22.9	Crossrail 2	0	0	0	0	-
130	22.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 23/05/2019

Site Area: 0.46ha



Recent site history - 2018 aerial photograph



Capture Date: 01/07/2018

Site Area: 0.46ha



Recent site history - 2012 aerial photograph



Capture Date: 26/03/2012

Site Area: 0.46ha



Recent site history - 2000 aerial photograph



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Capture Date: 07/05/2000

Site Area: 0.46ha



Recent site history - 1999 aerial photograph



Capture Date: 10/09/1999

Site Area: 0.46ha



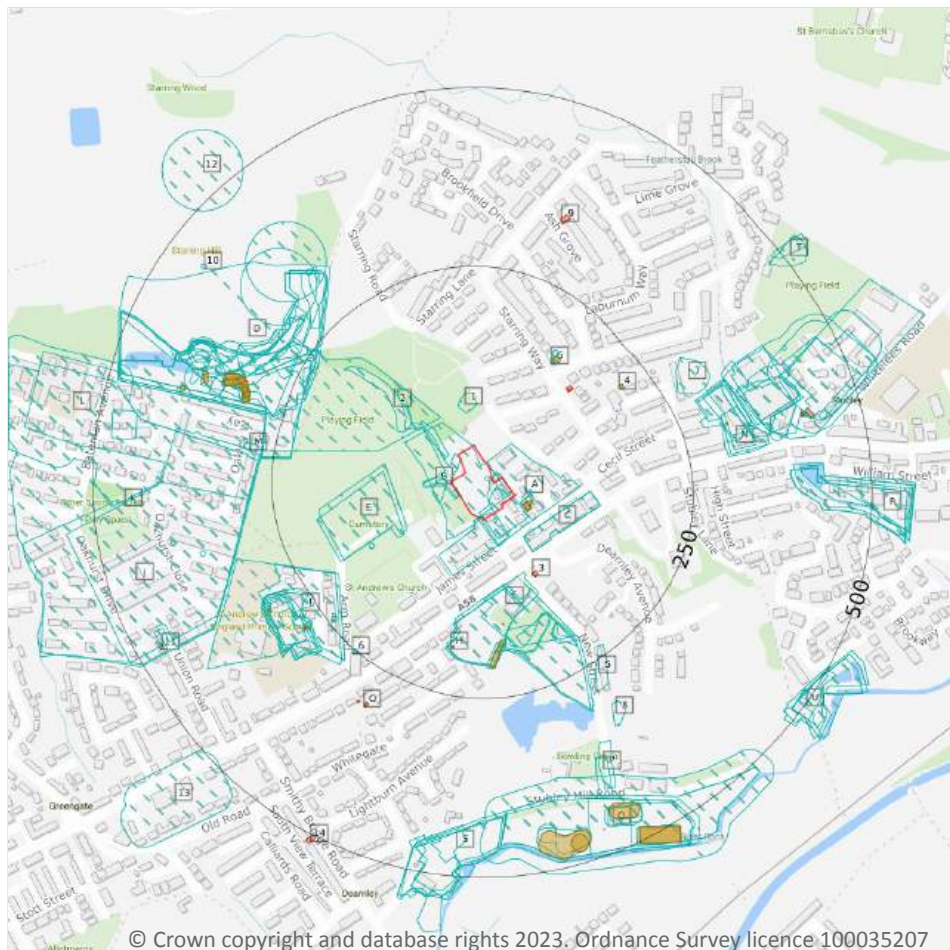
OS MasterMap site plan



Site Area: 0.46ha



1 Past land use



- 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

155

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 15 >](#)

ID	Location	Land use	Dates present	Group ID
A	On site	Unspecified Mills	1890	653253



ID	Location	Land use	Dates present	Group ID
A	On site	Sawmills	1949	720103
A	On site	Sawmills	1928	756164
B	On site	Unspecified Ground Workings	1976 - 1989	777182
B	On site	Sawmills	1938	787075
B	On site	Unspecified Ground Workings	1968	789054
B	5m W	Unspecified Pit	1928	690605
A	11m E	Unspecified Tanks	1938 - 1949	757580
A	13m SE	Unspecified Tanks	1928	777498
B	14m NW	Unspecified Ground Workings	1976 - 1989	777886
1	47m N	Unspecified Pit	1938	690595
C	50m SE	Unspecified Commercial/Industrial	1976	643190
C	50m SE	Unspecified Mill	1968	657125
D	58m NW	Sanitary Pipe Works	1949	773889
E	78m W	Cemetery	1938 - 1989	751610
2	79m NW	Refuse Heap	1928	677795
E	85m W	Cemetery	1908 - 1928	695740
F	92m SE	Woollen Mill	1851	671017
F	94m S	Unspecified Mill	1938 - 1949	759823
F	100m S	Unspecified Mill	1890	766374
F	101m S	Unspecified Mill	1928	787341
E	138m SW	Coal Pit	1851	654274
F	155m SE	Refuse Heap	1938 - 1949	754014
F	156m SE	Refuse Heap	1928	704457
F	157m SE	Unspecified Ground Workings	1968 - 1989	704369
G	157m NE	Unspecified Tank	1908 - 1928	786739
G	161m NE	Unspecified Tank	1938 - 1949	789512
F	170m S	Unspecified Tanks	1938	697712
F	173m S	Unspecified Tanks	1908 - 1928	789660



ID	Location	Land use	Dates present	Group ID
F	175m SE	Unspecified Heap	1938	650665
F	176m SE	Unspecified Ground Workings	1928	749418
F	176m S	Unspecified Tanks	1949	749682
I	201m SW	Unspecified Works	1976 - 1989	703890
I	204m SW	Oil Mills	1949	702844
D	226m W	Pipe Works	1928	654706
D	226m W	Sanitary Pipe Works	1908	729891
D	226m W	Unspecified Works	1890	678960
D	228m NW	Railway Sidings	1949	741827
D	228m NW	Railway Sidings	1938	781228
D	233m NW	Railway Sidings	1928	708498
5	234m SE	Unspecified Heap	1928	650664
I	236m SW	Unspecified Tank	1949	674556
I	236m SW	Unspecified Tank	1928 - 1938	721274
D	237m NW	Refuse Heap	1908	741299
D	247m NW	Refuse Heap	1928 - 1938	783518
6	248m SW	Coal Pits	1851	648739
I	248m SW	Sandstone Quarry	1851	687461
D	253m NW	Refuse Heap	1908	731766
I	253m SW	Unspecified Works	1968	790441
D	259m NW	Sanitary Pipe Works	1938	709655
D	261m NW	Refuse Heap	1890	746047
D	263m NW	Unspecified Ground Workings	1976 - 1989	788598
J	267m W	Unspecified Workhouse	1890	672196
K	268m W	Hospital	1949 - 1989	727694
I	269m SW	Oil Mills	1938	787271
7	270m NE	Reservoir and Filter Beds	1938	656656
K	270m W	Infirmary	1908	731793



ID	Location	Land use	Dates present	Group ID
L	270m W	Infirmery	1928 - 1938	736032
I	271m SW	Unspecified Mills	1890	653250
M	273m W	Mortuary	1928 - 1938	726933
I	273m SW	Oil Mills	1928	744999
M	276m W	Mortuary	1949	679694
I	279m SW	Oil Mills	1908	778830
N	280m E	Unspecified Mills	1908	653252
N	286m E	Unspecified Works	1968 - 1989	769343
D	286m NW	Railway Sidings	1908	747494
D	290m NW	Old Coal Shaft	1890	760646
I	293m SW	Unspecified Tank	1928	721642
N	297m E	Bakery	1928 - 1938	742430
D	299m NW	Refuse Heap	1928	726586
D	301m W	Unspecified Tank	1938	674554
D	303m W	Unspecified Tanks	1928	761955
D	304m W	Unspecified Tanks	1908	711376
D	304m NW	Unspecified Shaft	1908	665126
D	304m W	Unspecified Tanks	1949 - 1976	743499
I	305m SW	Unspecified Tank	1949	696506
D	305m NW	Unspecified Old Shaft	1928	710690
N	306m NE	Bakery	1949	740591
I	306m SW	Unspecified Tank	1938	714271
D	307m NW	Unspecified Tank	1938	674555
N	308m E	Unspecified Mill	1890	766081
D	310m NW	Old Coal Shaft	1908	737377
D	312m NW	Coal Pit	1851	654250
D	313m W	Unspecified Tanks	1890	696942
8	314m SE	Unspecified Heap	1968 - 1989	711769



ID	Location	Land use	Dates present	Group ID
D	315m NW	Unspecified Shaft	1928	665127
D	316m NW	Unspecified Old Shaft	1938	707745
D	317m NW	Unspecified Tanks	1938	716337
D	320m NW	Unspecified Tanks	1949 - 1976	719248
D	325m NW	Unspecified Old Shaft	1949	738976
N	325m E	Bakery	1949	762310
D	326m NW	Unspecified Disused Shaft	1976	664284
D	326m NW	Unspecified Old Shaft	1968	741436
D	326m NW	Unspecified Tank	1976	674553
N	334m E	Unspecified Mill	1890	743497
D	338m NW	Unspecified Quarry	1908	755349
D	340m W	Unspecified Shaft	1938	665128
D	340m NW	Unspecified Quarry	1928	784898
N	341m E	Unspecified Mill	1928 - 1938	770054
N	344m E	Woollen Mill	1851	671016
N	346m NE	Unspecified Works	1976 - 1989	781920
P	350m SE	Cuttings	1938 - 1949	703195
D	351m NW	Unspecified Ground Workings	1968 - 1989	698629
N	351m E	Unspecified Works	1968	787081
D	352m NW	Unspecified Tank	1976	674552
J	357m W	Unspecified Tank	1908 - 1928	787012
D	367m W	Unspecified Tank	1908 - 1928	704373
P	367m SE	Cuttings	1908 - 1928	778913
N	368m E	Bakery	1928 - 1938	722086
D	368m NW	Unspecified Quarry	1938	750537
D	369m W	Unspecified Tank	1949 - 1976	703081
D	371m NW	Unspecified Heap	1928	728828
D	371m NW	Unspecified Heap	1938 - 1949	697421



ID	Location	Land use	Dates present	Group ID
D	372m NW	Unspecified Quarry	1890	770112
Q	375m S	Sewage Works	1890	777680
R	387m E	Cotton Mill	1908	644408
R	387m E	Unspecified Mill	1928	781299
R	392m E	Unspecified Mill	1938	743547
N	392m E	Bakery	1968	762119
D	393m W	Unspecified Tank	1890 - 1908	727023
J	394m W	Unspecified Tank	1908 - 1928	712127
Q	399m S	Unspecified Works	1968 - 1976	750217
Q	399m S	Sewage Works	1949	762013
R	401m E	Unspecified Mill	1968 - 1989	731047
Q	405m S	Sewage Works	1938	779023
S	409m S	Unspecified Mills	1949	653251
S	413m S	Unspecified Mill	1938	788736
Q	416m S	Sewage Works	1928	699466
S	417m S	Unspecified Mill	1928	775139
S	417m S	Woollen Mill	1908	765668
N	418m E	Unspecified Commercial/Industrial	1976 - 1989	773143
N	427m NE	Chimney	1851	684558
R	427m E	Unspecified Mill	1890	715501
S	428m S	Unspecified Mill	1890	752243
Q	434m S	Unspecified Tanks	1949 - 1976	754973
Q	438m S	Unspecified Tanks	1949 - 1976	770922
Q	438m S	Unspecified Tanks	1938	737421
10	439m NW	Coal Pit	1851	654251
Q	439m S	Unspecified Tanks	1938	712339
Q	441m S	Unspecified Tanks	1928	738746
L	445m W	Research and Development Laboratories	1938	644825



ID	Location	Land use	Dates present	Group ID
Q	445m SE	Sewage Works	1908	719147
S	447m S	Woollen Mill	1851	786328
12	477m NW	Unspecified Disused Shaft	1976	664283
T	478m NE	Refuse Heap	1928 - 1938	718317
U	479m SE	Unspecified Mill	1890	779299
Q	481m SE	Filter Tanks	1908	675261
U	483m SE	Woollen Mill	1851	671015
R	485m E	Unspecified Mill	1949	759036
T	487m NE	Refuse Heap	1949	712779
U	488m SE	Glue, Grease and Manure Mill	1908	657586
U	488m SE	Unspecified Mill	1928 - 1938	725376
U	488m SE	Unspecified Mill	1949	749447
U	490m SE	Unspecified Mill	1968 - 1976	720218
13	494m SW	Garage	1968	693860

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

27

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

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
A	17m SE	Tanks	1910	100147
A	18m SE	Tanks	1930 - 1937	102740
F	147m S	Unspecified Tank	1891	84062
G	161m NE	Unspecified Tank	1910 - 1937	97053



ID	Location	Land use	Dates present	Group ID
F	171m S	Tanks	1910 - 1938	92754
H	181m S	Unspecified Tank	1959	93414
H	181m S	Unspecified Tank	1960	98953
4	208m NE	Unspecified Tank	1971 - 1996	94859
I	242m SW	Unspecified Tank	1930 - 1937	98433
I	277m SW	Tanks	1938	87596
I	281m SW	Tanks	1938	87597
D	302m W	Unspecified Tank	1930	84061
D	302m W	Tanks	1910	98473
D	303m W	Tanks	1960	97915
D	303m W	Tanks	1959	93253
D	308m W	Unspecified Tank	1930	84060
I	308m SW	Unspecified Tank	1930 - 1937	95789
N	312m E	Unspecified Tank	1891	84066
D	315m NW	Tanks	1930	90869
D	364m W	Unspecified Tank	1910 - 1960	96829
D	392m W	Unspecified Tank	1910	84058
R	434m E	Unspecified Tank	1910	84065
Q	436m SE	Tanks	1959 - 1960	102962
Q	444m S	Tanks	1938 - 1960	93081
Q	459m S	Unspecified Tank	1938	84040
Q	481m SE	Settlement Tanks	1938	85895
Q	481m SE	Filter Tanks	1910 - 1930	93347

This data is sourced from Ordnance Survey / Groundsure.



1.3 Historical energy features

Records within 500m	14
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Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
3	99m SE	Electricity Substation	1984 - 1988	58394
G	151m NE	Electricity Substation	1996	57966
G	151m NE	Electricity Substation	1971 - 1988	57882
O	300m SW	Electricity Substation	1979 - 1994	50526
O	303m SW	Electricity Substation	1979	45424
9	334m N	Electricity Substation	1988 - 1996	52194
N	415m E	Electricity Substation	1996	57725
N	415m E	Electricity Substation	1971	48439
N	416m E	Electricity Substation	1988	51355
N	418m E	Electricity Substation	1988	53534
N	419m E	Electricity Substation	1996 - 1999	58770
N	423m E	Electricity Substation	1979 - 1985	49926
11	463m SW	Electricity Substation	1979 - 1994	47273
14	500m SW	Electricity Substation	1979 - 1988	55253

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

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



This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

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 ungrouped 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

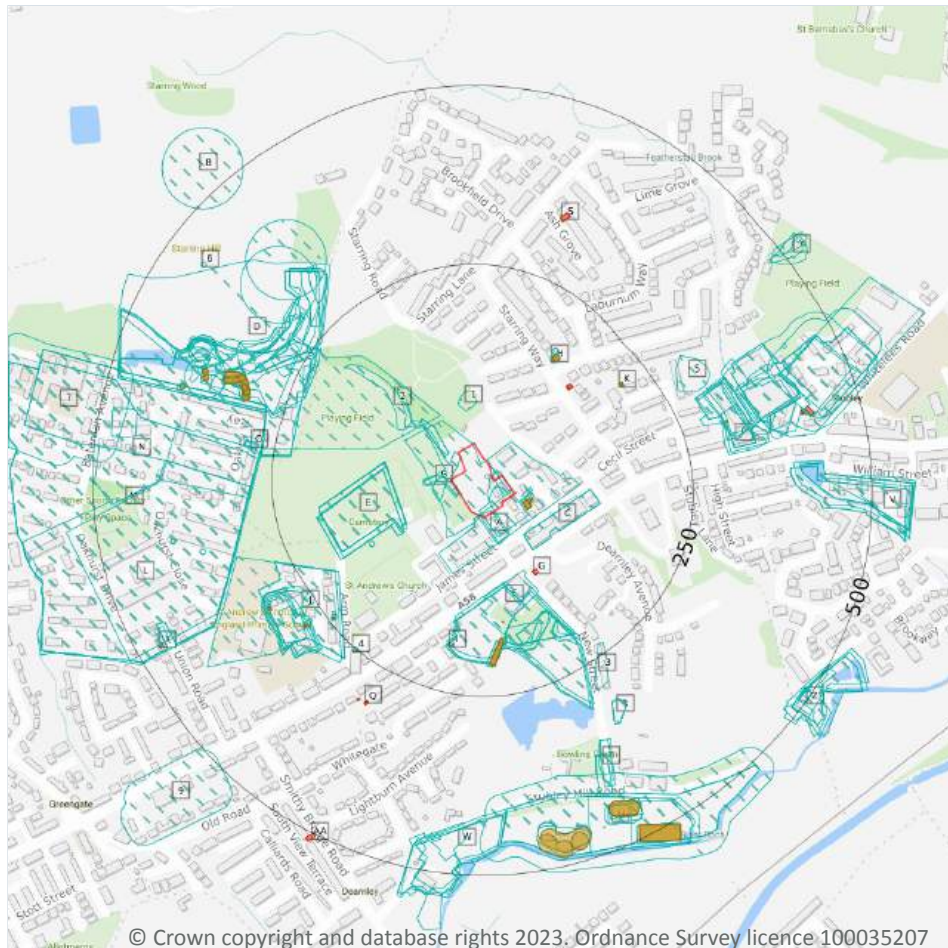
0

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



- 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

214

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 25 >](#)

ID	Location	Land Use	Date	Group ID
A	On site	Sawmills	1928	756164
A	On site	Sawmills	1949	720103
A	On site	Unspecified Mills	1890	653253

ID	Location	Land Use	Date	Group ID
B	On site	Unspecified Ground Workings	1989	777182
B	On site	Unspecified Ground Workings	1976	777182
B	On site	Unspecified Ground Workings	1968	789054
B	On site	Sawmills	1938	787075
B	5m W	Unspecified Pit	1928	690605
A	11m E	Unspecified Tanks	1949	757580
A	13m SE	Unspecified Tanks	1928	777498
A	13m E	Unspecified Tanks	1938	757580
B	14m NW	Unspecified Ground Workings	1989	777886
B	14m NW	Unspecified Ground Workings	1976	777886
1	47m N	Unspecified Pit	1938	690595
C	50m SE	Unspecified Commercial/Industrial	1976	643190
C	50m SE	Unspecified Mill	1968	657125
D	58m NW	Sanitary Pipe Works	1949	773889
E	78m W	Cemetery	1989	751610
E	78m W	Cemetery	1976	751610
E	78m W	Cemetery	1949	751610
E	78m W	Cemetery	1968	751610
2	79m NW	Refuse Heap	1928	677795
E	79m W	Cemetery	1938	751610
E	85m W	Cemetery	1928	695740
E	85m W	Cemetery	1908	695740
F	92m SE	Woollen Mill	1851	671017
F	94m S	Unspecified Mill	1949	759823
F	100m S	Unspecified Mill	1938	759823
F	100m S	Unspecified Mill	1890	766374
F	101m S	Unspecified Mill	1928	787341
E	138m SW	Coal Pit	1851	654274



ID	Location	Land Use	Date	Group ID
F	155m SE	Refuse Heap	1938	754014
F	156m SE	Refuse Heap	1928	704457
F	157m SE	Unspecified Ground Workings	1989	704369
F	157m SE	Unspecified Ground Workings	1976	704369
F	157m SE	Unspecified Ground Workings	1968	704369
H	157m NE	Unspecified Tank	1928	786739
H	157m NE	Unspecified Tank	1908	786739
F	158m S	Refuse Heap	1949	754014
H	161m NE	Unspecified Tank	1938	789512
H	167m NE	Unspecified Tank	1949	789512
F	170m S	Unspecified Tanks	1938	697712
F	173m S	Unspecified Tanks	1928	789660
F	173m S	Unspecified Tanks	1908	789660
F	175m SE	Unspecified Heap	1938	650665
F	176m SE	Unspecified Ground Workings	1928	749418
F	176m S	Unspecified Tanks	1949	749682
J	201m SW	Unspecified Works	1989	703890
J	201m SW	Unspecified Works	1976	703890
J	204m SW	Oil Mills	1949	702844
D	226m W	Pipe Works	1928	654706
D	226m W	Sanitary Pipe Works	1908	729891
D	226m W	Unspecified Works	1890	678960
D	228m NW	Railway Sidings	1949	741827
D	228m NW	Railway Sidings	1938	781228
D	233m NW	Railway Sidings	1928	708498
3	234m SE	Unspecified Heap	1928	650664
J	236m SW	Unspecified Tank	1949	674556
J	236m SW	Unspecified Tank	1938	721274



ID	Location	Land Use	Date	Group ID
D	237m NW	Refuse Heap	1908	741299
J	240m SW	Unspecified Tank	1928	721274
D	247m NW	Refuse Heap	1938	783518
4	248m SW	Coal Pits	1851	648739
J	248m SW	Sandstone Quarry	1851	687461
D	253m NW	Refuse Heap	1908	731766
J	253m SW	Unspecified Works	1968	790441
D	256m NW	Refuse Heap	1928	783518
D	259m NW	Sanitary Pipe Works	1938	709655
D	261m NW	Refuse Heap	1890	746047
D	263m NW	Unspecified Ground Workings	1989	788598
D	263m NW	Unspecified Ground Workings	1976	788598
L	267m W	Unspecified Workhouse	1890	672196
M	268m W	Hospital	1989	727694
M	268m W	Hospital	1976	727694
M	268m W	Hospital	1949	727694
M	268m W	Hospital	1968	727694
J	269m SW	Oil Mills	1938	787271
5	270m NE	Reservoir and Filter Beds	1938	656656
N	270m W	Infirmery	1928	736032
N	270m W	Infirmery	1908	731793
J	271m SW	Unspecified Mills	1890	653250
O	273m W	Mortuary	1938	726933
J	273m SW	Oil Mills	1928	744999
O	275m W	Mortuary	1928	726933
O	276m W	Mortuary	1949	679694
L	279m W	Infirmery	1908	731793
J	279m SW	Oil Mills	1908	778830



ID	Location	Land Use	Date	Group ID
P	280m E	Unspecified Mills	1908	653252
P	286m E	Unspecified Works	1989	769343
P	286m E	Unspecified Works	1976	769343
P	286m E	Unspecified Works	1968	769343
D	286m NW	Railway Sidings	1908	747494
D	290m NW	Old Coal Shaft	1890	760646
J	293m SW	Unspecified Tank	1928	721642
P	297m E	Bakery	1928	742430
D	299m NW	Refuse Heap	1928	726586
P	300m E	Bakery	1938	742430
D	301m W	Unspecified Tank	1938	674554
D	303m W	Unspecified Tanks	1928	761955
D	304m W	Unspecified Tanks	1908	711376
D	304m NW	Unspecified Shaft	1908	665126
D	304m W	Unspecified Tanks	1976	743499
D	304m W	Unspecified Tanks	1949	743499
D	304m W	Unspecified Tanks	1968	743499
J	305m SW	Unspecified Tank	1949	696506
D	305m NW	Unspecified Old Shaft	1928	710690
P	306m NE	Bakery	1949	740591
J	306m SW	Unspecified Tank	1938	714271
D	307m NW	Unspecified Tank	1938	674555
P	308m E	Unspecified Mill	1890	766081
D	310m NW	Old Coal Shaft	1908	737377
D	312m NW	Coal Pit	1851	654250
D	313m W	Unspecified Tanks	1890	696942
R	314m SE	Unspecified Heap	1989	711769
R	314m SE	Unspecified Heap	1976	711769



ID	Location	Land Use	Date	Group ID
R	314m SE	Unspecified Heap	1968	711769
D	315m NW	Unspecified Shaft	1928	665127
D	316m NW	Unspecified Old Shaft	1938	707745
D	317m NW	Unspecified Tanks	1938	716337
D	320m NW	Unspecified Tanks	1976	719248
D	320m NW	Unspecified Tanks	1949	719248
D	320m NW	Unspecified Tanks	1968	719248
D	325m NW	Unspecified Old Shaft	1949	738976
P	325m E	Bakery	1949	762310
D	326m NW	Unspecified Disused Shaft	1976	664284
D	326m NW	Unspecified Old Shaft	1968	741436
D	326m NW	Unspecified Tank	1976	674553
P	334m E	Unspecified Mill	1890	743497
D	338m NW	Unspecified Quarry	1908	755349
D	340m W	Unspecified Shaft	1938	665128
D	340m NW	Unspecified Quarry	1928	784898
P	341m E	Unspecified Mill	1928	770054
P	344m E	Woollen Mill	1851	671016
P	346m NE	Unspecified Works	1989	781920
P	346m NE	Unspecified Works	1976	781920
P	348m E	Unspecified Mill	1938	770054
T	350m SE	Cuttings	1938	703195
D	351m NW	Unspecified Ground Workings	1989	698629
D	351m NW	Unspecified Ground Workings	1976	698629
D	351m NW	Unspecified Ground Workings	1968	698629
P	351m E	Unspecified Works	1968	787081
D	352m NW	Unspecified Tank	1976	674552
T	352m SE	Cuttings	1949	703195



