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CIVIL • STRUCTURAL
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PROPOSED RESIDENTIAL DEVELOPMENT

**GREENVALE, BAMFORD
ROCHDALE**

FOR

WAINHOMES (NW) LTD

MARCH 2025

GEO-ENVIRONMENTAL INVESTIGATION REPORT

23154/GEIR/03

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EXECUTIVE SUMMARY

Site	The site is irregular in shape and extends to an area of approximately 2.73 hectares, located south of the Greenvale, Bamford, Rochdale.
NGR	SD 86024 13440
Site History	Careful appraisal of the historical maps show that the site has remained a parcel of farmland until around 2012 with the construction of the present-day residential property and outbuildings within the very north of the site. The remainder of the site has experienced no change or development and still comprises a parcel of land. Development within the surrounding area has been concentrated towards the north, with the construction and subsequent infilling of the reservoirs, and the expansion of residential properties. Immediately southwards, the area has remained farmland with little to no significant changes.
Investigations	The investigations have extended to: - • Walkover survey • Desk study • Extensive intrusive investigations by window sample boreholes and mechanically excavated trial pits • Chemical and geotechnical analyses of soil samples • Programme of ground gas monitoring
Ground Conditions	The ground investigation has identified made ground deposits only within WS01 to a depth of 2.20m bgl. The remainder of the site noted topsoil deposits overlying soft becoming firm clays, underlain by shallow mudstone of the Lower Pennine Coal Measures Formation. The eastern boundary recorded highly weathered bedrock of the Old Lawrence Rock from 1.00m.
Groundwater	These intrusive investigations have identified groundwater ingress within seven (7 No.) positions at depths between 1.50m and 3.00m below existing ground level. The water strike within the cohesive strata is considered to represent perched water. It is possible that minor water entries are likely to occur over a longer period of time where groundwater accumulates between the surface and underlying permeable clay material. It is also important to note that any sand deposits identified at depth may be susceptible to running sand conditions. TP05 and TP06 along the southern boundary have recorded the ingress of groundwater coinciding with the introduction of the weathered mudstone bedrock. It is possible that natural groundwater lies within the underlying bedrock and any excavations made to this depth may require localised pumping techniques.
Ground Gas	The conceptual site model suggests that the potential for explosive and toxic gases to be generated within this site is based on high on the basis of the following factors:- * Historical landfill located 104m north west * Made ground deposit – 99m north west * Infilled reservoirs – 114m north west and 165m north Final monitoring data classified the site as CS2 within the vicinity of WS01 only, which has been attributed to the Made Ground recorded within this position. Plots within this area should adopt CS2 Gas Protection Measures
Environmental	The chemical analysis undertaken on the representative samples of the made ground and topsoil material have identified elevated concentrations of lead within the made ground of WS01 only at a depth of 0.20m bgl. Based upon these results, there will be a requirement for a programme of hotspot remediation around WS01, whilst the topsoil material is deemed suitable for retention and reuse within the residential development.
Foundations	Available BGS records show an inferred fault of unknown displacement located within the development site. Taking into consideration the information gained from the investigation, alongside the presence of the fault, it is anticipated that the majority of plots can be found utilising traditional strip or deep strip foundations. However, reinforcement is required within all strip footings due to the presence of the geological fault (B385). WS01 towards the north west of the site has recorded deep made ground deposits overlying soft clays to 2.80m. Based on the current conditions and site levels, properties within this area should be provided with a piled foundation solution. However, if levels within this area are to be reduced as part of the development process, then this may allow us to remove the gas risk to these plots and also eliminate the need for piling. Final site levels will need to be considered in greater detail, to assess the foundation solution and potential gas risk, based on current monitoring data. The majority of the shallow ground conditions present within the site comprise of cohesive clays which are susceptible to volume change potential as a result of varying moisture content. Laboratory analysis undertaken upon samples of clay strata have shown varying plasticity indices. However, under the worst case scenario, the site is classified as having a medium volume change potential as defined by the NHBC Handbook, Chapter 4.2.

Slabs	It is recommended that suspended ground floor construction be adopted for all properties located within this site. These floors may be of a pre-cast concrete beam and block arrangement or of a suitably designed cast in-situ reinforced concrete.
SUDS	Assessment of the ground conditions present within this site in terms of sustainable urban drainage confirms the presence of topsoil overlying effectively impermeable cohesive natural strata across the majority of the site. Where granular units and bedrock were identified, this typically corresponded with the ingress of groundwater. As such, we consider the site is unsuitable for the adoption of a soakaway system and other means of surface water disposal should be considered.
Further Works	Production of a formal Remediation Strategy detailing the minimal remedial works required to allow for the safe development of the site, including hotspot remediation of WS01 and gas protection measures to CS2 for plots within close vicinity of WS01. If any unusual or suspicious strata or ground conditions are encountered during the subsequent site stripping preparation work, it will be necessary for these areas to be brought to the attention of the appropriate authorities so that all necessary inspection, sampling and testing may be undertaken to determine whether these materials present a hazard to human health. It is incumbent upon the site contractors to advise a responsible authority of any unusual findings within the site which may then be further investigated.

This brief summary should not be assumed to represent a complete account of all the potential geo-environmental issues that may exist at the site. As such it is strongly recommended that the report be read in its entirety.

GEO-ENVIRONMENTAL INVESTIGATION WORKS

GREENVALE, BAMFORD, ROCHDALE

1.0 INTRODUCTION

1.1 Instructions

1.1.1 We are instructed by Wainhomes (NW) Ltd, Kelburn Court, Daten Park, Birchwood, Warrington, WA3 6UT to undertake a programme of ground investigation works at a site located at Greenvale, Bamford, Rochdale, which they intend to redevelop in a residential manner.

1.2 Object

1.2.1 The object of these investigations are as follows:

- To determine the engineering properties of the soils, present within the site to form a basis upon which foundation and general infrastructure recommendations and design may be based;
- To enable sufficient information regarding ground conditions to be obtained from which risks to end users and the environment can be assessed;
- To utilise the information obtained from the investigations to provide recommendations for remediation measures where required.

1.3 Scope

1.3.1 The investigations considered within this report have comprised of the following elements:

- An initial environmental and engineering desk study based upon existing reports, services location information, geological, hydrogeology and hydrological information, a commercially available database and old Ordnance Survey maps;
- An initial walkover survey of the site has been undertaken prior to any intrusive investigations being commenced to determine the presence of any visible hazards or features which may affect the design of the ground investigation works;
- Undertake ground investigation works by window sample boreholes and mechanically excavated trial pits;
- Assess the possibility of toxic and explosive ground gases.
- Determine the presence, nature and extent of any soil and groundwater contamination at the site;
- Determination of the engineering properties of the soils present within the site to form a basis upon which recommendations for foundations and infrastructure construction may be based;
- Identify the potential requirements for any remedial action, where required.

1.4 Development Proposals

1.4.1 At the time of preparation of this report, we have been provided with a Proposed Site Layout (drawing number: 23-025 0001, dated 19/02/2025), a copy of which is appended to this report.

The development proposals include for the construction of forty-three (43 No.) residential plots in detached and semi-detached configurations, with associated road access and private garden areas. Due to the presence of the overhead power lines, an area of POS is located along the western and south western boundary.

- 1.4.2 It is acknowledged that the development proposals for the site are likely to be amended as a result of local planning requirements. It is however anticipated that the current proposals will be representative of the final development approval. However, if the final development proposals are radically different from the current proposals, then recommendations made within this report may become inappropriate.

1.5 Services

- 1.5.1 Service records show a surface water public sewer (300 VC) entering the site off Greenvale and travelling towards the south east corner before dog legging and leaving the site. Overhead 132kV power lines enter the site from the north west corner and travel southwards, before exiting the site on the southern boundary.

2.0 THE SITE

2.1 Location

- 2.1.1 The site is irregular in shape and extends to an area of approximately 2.73 hectares, located south of the Greenvale, Bamford, Rochdale. The centre of the site is situated at approximate National Grid Reference SD 86024 13440. The site location is shown in figure 1 below.



Figure 1 Site Location

2.2 Boundaries

- 2.2.1 The site boundaries towards the east, west and south lead onto further parcels of greenfield land, whilst the northern boundary is formed by residential properties along Greenvale.

2.3 Access

- 2.3.1 The site is currently accessed via the driveway of number 58 Greenvale, Bamford, with a further double gate providing access into the field. A review of the current development plans shows access into the residential development will be formed in the location of the existing property.

2.4 Topography

- 2.4.1 The north western corner of the site has been built up to become level with the access gate from the residential property. The site then slopes down, quite considerably towards the south. However, the wider site area shows minimal topographical change. Consideration will be needed on final site levels, especially towards the north of the site.

2.5 Site Conditions

- 2.5.1 At the time of the site walkover the site comprised of a residential property with outbuildings and a driveway to the north off Greenvale. Whilst the wider site area encompassed overgrown greenfield land.

2.6 Trees

- 2.6.1 Abundant mature trees and vegetation was noted within the site and along most of the sites boundaries. There will therefore be a requirement to undertake an arboricultural report.

2.7 Walkover Survey

- 2.7.1 Prior to commencing the ground investigation works, we have undertaken an initial walkover survey of the site to identify any areas which may impact upon the proposed site redevelopment works. These features are identified upon the walkover survey plan which is appended to this report for reference.
- 2.7.2 The site walkover was conducted on the 28th October 2024 and at the time of the survey the weather conditions were dry and relatively cloudy. The site, during the walkover survey, could be accessed using the tarmacked driveway of a residential property on Greenvale, Bamford, Rochdale. The access area, bound on both sides by residential dwellings, went down the side of the property leading to a metal gate on the right-hand side which provided access to the north west of the site. There is also a small residential gate that provides entrance to the north east part of the site. Adjacent to this gate resides a small open wooden shed that is empty.
- 2.7.3 The site was predominantly, to some extent, overgrown grassland encompassed by a variety of different shrubbery, bushes, well established trees and hedgerows with an overhead electricity line running from the north west of the site to the south. The northern section of the site is of higher elevation than the remaining site area therefore elevation declines from the north to the south.

The northern site boundary is bordered by residential properties and their gardens. Boundaries in the south, east and west are bordered by grassland and playing fields. A dry-stone wall is present along the site boundary in the north east. High mesh metal fencing creates a site boundary along the east, west and southern perimeters, with the integration of wooden fencing in the south. An electricity pylon resides just outside of the site boundary in the south. Centrally north of the site there is a portion of dense vegetation consisting of well-established trees and shrubbery, this area of land runs along the southern boundary of the residential property.

- 2.7.4 The parcel of elevated land in the north west, next to the site entrance, is comprised of overgrown grassland and shrubbery, complete with a stone wall to the east and deep vegetation to the north. Several pieces of household waste have been discarded onto this section of land, including old sinks and wood.

3.0 DESK STUDY

- 3.0.1 As part of our environmental desk studies we have commissioned an Enviro+Geo Insight report by Groundsure which gives detail of all recorded environmental features relating to the site and its immediate surrounding area. We have also obtained copies of all available old Ordnance Survey maps for the area, and these give some historical guidance regarding the former usage of the site area and its immediate vicinity.

3.1 Historical Industrial Sites

- 3.1.1 The Enviro-Insight report has identified forty-six (46 No.) records of historical industrial land uses within 500m of the site, six (6 No.) of which are within 250m of the development boundary. The closest of these records is situated 213m south east and relates to an unspecified mill on the 1890 year of mapping. Other records include a Cotton Mill (214m south east), unspecified mills (215m – 218m south east) and a gasometer (218m south east). Due to the distance of the records from the site, they are not believed to pose a contamination risk.
- 3.1.2 The Groundsure report has identified eighteen (18 No.) historical tanks within 500m of the site boundary. The closest of these records is located 223m north west and relates to settling tanks associated with the former water treatment works on the 1930 year of mapping.
- 3.1.3 The Groundsure report has identified nine (9 No.) historical energy features within 500m of the site boundary. All records relate to electricity substations, with the closest situated 133m north. Due to the distance of the substation from the development site, it is not believed to pose a PCB contamination risk.
- 3.1.4 The Groundsure report has not identified any historical petrol stations or historical garages within 500m of the site.

3.2 Landfill Sites

- 3.2.1 The Groundsure report has not identified any active or recent landfills, or historical landfills (BGS records or LA/mapping records). There is however one (1 No.) historical landfill under the EA/NRW records, located 104m north west at Clay Lane Water Treatment Works. No further information is provided with regards to waste type, operator or first and last records.

- 3.2.2 The report has not identified any historical waste sites or licensed waste sites within 480m of the site boundary, although records of licensed waste sites do exist beyond this point.
- 3.2.3 The report has not identified any waste exemptions within 250m of the development site, although records do exist beyond this point.

3.3 Current Land Uses

- 3.3.1 The Groundsure report has identified eight (8 No.) recent industrial land uses within 250m of the site. The first two records relate to pylons located 19m south and 131m north, with further records including electricity substations (139m north), Rochdale PC (142m north), and works (162m north west).
- 3.3.2 The Groundsure report has not identified any current or recent petrol stations within 500m of the search boundary.
- 3.3.3 The Groundsure report has not identified any records of licensed industrial activities (Part A(1)) or licensed pollutant release (Part A(2)/B) permits within 250m of the site boundary.
- 3.3.4 The report has not identified any licensed discharge to controlled waters within 250m of the site boundary, although records do exist beyond this point.

3.4 Hydrogeology & Hydrology

- 3.4.1 The superficial deposits below the site are recorded as a Secondary Undifferentiated. This is assigned where it is not possible to attribute either category A or B to a rock type. These layers have previously been designated as both minor and non-aquifers in different locations due to the variable characteristics of the rock type.
- 3.4.2 The underlying bedrock is noted to be a Secondary A aquifer which contains permeable layers capable of supporting water supplies at a local rather than strategic scale and in some cases, forms an important source of base flow to rivers.
- 3.4.3 The groundwater vulnerability map of the site shows the superficial deposits within the site to be of a low vulnerability, with a thickness greater than 10m. The underlying Secondary A aquifer within the bedrock is considered to be of a low vulnerability with a flow mechanism of well-connected fractures.
- 3.4.4 The site and surrounding 500m is not located within a Source Protection Zone (SPZ).
- 3.4.5 The report has not identified any surface water abstractions within 1,000m of the site boundary, although records do exist beyond this point. Additionally, there are no licensed groundwater abstractions within 500m of the site.
- 3.4.6 The Water Framework Directive (WFD) is an EU-led framework for the protection of inland surface waters, coastal waters and groundwater through river basin-level management planning. In terms of surface waters, these basins are broken down into smaller units known as management, operational and water body catchments. The development site is located within a WFD surface water body catchment, relating to the Roch (Spodden to Irwell), with an operational catchment of the Roch Irk Medlock and a management catchment of the Irwell.

- 3.4.7 The site lies within a WFD for groundwater bodies relating to the Northern Manchester Carboniferous Aquifers, with a poor overall and quantitative rating and a poor chemical rating.

3.5 Flooding

- 3.5.1 The site is not located within an area at risk of flooding from rivers and seas (RoFRaS) without defences.
- 3.5.2 The highest risk both on site and within 50m of the site boundary for surface water flooding is 1 in 30 years with a maximum modelled depth between 0.3m and 1.0m. Additionally, the highest risk on site and within 50m for groundwater flooding is low.

3.6 Environmentally Sensitive Areas

- 3.6.1 The site is located within a SSSI Impact Risk Zone and therefore an initial assessment of the potential risks to the SSSI are required, relating to the development proposals. The zones around each SSSI reflect particular sensitivities of the features for which could have potentially adverse impacts.
- 3.6.2 The report has identified that the site is located within an area of greenbelt land under Merseyside and Greater Manchester, with a Local Authority of Rochdale.
- 3.6.3 The land has been classified taking into consideration multiple factors including climate, physical geography and soil properties. The development site has been classified as Grade 3, containing good to moderate quality agricultural land with moderate limitations.

3.7 Geology

- 3.7.1 The Groundsure report has identified an area of made ground 99m north west of the development site. Reference to available mapping shows the record most probably relates to Clay Lane Water Treatment works and the infilling of the service reservoir.
- 3.7.2 The Groundsure report has indicated that the site is underlain by superficial deposits of diamicton till comprising predominantly of clays with minor sands and gravels. The qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of the superficial deposits have a low to high permeability with a mixed flow type.
- 3.7.3 The bedrock geology underlying the site is variable and comprises of both the Old Lawrence Rock of sandstone units, alongside Pennine Lower Coal Measures Formation of interbedded mudstone, siltstone and sandstone units. The rate of vertical movement of water within the bedrock has a low to high permeability with a fracture flow type.
- 3.7.4 The report has identified an inferred fault with an unknown displacement located within the site boundary. As such, there will be a requirement for all foundations to be provided with suitable reinforcement.
- 3.7.5 The site is located within an area where less than 1% of properties are above the action level for Radon gas and as such, no further consideration is required with regards to radon gas.

3.8 Ground Workings

3.8.1 The Groundsure report has recorded thirty (30 No.) surface ground working within 250m of the site boundary. The first fifteen records relate to reservoirs between 114m north west and 166m south east. The reservoirs to the north west relate to Clay Lane Service Reservoir, whilst the records to the south east possibly relate to the reservoirs associated with Pitfield Mills (Cotton).

3.8.2 The report has not identified any underground workings within 250m of the site, however, records do exist beyond this point.

3.9 Mining & Ground Stability

3.9.1 The Groundsure report has indicated that the site is located within a coal mining area as defined by the Coal Authority and therefore a Coal Authority mining report has been obtained and is appended to this report for reference. The Coal Authority report has indicated that the site does not lie within the potential zone of influence for any recorded underground coal workings. Additionally, there are no coal mine entries recorded to lie within 20m of the boundary and there have been no damage arising from geological faults or other lines of weakness active by coal mining. The Coal Authority have no evidence of a damage notice or subsidence claim for the site or within 50m since 31st October 1994. As a result of the information provided within the report, no further action needs to be taken in terms of coal mining.

3.9.2 The report indicates that there is a 'negligible' hazard rating for compressible deposits and ground dissolution of soluble rocks, whilst running sands, collapsible deposits, shrink swell clays and landslides all have a 'very low' hazard rating.

3.10 Background Soil Chemistry

3.10.1 The Geo-Insight report includes an estimated geometric mean soil concentration of various elements. Assessment of this information suggests that all determinands listed are at concentrations below the current tier 1 assessment criteria.

3.11 Railways & Tunnels

3.11.1 The Groundsure report has not identified any records relating to any railway infrastructure and projects within 250m of the development site boundary.

3.12 Site History

3.12.1

Table 1 – Review of Historical Maps & Aerial Photography		
Date	Site	Adjacent Land
1851	The site forms several parcels of farmland. The main pipe of Heywood Water Works enters the site within the north west corner before existing along the western boundary.	The wider area is predominantly farmland. Pitfield Mill (Cotton) is located 213m south east and includes the presence of a gasometer (218m south east). Further Mills including Minorea Mill and Ashworth Mill are situated in excess of 200m from the development site boundary.
1890	The water pipe to Heywood Water Works is no longer represented on the maps.	A small reservoir is located 100m north west, with a much larger reservoir situated 225m north. Both reservoirs are associated with Heywood Water Works. Further reservoirs have been constructed towards the south east, possibility relating to Pitfield Mill, which has been an expansion in size.

Table 1 – Review of Historical Maps & Aerial Photography (Continued)		
Date	Site	Adjacent Land
1908 – 1910	No significant changes.	The reservoir to the north west has been relabeled as Clay Lane Service Reservoir (Heywood & Middleton Water Board). Further expansion of Pitfield Mills. Increase in size of Bamford village.
1928 – 1930	A possible building or barn has been constructed within the north eastern corner.	Additional of several residential properties along Clay Lane to the north.
1938	No significant changes.	No significant changes.
1956 – 1959	No significant changes.	Pitfield Mills have been demolished.
1960 – 1961	Overhead electricity cables enter the site from the southern boundary and travel towards the north west through the site. The building / barn within the north east is no longer presented on the maps.	Increase in number of residential properties along Clay Lane.
1967 – 1968	No significant changes.	No significant changes.
1975	No significant changes.	Residential estate constructed between Clay Lane and the northern boundary of the development site. Bamford has grown in size and contains abundant residential properties and schools.
1983 – 1987	No significant changes.	Increase in number of residential properties to the east.
1990 – 1992	No significant changes.	The smaller reservoir, 100m north has been backfilled.
2001	No significant changes.	The larger reservoir to the north has been backfilled and the area redeveloped into a residential estate.
2012	Residential property and outbuildings have been constructed within the northern most area of site, off Greenvale	No significant changes.
2024	No significant changes.	No significant changes.

3.12.2 Careful appraisal of the historical maps show that the site has remained a parcel of farmland until around 2012 with the construction of the present-day residential property and outbuildings within the very north of the site. The remainder of the site has experienced no change or development and still comprises a parcel of land. Development within the surrounding area has been concentrated towards the north, with the construction and subsequent infilling of the reservoirs, and the expansion of residential properties. Immediately southwards, the area has remained farmland with little to no significant changes.

3.13 Anticipated Ground Conditions

3.13.1 Based upon the information obtained during the initial desk study phase, the anticipated ground conditions are expected to comprise of strata as detailed in table 2 below.

Table 2 – Anticipated Ground Conditions	
Ground Material	Anticipated Condition
Topsoil	Topsoil is expected across the majority of the site at varying thicknesses.
Made Ground Deposits	Made ground is expected towards the north of the site in association with the residential property and outbuildings. Little to no made ground is expected across the wider area.
Superficial Deposits	Diamicton till deposits comprising of clays and silts with minor sand and gravel beds.
Bedrock	Combination of the Old Lawrence Rock (sandstone) and Pennine Lower Coal Measures (interbedded mudstone, siltstone and sandstone).
Groundwater	Expected to lie at depth within bedrock.

- 3.13.2 Based upon the data available within the desk study and tables 1 and 2 above, potential ground related issues associated with the proposed redevelopment of this site are likely to include the elements noted in table 3 below.

Table 3 – Potential Ground Related Issues		
Type of Issue	Site Specific Issue	Remarks (Refer to walk over survey plan)
Potential on Site Contamination Sources.	Potential varying depths of made ground in and around residential property	Concentrated towards the north of the site.
Potential off Site Contamination Sources.	Changing site usages directly adjacent to the development boundary.	Possible minor levels of contamination from neighbouring properties.
Potential Geotechnical Hazards.	Volume change potential of soils	Till deposits comprising of clays and silts with minor sands and gravels.

3.14 Preliminary Conceptual Model

- 3.14.1 The information presented within this Desk Study section of this report has been used to compile a preliminary conceptual model for the site. The identified potential contaminant and receptors have been considered along with any possible pathways that may link them. The resulting pollution linkages are considered in table 4. The risk classification has been estimated in accordance with the terms and definitions based upon CIRIA C552 Contaminated Land Risk Assessment, A Guide to Good Practice.

Table 4 – Preliminary Conceptual Site Model						
Potential Source	Potential Receptor	Possible Pathway	Probability	Consequence	Risk	Mitigation / Investigation
Contaminated soils	Future site users	Direct contact of soils Inhalation or ingestion of soil / dust	UI	Md	Low	Sampling and testing of topsoil deposits to determine their suitability for retention within a residential environment. Sampling and testing of any made ground strata encountered.
	Surface water in the vicinity of the site	Leaching of contaminants through drainage system	UI	Md	Low	
	Ground water in aquifer	Leaching of contaminants to ground water	UI	Md	Low	
	Future site users	Vapour migration from soils	UI	Md	Low	
	Proposed buildings and services	Direct contact with contaminated soils	Lw	Md	Moderate/Low	
	Plants in gardens and soft landscaping	Direct contact	Lw	Md	Moderate/Low	
Contaminated ground water	Site personnel during construction	Water entering excavations	Lw	Md	Moderate / Low	Sampling of ground water if contamination noted.
	Future site Users	Retained surface water	Lw	Mi	Low	

Table 4 – Preliminary Conceptual Site Model (Continued)						
Potential Source	Potential Receptor	Possible Pathway	Probability	Consequence	Risk	Mitigation / Investigation
Toxic and explosive gases	Proposed buildings and occupiers	Ground gas migration into buildings	Lw	Md	Moderate / Low	Potential gas risk from the infilling of reservoirs to the north of the site.
Radon gases	Proposed buildings and occupiers	Ground gas migration into buildings	UI	Md	Low	Less than 1% of properties above the action level. No radon precautions required.
Key: Consequence: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Probability: Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely						

4.0 SITE WORKS

4.1 Intrusive Works

- 4.1.1 The ground conditions present within this site have been investigated utilising a series of five (5 No.) window sample boreholes and fourteen (14 No.) trial pits supervised by a REFA Engineer utilising a backhoe style excavator.
- 4.1.2 Representative samples of strata encountered during these investigation works have been retained for laboratory analyses and testing where considered to be appropriate. Visual appraisal of the strata present has also been undertaken during these investigations.

4.2 Locations

- 4.2.1 The locations of the boreholes were chosen by ourselves in conjunction with the desk study information. The locations were chosen in an effort to identify the representative ground conditions and shallow geology present across the whole site area.
- 4.2.2 The locations of each of the window sample and trial pit positions are indicated upon the appended exploratory hole location plan 23154/01A. These locations are shown in relation to site features present at the time of the investigations. It should be noted that these intrusive investigations have been limited to the areas where access was available within the site.

4.3 Records

- 4.3.1 During the investigation's details of the strata types, water entries, ground conditions and levels have been maintained by the site engineer. This information has been collated into a series of borehole and trial pit journals which are appended to this report for reference.

4.4 Targeting

- 4.4.1 The investigation locations were undertaken to identify the shallow superficial strata present over the whole site area, though it is acknowledged that ground conditions may vary between investigation locations.

- 4.4.2 The investigation locations have been spread over the whole area of the site in accordance with the recommendations laid down in BS10175: 2011 "Investigation of Potentially Contaminated Sites". The initial ground investigation strategy is detailed within table 5.

Table 5 - Initial Ground Investigation Strategy		
Exploratory Hole No.	Target	Purpose
WS01-WS05 TP01 – TP14	Generally, over the site	To determine the general nature of underlying soils and geology including: 1. Nature, distribution and thickness of made ground. 2. Nature, degree and extent of potential contamination. 3. Content of unacceptable material e.g., peat and biodegradable matter etc. 4. Suitability of the ground for the founding of structures. 5. Engineering properties of the ground.

5.0 **GROUND CONDITIONS**

5.1 **Topsoil**

- 5.1.1 Topsoil deposits were recorded across the site to a maximum depth of 0.40m and comprised a dark grey silty clay with abundant rootlets. The topsoil has been sampled and sent for laboratory testing to determine its suitability for reuse and retention within a residential environment.

