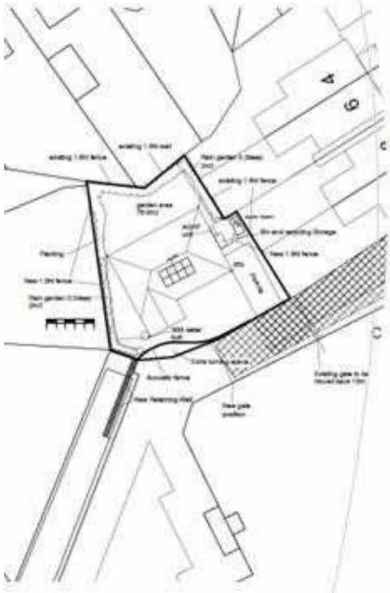

EARTH ENVIRONMENTAL & GEOTECHNICAL

Geo-Environmental Site Investigation Report

Winford Grove

Bristol

BS13 7DY

Report Ref: B3305/24

January 2024

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GEO-ENVIRONMENTAL
SITE INVESTIGATION REPORT

WINFORD GROVE

BRISTOL

BS13 7DY

Report Ref: B3305/24

JANUARY 2024

Prepared on Behalf of:

Country Developments (Bristol) Ltd

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DISTRIBUTION:

1 electronic copy MPDS

GEO-ENVIRONMENTAL SITE INVESTIGATION REPORT

Winford Grove, Bristol, BS13 7DY

Report Reference: B3305/23

Version B.0

Date: 3rd January 2023

Prepared for: Country Developments (Bristol) Ltd

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Definition of Version Code:
D. Applied during initial drafting of the report before it has been reviewed.
C. Applied after the report has been reviewed but before it has been approved by the Project Manager.
B. Applied after the Project Manager has approved the report ready for issue to the client.
A. Applied to reports after external/internal review.

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Written by:

Christian Kielinger
Geo-environmental Consultant

Approved by:

Simon Leat
Managing Director

[redacted]

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1.0 EXECUTIVE SUMMARY

Appointment	A Geo-environmental Site Investigation has been commissioned to examine ground conditions and retrieve soil samples for geotechnical and chemical testing for a proposed residential development in Bristol.
The Site	The (undeveloped) site is located at Winford Grove, Bristol at NGR ST 57118 69756, postcode BS13 7DY. The site is underlain by the Rugby Limestone Member.
Environmental Considerations	On Site: surface workings, 4 historical industrial land uses, 3 historical railway features Within 250m of Site: 4 Britpits, 53 historical industrial land uses, 1 historical tank, 4 historical energy features, 2 recent industrial land uses, 1 historical landfill.
Site History	The site has been occupied by fields and undeveloped until the 1980s when part of a Boys Club occupied the site. Earthworks were present on site during the 1940s and 1950s.
The Investigation	The investigation comprised window sample boreholes with associated in situ testing and sampling, laboratory geotechnical and contamination testing.
Ground Conditions Encountered	The exploratory boreholes have encountered variable cohesive Made Ground, thickness up to 2.0m, overlying soft to firm sandy/gravelly clay. Limestone bedrock was encountered at depths of between 3.9m and 5.0mbgl. Groundwater was not encountered during the current investigation. Groundwater was encountered during the previous investigation in WS1 and WS2 at a depth of 5.00mbgl.
Foundation Assessment	Strip foundations, raft foundations, piled foundations suitable subject to foundation loadings and settlement tolerances. Design Sulphate Class for the site = DS-1 ACEC site classification = AC-1s. Design CBR = 2%
Soil Contamination Risk Assessment	Low to moderate potential risk from soil contamination to workers during construction. Low potential risk to future site users (hard cover areas). High potential risk to future site users (soft landscaped areas). Remediation of soft landscaped areas required.
Soil Waste Assessment	All samples tested (6 nr) are classified as Non-Hazardous.
Protection of Buried Water Services	Special precautions likely required.
Land Gas Risk Assessment	Basic radon protection measures required.
This sheet is intended to provide a summary only of the report. It does not provide a definitive engineering analysis for the purposes of costing or construction and is subject to the limitation of the agreed brief.	

2.0 INTRODUCTION

2.1 Background

A geo-environmental site investigation report has been commissioned by MPDS, acting on behalf of Country Developments (Bristol) Ltd (the 'Client) to examine ground conditions and retrieve soil samples for geotechnical and chemical testing for a proposed development in site.

2.2 Terms of Reference

Earth Environmental and Geotechnical (Southern) Ltd (EEGSL) was commissioned by the Client to undertake an Investigation of the site in accordance with a proposal B3305 dated 17th October 2023. The objectives of this investigation are as follows:

- *Provide Phase I Desk Study Information.*
- *Assessment of ground conditions for design of foundations and infrastructure associated with proposed development.*
- *Assess the presence and likely extent of any potential environmental hazards (soil, groundwater, and gas) associated within the areas of the site investigated.*

2.3 Report References

Information supplied by MPDS is listed below:

- Phase 1 Desk Study Report & Phase 2 Intrusive Report, *'Land to the rear of Winford Grove, Bedminster Down, Bristol,* Geo-Testing Services Report reference 2017/7309 (June 2017).

2.4 Report Scope

This report presents a review of desk study information, full factual records of the site work carried out, the ground conditions encountered in the exploratory holes, the in situ and laboratory test results. All information collected has been used to provide an interpretation of the ground conditions, with recommendations on geotechnical design and potential ground contamination risks for the proposed development.

2.5 Limitations of the Study

The report is written in the context of an agreed scope of work and budget and should not be used in a different context. New information, improved practices or changes in legislation may require a reinterpretation of the report in whole or in part. EEGSL reserve the right to amend either conclusions or recommendations in light of any further information that may become available. The report is provided for the sole use by the client and is confidential to them.

Recommendations within this report are also based on exploratory records and examination of samples and, where applicable, laboratory tests. No liability can be accepted for conditions not revealed by the boreholes and trial pits, particularly at intervening locations. Whilst every effort is made to ensure accuracy of data supplied, all opinions expressed as to the spatial distribution of strata between sampling locations is for guidance only and no responsibility is accepted as to its accuracy.

3.0 THE SITE

3.1 Site Location & Description

The site is located at Winford Grove, Bristol at National Grid Reference ST 57118 69756 with a nearest postcode of BS13 7DY. The site location is shown in Figure 1 below.

Figure 1 – Site Location Plan

The site is an area of undeveloped land approximately 0.03 ha which is overgrown with vegetation and has two containers present. The site is bordered by residential buildings to the north, east and west. To the south the site is bordered by the Bedminster Down Ex-Service Club. The site and surrounding area are shown in Figure 2 below.

Figure 2 – Aerial Photograph Showing Site Location

General site photographs are presented in Figure 3 below.