ID	Location	Land Use	Date	Group ID
L	357m W	Unspecified Tank	1928	787012
L	357m W	Unspecified Tank	1908	787012
D	367m W	Unspecified Tank	1928	704373
D	367m W	Unspecified Tank	1908	704373
T	367m SE	Cuttings	1928	778913
T	367m SE	Cuttings	1908	778913
P	368m E	Bakery	1938	722086
D	368m NW	Unspecified Quarry	1938	750537
D	369m W	Unspecified Tank	1976	703081
D	369m W	Unspecified Tank	1949	703081
D	369m W	Unspecified Tank	1968	703081
D	371m NW	Unspecified Heap	1928	728828
D	371m NW	Unspecified Heap	1938	697421
D	372m NW	Unspecified Quarry	1890	770112
U	375m S	Sewage Works	1890	777680
D	376m NW	Unspecified Heap	1949	697421
V	387m E	Unspecified Mill	1928	781299
V	387m E	Cotton Mill	1908	644408
V	392m E	Unspecified Mill	1938	743547
P	392m E	Bakery	1968	762119
D	393m W	Unspecified Tank	1890	727023
L	394m W	Unspecified Tank	1928	712127
L	394m W	Unspecified Tank	1908	712127
D	395m W	Unspecified Tank	1908	727023
U	399m S	Unspecified Works	1976	750217
U	399m S	Sewage Works	1949	762013
U	399m S	Unspecified Works	1968	750217
V	401m E	Unspecified Mill	1989	731047



ID	Location	Land Use	Date	Group ID
V	401m E	Unspecified Mill	1976	731047
V	401m E	Unspecified Mill	1968	731047
P	404m E	Bakery	1928	722086
U	405m S	Sewage Works	1938	779023
W	409m S	Unspecified Mills	1949	653251
W	413m S	Unspecified Mill	1938	788736
U	416m S	Sewage Works	1928	699466
W	417m S	Unspecified Mill	1928	775139
W	417m S	Woollen Mill	1908	765668
P	418m E	Unspecified Commercial/Industrial	1989	773143
P	418m E	Unspecified Commercial/Industrial	1976	773143
P	427m NE	Chimney	1851	684558
V	427m E	Unspecified Mill	1890	715501
W	428m S	Unspecified Mill	1890	752243
U	434m S	Unspecified Tanks	1976	754973
U	434m S	Unspecified Tanks	1949	754973
U	434m S	Unspecified Tanks	1968	754973
U	438m S	Unspecified Tanks	1976	770922
U	438m S	Unspecified Tanks	1949	770922
U	438m S	Unspecified Tanks	1968	770922
U	438m S	Unspecified Tanks	1938	737421
6	439m NW	Coal Pit	1851	654251
U	439m S	Unspecified Tanks	1938	712339
U	441m S	Unspecified Tanks	1928	738746
N	445m W	Research and Development Laboratories	1938	644825
U	445m SE	Sewage Works	1908	719147
W	447m S	Woollen Mill	1851	786328
7	463m W	Infirmary	1938	736032



ID	Location	Land Use	Date	Group ID
8	477m NW	Unspecified Disused Shaft	1976	664283
Y	478m NE	Refuse Heap	1928	718317
Z	479m SE	Unspecified Mill	1890	779299
Y	479m NE	Refuse Heap	1938	718317
U	481m SE	Filter Tanks	1908	675261
Z	483m SE	Woollen Mill	1851	671015
V	485m E	Unspecified Mill	1949	759036
Y	487m NE	Refuse Heap	1949	712779
Z	488m SE	Unspecified Mill	1928	725376
Z	488m SE	Glue, Grease and Manure Mill	1908	657586
Z	488m SE	Unspecified Mill	1949	749447
Z	490m SE	Unspecified Mill	1976	720218
Z	490m SE	Unspecified Mill	1968	720218
Z	491m SE	Unspecified Mill	1938	725376
9	494m SW	Garage	1968	693860

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

42

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 25 >](#)

ID	Location	Land Use	Date	Group ID
A	17m SE	Tanks	1910	100147
A	18m SE	Tanks	1930	102740
A	18m SE	Tanks	1937	102740
F	147m S	Unspecified Tank	1891	84062
H	161m NE	Unspecified Tank	1910	97053



ID	Location	Land Use	Date	Group ID
H	161m NE	Unspecified Tank	1930	97053
H	161m NE	Unspecified Tank	1937	97053
F	171m S	Tanks	1910	92754
F	171m S	Tanks	1930	92754
F	171m S	Tanks	1938	92754
I	181m S	Unspecified Tank	1959	93414
I	181m S	Unspecified Tank	1960	98953
K	208m NE	Unspecified Tank	1988	94859
K	208m NE	Unspecified Tank	1996	94859
K	209m NE	Unspecified Tank	1971	94859
J	242m SW	Unspecified Tank	1930	98433
J	242m SW	Unspecified Tank	1937	98433
J	277m SW	Tanks	1938	87596
J	281m SW	Tanks	1938	87597
D	302m W	Unspecified Tank	1930	84061
D	302m W	Tanks	1910	98473
D	303m W	Tanks	1960	97915
D	303m W	Tanks	1959	93253
D	308m W	Unspecified Tank	1930	84060
J	308m SW	Unspecified Tank	1930	95789
J	308m SW	Unspecified Tank	1937	95789
P	312m E	Unspecified Tank	1891	84066
D	315m NW	Tanks	1930	90869
D	364m W	Unspecified Tank	1910	96829
D	364m W	Unspecified Tank	1930	96829
D	367m W	Unspecified Tank	1959	96829
D	367m W	Unspecified Tank	1960	96829
D	392m W	Unspecified Tank	1910	84058

ID	Location	Land Use	Date	Group ID
V	434m E	Unspecified Tank	1910	84065
U	436m SE	Tanks	1960	102962
U	436m S	Tanks	1959	102962
U	444m S	Tanks	1960	93081
U	451m S	Tanks	1938	93081
U	459m S	Unspecified Tank	1938	84040
U	481m SE	Filter Tanks	1910	93347
U	481m SE	Filter Tanks	1930	93347
U	481m SE	Settlement Tanks	1938	85895

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	26
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Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 25 >](#)

ID	Location	Land Use	Date	Group ID
G	99m SE	Electricity Substation	1988	58394
G	99m SE	Electricity Substation	1984	58394
H	151m NE	Electricity Substation	1996	57966
H	151m NE	Electricity Substation	1988	57882
H	153m NE	Electricity Substation	1971	57882
Q	300m SW	Electricity Substation	1994	50526
Q	300m SW	Electricity Substation	1994	50526
Q	302m SW	Electricity Substation	1979	50526
Q	302m SW	Electricity Substation	1988	50526
Q	303m SW	Electricity Substation	1979	45424
S	334m N	Electricity Substation	1988	52194



ID	Location	Land Use	Date	Group ID
S	334m N	Electricity Substation	1996	52194
P	415m E	Electricity Substation	1996	57725
P	415m E	Electricity Substation	1971	48439
P	416m E	Electricity Substation	1988	51355
P	418m E	Electricity Substation	1988	53534
P	419m E	Electricity Substation	1996	58770
P	419m E	Electricity Substation	1999	58770
P	423m E	Electricity Substation	1979	49926
P	423m E	Electricity Substation	1985	49926
X	463m SW	Electricity Substation	1994	47273
X	463m SW	Electricity Substation	1994	47273
X	463m SW	Electricity Substation	1979	47273
X	463m SW	Electricity Substation	1988	47273
AA	500m SW	Electricity Substation	1979	55253
AA	500m SW	Electricity Substation	1988	55253

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

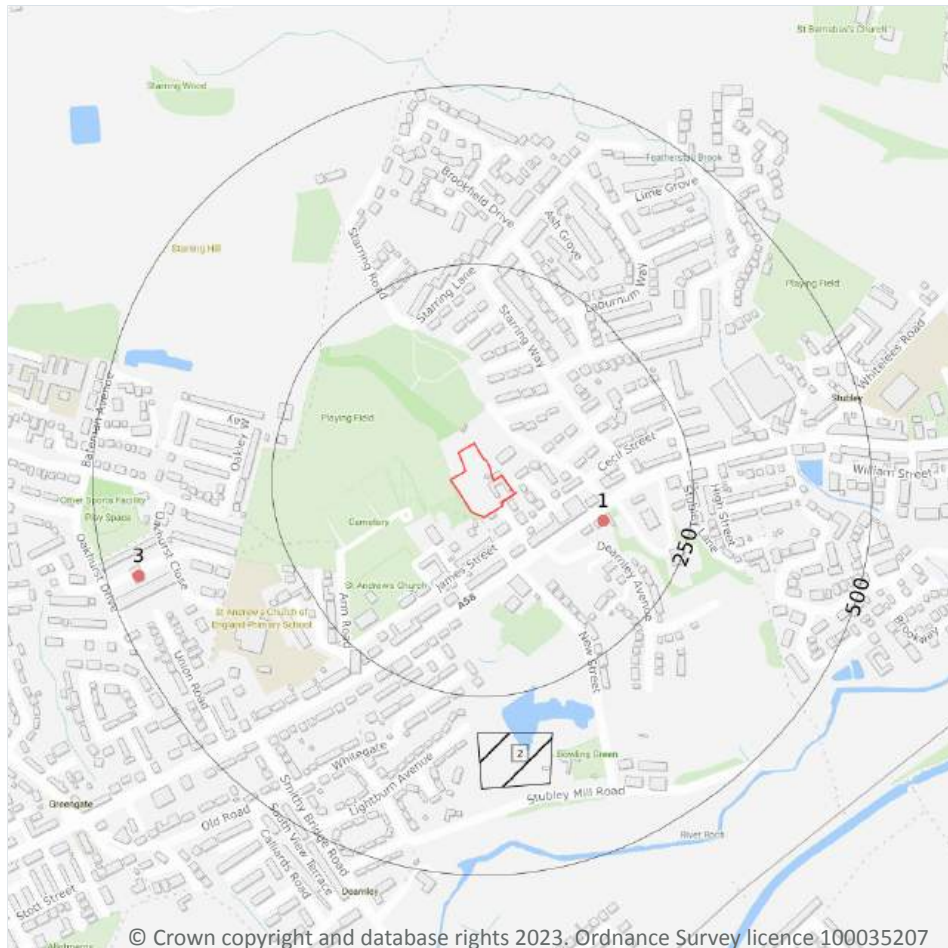
0

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)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

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

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

3.2 Historical landfill (BGS records)

Records within 500m

0

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

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m

0

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

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

3.4 Historical landfill (EA/NRW records)

Records within 500m

1

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

Features are displayed on the Waste and landfill map on [page 37 >](#)

ID	Location	Details		
2	300m S	Site Address: New Street/Land At Stubley Mill Road, Off Littleborough, Rochdale, Greater Manchester Licence Holder Address: Rochdale MBC, Municipal Offices, Smith Street, Rochdale	Waste Licence: Yes Site Reference: D033, RD/LIC/490/87 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 09/03/1988 Licence Surrender: -	Operator: - Licence Holder: Rochdale Borough Planning and Estates Officer First Recorded 31/03/1988 Last Recorded: 31/12/1990

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

3.5 Historical waste sites

Records within 500m

0

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

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

3.6 Licensed waste sites

Records within 500m

0

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

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

3.7 Waste exemptions

Records within 500m

2

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.

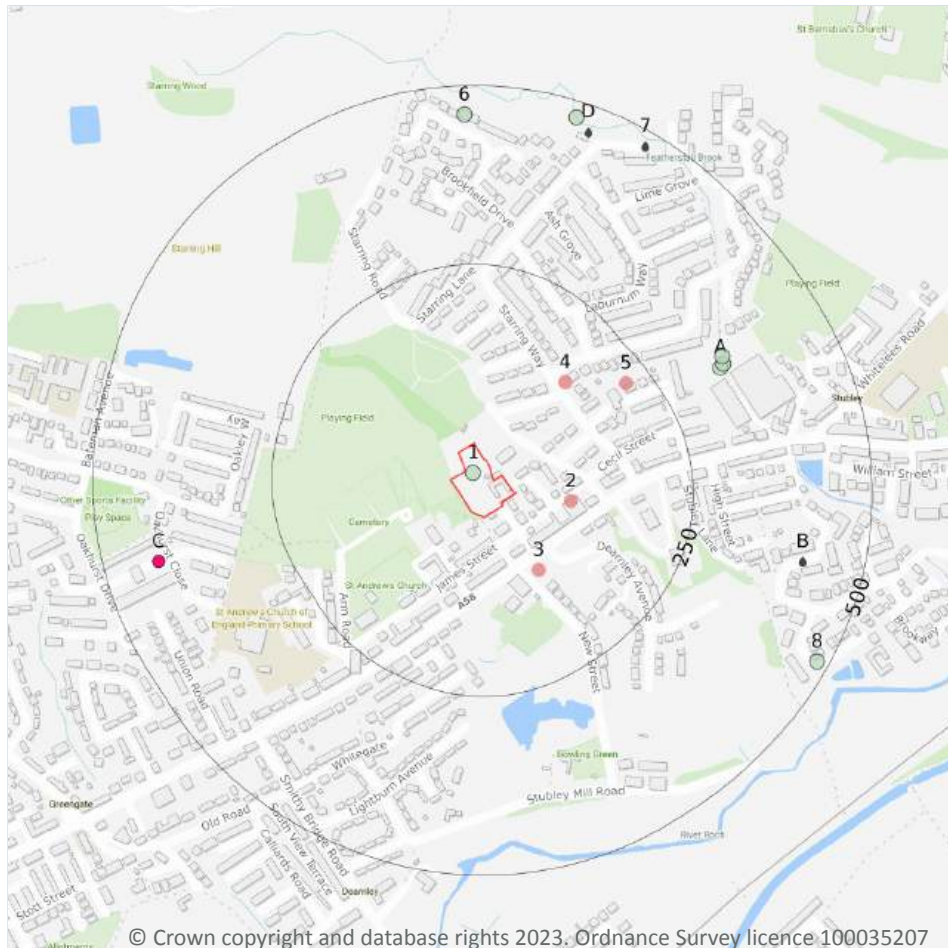
Features are displayed on the Waste and landfill map on [page 37 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
1	130m E	-	WEX263458	Using waste exemption	Not on a farm	Use of waste in construction
3	457m W	Birch Hill Hospital, Birch Road, Wardle, Rochdale, OL129QB	WEX348611	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

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



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Radioactive Substance Authorisations
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

4

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 40 >](#)

ID	Location	Company	Address	Activity	Category
2	80m E	Brookfield Engineering Co	13, James Street, Littleborough, Greater Manchester, OL15 8LT	Industrial Engineers	Engineering Services
3	103m SE	Electricity Sub Station	Greater Manchester, OL15	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
4	153m NE	Electricity Sub Station	Greater Manchester, OL15	Electrical Features	Infrastructure and Facilities
5	216m NE	Tank	Greater Manchester, OL15	Tanks (Generic)	Industrial Features

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 **0**

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.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

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

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

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

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

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

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

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

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

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

4.10 Licensed industrial activities (Part A(1))

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

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

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

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

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

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.

This data is sourced from Local Authority records.



4.12 Radioactive Substance Authorisations

Records within 500m

2

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

Features are displayed on the Current industrial land use map on [page 40](#) >

ID	Location	Address	Details	
C	423m W	Rochdale Ha, Birch Hill Hospital, Rochdale, Lancashire, OL12 9QB	Operator: Rochdale Ha Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AB9577 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled
C	423m W	Rochdale Healthcare Nhs Trust, Birch Hill Hospital, Rochdale, Lancashire, OL12 9QB	Operator: Rochdale Healthcare Nhs Trust Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AM0309 Date of approval: 23/05/1994	Effective from: 20/06/1994 Last date of update: 01/01/2015 Status: Revoked/cancelled

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

4.13 Licensed Discharges to controlled waters

Records within 500m

4

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 40](#) >

ID	Location	Address	Details	
B	413m E	ARMOUR HESS CHEMICALS, CLOUGHFIELD WORKS, BROWN BANK, LITTLEBOROUGH, GREATER MANCHESTER	Effluent Type: TRADE DISCHARGES - COOLING WATER Permit Number: 0168/816 Permit Version: 1 Receiving Water: ROCHDALE CANAL	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 07/07/1994 Revocation Date: 07/07/1994
B	413m E	ARMOUR HESS CHEMICALS, CLOUGHFIELD WORKS, BROWN BANK, LITTLEBOROUGH, GREATER MANCHESTER	Effluent Type: TRADE DISCHARGES - COOLING WATER Permit Number: 0168/816 Permit Version: 1 Receiving Water: ROCHDALE CANAL	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 07/07/1994 Revocation Date: 07/07/1994



ID	Location	Address	Details	
D	463m N	PARTINGTON RES DEVELOPMENT SWO, STARRING WAY, LITTLEBOROUGH, ROCHDALE, GREATER MANCHESTER	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: 016992002 Permit Version: 1 Receiving Water: FEATHERSTALL BROOK	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 29/04/1986 Revocation Date: 01/11/1994
7	479m NE	PARTINGTON LTD RES DEVELOPMENT SWO, OFF NEW ESTATE ROAD, STARRING WAY, LITTLEBOROUGH, ROCHDALE, GREATER MANCHESTER	Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: 016991226 Permit Version: 1 Receiving Water: FEATHERSTALL BROOK	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 01/11/1994 Revocation Date: 01/11/1994

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

7

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 40 >](#)

ID	Location	Details	
1	On site	Incident Date: 05/03/2001 Incident Identification: 15 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
A	337m NE	Incident Date: 29/06/2001 Incident Identification: 12250 Pollutant: Other Pollutant Pollutant Description: Other	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)
A	343m NE	Incident Date: 06/04/2020 Incident Identification: 1795706 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
A	348m NE	Incident Date: 06/07/2001 Incident Identification: 14175 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Smoke	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)
6	459m N	Incident Date: 15/05/2001 Incident Identification: 5571 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Vegetable Cuttings and Deposits	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
D	477m N	Incident Date: 17/09/2002 Incident Identification: 108298 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

ID	Location	Details	
8	483m SE	Incident Date: 10/05/2002 Incident Identification: 82291 Pollutant: Inert Materials and Wastes Pollutant Description: Construction and Demolition Materials and Wastes	Water Impact: Category 3 (Minor) 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.

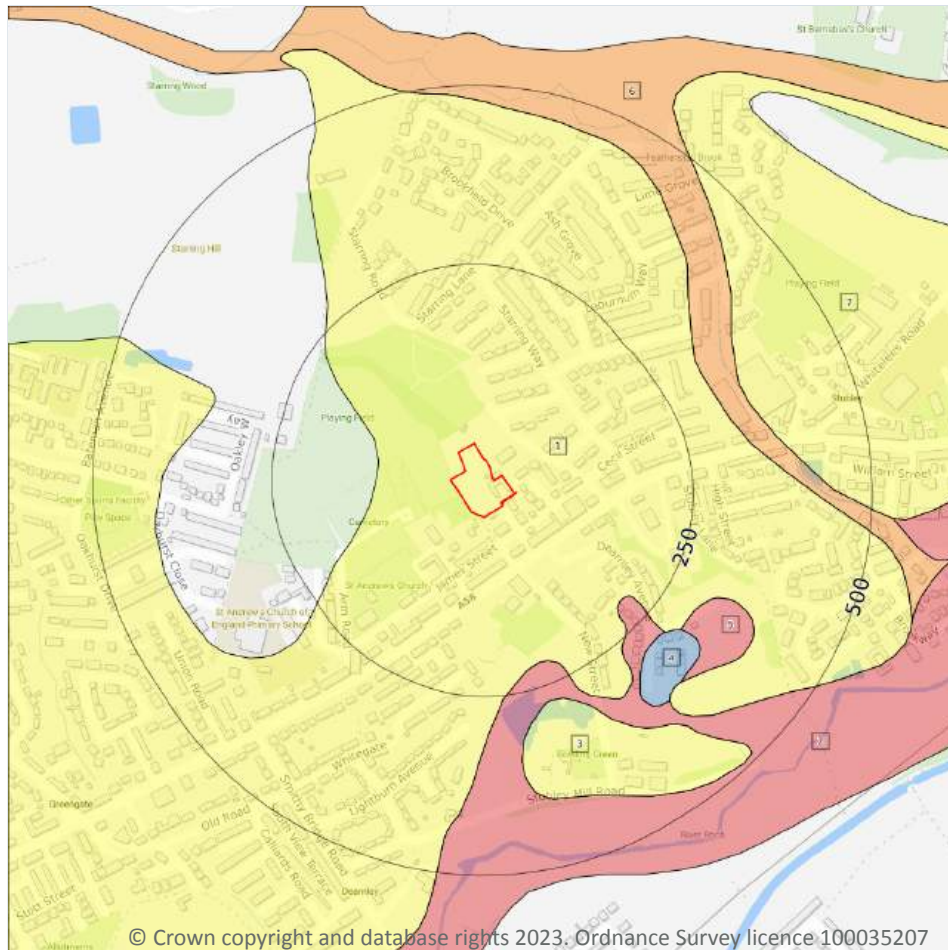
4.21 Pollution inventory radioactive waste

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



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

5.1 Superficial aquifer

Records within 500m

7

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 47](#) >

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	210m SE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

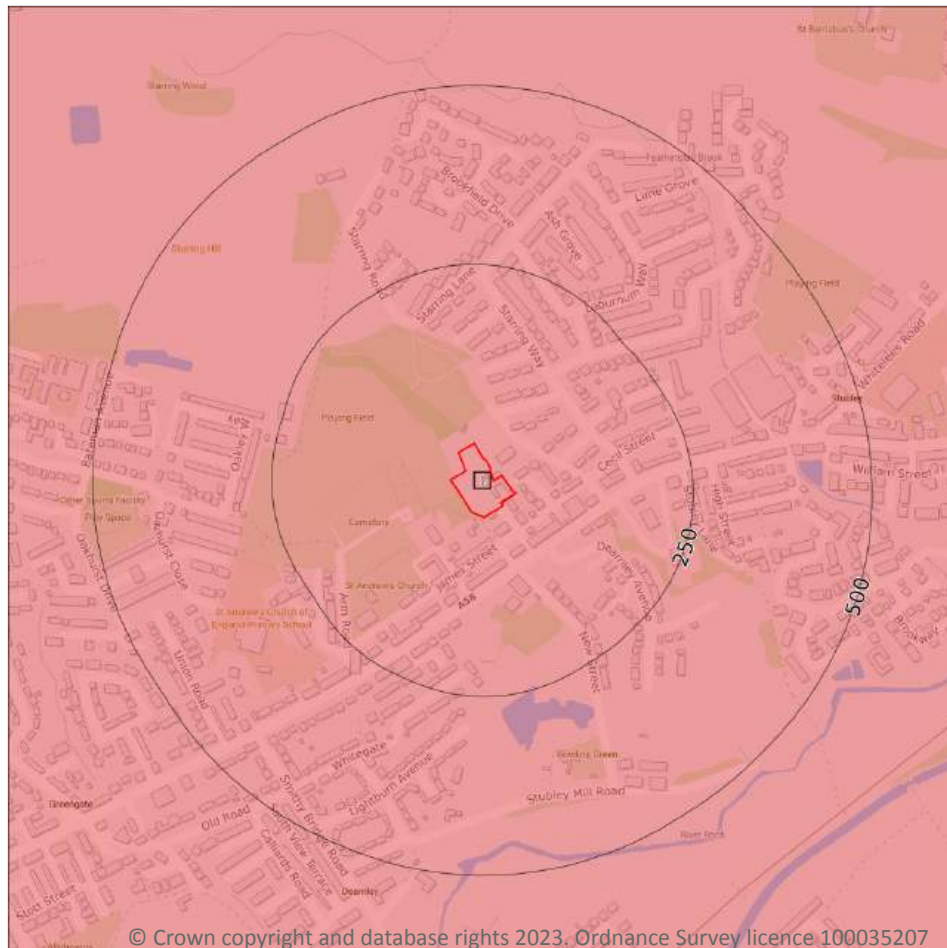


ID	Location	Designation	Description
3	272m S	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	283m SE	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
5	299m SE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
6	310m NE	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
7	350m E	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

1

Aquifer status of groundwater held within bedrock geology.