5.2 **Made Ground**

- 5.2.1 Made ground was encountered within WS01 only to a maximum depth of 2.20m bgl and comprised a soft dark brown gravelly sandy clay with gravel of brick and fragments of glass to 0.50m bgl. This was seen to be underlain by a sandy gravel with fragments of ceramics to 0.70m, followed by dark grey clay with gravel of mudstone, sandstone and concrete, with fragments of plastic to 2.20m bgl.
- 5.2.2 Due to the variable nature of the made ground material, it is considered that the made ground is incapable of offering a uniform safe bearing capacity for foundations.

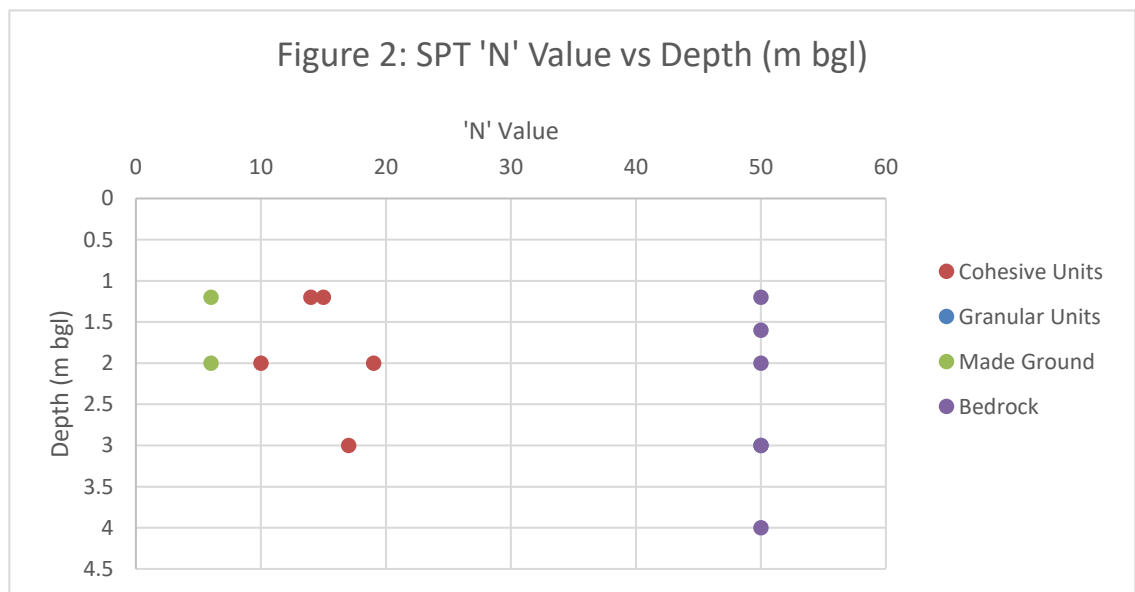
5.3 **Natural Strata**

- 5.3.1 These investigations have identified cohesive strata across the site, with isolated pockets of granular sands towards the north west and eastern boundary. The upper clay units compose of very soft to soft, grey mottled orangish brown slightly gravelly silty clay with frequent sand pockets. Deeper soft units have been identified predominantly towards the south east (TP05, TP06 and TP12) and within isolated pockets (TP02 and WS01) to depths of up to 2.30m bgl.
- 5.3.2 Strength of the cohesive clay units increases with depth, with a marked transition from around 1.00m below existing ground level. These firmer units generally comprise of grey mottled brown, slightly gravelly, slightly sandy silty clay with an occasional cobble content of sandstone and mudstone.

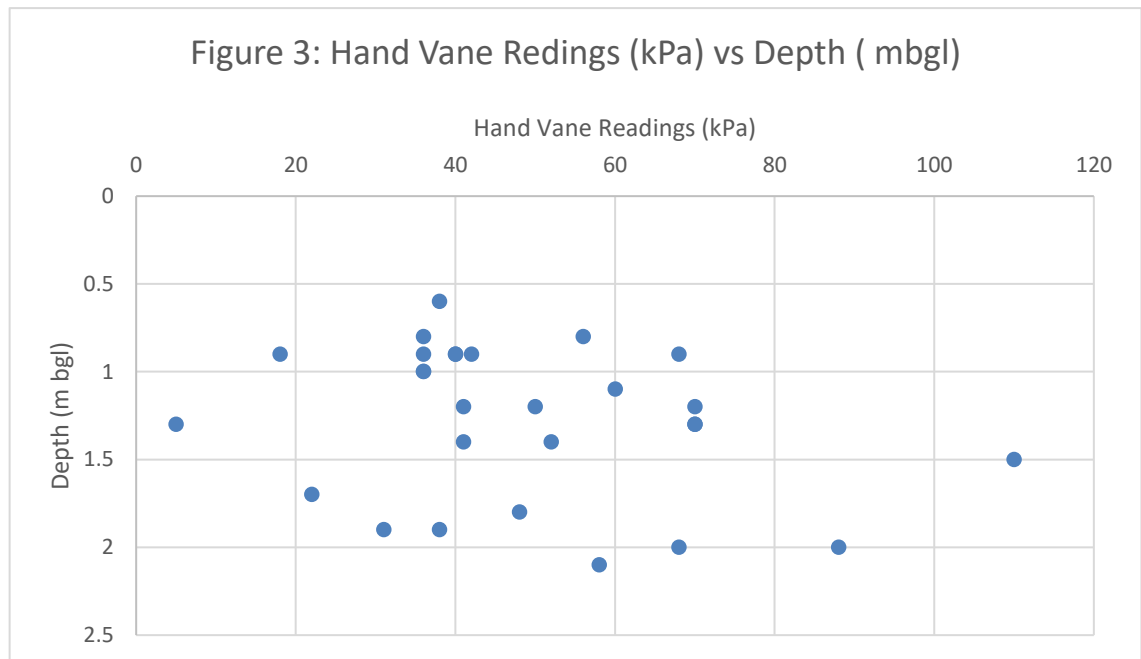
In situ standard penetration tests (SPTs) have recorded 'N' values ranging from 10 to 18 within the clay. Whilst in-situ hand vane tests have recorded results between 5 kPa and 110 kPa. Based upon this information we can consider the clay strata of offering a safe bearing capacity in the order of 90kN/m² at a minimum depth of 1.00m bgl. Greater bearing capacities can be achieved with increasing depth.

5.3.3 Granular sands were recorded within only three locations (WS01, WS04 and TP01) and included for a shallow and deeper unit. The shallower sand within TP01 at depths between 0.40m and 0.70m comprised a dark grey mottled brown clayey sand, whilst within WS04 at 0.50m to 1.20m, the strata consist of a brown slightly gravelly sand with gravel of sandstone. By contrast, the underlying deeper sands, recorded from depths of 2.00m (TP01) recorded slight brown sand, whilst WS01 recorded a dark brown gravelly, clayey sand from 2.80m to 3.40m bgl. In situ standard penetration tests were only conducted within the granular units in WS01 at 3.00m and recorded an 'N' value of 50 blows over 245mm.

5.3.4 Figure 2 below plots the 'N' value of the cohesive, granular and made ground strata alongside the highly weathered bedrock strata against depth. The plots shows weaker readings within the made ground strata, increasing in strength within the clay units. All in-situ standard penetration test refused within the weathered bedrock strata.



5.3.5 Results from the in-situ hand vane tests have been plotted within Figure 3 overleaf. The graph shows that the majority of the softer clays are at the shallower depths, with foundations needing to be extended beyond these points. From 1.00m below ground level, the KPa of the clays increase to, in most cases, a suitable strength for the installation of foundations. Nevertheless, a Development Constraints Plan has been appended to this report which details further foundation recommendations and constraints across the development site.



5.4 Bedrock

- 5.4.1 During these investigations works, an extremely weak, thinly laminated, grey, highly weathered mudstone has been identified across the site at depths between 1.60m and 4.00m bgl and generally coincided with either refusal of the SPT or termination of the trial pits due to a failure to progress. It is believed this stratum represents the mudstone units within Pennine Lower Coal Measures Formation.
- 5.4.2 By contrast, TP07 and TP08 recorded light grey, slightly sandy clayey gravel of sandstone with occasional sandstone boulders and a high sandstone cobble content. Reference to BGS mapping shows the Old Lawrence Rock to possibly underly the site within the eastern corner, before being conected by the inferred fault.
- 5.4.3 Although not all exploratory hole locations recorded the presence of bedrock during the investigation works, we can presume that bedrock lies at a relatively shallow depth across the development site. The underlying bedrock is considered to offer a safe bearing capacity within the weathered zone of at least 250kN/m². However, this increases significantly within the un-weathered material where bearing capacities in excess of 350kN/m² are achievable.

5.5 Groundwater

- 5.5.1 These intrusive investigations have identified groundwater ingress within seven (7 No.) positions at depths between 1.50m and 3.00m below existing ground level. The water strike within the cohesive strata is considered to represent perched water. It is possible that minor water entries are likely to occur over a longer period of time where groundwater accumulates between the surface and underlying permeable clay material. It is also important to note that any sand deposits identified at depth may be susceptible to running sand conditions.
- 5.5.2 TP05 and TP06 along the southern boundary have recorded the ingress of groundwater coinciding with the introduction of the weathered mudstone bedrock. It is possible that natural groundwater lies within the underlying bedrock and any excavations made to this depth may require localised pumping techniques.

Table 6: Summary of Groundwater Entries

Position	Depth (m bgl)	Strata	Comments
WS01	3.00	Sand	Ingress
TP02	1.60	Clay	Perched
TP04	1.80	Clay	Perched
TP05	2.00	Mudstone	Ingress
TP06	2.00	Mudstone	Ingress
TP10	1.50	Clay	Perched
TP12	2.00	Clay	Perched

- 5.5.3 It should be acknowledged that further localised groundwater may accumulate within the clay and sand deposits, especially during episodes of intense rainfall, and that this may locally result in flooding of deeper excavations and require localised sump pumping techniques.

5.6 Excavations

- 5.6.1 The natural strata across the site typically comprises of soft becoming stiff cohesive clays units, with an increase in granular sands and gravels towards the north eastern corner and north west of the development site. Shallow bedrock has been noted across most of the site, from an average depth of 2.00m bgl. Excavations within the clay and bedrock strata would be anticipated to be capable of remaining open for a significant period of time without side support. However, the presence of sands, coinciding with groundwater in certain locations could result in unstable ground conditions. Therefore, there remains a risk of sudden collapse of excavations to ground workers and all excavations made within the site should be provided with appropriate side support.

- 5.6.2 It is essential that personnel should not be allowed to approach or enter any excavation made upon this site unless appropriate precautions have been adopted to ensure that hazardous side instability has been prevented. This is particularly important in relation to foundation and drainage construction where personnel may be specifically required to enter deeper excavations for construction purposes. Reference should be made to H.S.E. publications 150 for guidance.

5.7 Contamination

- 5.7.1 The intrusive investigations have recorded made ground only within WS01 to a depth of 2.20m bgl, noting also the presence of anthropogenic materials. Representative samples of the made ground material has been retained for analysis to determine whether it is suitable for retention within the proposed development.
- 5.7.2 Topsoil deposits have been recorded across the wider site area and further samples have been obtained to determine the topsoil's suitability for reuse and retention within the proposed residential development.

5.8 Sampling

- 5.8.1 Based upon the initial site appraisal in conjunction with the findings of the intrusive investigation, a series of representative samples of the strata encountered have been retained for laboratory analyses. These analyses have been intended to determine the potential presence of any contamination which may represent a hazard to the site operatives or end users of the site. This section of work is considered in more detail in section 7 of this report.

5.9 SUDS

- 5.9.1 Assessment of the ground conditions present within this site in terms of sustainable urban drainage confirms the presence of topsoil overlying effectively impermeable cohesive natural strata across the majority of the site. Where granular units and bedrock were identified, this typically corresponded with the ingress of groundwater. As such, we consider the site is unsuitable for the adoption of a soakaway system and other means of surface water disposal should be considered.

6.0 CONTAMINATION ANALYSIS & ASSESSMENT CRITERIA

6.1 Sampling

- 6.1.1 This investigation has identified made ground deposits within WS01, whilst topsoil has been recorded across the wider site area. A total of ten (10 No.) samples of strata have been retained during this investigation for chemical analysis. These samples are considered to be representative of the ground conditions within the site and form a basis for assessment of their potential for retention within a residential environment.
- 6.1.2 All samples obtained from this site were considered to be subject to a programme of PAH analyses. Accordingly, all samples have been placed into a 500ml wide necked brown glass jar. All soil samples have been stored in cool boxes at temperatures of approximately 4° (+ or - 2°C) until delivery to the selected laboratory. All sample containers were marked with the site address, trial pit or borehole number, depth and date of sampling. All samples have been tested within the specified handling period to accord with the sampling protocol presented by i2 Analytical Ltd.

6.2 Range

- 6.2.1 Made ground deposits have been identified within WS01 only, with topsoil deposits extending over the wider site area. Representative samples of the made ground and topsoil have been retained for analysis to determine whether their suitable for retention within the proposed development.
- 6.2.2 Desk Study information has not indicated any potentially naturally occurring elevated concentrations of contaminants within the natural strata and therefore, the natural strata is considered suitable for retention within the proposed development.

6.3 Laboratory

- 6.3.1 All samples selected for chemical analyses have been returned to i2 Analytical Ltd, who are an MCERTS and UKAS accredited laboratory facility. Each sample has been subject to a range of chemical analyses to determine the concentrations of a wide range of common contaminants applicable to the former use of this site and the materials present. Details of the analysis programme are shown in table 7 below. Confirmation of the UKAS and MCERTS accreditations for each test is indicated within the results which are appended to this report.

6.4 Development Proposals

- 6.4.1 We understand that the site is to be re-developed in a residential manner with associated rear gardens, areas of hard standing and access roads. It is essential to ensure that the materials present within the sensitive site areas are suitable for retention within a residential environment.

6.5 Analysis Range

- 6.5.1 The preliminary conceptual model identifies that there is the potential for a pollutant pathway linkage to be present at the site and that further assessment is required. Table 7 below confirms the range of analyses undertaken upon the samples of made ground and topsoil obtained from this site.

Table 7: Chemical Testing Schedule		
Analysis	Determinands	No. of Samples
Metals	Arsenic, Cadmium, Chromium (total), Copper, Lead, Mercury, Nickel, Selenium, Zinc	10
Organics 1	PAH – USEPA 16 suite, Phenol	10
Asbestos	Asbestos Screen	8
Inorganics	Cyanide, Soluble sulphates, Sulphide, pH, TOC	10
Hydrocarbons	TPH (CWG) (BTEX)	2

6.6 Results

- 6.6.1 Full details of the chemical analyses results are appended to this report for reference and should be read in conjunction with the comments and recommendations regarding risk assessments. Summaries of the test results are presented in conjunction with the current assessment criteria in Section 7 of this report.

6.7 Approach

- 6.7.1 The current UK approach to the consideration of contaminated land is based upon the Principals of risk assessment. This in turn is founded upon the use of a source-pathway-target Principal in order to establish the presence of a potential pollutant linkage. Our approach to the risk assessment is consistent with UK guidance and best practice. As advocated in the EA Policy Statement: Guidelines for Environmental Risk Assessment and Management a tiered approach has been adopted. This tiered approach is central to Part IIA of the Environmental Protection Act 1990 and the Town and Country Planning Act 1990.

6.8 Site Classification

- 6.8.1 A proposed site layout has been made available to us and we can confirm that the site is intended to be developed on a private residential basis with private rear garden areas. Accordingly, the site usage has been considered on the basis of an end land use of **residential with plant uptake** as defined by EA Science Report SC050021/SR3 2009 in relation to the most recent soil guideline values.

6.9 Criteria

- 6.9.1 The concentrations of contaminants within the ground have been compared to a range of generic soil guideline values that have been prepared by DEFRA and the Environment Agency. Where published, soil guideline values (SGV) have been utilised as intervention values for the purpose of an initial tier 1 assessment.
- 6.9.2 At the time of the preparation of this report soil guideline values were available only for a limited number of contaminants and the development of both the CLEA model and additional soil guideline values is on-going. Where published soil guideline values are available, they have been utilised as intervention values for the purposes of an initial tier 1 assessment. A number of SGV's have recently been updated to reflect a modern approach to the protection of human health.

- 6.9.3 In March 2014 the Department for Environment Food & Rural Affairs published SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination Policy Companion Document. This document provides a series of Category 4 screening levels based upon differing land uses. Reference has been made to the values presented within this report in relation to the appropriate land usage.
- 6.9.4 Where soil guideline values were not published at the time of preparing this report, generic assessment criteria (GAC) published by Land Quality Management Ltd., in conjunction with the Chartered Institute of Environmental Health have been adopted. The values published in the "LQM/CIEH S4UL's for Human Health Risk Assessment" Registration No. S4UL3265.
- 6.9.5 Reference has also been made to published soil screening values presented by Atkins Ltd., under their Atrisk Subscription Service. The SSVs have been adopted where SGVs or GACs are not available. The remaining contaminants have been considered based upon information that was the best available at the time of the study.

7.0 RESULTS OF ANALYSIS & QUALITATIVE RISK ASSESSMENT

7.1 Model

- 7.1.1 As discussed above, assessment of contaminated land is based upon a simple assessment of pollutant linkages referred to as the source-pathway-target model. This assessment considers the current or proposed usage of the site in terms of suitability for use. This implies the use of risk assessment in Principal in order to evaluate the potential effects and concerns of contamination on a site-specific basis.
- 7.1.2 Initial assessment of the chemical analyses results has been undertaken to assess the concentrations of determinands in relation to tier 1 assessment criteria. The summary of these test results is detailed below.

7.2 Results Summary

- 7.2.1 The samples were obtained from the made ground deposits across the whole of the site. Tables 8 to 11 have been prepared as a summary of the laboratory analyses depending upon the class of analyses undertaken and the strata type present. The test results have been compared to the adopted assessment criteria, relating to a proposed residential with home grown produce land usage.

7.3 Metals & Inorganics

- 7.3.1 Table 8 indicates the range of contaminants that were included within the metals and inorganics analyses along with their respective assessment criteria. Elevated lead concentrations were recorded within WS01 at 0.20m, within the made ground strata.

Table 8: Summary of Contamination Analysis: Metals & Inorganics					
	No. of Samples	Range of Values (mg/kg)	Assessment Criteria (mg/kg)	No. of Samples Failing	Locations
Arsenic	10	14 – 27	37 ³	0	-
Cadmium	10	<0.2 – 1.0	11.0 ³	0	-
Chromium (total)	10	15 – 330	910 ³	0	-
Copper	10	25 – 100	2400 ³	0	-
Lead	10	51 – 240	200 ¹	1	WS01 at 0.20m
Mercury	10	<0.3 – 0.4	40 ³	0	-
Nickel	10	10 – 150	180 ³	0	-
Selenium	10	<1.0	250 ³	0	-
Zinc	10	47 - 190	3700 ³	0	-
Total Cyanide	10	<1.0	34.0 ²	0	-
Phenol	10	<1.0 – 1.2	200 ³	0	-
pH	10	5.6 – 7.7	-	0	-
SOM	10	3.27 – 10.82	-	0	-
TOC %	10	1.9 – 9.1	-	0	-
SO ₄ (2:1)	10	31 - 1300	500	0	-
Asbestos	8	ND	Present/Absent	0	-
¹ DEFRA : SP1010 : Category 4 Screening Levels ² Atkins Atrisk SSV residential with home grown produce (2.5% SOM) ³ LQM and CIEH S4UL's for Human Health Risk Assessment (Registration No. S4UL 3265) residential with home grown produce (2.5% SOM) ⁴ BRE Special Digest 1:2005 DS-1 (units in g/l) ND – None Detected					

7.3.2 Samples of topsoil and made ground have been screened for the presence of asbestos. No asbestos fibres have been identified and therefore, no remedial works are required in terms of asbestos containing materials and fibres.

7.4 Speciated PAH

7.4.1 The made ground and topsoil samples retained from the site investigation have been subject to a programme of analyses which have assessed the concentrations of the individual constituents of the polycyclic aromatic hydrocarbon series. A summary of these results is shown in table 9. The assessment criteria utilised are based upon the presence of 2.5% soil organic matter within the samples generally. Reference to the tests results does however show more variable soil organic matter content.

Table 9: Summary of Contamination Analysis: Organics: PAH USEPA 16 Suite

	No. of Samples	Range of Values (mg/kg)	Assessment Criteria ¹ (mg/kg)	No. of Samples Failing	Locations
Naphthalene	10	<0.05 – 0.1	5.6	0	-
Acenaphthylene	10	<0.05 – 0.05	420	0	-
Acenaphthene	10	<0.05 – 0.2	510	0	-
Fluorene	10	<0.05 – 0.15	400	0	-
Phenanthrene	10	<0.05 – 1.5	220	0	-
Anthracene	10	<0.05 – 0.37	5400	0	-
Fluoranthene	10	0.05 – 2.4	560	0	-
Pyrene	10	0.05 – 2.2	1200	0	-
Benzo[a]anthracene	10	<0.05 – 1.0	11.0	0	-
Chrysene	10	<0.05 – 1.3	22.0	0	-
Benzo[a]pyrene	10	<0.05 – 1.1	5.0 ²	0	-
Indeno[123-cd]pyrene	10	<0.05 – 0.57	36.0	0	-
Dibenz[ah]anthracene	10	<0.05 – 0.15	0.28	0	-
Benzo[ghi]perylene	10	<0.05 – 0.61	340	0	-
Benzo[b]fluoranthene	10	<0.05 – 1.2	3.3	0	-
Benzo[k]fluoranthene	10	<0.05 – 0.61	93	0	-

¹ LQM & CIEH S4UL's for human health risk assessment (Registration No. S4UL 3265) – Residential with home grown produce (2.5% SOM)

² DEFRA : SP1010 : Category 4 Screening Levels

7.4.2 Assessment of table 9 has indicated there are no elevated concentrations of PAH compounds above the adopted assessment criteria.

7.5 TPH (CWG)

7.5.1 As part of the analysis of the made ground material, chemical testing has been extended to the hydrocarbon fractions and the results are appended in table 10. A review of the data indicates the results are below the assessment criteria and as such, there is no requirement for remediation in terms of hydrocarbons.

Table 10: Summary of Contamination Analysis: Organics: TPH (CWG) Suite

	No. of Samples	Range of Values mg/kg	Assessment* Criteria mg/kg	No. of Samples Failing	Notes
Aliphatic EC> 5 - 6	2	<0.01	78.0	0	-
Aliphatic EC> 6 - 8	2	<0.01	230	0	-
Aliphatic EC> 8 - 10	2	<0.01	65.0	0	-
Aliphatic EC> 10 - 12	2	<1.0	330	0	-
Aliphatic EC> 12 - 16	2	<2.0 – 4.5	2400	0	-
Aliphatic EC> 16 - 35	2	<8.0 – 48	92000	0	-
Aliphatic EC> 35 - 44	2	<8.4 - 19	92000	0	-
Aromatic EC> 5 - 7	2	<0.01	140	0	-
Aromatic EC> 7 - 8	2	<0.01	290	0	-
Aromatic EC> 8 - 10	2	<0.02	83.0	0	-
Aromatic EC> 10 - 12	2	<1.0	180	0	-
Aromatic EC> 12 - 16	2	<2.0 – 5.6	330	0	-
Aromatic EC> 16 - 21	2	<10 – 22	540	0	-
Aromatic EC> 21 - 35	2	12 – 53	1500	0	-
Aromatic EC> 35 - 44	2	<8.4 - 22	1500	0	-

*Criteria values based upon LQM & CIEH S4UL's for human health risk assessment (Registration No. S4UL 3265) – Residential with home grown produce (2.5% SOM)

7.6 BTEX

7.6.1 As part of the hydrocarbon analysis, the BTEX range of hydrocarbons have been analysed. All concentrations have been recorded below the limit of detection (LOD), and therefore no remediation is required in terms of BTEX fractions.

Table 11: Summary of Contamination Analysis: Organics: BTEX Suite

	No. of Samples	Range of Values (mg/kg)	Assessment* Criteria (mg/kg)	No. of Samples Failing	Notes
Benzene	2	<0.005	0.17	0	
Toluene	2	<0.005	290	0	
EthylBenzene	2	<0.005	110	0	
M/PXylenes	2	<0.005	140	0	
O - Xylene	2	<0.005	140	0	
Methyl tert-Butyl Ether	2	<0.005	20 ¹	0	
Criteria values based upon LQM & CIEH S4UL's for human health risk assessment (Registration No. S4UL 3265) – Residential with home grown produce (2.5% SOM) ¹ Atkins Atrisk SSV residential with home grown produce (1% SOM)					

7.7 Sulphates

7.7.1 Within the programme of laboratory testing each sample has also been analysed to determine the concentration of water-soluble sulphates within the ground. Reference to the laboratory results presented by i2 Analytical Ltd confirms that soluble sulphates are present at concentrations of 31 and 1300 mg/l. The elevated readings of 790 and 1300 mg/l were recorded within WS01 at 1.20m in the made ground material. It is possible due to the contamination noted within WS01 and existing site levels, the made ground may be removed within this area and as such, Table 12 details the two possible concrete classification scenarios, either taking into consideration the elevated omitting, if this material can be segregated. Reference to BRE Special Publication 1: 2005 "Concrete in Aggressive Ground".

Table 12: Concrete Classification Based on a Greenfield Location with Mobile Groundwater

	Laboratory Results (mg/l)	S04(2:1) (mg/l)	pH	Design Sulphate Class	ACEC Class	DC Class (100 years working life)
Omitting WS01 readings	31 – 200	<500	>5.5	DS-1	AC-1	DC-1
Including WS01 readings	31 - 1300	500 - 1500	>5.5	DS-2	AC-2	DC-2

7.8 Index Properties

7.8.1 A total of ten (10 No.) samples of the natural clay strata encountered during these investigations have been returned to a civil laboratory to determine their index properties. Copies of the laboratory tests are appended to this report for reference. A summary of the plasticity index tests are shown in table 13.

Table 13: Summary of Plasticity Index Test Results

Location	Depth (m bgl)	Modified Plasticity Index (%)	NHBC Volume Change Potential
WS01	1.20	17.82	Low
WS03	2.30	20.79	Medium
TP04	1.20	12.96	Low
TP05	1.40	14.40	Low
TP06	1.90	12.24	Low
TP07	0.90	16.00	Low
TP08	1.40	12.60	Low
TP09	1.70	24.36	Medium
TP10	1.00	10.01	Low
TP14	1.80	14.49	Low

7.8.2 Generally, the clays within the site exhibit a low volume change potential, with modified plasticity index results between 10.01% and 17.82%. However, two of the samples have recorded modified plasticity index results between 20.79% and 24.36%, which would equate to a medium volume change potential. With reference to the NHBC Guidance, Chapter 4.2, on average the site could be classified as having a low volume change, but under worst case scenario, this should be increased to a medium volume change potential.