Figure 3 – General Site Photograph

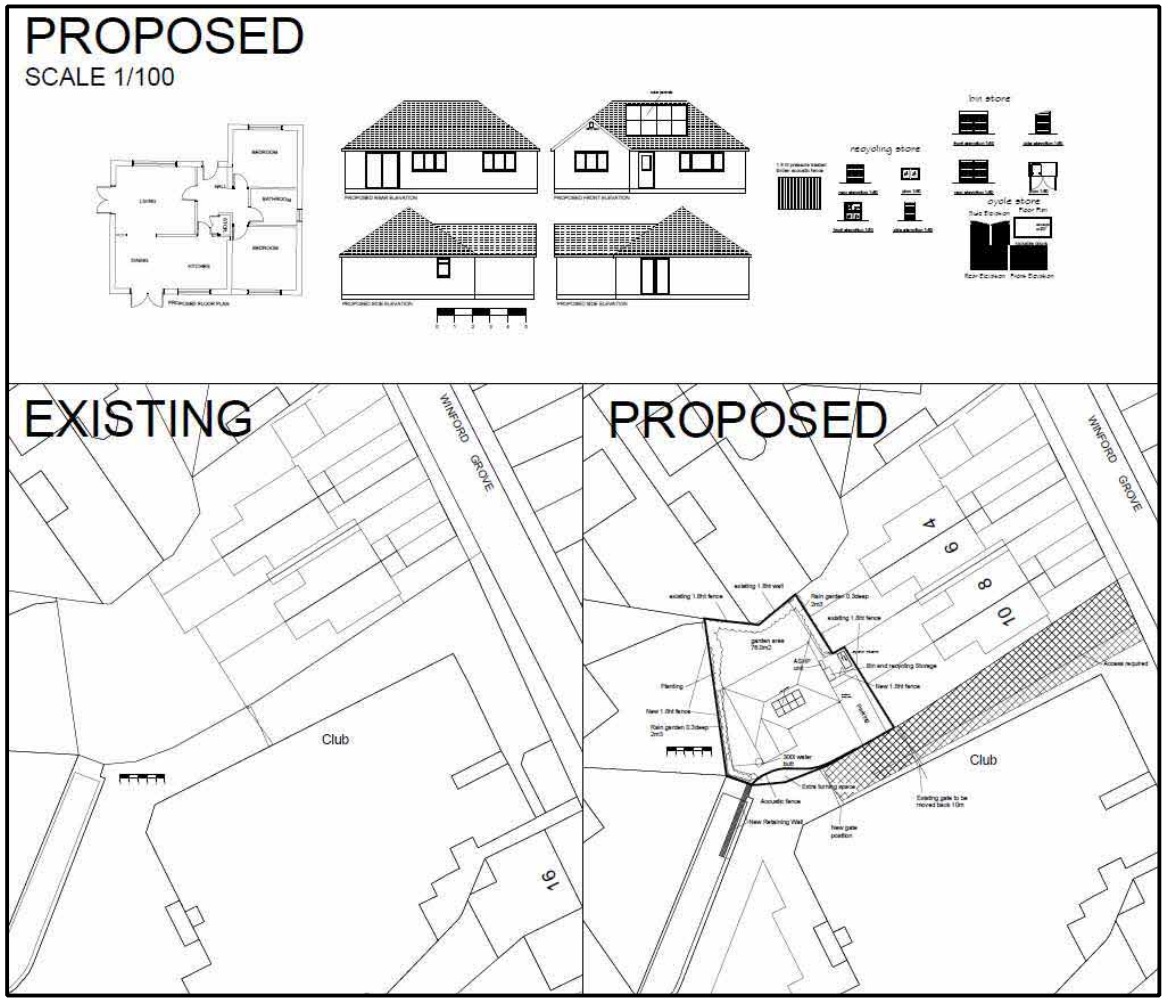
Photo 1	Photo 2
	
Photo 3	**Photo 4**
	

3.2 Proposed Development

It is proposed to construct a new dwelling on site with associated areas of hardstanding and soft landscaping.

The proposed development layout details are shown in Figure 4 overleaf.

Figure 4 – Proposed Development Details



3.3 Previous Investigation

A previous Phase 1 & Phase 2 investigation was carried out in 2017 by Geo-Testing Services.

The investigation comprised window sample boreholes with associated in situ testing and laboratory geotechnical and contamination testing.

For the purposes of this report, the relevant information from the previous investigation will be included in the following sections.

4.0 GEOLOGICAL SETTING

The geology of the site is covered by British Geological Survey (BGS) online data and the site-specific Groundsure Insight Report (Appendix 1).

The following sections are generally limited to locations within 250m of the site boundary unless it is considered that installation or activities beyond that range could potentially have an impact on the site or be affected by the redevelopment of the site.

4.1 Geology

The Groundsure Report indicates the site could be underlain by infilled ground.

According to the British Geological Survey (BGS), the site is underlain by the Rugby Limestone Member of Jurassic age. The Rugby Limestone Member is described as alternating grey, argillaceous limestones, and mudstones.

There are no geological faults located within 250m of the site.

There are no historical BGS borehole records within 250m of the site.

4.2 Ground Stability

The site is in an area where the hazard rating for shrink swell clays and ground dissolution of rocks is negligible. A very low hazard rating exists for running sands, landslides and collapsible deposits. A moderate hazard rating exists for compressible deposits.

4.3 Radon Potential

The site is in a Radon Affected Area where between 3% and 5% of properties are above the Action Level. Basic radon protection measures are required.

4.4 Soil Chemistry

There is one estimated background soil chemistry record on site, recording levels of arsenic = 35-45mg/kg, cadmium = 1.8mg/kg, chromium = 90-120mg/kg, nickel = 30-45mg/kg and lead = 100mg/kg. With the exception of arsenic, all the above chemicals: (arsenic, cadmium, chromium, nickel, or lead) have estimated concentrations on site that are below the recognised screening levels based on Defra C4SL Health Criteria Values(March 2014) and LQM/CIEH Suitable 4 Use Levels(2015) for the relevant residential setting, shown in the table below.

Table 1 – Soil Screening Levels

Determinand	C4SL/S4UL Levels (mg/kg)*	
	Residential with homegrown produce	**Residential** without homegrown produce
Arsenic	37	40
Cadmium	26	149
Chromium	910	910
Lead	200	310
Nickel	180	180

4.5 Mining, Ground Workings & Natural Cavities

There are 4 records of BritPits located within 250m of the site. The closest is 2m southwest of the site and is a named Bedminster Down which is a ceased surface mineral working for limestone.

There are 4 records of surface ground workings on site and a further 65 records within 250m of the site. The ground workings on site are recorded as old/unspecified quarry/pits, dated 1887-1953.

The site is recorded to be within a coal mining area, however, the Coal Authority's interactive on-line map does not indicate the site to be located within a Development High Risk Area associated with coal mining legacy features.

re is 1 record of coal mining on site as defined by the Coal Authority.

There are no records of underground workings, natural cavities or mining cavities within 250m.

There are no brine areas, gypsum areas, tin mining, or clay mining records on site.

5.0 ENVIRONMENTAL SETTING

Environmental conditions are covered by Environment Agency (EA) and British Geological Survey (BGS) online data, and the site-specific Groundsure Insight report (Appendix 1).

The following sections are generally limited to locations within 250m of the site boundary unless it is considered that installations or activities beyond that range could potentially have an impact on the site or be affected by the redevelopment of the site.

5.1 Industrial Land Use Information

Historical and current industrial land usage on-site and within 250m of the site is summarised in Table 2 below:

Table 2 - Summary of Industrial Land Use

Description	Records On-Site	Records within 250m of site	Details
Historical Industrial Land Uses	4	53	On-site: Unspecified old quarries, unspecified quarries, and railway sidings. Closest off-site: unspecified quarry immediately east (1938)
Historical Tanks	0	1	Tanks 164m northeast (1903)
Historical Energy Features	0	4	Closest off-site: Electricity substation 20m northeast (1972 - 1992)
Historical Petrol Station	0	0	-
Historical Garage	0	0	-
Historical Military Land	0	0	-
Historical Railway Features	3	0	On-site: 3 railway sidings 1902 -1905
Recent Industrial Land Use	0	2	Closest off-site: Electricity substation 29m northeast
Current/Recent Petrol Stations	0	0	-
Electricity Cables	0	0	-
Gas Pipelines	0	0	-
Current Railway Features	0	0	-

5.2 Waste and Landfill Sites

There are no current landfill sites or waste facilities within 250m of the site.

There is 1 record of historical landfill recorded 188m northwest of the site, which was permitted to take industrial, commercial and household waste, last recorded in 1978.

There are no waste exemptions records within 250m of the site.

5.3 Environmental Permits, Incidents and Registers

There are no records of environmental permits, incidents, and registers within 250m of the site.

5.4 Hydrogeology and Hydrology

The bedrock permeability on site has been classed as low to high with well-connected fractures flow type. The vulnerability of the bedrock aquifer is considered high.

The bedrock beneath the site is classified as 'Secondary A' by the Environment Agency. The EA definition is given below:

> *"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."*

Soils on site are classified as having intermediate leaching potential.

The site is not located within a source protection zone.

There are no recorded groundwater abstraction, surface water or potable water licenses within 250m of the site.

There are no records of surface water features within 250m of site.

5.5 Potential Flood Risks

The site is not located within a flood risk area.

5.6 Environmentally Sensitive Sites

The site is not located within 250m of an environmentally sensitive site other than the Bath and Bristol green belt located 90m northwest.

5.7 Visual and Cultural Designations

There are no recorded world heritage sites, national parks, or Scheduled Ancient Monuments within 250m of the site.

There is 1 record of a listed building located 89m east of the site, the Church of St Oswald.

The agricultural land classification of the site is urban.

5.8 Habitat Designations

There are no habitat designations within 250m of the site.

6.0 SITE HISTORY

The historical development of the site has been determined by reference to historical plans and Google Earth imagery. The reviewed historical plans comprise only readily available records and may be limited; however, the information available to date indicates that additional searches are unlikely to add to our understanding of the site. The earliest available historical mapping covering the site dates back to 1883. The site history is summarised in Table 3 below.

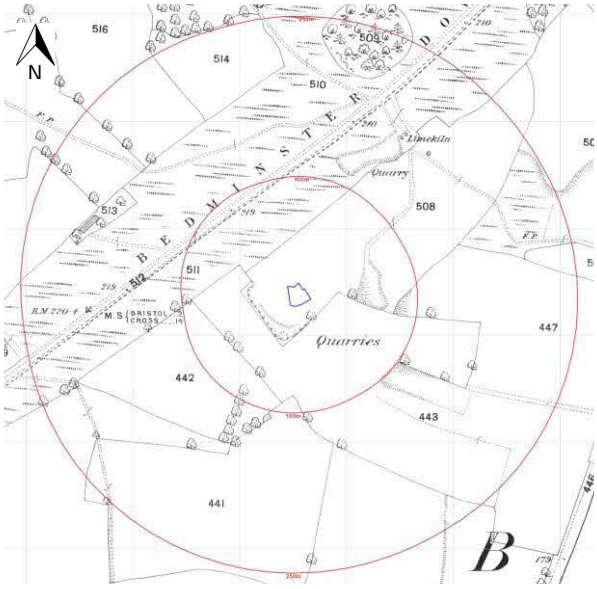
Table 3 - Summary of Site History

Date	Site	Surrounding Land Use (Within 250m of Site)
1883-1887	Site is an open field.	Quarries located to E, SE and NE. Bedminster Down road located 100m NW. Limekiln located 180m northeast. Residential buildings located 210m W.
1903-1904	No significant change	No significant change
1916-1917	No significant change	No significant change
1930-1931	No significant change	No significant change.
1938	No significant change	Residential areas have expanded around site with the closest roads, Winford Grove present 40m E, Brunel Road 40m N and Felton Grove 90m S. Surrounding quarries and old quarries no longer present.
1948-1952	Site partly occupied by earthworks.	Further residential development surrounding the site, including a school and electricity substation.
1965	No significant change.	No significant change.
1975	Now an open area of land with no significant features present.	Boys club now present on the NE border of the site. Ex-service club located 5m SE. Electrical substation located 35m NE. Former telephone repeater station located 70m NE is now a Post office Repeater Station. Public convenience located 200m N. School located 210m SE now named Bedminster Down County Primary School. Council yard located 210m N.
1989-1992	The site is now part of the Boys club with part of the club building present on it.	Council yard located 210m N is no longer present.
2001-2003	No significant change.	No significant change.
2010	No building present on site.	The Boys Club on the NE border no longer present. Allotments gardens 180m NW no longer present.
2023	Two containers now present on site.	Residential properties now located on the NE border of the site.