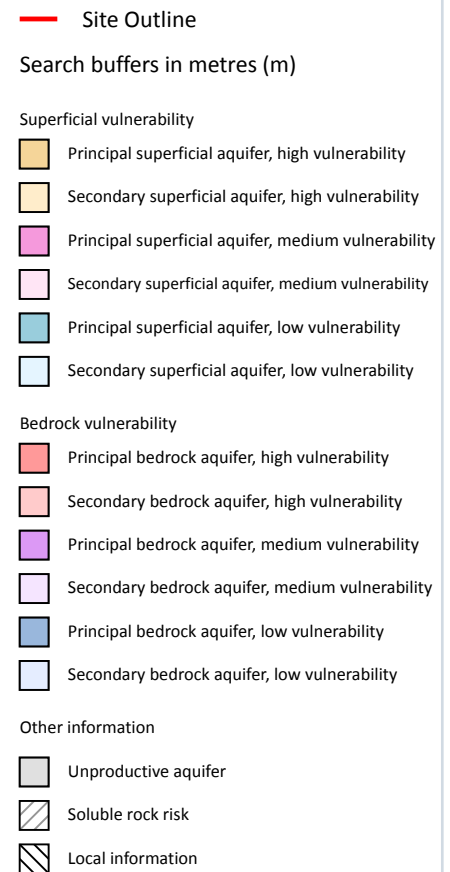
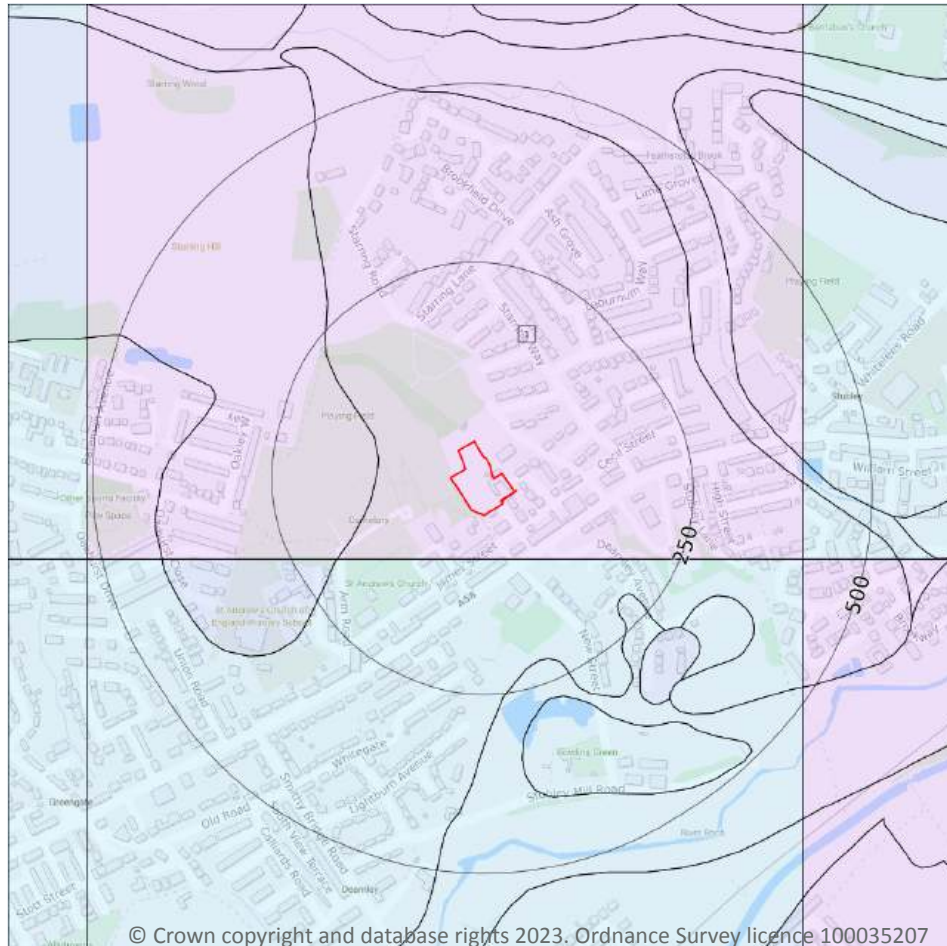
Features are displayed on the Bedrock aquifer map on [page 49](#) >

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

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



Groundwater vulnerability



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 50](#) >

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

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

5.4 Groundwater vulnerability- soluble rock risk

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

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

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

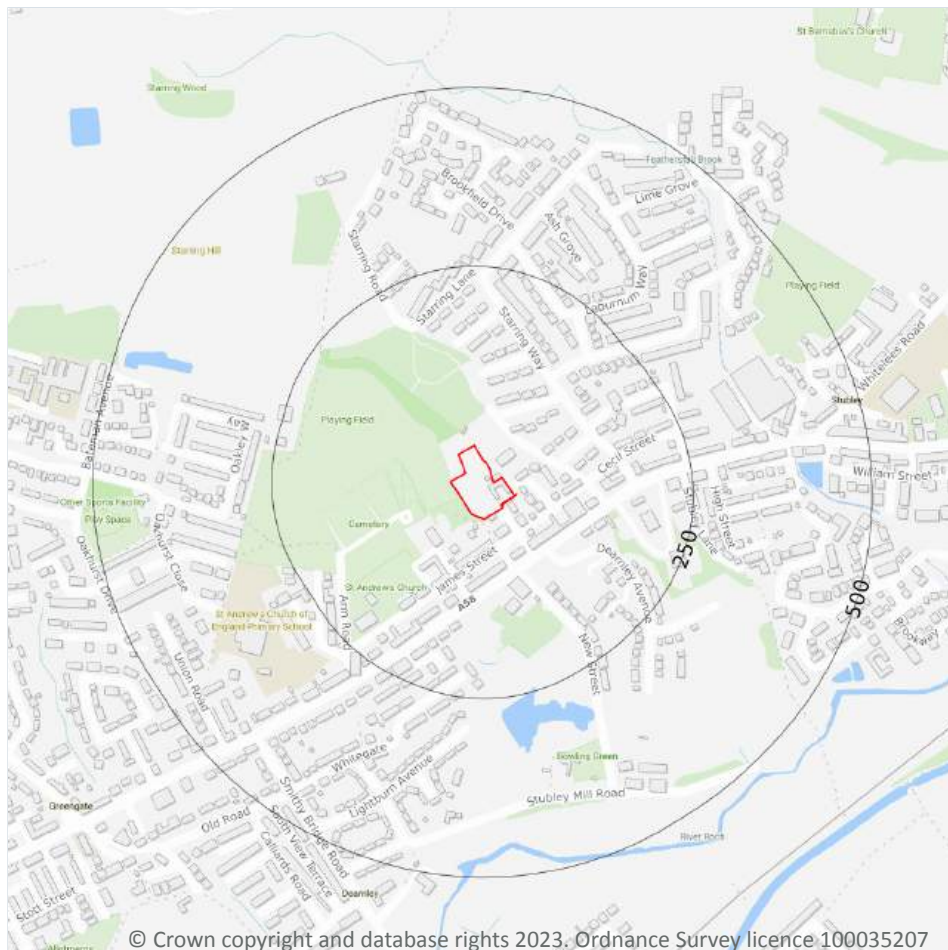
5.5 Groundwater vulnerability- local information

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

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

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

Abstractions and Source Protection Zones



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

5.6 Groundwater abstractions

Records within 2000m

6

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

Features are displayed on the Abstractions and Source Protection Zones map on [page 52 >](#)

ID	Location	Details	
-	926m E	Status: Historical Licence No: 2569002250 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT STOCKTON STREET LITTLEBOROUGH Data Type: Point Name: VITA THERMOPLASTIC COMPOUNDS LTD Easting: 393500 Northing: 416300	Annual Volume (m ³): 72730 Max Daily Volume (m ³): 331 Original Application No: - Original Start Date: 23/01/1991 Expiry Date: - Issue No: 101 Version Start Date: 24/10/2005 Version End Date: -
-	1293m NW	Status: Historical Licence No: 2569002146 Details: Water Bottling Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, WARDLE, ROCHDALE" Data Type: Point Name: COOK STREET PALLETS LTD Easting: 391400 Northing: 416800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 19/10/1990 Version End Date: -
-	1293m NW	Status: Historical Licence No: 2569002146 Details: Water Bottling Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, WARDLE, ROCHDALE Data Type: Point Name: COOK STREET PALLETS LTD Easting: 391400 Northing: 416800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 19/10/1990 Version End Date: -
-	1329m NW	Status: Active Licence No: 2569002146 Details: Water Bottling Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES AT WARDLE, ROCHDALE Data Type: Point Name: WARDLE SPRING WATER CO LTD Easting: 391370 Northing: 416820	Annual Volume (m ³): 25457.6 Max Daily Volume (m ³): 75.72 Original Application No: 827 Original Start Date: 04/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2008 Version End Date: -



ID	Location	Details	
-	1924m NE	Status: Historical Licence No: 2569002062 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "BRICK LINED CATCHPIT AT HIGHER GALE,GALE, LITTLEBOROUGH" Data Type: Point Name: HARRISON Easting: 394100 Northing: 417300	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 10/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 10/02/1966 Version End Date: -
-	1924m NE	Status: Historical Licence No: 2569002062 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BRICK LINED CATCHPIT AT HIGHER GALE,GALE, LITTLEBOROUGH Data Type: Point Name: HARRISON Easting: 394100 Northing: 417300	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 10/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 10/02/1966 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m

33

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 52 >](#)

ID	Location	Details	
-	884m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH" Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -



ID	Location	Details	
-	884m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH" Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	884m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH" Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	884m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	884m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -

ID	Location	Details	
-	884m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	884m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): 1654780 Max Daily Volume (m ³): 4546 Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	884m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): 1654780 Max Daily Volume (m ³): 4546 Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	884m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393450 Northing: 415860	Annual Volume (m ³): 1654780 Max Daily Volume (m ³): 4546 Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -

ID	Location	Details	
-	1033m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH 95 Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH 95 Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH 95 Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH \$95" Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -

ID	Location	Details	
-	1033m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH \$95" Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: "Surface, Non-Tidal - North West Region" Point: "ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH \$95" Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH \$95 Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH \$95 Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -



ID	Location	Details	
-	1033m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH \$95 Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES, LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -

ID	Location	Details	
-	1033m E	Status: Historical Licence No: 2569002008 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): 1654780 Max Daily Volume (m ³): 4546 Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): 1654780 Max Daily Volume (m ³): 4546 Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1033m E	Status: Historical Licence No: 2569002008 Details: General Cooling (Existing Licences Only) (Low Loss) Direct Source: Surface, Non-Tidal - North West Region Point: ROCHDALE CANAL AT PREMISES LITTLEBOROUGH Data Type: Point Name: AKZO NOBEL CHEMICALS LTD Easting: 393630 Northing: 416100	Annual Volume (m ³): 1654780 Max Daily Volume (m ³): 4546 Original Application No: - Original Start Date: 21/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/11/1994 Version End Date: -
-	1449m NE	Status: Historical Licence No: 2569001244 Details: Make-Up or Top Up Water Direct Source: "Surface, Non-Tidal - North West Region" Point: "LONG CLOUGH BROOK, LITTLEBOROUGH" Data Type: Point Name: LITTLEBOROUGH ANGLING SOCIETY Easting: 393300 Northing: 417400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 07/05/1993 Expiry Date: - Issue No: 100 Version Start Date: 13/07/1993 Version End Date: -

ID	Location	Details	
-	1449m NE	Status: Historical Licence No: 2569002271 Details: Fish Farm/Cress Pond Throughflow Direct Source: Surface, Non-Tidal - North West Region Point: LONG CLOUGH BROOK, LITTLEBOROUGH Data Type: Point Name: Todmorden Anglers Society Easting: 393300 Northing: 417400	Annual Volume (m ³): 72000 Max Daily Volume (m ³): 197.26 Original Application No: NPS/WR/030019 Original Start Date: 07/05/1993 Expiry Date: - Issue No: 5 Version Start Date: 24/12/2018 Version End Date: -
-	1449m NE	Status: Historical Licence No: 2569002271 Details: Fish Farm/Cress Pond Throughflow Direct Source: "Surface, Non-Tidal - North West Region" Point: "LONG CLOUGH BROOK, LITTLEBOROUGH" Data Type: Point Name: BARBER Easting: 393300 Northing: 417400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 07/05/1993 Expiry Date: - Issue No: 3 Version Start Date: 01/04/2000 Version End Date: -
-	1449m NE	Status: Historical Licence No: 2569001244 Details: Make-Up Or Top Up Water Direct Source: Surface, Non-Tidal - North West Region Point: LONG CLOUGH BROOK, LITTLEBOROUGH Data Type: Point Name: LITTLEBOROUGH ANGLING SOCIETY Easting: 393300 Northing: 417400	Annual Volume (m ³): 72000 Max Daily Volume (m ³): 197.26 Original Application No: - Original Start Date: 07/05/1993 Expiry Date: - Issue No: 100 Version Start Date: 13/07/1993 Version End Date: -
-	1609m NE	Status: Historical Licence No: 2569002240 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: TOWN HOUSE BROOK AND GALE HOUSE RESERVOIR OVERFLOW AT LI Data Type: Point Name: WALSDEN PRINTING CO LTD Easting: 393800 Northing: 417170	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 18/07/1989 Expiry Date: - Issue No: 100 Version Start Date: 13/12/1996 Version End Date: -
-	1706m NW	Status: Historical Licence No: 2569002114 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: RESERVOIR ON TRIB OF R ROCH AT WARDLE, NEAR ROCHDALE Data Type: Point Name: STRONG INTERNATIONAL LTD Easting: 391100 Northing: 417100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 27/01/1966 Expiry Date: - Issue No: 101 Version Start Date: 15/11/1996 Version End Date: -



ID	Location	Details	
-	1878m NE	Status: Historical Licence No: 2569002240 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: TOWN HOUSE BROOK AND GALE HOUSE RESERVOIR OVERFLOW111 Data Type: Point Name: WALSDEN PRINTING CO LTD Easting: 394110 Northing: 417210	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 18/07/1989 Expiry Date: - Issue No: 100 Version Start Date: 13/12/1996 Version End Date: -
-	1912m E	Status: Historical Licence No: 2569002136 Details: Process Water Direct Source: Surface, Non-Tidal - North West Region Point: SHORE LANE BRK AT LITTLEBOROUGH Data Type: Point Name: FOTHERGILL ENGINEERED FABRICS LTD Easting: 394500 Northing: 415900	Annual Volume (m ³): 35641 Max Daily Volume (m ³): 136 Original Application No: 0074 Original Start Date: 01/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/06/2007 Version End Date: -
-	1912m E	Status: Historical Licence No: 2569002136 Details: Non-Evaporative Cooling Direct Source: Surface, Non-Tidal - North West Region Point: SHORE LANE BRK AT LITTLEBOROUGH Data Type: Point Name: FOTHERGILL ENGINEERED FABRICS LTD Easting: 394500 Northing: 415900	Annual Volume (m ³): 35641 Max Daily Volume (m ³): 136 Original Application No: 0074 Original Start Date: 01/02/1966 Expiry Date: - Issue No: 101 Version Start Date: 25/06/2007 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m

3

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

Features are displayed on the Abstractions and Source Protection Zones map on [page 52 >](#)



ID	Location	Details	
-	1293m NW	Status: Historical Licence No: 2569002146 Details: Water Bottling Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, WARDLE, ROCHDALE" Data Type: Point Name: COOK STREET PALLETS LTD Easting: 391400 Northing: 416800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 19/10/1990 Version End Date: -
-	1293m NW	Status: Historical Licence No: 2569002146 Details: Water Bottling Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, WARDLE, ROCHDALE Data Type: Point Name: COOK STREET PALLETS LTD Easting: 391400 Northing: 416800	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 04/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 19/10/1990 Version End Date: -
-	1329m NW	Status: Active Licence No: 2569002146 Details: Water Bottling Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES AT WARDLE, ROCHDALE Data Type: Point Name: WARDLE SPRING WATER CO LTD Easting: 391370 Northing: 416820	Annual Volume (m ³): 25457.6 Max Daily Volume (m ³): 75.72 Original Application No: 827 Original Start Date: 04/02/1966 Expiry Date: - Issue No: 102 Version Start Date: 01/04/2008 Version End Date: -

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

5.9 Source Protection Zones

Records within 500m	0
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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
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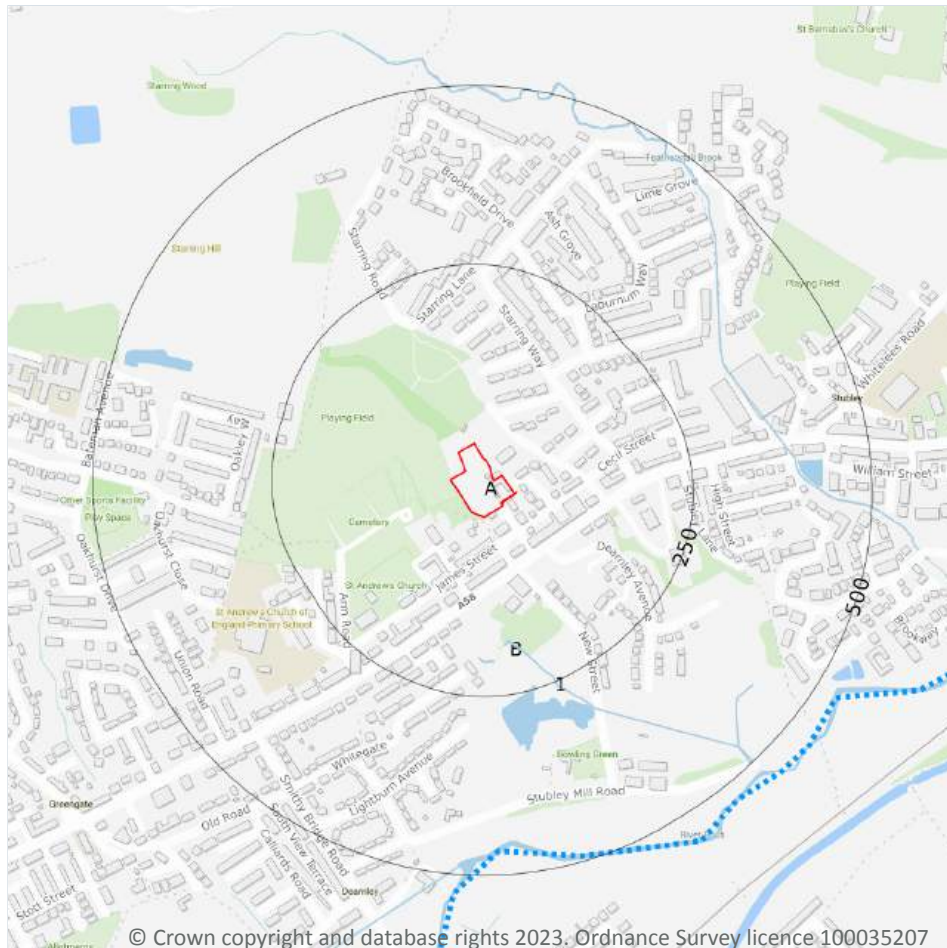
Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.



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

4

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

Features are displayed on the Hydrology map on [page 65 >](#)

ID	Location	Type of water feature	Ground level	Permanence	Name
B	173m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
1	177m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	177m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
B	196m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

3

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

Features are displayed on the Hydrology map on [page 65 >](#)

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 65 >](#)

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River	Roch (Source to Spodden)	GB112069064720	Roch Irk Medlock	Irwell

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 65 >](#)

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
9	466m S	River	Roch (Source to Spodden)	GB112069064720 ↗	Moderate	Fail	Moderate	2019

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

6.5 WFD Groundwater bodies

Records on site

1

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.

Features are displayed on the Hydrology map on [page 65 >](#)

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	On site	Northern Manchester Carboniferous Aquifers	GB41202G101800 ↗	Poor	Poor	Good	2019

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 the sea

Records within 50m**0**

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; 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). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 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

1 in 30 year, 0.3m - 1.0m

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

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 71](#) >

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	Between 0.3m and 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.3m and 1.0m

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

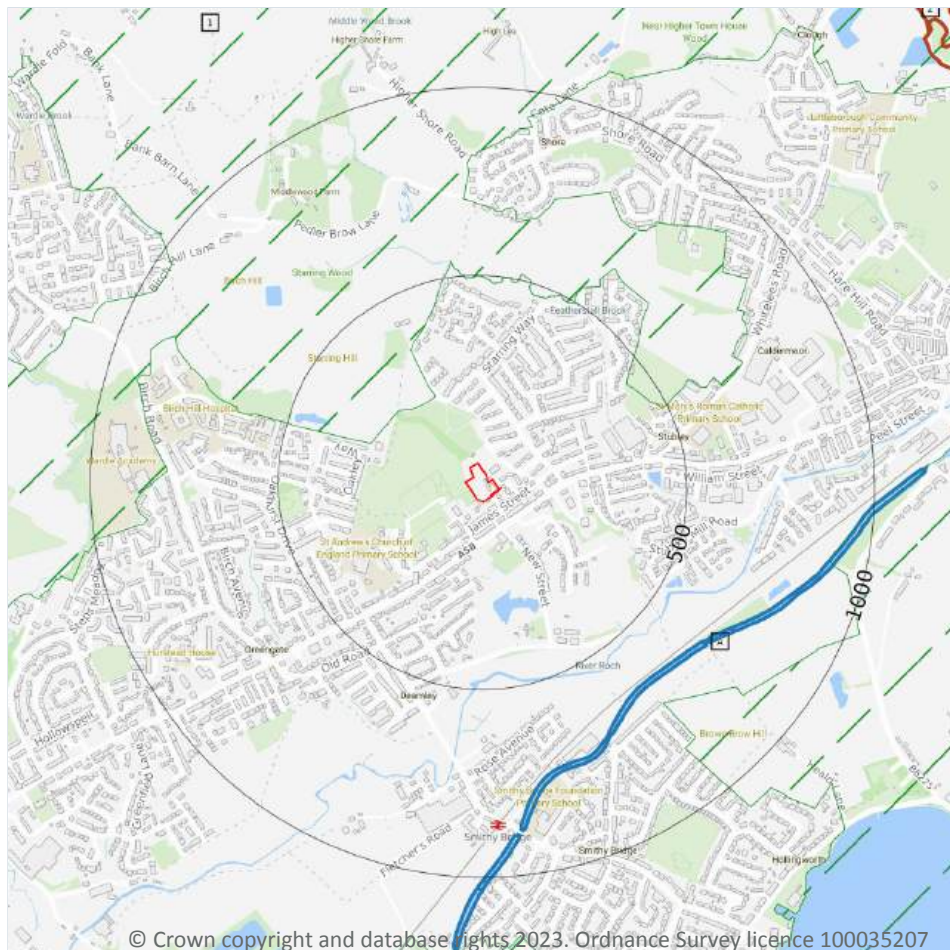
Low

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 73](#) >

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- + Special Areas of Conservation (SAC)
- Designated Ancient Woodland
- Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

2

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.

Features are displayed on the Environmental designations map on [page 74 >](#)

ID	Location	Name	Data source
A	640m SE	Rochdale Canal	Natural England



ID	Location	Name	Data source
B	891m S	Rochdale Canal	Natural England

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	2
-----------------------------	----------

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.

Features are displayed on the Environmental designations map on [page 74 >](#)

ID	Location	Name	Features of interest	Habitat description	Data source
A	640m SE	Rochdale Canal	Floating water-plantain.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural England
B	891m S	Rochdale Canal	Floating water-plantain.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Inland water bodies (Standing water, Running water)	Natural England

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

6

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 74 >](#)

ID	Location	Name	Woodland Type
2	1617m NE	Unknown	Ancient & Semi-Natural Woodland
3	1626m NE	Unknown	Ancient & Semi-Natural Woodland
-	1802m E	Ealees Wood	Ancient & Semi-Natural Woodland
-	1909m W	Buckley Wood	Ancient Replanted Woodland



ID	Location	Name	Woodland Type
-	1943m E	Ealees Wood	Ancient & Semi-Natural Woodland
-	1963m W	Buckley 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

1

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

Features are displayed on the Environmental designations map on [page 74 >](#)

ID	Location	Name	Local Authority name
1	208m NW	Merseyside and Greater Manchester	Rochdale



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

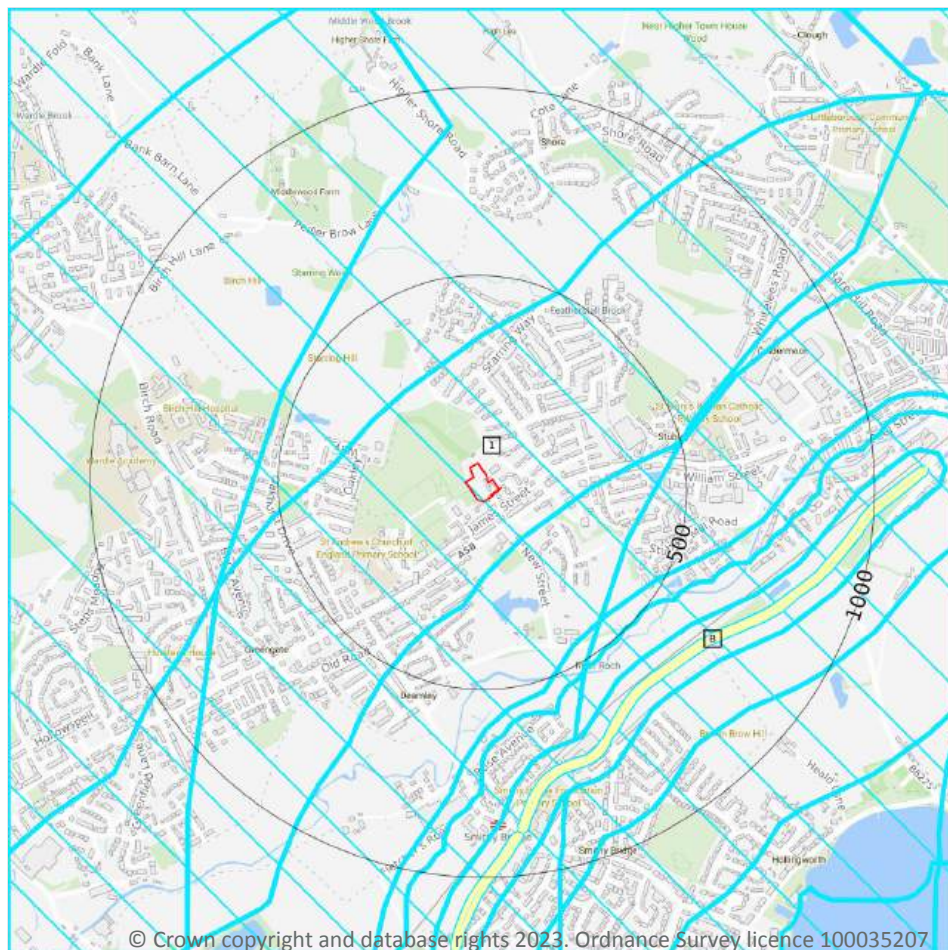
0

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.