8.0 GAS MONITORING

8.1 General

8.1.1 The Desk Study identified a historical landfill located 104m north west at Clay Lane Water Treatment Works, in addition to the area of made ground 99m north west and infilling or former reservoirs 114m north west and 165m north. It was therefore considered that base upon the this information, a programme of ground gas monitoring should be undertaken, with gas monitoring standpipes being installed within positions WS01, WS02, and WS03 to assess any possible gas generation issues.

8.2 Installation

8.2.1 To identify the presence of ground gases generating from the made ground material, window sample boreholes have been installed with permanent gas monitoring wells. In an effort to determine the presence of any gas migration or generation the response zone has been created at depths varying between 1.00m and 4.00m bgl.

8.2.2 The installations have included for the insertion of high-density polyethylene 50mm diameter plain and slotted standpipes. The annulus space around the standpipes has been filled with non-calcareous pea gravel in the range of 2mm – 5 mm. Above and below each response zone a minimum 1.0m bentonite clay seal has been installed and each position has been finished with a gas tap and flush lockable steel cover. Full details of the installations are appended to this report for reference.

8.3 Dates

8.3.1 Gas monitoring points were installed on the 28th October 2024 and the first visit was undertaken on the 22nd November 2024. Monitoring has been carried out over a three month period and was comprised of a gas monitoring visit every two weeks, totalling six visits over three months. The final visit was carried out on the 30th January 2025.

8.4 Procedure

8.4.1 The installation of the gas wells and gas monitoring procedures have been based upon the recommendations laid down in CIRIA C665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" along with NHBC publication No. 4 "Guidance on Evaluation of Development Proposals on Site where Methane and Carbon Dioxide are Present". In accordance with the documentation, it is intended that the period of monitoring will be up to three months with at least six monitoring visits being undertaken during that period. This assessment is based upon Tables 5.5a and 5.5b of CIRIA C665 and relates to a residential development with a low potential source of gas.

8.5 Range

8.5.1 The installed gas wells are intended to be monitored for flammable gas calibrated to methane, carbon dioxide, oxygen and gas flow using a portable infrared gas analyser. The analyser is an LMS type G3Xi gas meter and has been calibrated with an annual period. Full details of the analysis program and assessments are presented within the appendix of this report.

8.6 Monitoring

8.6.1 The gas monitoring recommendations require that gas monitoring rounds should encompass various climatic conditions particularly in relation to atmospheric pressures. Ideally at least one round should be undertaken at an atmospheric pressure of less than 1000mb although this has not been achievable over the monitoring period. Readings at falling pressures and after heavy rain are also considered to be desirable.

8.7 Results

8.7.1 The conceptual site model suggests that the potential for explosive and toxic gases to be generated within this site is based on high on the basis of the following factors:-

- Historical landfill located 104m north west
- Made ground deposit – 99m north west
- Infilled reservoirs – 114m north west and 165m north

8.7.2 The final results of the ground gas monitoring are reported below in table 14.

Table 14: Summary of Gas Monitoring Results								
Location	No of Monitoring Visits	Methane % v/v	Carbon Dioxide % v/v	Oxygen %	Flow l/hr	W.L. Depth	Base Of Installation (m)	Atmospheric Pressure (mB)
WS01	6	0.0	0.0-8.2	13.0-20.0	0.00	0.00-2.50	3.00	960 – 1002
WS02	6	0.0	0.0-4.2	16.9-20.1	0.00	0.00-2.00	3.00	962 – 1002
WS03	6	0.0	0.0-5.2	15.7-20.1	0.00	0.00-DRY	4.00	960 - 1002

Note ND - none detected

8.7.3 Final gas results have identified a maximum concentration of methane at 0.0% and maximum carbon dioxide concentration has been identified at 8.2% within positions WS01.

8.7.4 Monitoring has recorded no measurable flows and therefore minimum flow value of 0.1 l/hr has been utilised for the calculation of a gas screening value (gsv).

- 8.7.5 Based upon the monitoring data calculations we can confirm that the maximum GSV for methane is 0.0% and the maximum GSV for carbon dioxide is 0.0082 l/hr. Reference to Table 8.5 CIRIA C665 confirms that based upon this GSV values the site should be classified as Characteristic Situation 1. However, carbon dioxide has been recorded at levels above 5% and therefore, gas protective measures will increase to Characteristic Situation 2.
- 8.7.6 The elevated carbon dioxide reading identified within WS01 has been attributed to the Made Ground strata recorded within this position to 2.20m. It is considered within the area of WS01, the level of the ground has been raised which has attributed to a localised area of Made Ground. As such, based on the results of ground gas monitoring programme, localised ground gas protection measures are required within the 'raised' area, as identified within the appended development constraints plan, 23154/02B.
- 8.7.7 Within the area of WS03, one slightly raised reading was recorded within WS03 at 5.2% and the subsequent visits, have not recorded any carbon dioxide readings. The material encountered within this position comprised of natural topsoil deposits overlying superficial deposits which do not contain any organic content. As the remaining visits did not show any levels of carbon dioxide or methane, it is considered that this reading poses a very low risk to the end users of the site and subsequently ground gas protection measures are not required within the vicinity of WS03.

9.0 DISCUSSIONS

9.1 General

- 9.1.1 The desk study information has identified the site has remained a parcel of farmland until around until around 2012 with the construction of the present-day residential property and outbuildings within the very north of the site. The remainder of the site has experienced no change or development and still comprises a parcel of land. Development within the surrounding area has been concentrated towards the north, with the construction and subsequent infilling of the reservoirs, and the expansion of residential properties. Immediately southwards, the area has remained farmland with little to no significant changes.
- 9.1.2 The ground investigation has identified made ground deposits only within WS01 to a depth of 2.20m bgl. The remainder of the site noted topsoil deposits overlying soft becoming firm clays, underlain by shallow mudstone of the Lower Pennine Coal Measures Formation. The eastern boundary recorded highly weathered bedrock of the Old Lawrence Rock from 1.00m.
- 9.1.3 The results of the chemical analyses undertaken upon representative samples of strata obtained from this site have been assessed in Section 7 above and subject to further discussion below.

9.2 Contamination

- 9.2.1 The chemical analysis undertaken on the representative samples of made ground material have identified elevated lead concentrations within WS01 only at 0.20m. Analysis of the topsoil material from across the whole site area has not recorded any elevated concentrations of metals, inorganics, PAH or TPH compounds and therefore, the topsoil is deemed suitable for reuse and retention within the proposed development.

9.2.2 Where any visual or olfactory evidence of suspicious ground conditions are encountered during the development process, it is important that works within this area are terminated and appropriate authorities notified. Appropriate inspection, sampling and testing should then be undertaken to determine whether these materials represent a potential hazard to site operatives or end users of the site prior to works recommencing.

9.3 Revised Conceptual Site Model

9.3.1 As a result of these intrusive ground investigations and subsequent programme of chemical analyses, it has been possible to revise the preliminary conceptual site model presented in Section 3. The revised conceptual site model is now shown in table 15. This report adopts the methodology for risk evaluation presented in CIRIA report C552 'Contaminated Land Risk Assessment – A Guide to Good Practice', 2001. The method is qualitative and involves the classification of the following:

9.3.2 In the context of regulatory definition of 'Contaminated Land' (as defined by the EPA 1990), 'very high' and 'high' risks would fall under the classification of 'Contaminated Land'. 'Moderate' risk could also potentially be classified as 'Contaminated Land' but any lower risk rating would not. Thus, the following potential exposure pathways between potential and known contaminant sources based on information provided to date and receptors are tentatively identified in table 15.

Table 15 – Revised Conceptual Site Model						
Potential Source	Potential Receptor	Possible Pathway	Probability	Consequence	Risk	Mitigation / Investigation
Contaminated soils	Future site users	Direct contact of soils Inhalation or ingestion of soil / dust	Li	Mi	Moderate / Low	High lead concentrations noted within the made ground material at WS01 (0.20m bgl). Programme of hotspot remediation required within this location. Testing of topsoil recorded no elevated concentrations and is therefore suitable for reuse and retention.
	Surface water in the vicinity of the site	Leaching of contaminants through drainage system	Li	Mi	Moderate / Low	
	Ground water in aquifer	Leaching of contaminants to ground water	UI	Md	Low	
	Future site users	Vapour migration from soils	UI	Md	Low	
	Proposed buildings and services	Direct contact with contaminated soils	UI	Md	Low	
	Plants in gardens and soft landscaping	Direct contact	Lw	Mi	Low	
Contaminated ground water	Site personnel during construction	Water entering excavations	Lw	Mi	Low	
	Future site Users	Retained surface water	Lw	Mi	Low	
Toxic and explosive gases	Proposed buildings and occupiers	Ground gas migration into buildings	Li	Md	Moderate	CS2 Ground Gas Protection Measures required within the vicinity of WS01.
Radon gases	Proposed buildings and occupiers	Ground gas migration into buildings	UI	Md	Low	Less than 1% of properties above the action level. No radon precautions required.
Key: Consequence: Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor Probability: Hi = High, Li = Likely, Lw = Low Likelihood, UI = Unlikely						

9.4 Foundations

- 9.4.1 The investigation has identified topsoil overlying natural drift deposits across the whole site area. The superficial strata generally comprised soft becoming stiff clays, with isolated pockets of granular sands towards to the north west and eastern boundary. Strength of the cohesive clay units increases with depth, with a marked transition from around 1.00m bgl. In-situ standard penetration tests have recorded 'N' values ranging from 10 to 18 and based upon this information, the clay units are considered capable of offering a safe bearing capacity of 90kN/m² at a minimum depth of 1.00m bgl.
- 9.4.2 Available BGS records show an inferred fault of unknown displacement located within the development site. Taking into consideration the information gained from the investigation, alongside the presence of the fault, it is anticipated that the majority of plots can be found utilising traditional strip or deep strip foundations. However, reinforcement is required within all strip footings due to the presence of the geological fault (B385).
- 9.4.3 The Development Constraints Plan (23154/02/B) identifies an area of soft ground conditions towards the south west of the site (TP05, TP06, TP12). These deposits have recorded soft clays to depths of 2.30m bgl, overlying highly weathered mudstone bedrock and as such, there will be a requirement for foundations within this area to be taken deeper. Bedrock was encountered within the majority of locations, at depths ranging from 1.60m to 4.00m bgl as a weathered mudstone, whilst TP07 and TP08 recorded a sandstone gravel, possibly representing the start of the Old Lawrence Rock formation. It is anticipated that within the highly weathered zones, the bedrock is capable of offering a minimum safe bearing capacity of 250kN/m², at a minimum depth of 1.60m, increasing rapidly within the un-weathered zone, where bearing capacities in excess of 350kN/m² are achievable.
- 9.4.4 In those areas where softer, weaker strata is present, foundations will need to extend to greater depths. However, it is essential that foundation excavations are not 'over dug' where rock is encountered, as it will then be necessary for the whole foundations to be formed upon rock. Any foundations extending to rockhead, will also require the provision of a reinforced foundation solution, though, a full assessment should be undertaken by a foundations engineer.
- 9.4.5 WS01 towards the north west of the site has recorded deep made ground deposits overlying soft clays to 2.80m. Based on the current conditions and site levels, properties within this area should be provided with a piled foundation solution. However, if levels within this area are to be reduced as part of the development process, then this may allow us to remove the gas risk to these plots and also eliminate the need for piling. Final site levels will need to be considered in greater detail, to assess the foundation solution and potential gas risk, based on current monitoring data.
- 9.4.6 The majority of the shallow ground conditions present within the site comprise of cohesive clays which are susceptible to volume change potential as a result of varying moisture content. Laboratory analysis undertaken upon samples of clay strata have shown varying plasticity indices. However, under the worst case scenario, the site is classified as having a medium volume change potential as defined by the NHBC Handbook, Chapter 4.2.

9.5 Ground Floor Construction

- 9.5.1 It is recommended that all properties within the site should be provided with a suspended ground floor construction. This may be of a specialist manufactured pre-cast concrete beam and block type or of a designed cast in situ construction. In those areas where tree root effects are important it is recommended that a pre-cast concrete beam and block type floor is utilised to allow for the provision of a suitable air void below ground floor construction.
- 9.5.2 The programme of ground gas monitoring has concluded and it is recommended that CS2 ground precautions are adopted within the area of WS01 as part of the ground floor construction.

9.6 SUDS

- 9.6.1 Assessment of the ground conditions present within this site in terms of sustainable urban drainage confirms the presence of topsoil overlying effectively impermeable cohesive natural strata across the majority of the site. Where granular units and bedrock were identified, this typically corresponded with the ingress of groundwater. As such, we consider the site is unsuitable for the adoption of a soakaway system and other means of surface water disposal should be considered.

10.0 CONCLUSIONS & RECOMMENDATIONS

10.1 Further Work

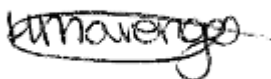
- 10.1.1 Due to the raised concentrations of lead within the made ground material in WS01 at 0.20m, there will be a requirement for a programme of hotspot remediation. In addition, the Remediation Strategy should also include proposals for the adoption of CS2 Gas Protection measures for the plots within the vicinity of WS01. These should be detailed within a formal Remediation Strategy to allow for the safe development of the site.
- 10.1.2 If any unusual or suspicious strata or ground conditions are encountered during the subsequent site stripping preparation work, it will be necessary for these areas to be brought to the attention of the appropriate authorities so that all necessary inspection, sampling and testing may be undertaken to determine whether these materials present a hazard to human health. It is incumbent upon the site contractors to advise a responsible authority of any unusual findings within the site which may then be further investigated.

11.0 NOTES

- 11.1 All reports are for advisory purposes only and all design decisions are the ultimate responsibility of others.
- 11.2 Unless stated otherwise the investigation has been undertaken in general accordance with the recommendations given in BS 5930 : 1999 "A Code of Practice for site Investigations" and the laboratory testing has been carried out in accordance with BS 1377 : 1990 "Methods of Test for Civil Engineering Purposes".

- 11.3** Soil and rock descriptions are generally based on the scales of strength and relative density within BS 5930 although it should be noted that in certain circumstances descriptions are based on site records or a qualitative assessment without the benefit of in-situ or laboratory test results.
- 11.4** The assessment of ground conditions given in this report is based on the results of the fieldwork and laboratory testing carried out and there may be other conditions at the site not encountered by these works, which have not been taken into account.
- 11.5** The scope of the investigation and information provided may not necessarily reflect all the geotechnical and environmental aspects related to the site, and the omission of certain items does not mean that the site is unaffected by such problems.
- 11.6** It should be noted that groundwater levels can vary and may at times be significantly different to those recorded during the investigation and attention is drawn to BS 5930 which indicates that measurements may be necessary over an extended period of time to investigate changes in groundwater pressures due to seasonal, tidal and other causes.
- 11.7** Any recommendations on construction methods within this report are for initial guidance only and all design proposals remain the responsibility of the appropriate contractor/consultant.
- 11.8** Further assessment, investigation, construction activities or time may reveal conditions that were not found during the period of investigation and, therefore, could not have been taken into account in the preparation of the report and where such information might impact upon the stated opinion R. E. Fry & Associates Ltd request the opportunity to review such information and modify the report if necessary.
- 11.9** Where information has been obtained from sources other than the direct findings of the investigation, R. E. Fry & Associates Ltd cannot and does not guarantee the authenticity or reliability of this information.
- 11.10** Where opinions expressed in this report are based on current available guidelines and legislation, no liability can be accepted by R. E. Fry & Associates Ltd for the effects of any future changes to such guidelines and legislation.
- 11.11** This report has been prepared on the instructions and to the requirements of the named client and any unauthorised party using this information for any purpose does so at his own risk and any duty of care to that party is excluded.

Signed for and on behalf of
R E FRY & ASSOCIATES LIMITED



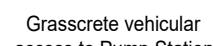
Hollie Marengo BSc (Hons), MSc, FGS
Senior Geo-Environmental Manager

APPENDIX A

general notes:
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- | | |
|---|--|
|  | Application Boundary |
|  | Existing trees to be retained |
|  | Existing root protections |
|  | Indicative planting |
|  | Indicative hedging |
|  | Existing trees to be removed |
|  | Denotes shared drives |
|  | Denotes raised tables |
|  | Denotes affordable housing units |
|  | Overhead Cable Swing Line + 1m Easement |
|  | Denotes timber gate |
|  | Denotes 1.8m high feathered edge timber fence (refer to detail FD-004) |



Indicative SuDS

Potential PROW link

Wain HOMES		GREENVALE, BAMFORD, ROCHDALE						
Code	House Type	Bed & Type	Storey	Parking	Unit No.	Build Sq/Ft	Total Build Sq/Ft	Mix %
Affordable								
REC	Backfold	2B-3P Mews / Semi	2	2PS	7	771	5397	16%
Sub-Total					7	771	5397	16%
Open Market								
PAR	Parkland	3B-4P Semi	2	2PS	5	1012	5060	12%
MEA	Meadowvale	3B-4P Detached	2	2PS	7	1093	7651	16%
HIG	Hightstone	4B-7P Detached	2	2PS + SIG	8	1306	11168	19%
PEA	Peakridge	5B-8P Detached	2	2PS + SIG	6	1679	10074	14%
STA	Standish	5B-8P Detached	2	2PS + SIG	4	1907	7628	9%
CAP	Capstone	5B-8P Detached	2	2PS + SDG	6	2240	13440	14%
Sub-Total					36	9327	55021	84%
TOTAL					43	10098	60418	100%
Gross Site Area			6.66 Acres					
Nett Site Area			4.23 Acres					
Net Density			10 Units / Acre					
SqFt / Net Developable Acre			14283 SqFt / Acre					

C	04/03/2025	ELC	Overhead cable swing lines updated. Plots along swing line adjusted accordingly. Indicative footpath links, SUDS & pump station added.
B	04/03/2025	ELC	Plot 2 changed to HIG. Plot 23 & 24 changed to STA & PEIA respectively.
A	04/03/2025	ELC	Sub-station moved & access road adjusted to accommodate. Plot 41 swapped to HIG. Plot 8 swapped to PEIA. Plots 8-12 moved. 23-25 rotated.

Client

Wain
HOMES

mck associates limited
architecture ■ building surveying ■ urban design

burnaby villa ■ 48 watling street road ■ fulwood ■ preston ■ pr2 8bp
tel: 01772 774510 fax: 01772 774511 email mck@mckassociates.co.uk

Project:
GREENVALE
BAMFORD
ROCHDALE

Drawing Title:

PROPOSED SITE LAYOUT

Drawn: ELC	Checked: PGM	Scale: 1:500	Date: 19/02/2025
Job No: 23-025		Drawing No: 0001	Rev: C

A1

PLANNING



ing. Name & Location: Z:\Job's\2023 Jobs\23-025 Walin Homes - Greenwale, Barnford, Rochdale\Drawings\Modell\2.2 Proposed\02.2 Site Layouts\Processed Site Layout Rev C.dwg.

APPENDIX B

54, GREENVALE, ROCHDALE, OL11 5QJ

Order Details

Date: 19/02/2024
Your ref: 23154
Our Ref: GS-JBF-XN5-121-69D

Site Details

Location: 386024 413440
Area: 2.73 ha
Authority: [Rochdale Metropolitan Borough Council](#) ↗



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Summary of findings

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

[p. 9 >](#)

OS MasterMap site plan

[p.12 >](#) 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
13 >	1.1 >	Historical industrial land uses >	0	0	6	40	-
15 >	1.2 >	Historical tanks >	0	0	3	15	-
16 >	1.3 >	Historical energy features >	0	0	2	7	-
17	1.4	Historical petrol stations	0	0	0	0	-
17	1.5	Historical garages	0	0	0	0	-
18	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
19 >	2.1 >	Historical industrial land uses >	0	0	10	57	-
22 >	2.2 >	Historical tanks >	0	0	4	23	-
23 >	2.3 >	Historical energy features >	0	0	3	7	-
24	2.4	Historical petrol stations	0	0	0	0	-
24	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
25	3.1	Active or recent landfill	0	0	0	0	-
25	3.2	Historical landfill (BGS records)	0	0	0	0	-
26	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
26 >	3.4 >	Historical landfill (EA/NRW records) >	0	0	1	0	-
26	3.5	Historical waste sites	0	0	0	0	-
26	3.6	Licensed waste sites	0	0	0	0	-
27 >	3.7 >	Waste exemptions >	0	0	0	61	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
33 >	4.1 >	Recent industrial land uses >	0	1	7	-	-
34	4.2	Current or recent petrol stations	0	0	0	0	-
34	4.3	Electricity cables	0	0	0	0	-
34	4.4	Gas pipelines	0	0	0	0	-
35	4.5	Sites determined as Contaminated Land	0	0	0	0	-



35	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
35	4.7	Regulated explosive sites	0	0	0	0	-
35	4.8	Hazardous substance storage/usage	0	0	0	0	-
35	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
36	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
36 >	4.11 >	<u>Licensed pollutant release (Part A(2)/B) ></u>	0	0	0	1	-
36	4.12	Radioactive Substance Authorisations	0	0	0	0	-
36 >	4.13 >	<u>Licensed Discharges to controlled waters ></u>	0	0	0	2	-
37	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
37	4.15	Pollutant release to public sewer	0	0	0	0	-
37	4.16	List 1 Dangerous Substances	0	0	0	0	-
38	4.17	List 2 Dangerous Substances	0	0	0	0	-
38	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
38	4.19	Pollution inventory substances	0	0	0	0	-
38	4.20	Pollution inventory waste transfers	0	0	0	0	-
38	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	<u>Hydrogeology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
39 >	5.1 >	<u>Superficial aquifer ></u>	Identified (within 500m)				
41 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
42 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
43	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
43	5.5	Groundwater vulnerability- local information	None (within 0m)				
44 >	5.6 >	<u>Groundwater abstractions ></u>	0	0	0	0	24
51 >	5.7 >	<u>Surface water abstractions ></u>	0	0	0	0	17
55 >	5.8 >	<u>Potable abstractions ></u>	0	0	0	0	5
56	5.9	Source Protection Zones	0	0	0	0	-
57	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	<u>Hydrology ></u>	On site	0-50m	50-250m	250-500m	500-2000m
58	6.1	Water Network (OS MasterMap)	0	0	0	-	-



58	6.2	Surface water features	0	0	0	-	-
59 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
59 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
60 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
61	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
61	7.2	Historical Flood Events	0	0	0	-	-
61	7.3	Flood Defences	0	0	0	-	-
62	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
62	7.5	Flood Storage Areas	0	0	0	-	-
63	7.6	Flood Zone 2	None (within 50m)				
63	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
64 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
66 >	9.1 >	Groundwater flooding >	Low (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
67	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
68	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
68	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
68	10.4	Special Protection Areas (SPA)	0	0	0	0	0
68	10.5	National Nature Reserves (NNR)	0	0	0	0	0
69	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
69 >	10.7 >	Designated Ancient Woodland >	0	0	0	1	12
70	10.8	Biosphere Reserves	0	0	0	0	0
70	10.9	Forest Parks	0	0	0	0	0
70	10.10	Marine Conservation Zones	0	0	0	0	0
70 >	10.11 >	Green Belt >	1	0	0	0	0
71	10.12	Proposed Ramsar sites	0	0	0	0	0



71	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
71	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
71	10.15	Nitrate Sensitive Areas	0	0	0	0	0
72	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
73 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
74	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
75	11.1	World Heritage Sites	0	0	0	-	-
75	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
75	11.3	National Parks	0	0	0	-	-
75	11.4	Listed Buildings	0	0	0	-	-
76	11.5	Conservation Areas	0	0	0	-	-
76	11.6	Scheduled Ancient Monuments	0	0	0	-	-
76	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
77 >	12.1 >	Agricultural Land Classification >	Grade 4 (within 250m)				
78	12.2	Open Access Land	0	0	0	-	-
78	12.3	Tree Felling Licences	0	0	0	-	-
78	12.4	Environmental Stewardship Schemes	0	0	0	-	-
79	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
80	13.1	Priority Habitat Inventory	0	0	0	-	-
80	13.2	Habitat Networks	0	0	0	-	-
80	13.3	Open Mosaic Habitat	0	0	0	-	-
80	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
81 >	14.1 >	10k Availability >	Identified (within 500m)				
82 >	14.2 >	Artificial and made ground (10k) >	0	0	2	1	-
83 >	14.3 >	Superficial geology (10k) >	1	0	1	4	-

84 >	14.4 >	Landslip (10k) >	0	0	0	1	-
85 >	14.5 >	Bedrock geology (10k) >	7	1	9	4	-
87 >	14.6 >	Bedrock faults and other linear features (10k) >	1	0	5	3	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
88 >	15.1 >	50k Availability >	Identified (within 500m)				
89 >	15.2 >	Artificial and made ground (50k) >	0	0	1	0	-
90	15.3	Artificial ground permeability (50k)	0	0	-	-	-
91 >	15.4 >	Superficial geology (50k) >	1	0	2	4	-
92 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
92	15.6	Landslip (50k)	0	0	0	0	-
92	15.7	Landslip permeability (50k)	None (within 50m)				
93 >	15.8 >	Bedrock geology (50k) >	7	1	13	5	-
95 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
95 >	15.10 >	Bedrock faults and other linear features (50k) >	1	0	5	2	-
Page	Section	Boreholes >	On site	0-50m	50-250m	250-500m	500-2000m
97 >	16.1 >	BGS Boreholes >	0	0	13	-	-
Page	Section	Natural ground subsidence >					
99 >	17.1 >	Shrink swell clays >	Very low (within 50m)				
100 >	17.2 >	Running sands >	Very low (within 50m)				
101 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
102 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
103 >	17.5 >	Landslides >	Very low (within 50m)				
104 >	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
106	18.1	BritPits	0	0	0	0	-
107 >	18.2 >	Surface ground workings >	0	0	30	-	-
108 >	18.3 >	Underground workings >	0	0	0	3	11
109	18.4	Underground mining extents	0	0	0	0	-
109	18.5	Historical Mineral Planning Areas	0	0	0	0	-