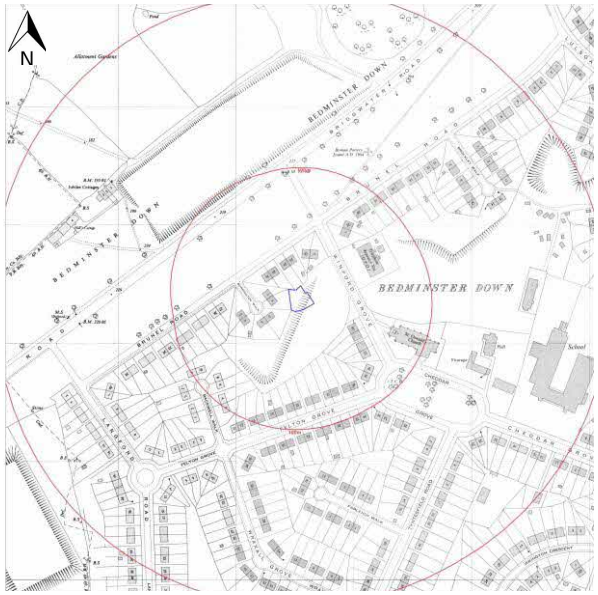
Selected extracts from historical maps are presented in Figure 5 overleaf.

Figure 5 – Historical Map Extracts

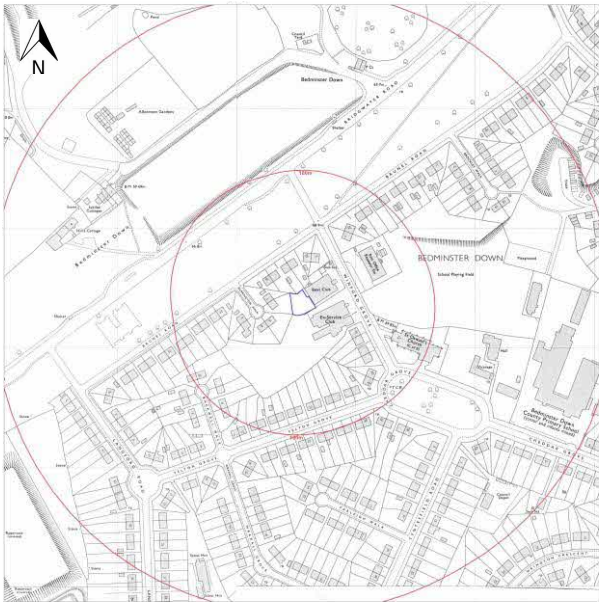
1886



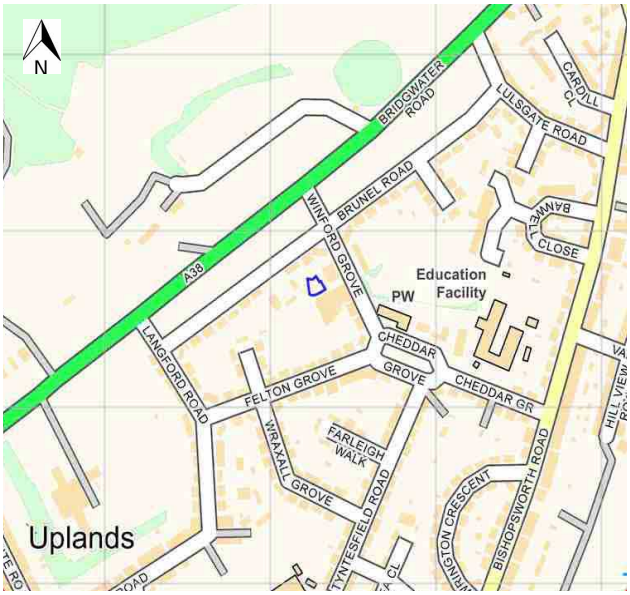
1948



1975



2023



7.0 PRELIMINARY CONTAMINATION RISK ASSESSMENT

7.1 Introduction

The following paragraphs outline a Preliminary Risk Assessment (PRA) for the site based on the above desk study information as defined by DEFRA and the EA Model Procedures for the Management of Land Contamination, CLR11(2004).

Table 6 provides a Preliminary Conceptual Model (PCM) which considers the source-pathway-receptor linkages present alongside the likelihood, severity and risk level as defined within Table 4 and Table 5 below. The assessment of probability, a modified risk table, and certain consequence definitions are based on CIRIA C552 and CLR11.

Table 5 considers whether a pollution linkage is potentially present and provides a preliminary qualitative assessment of risk based on the information currently available. Where a possible linkage is identified, it does not necessarily mean that a significant risk exists but indicates that further information is required through appropriate site investigation to substantiate the conceptual model.

The PCM/PRA is based on a residential end use.

Table 4 - Consequence, Probability and Risk

Probability	Consequence,	Risk
High Likelihood- There is a pollution linkage and an event either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution	Very High – acute risk to the human health likely to result in significant harm. Risk of severe or irreversible effect on ground/surface water quality. Catastrophic damage to buildings / property.	Very High – there is a high potential that the source-pathway-receptor scenarios may give rise to harm to human health or the environment and remedial action is likely to be required.
Likely – there is a pollution linkage and all the elements are present, which means that it is probable an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.	High – Severe or irreversible effect on human health. Temporary severe or irreversible effect on ground/surface water quality. Reduction of water quality rendering groundwater or surface water unfit to drink and/or substantial adverse impact on groundwater dependant environmental receptors.	High – it is likely that the source-pathway-receptor scenarios may give rise to an impact on human health or the environment, which may require remediation and/or control measures to mitigate risks
Low likelihood– there is a pollutant linkage and circumstances are possible for an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term	Moderate – Long term or short term moderate effect on human health. Moderate effect on ground/surface water quality, reversible with time. Reduced reliability of a supply at a groundwater or surface water abstraction source	Moderate – it is possible that the source-pathway-receptor scenarios may give rise to an impact on human health or the environment, however it is either relatively unlikely that such would be severe, or if any harm were to occur it is more likely that harm would be mild.
Unlikely – there is a pollution linkage, but circumstances are such that it is doubtful that an event would occur even in the very long term.	Low – Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.) Slight effect on ground/surface water quality, reversible with time. Marginal reduced reliability of a supply at a groundwater or surface water abstraction source.	Low – it is possible that harm could arise at the source, however it is likely that they would at worst be mild.
		Very Low – it is unlikely that the source-pathway-receptor scenarios will give rise to an impact on human health or the environment.

Table 5 - Estimation of Level of Risk by Comparison of Consequence and Probability

		Consequence			
		High	**Moderate**	**Low**	**Very low**
Probability	**High Likelihood**	Very High	High risk	Moderate risk	Moderate to low risk
	Likely	High risk	Moderate risk	Moderate to low risk	Low risk
	Low Likelihood	Moderate risk	Moderate to low risk	Low risk	Very low risk
	Unlikely	Moderate to low risk	Low risk	Very low risk	Very low risk

7.2 Potential Sources

The following potential sources have been considered for the assessment site.

Records indicate the site could have been infilled historically, which could potentially be a source of contamination.

Backfilled quarries are located in the surrounding area.

7.3 Potential Receptors

The following receptors have been considered as part of this assessment.

Current land users.
Adjacent land users.
Future land users.
Construction workers during site development works.

7.4 Potential Pathways

The following pathways have been considered as part of this assessment.

Direct / dermal contact, ingestion, inhalation pathways of potentially contaminated soils.
Vertical or lateral migration of contamination on and off site.