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



SSSI Impact Zones and Units



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

10.17 SSSI Impact Risk Zones

Records on site

1

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

Features are displayed on the SSSI Impact Zones and Units map on [page 80](#) >

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals. Wind and Solar - Wind turbines. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction. Residential - Residential development of 100 units or more. Rural residential - Any residential development of 50 or more houses outside existing settlements/urban areas. Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t). Combustion - General combustion processes >20mw 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. Composting - Any composting proposal with more than 500 tonnes maximum annual operational throughput. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	2
-----------------------------	----------

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.

Features are displayed on the SSSI Impact Zones and Units map on [page 80 >](#)

ID: B
 Location: 640m SE
 SSSI name: Rochdale Canal
 Unit name: Failsworth
 Broad habitat: Standing Open Water And Canals
 Condition: Unfavourable - Recovering
 Reportable features:

Feature name	Feature condition	Date of assessment
Population of Schedule 8 plant - Luronium natans, Floating Water-plantain	Unfavourable - Recovering	25/11/2010



ID: 14
Location: 891m S
SSSI name: Rochdale Canal
Unit name: Failsworth
Broad habitat: Standing Open Water And Canals
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Population of Schedule 8 plant - Luronium natans, Floating Water-plantain	Unfavourable - Recovering	25/11/2010

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



11 Visual and cultural designations



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

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

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

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

11.3 National Parks

Records within 250m

0

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

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

11.4 Listed Buildings

Records within 250m

3

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

Features are displayed on the Visual and cultural designations map on [page 83 >](#)

ID	Location	Name	Grade	Reference Number	Listed date
1	69m SE	18, 20 And 22, New Road (See Details For Further Address Information)	II	1068520	23/04/1986
2	157m NE	Bents Farmhouse And Adjoining Barn	II	1366279	23/04/1986
3	190m E	Stubley Old Hall	II*	1162360	02/01/1967

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

11.6 Scheduled Ancient Monuments

Records within 250m

0

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

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

11.7 Registered Parks and Gardens

Records within 250m

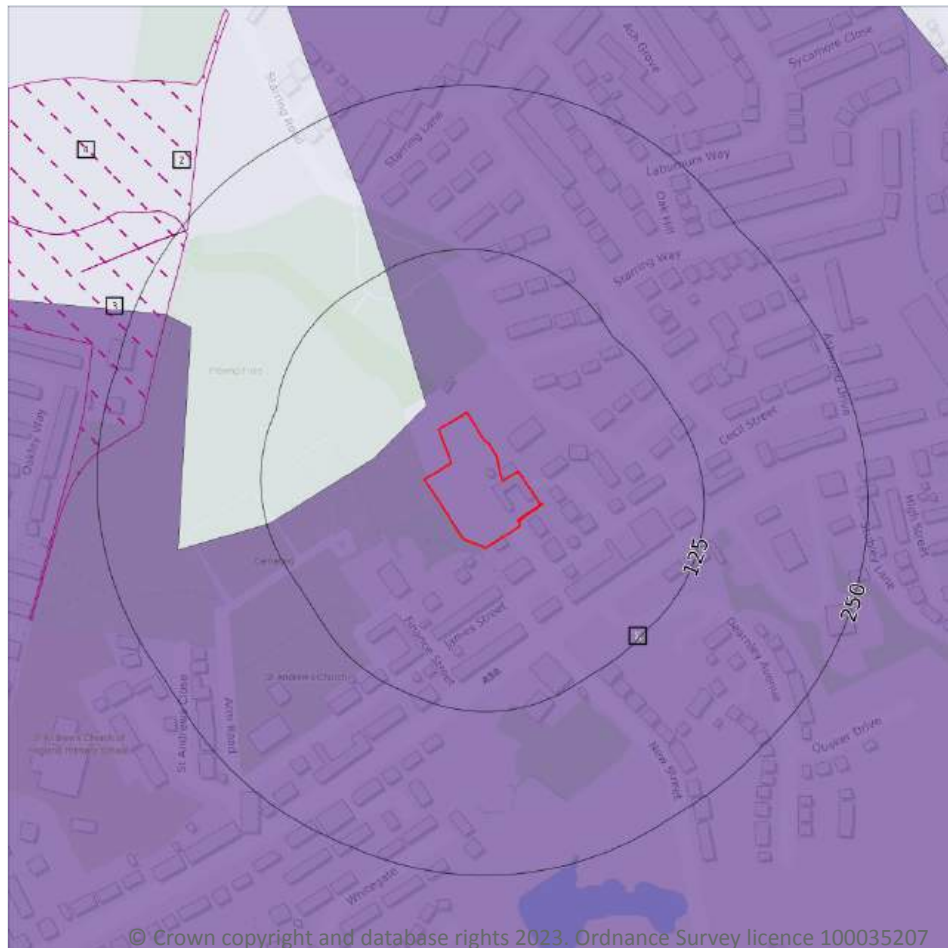
0

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

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



12 Agricultural designations



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

12.1 Agricultural Land Classification

Records within 250m

2

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 86](#) >

ID	Location	Classification	Description
1	On site	Urban	-

ID	Location	Classification	Description
2	19m NW	Grade 4	Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m

2

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.

Features are displayed on the Agricultural designations map on [page 86 >](#)

ID	Location	Name	Classification	Other relevant legislation
3	220m W	-	Section 4 Conclusive Open Country	-
4	245m NW	-	Section 4 Conclusive Open Country	-

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

12.3 Tree Felling Licences

Records within 250m

0

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

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

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

This data is sourced from Natural England.



12.5 Countryside Stewardship Schemes

Records within 250m

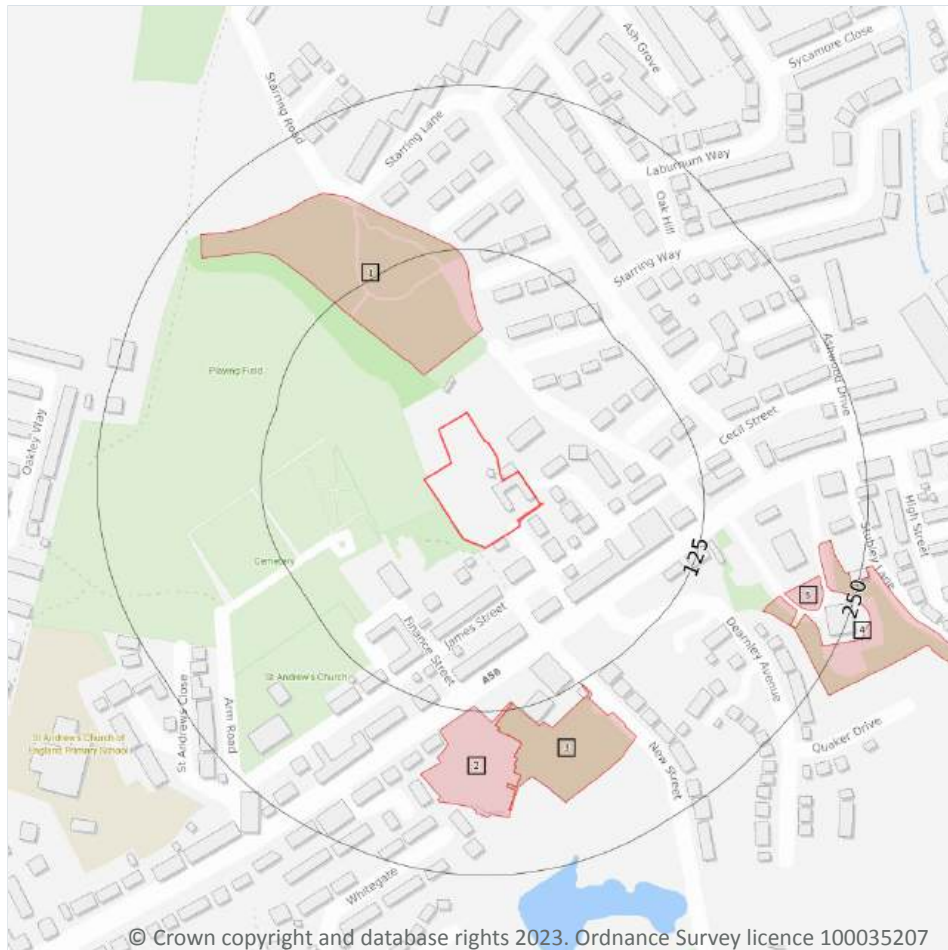
0

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

This data is sourced from Natural England.



13 Habitat designations



- Site Outline
- Search buffers in metres (m)
- Priority Habitat Inventory
- Open Mosaic Habitat
- Limestone Pavement Orders
- Habitat Networks
- Primary Habitat
- Restorable Habitat
- Associated Habitats
- Habitat Restoration-Creation
- Network Enhancement Zone 1
- Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

5

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 89](#) >

ID	Location	Main Habitat	Other habitats
1	42m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	119m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	120m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	189m SE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)



ID	Location	Main Habitat	Other habitats
5	198m 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.

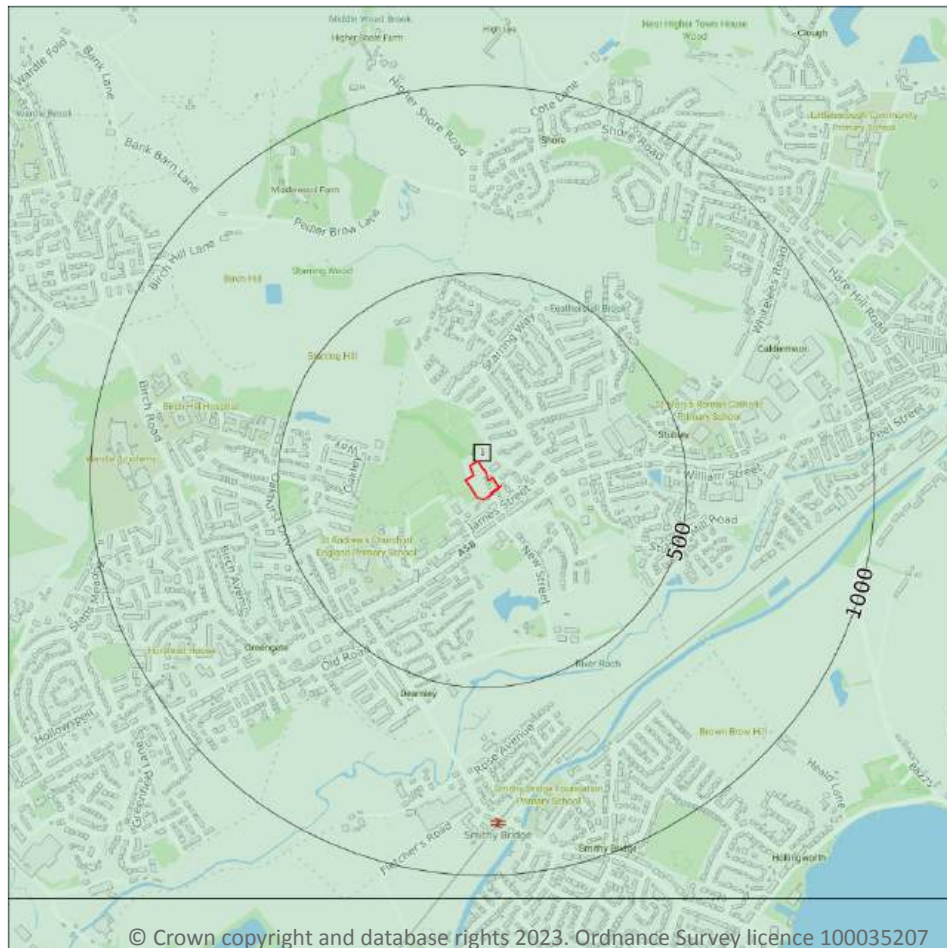
13.4 Limestone Pavement Orders

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.

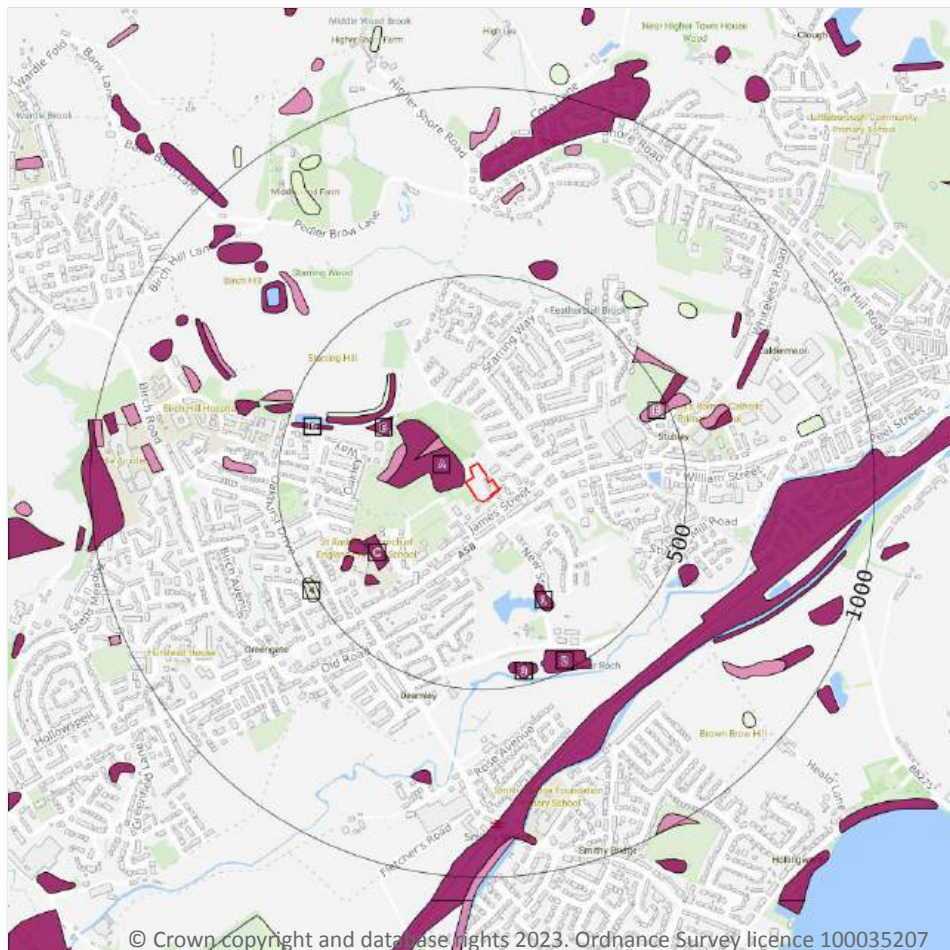
Features are displayed on the Geology 1:10,000 scale - Availability map on [page 91](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SD91NW

This data is sourced from the British Geological Survey.



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



— Site Outline
Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m

19

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.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on [page 92](#) >

ID	Location	LEX Code	Description	Rock description
A	5m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	86m NW	WGR-VOID	Worked Ground (Undivided)	Void
A	174m NW	WGR-VOID	Worked Ground (Undivided)	Void
B	233m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

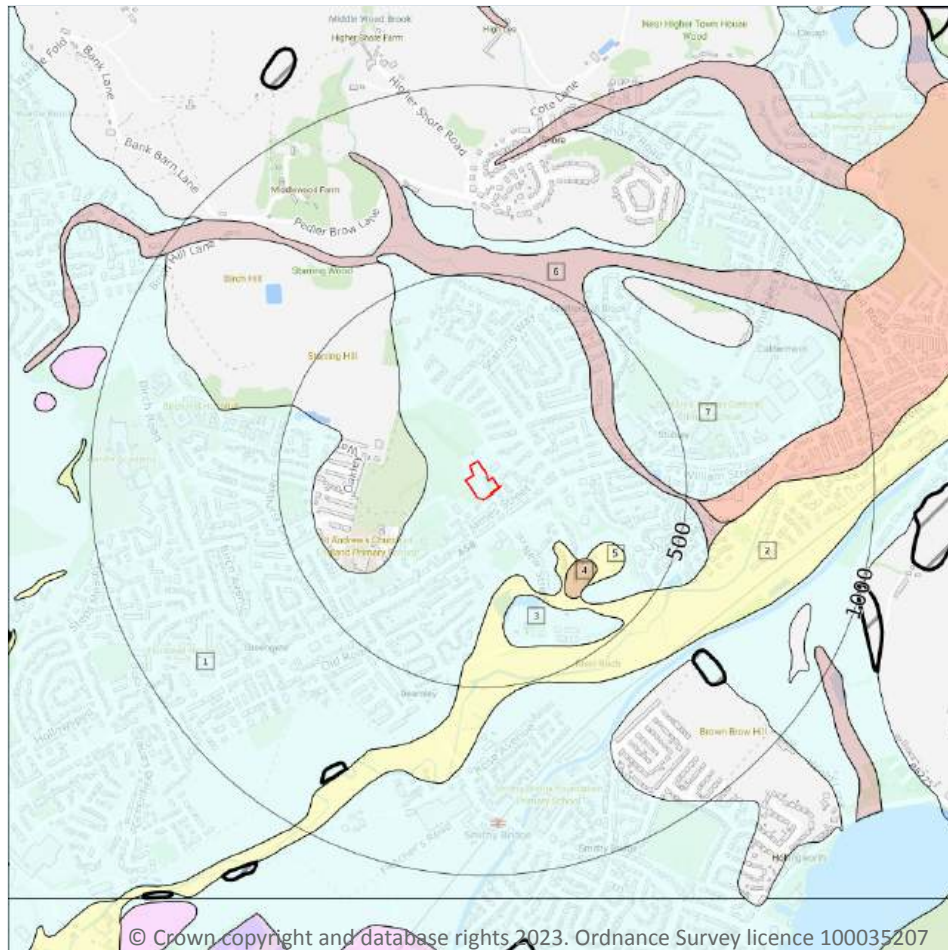


ID	Location	LEX Code	Description	Rock description
1	261m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
B	263m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
B	278m NW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
C	278m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
C	318m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
C	340m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
C	359m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
D	379m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
E	421m E	WGR-VOID	Worked Ground (Undivided)	Void
2	429m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	434m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	483m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
E	486m NE	WGR-VOID	Worked Ground (Undivided)	Void
E	486m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
D	499m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (10k)
- Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

7

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.

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 94](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
2	211m SE	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	272m S	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton



ID	Location	LEX Code	Description	Rock description
4	283m SE	PEAT-P	Peat - Peat	Peat
5	299m SE	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
6	310m NE	HEAD-DMTN	Head - Diamicton	Diamicton
7	350m E	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

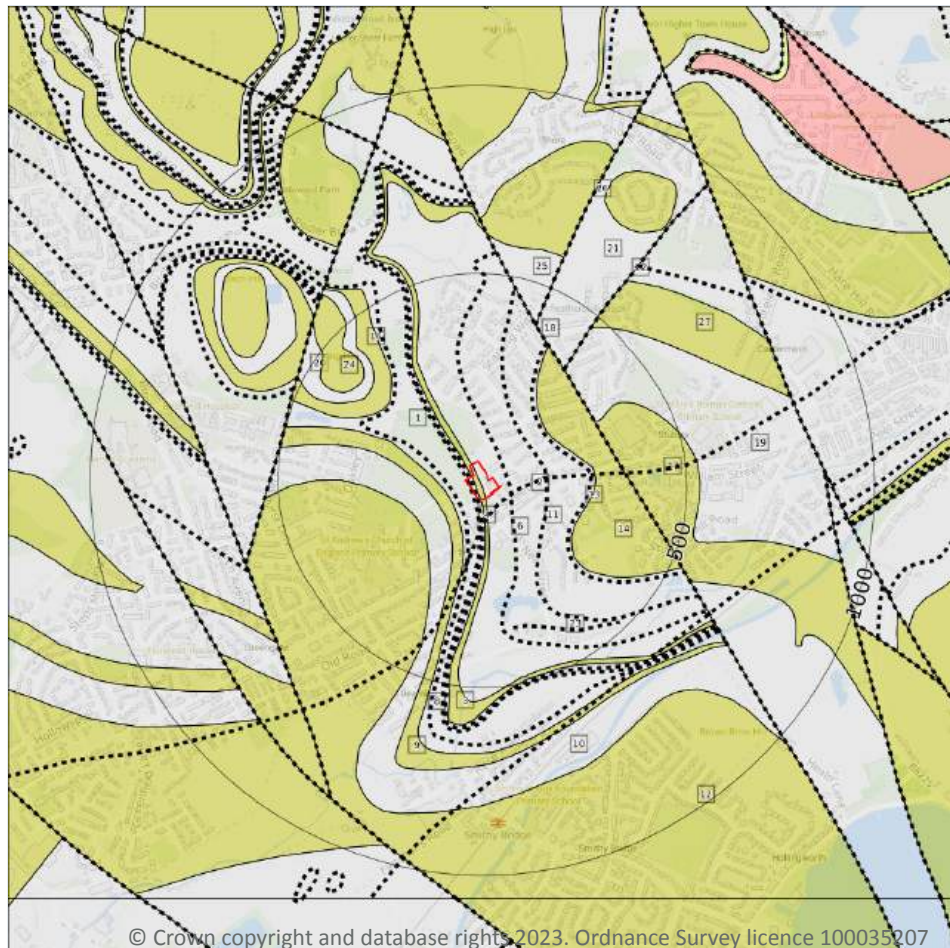
0

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



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

15

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.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 96](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
2	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
3	On site	GAS-SDST	Great Arc Sandstone - Sandstone	Langsettian Sub-age



ID	Location	LEX Code	Description	Rock age
9	62m W	DF-SDST	Darwen Flags - Sandstone	Langsettian Sub-age
10	97m SW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
12	165m SW	MLRS-SDST	Milnrow Sandstone - Sandstone	Langsettian Sub-age
14	189m NE	WH-SDST	Woodhead Hill Rock - Sandstone	Langsettian Sub-age
16	273m NW	DF-SDST	Darwen Flags - Sandstone	Langsettian Sub-age
17	308m NE	MLRS-SDST	Milnrow Sandstone - Sandstone	Langsettian Sub-age
19	309m NE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
20	332m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
21	335m NE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
24	365m NW	MLRS-SDST	Milnrow Sandstone - Sandstone	Langsettian Sub-age
25	393m N	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
27	462m NE	DF-SDST	Darwen Flags - Sandstone	Langsettian Sub-age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

12

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.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 96 >](#)

ID	Location	Category	Description
4	On site	ROCK	Coal seam, inferred
5	On site	FOSSIL_HORIZON	Fossil horizon, marine band
6	29m E	ROCK	Coal seam, inferred
7	30m SE	LANDFORM	Buried channel or valley margin
8	45m W	ROCK	Coal seam, inferred

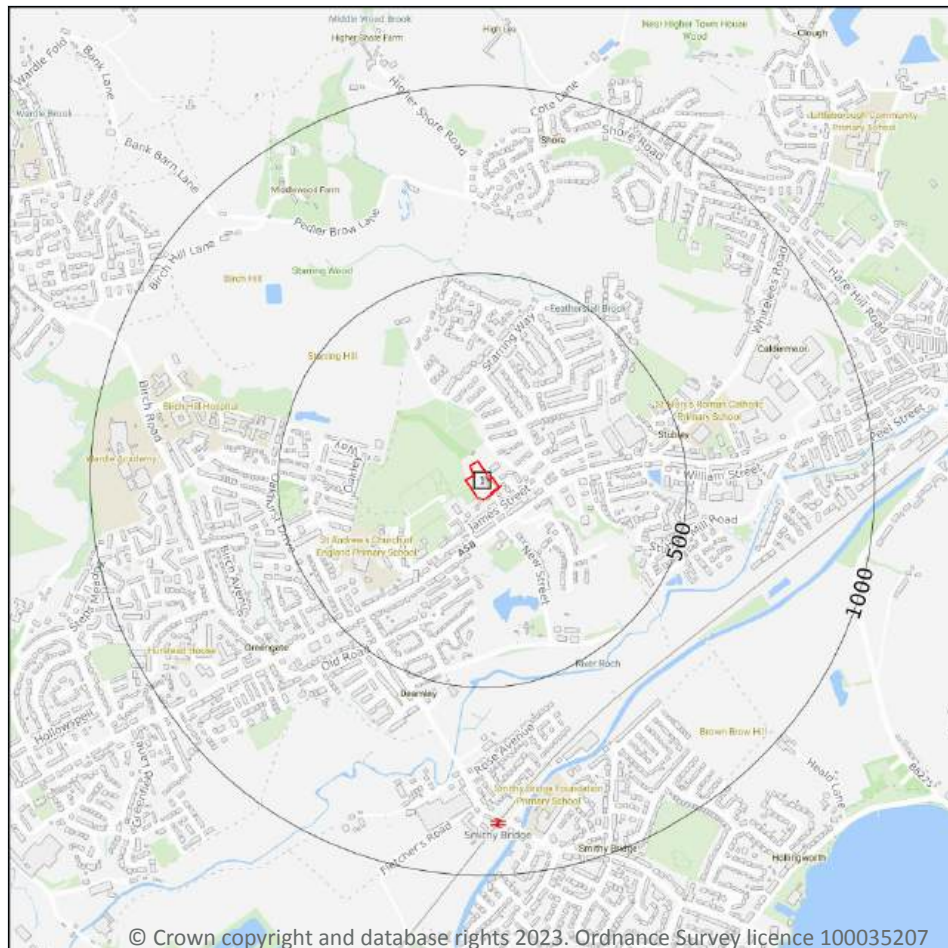


ID	Location	Category	Description
11	126m E	ROCK	Coal seam, inferred
13	181m NE	ROCK	Coal seam, inferred
15	263m NW	ROCK	Coal seam, inferred
18	308m NE	FAULT	Normal fault, inferred
22	335m NE	FAULT	Normal fault, inferred
23	350m S	LANDFORM	Crestline of elongate mound
26	393m N	FAULT	Normal fault, inferred