109 >	18.6 >	Non-coal mining >	0	0	0	0	1
110	18.7	JPB mining areas	None (within 0m)				
110	18.8	The Coal Authority non-coal mining	0	0	0	0	-
110	18.9	Researched mining	0	0	0	0	-
110	18.10	Mining record office plans	0	0	0	0	-
111	18.11	BGS mine plans	0	0	0	0	-
111 >	18.12 >	Coal mining >	Identified (within 0m)				
111	18.13	Brine areas	None (within 0m)				
111	18.14	Gypsum areas	None (within 0m)				
111	18.15	Tin mining	None (within 0m)				
112	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes >	On site	0-50m	50-250m	250-500m	500-2000m
113	19.1	Natural cavities	0	0	0	0	-
114	19.2	Mining cavities	0	0	0	0	0
114	19.3	Reported recent incidents	0	0	0	0	-
114 >	19.4 >	Historical incidents >	0	0	0	4	-
115	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
116 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
118 >	21.1 >	BGS Estimated Background Soil Chemistry >	16	3	-	-	-
119	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
119	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
120	22.1	Underground railways (London)	0	0	0	-	-
120	22.2	Underground railways (Non-London)	0	0	0	-	-
120	22.3	Railway tunnels	0	0	0	-	-
120	22.4	Historical railway and tunnel features	0	0	0	-	-
120	22.5	Royal Mail tunnels	0	0	0	-	-



121	22.6	Historical railways	0	0	0	-	-
121	22.7	Railways	0	0	0	-	-
121	22.8	Crossrail 1	0	0	0	0	-
121	22.9	Crossrail 2	0	0	0	0	-
121	22.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 23/05/2019

Site Area: 2.73ha



Contact us with any questions at:

info@groundsure.com

01273 257 755

Date: 19 February 2024

Recent site history - 2012 aerial photograph



Capture Date: 26/03/2012

Site Area: 2.73ha



Contact us with any questions at:

info@groundsure.com

01273 257 755

Date: 19 February 2024

Recent site history - 1999 aerial photograph



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Capture Date: 10/09/1999

Site Area: 2.73ha



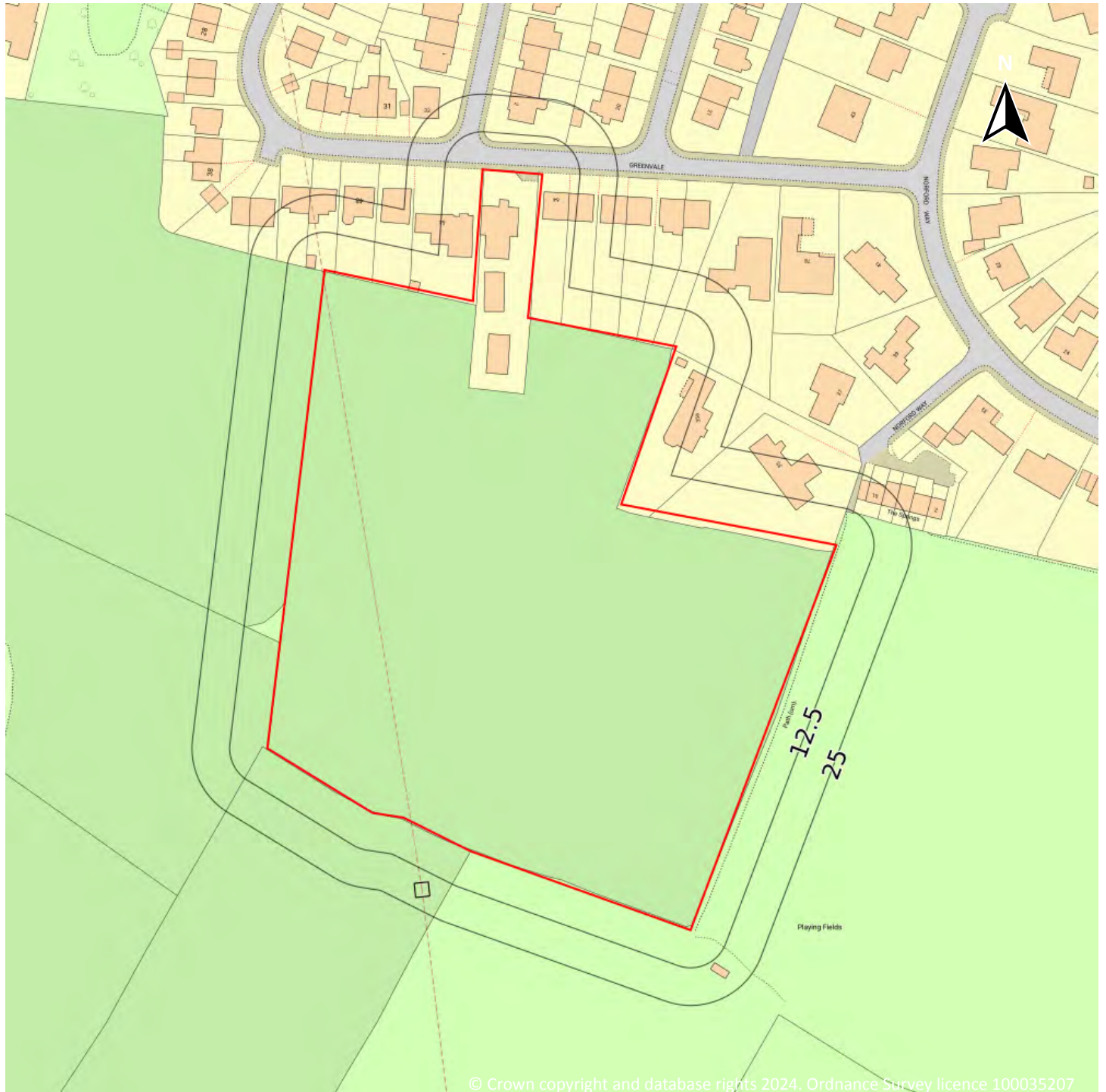
Contact us with any questions at:

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Date: 19 February 2024

OS MasterMap site plan



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Site Area: 2.73ha



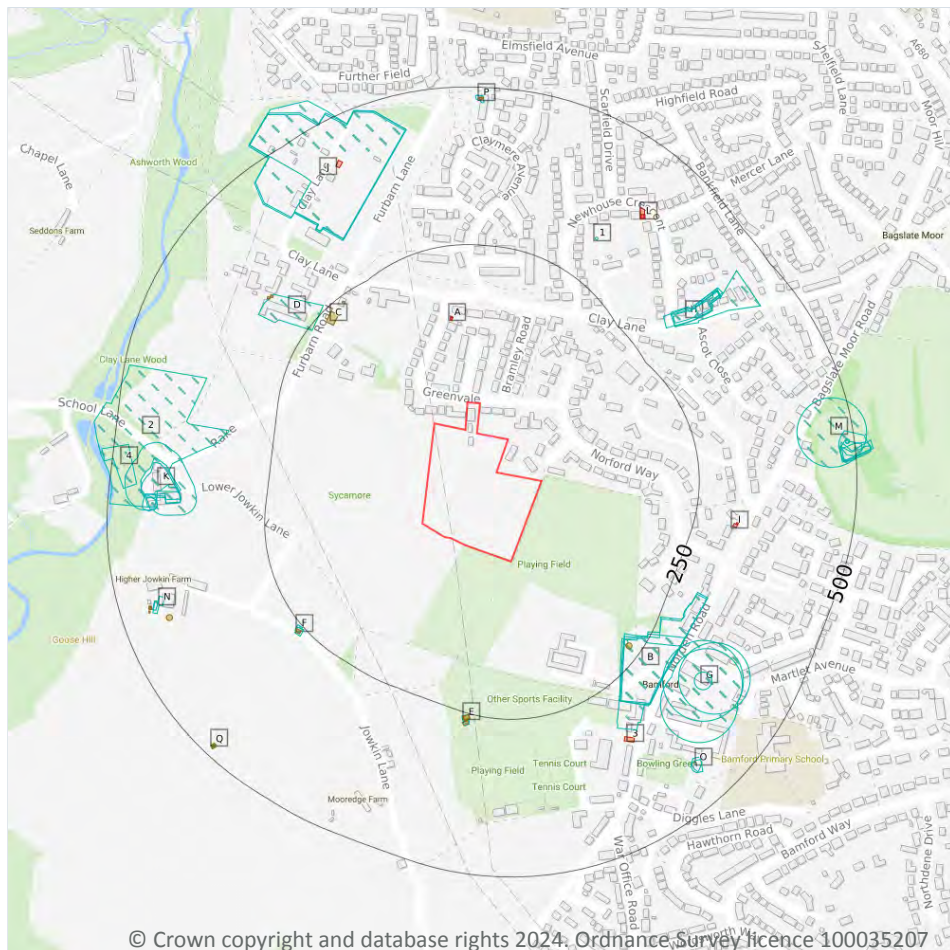
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1 Past land use



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

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1.1 Historical industrial land uses

Records within 500m

46

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

Features are displayed on the Past land use map on [page 13 >](#)

ID	Location	Land use	Dates present	Group ID
B	213m SE	Unspecified Mills	1890	711653



ID	Location	Land use	Dates present	Group ID
B	214m SE	Cotton Mill	1851	644249
B	215m SE	Unspecified Mills	1908	761420
B	218m SE	Gasometer	1851	655115
B	218m SE	Unspecified Mills	1928 - 1938	720419
D	243m NW	Hospital	1968 - 1992	713614
F	252m SW	Unspecified Tank	1949	713233
E	252m S	Unspecified Tank	1975 - 1992	712800
F	252m SW	Unspecified Tank	1928 - 1938	736329
E	258m S	Unspecified Tank	1949	768263
E	260m S	Unspecified Tank	1928 - 1938	728182
G	294m SE	Unspecified Hole	1938	758167
H	307m NE	Unspecified Mill	1890	657010
G	309m SE	Unspecified Hole	1890 - 1908	767148
G	315m SE	Unspecified Hole	1949	752333
1	318m NE	Coal Pit	1851	654090
H	319m NE	Cotton Mill	1851	644259
H	319m NE	Laundry	1928	762028
2	322m W	Fulling Mill	1851	655336
H	323m NE	Laundry	1949	749517
J	324m NW	Electric Substation	1975 - 1987	734968
J	324m NW	Electric Substation	1992	751546
J	326m NW	Unspecified Works	1968	678963
G	345m SE	Pit Hole	1928	652025
H	355m NE	Laundry	1938	766728
K	360m W	Unspecified Disused Mill	1949	704339
K	385m W	Unspecified Disused Mill	1908	771918
K	385m W	Unspecified Disused Mill	1928 - 1938	726809
K	385m W	Unspecified Commercial/Industrial	1968 - 1975	769757



ID	Location	Land use	Dates present	Group ID
M	411m E	Unspecified Shaft	1890	665154
K	421m W	Unspecified Pit	1890 - 1908	751986
K	421m W	Unspecified Pit	1928 - 1938	768314
K	422m W	Unspecified Pit	1949	730315
O	425m SE	Unspecified Pit	1949	697288
N	425m W	Unspecified Tanks	1928 - 1938	720738
O	429m SE	Unspecified Pit	1928 - 1938	772548
N	436m W	Unspecified Tanks	1949	764617
4	457m W	Unspecified Mill	1890	657009
M	474m E	Unspecified Ground Workings	1928 - 1938	745785
M	475m E	Old Coal Pit	1890	682296
P	476m N	Unspecified Tanks	1949	666402
M	476m E	Refuse Heap	1908	677415
M	477m E	Unspecified Heap	1968 - 1992	783617
M	478m E	Unspecified Ground Workings	1949	694194
M	485m E	Old Coal Shaft	1908	639845
M	486m E	Shafts	1851	675288

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

18

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

Features are displayed on the Past land use map on [page 13 >](#)

ID	Location	Land use	Dates present	Group ID
C	223m NW	Settling Tanks	1930	78166



ID	Location	Land use	Dates present	Group ID
B	225m SE	Unspecified Tank	1890 - 1910	99271
C	237m NW	Unspecified Tank	1930	84156
E	251m S	Unspecified Tank	1959 - 1975	100386
E	251m S	Unspecified Tank	1990	97179
F	257m SW	Unspecified Tank	1930	84230
E	261m S	Unspecified Tank	1930	84232
D	325m NW	Unspecified Tank	1961	84155
D	327m NW	Unspecified Tank	1979	84154
N	423m SW	Unspecified Tank	1992	84236
N	449m W	Tanks	1961 - 1992	104262
N	451m W	Tanks	1979	87674
N	453m W	Tanks	1930	87675
Q	480m SW	Unspecified Tank	1979	84235
Q	480m SW	Unspecified Tank	1961	98330
P	481m N	Tanks	1959 - 1991	100131
P	481m N	Unspecified Tanks	1992	88211
Q	482m SW	Unspecified Tank	1992	93827

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

9

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

Features are displayed on the Past land use map on [page 13 >](#)

ID	Location	Land use	Dates present	Group ID
A	133m N	Electricity Substation	1975 - 1992	50045



ID	Location	Land use	Dates present	Group ID
A	133m N	Electricity Substation	1985	49685
I	311m E	Electricity Substation	1975	45478
I	316m E	Electricity Substation	1990	45477
3	331m SE	Electricity Substation	1990	45476
L	388m NE	Electricity Substation	1985	53636
L	388m NE	Electricity Substation	1992	58193
L	389m NE	Electricity Substation	1975	53096
J	424m NW	Electricity Substation	1979	45474

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

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

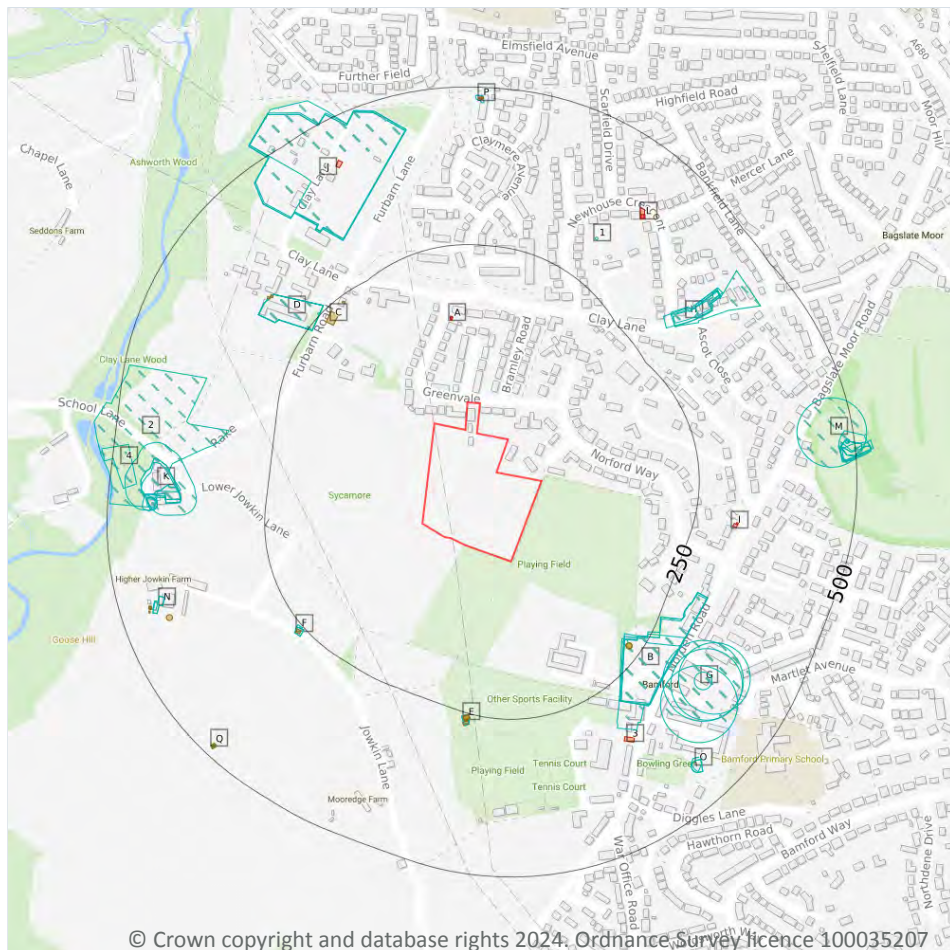
0

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



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

2.1 Historical industrial land uses

Records within 500m

67

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 19](#) >

ID	Location	Land Use	Date	Group ID
B	213m SE	Unspecified Mills	1890	711653
B	214m SE	Cotton Mill	1851	644249
B	215m SE	Unspecified Mills	1908	761420



ID	Location	Land Use	Date	Group ID
B	218m SE	Gasometer	1851	655115
B	218m SE	Unspecified Mills	1938	720419
B	218m SE	Unspecified Mills	1928	720419
D	243m NW	Hospital	1992	713614
D	243m NW	Hospital	1987	713614
D	243m NW	Hospital	1975	713614
D	243m NW	Hospital	1968	713614
F	252m SW	Unspecified Tank	1949	713233
E	252m S	Unspecified Tank	1992	712800
E	252m S	Unspecified Tank	1987	712800
E	252m S	Unspecified Tank	1975	712800
F	252m SW	Unspecified Tank	1938	736329
F	252m SW	Unspecified Tank	1928	736329
E	258m S	Unspecified Tank	1949	768263
E	260m S	Unspecified Tank	1938	728182
E	260m S	Unspecified Tank	1928	728182
G	294m SE	Unspecified Hole	1938	758167
H	307m NE	Unspecified Mill	1890	657010
G	309m SE	Unspecified Hole	1908	767148
G	313m SE	Unspecified Hole	1890	767148
G	315m SE	Unspecified Hole	1949	752333
1	318m NE	Coal Pit	1851	654090
H	319m NE	Cotton Mill	1851	644259
H	319m NE	Laundry	1928	762028
2	322m W	Fulling Mill	1851	655336
H	323m NE	Laundry	1949	749517
J	324m NW	Electric Substation	1987	734968
J	324m NW	Electric Substation	1975	734968



ID	Location	Land Use	Date	Group ID
J	324m NW	Electric Substation	1992	751546
J	326m NW	Unspecified Works	1968	678963
G	345m SE	Pit Hole	1928	652025
H	355m NE	Laundry	1938	766728
K	360m W	Unspecified Disused Mill	1949	704339
K	385m W	Unspecified Disused Mill	1908	771918
K	385m W	Unspecified Disused Mill	1938	726809
K	385m W	Unspecified Disused Mill	1928	726809
K	385m W	Unspecified Commercial/Industrial	1975	769757
K	385m W	Unspecified Commercial/Industrial	1968	769757
M	411m E	Unspecified Shaft	1890	665154
K	421m W	Unspecified Pit	1908	751986
K	421m W	Unspecified Pit	1938	768314
K	421m W	Unspecified Pit	1928	768314
K	421m W	Unspecified Pit	1928	768314
K	422m W	Unspecified Pit	1949	730315
O	425m SE	Unspecified Pit	1949	697288
K	425m W	Unspecified Pit	1890	751986
N	425m W	Unspecified Tanks	1938	720738
N	425m W	Unspecified Tanks	1928	720738
O	429m SE	Unspecified Pit	1938	772548
O	429m SE	Unspecified Pit	1928	772548
N	436m W	Unspecified Tanks	1949	764617
4	457m W	Unspecified Mill	1890	657009
M	474m E	Unspecified Ground Workings	1938	745785
M	474m E	Unspecified Ground Workings	1928	745785
M	475m E	Old Coal Pit	1890	682296
P	476m N	Unspecified Tanks	1949	666402



ID	Location	Land Use	Date	Group ID
M	476m E	Refuse Heap	1908	677415
M	477m E	Unspecified Heap	1992	783617
M	477m E	Unspecified Heap	1987	783617
M	477m E	Unspecified Heap	1975	783617
M	477m E	Unspecified Heap	1968	783617
M	478m E	Unspecified Ground Workings	1949	694194
M	485m E	Old Coal Shaft	1908	639845
M	486m E	Shafts	1851	675288

This data is sourced from Ordnance Survey / Groundsure.

2.2 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. 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 19 >](#)

ID	Location	Land Use	Date	Group ID
C	223m NW	Settling Tanks	1930	78166
B	225m SE	Unspecified Tank	1890	99271
B	225m SE	Unspecified Tank	1910	99271
C	237m NW	Unspecified Tank	1930	84156
E	251m S	Unspecified Tank	1959	100386
E	251m S	Unspecified Tank	1975	100386
E	251m S	Unspecified Tank	1990	97179
E	252m S	Unspecified Tank	1960	100386
F	257m SW	Unspecified Tank	1930	84230
E	261m S	Unspecified Tank	1930	84232
D	325m NW	Unspecified Tank	1961	84155
D	327m NW	Unspecified Tank	1979	84154



ID	Location	Land Use	Date	Group ID
N	423m SW	Unspecified Tank	1992	84236
N	449m W	Tanks	1992	104262
N	449m W	Tanks	1961	104262
N	451m W	Tanks	1979	87674
N	453m W	Tanks	1930	87675
Q	480m SW	Unspecified Tank	1979	84235
Q	480m SW	Unspecified Tank	1961	98330
P	481m N	Tanks	1961	100131
P	481m N	Tanks	1988	100131
P	481m N	Tanks	1991	100131
P	481m N	Unspecified Tanks	1992	88211
P	481m N	Tanks	1959	100131
P	481m N	Tanks	1981	100131
P	481m N	Tanks	1968	100131
Q	482m SW	Unspecified Tank	1992	93827

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

10

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 19 >](#)

ID	Location	Land Use	Date	Group ID
A	133m N	Electricity Substation	1975	50045
A	133m N	Electricity Substation	1985	49685
A	134m N	Electricity Substation	1992	50045
I	311m E	Electricity Substation	1975	45478
I	316m E	Electricity Substation	1990	45477



ID	Location	Land Use	Date	Group ID
3	331m SE	Electricity Substation	1990	45476
L	388m NE	Electricity Substation	1985	53636
L	388m NE	Electricity Substation	1992	58193
L	389m NE	Electricity Substation	1975	53096
J	424m NW	Electricity Substation	1979	45474

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

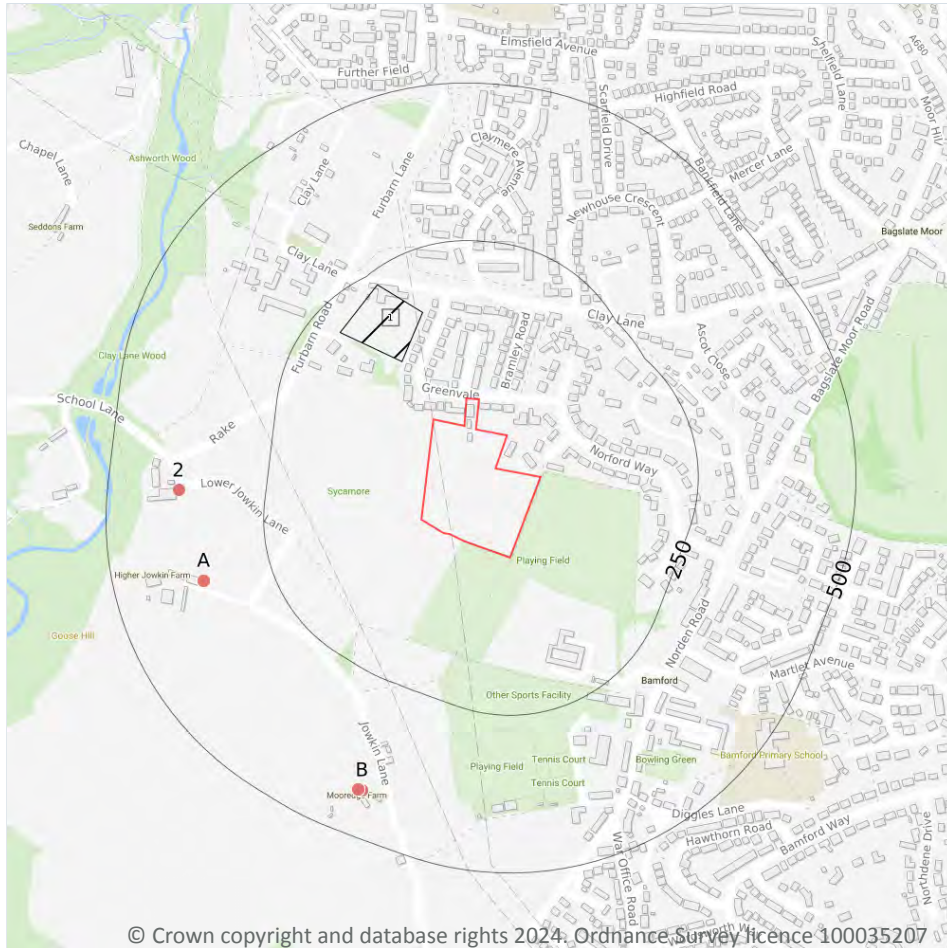
0

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 25 >](#)

ID	Location	Details		
1	104m NW	Site Address: Clay Lane Water treatment Works, Clay Lane, Norden, Rochdale Licence Holder Address: -	Waste Licence: - Site Reference: RD/LIC/496/87 Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded: - Last Recorded: -

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

3.5 Historical waste sites

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

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

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

3.6 Licensed waste sites

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

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

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

3.7 Waste exemptions

Records within 500m

61

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 25 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Using waste exemption	On a farm	Use of waste in construction
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Using waste exemption	On a farm	Burning of waste as a fuel in a small appliance
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Using waste exemption	On a farm	Use of waste for a specified purpose
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Using waste exemption	On a farm	Spreading of plant matter to confer benefit
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Using waste exemption	On a farm	Incorporation of ash into soil
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Storing waste exemption	On a farm	Storage of waste in secure containers



ID	Location	Site	Reference	Category	Sub-Category	Description
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Storing waste exemption	On a farm	Storage of waste in a secure place
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Using waste exemption	On a farm	Use of mulch
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX347986	Disposing of waste exemption	On a farm	Burning waste in the open
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Storing waste exemption	On a Farm	Storage of waste in a secure place
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Storing waste exemption	On a Farm	Storage of waste in secure containers
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Disposing of waste exemption	On a Farm	Deposit of waste from dredging of inland waters
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Treating waste exemption	On a Farm	Aerobic composting and associated prior treatment
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Treating waste exemption	On a Farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Treating waste exemption	On a Farm	Preparatory treatments (baling, sorting, shredding etc)
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Treating waste exemption	On a Farm	Cleaning, washing, spraying or coating relevant waste
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Using waste exemption	On a Farm	Incorporation of ash into soil
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Using waste exemption	On a Farm	Spreading of plant matter to confer benefit



ID	Location	Site	Reference	Category	Sub-Category	Description
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Using waste exemption	On a Farm	Use of waste for a specified purpose
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Using waste exemption	On a Farm	Burning of waste as a fuel in a small appliance
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Using waste exemption	On a Farm	Use of waste in construction
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Disposing of waste exemption	On a Farm	Burning waste in the open
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Using waste exemption	On a Farm	Use of mulch
A	359m W	LOWER JOWKIN FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX220260	Using waste exemption	On a Farm	Spreading waste on agricultural land to confer benefit
2	388m W	WATERLOO FARM, CARR WOOD, ROCHDALE, OL11 5UT	WEX260417	Using waste exemption	On a farm	Use of waste in construction
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Disposing of waste exemption	Both agricultural and non- agricultural waste	Deposit of waste from dredging of inland waters
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Storing waste exemption	Both agricultural and non- agricultural waste	Storage of waste in secure containers
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Storing waste exemption	Both agricultural and non- agricultural waste	Storage of waste in a secure place
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Treating waste exemption	Both agricultural and non- agricultural waste	Cleaning, washing, spraying or coating relevant waste