Table 6 - Preliminary Conceptual Model

Source	Pathway	Receptor	Probability	Consequence	Risk	Comment
Contamination of the ground beneath site due to current and historical use	Dermal contact, ingestion and inhalation of soils dust	Current Site Users	Unlikely	Low	Very Low	The risk to current site users from potential contamination within the ground beneath site is considered **VERY LOW** based on a lack of historical usage/development and the site being disused.
		Future Site users	Likely	Low	Moderate to Low	The risk to future site users via direct exposure is considered to be **MODERATE TO LOW** based on potentially infilled ground being present.
		Construction Workers	Likely	Low	Moderate to Low	The risk to construction workers via direct exposure is considered to be MODERATE TO LOW based on potentially infilled ground being present. However, it is expected that exposure duration will be short-term only, and assuming appropriate health and safety measures are adopted (in line with CDM and other relevant health and safety guidance) **LOW** risk to construction workers is anticipated.
	Vertical or lateral migration of contamination (including ground gas) on and off site.	Current Site Users	Unlikely	Low	Very Low	Based on anticipated ground conditions beneath the site the risk to current users from migrating contamination at the assessment site is considered as **VERY LOW** based on a lack of historical usage/development and the site being disused.
		Adjacent land users	Likely	Moderate	Moderate	The risk to adjacent site users from migrating contamination at the assessment site is considered **MODERATE** given the potential presence of infilled land and quarries.
		Future land users	Likely	Moderate	Moderate	Based on anticipated ground conditions beneath the site the risk to current users from migrating contamination (ground gas) at the assessment site is considered **MODERATE**, given the potential presence of infilled land and quarries.
		Controlled Waters	Unlikely	Low	Very Low	The current risk to controlled waters from contamination at the assessment site is considered **VERY LOW** as there are no surface water features within 250m of the site.
		Construction Workers	Low likelihood	Moderate	Low to Moderate	Based on anticipated ground conditions beneath the site the risk to construction workers from migrating contamination (ground gas) at the assessment site is considered **LOW to MODERATE.**

7.5 Preliminary Risk Assessment

From review of historical and current day information, the site appears to have remained a field and completely undeveloped from 1883 until 1948 but the site didn't become developed until 1989. There are records of potential infilled land on and adjacent to the site..

Based on the above information the site has an overall risk rating of **LOW TO MODERATE.**

8.0 SITE INVESTIGATION

8.1 Exploratory Fieldwork

The fieldwork was carried out by EEGSL on 27th November and comprised:

- 4 window sample boreholes (designated WS01 to WS04 inclusive) were sunk to depths of between 4.60m and 5.00m below existing ground level. Window sampler boring is carried out with a small, track-mounted rig, which uses a chain-driven trip hammer to drive sampling tubes or penetrometers into the ground. These tools are coupled to the anvil of the hammer by solid drill rods. Sampling tubes comprise "windowless samplers", which are plain sampler tubes in which a continuous disturbed sample is recovered within a semi-rigid plastic liner. In order to reduce friction within the borehole, sampling tubes of progressively smaller diameter are used as the borehole depth increases. Sampler diameters generally range from between approximately 90mm to 50mm. Standard penetration tests (SPT's) were conducted in suitable materials. Groundwater observations were noted where possible. These observations relate to the time of the investigation only, and do not necessarily reflect seasonal fluctuations. Log sheets are included in Appendix 2.

- Dynamic probe tests were carried out generally in accordance with BS EN ISO 22476-2, at each WS location from ground level to depths of up to 5.00m below ground level. The results of these tests are shown in the Appendix 3. Dynamic probe tests are conducted with a window sampler type rig, which uses a chain-driven trip hammer to drive a cone-tipped, solid steel penetrometer into the ground. The "super heavy" test (DPSH) uses a 50.5mm diameter cone, and a 63.5kg hammer, falling over a distance of 750mm. The resistance of the ground to the dynamic penetration is given by the number of blows required to drive the cone over depth increments of 100mm (DPN_{100}).

Each exploratory location was scanned using a Cable Avoidance Tool (CAT) in order to locate unrecorded underground services, and the exploratory locations were repositioned if necessary. On completion, all samples recovered from the site were taken to a specialist laboratory for testing.

All site investigation work was supervised full time by a representative of EEGSL. The logging of soils and rocks has been carried out in accordance with BS5930(2015) except where superseded by the soil and rock description methodology in BS EN14688-1(2002), BS EN 14688-2(2004) and BS EN 14689-1(2003).

A summary of exploratory holes undertaken in presented in Table 7 overleaf.

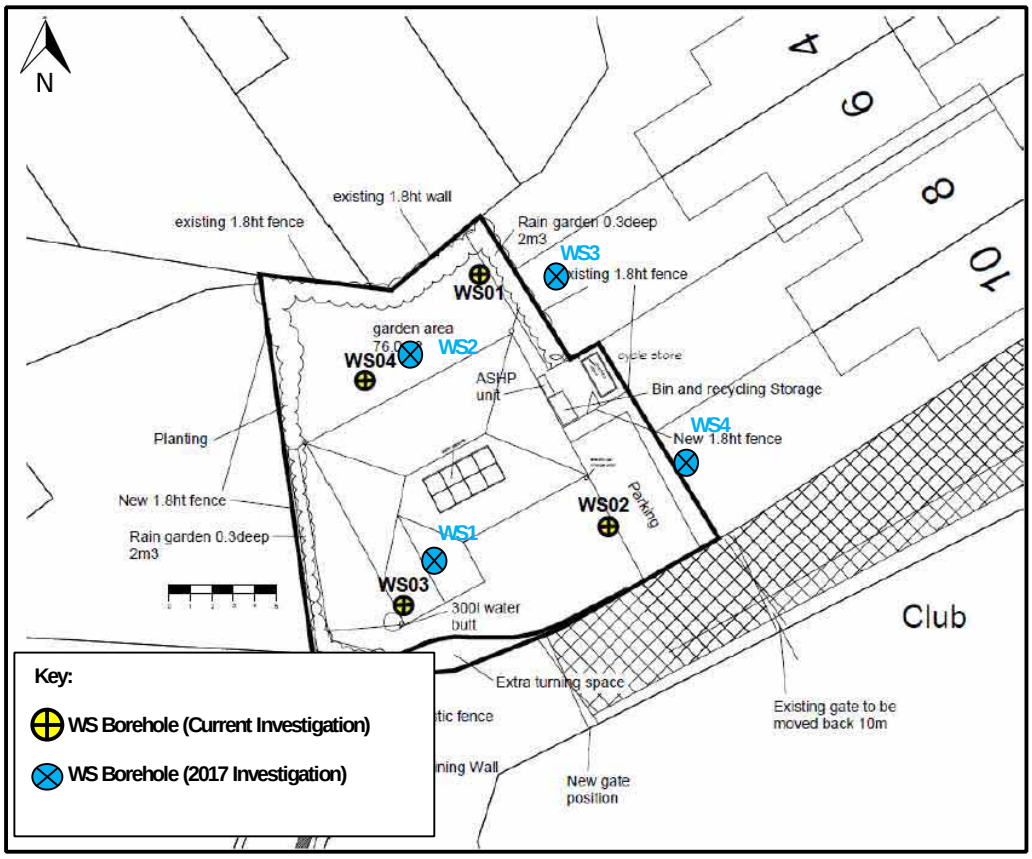
Table 7 – Summary of Exploratory Holes Undertaken

Investigation	Hole	Type*	Depth (m)	Date Started	Date Finished	Location		Backfill Details**
						Easting (m)	Northing (m)	
Current Investigation	WS01	WS	4.60	27/11/2023	27/11/2023	357052	169740	A
	DPWS01	DP	4.60	27/11/2023	27/11/2023	357052	169740	-
	WS02	WS	5.00	27/11/2023	27/11/2023	357058	169737	A
	DPWS02	DP	5.00	27/11/2023	27/11/2023	357058	169737	-
	WS03	WS	5.00	27/11/2023	27/11/2023	357055	169737	A
	DPWS03	DP	5.00	27/11/2023	27/11/2023	357055	169737	-
	WS04	WS	4.80	27/11/2023	27/11/2023	357049	169740	A
	DPWS04	DP	4.90	27/11/2023	27/11/2023	357049	169740	-
Previous 2017 Investigation	WS1	WS	5.10	13/03/2017	13/03/2017	-	-	A
	WS2	WS	5.50	13/03/2017	13/03/2017	-	-	A
	WS3	WS	4.60	13/03/2017	13/03/2017	-	-	A
	WS4	WS	4.60	13/03/2017	13/03/2017	-	-	A

WS = Window Sample, DP = Dynamic Probe
**A = Arisings

The fieldwork was carried out generally in accordance with BS 5930:2015 Code of Practice for Site Investigations, Eurocode 7, unless otherwise stated. The exploratory hole locations are shown approximately on the Exploratory Hole Location Plan below:

Figure 6 - Exploratory Hole Location Plan



8.2 Laboratory Testing Programme

8.2.1 *Geotechnical Testing*

A programme of laboratory testing was carried out on samples taken from the various strata to assist in classification and determine the engineering properties of the materials underlying the site. The testing was scheduled by EEGSL and carried out by GSTL. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of the specific tests used in each case are given in Table 7 below.

Table 8 - Summary of Geotechnical Laboratory Tests Undertaken

TEST	STANDARD	No.
Moisture Content	BS1377:1990 Part 2, Clause 3.2	2
Liquid Limit, Plastic Limit, Plasticity Index	BS1377:1990 Part 2, Clause 4/5	2
Sulphate content of 2:1 soil:water extract	BS1377:1990 Part 3, Clause 5	3
pH value	BS1377:1990 Part 3, Clause 9	3

The results of the laboratory geotechnical tests are included in Appendix 4.