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 99](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW076_rochdale_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

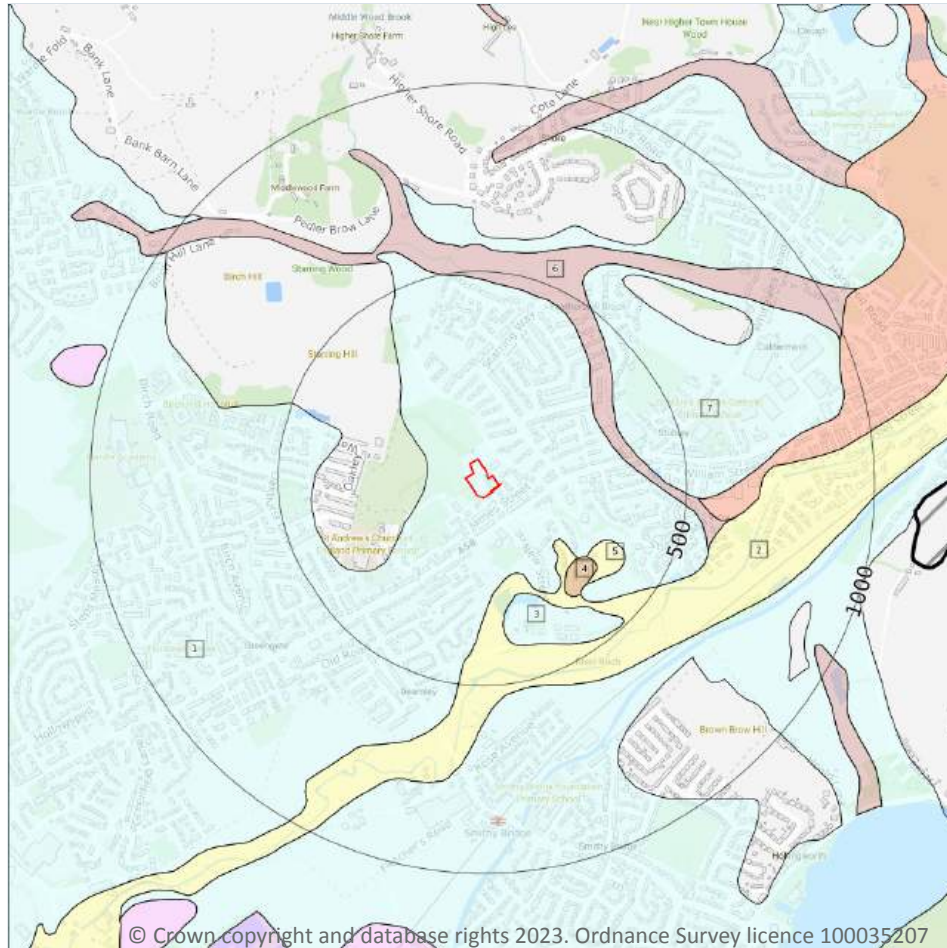
0

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

7

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 101](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON
2	210m SE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
3	272m S	TILLD-DMTN	TILL, DEVANSIAN	DIAMICTON



ID	Location	LEX Code	Description	Rock description
4	283m SE	PEAT-P	PEAT	PEAT
5	299m SE	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
6	310m NE	HEAD-DMTN	HEAD	DIAMICTON
7	350m E	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.

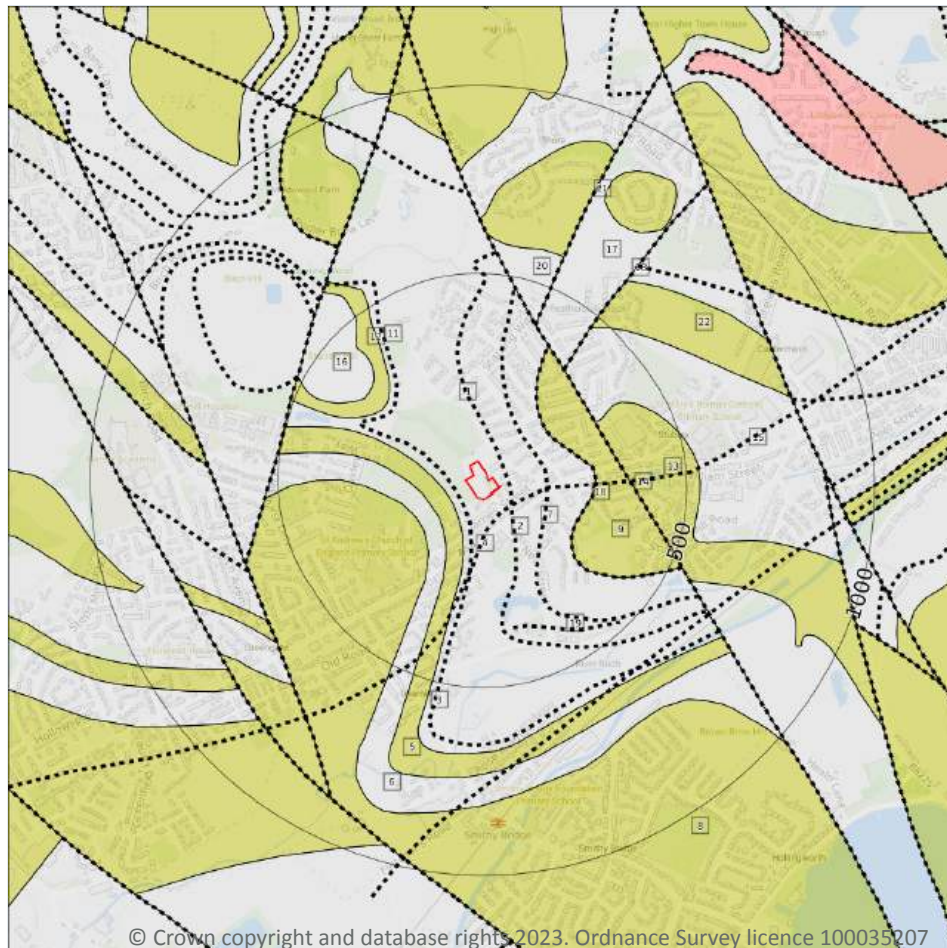
15.7 Landslip permeability (50k)

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 103 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
5	62m W	DF-SDST	DARWEN FLAGS - SANDSTONE	WESTPHALIAN
6	114m SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
8	165m SW	MLRS-SDST	MILNROW SANDSTONE - SANDSTONE	WESTPHALIAN
9	189m NE	WH-SDST	WOODHEAD HILL ROCK - SANDSTONE	WESTPHALIAN
12	277m NW	DF-SDST	DARWEN FLAGS - SANDSTONE	WESTPHALIAN
13	308m NE	MLRS-SDST	MILNROW SANDSTONE - SANDSTONE	WESTPHALIAN
15	309m NE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
16	332m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
17	335m NE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
20	392m N	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
22	462m NE	DF-SDST	DARWEN FLAGS - 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	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

10

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 103](#) >



ID	Location	Category	Description
2	28m E	ROCK	Coal seam, inferred
3	37m W	ROCK	Coal seam, inferred
4	51m SE	LANDFORM	Approximate margin of buried (superficial deposit-filled) channel or valley
7	126m E	ROCK	Coal seam, inferred
10	189m NE	ROCK	Coal seam, inferred
11	253m NW	ROCK	Coal seam, inferred
14	308m NE	FAULT	Fault, inferred
18	335m NE	FAULT	Fault, inferred
19	349m S	LANDFORM	Elongate mound crestline
21	392m N	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

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

16.1 BGS Boreholes

Records within 250m

2

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

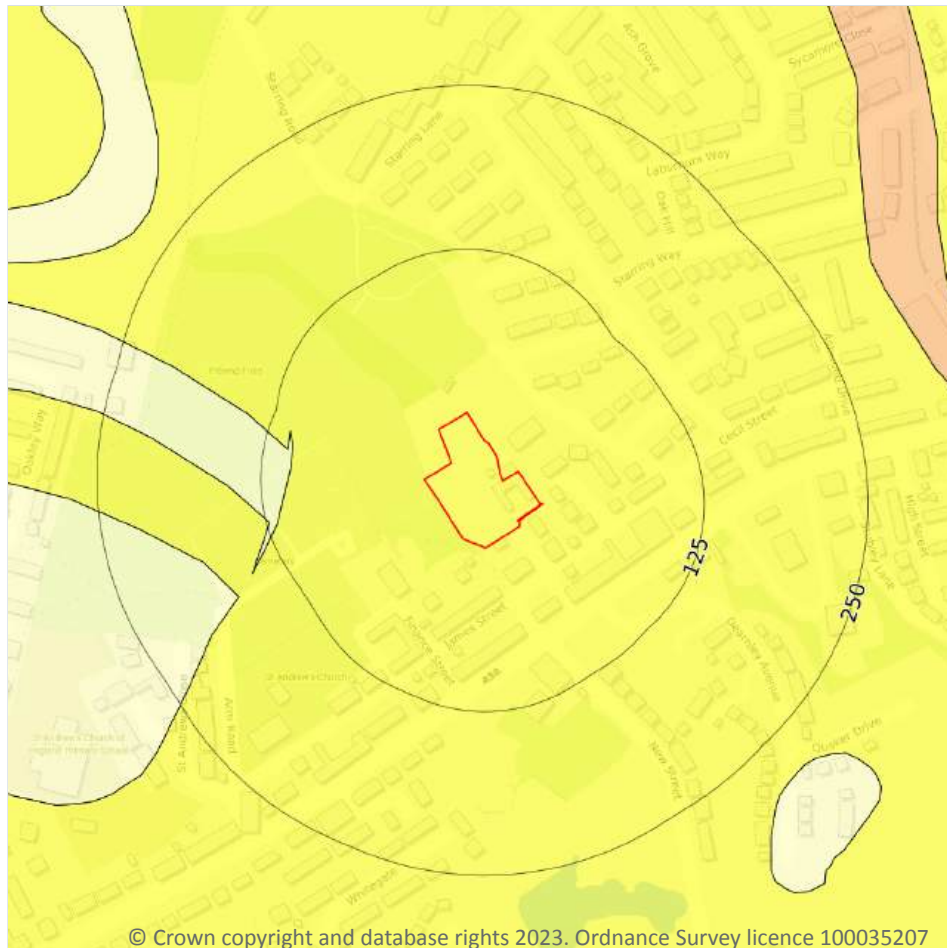
Features are displayed on the Boreholes map on [page 106 >](#)

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	109m SE	392664 416007	STUBLEY BROW	83.52	N	34813 ↗
2	148m SE	392670 415960	LANCTON FLORANA LTD	-1.0	N	34940 ↗

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

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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).

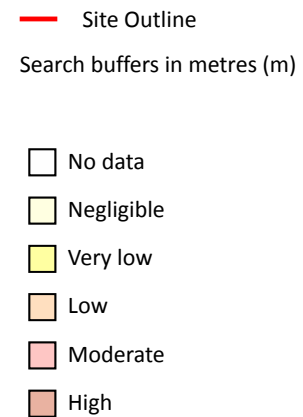
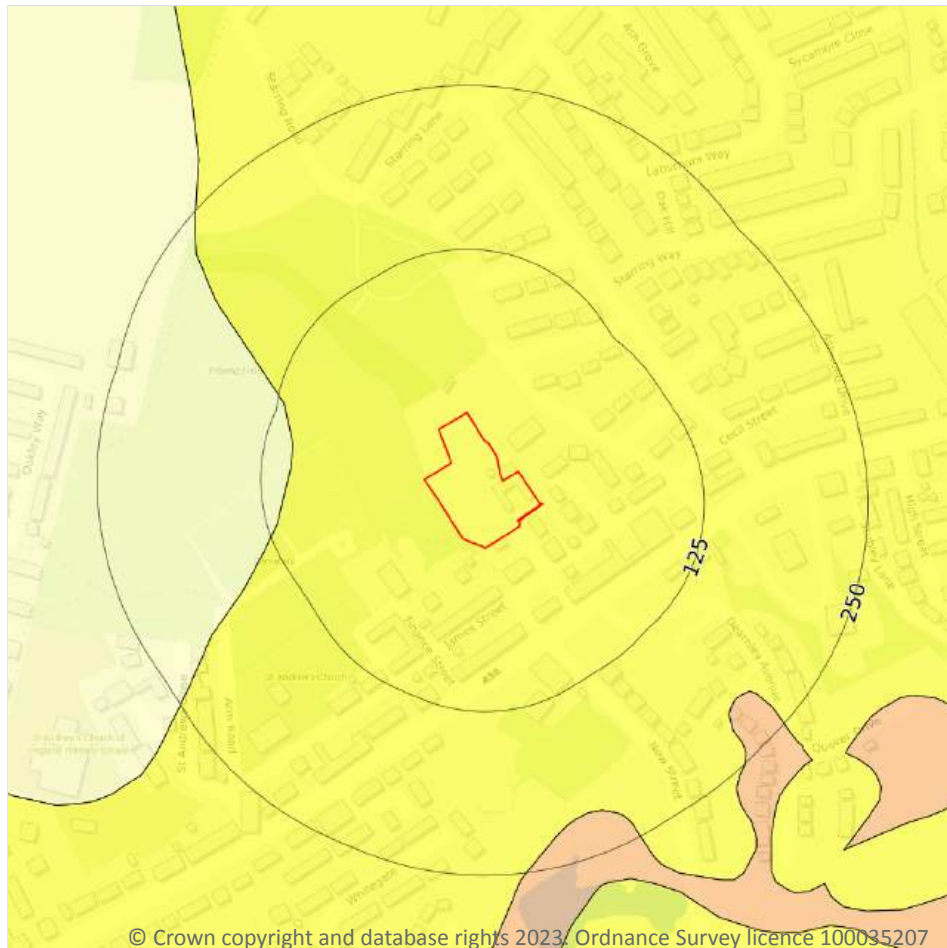
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 107](#) >

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



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.

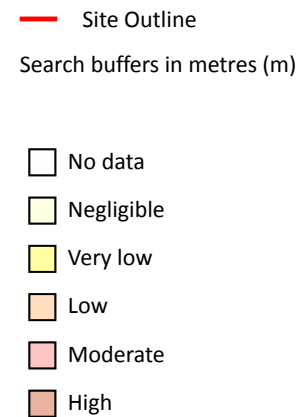
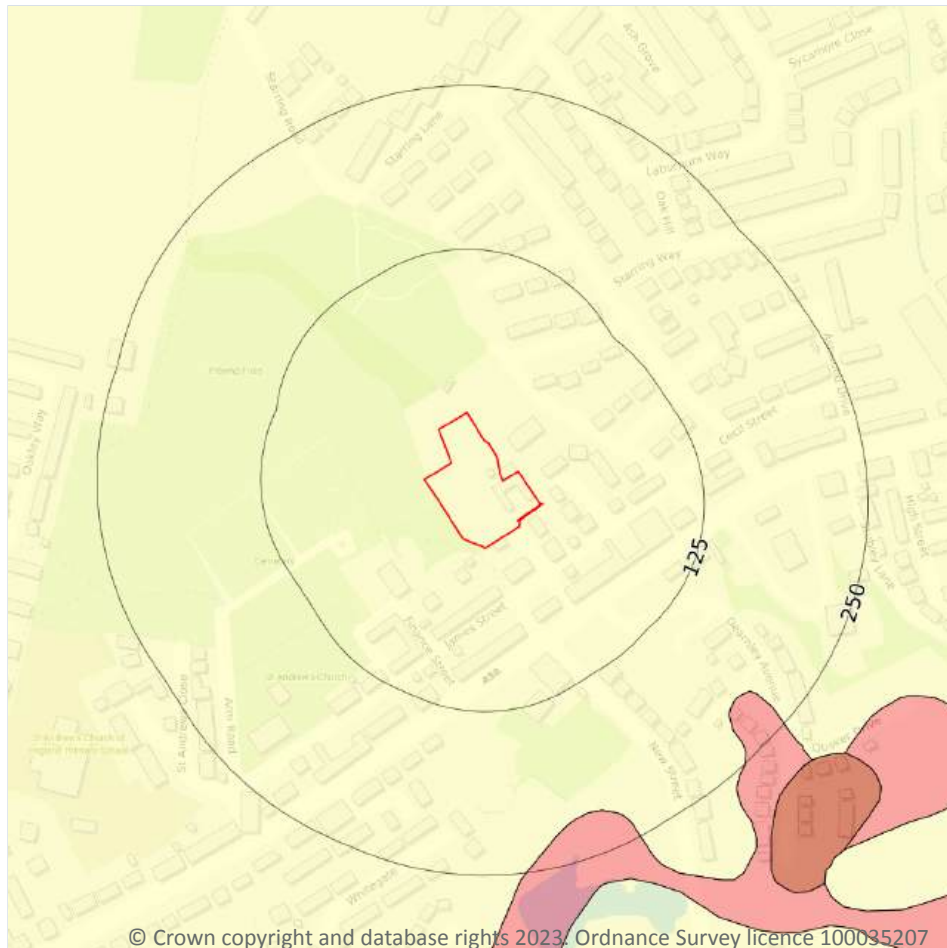
Features are displayed on the Natural ground subsidence - Running sands map on [page 108](#) >

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



17.3 Compressible deposits

Records within 50m

1

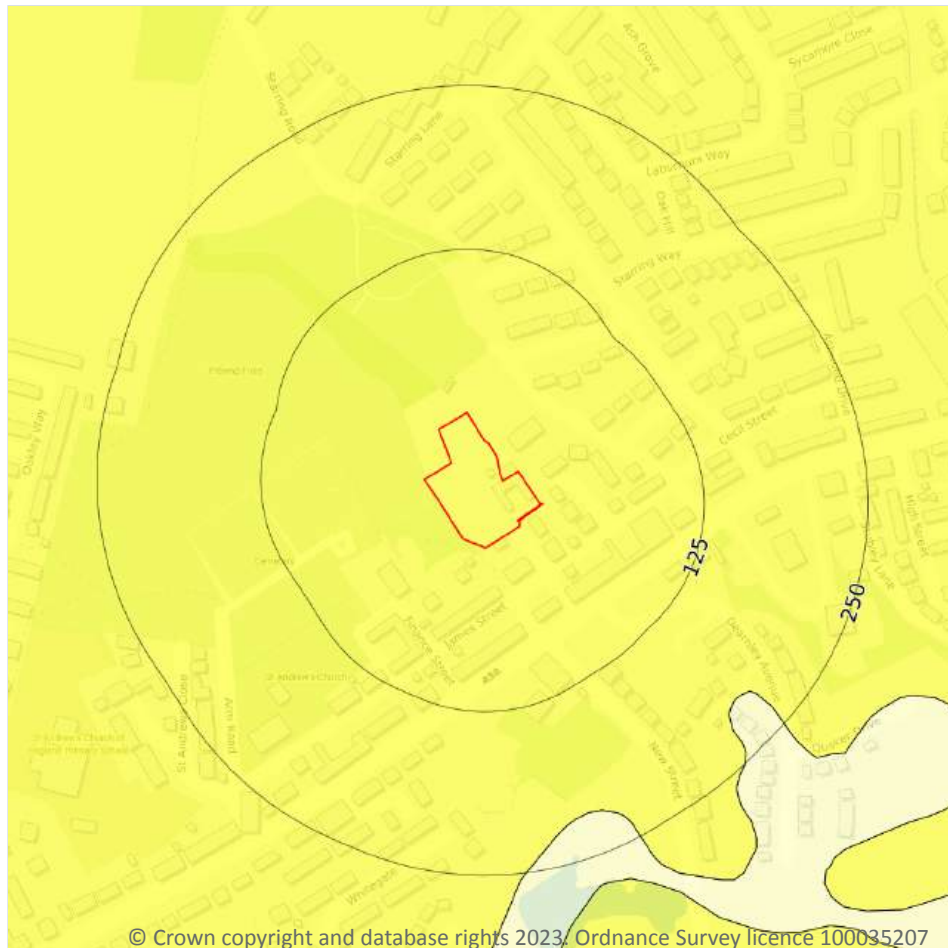
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

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



- 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.

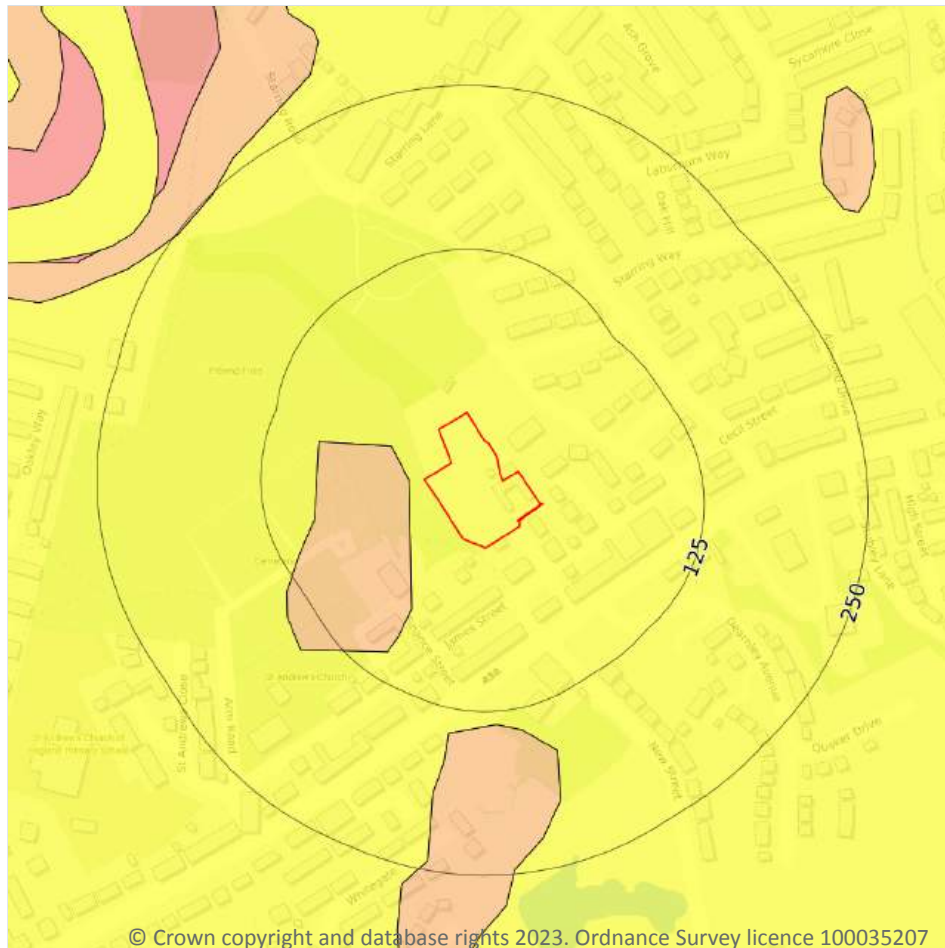
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 110 >](#)