ID	Location	Site	Reference	Category	Sub-Category	Description
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Treating waste exemption	Both agricultural and non-agricultural waste	Aerobic composting and associated prior treatment
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Treating waste exemption	Both agricultural and non-agricultural waste	Preparatory treatments (baling, sorting, shredding etc)
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Treating waste exemption	Both agricultural and non-agricultural waste	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of waste in construction
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading of plant matter to confer benefit
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Using waste exemption	Both agricultural and non-agricultural waste	Incorporation of ash into soil
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Using waste exemption	Both agricultural and non-agricultural waste	Burning of waste as a fuel in a small appliance
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of waste for a specified purpose
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Disposing of waste exemption	Both agricultural and non-agricultural waste	Burning waste in the open



ID	Location	Site	Reference	Category	Sub-Category	Description
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading waste on agricultural land to confer benefit
B	427m S	Mooredge Farm Jowkin Lane ROCHDALE Lancashire OL11 5UU	EPR/PF0233TU /A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of mulch
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Storing waste exemption	On a farm	Storage of waste in secure containers
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Storing waste exemption	On a farm	Storage of waste in a secure place
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Treating waste exemption	On a farm	Cleaning, washing, spraying or coating relevant waste
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Using waste exemption	On a farm	Use of waste in construction
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Using waste exemption	On a farm	Spreading of plant matter to confer benefit
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Using waste exemption	On a farm	Incorporation of ash into soil

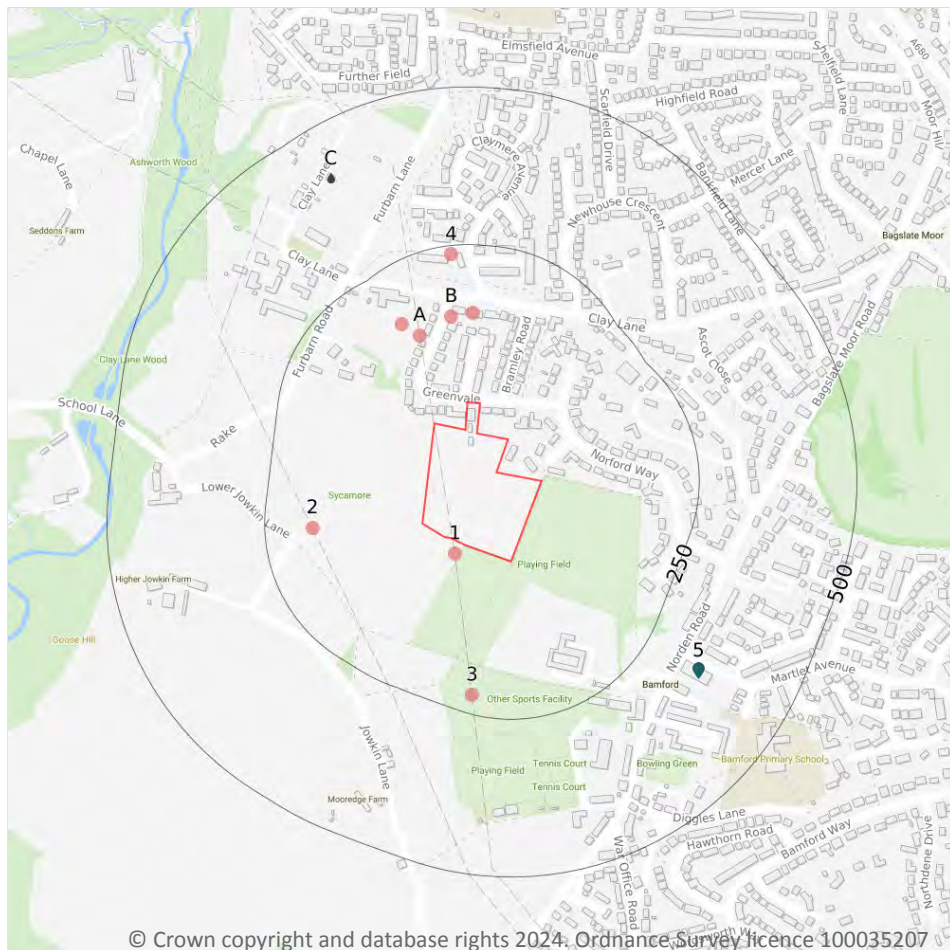


ID	Location	Site	Reference	Category	Sub-Category	Description
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Using waste exemption	On a farm	Burning of waste as a fuel in a small appliance
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Using waste exemption	On a farm	Use of waste for a specified purpose
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Disposing of waste exemption	On a farm	Burning waste in the open
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
B	429m S	MOOREDGE FARM, JOWKIN LANE, ROCHDALE, OL11 5UU	WEX068638	Using waste exemption	On a farm	Use of mulch

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
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters

4.1 Recent industrial land uses

Records within 250m

8

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 33](#) >

ID	Location	Company	Address	Activity	Category
1	19m S	Pylon	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities
A	131m N	Pylon	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities
B	139m N	Electricity Sub Station	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
B	142m N	Rochdale P C	105, Clay Lane, Rochdale, Greater Manchester, OL11 5QW	Electrical Equipment Repair and Servicing	Repair and Servicing
A	162m NW	Works	Greater Manchester, OL11	Unspecified Works Or Factories	Industrial Features
2	175m W	Pylon	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities
3	220m S	Pylon	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities
4	236m N	Electricity Sub Station	Greater Manchester, OL11	Electrical Features	Infrastructure and Facilities

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**1**

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

Features are displayed on the Current industrial land use map on [page 33 >](#)

ID	Location	Address	Details	
5	343m SE	Bamford Dry Cleaners, 5A Bamford Precinct, Martlett Avenue, Rochdale, Lancashire, OL11 5QY	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m**0**

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

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

4.13 Licensed Discharges to controlled waters

Records within 500m**2**

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 33 >](#)



ID	Location	Address	Details	
C	415m NW	ROCHDALE SUB STN, ROCHDALE, GREATER MANCHESTER	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: 01M/239 Permit Version: 1 Receiving Water: -	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 01/04/1991 Revocation Date: 31/12/1994
C	415m NW	ROCHDALE SUB STN, ROCHDALE, GREATER MANCHESTER	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: 01M/239 Permit Version: 2 Receiving Water: -	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: - Effective Date: 01/01/1995 Revocation Date: -

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

4.14 Pollutant release to surface waters (Red List)

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

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

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

4.15 Pollutant release to public sewer

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

Discharges of Special Category Effluents to the public sewer.

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

4.16 List 1 Dangerous Substances

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

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

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



4.17 List 2 Dangerous Substances

Records within 500m

0

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

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m

0

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

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

4.19 Pollution inventory substances

Records within 500m

0

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

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

4.20 Pollution inventory waste transfers

Records within 500m

0

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

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

4.21 Pollution inventory radioactive waste

Records within 500m

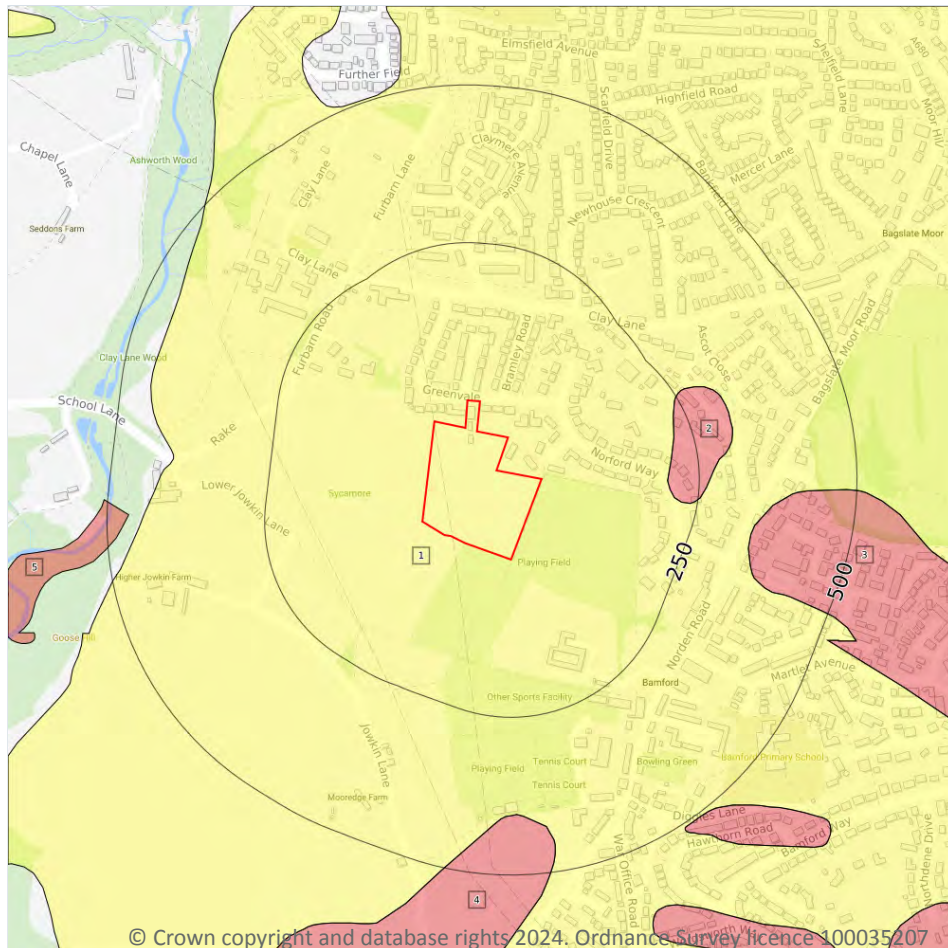
0

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

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



5 Hydrogeology - Superficial aquifer



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

5.1 Superficial aquifer

Records within 500m

5

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on [page 39](#) >

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	200m E	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

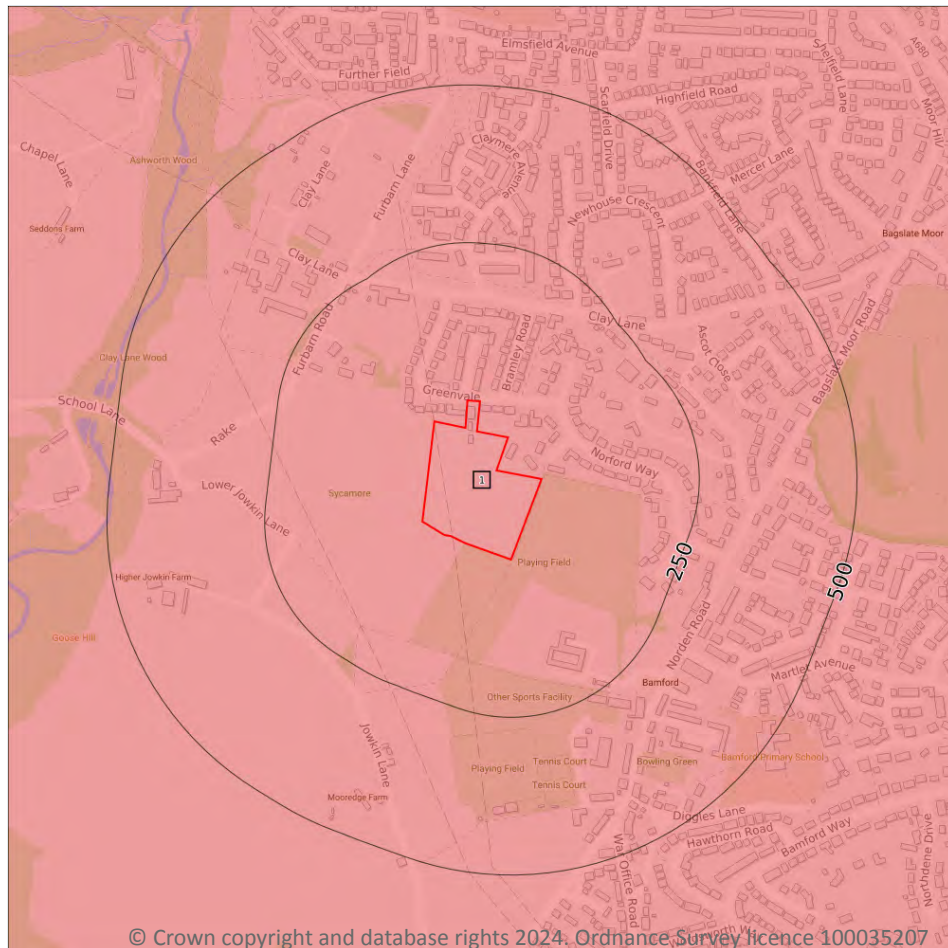


ID	Location	Designation	Description
3	343m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	404m S	Secondary 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
5	466m W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

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



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.

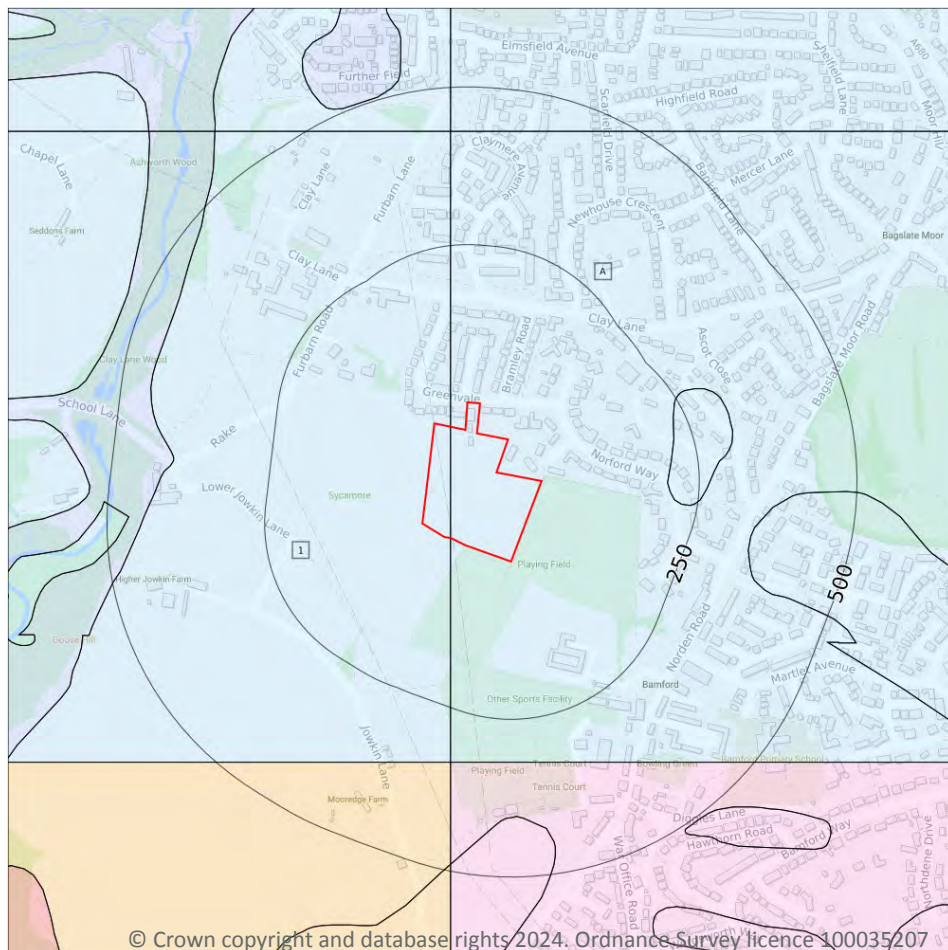
Features are displayed on the Bedrock aquifer map on [page 41](#) >

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

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



Groundwater vulnerability



— Site Outline

Search buffers in metres (m)

Superficial vulnerability

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

Bedrock vulnerability

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

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m

2

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 42](#) >



ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: 40-70% Dilution value: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: >10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
A	On site	Summary Classification: Secondary superficial aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: 40-70% Dilution value: >550mm/year	Vulnerability: Low Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures

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

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

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

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

5.5 Groundwater vulnerability- local information

Records on site

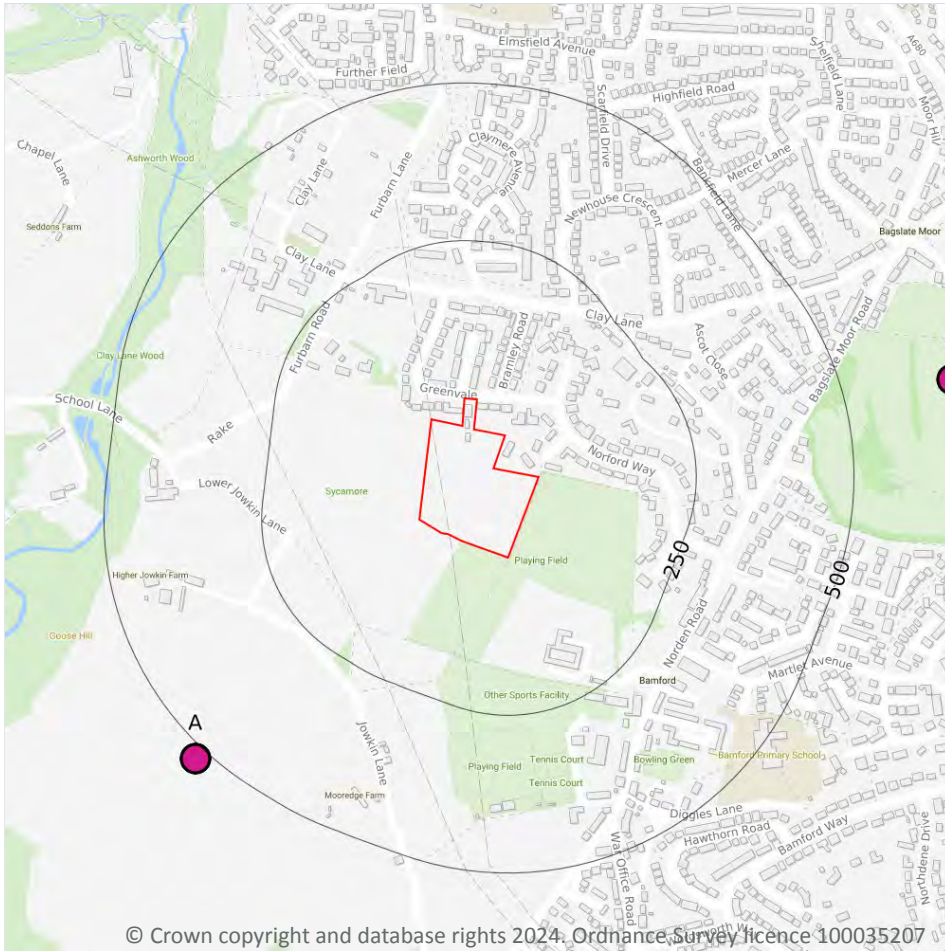
0

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

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



Abstractions and Source Protection Zones



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- 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

24

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 44](#) >



ID	Location	Details	
A	519m SW	Status: Historical Licence No: 2569002180 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "WELL AT MOOR EDGE FARM, BAMFORD, ROCHDALE" Data Type: Point Name: BLACKBOROUGH Easting: 385600 Northing: 413000	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/02/1966 Version End Date: -
A	519m SW	Status: Historical Licence No: 2569002183 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "WELL AT MOOR EDGE FARM, BAMFORD, ROCHDALE" Data Type: Point Name: MILLS Easting: 385600 Northing: 413000	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/02/1966 Version End Date: -
A	519m SW	Status: Historical Licence No: 2569002180 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: WELL AT MOOR EDGE FARM, BAMFORD, ROCHDALE Data Type: Point Name: BLACKBOROUGH Easting: 385600 Northing: 413000	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/02/1966 Version End Date: -
A	519m SW	Status: Historical Licence No: 2569002183 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: WELL AT MOOR EDGE FARM, BAMFORD, ROCHDALE Data Type: Point Name: MILLS Easting: 385600 Northing: 413000	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/02/1966 Version End Date: -



ID	Location	Details	
B	673m E	Status: Active Licence No: 2569002140 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: BOREHOLE AT ROCHDALE GOLF COURSE AT NORDEN, ROCHDALE Data Type: Point Name: ROCHDALE GOLF CLUB LTD Easting: 386800 Northing: 413600	Annual Volume (m ³): 7272 Max Daily Volume (m ³): 120 Original Application No: 0962 Original Start Date: 01/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 18/11/1997 Version End Date: -
B	673m E	Status: Historical Licence No: 2569002140 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: "BOREHOLE AT ROCHDALE GOLF COURSE AT NORDEN, ROCHDALE" Data Type: Point Name: ROCHDALE GOLF CLUB LTD Easting: 386800 Northing: 413600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 18/11/1997 Version End Date: -
-	964m S	Status: Active Licence No: 2569002217 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT BUTTERWORTH FOLD FARM BAMFORD ROCHDALE Data Type: Point Name: JAMES SWALLOW LTD Easting: 385800 Northing: 412400	Annual Volume (m ³): 33185.8 Max Daily Volume (m ³): 90.92 Original Application No: 2563 Original Start Date: 22/09/1980 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2007 Version End Date: -
-	964m S	Status: Historical Licence No: 2569002217 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT BUTTERWORTH FOLD FARM, BAMFORD, ROCHDALE" Data Type: Point Name: JAMES SWALLOW LTD Easting: 385800 Northing: 412400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 22/09/1980 Expiry Date: - Issue No: 100 Version Start Date: 22/09/1980 Version End Date: -



ID	Location	Details	
-	964m S	Status: Historical Licence No: 2569002217 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT BUTTERWORTH FOLD FARM, BAMFORD, ROCHDALE Data Type: Point Name: JAMES SWALLOW LTD Easting: 385800 Northing: 412400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 22/09/1980 Expiry Date: - Issue No: 100 Version Start Date: 22/09/1980 Version End Date: -
-	1764m S	Status: Historical Licence No: 2569002037 Details: Boiler Feed Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, CRIMBLE MILLS,HEYWOOD" Data Type: Point Name: ROE ACRE DYEING & FELTING CO LTD Easting: 386500 Northing: 411600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/05/1993 Version End Date: -
-	1764m S	Status: Historical Licence No: 2569002037 Details: Process water Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, CRIMBLE MILLS,HEYWOOD" Data Type: Point Name: ROE ACRE DYEING & FELTING CO LTD Easting: 386500 Northing: 411600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/05/1993 Version End Date: -
-	1764m S	Status: Historical Licence No: 2569002037 Details: Process water Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, CRIMBLE MILLS,HEYWOOD Data Type: Point Name: K.SHAW & COMPANY LTD. Easting: 386500 Northing: 411600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/10/2002 Version End Date: -



ID	Location	Details	
-	1764m S	Status: Historical Licence No: 2569002037 Details: Boiler Feed Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, CRIMBLE MILLS, HEYWOOD Data Type: Point Name: K. SHAW & COMPANY LTD. Easting: 386500 Northing: 411600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/10/2002 Version End Date: -
-	1962m SW	Status: Historical Licence No: 2569002248 Details: General Farming & Domestic Direct Source: Ground Water - North West Region Point: "BOREHOLE AT FERNISES FARM, GRIFEL HURST LANE" Data Type: Point Name: THOMPSON Easting: 384200 Northing: 412500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 12/06/1991 Expiry Date: - Issue No: 100 Version Start Date: 12/06/1991 Version End Date: -
-	1962m SW	Status: Historical Licence No: 2569002248 Details: General Farming & Domestic Direct Source: Ground Water - North West Region Point: BOREHOLE AT FERNISES FARM, GRIFEL HURST LANE Data Type: Point Name: THOMPSON Easting: 384200 Northing: 412500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 12/06/1991 Expiry Date: - Issue No: 100 Version Start Date: 12/06/1991 Version End Date: -
-	1968m N	Status: Historical Licence No: 2569002187 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "BOREHOLES (2) AT PREMISES, NORDEN, ROCHDALE" Data Type: Point Name: ALEXANDER DREW & SONS LTD Easting: 385300 Northing: 415400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/05/1990 Version End Date: -



ID	Location	Details	
-	1968m N	Status: Historical Licence No: 2569002187 Details: Process water Direct Source: Ground Water - North West Region Point: "BOREHOLES (2) AT PREMISES, NORDEN, ROCHDALE" Data Type: Point Name: ALEXANDER DREW & SONS LTD Easting: 385300 Northing: 415400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/05/1990 Version End Date: -
-	1968m N	Status: Historical Licence No: 2569002187 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BOREHOLES (2) AT PREMISES, NORDEN, ROCHDALE Data Type: Point Name: ALEXANDER DREW & SONS LTD Easting: 385300 Northing: 415400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/05/1990 Version End Date: -
-	1968m N	Status: Historical Licence No: 2569002187 Details: Process water Direct Source: Ground Water - North West Region Point: BOREHOLES (2) AT PREMISES, NORDEN, ROCHDALE Data Type: Point Name: ALEXANDER DREW & SONS LTD Easting: 385300 Northing: 415400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/05/1990 Version End Date: -
-	1975m W	Status: Historical Licence No: 2569002189 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT THORNHURST FARM, HEYWOOD Data Type: Point Name: OVENDEN Easting: 384000 Northing: 413100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/02/1966 Version End Date: -



ID	Location	Details	
-	1975m W	Status: Historical Licence No: 2569002189 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT THORNHURST FARM, HEYWOOD" Data Type: Point Name: OVENDEN Easting: 384000 Northing: 413100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/02/1966 Version End Date: -
-	1988m W	Status: Historical Licence No: 2569002224 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: "BOREHOLE AT PREMISES, ASHWORTH" Data Type: Point Name: TOMLINSON Easting: 384100 Northing: 414200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/11/1982 Expiry Date: - Issue No: 100 Version Start Date: 01/11/1982 Version End Date: -
-	1988m W	Status: Historical Licence No: 2569002224 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, ASHWORTH Data Type: Point Name: TOMLINSON Easting: 384100 Northing: 414200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/11/1982 Expiry Date: - Issue No: 100 Version Start Date: 01/11/1982 Version End Date: -
-	1988m W	Status: Historical Licence No: 2569002224 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Ground Water - North West Region Point: BOREHOLE AT PREMISES, ASHWORTH Data Type: Point Name: TOMLINSON Easting: 384100 Northing: 414200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 01/11/1982 Expiry Date: - Issue No: 100 Version Start Date: 01/11/1982 Version End Date: -