8.2.2 *Environmental Testing*

The environmental chemistry of the ground was investigated by specialist chemical analysis of selected samples, scheduled by EEGSL and carried out by DETS Ltd. Chemical analyses were carried out on 4 soil samples and were submitted for the following suite of determinants:

Asbestos Screen, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Cyanide, Sulphate (SO_4), Sulphide, pH, Soil Organic Matter, Phenol, speciated Total Petroleum Hydrocarbons (TPH) and speciated Polyaromatic Hydrocarbons (PAH).

The results of the laboratory contamination tests are included in Appendix 4.

The range of potentially hazardous contaminants present on the site can be wide and varied, and the suite has been chosen to reflect both commonly found contaminants and others indicated by research to have a significant risk of being present. It is, however, possible that others may exist for which analyses have not been carried out. It is also possible that contaminants exist on the site but were not present at any of the exploratory hole locations.

9.0 GROUND CONDITIONS ENCOUNTERED

9.1 Soil Profile Encountered

The sequence of strata encountered beneath the site was as follows:

Made Ground – Variable Made Ground was encountered in all the exploratory holes, comprising:
- Clayey gravel, thickness 0.20m to 0.25m.
- Sandy clay with brick, limestone, mudstone, cement, asphalt, glass, thickness 0.40m to 1.75m.

Weathered Bedrock was encountered in all the boreholes and comprised:
- Sandy gravelly CLAY with limestone and mudstone cobbles, thickness 1.90m to 4.30m.

Bedrock was encountered in WS01 and WS1-WS4(2017) and comprised:
- LIMESTONE.

The depths of the various materials encountered in each of the exploratory holes are summarised in Table 9 below.

Table 9 - Summary of Ground Conditions Encountered

Investigation	Hole	Depth to Stratum (m)				GROUND-WATER
		MADE GROUND		Weathered RUGBY LIMESTONE MEMBER	RUGBY LIMESTONE MEMBER	
		Clayey gravel of limestone	Gravelly/sandy clay with brick, limestone, cement, asphalt, glass, mudstone	Sandy/cobbly CLAY with some limestone cobbles	LIMESTONE	
Current Investigation	WS01	GL-0.25	0.25-2.00	2.00-3.90	3.90-4.60	Dry
	WS02	GL-0.20	0.20-0.60	0.60-5.00		Dry
	WS03	GL-0.25	0.25-0.70	0.70-5.00		Dry
	WS04	GL-0.25	0.25-1.40	1.40-4.80		Dry
2017 Investigation	WS1		GL-1.80	1.80-5.00	5.00-5.10	5.00m
	WS2		GL-1.40	1.40-5.00	5.00-5.50	5.00m
	WS3		GL-1.80	1.80-4.50	4.50-4.60	Dry
	WS4		GL-1.00	1.00-4.50	4.50-4.60	Dry

9.2 Obstructions

Underground man-made obstructions were not encountered during the investigation.

9.3 Groundwater

Groundwater was not encountered during the current investigation.

Groundwater was encountered during the previous investigation in WS1 and WS2 at a depth of 5.00mbgl.

9.4 Visual / Olfactory Evidence of Contamination

Visual/olfactory evidence of contamination was not encountered in any of the exploratory holes.

10.0 ENGINEERING PROPERTIES OF STRATA ENCOUNTERED

10.1 General

This section discusses the engineering properties of the strata encountered based on results of in situ testing and laboratory testing obtained during the investigation.

Table 10 below summarises results of laboratory testing.

Table 10 - Summary of Laboratory Geotechnical Test Results

Location	Depth (m)	Strata*	CLASSIFICATION				CHEMICAL	
			Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Water Soluble Sulphate (mg/l)	pH Value
WS01	2.20-2.40	WBc	27	67	25	42	160	8.2
WS02	1.20-1.40	WBc	27	62	23	39		
WS04	0.80-1.00	MG					69	8.3
*MG = Made Ground, WBc = Weathered Bedrock (Clay)								

10.2 Made Ground

SPT N values range from 3 to 18, as can be seen from SPT v Depth Plot (Figure 7) overleaf. These results suggest the Made Ground is loose to medium dense where granular and variably very soft to firm where cohesive.

Laboratory tests have given values of **water soluble sulphate** = 69mg/l, together with a **pH Value** = 8.3.

10.3 Weathered Bedrock (Clay)

Atterberg Limit tests have given values of **liquid limit** in the range 62% to 67% and **plastic limit** values in the range 23% to 25%, resulting in values of **plasticity index** in the range 39% to 42%. These results suggest the samples tested are clay of high plasticity as shown on the Plasticity Chart included in the Appendices. For design purposes, a value of plasticity index = 41% is recommended, based on the upper quartile value of the results.

In accordance with NHBC Chapter 4.2 Building Near Trees(2003) soils can be classified in terms of **volume change potential**, using the relationship:

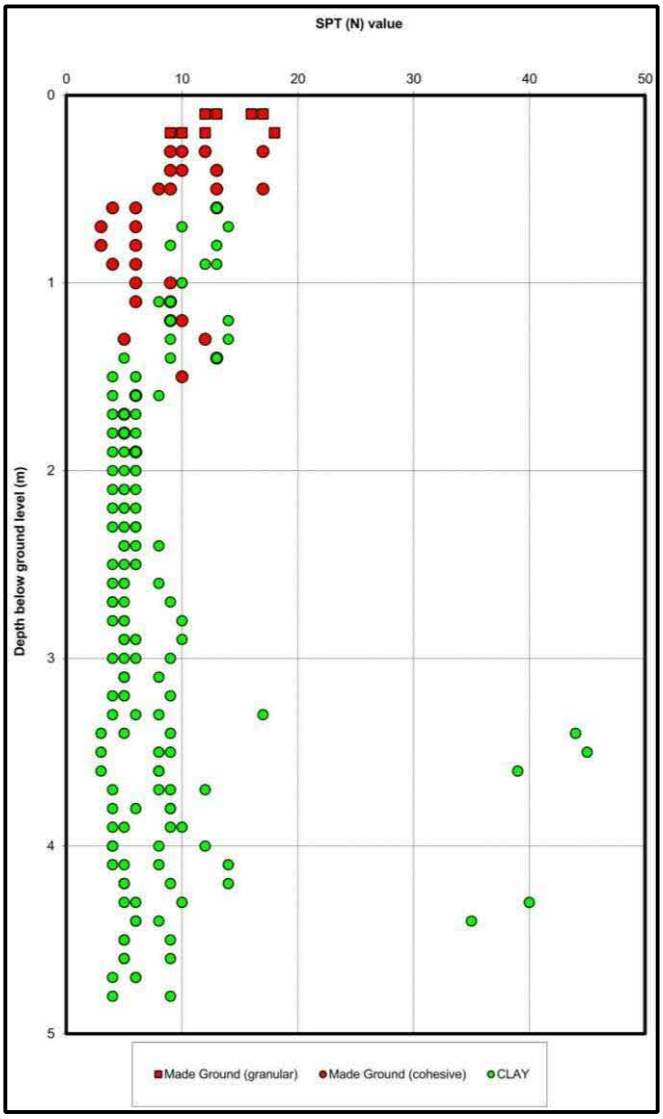
$$I_p' = I_p \times \frac{\%\ \text{less than } 425\mu m}{100\%}$$

….where I_p' = modified plasticity index, I_p = plasticity index.

Based on the laboratory test results, the above relationship and Table 1 of NHBC Chapter 4.2, the samples tested are shown to have **medium to high volume change potential**.

SPT N values range from 3 to 45, as can be seen from SPT v Depth Plot (Figure 7), with most values in the range 5-10. These results suggest the clay is generally very soft to firm, stiff in places.

Figure 7 – SPT v Depth Plot



Details of N Value results and derived design values are summarised in Table 11 below.

Table 11 - Summary of SPT Results and Design Values (Clay)

Depth	Range of N Values	Design N value*	Shear Strength**	Coefficient of Volume Compressibility**
1.0m	8-13	10	42kN/m^2	0.22 m^2/MN
1.5 m	5-13	7	29kN/m^2	0.32 m^2/MN
2.0 m	4-6	5	21kN/m^2	0.44 m^2/MN
2.5 m	4-8	6	25kN/m^2	0.37 m^2/MN
3.0m	4-10	6	25kN/m^2	0.37 m^2/MN
3.5m	3-45	15	63kN/m^2	0.15 m^2/MN
4.0m	4-14	7	29 kN/m^2	0.32 m^2/MN
4.5m	5-35	9	38 kN/m^2	0.25 m^2/MN
*based on average value of results. **based on design N Value and correlations by Stroud & Butler(1975).				

Effective stress strength parameters may also be obtained from correlations with plasticity index. For a plasticity index of 41%:

BS8002(1994), Table 2 gives $\phi'_{crit} \approx 22^o$;
Gibson(1953), gives $\phi_d = 24.1^o$.

Based on all the above, design values of $\phi' = 22^o$ and $c' = 0kN/m^2$ are recommended.

Laboratory tests have given values of **water soluble sulphate** = 160mg/l, together with a **pH Value** = 8.2.