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

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17.5 Landslides

Records within 50m

2

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](#) >

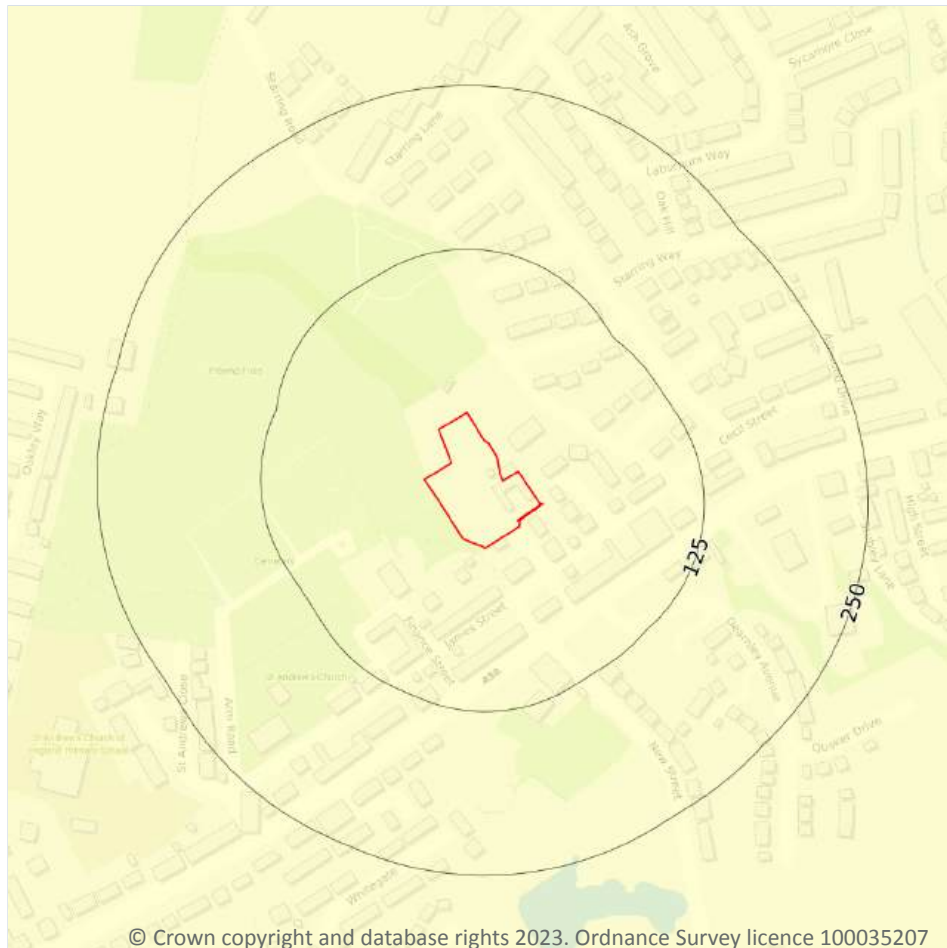
Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

Location	Hazard rating	Details
12m W	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



— Site Outline
Search buffers in metres (m)

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

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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 113 >](#)

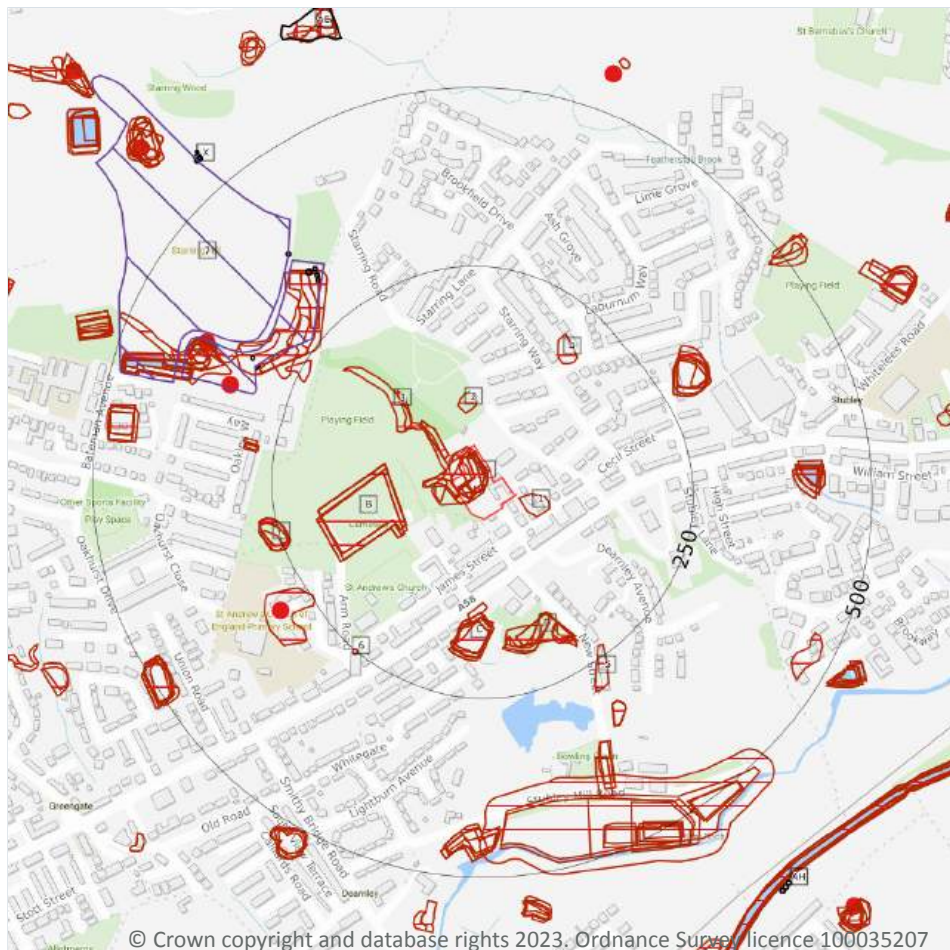
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



This data is sourced from the British Geological Survey.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining
- 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 BritPits

Records within 500m

3

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 and ground workings map on [page 115](#) >

ID	Location	Details	Description
G	298m SW	Name: Newroad Address: LITTLEBOROUGH, Lancashire 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
E	334m W	Name: Starring Stoneware Works Address: Wardle, ROCHDALE, Lancashire Commodity: Fireclay Status: Ceased	Type: Working is partly surface and partly underground, working the same bodies for the same commodities 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
E	385m NW	Name: Starring Sanitary Pipe Works Address: Wardle, ROCHDALE, Lancashire 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

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	53
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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 and ground workings map on [page 115 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Reservoirs	1989	1:10000
A	On site	Reservoirs	1976	1:10000
A	On site	Reservoirs	1949	1:10560
A	On site	Reservoirs	1928	1:10560
A	On site	Reservoirs	1908	1:10560
A	On site	Ponds	1968	1:10560
A	On site	Unspecified Ground Workings	1989	1:10000



ID	Location	Land Use	Year of mapping	Mapping scale
A	On site	Unspecified Ground Workings	1976	1:10000
A	On site	Reservoirs	1938	1:10560
A	On site	Reservoirs	1890	1:10560
A	On site	Unspecified Ground Workings	1968	1:10560
A	5m W	Unspecified Pit	1928	1:10560
1	8m E	Pond	1890	1:10560
A	14m NW	Unspecified Ground Workings	1989	1:10000
A	14m NW	Unspecified Ground Workings	1976	1:10000
2	47m N	Unspecified Pit	1938	1:10560
B	78m W	Cemetery	1989	1:10000
B	78m W	Cemetery	1976	1:10000
B	78m W	Cemetery	1949	1:10560
B	78m W	Cemetery	1968	1:10560
3	79m NW	Refuse Heap	1928	1:10560
B	79m W	Cemetery	1938	1:10560
B	85m W	Cemetery	1928	1:10560
B	85m W	Cemetery	1908	1:10560
C	117m S	Reservoir	1890	1:10560
C	131m S	Pond	1989	1:10000
C	131m S	Pond	1976	1:10000
C	131m S	Reservoir	1949	1:10560
C	131m S	Pond	1968	1:10560
C	136m S	Pond	1851	1:10560
C	138m S	Reservoir	1938	1:10560
C	142m S	Reservoir	1928	1:10560
C	142m S	Reservoir	1908	1:10560
D	155m SE	Refuse Heap	1938	1:10560
D	156m SE	Refuse Heap	1928	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
D	157m SE	Unspecified Ground Workings	1989	1:10000
D	157m SE	Unspecified Ground Workings	1976	1:10000
D	157m SE	Unspecified Ground Workings	1968	1:10560
D	158m S	Refuse Heap	1949	1:10560
4	169m NE	Pond	1851	1:10560
D	175m SE	Unspecified Heap	1938	1:10560
D	176m SE	Unspecified Ground Workings	1928	1:10560
5	234m SE	Unspecified Heap	1928	1:10560
E	237m NW	Refuse Heap	1908	1:10560
F	239m W	Pond	1938	1:10560
F	239m W	Pond	1989	1:10000
F	239m W	Pond	1976	1:10000
F	239m W	Pond	1949	1:10560
F	239m W	Pond	1968	1:10560
F	241m W	Pond	1928	1:10560
E	247m NW	Refuse Heap	1938	1:10560
6	248m SW	Coal Pits	1851	1:10560
G	248m SW	Sandstone Quarry	1851	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m

20

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 and ground workings map on [page 115 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
E	304m NW	Unspecified Shaft	1908	1:10560
E	310m NW	Old Coal Shaft	1908	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
E	315m NW	Unspecified Shaft	1928	1:10560
E	316m NW	Unspecified Old Shaft	1938	1:10560
E	325m NW	Unspecified Old Shaft	1949	1:10560
E	326m NW	Unspecified Disused Shaft	1976	1:10000
E	326m NW	Unspecified Old Shaft	1968	1:10560
E	364m NW	Air Shaft	1908	1:10560
X	546m NW	Old Air Shaft	1938	1:10560
X	546m NW	Old Air Shaft	1928	1:10560
X	546m NW	Air Shaft	1908	1:10560
X	547m NW	Unspecified Old Shaft	1968	1:10560
X	557m NW	Old Air Shaft	1949	1:10560
AC	599m N	Colliery	1890	1:10560
AH	656m SE	Old Air Shaft	1949	1:10560
AH	658m SE	Old Air Shaft	1938	1:10560
AH	659m SE	Old Air Shaft	1928	1:10560
AH	659m SE	Old Air Shaft	1908	1:10560
-	873m NW	Old Coal Shaft	1908	1:10560
-	874m NW	Unspecified Old Shaft	1890	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m

0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.



18.5 Historical Mineral Planning Areas

Records within 500m

2

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 and ground workings map on [page 115 >](#)

ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
E	261m NW	Starring	Clay, coal	Surface mineral working	Valid	27/6/51
7	323m NW	Starring	Clay, fireclay	Mineral working is partly on the surface and partly underground	Valid	20/12/51

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

0

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

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site

0

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

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m

0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the



Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m

0

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m

0

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m

0

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 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.



18.13 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.

18.14 Gypsum areas

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

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

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

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 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 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m

0

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

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m

0

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

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m

0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



This data is sourced from Groundsure.

19.5 National karst database

Records within 500m

0

This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

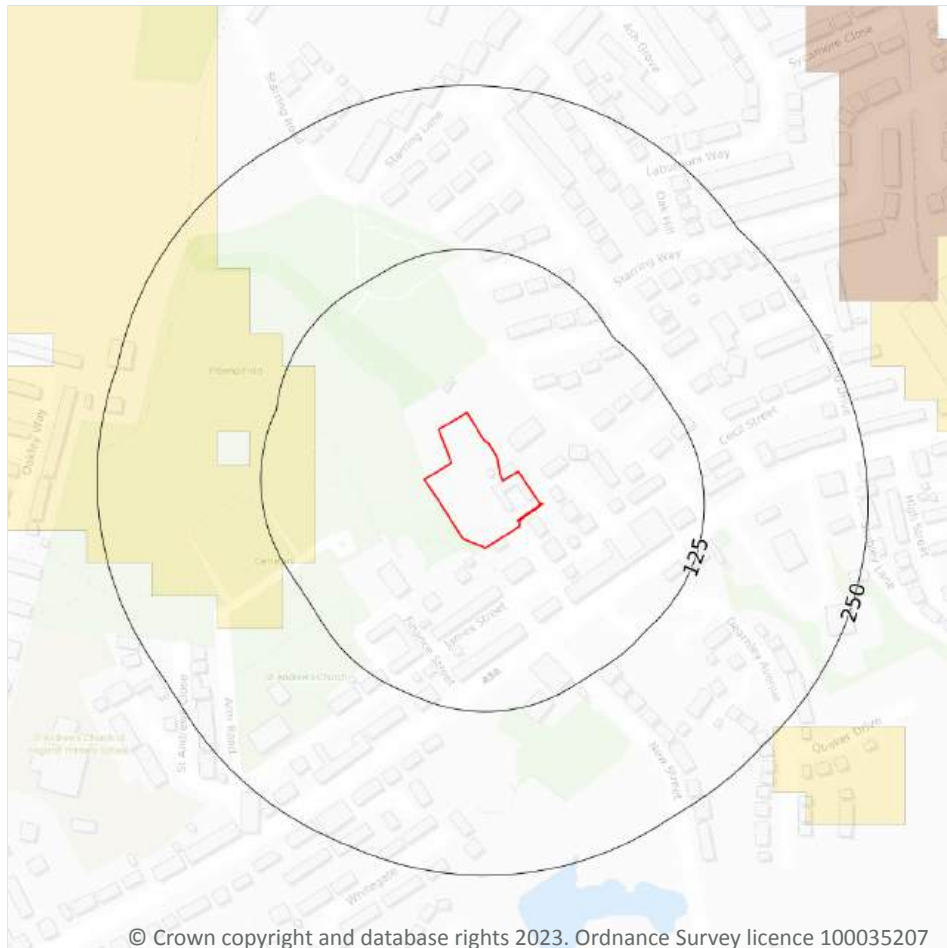
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.



20 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%

20.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on [page 125 >](#)

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



This data is sourced from the British Geological Survey and UK Health Security Agency.



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

2

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

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
8m W	15 - 25 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

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

This data is sourced from the British Geological Survey.

21.3 BGS Measured Urban Soil Chemistry

Records within 50m

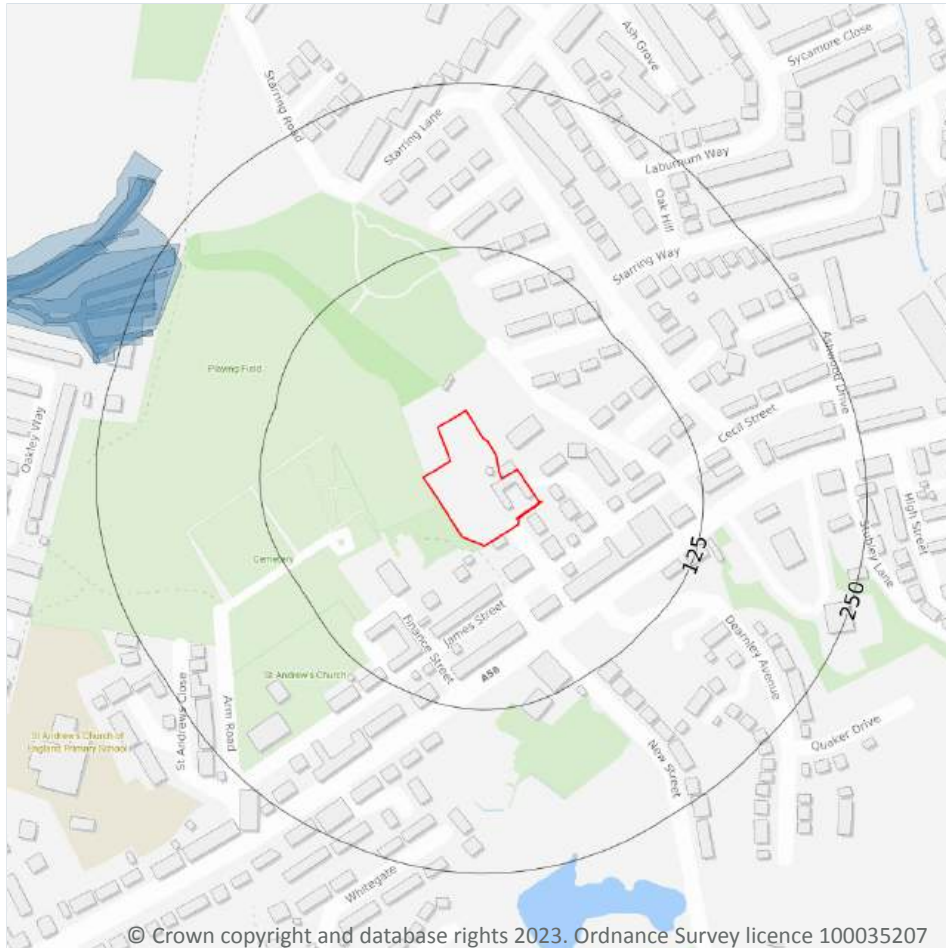
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The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects



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

22.1 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.

22.2 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.

22.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m

5

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

Features are displayed on the Railway infrastructure and projects map on [page 128 >](#)

Location	Land Use	Year of mapping	Mapping scale
228m NW	Railway Sidings	1949	10560
228m NW	Railway Sidings	1938	10560
229m NW	Tramway Sidings	1930	2500
229m NW	Tramway Sidings	1937	2500
233m NW	Railway Sidings	1928	10560

This data is sourced from Ordnance Survey/Groundsure.

22.5 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.



22.6 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.

22.7 Railways

Records within 250m**0**

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

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 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.

22.9 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.

22.10 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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Harwood Street, Littleborough,
OL15 8NA

Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: County Series

Map date: 1851

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1848
Revised N/A
Edition 1851
Copyright N/A
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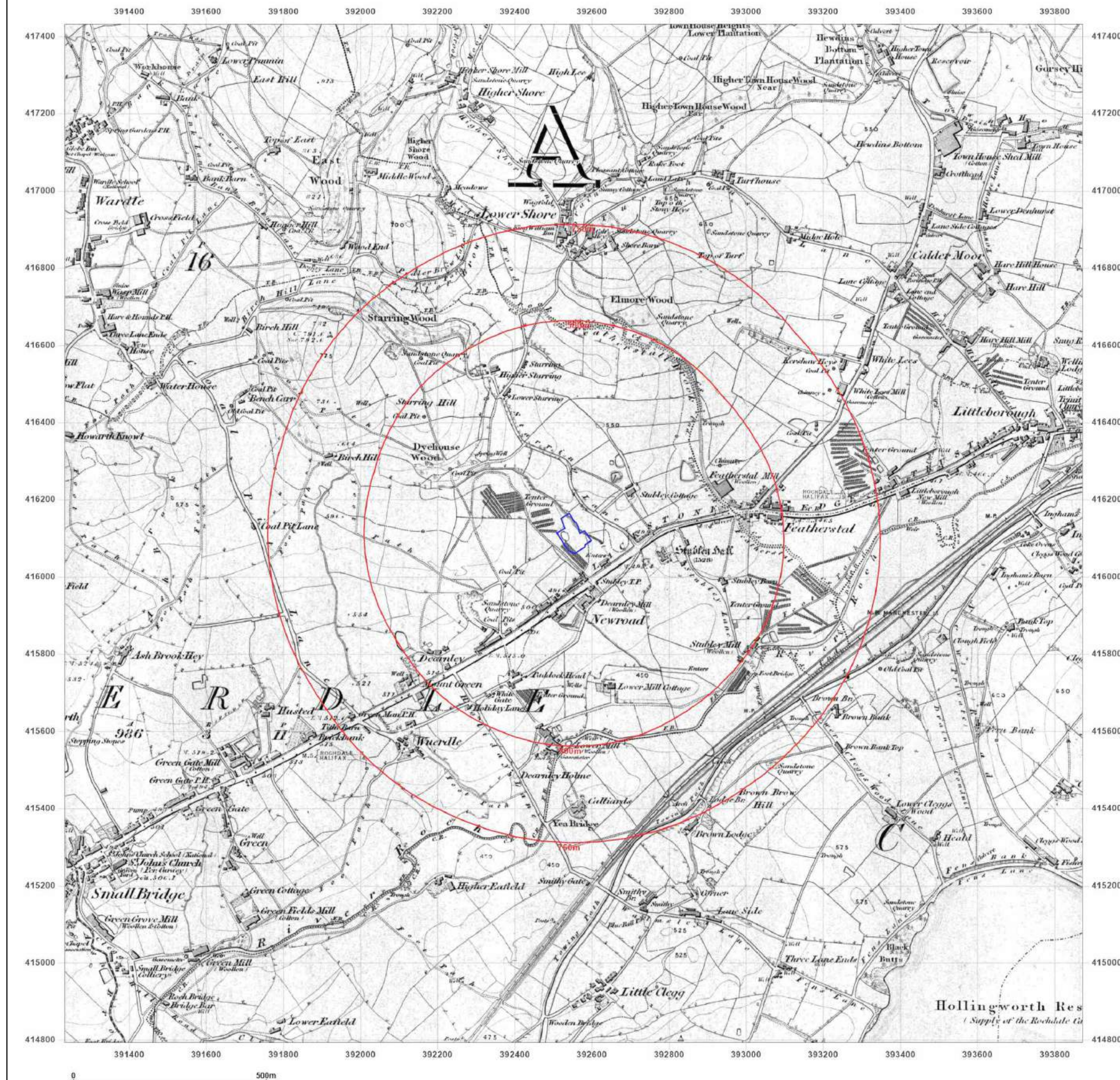


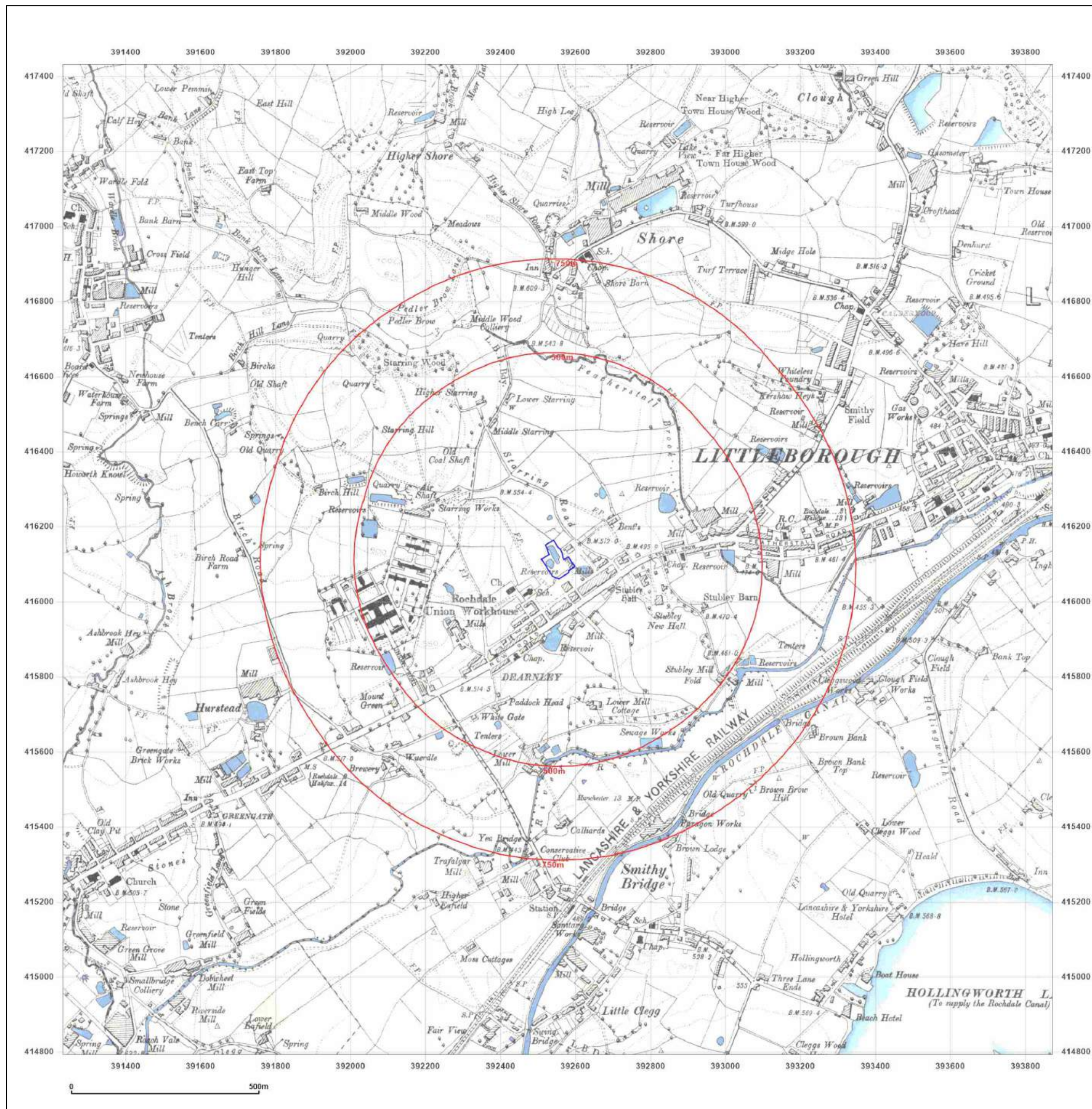
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Map Name: County Series