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



5.7 Surface water abstractions

Records within 2000m

17

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 44](#) >

ID	Location	Details	
-	1177m SW	Status: Historical Licence No: 2569002166 Details: Process water Direct Source: "Surface, Non-Tidal - North West Region" Point: "CHEESDEN BRK AT SIMPSON CLOUGH, HEYWOOD" Data Type: Point Name: J R CROMPTON LTD Easting: 385300 Northing: 412400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 24/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/05/2001 Version End Date: -
-	1177m SW	Status: Historical Licence No: 2569002166 Details: Boiler Feed Direct Source: "Surface, Non-Tidal - North West Region" Point: "CHEESDEN BRK AT SIMPSON CLOUGH, HEYWOOD" Data Type: Point Name: J R CROMPTON LTD Easting: 385300 Northing: 412400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 24/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/05/2001 Version End Date: -
-	1177m SW	Status: Historical Licence No: 2569002166 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: CHEESDEN BRK AT SIMPSON CLOUGH, HEYWOOD Data Type: Point Name: J R CROMPTON LTD Easting: 385300 Northing: 412400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 24/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/05/2001 Version End Date: -



ID	Location	Details	
-	1177m SW	Status: Historical Licence No: 2569002166 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: CHEESDEN BRK AT SIMPSON CLOUGH, HEYWOOD Data Type: Point Name: J R CROMPTON LTD Easting: 385300 Northing: 412400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 24/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 21/05/2001 Version End Date: -
-	1177m SW	Status: Historical Licence No: 2569002166 Details: Process Water Direct Source: Surface, Non-Tidal - North West Region Point: CHEESDEN BROOK AT SIMPSON CLOUGH HEYWOOD Data Type: Point Name: UNION PAPERTECH LIMITED Easting: 385300 Northing: 412400	Annual Volume (m ³): 2136620 Max Daily Volume (m ³): 12437.86 Original Application No: 949 Original Start Date: 24/01/1966 Expiry Date: - Issue No: 101 Version Start Date: 13/08/2007 Version End Date: -
-	1177m SW	Status: Historical Licence No: 2569002166 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: CHEESDEN BROOK AT SIMPSON CLOUGH HEYWOOD Data Type: Point Name: UNION PAPERTECH LIMITED Easting: 385300 Northing: 412400	Annual Volume (m ³): 2136620 Max Daily Volume (m ³): 12437.86 Original Application No: 949 Original Start Date: 24/01/1966 Expiry Date: - Issue No: 101 Version Start Date: 13/08/2007 Version End Date: -
-	1291m SW	Status: Historical Licence No: 2569002255 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Surface, Non-Tidal - North West Region Point: NADEN BROOK AT SIMPSON CLOUGH, HEYWOOD 112 Data Type: Point Name: J R CROMPTON LTD Easting: 385360 Northing: 412230	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 12/02/1993 Expiry Date: - Issue No: 101 Version Start Date: 10/10/2000 Version End Date: -



ID	Location	Details	
-	1291m SW	Status: Historical Licence No: 2569002255 Details: General use relating to Secondary Category (Medium Loss) Direct Source: "Surface, Non-Tidal - North West Region" Point: "NADEN BROOK AT SIMPSON CLOUGH, HEYWOOD S112" Data Type: Point Name: J R CROMPTON LTD Easting: 385360 Northing: 412230	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 12/02/1993 Expiry Date: - Issue No: 101 Version Start Date: 10/10/2000 Version End Date: -
-	1291m SW	Status: Historical Licence No: 2569002255 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Surface, Non-Tidal - North West Region Point: NADEN BROOK AT SIMPSON CLOUGH, HEYWOOD S112 Data Type: Point Name: J R CROMPTON LTD Easting: 385360 Northing: 412230	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 12/02/1993 Expiry Date: - Issue No: 101 Version Start Date: 10/10/2000 Version End Date: -
-	1291m SW	Status: Historical Licence No: 2569002255 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Surface, Non-Tidal - North West Region Point: NADEN BROOK AT SIMPSON CLOUGH, HEYWOOD Data Type: Point Name: UNION PAPERTECH LIMITED Easting: 385360 Northing: 412230	Annual Volume (m³): 2136620 Max Daily Volume (m³): 6219 Original Application No: 949 Original Start Date: 12/02/1993 Expiry Date: - Issue No: 102 Version Start Date: 13/08/2007 Version End Date: -
-	1301m N	Status: Historical Licence No: 2569002221 Details: Process water Direct Source: "Surface, Non-Tidal - North West Region" Point: "NADEN BRK AT NORDERN, NR ROCHDALE" Data Type: Point Name: TACKLEA WORKS LTD Easting: 385600 Northing: 414800	Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 04/11/1981 Expiry Date: - Issue No: 100 Version Start Date: 05/02/1988 Version End Date: -



ID	Location	Details	
-	1301m N	Status: Historical Licence No: 2569002221 Details: Process Water Direct Source: Surface, Non-Tidal - North West Region Point: NADEN BRK AT NORDERN, NR ROCHDALE Data Type: Point Name: TACKLEA WORKS LTD Easting: 385600 Northing: 414800	Annual Volume (m ³): 150018 Max Daily Volume (m ³): 590.98 Original Application No: - Original Start Date: 04/11/1981 Expiry Date: - Issue No: 100 Version Start Date: 05/02/1988 Version End Date: -
-	1764m S	Status: Historical Licence No: 2569002270 Details: Boiler Feed Direct Source: Surface, Non-Tidal - North West Region Point: RIVER ROCH AT HEYWOOD Data Type: Line Name: ROE ACRE DYEING & FELTING CO LTD Easting: 386620 Northing: 411500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 17/06/1999 Version End Date: -
-	1764m S	Status: Historical Licence No: 2569002270 Details: Process water Direct Source: Surface, Non-Tidal - North West Region Point: RIVER ROCH AT HEYWOOD Data Type: Line Name: ROE ACRE DYEING & FELTING CO LTD Easting: 386620 Northing: 411500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 17/06/1999 Version End Date: -
-	1784m NW	Status: Historical Licence No: 2569002197 Details: Potable Water Supply - Direct Direct Source: "Surface, Non-Tidal - North West Region" Point: "ASHWORTH MOOR, NADEN & GREENBOOTH RESERVOIRS, ROCHDALE*31" Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 385300 Northing: 415200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 22/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 14/03/1990 Version End Date: -
-	1784m NW	Status: Historical Licence No: 2569002197 Details: Potable Water Supply - Direct Direct Source: Surface, Non-Tidal - North West Region Point: ASHWORTH MOOR, NADEN & GREENBOOTH RESERVOIRS, ROCHDALE*31 Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 385300 Northing: 415200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 22/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 14/03/1990 Version End Date: -



ID	Location	Details	
-	1784m NW	Status: Historical Licence No: 2569002197 Details: Potable Water Supply - Direct Direct Source: Surface, Non-Tidal - North West Region Point: ASHWORTH MOOR, NADEN & GREENBOOTH RESERVOIRS, ROCHDALE Data Type: Point Name: United Utilities Water Ltd Easting: 385300 Northing: 415200	Annual Volume (m ³): 9092000 Max Daily Volume (m ³): 40914 Original Application No: 1613 Original Start Date: 22/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 14/03/1990 Version End Date: -

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

5.8 Potable abstractions

Records within 2000m

5

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 44 >](#)

ID	Location	Details	
-	1784m NW	Status: Active Licence No: 2569002197 Details: Potable Water Supply - Direct Direct Source: Surface, Non-Tidal - North West Region Point: ASHWORTH MOOR, NADEN & GREENBOOTH RESERVOIRS, ROCHDALE Data Type: Point Name: United Utilities Water Ltd Easting: 385300 Northing: 415200	Annual Volume (m ³): 9092000 Max Daily Volume (m ³): 40914 Original Application No: 1613 Original Start Date: 22/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 14/03/1990 Version End Date: -
-	1784m NW	Status: Historical Licence No: 2569002197 Details: Potable Water Supply - Direct Direct Source: "Surface, Non-Tidal - North West Region" Point: "ASHWORTH MOOR, NADEN & GREENBOOTH RESERVOIRS, ROCHDALE*31" Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 385300 Northing: 415200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 22/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 14/03/1990 Version End Date: -



ID	Location	Details	
-	1784m NW	Status: Historical Licence No: 2569002197 Details: Potable Water Supply - Direct Direct Source: Surface, Non-Tidal - North West Region Point: ASHWORTH MOOR, NADEN & GREENBOOTH RESERVOIRS, ROCHDALE*31 Data Type: Point Name: UNITED UTILITIES WATER PLC Easting: 385300 Northing: 415200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 22/03/1966 Expiry Date: - Issue No: 100 Version Start Date: 14/03/1990 Version End Date: -
-	1968m N	Status: Historical Licence No: 2569002187 Details: "Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services" Direct Source: Ground Water - North West Region Point: "BOREHOLES (2) AT PREMISES, NORDEN, ROCHDALE" Data Type: Point Name: ALEXANDER DREW & SONS LTD Easting: 385300 Northing: 415400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/05/1990 Version End Date: -
-	1968m N	Status: Historical Licence No: 2569002187 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Ground Water - North West Region Point: BOREHOLES (2) AT PREMISES, NORDEN, ROCHDALE Data Type: Point Name: ALEXANDER DREW & SONS LTD Easting: 385300 Northing: 415400	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/02/1966 Expiry Date: - Issue No: 100 Version Start Date: 30/05/1990 Version End Date: -

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

5.9 Source Protection Zones

Records within 500m

0

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

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



5.10 Source Protection Zones (confined aquifer)

Records within 500m

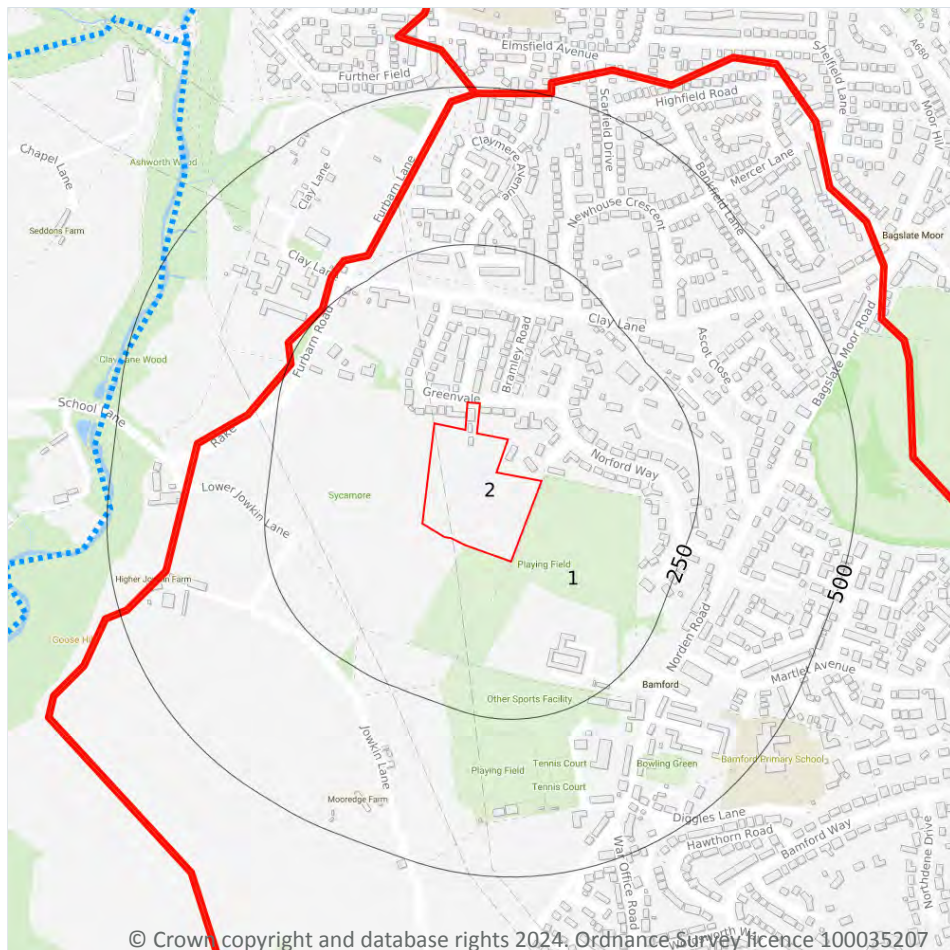
0

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

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



6 Hydrology



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

6.1 Water Network (OS MasterMap)

Records within 250m

0

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

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

0

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



This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site

1

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

Features are displayed on the Hydrology map on [page 58](#) >

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River	Roch (Spodden to Irwell)	GB112069064600	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 58](#) >

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	1316m SE	River	Roch (Spodden to Irwell)	GB112069064600 ↗	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 58](#) >

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
2	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 64 >](#)

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 Ambiantal Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

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

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9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

Low

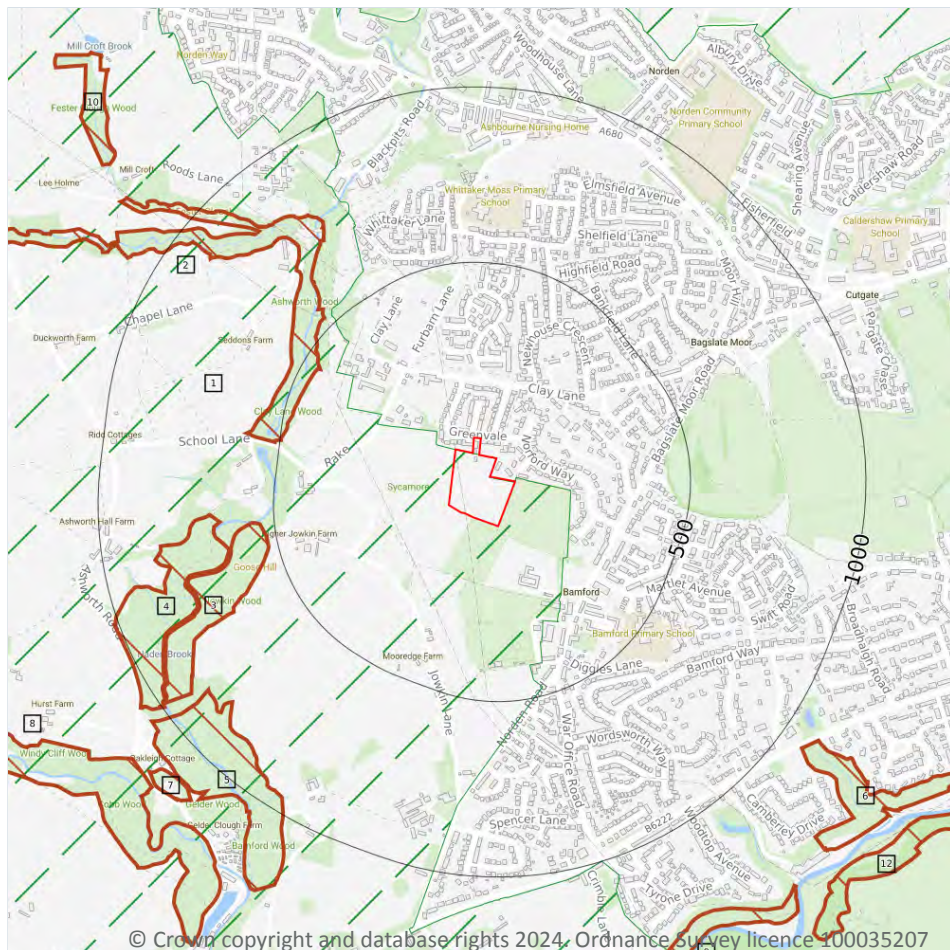
Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks 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 66 >](#)

This data is sourced from Ambiantal Risk Analytics.



10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Designated Ancient Woodland
- Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

0

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

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



10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m

0

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m

0

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m

0

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m

0

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

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



10.6 Local Nature Reserves (LNR)

Records within 2000m

0

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

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

10.7 Designated Ancient Woodland

Records within 2000m

13

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 67 >](#)

ID	Location	Name	Woodland Type
2	448m NW	Naden Brook Wood	Ancient & Semi-Natural Woodland
3	527m W	Jowkin Wood	Ancient & Semi-Natural Woodland
4	640m W	Jowkin Wood	Ancient & Semi-Natural Woodland
5	834m SW	Jowkin Wood	Ancient & Semi-Natural Woodland
6	1072m SE	River Rock Wood (2)	Ancient & Semi-Natural Woodland
7	1098m SW	Jowkin Wood	Ancient & Semi-Natural Woodland
8	1156m SW	Jowkin Wood	Ancient & Semi-Natural Woodland
9	1250m SE	Unknown	Ancient & Semi-Natural Woodland
10	1277m NW	Fester Clough Wood	Ancient & Semi-Natural Woodland
-	1385m NW	Wolstenholme Wood	Ancient & Semi-Natural Woodland
12	1387m SE	Springfield Wood	Ancient & Semi-Natural Woodland
-	1540m SW	Simpson Clough Wood	Ancient & Semi-Natural Woodland
-	1885m SW	Unknown	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 67 >](#)

ID	Location	Name	Local Authority name
1	On site	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

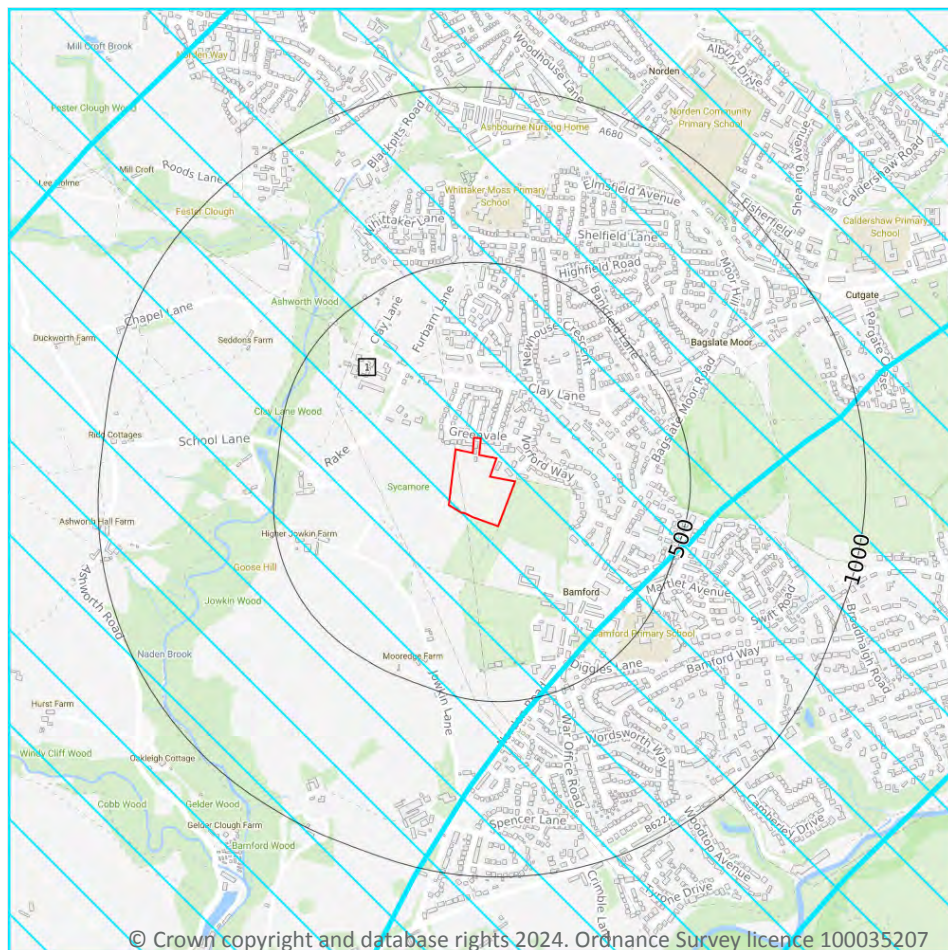
0

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 73](#) >

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t). Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	0
----------------------	---

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

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



11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

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

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

11.3 National Parks

Records within 250m

0

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

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

11.4 Listed Buildings

Records within 250m

0

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



This data is sourced from 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

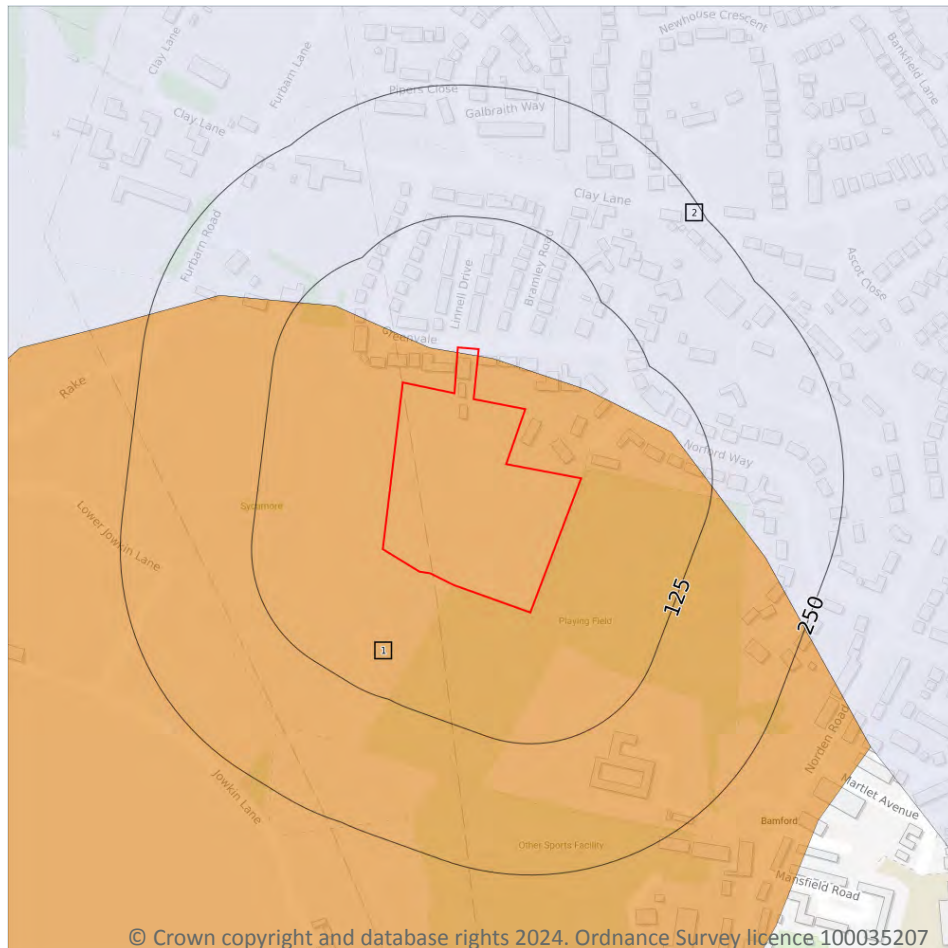
0

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 77](#) >

ID	Location	Classification	Description
1	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.



ID	Location	Classification	Description
2	On site	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

0

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

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

12.3 Tree Felling Licences

Records within 250m

0

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

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

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

13.1 Priority Habitat Inventory

Records within 250m

0

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

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.



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

3

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 82](#) >

ID	Location	LEX Code	Description	Rock description
1	99m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	173m N	WMGR-ARTDP	Infilled Ground	Artificial Deposit
3	463m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.



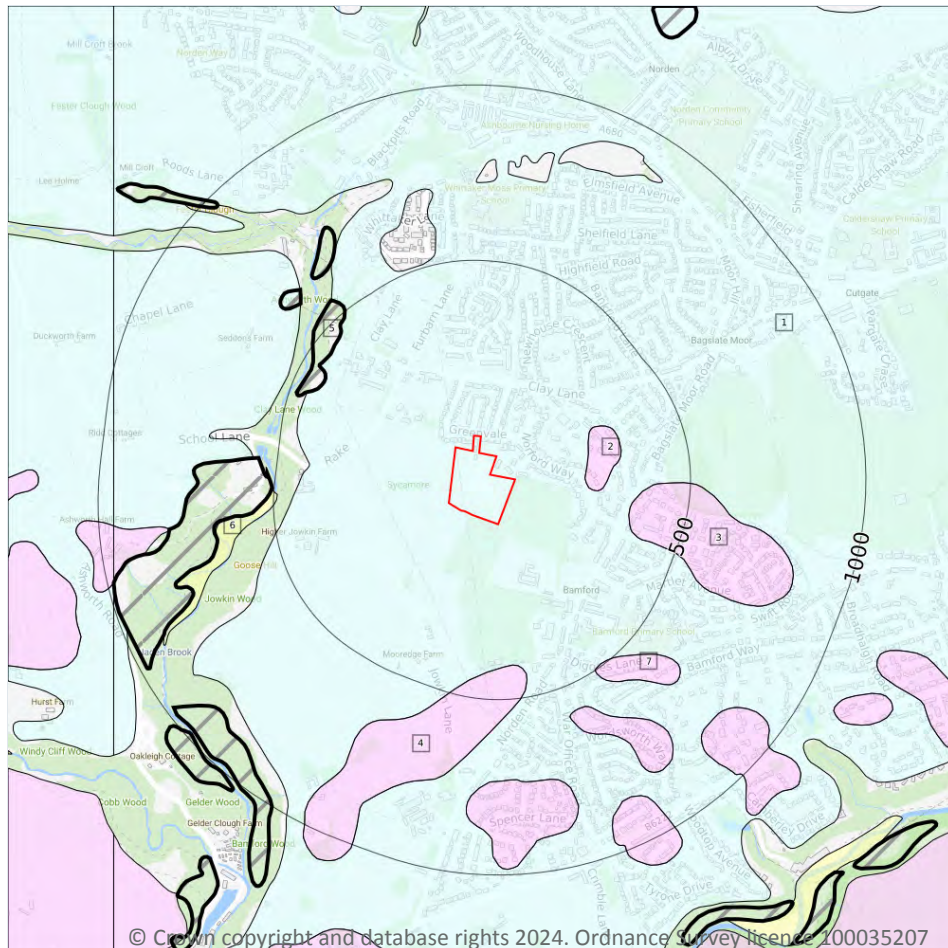
Contact us with any questions at:

info@groundsure.com ↗

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Date: 19 February 2024

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

6

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 83](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
2	199m E	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel
3	338m E	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel



ID	Location	LEX Code	Description	Rock description
4	404m S	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel
6	490m W	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
7	494m SE	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

1

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.