11.0 GEOTECHNICAL ASSESSMENT

11.1 Proposed Development

It is proposed to construct a new dwelling on site with associated areas of hardstanding and soft landscaping. At the time of writing this report, anticipated structural loadings were not known.

11.2 Ground Conditions Encountered

The exploratory boreholes have encountered variable cohesive Made Ground, thickness up to 2.0m, overlying soft to firm sandy/gravelly clay. Limestone bedrock was encountered at depths of between 3.9m and 5.0mbgl. Groundwater was not encountered during the current investigation. Groundwater was encountered during the previous investigation in WS1 and WS2 at a depth of 5.00mbgl.

The desk study has indicated the site could potentially be occupied by infilled ground associated with old pits/quarries. Evidence of backfilled pits/quarries has not been encountered in any of the exploratory holes. The pits/quarries would have worked the limestone beneath the site which has been encountered at approximately 5.0mbgl, and it could be anticipated that the pits/quarried would have been deeper than this. The exploratory holes have only encountered (in places) Made Ground to a maximum of 2.0m, which is unlikely to represent infilled pits/quarries.

11.3 Foundations

The preferred foundation options will depend on the anticipated foundations loadings. A variety of foundation solutions could be suitable at this site, including conventional shallow depth strip foundations, raft foundations, piled foundations and ground improvement, subject to anticipated structural loadings and tolerance of the proposed structure to settlement. For the purposes of this report, all these foundations options are discussed in the following sections.

Where trees are present on site boundaries, or should trees be planted as part of the redevelopment, foundations could be within their influence zone. In order to avoid possible excessive settlement due to water removal by trees during dry periods or ground heave due to tree removal, the recommendations of the National House Building Council Practice Standard “Building Near Trees”, should be closely followed. In this context clays near surface should be considered as having high volume change potential.

11.3.1 *Conventional Shallow Depth Strip Foundations*

Based on the ground conditions encountered and type of proposed development it is considered conventional shallow depth (strip) foundations could be suitable on site.

Foundations should be taken down a minimum 1m depth and placed in the natural clay. If any Made Ground or particularly loose or soft material is found at foundation level, either this should be excavated and replaced with suitable granular fill, or the foundation extended to suitable strata. In this context, attention is drawn to the significant thickness of Made Ground encountered in WS01 and WS04 (1.4m-2.0m).

Table 12 below summarises anticipated allowable bearing pressures for strip foundations placed at different levels in the natural clay. The bearing capacities are calculated based on Hansen's(1978) method and assuming a factor of safety against bearing capacity failure of 3. Groundwater is assumed to be at 5.0mbgl.

Table 12 - Summary of Allowable Bearing Pressures (Strip Foundations)

Foundation Depth	Strata	Design Value (Section 10)	Foundation Type	Foundation Size	Allowable Bearing Pressure
1.0m	CLAY	$c_u = 42\,kN/m^2$	Strip	0.4m wide	$110\,kN/m^2$
				1.0m wide	$100\,kN/m^2$
1.5m	CLAY	$c_u = 29\,kN/m^2$	Strip	0.4m wide	$85\,kN/m^2$
				1.0m wide	$80\,kN/m^2$
2.0m	CLAY	$c_u = 21\,kN/m^2$	Strip	0.4m wide	$70\,kN/m^2$
				1.0m wide	$65\,kN/m^2$
2.5m	CLAY	$c_u = 25\,kN/m^2$	Strip	0.4m wide	$80\,kN/m^2$
				1.0m wide	$75\,kN/m^2$

Table 13 below summarises anticipated settlements of foundations, using design parameters based on results in Section 10. For the purposes of the calculations, the structural loading has been assumed as equal to the allowable bearing pressure in Table 12 to give a worst case scenario. Bedrock is assumed to be at 5.0mbgl.

Table 13 - Summary of Anticipated Settlements (Strip Foundations)

Foundation Depth	Strata	Foundation Type	Foundation Size	Foundation Loading	Average Settlement (mm)*
1.0m	CLAY	Strip	0.4m wide	$110\,kN/m^2$	15 -20
			1.0m wide	$100\,kN/m^2$	30 -35
1.5m	CLAY	Strip	0.4m wide	$85\,kN/m^2$	15 -20
			1.0m wide	$80\,kN/m^2$	25 -30
2.0m	CLAY	Strip	0.4m wide	$70\,kN/m^2$	10 -15
			1.0m wide	$65\,kN/m^2$	20 -25
2.5m	CLAY	Strip	0.4m wide	$80\,kN/m^2$	10 -15
			1.0m wide	$75\,kN/m^2$	15 -20

Settlements for other bearing pressures may be estimated on a pro-rata basis but bearing pressures should not exceed the allowable net bearing pressure based on ultimate bearing capacity.

Floor slabs should be designed as suspended where Made Ground is >600mm thickness or the slab is within the zone of influence of a tree. Floor slabs may be designed as ground bearing where Topsoil/Made Ground is excavated and replaced with a suitable granular fill and the slab is not located within the zone of influence of a tree.

All foundation excavations should be inspected by a suitable qualified engineer to prove that the founding strata is suitable and uniform along the length of the foundation, and capable of taking the anticipated structural loadings.

Should the above allowable bearing pressure be less than anticipated structural loadings, or the anticipated settlement too high for the proposed structure, alternative foundation options can be considered ,as discussed in the following sections.

11.3.2 *Raft Foundations*

A thickened-edge raft, suitably reinforced to act as a rigid structure, placed at shallow depth, could be considered.

For guidance a raft 10m x 5m in plan, placed at 0.6m depth could be designed to an allowable bearing pressure of the order of 50kN/m^2, at which loading average settlement across the raft could be 35-40mm.

If rafts are to be considered, additional in situ testing, such as plate bearing tests should be undertaken at proposed formation level to confirm loadings the ground can take and anticipated settlement at these loadings.

11.3.3 *Ground Improvement*

Alternatively ground treatment (e.g. vibro displacement) may be an option, subject to environmental and noise/vibration constraints.

For example, vibro stone columns are often used to solve a wide range of static, dynamic and seismic foundation problems by using powerful depth vibrators to densify soils of form stone columns that compact or reinforce soils in situ. Vibro systems can be used to treat granular deposits, fills, made ground and soft clays/silts.

Soils treated by vibro could offer an allowable bearing pressure in the range 100kN/m^2 to 200kN/m^2, depending on column spacings and ground encountered.

Once the treatment has been carried out, spread foundations may be adopted across the site, and designed to the loadings given above. Providing that any imported fill material between the tops of the columns and the underside of the floor slab is placed in a controlled manner, floor slabs may be ground bearing. Positive assurances should be sought from an experienced specialist contractor that the proprietary system proposed is capable of providing the required working loads in the ground conditions encountered, with a guarantee on maximum settlement for both footings and floor slabs.

11.3.4 *Piled Foundations*

The proposed structure could be founded on piles taken down into the limestone bedrock, encountered at a depth of greater than 5.0m below existing ground level.

A variety of pile types may be used, including bored, continuous flight auger (CFA) piles and screw piles. Driven piles may be suitable, subject to environmental and noise/vibration constraints.

Because of the various advantages and limitations of each pile type, and the cost implications, advice should be sought from specialist piling contractors to determine the most suitable and cost-effective type. They should also be able to give recommended pile diameters and depths and likely pile capacities, with guaranteed performance. It is recommended a pile test be carried out to confirm pile capacities. In assessing the pile capacities, contractors should make an allowance for the effects of negative skin friction, particularly in the made ground and soft clays.

It is essential the advice of a specialist piling contractor is sought and that positive assurances are provided by the piling contractor that their proprietary system is capable of providing the required working loads in the ground conditions encountered.

11.4 Pavement Design

Based on the types of near surface strata encountered, it is recommended for preliminary design purposes a CBR value = 2% is adopted.

Consideration should be given to the potential differing ground conditions near surface, which could cause pavements to be partly constructed on clay or variable made ground. In this context a flexible pavement design may be required.

Consideration should also be given to the use of geotextiles to allow reduction of capping thickness. For example, biaxial geogrids are often used to reduce capping thickness. The advice of a suitable contractor should be sought as to the most appropriate type of geotextile to use in the ground conditions encountered at this site.

It should be noted the type of construction will depend on proposed finished pavement levels across the site and it is recommended the pavement design is reviewed once these levels are known. In this context, it is essential further in situ CBR testing is carried out once formation levels are known to confirm design CBR values.

All formation excavations should be examined by a suitably experienced engineer or inspector to check for soft or unsuitable material, which should be removed and replaced with compacted granular fill. Also, to ensure good compaction and remove unevenness, the formation should be compacted with equipment suitable for use in the ground conditions encountered. Careful inspection of this work will also help identify any soft spots at or just below formation level.

11.5 Chemical Attack on Buried Concrete

Chemical tests (see Appendices) show low levels of water soluble sulphates and near neutral/slightly alkaline conditions. Based on these conditions, it is recommended that for foundations the Design Sulphate Class for the site, as defined in BRE Special Digest 1[(2005)], be taken as DS-1, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-1s. The recommendations of BRE Special Digest 1 should be followed for concrete foundations and ground bearing floor slabs.