Map date: 1890-1892

Scale: 1:10,560

Printed at: 1:10,560



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Grid Ref: 392552, 416112

Map Name: County Series

Map date: 1908

Scale: 1:10,560

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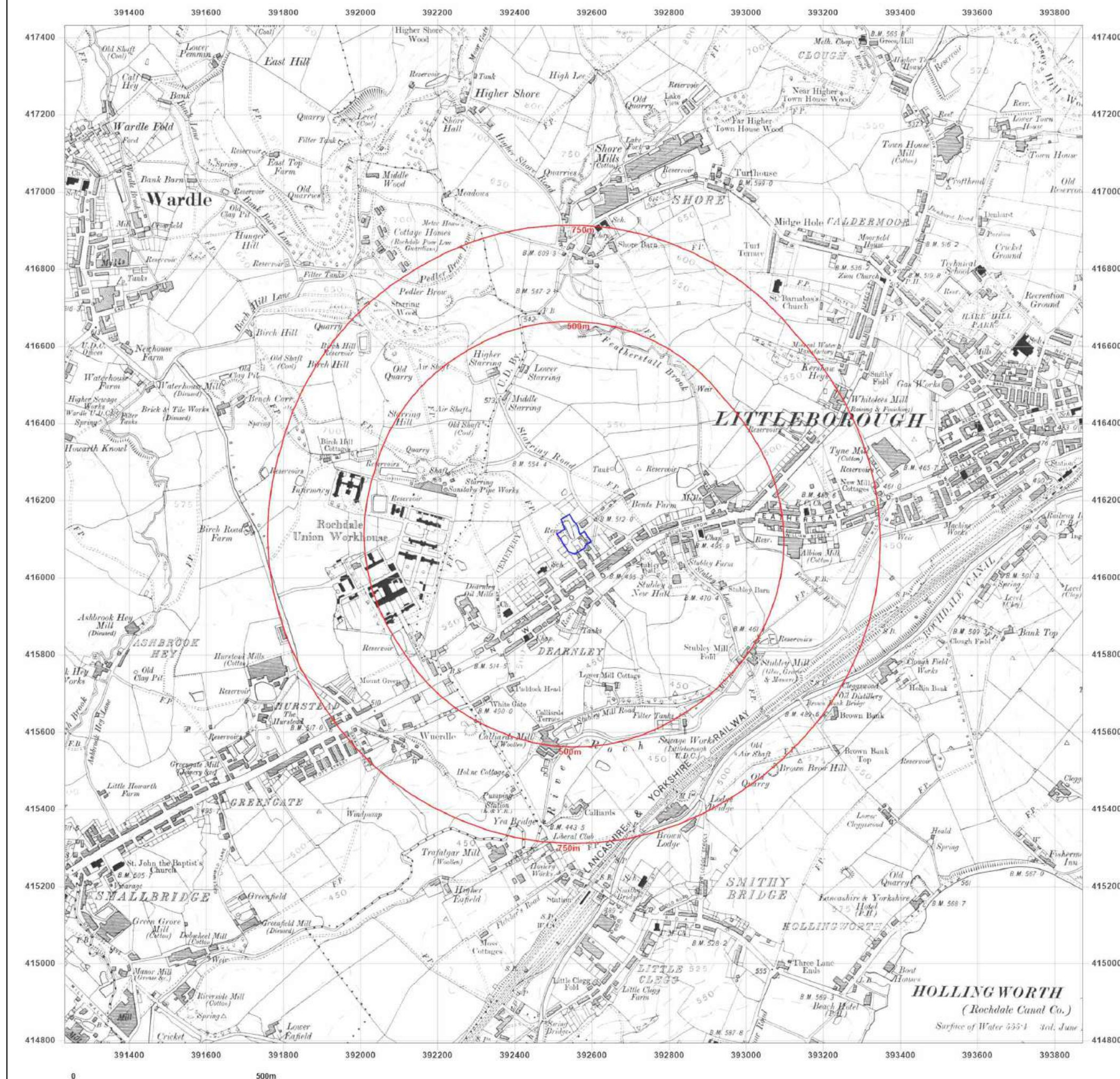


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Grid Ref: 392552, 416112

Map Name: County Series

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Printed at: 1:10,560



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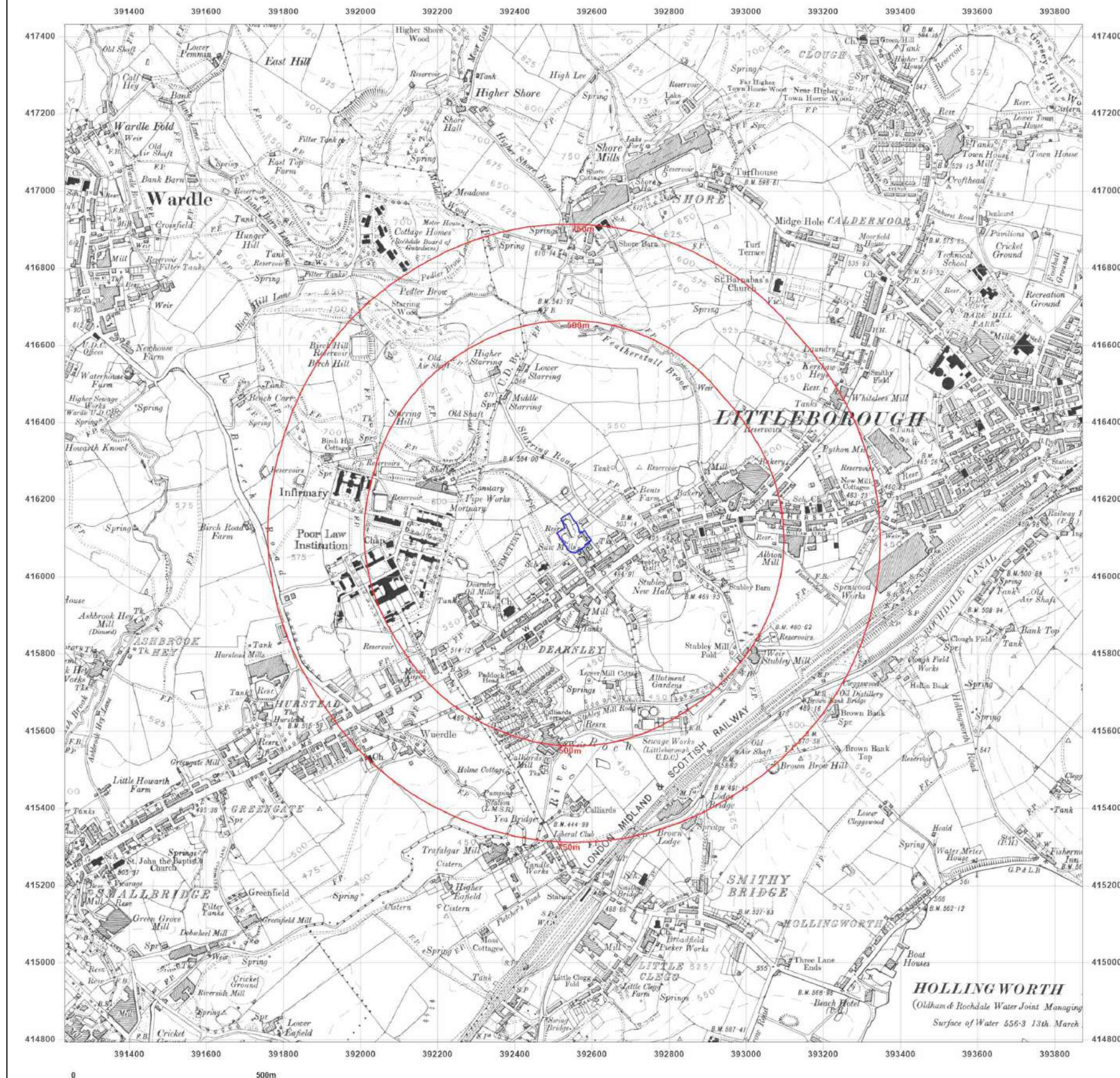


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Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



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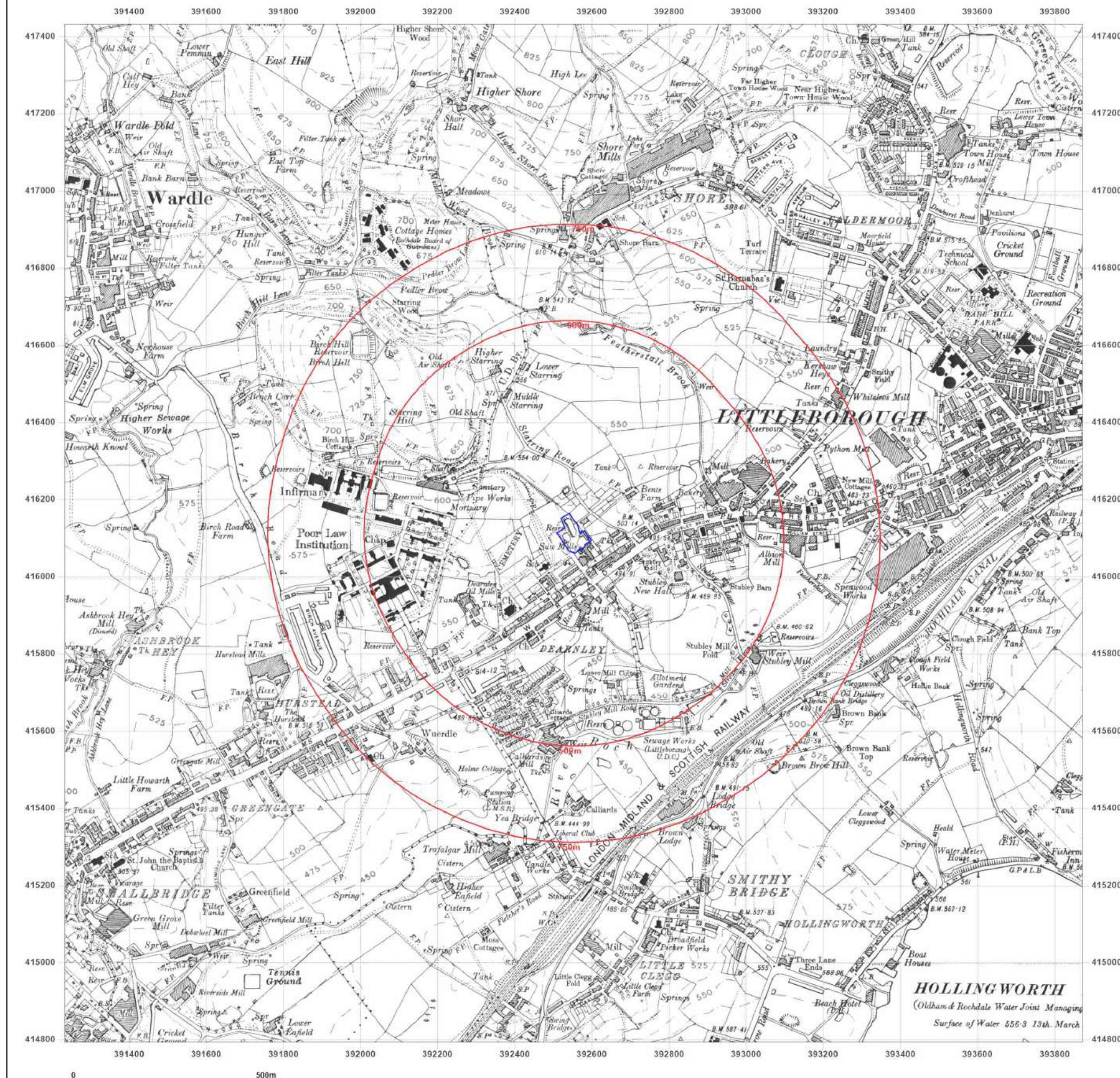


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Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: Provisional

Map date: 1949-1954

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1954
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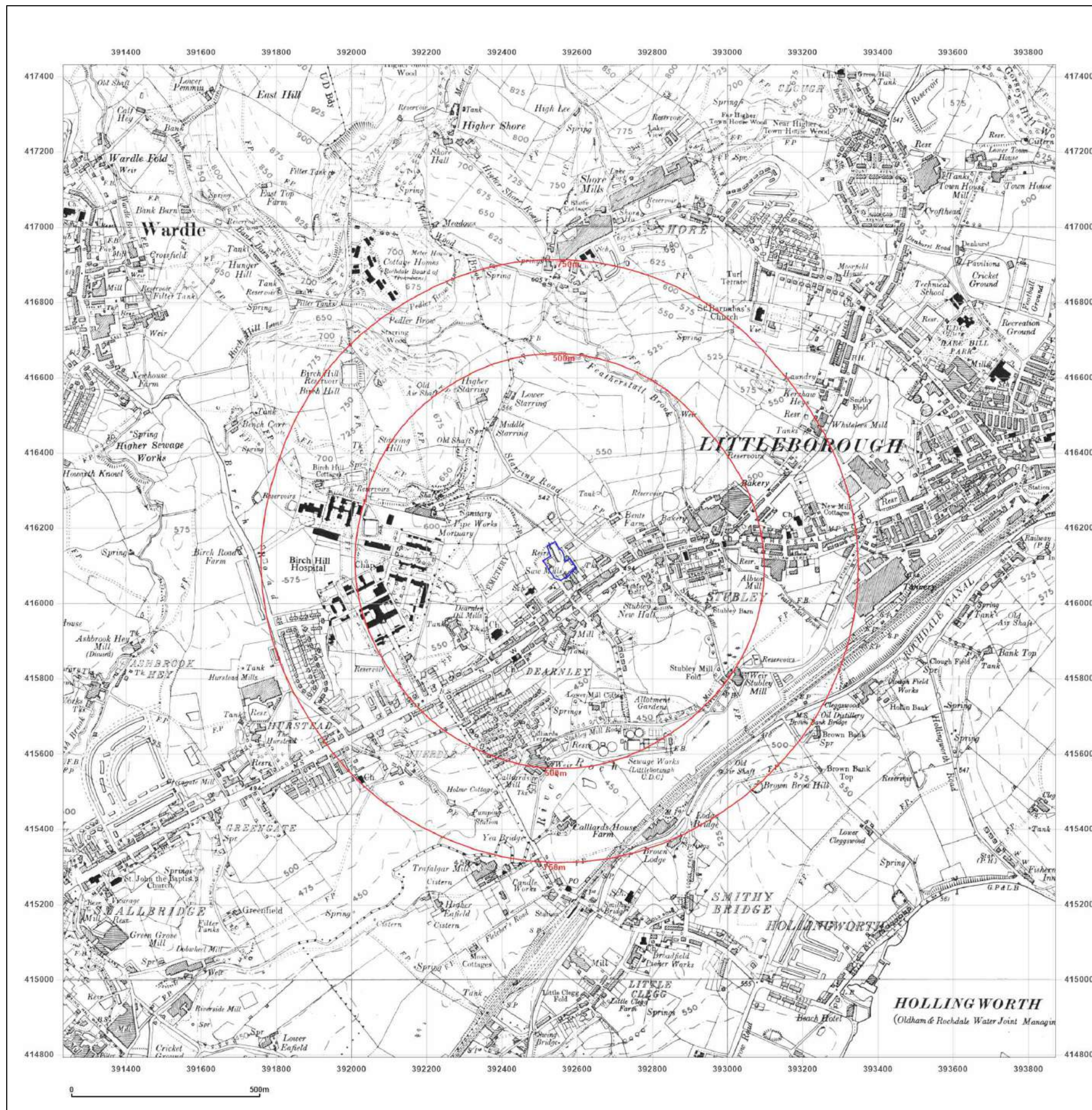


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Map Name: Provisional

Map date: 1967-1968

Scale: 1:10,560

Printed at: 1:10,560



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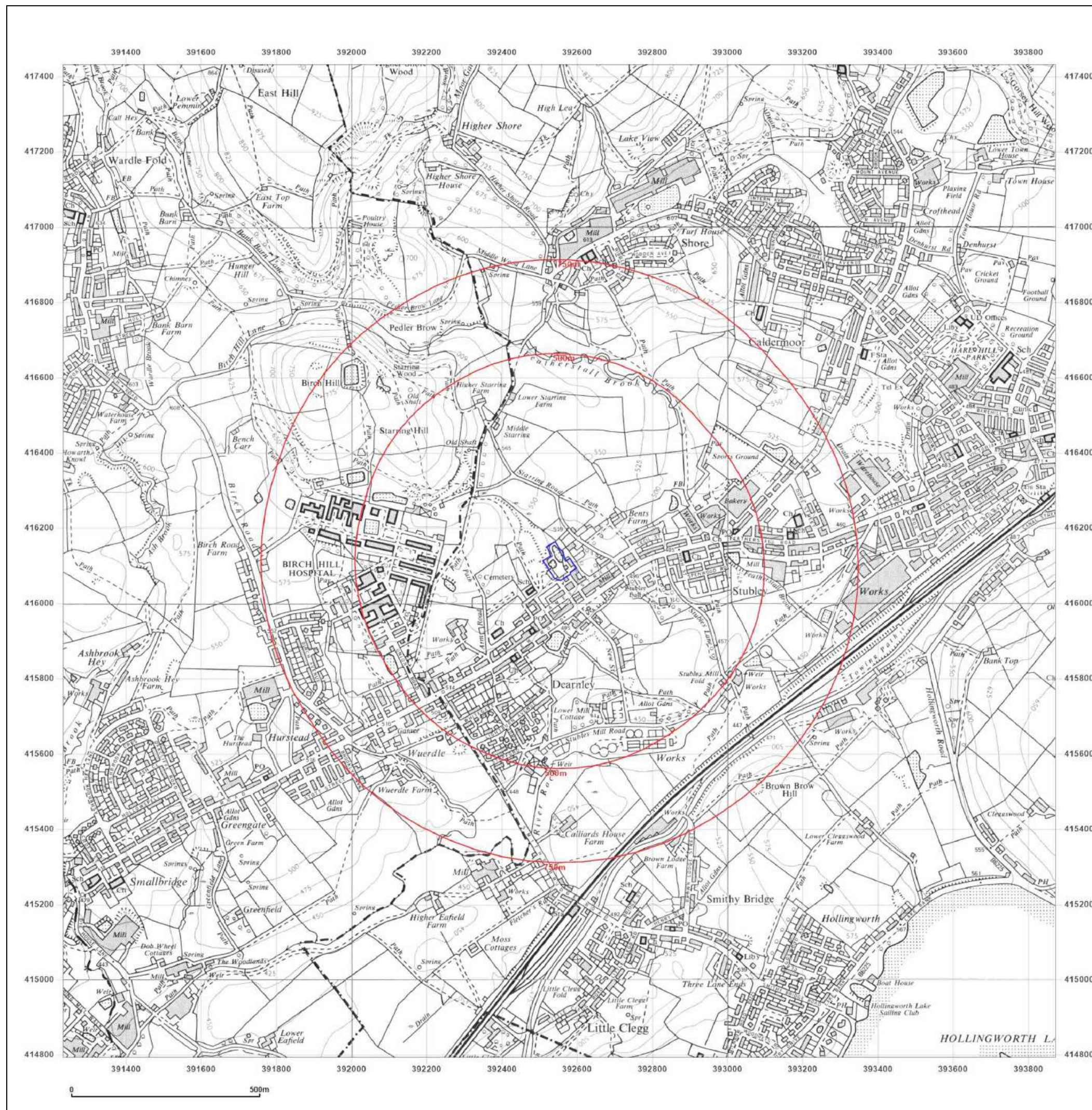


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Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 1976

Scale: 1:10,000

Printed at: 1:10,000



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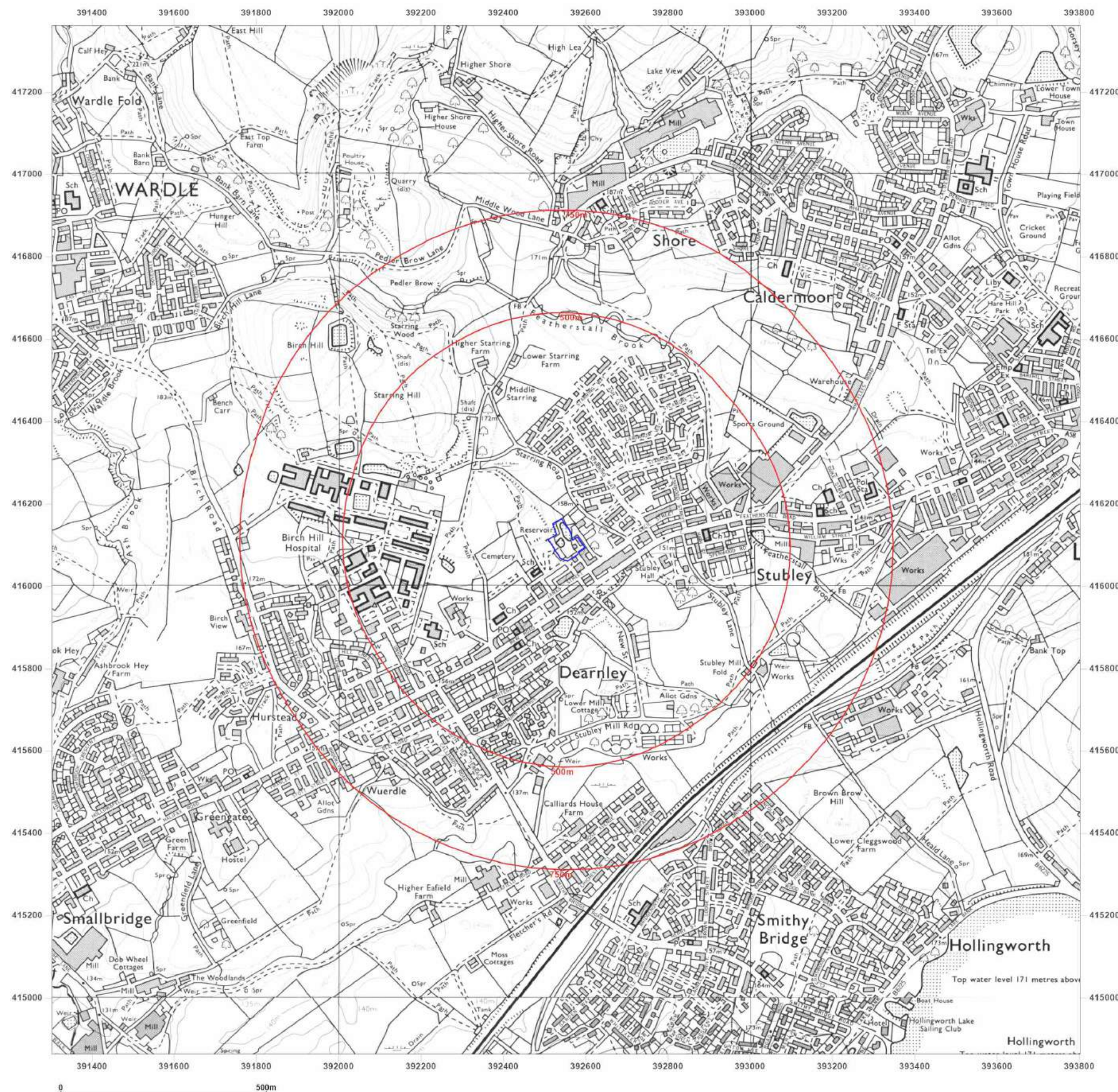


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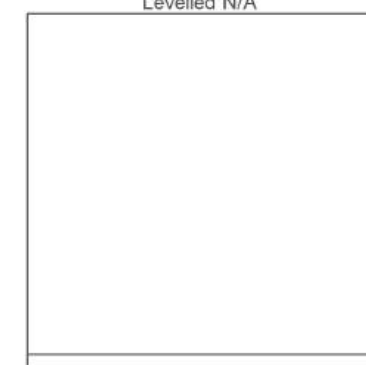
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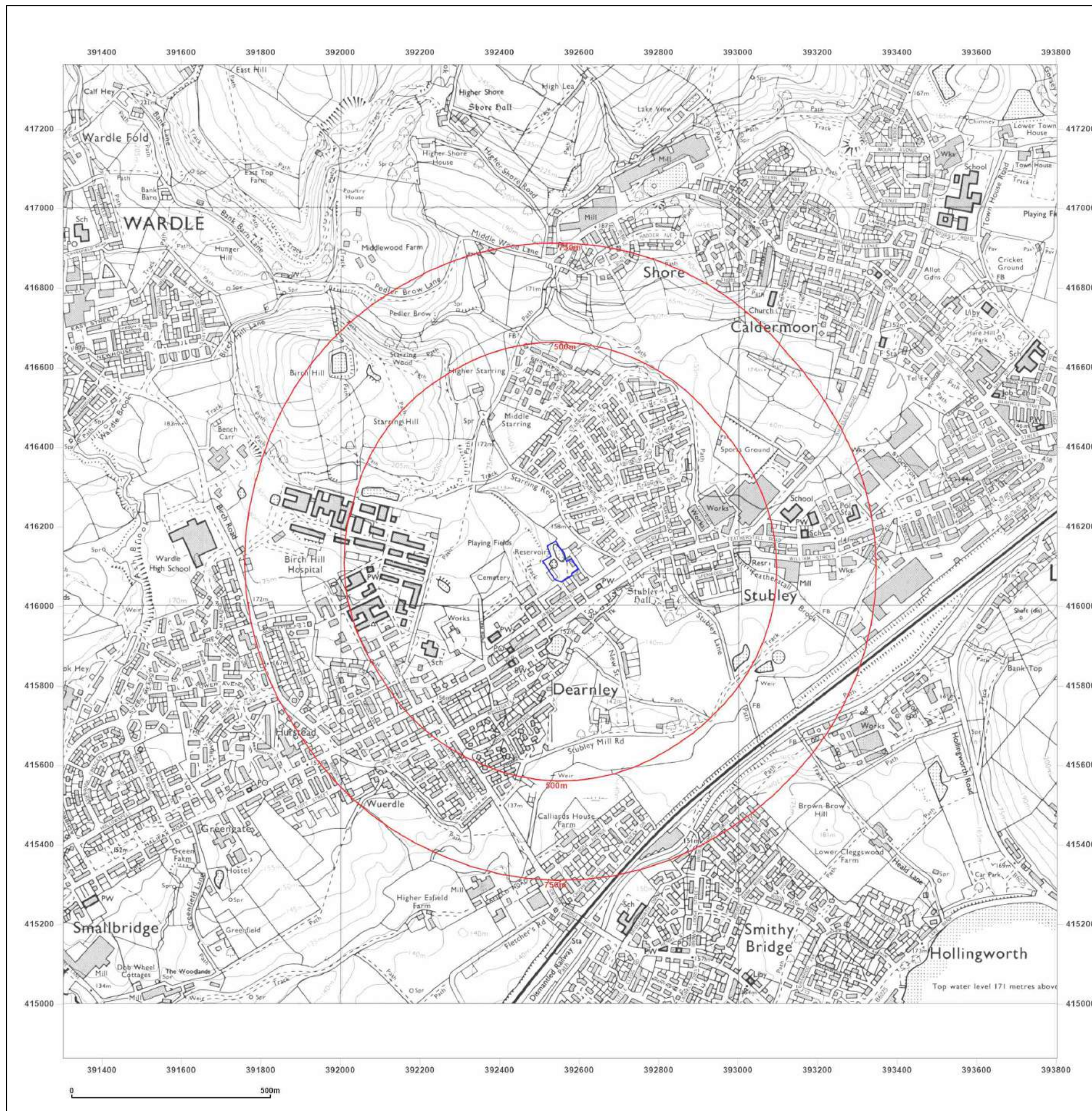