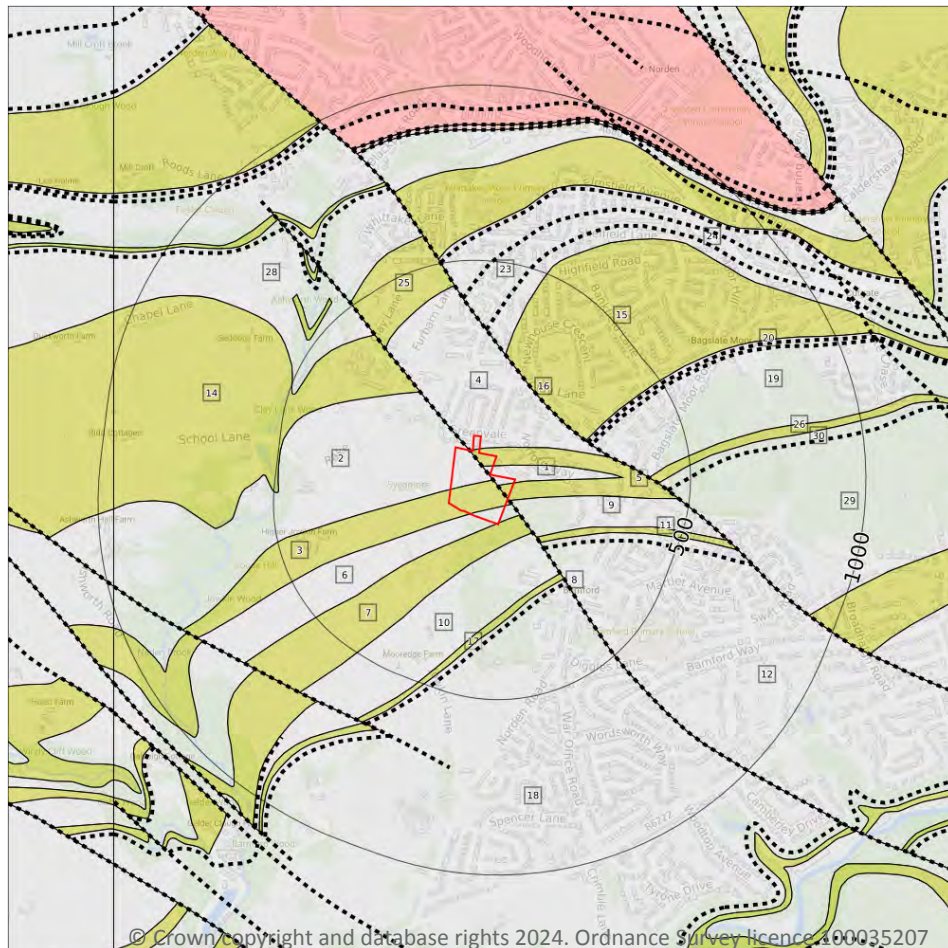
Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 83](#) >

ID	Location	LEX Code	Description	Rock description
5	419m NW	SLIP-UNKNOWN	Landslide Deposits	Unknown/unclassified Entry

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

21

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 85 >](#)

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	OL-SDST	Old Lawrence Rock - Sandstone	Langsettian Sub-age



ID	Location	LEX Code	Description	Rock age
4	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
5	On site	OL-SDST	Old Lawrence Rock - Sandstone	Langsettian Sub-age
6	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
7	On site	OL-SDST	Old Lawrence Rock - Sandstone	Langsettian Sub-age
9	5m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
10	61m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
11	116m SE	RSC-SDST	Riddle Scout Rock - Sandstone	Langsettian Sub-age
12	130m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
14	188m NW	MLRS-SDST	Milnrow Sandstone - Sandstone	Langsettian Sub-age
15	198m NE	GAS-SDST	Great Arc Sandstone - Sandstone	Langsettian Sub-age
17	211m SE	RSC-SDST	Riddle Scout Rock - Sandstone	Langsettian Sub-age
18	229m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
19	229m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
23	243m N	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
25	345m NW	MLRS-SDST	Milnrow Sandstone - Sandstone	Langsettian Sub-age
26	382m E	HER-SDST	Helpet Edge Rock - Sandstone	Langsettian Sub-age
28	395m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
29	409m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And 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

9

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.

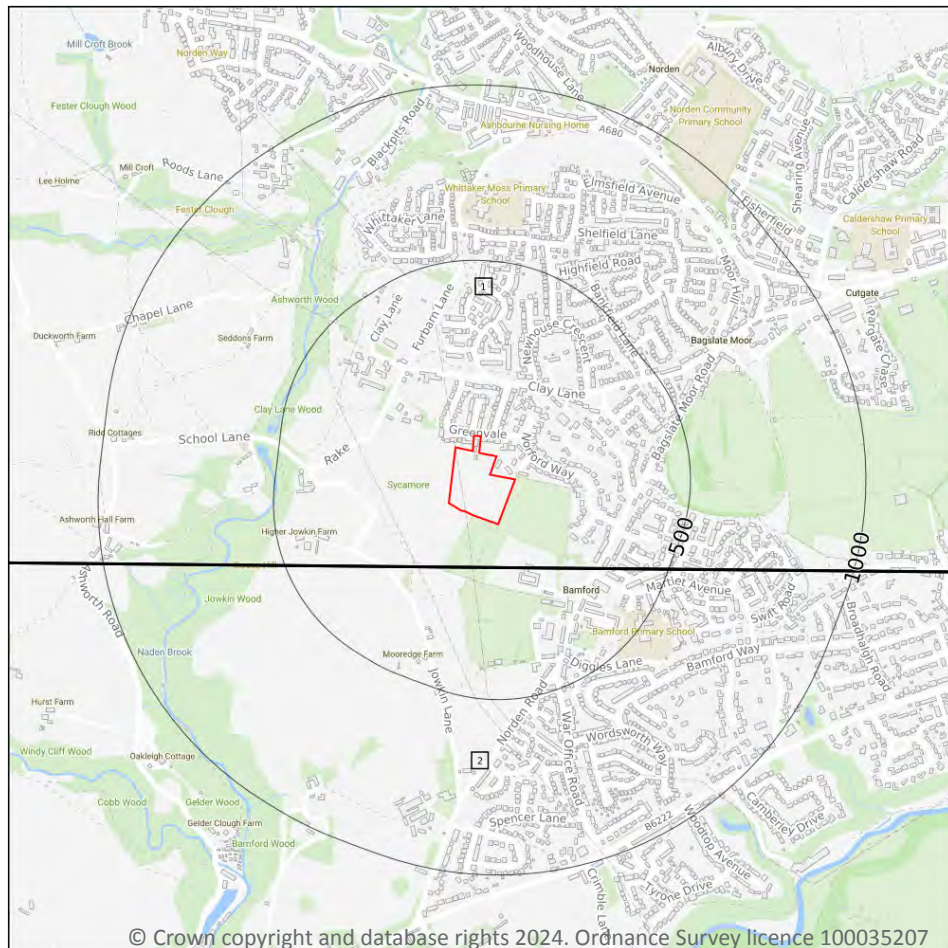
Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 85](#) >

ID	Location	Category	Description
8	On site	FAULT	Normal fault, inferred; crossmarks on downthrow side
13	147m SE	ROCK	Coal seam, inferred
16	198m NE	FAULT	Normal fault, inferred; crossmarks on downthrow side
20	233m E	ROCK	Coal seam, inferred
21	239m E	FOSSIL_HORIZON	Fossil horizon, marine band
22	241m SE	ROCK	Coal seam, inferred
24	304m N	ROCK	Coal seam, inferred
27	393m N	ROCK	Coal seam, inferred
30	436m E	ROCK	Coal seam, 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

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15.1 50k Availability

Records within 500m

2

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

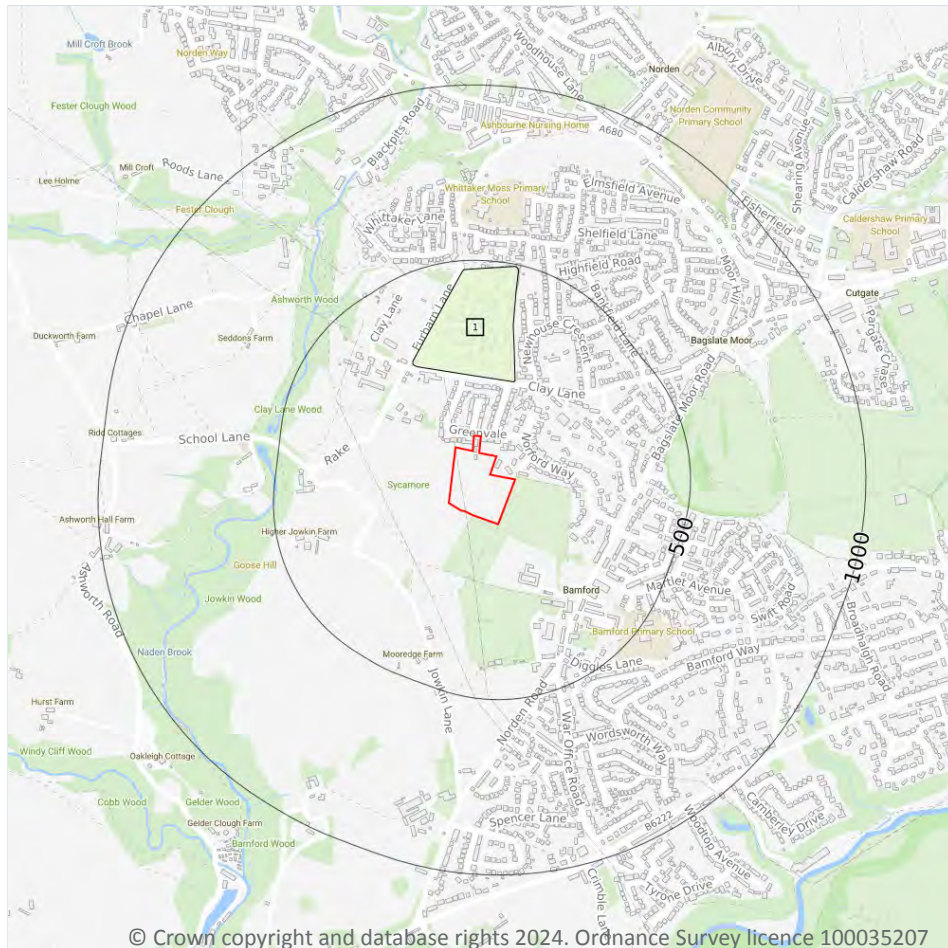
Features are displayed on the Geology 1:50,000 scale - Availability map on [page 88](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	Full	Full	Full	EW076_rochdale_v4
2	124m S	No coverage	Full	Full	No coverage	EW085_manchester_v4

This data is sourced from the British Geological Survey.



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



— Site Outline
Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

1

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.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on [page 89](#) >

ID	Location	LEX Code	Description	Rock description
1	168m N	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.



15.3 Artificial ground permeability (50k)

Records within 50m

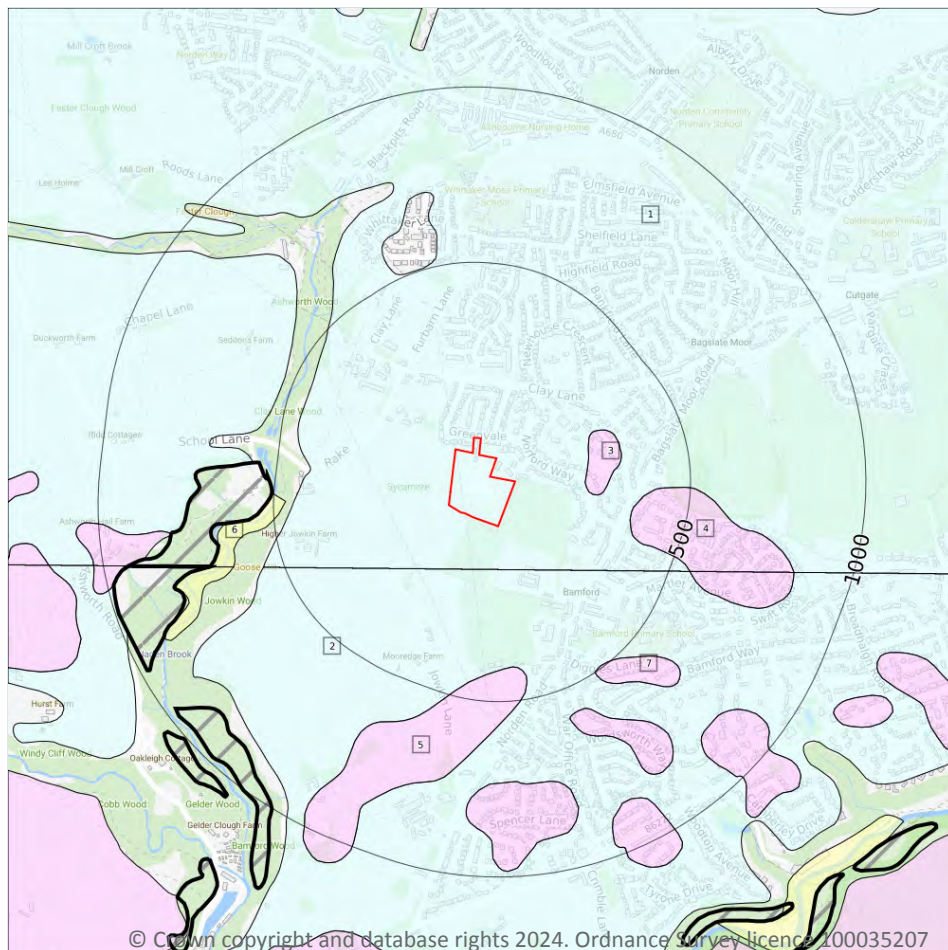
0

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 91](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
2	123m S	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
3	200m E	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL



ID	Location	LEX Code	Description	Rock description
4	343m E	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
5	403m S	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
6	466m W	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
7	494m SE	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL

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

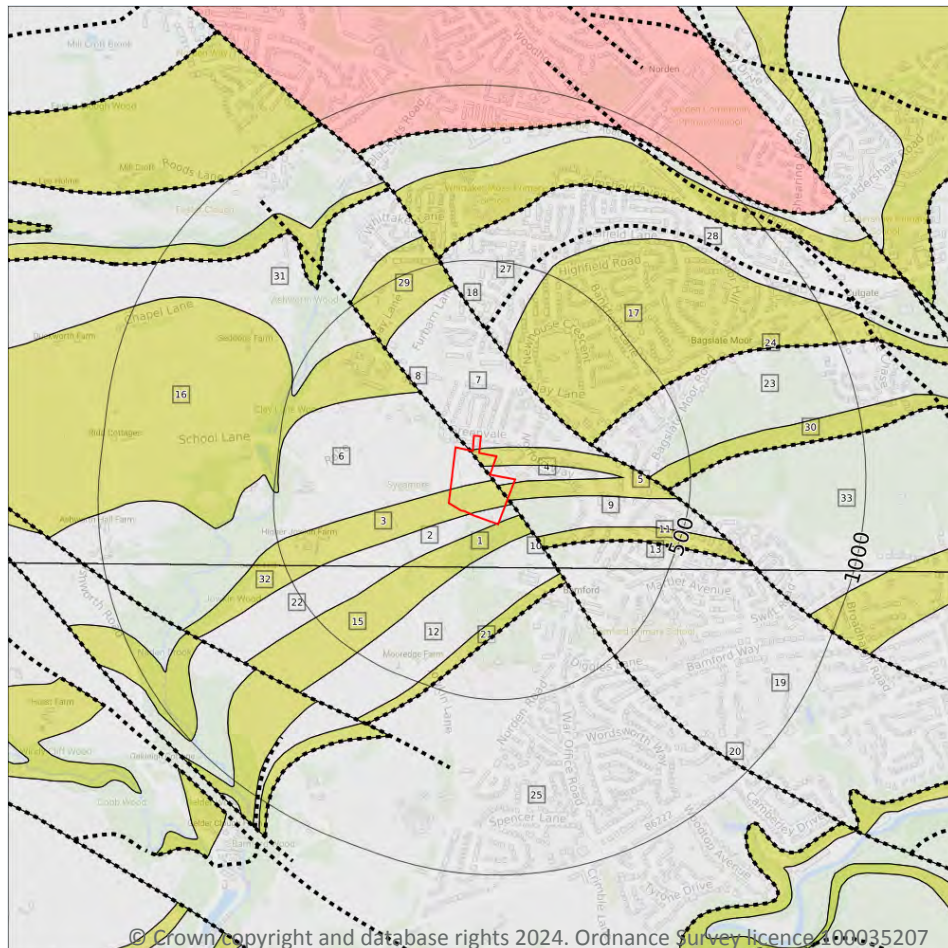
0

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

26

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 93](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	OL-SDST	OLD LAWRENCE ROCK - SANDSTONE	WESTPHALIAN
2	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
3	On site	OL-SDST	OLD LAWRENCE ROCK - SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
4	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
5	On site	OL-SDST	OLD LAWRENCE ROCK - SANDSTONE	WESTPHALIAN
6	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
7	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
9	5m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
10	61m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
11	115m SE	RSC-SDST	RIDDLE SCOUT ROCK - SANDSTONE	WESTPHALIAN
12	123m S	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
13	146m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
15	147m S	OL-SDST	OLD LAWRENCE ROCK - SANDSTONE	WESTPHALIAN
16	188m NW	MLRS-SDST	MILNROW SANDSTONE - SANDSTONE	WESTPHALIAN
17	199m NE	GAS-SDST	GREAT ARC SANDSTONE - SANDSTONE	WESTPHALIAN
19	209m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
21	211m SE	RSC-SDST	RIDDLE SCOUT ROCK - SANDSTONE	WESTPHALIAN
22	227m SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
23	239m E	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
25	242m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
27	243m N	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
29	345m NW	MLRS-SDST	MILNROW SANDSTONE - SANDSTONE	WESTPHALIAN
30	382m E	HER-SDST	HELPET EDGE ROCK - SANDSTONE	WESTPHALIAN
31	386m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
32	407m SW	OL-SDST	OLD LAWRENCE ROCK - SANDSTONE	WESTPHALIAN
33	436m E	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

4

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
On site	Fracture	Moderate	Low
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m

8

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 93](#) >

ID	Location	Category	Description
8	On site	FAULT	Fault, inferred
14	146m SE	ROCK	Coal seam, inferred
18	199m NE	FAULT	Fault, inferred
20	209m SE	FAULT	Fault, inferred
24	239m E	FOSSIL_HORIZON	Marine band
26	242m SE	ROCK	Coal seam, inferred

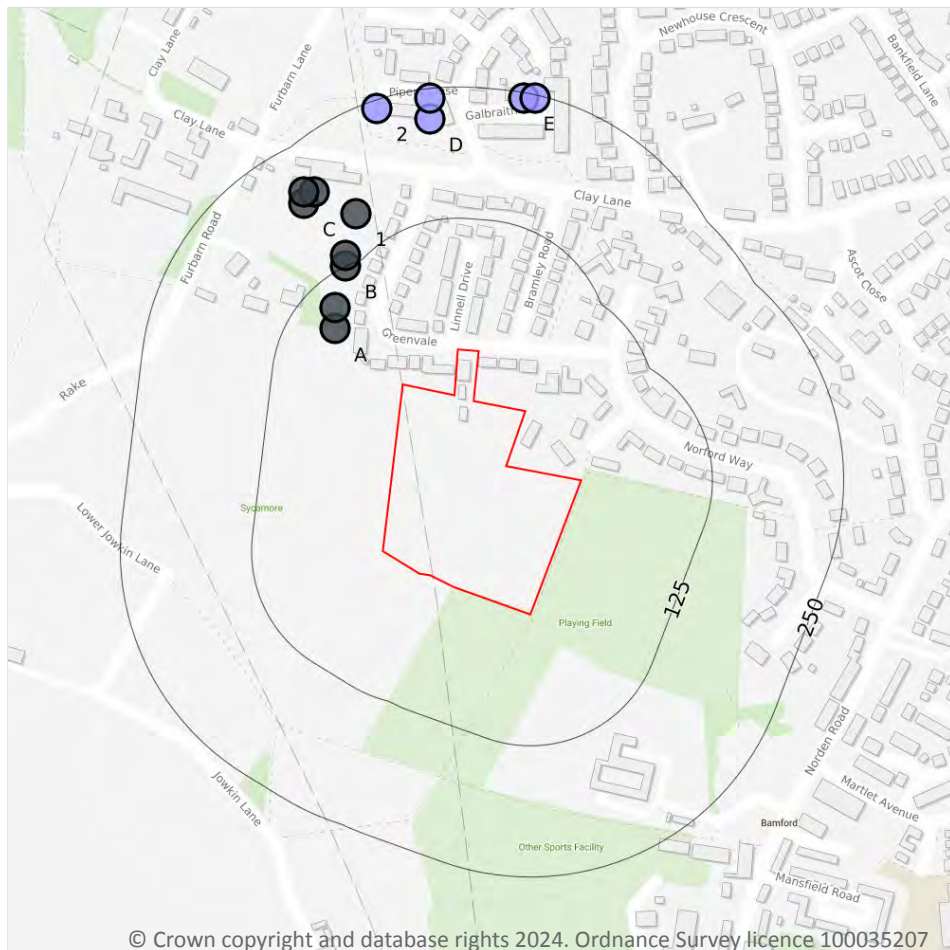


ID	Location	Category	Description
28	304m N	ROCK	Coal seam, inferred
34	436m E	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



16 Boreholes



— Site Outline
Search buffers in metres (m)

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

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16.1 BGS Boreholes

Records within 250m

13

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 97](#) >

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	83m NW	385910 413590	CLAY LANE ROCHDALE 2	-	Y	N/A
A	97m NW	385910 413610	CLAY LANE ROCHDALE 3	-	Y	N/A
B	125m NW	385920 413650	CLAY LANE ROCHDALE 5	-	Y	N/A

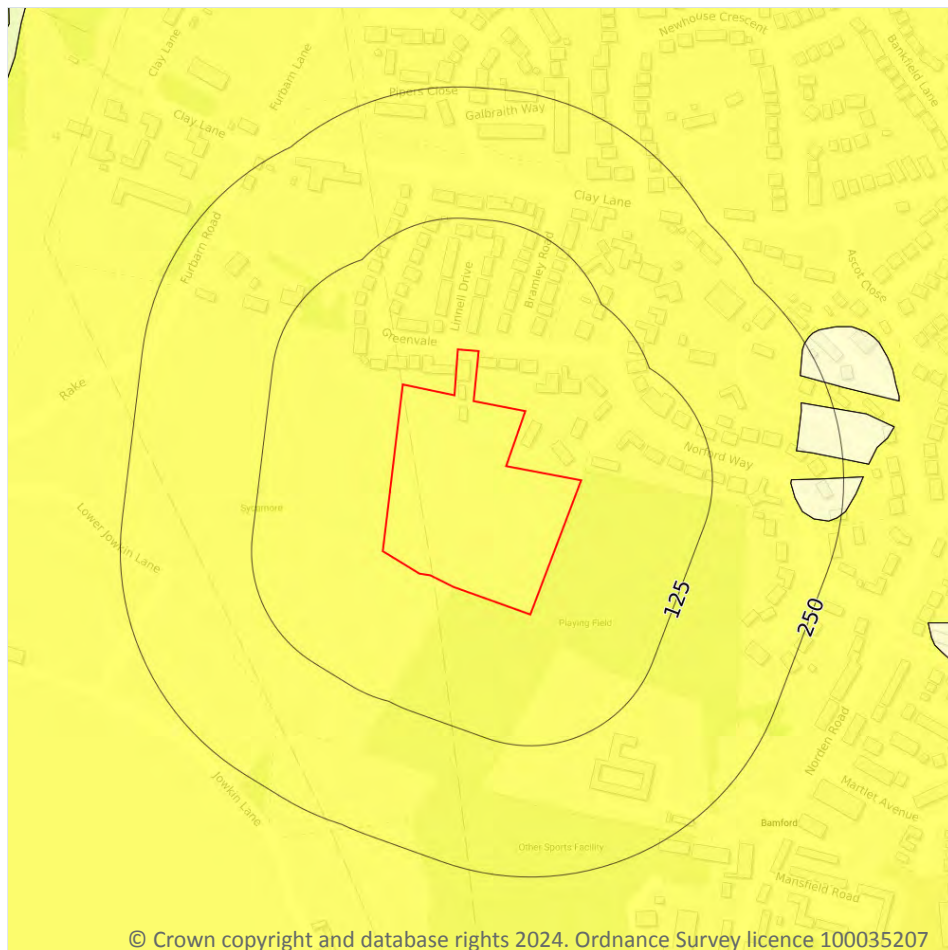


ID	Location	Grid reference	Name	Length	Confidential	Web link
B	134m NW	385920 413660	CLAY LANE ROCHDALE 4	-	Y	N/A
1	162m N	385930 413700	CLAY LANE ROCHDALE 7	-	Y	N/A
C	197m NW	385880 413710	CLAY LANE ROCHDALE 8	-	Y	N/A
C	202m NW	385890 413720	CLAY LANE ROCHDALE BH2	-	Y	N/A
C	206m NW	385880 413720	CLAY LANE ROCHDALE BH1	-	Y	N/A
D	221m N	386000 413790	FORMER CLAY LANE RESEVOIR TP 7A	3.8	N	30137 ↗
D	241m N	386000 413810	FORMER CLAY LANE RESEVOIR TP 7B	2.2	N	30138 ↗
2	242m N	385950 413800	FORMER CLAY LANE RESEVOIR TP 8A	3.5	N	30139 ↗
E	245m N	386090 413810	FORMER CLAY LANE RESEVOIR TP 3B	3.7	N	30130 ↗
E	247m N	386100 413810	FORMER CLAY LANE RESEVOIR TP 3A	3.5	N	30129 ↗

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

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).