11.6 Suitability of Excavated Materials

Acceptability criteria and testing, and methods of compaction/placement will depend on the type of contract and specification used for the construction of the proposed development and it is recommended that earthworks specifications are reviewed by a suitably qualified engineer, once these have been prepared by the relevant parties.

The cohesive Made Ground and near surface soft clays are unlikely to be suitable for re-use as fill, and should be used for landscaping purposes, providing they are not contaminated.

Granular Made Ground could be suitable for re-use as structural fill, providing it is not contaminated and does not contain excessive amounts of clay and providing moisture contents are controlled during placement. The control of moisture contents will be important as the cohesive content of this stratum is likely to be sensitive to moisture content changes.

11.7 Temporary Works

Formations are likely to be susceptible to damage both by weather and trafficking, and should be protected immediately on exposure, particularly in areas where construction plant will access the site.

Excavations in Made Ground and near surface soft soils are likely to be unstable and should be battered back to an angle of 1 in 2, or a system of close sheeting and shoring adopted to ensure stability, and in particular where personnel are required to enter excavations.

All excavations should be adequately supported where personnel are required to enter.

Groundwater seepages could be encountered near surface within excavations, particularly during the wetter months of the year. If required intermittent pumping of excavations from a suitable located sump should be adequate at this site to keep excavations dry.

All materials on site should be capable of being excavated using conventional excavating

12.0 SOIL CONTAMINATION RISK ASSESSMENT

12.1 General

The following sections provide a Human Health Soil Assessment for groundworkers during development and future site users.

For the purposes of this report, the relevant results from tests undertaken during the previous investigation within the site boundary (i.e. WS1 and WS2) will also be considered.

12.2 Tier I Human Health Soil Risk Assessment – Groundworkers During Development

To assess the risk of soil contamination to construction and ground workers during development, guidelines from the HSE Document 'Protection of workers and the general public during development of contaminated land'(1991) are used. The document assesses soil contamination test results and classifies the site as being uncontaminated or contaminated with varying degrees of contamination from 'slight' to 'unusually heavy'.

The guideline values and laboratory test results are summarised in the following table:

Table 14 - Summary of Guideline Values for Protection of Workers and the General Public During Development of Contaminated Land

Contaminant	Typical Values* for:					Test Results	Class
	Uncontaminated Soils	Slight Contamination	Contaminated	Heavy Contamination	Unusually Heavy Contamination		
	Class A	Class B	Class C	Class D	Class E		
pH (alkaline)	7 - 8	8 - 9	9 - 10	10 - 12	12	7.7 -8.1	A-B
Arsenic	0 - 30	30 - 50	50 - 100	100 - 500	500	1.3 -30	A
Cadmium	0 - 1	1 - 3	3 - 10	10 - 50	50	0.3 -4.5	A-C
Chromium	0 - 100	100 - 200	200 - 500	500 - 2500	2500	17 -76	A
Copper	0 - 100	100 - 200	200 - 500	500 - 2500	2500	27 -177	A-B
Lead	0 - 500	500 - 1000	1000 - 2000	2000 – 1%	1.0%	17 -457	A
Mercury	0 - 1	1 - 3	3 - 10	10 - 50	50	<1 -3.2	A-C
Nickel	0 - 20	20 - 50	50 - 200	200 - 1000	1000	10-33	A-B
Zinc	0 - 250	250 - 500	500 - 1000	1000 - 5000	5000	61 -361	A-B
Boron	0 - 2	2 - 5	5 - 50	50 - 250	250	0.8 -2.2	A-B
Selenium	0 - 1	1 - 3	3 - 10	10 - 50	50	<2 -12.1	A-D
Barium	0-500	500 -1000	1000 -2000	2000 -1.0%	1.0%	93 -637	A-B
Beryllium	0 - 5	5 - 10	10 - 20	20 - 50	50	0.8 -1.4	A
Vanadium	0 - 100	100 - 200	200 - 500	500 - 2500	2500	16 -31	A
Sulphate	0 - 2000	2000 - 5000	5000 – 1%	1% - 5%	5.05%	979 - 2236	A-B
Sulphide	0 - 10	10 - 20	20 - 100	100 - 500	500	<5	A
Cyanide (free)	0 - 1	1 - 5	5 - 50	50 - 100	100	<1	A
Coal Tar	0-500	500 -1000	1000 -2000	2000 -1.0%	1.0%	<42 -57	A
Phenol	0 - 2	2 - 5	5 - 50	50 - 250	250	<2	A

Based on the above results there is a low to moderate potential risk from soil contamination to construction workers, ground workers and members of the public, and appropriate measures, such as PPE, site health plans, appropriate disposal of material arisings will be required to mitigate this risk.

12.3 Tier I Human Health Soil Risk Assessment – Future Site Users

As part of the contamination assessment, the chemical results obtained by EEGSL have been screened against accepted compliance criteria, namely:

Defra C4SL Health Criteria Values(March 2014), where available; and
Tier 1 assessment values - based on LQM/CIEH Suitable 4 Use Levels(2015) (S4ULs).

As a preliminary screening assessment, all results have been compared to residential end use criteria.

The comparison of results is summarised in Tables 15, 16 and 17 below.

Table 15 - Soil Results Comparison with C4SL/S4UL Levels (Metals)

Determinand	C4SL/S4UL Levels (mg/kg)*		WS01 (2023) 0.40-0.60m	WS02 (2023) 0.80-1.00m	WS03 (2023) 0.30-0.40m	WS04 (2023) 0.60-0.80m	WS1 (2017) 0.30m	WS2 (2017) 0.40m
	Residential with homegrown produce	**Residential** without homegrown produce						
Arsenic	37	40	27	8	20	30	4.1	1.3
Beryllium	1.7	1.7	1.1	0.8	1.0	1.4	-	-
Boron	290	11000	1.9	1.2	1.2	2.2	0.9	0.8
Cadmium	26	149	1.8	0.3	1.1	1.7	3.5	4.5
Chromium	910	910	20	17	17	22	76	55
Chromium VI	21	21	<2	<2	<2	<2	-	-
Copper	2400	7100	66	27	61	82	177	65
Lead	200	310	457	20	309	248	17	36
Mercury	1.2	1.2	<1	<1	<1	<1	3.2	1.2
Nickel	180	180	20	27	17	33	10	20
Selenium	250	430	<2	<2	<2	<2	5.1	12.1
Vanadium	410	1200	31	16	26	31	-	-
Zinc	3700	4000	325	61	361	276	69	73
Exceedences are shown in red								

Table 16 - Soil Results Comparison with C4SL/S4UL Levels (Petroleum Hydrocarbons)

Determinand		C4SL/S4UL Levels (mg/kg)*						WS01 (2023) 0.40-0.60m	WS02 (2023) 0.80-1.00m	WS03 (2023) 0.30-0.40m	WS04 (2023) 0.60-0.80m	WS1 (2017) 0.30m	WS2 (2017) 0.40m
		Residential with homegrown produce			Residential without homegrown produce								
SOM (%)		1.0	2.5	6.0	1.0	2.5	6.0	10.9	2.6	6	13.7	-	-
Benzene		0.87	17	0.37	3.3	0.70	1.4	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01
Toluene		130	290	660	880	1900	3900	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Ethylbenzene		47	110	260	83	190	440	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01
o-xylenes		60	140	330	88	210	480	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01
m-xylenes		59	140	320	82	190	450	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01
p-xylenes		56	130	310	79	180	430	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01
Aliphatic (EC)	5-6	42	78	160	42	78	160	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	>6-8	100	230	530	100	230	530	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
	>8-10	27	65	150	27	65	150	<2	<2	<2	<2	<1	<1
	>10-12	130	330	760	130	330	770	<2	<2	<2	<2	<1	<1
	>12-16	1100	24000	4300	1100	24000	4400	<3	<3	<3	<3	<1	<1
	>16-35	65000	92000	110000	65000	92000	110000	<10	<10	<10	<10	1.5	<1
Aromatic (EC)	5-7	70	78	300	370	690	1400	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	>7-8	130	230	660	860	1800	3900	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
	>8-10	34	65	190	47	110	270	<2	<2	<2	<2	<1	<1
	>10-12	74	330	380	250	590	1200	<2	<2	<2	<2	<1	<1
	>12-16	140	24000	660	1800	2300	2500	<2	<2	<2	<2	<1	<1
	>16-21	280	92000	930	1900	1900	1900	25	<3	<3	<3	<1	<1
	>21-35	1100	92000	1700	1900	1900	1900	33	<10	<10	<10	4.8	6.5

Exceedences are shown in red

Table 17 - Soil Results Comparison with C4SL/S4UL Levels (Polycyclic Aromatic Hydrocarbons & Phenols)