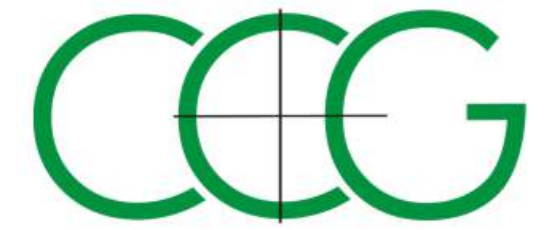
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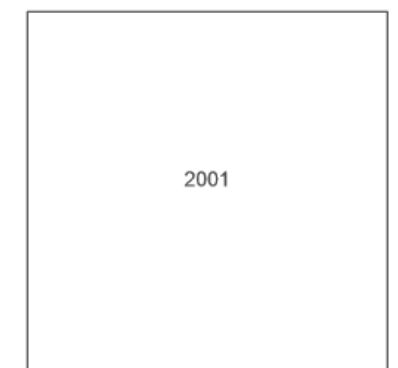
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Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

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Client Ref: CMAPS-AAG-1110335-4165-200623
Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010



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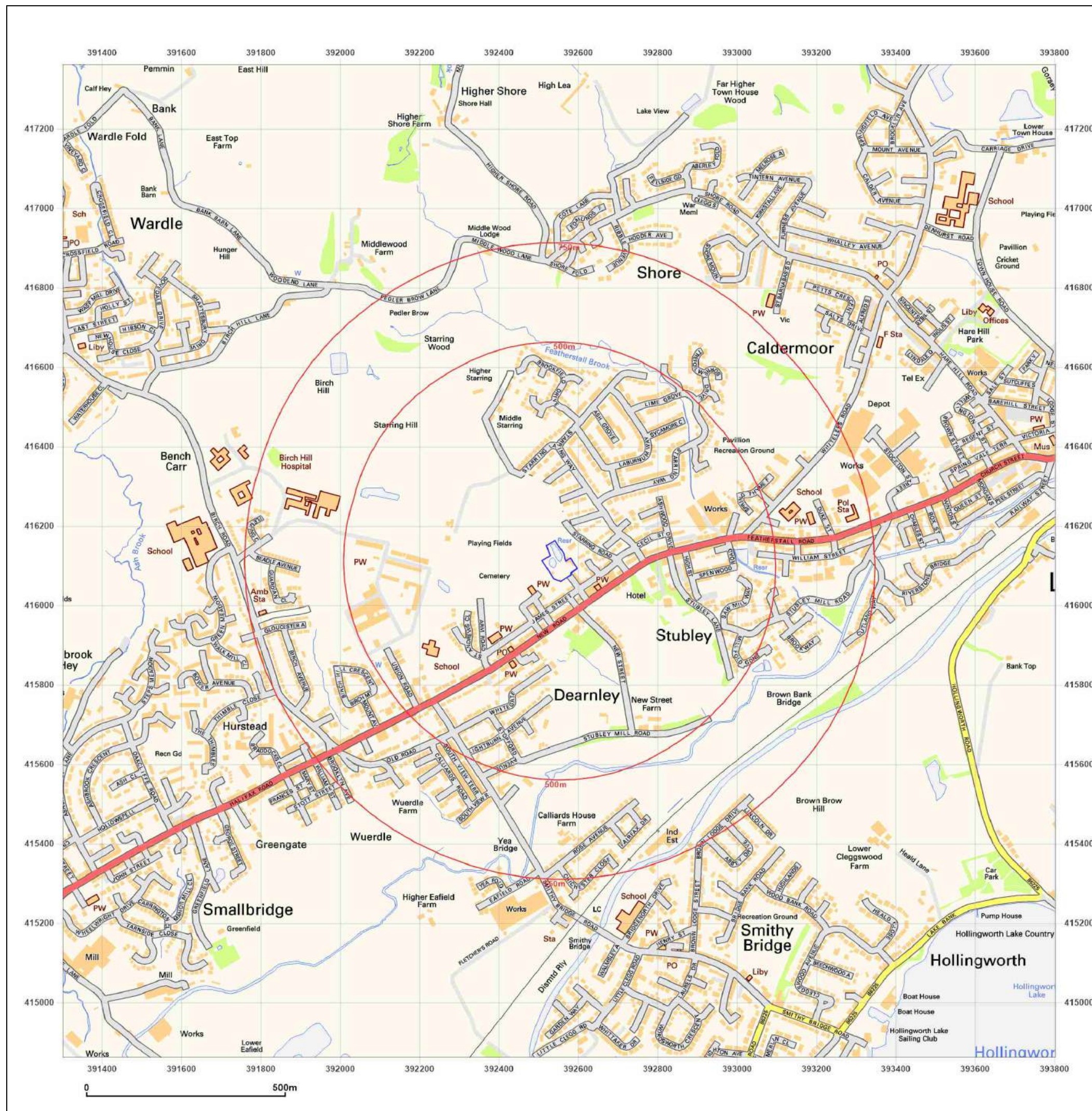


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Report Ref: CMAPS-AAG-1110335-4165-200623HIS
Grid Ref: 392552, 416112

Map Name: National Grid

Map date: 2023

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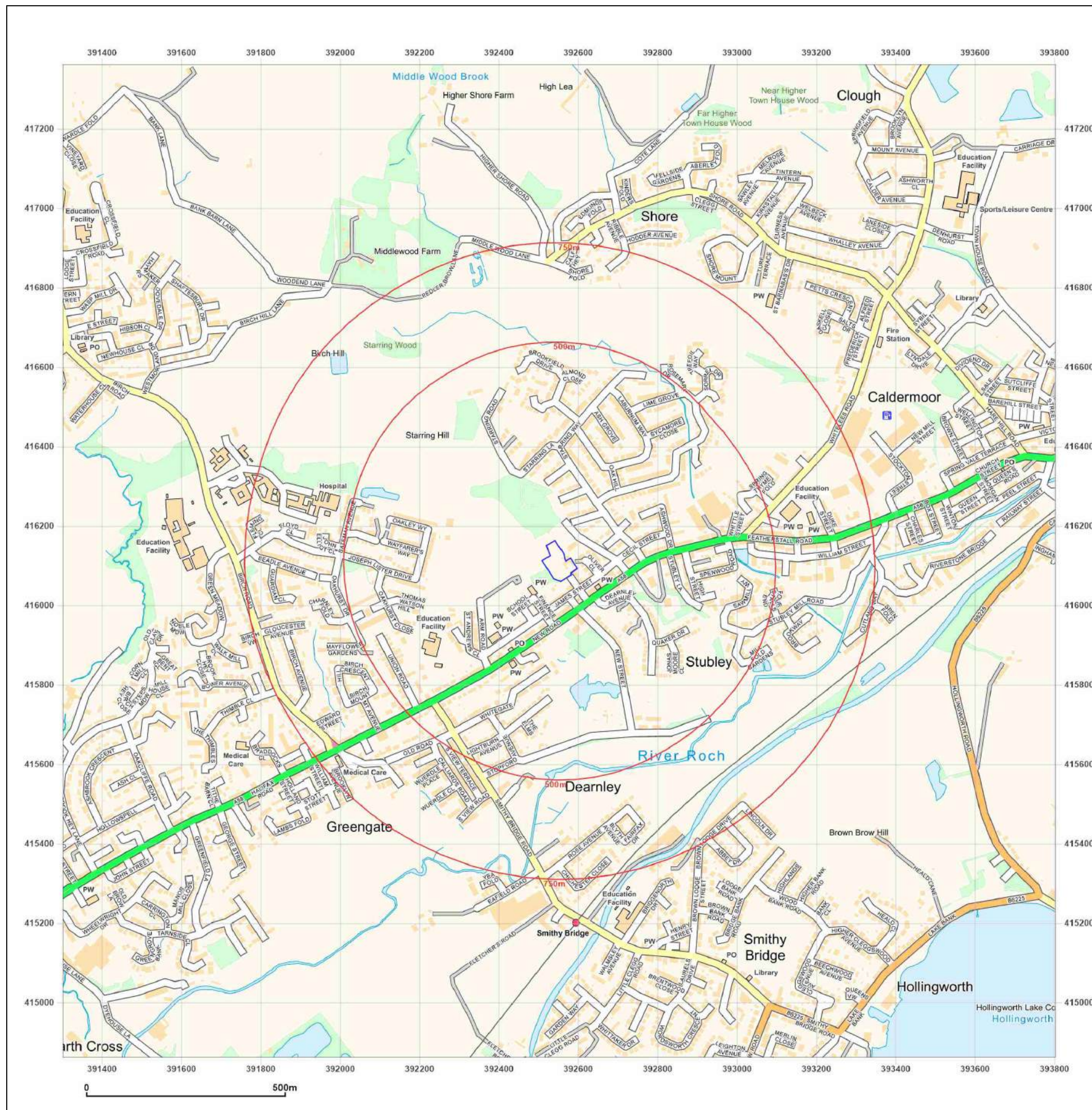


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APPENDIX L: CURRENT GUIDANCE & LEGISLATIONS

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 the planning and redevelopment process. In situations where there is very high pollution risk direct action from the Local Authority is usually necessary. Planning Policy Statement 23 (PPS23) provides guidance on the planning process and requires that sites which have been developed shall not be capable of being determined "contaminated land" under Part IIA.

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

- (a) to identify and remove unacceptable risks to human health and the environment;
- (b) to seek to bring damaged land back into beneficial use;
- (c) to seek to ensure that the cost burdens faced by individuals, companies and society 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 satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby running the risk of distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).

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

RISK ASSESSMENT METHODOLOGY

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

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

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

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

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

Land contamination risk management' (LCRM) (2020)), 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 contamination at the site. If GAC are deemed unacceptable for risk assessment purposes or cannot be developed, a Tier 3 Detailed Quantitative Risk Assessment (DQRA) is required.

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

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 already obtained.

If DQRA reveals that unacceptable risks are not present then no further action is required. If DQRA identifies a possibility of risk, a decision must be made whether further work is required or necessary for the purposes of risk assessment. If further risk assessment is deemed not suitable not required an Options Appraisal should be undertaken. If further risk assessment is required, the scope and nature of further risk assessment must be decided at this point.

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

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

Background

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

- Environment Agency : 2008: Updated Technical Background to the CLEA model Science Report SC050021/SR3
- Environment Agency : 2008: Human Health Toxicological Assessment of Contaminants in Soil SC050021/SR2

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

- CL:AIRE :2008 Guidance on Comparing Data With a Critical Concentration

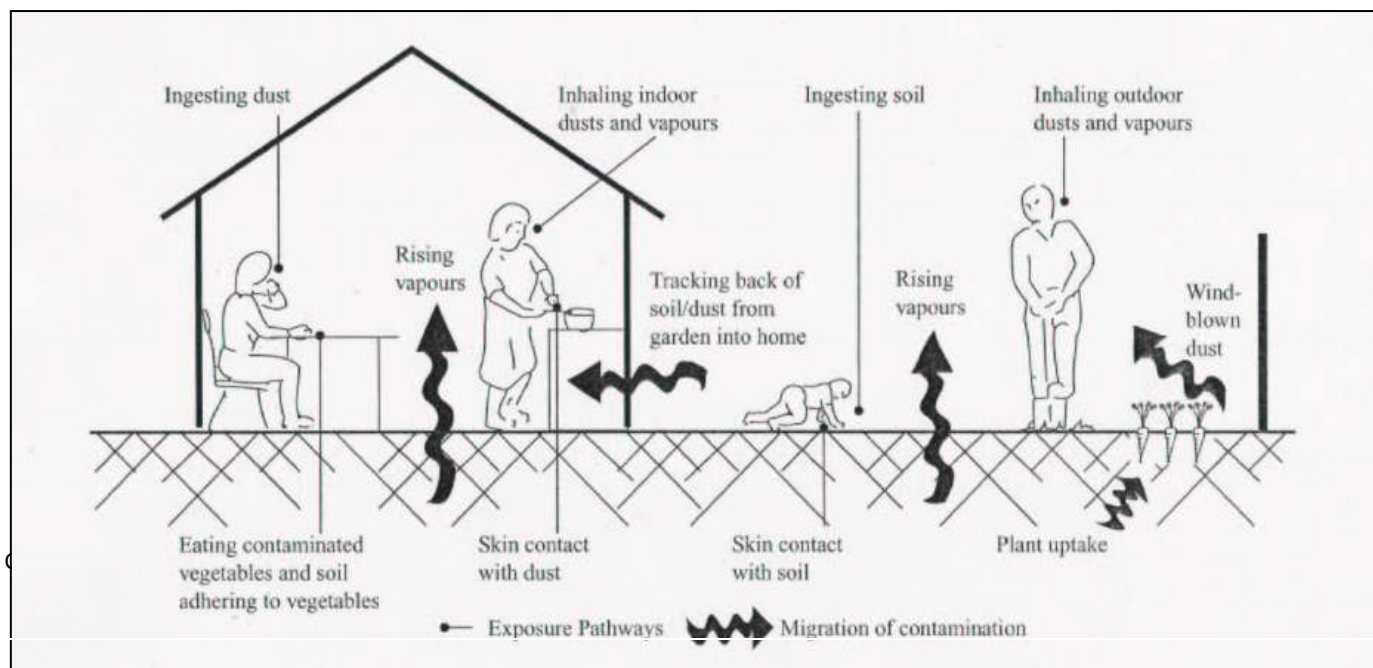
Other guidance/software used in spatial / statistical assessment is provided in:

- USEPA 2006: Data Quality Assessment: Statistical Methods for Practitioners
- Spatial Analysis and Decision Assistance (SADA) – The University of Tennessee

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

A program for the derivation of GAC's based on the above guidance is provided by the Environment Agency and is entitled "CLEA Software Version 1.06".

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:



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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 Methodology

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

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

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

The methods used by **CC GEOTECHNICAL LTD** to derive assessment criteria, to statistically analyse chemical data and to compare chemical data to the derived assessment criteria are discussed 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 Quantitative Risk Assessment (GQRA). However, further assessment may be required taking into consideration site specific factors such as the way the land is used, the soil type, the building

characteristics and the exact nature of the receptor, to determine whether there is a significant possibility of risk to human health to site users. Such an assessment is known as a Detailed Quantitative Risk Assessment (DQRA) and the resultant threshold concentrations are known as Site Specific Assessment Criteria (SSAC). Such assessments should be conducted with the agreement of the local authority (or the Environment Agency) since it is the authority that determines whether land is Contaminated Land or whether Planning Permission for a new development may be granted.

For the purposes of this report, assessment criteria have been derived in accordance with current guidance based on the conceptual model for the proposed land use using the CLEA v1.06 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, Aromatic EC10-EC12, Aromatic EC12-EC16, Aliphatic EC5-EC6, Aliphatic EC8-EC10, Aliphatic EC10-EC12, Aliphatic EC12-EC16), plots of the GAC as a function of Soil Organic Matter (SOM) are used to determine if they pose a potential risk to human health, which are presented hereunder. Where there is an exceedance further assessment may be undertaken.

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

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

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

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

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

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

The Outlier Test used in the statistical assessment may not be able to identify separate populations if numerous populations are present. In order 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).

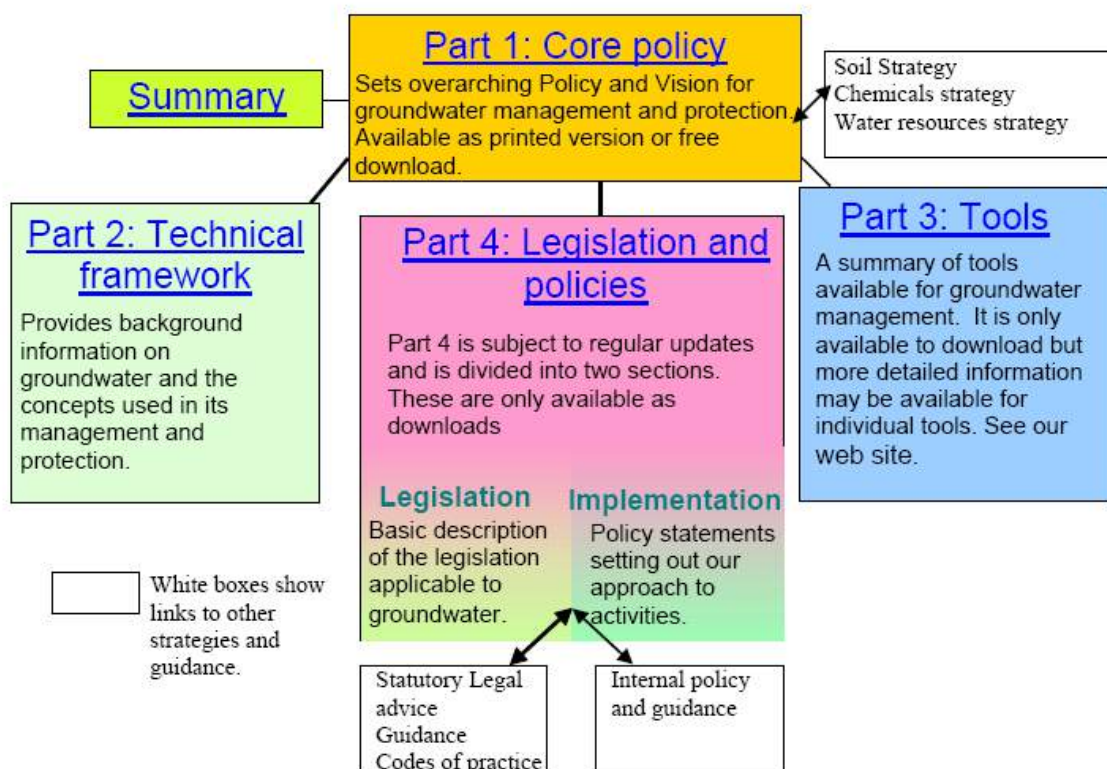
Environment Agency Guidance

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.

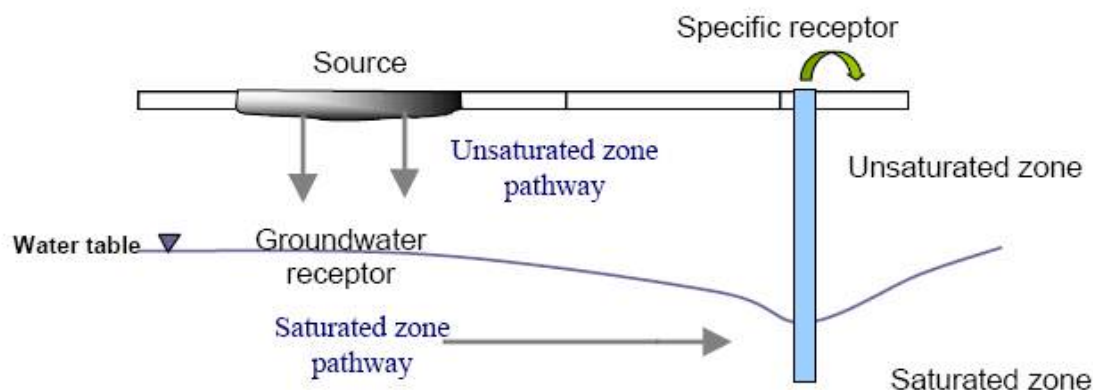
When assessing groundwater impact the Environment Agency advocate the application of their framework methodology "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination" Environment Agency (2006). The methodology has four levels of assessment as described below:

- **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 Substances Directive (76/464/EEC and Daughter Directives)
- The Surface Waters (Abstraction for Drinking Water Classification) Regulations 1996
- World Health Organisation Drinking Water Standards 2004

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

- To devise suitable remedial solutions
- To carry out more investigation, sampling and analysis
- To conduct a site specific Detailed Quantitative Risk Assessment (DQRA) to determine if the materials are suitable for their proposed use, or devise site specific clean-up level

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

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

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

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

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

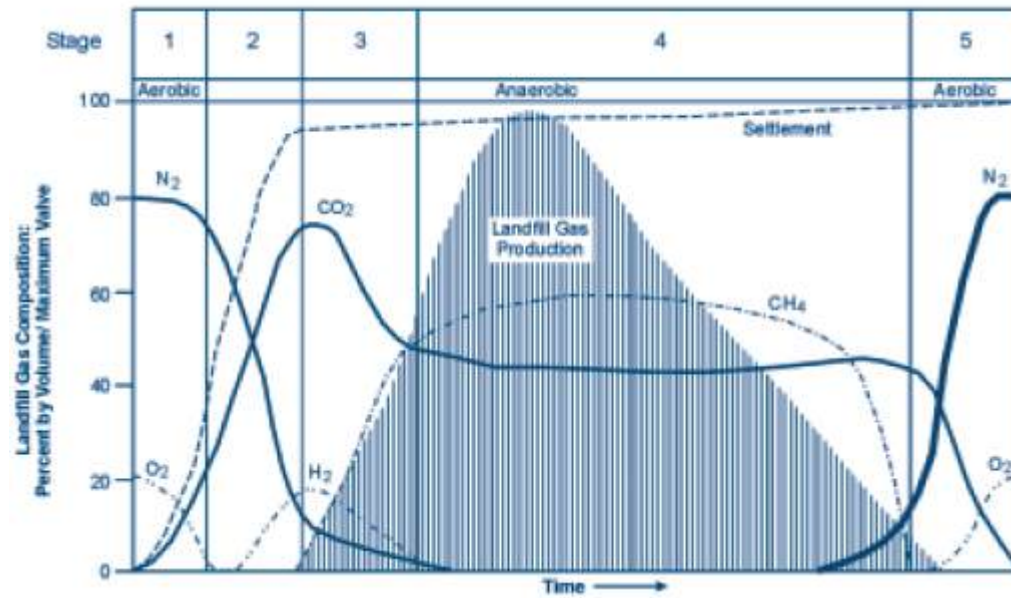
is no simple indicator of the presence of the gas until such a time as explosive limits are reached and an incident occurs. Methane is lighter than air and has a low toxicity. However, at high concentrations it can result in asphyxiation due to oxygen displacement.

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

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 +A1 2019) "Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings"**
This document provides an overview of gas characterisation and assessment. The Standard is intended to be used by designers of gas protection measures and regulators involved in the assessment of design solutions.

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

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

Ground Gas Risk Assessment Methodology

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

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

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

Tier 1 Preliminary Risk Assessment

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

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

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

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

Notes

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

The monitoring programme is decided using the above table prior to the intrusive site investigation. However, if the intrusive investigation reveals that 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 Quantitative Risk Assessment is undertaken upon completion of the required gas monitoring period.

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

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

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 BS8485:2007, which supersedes the guidance included within CIRIA C665, is used for selection of gas protection measures.

BS8485:2015 +A1 2019 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 + A1 2019 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 housing¹. These are for comparative purposes but the boundaries between the traffic light indications and CS values do not coincide.

a) Public buildings include, for example, managed apartments, schools and hospitals.

b) Industrial buildings are generally open and well ventilated. However, areas such as office pods might require a separate assessment and may be classified as commercial buildings and require a different scope of gas protection to the main building.

c) Maximum methane concentration 20% otherwise consider and increase to CS3.

d) Residential building on higher traffic light/CS sites is not recommended unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

e) Consideration of issues such as ease of evacuation and how false alarms will be handled are needed when completing the design specification of any gas protection scheme

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

BS8485:2015 A1 +2019 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 BS8485:2015 +A1 2019 Table 3 shown below:

PROTECTION ELEMENT /SYSTEM		SCORE	COMMENTS
a) Venting/dilution (See Annex A BS8485)			
Passive sub floor ventilation (venting layer can be a clear void or formed using gravel, geocomposites, polystyrene void formers, etc.) ^A	Very good performance	2.5	Ventilation performance in accordance with Annex A (BS8485) If passive ventilation is poor this is generally unacceptable and some form of active system will be required. 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. Mechanically assisted systems come in two forms: extraction and positive pressurization.
	Good performance	1	
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	
Ventilated car park (basement or undercroft)		4	
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 + A1 2019 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 LCRM (2020)) "*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 M: NOTES ON LIMITATIONS

Standard Terms and Conditions of Engagement

Notes on Limitations For Geoenvironmental and Geotechnical Consultancy Services

General

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

CC GEOTECHNICAL LTD accepts no responsibility or liability for:

the consequences of this document being used for any purpose or project other than for which it was commissioned and/or

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 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.