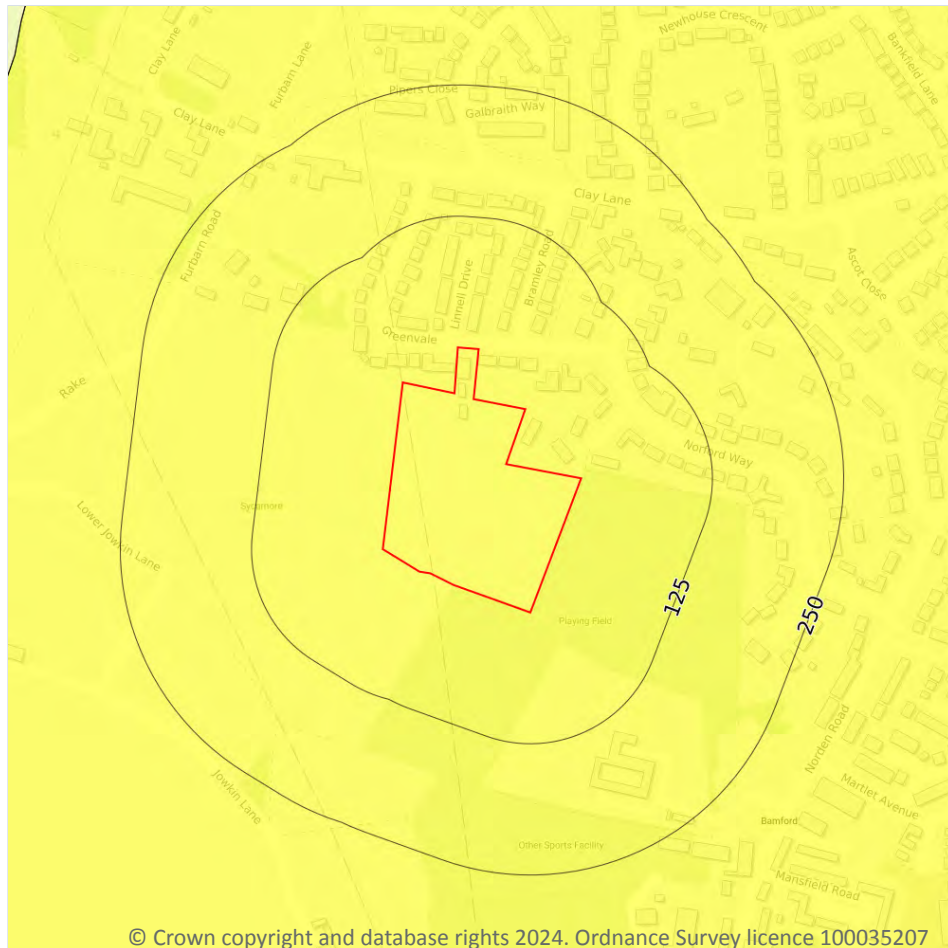
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 99](#) >

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- No data
 - Negligible
 - Very low
 - Low
 - Moderate
 - High

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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.

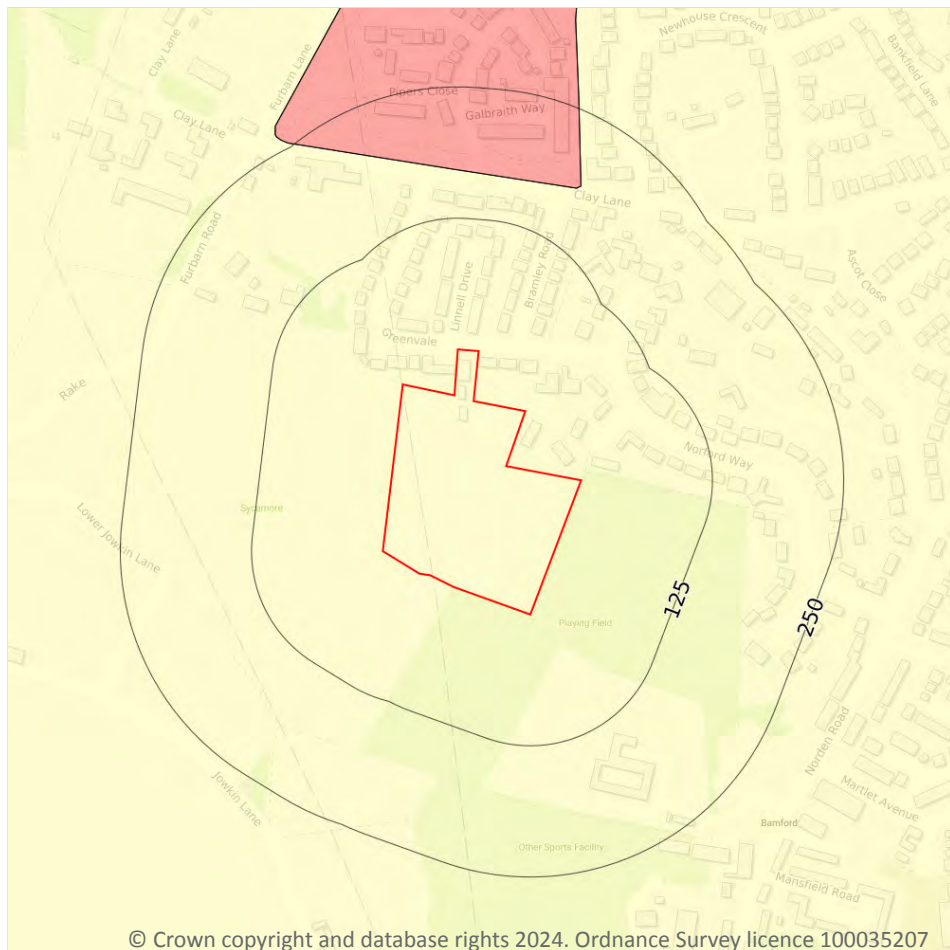
Features are displayed on the Natural ground subsidence - Running sands map on [page 100](#) >

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



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 Compressible deposits

Records within 50m

1

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

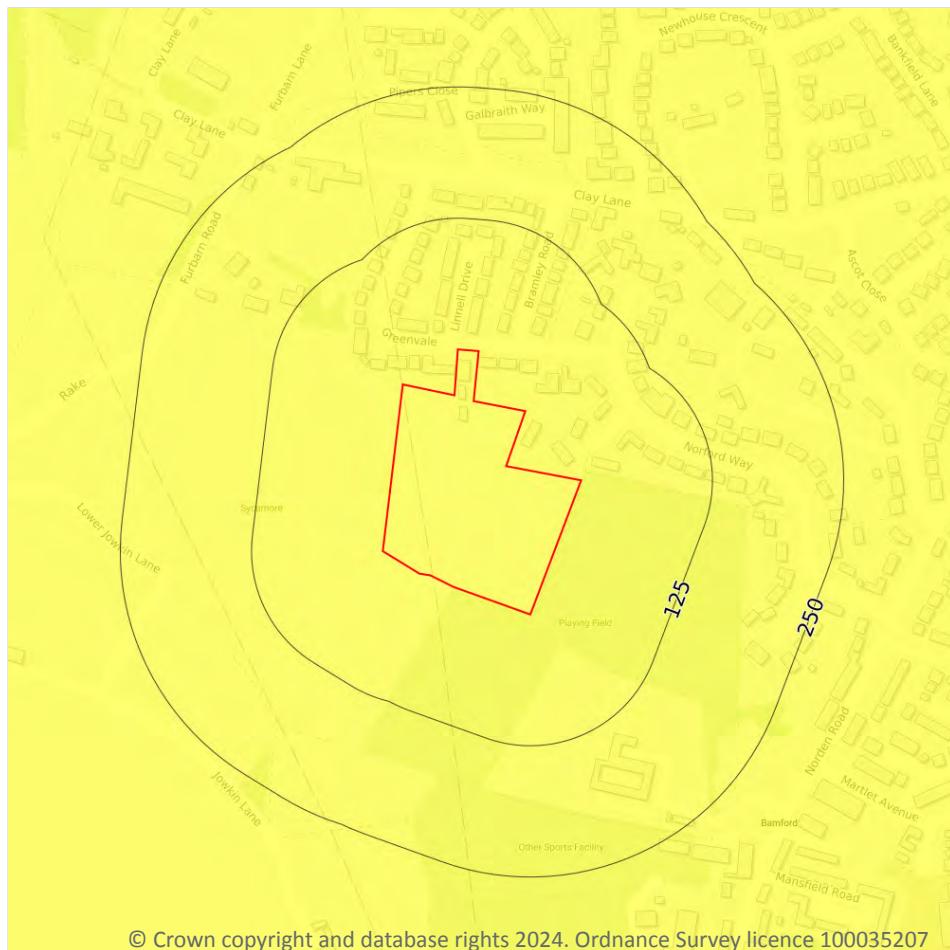
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 101](#) >

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

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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.

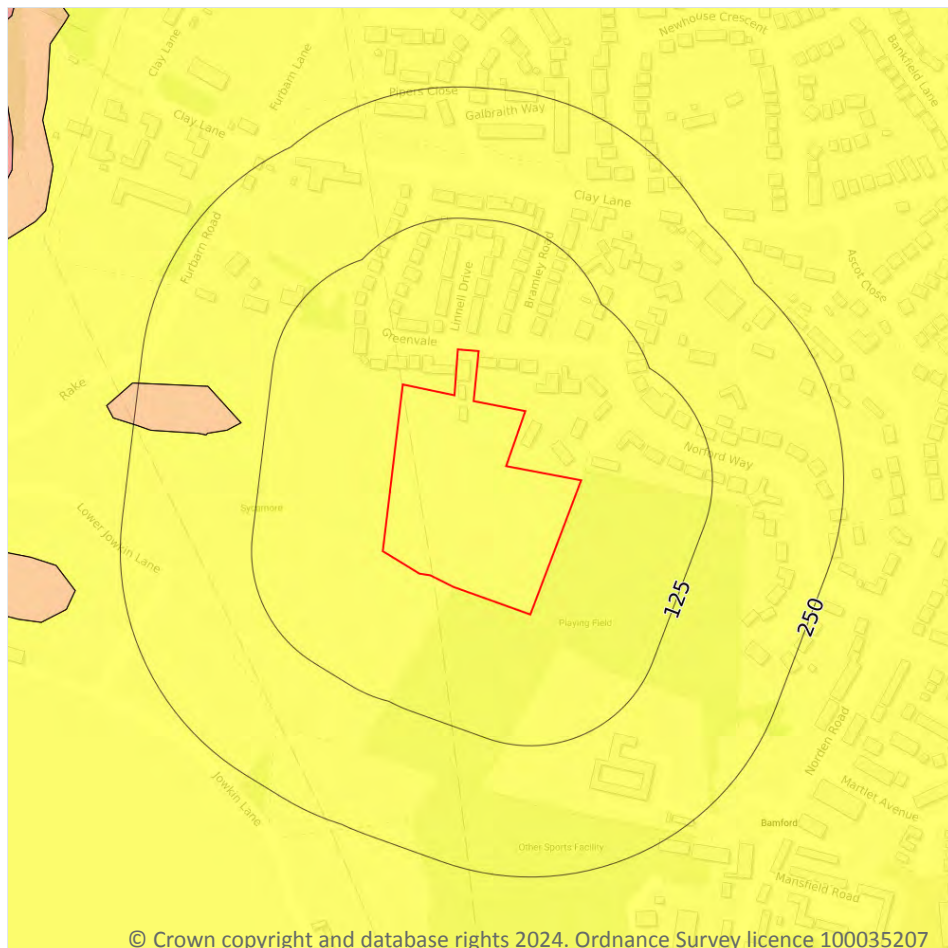
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 102](#) >

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

1

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

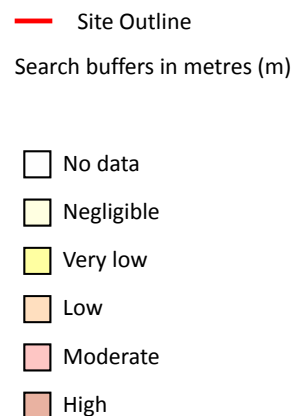
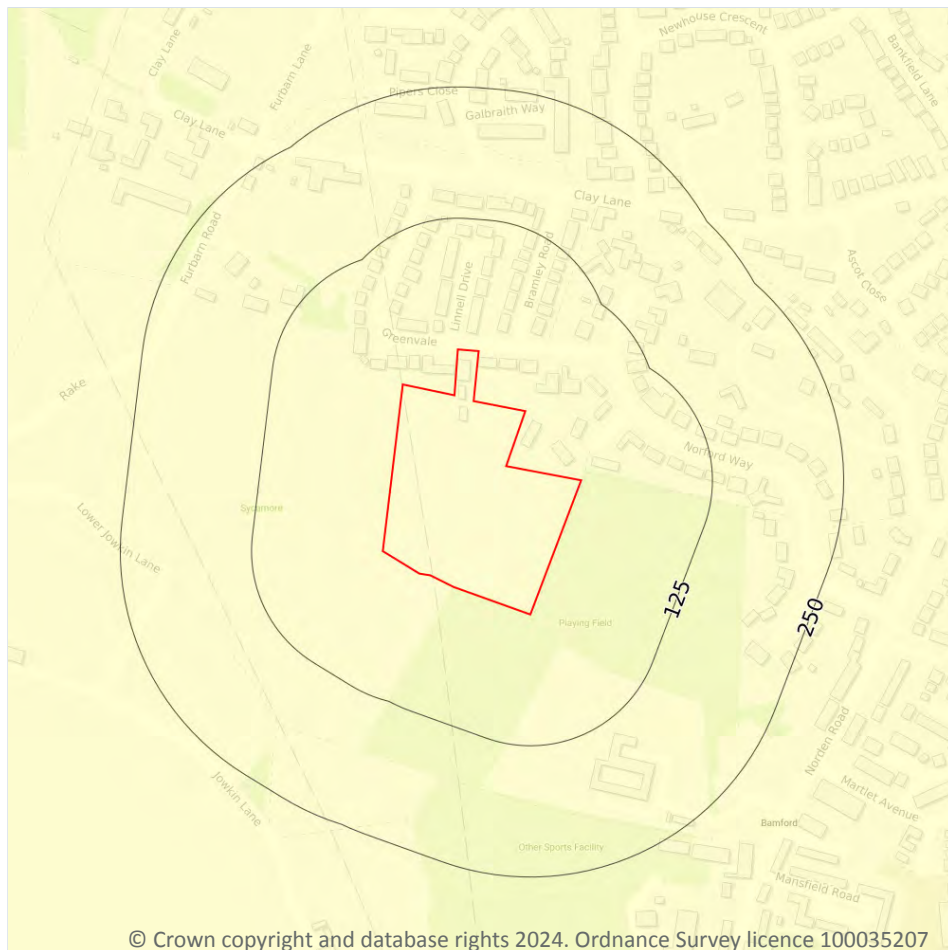
Features are displayed on the Natural ground subsidence - Landslides map on [page 103 >](#)

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

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



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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 104](#) >

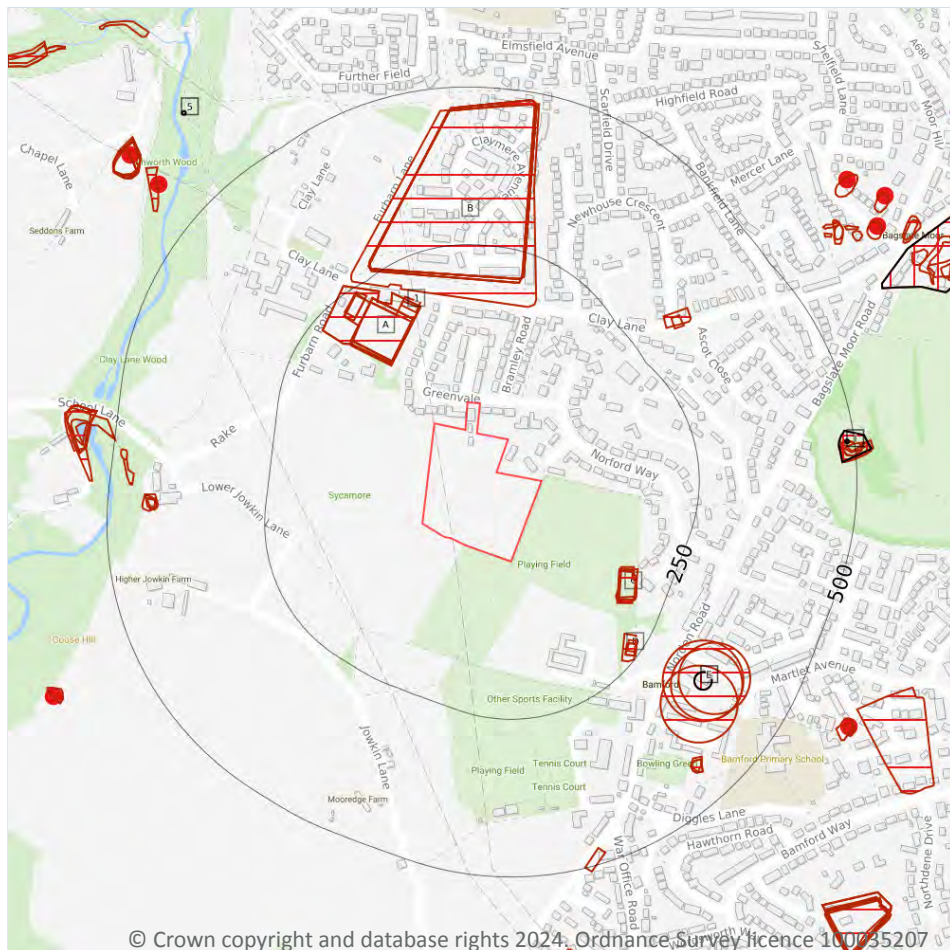
Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.



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

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18.1 BritPits

Records within 500m

0

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

This data is sourced from the British Geological Survey.



18.2 Surface ground workings

Records within 250m

30

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 106 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
A	114m NW	Reservoir	1908	1:10560
A	116m NW	Reservoir	1928	1:10560
A	116m NW	Reservoir	1938	1:10560
A	116m NW	Reservoir	1890	1:10560
A	119m NW	Reservoir	1987	1:10000
A	119m NW	Reservoir	1975	1:10000
A	119m NW	Reservoir	1949	1:10560
A	119m NW	Reservoir	1968	1:10560
B	162m N	Reservoir	1908	1:10560
1	164m N	Reservoir	1949	1:10560
C	165m SE	Reservoir	1938	1:10560
C	165m SE	Reservoirs	1890	1:10560
C	165m SE	Reservoirs	1928	1:10560
C	166m SE	Reservoirs	1908	1:10560
C	166m SE	Reservoirs	1949	1:10560
C	168m SE	Pond	1968	1:10560
B	195m N	Reservoir	1938	1:10560
B	195m N	Reservoir	1890	1:10560
B	195m N	Reservoir	1928	1:10560
B	201m N	Reservoir	1992	1:10000
B	201m N	Reservoir	1987	1:10000
B	201m N	Reservoir	1975	1:10000
B	201m N	Reservoir	1949	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
B	201m N	Reservoir	1968	1:10560
A	207m NW	Pond	1928	1:10560
A	209m NW	Reservoir	1949	1:10560
D	213m SE	Reservoir	1890	1:10560
D	224m SE	Reservoir	1949	1:10560
D	225m SE	Reservoir	1938	1:10560
D	225m SE	Reservoir	1928	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m

14

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 106](#) >

ID	Location	Land Use	Year of mapping	Mapping scale
E	345m SE	Pit Hole	1928	1:10560
I	475m E	Old Coal Pit	1890	1:10560
I	485m E	Old Coal Shaft	1908	1:10560
O	621m NE	Colliery	1890	1:10560
5	629m NW	Old Coal Shafts	1908	1:10560
-	873m E	Unspecified Old Shaft	1890	1:10560
-	881m N	Colliery	1890	1:10560
-	969m W	Disused Colliery	1908	1:10560
-	969m W	Disused Colliery	1949	1:10560
-	971m W	Unspecified Dismantled Mine	1983	1:10000
-	971m W	Unspecified Dismantled Mine	1967	1:10560
-	972m W	Colliery	1890	1:10560
-	978m W	Disused Colliery	1938	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
-	978m W	Disused Colliery	1928	1:10560

This 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

0

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

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

1

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

Features are displayed on the Mining and ground workings map on [page 106](#) >

ID	Location	Name	Commodity	Class	Likelihood
-	895m N	Not available	Vein Mineral	A	Underground mine workings are uncommon, although the geology is similar to that worked elsewhere. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.

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

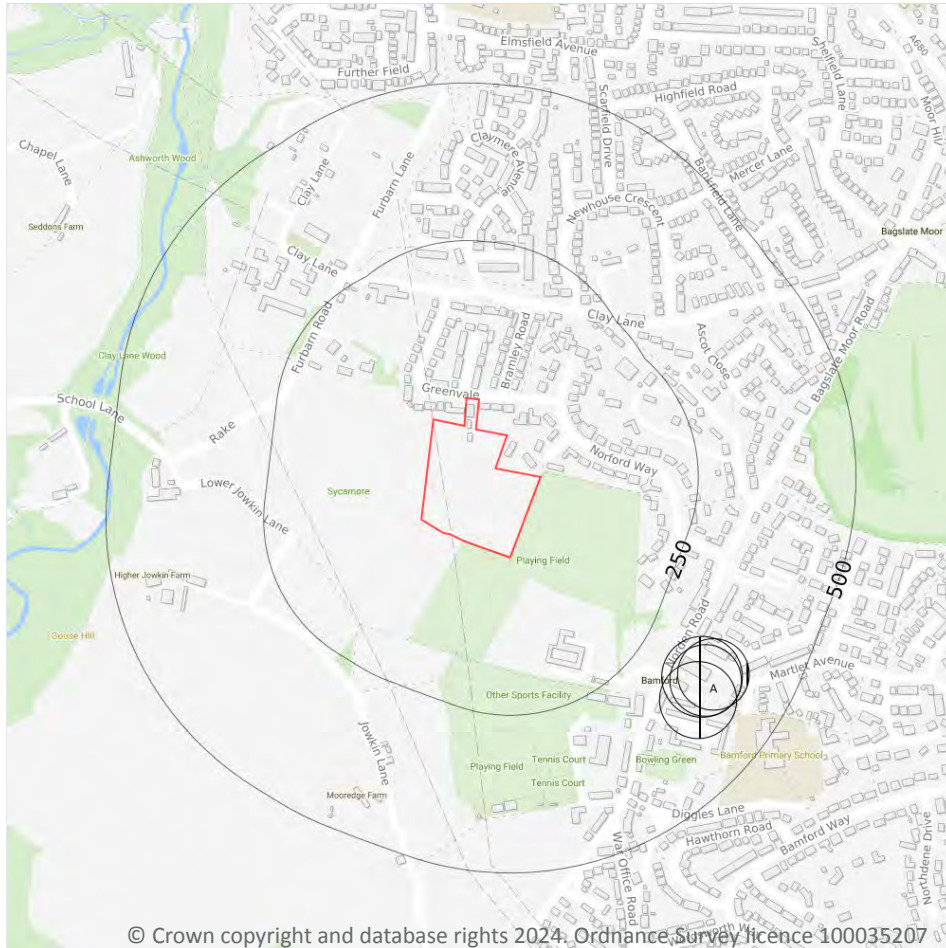
0

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



- Site Outline
- Search buffers in metres (m)
- Natural cavities (Area)
- Natural cavities (Point)
- Mining cavities
- Reported recent incidents
- Historical incidents
- BGS karst database (Point)
- BGS karst database (Line)
- BGS karst database (Area)

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

4

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.

Features are displayed on the Ground cavities and sinkholes map on [page 113 >](#)

ID	Location	Type	Date of mapping
A	294m SE	Unspecified Hole	1938
A	309m SE	Unspecified Hole	1908
A	313m SE	Unspecified Hole	1890



ID	Location	Type	Date of mapping
A	315m SE	Unspecified Hole	1949

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.

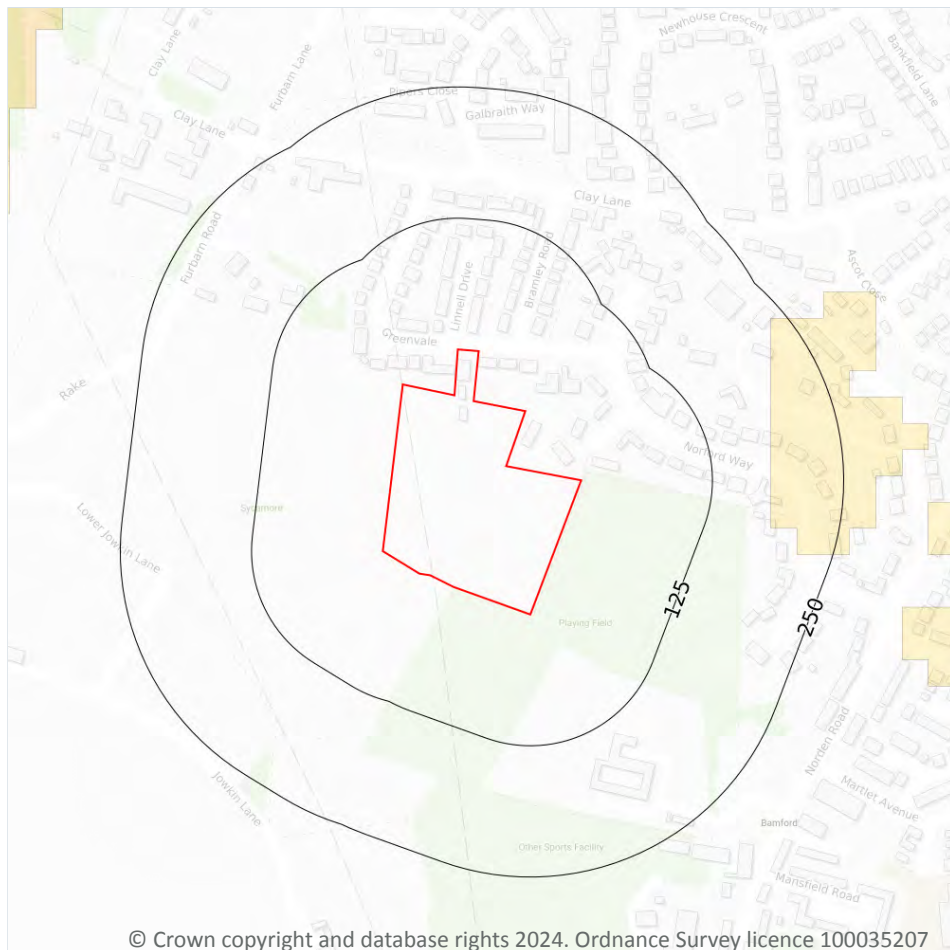
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 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.

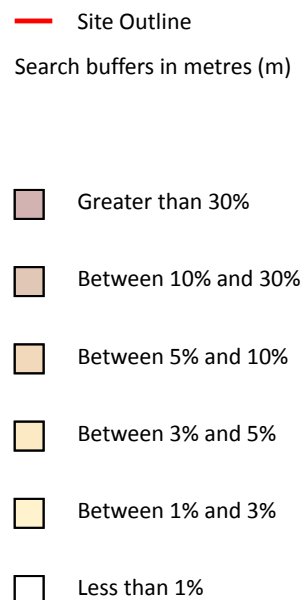
This data is sourced from the British Geological Survey.



20 Radon



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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 116](#) >

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

19

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 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg



Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
6m SW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
17m NW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
25m SE	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 - 2.2 mg/kg	60 - 90 mg/kg	30 - 45 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

0

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

This data is sourced from the British Geological Survey.



22 Railway infrastructure and projects

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**0**

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.

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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