Determinand	C4SL/S4UL Levels (mg/kg)*						WS01 (2023) 0.40-0.60m	WS02 (2023) 0.80-1.00m	WS03 (2023) 0.30-0.40m	WS04 (2023) 0.60-0.80m	WS1 (2017) 0.30m	WS2 (2017) 0.40m
	Residential with homegrown produce			Residential without homegrown produce								
Polycyclic Aromatic Hydrocarbons												
SOM (%)	1.0	2.5	6.0	1.0	2.5	6.0	10.9	2.6	6	13.7	-	-
Naphthalene	2.3	5.6	13	2.3	5.6	13	0.31	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	170	420	920	2900	4600	6000	0.15	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	210	510	1100	3000	4700	6000	0.20	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	170	400	860	2800	3800	4500	0.18	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	95	220	440	1300	1500	1500	3.23	<0.1	<0.1	<0.1	0.3	0.8
Anthracene	2400	5400	11000	31000	35000	37000	0.81	<0.1	<0.1	<0.1	<0.1	0.1
Fluoranthene	280	560	890	1500	1600	1600	8.93	0.16	1.08	0.36	0.7	1.5
Pyrene	620	1200	2000	3700	3800	3800	7.85	0.15	1.00	0.33	0.6	1.6
Benz(a)anthracene	7.2	11	13	11	14	15	4.46	<0.1	0.54	0.15	0.7	1.2
Chrysene	15	22	27	30	31	32	3.67	<0.1	0.57	0.18	0.8	0.5
Benzo(a)pyrene	5.0	2.7	3.0	5.3	3.2	3.2	4.42	<0.1	0.57	0.17	0.5	0.9
Benzo(b)fluoranthene	2.6	3.3	3.7	3.9	4.0	4.0	4.72	<0.1	0.61	0.20	0.9	1.0
Benzo(k)fluoranthene	77	93	100	110	110	110	1.59	<0.1	0.25	<0.1	0.6	1.0
Indeno(1,2,3-cd)pyrene	27	36	41	45	46	46	2.04	<0.1	0.31	<0.1	0.9	0.9
Dibenz(a,h)anthracene	0.24	0.28	0.3	0.31	0.31	0.32	0.39	<0.1	<0.1	<0.1	0.2	0.3
Benzo(ghi)perylene	320	340	350	360	360	360	1.74	<0.1	0.27	<0.1	0.8	0.9
Phenols												
Phenol	280	550	1100	750	1300	2300	<2	<2	<2	<2	<5	<5

Exceedences are shown in red

From Tables 15, 16 and 17 it can be some of the samples have elevated levels n contaminants. These elevated contaminants are summarised in Table 18 below.

Table 18 – Summary of Elevated Levels of Contamination

Location	Depth	Strata	Elevated contaminants in excess of:	
			Residential end use with homegrown produce	Residential end use without homegrown produce
WS01(2023)	0.40 -0.60 m	Made Ground	Lead , ,PAH	Lead , PAH
WS02(2023)	0.80 -1.00m	Natural Clay	-	-
WS03(2023)	0.30 -0.40m	Made Ground	Lead	-
WS04(2023)	0.60 -0.80m	Made Ground	Lead	-
WS1(2017)	0.30m	Made Ground	Mercury	Mercury
WS2(2017)	0.40m	Made Ground	Mercury	Mercury

Asbestos has not been encountered in any of the samples tested.

12.4 Soil Waste Assessment

Environment Agency Technical Guidance WM3.1: Hazardous Waste; "Guidance on the classification and assessment of waste", May 2018, published by Environment Agency of England and Wales, SEPA, NIEA and Natural Resources Wales has been used to characterise soil materials.

HazWasteOnline™ a cloud-based software application for the management, analysis and reporting of hazardous waste materials has been used to make this assessment.

The Hazardous Waste Assessment (included in Appendix 5) confirms that the samples tested can be classified as **Non-Hazardous**.

13.0 PROTECTION OF BURIED WATER PIPES

The potential risk to new buried water pipes associated with ground contamination has been assessed using the Water Regulations Advisory Scheme (WRAS) Guidance Note No. 9-04-03(2002) and Water UK *'Contaminated Land Assessment Guidance'* (January 2014). The results of contamination testing compared to WRAS Guidance Values are summarised in the following table:

Table 19 – Soil Results Comparison with WRAS Guidance Levels

Contaminant	Threshold Level (mg/kg)	WS01 (2023) 0.40-0.60m	WS02 (2023) 0.80-1.00m	WS03 (2023) 0.30-0.40m	WS04 (2023) 0.60-0.80m	WS1 (2017) 0.30m	WS2 (2017) 0.40m	No. of Exceedances
Corrosion								
Sulphate	2000	1814	979	1018	2236	-	-	0
Sulphide	250	<5	<5	<5	<5	-	-	0
pH	5 ≤ pH ≤ 8	8.1	7.9	8.0	7.7	7.9	8.1	3
Toxicity								
Arsenic	10	27	8	20	30	4.1	1.3	3
Cadmium	3	1.8	0.3	1.1	1.7	3.5	4.5	2
Chromium (hexavalent)	25	<2	<2	<2	<2	<0.8	<0.8	0
Chromium (total)	600	20	17	17	22	76	65	0
Cyanide (free)	25	<1	<1	<1	<1	<1	<1	0
Cyanide (complex)	250	<1	<1	<1	<1	-	-	0
Lead	500	457	20	309	248	17	36	0
Mercury	1	<1	<1	<1	<1	3.2	1.2	2
Selenium	3	<2	<2	<2	<2	5.1	12.1	2
Organic contaminants								
BTEX & MTBE	0.1	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	0
EC5-EC10 ali + aro hydrocarbons	2	<2	<2	<2	<2	<1	<1	0
EC10-EC16 ali + aro hydrocarbons	10	<3	<3	<3	<3	<1	<1	0
EC16-EC40 ali + aro hydrocarbons	500	58	<10	<10	<10	4.8	6.5	0
Phenols	2	<2	<2	<2	<2	<5	<5	0
Polycyclic Aromatic Hydrocarbons (PAH)	50	44.7	<1.6	5.6	<1.6	8.3	5.4	0

Notes:
(1) For copper pipes, corrosive if pH<5 or >8.

From the above table, it can be seen there are some elevated contaminant levels suggesting special requirements could be need for new water pipes.

14.0 REVIEW OF PRELIMINARY CONTAMINATION RISK ASSESSMENT

The Following table provides a review of the Preliminary Conceptual Model/Contamination Risk Assessment included in Section 7.0, based on the findings of the Phase II investigation, and laboratory testing.

Table 20 - Revised Conceptual Model

Source	Pathway	Receptor	Risk
Contamination of the ground beneath site due to current and historical use	Dermal contact, ingestion and inhalation of soils dust	Current Site Users	VERY LOW
		Future Site users	Hard Cover Development : VERY LOW Soft Landscaping: HIGH
		Construction Workers	LOW TO MODERATE
	Vertical or lateral migration of contamination (including ground gas) on and off site.	Current Site Users	VERY LOW
		Adjacent land users	LOW
		Future land users	LOW
		Controlled Waters	VERY LOW
		Construction Workers	LOW

15.0 GROUND CONTAMINATION CONCLUSIONS AND RECOMMENDATIONS

15.1 Soil Contamination

Based on available soil contamination test results there is a low to moderate potential risk from soil contamination to construction workers and ground workers during development and appropriate measures such as PPE, site health plans, appropriate disposal of material arisings will be required to mitigate this risk. The groundworks contractor must provide a soil management plan including methods of dealing with soil contamination encountered during groundworks.

As discussed in the above sections, elevated levels of lead, mercury and PAH have been encountered within the Made Ground near surface, above the recommended guideline values for residential end use with and without home grown produce.

Areas of proposed hardcover development will not require any remediation as these areas effectively seal contamination beneath and break any potential source-pathway-pollutant linkage.

The elevated contamination encountered is located within the Made Ground near surface. Areas of proposed soft landscaping will require remediation. This can be carried out by either removing the Made Ground from these areas, capping the Made Ground with a minimum 600mm of clean imported material, or a combination of both, depending on finished site levels.

The presence of higher levels of contamination on areas of the site not covered by the current exploratory holes should not be discounted and additional spot checks would be prudent, particularly during groundworks and in areas of proposed soft landscaping. This testing can be carried out as part of the Soil Management Plan for the site.

15.2 Soil Disposal

Soils should be disposed of at a suitable site, registered to take the levels of contamination encountered. All samples tested have been classified as Non-Hazardous in accordance with Environment Agency guidance WM3.1.

15.3 Asbestos

Asbestos has not been encountered in any of the samples tested. It is therefore considered the risk of asbestos being in the ground is low.

15.4 Land Gas

Another potential source of contamination is land gas. Land gas is largely generated by the decomposition of organic matter, both in natural soils such as peat, and manmade materials such as landfill or other fill materials. The gases that are normally associated with these materials, which can pose a risk to health, include methane (which is toxic and potentially explosive) and carbon dioxide (which is toxic). Oxygen depletion is also a consequence of the generation of these other gases. Based the ground conditions encountered it is considered the risk posed by land gas is low and land gas protection measures will not be required for new buildings.

Based on information included in the Groundsure report, basic protection against the ingress of radon gas into the new building is required. Appropriate construction techniques are detailed in the BRE document *Radon: guidance on protective measures for new dwellings*.

15.4 Risk to Groundwater and Surface Waters

Based on the ground and groundwater conditions encountered and results of laboratory testing it is considered the risk from contamination to groundwater and surface waters is low.

15.5 Risk to Buried (Water) Services

Based on the results of laboratory testing it is considered standard materials are unlikely to be appropriate for new water pipes. The advice of the water supply company should be sought.

15.6 Site Personnel & Other Matters

As with all construction sites, personnel working on the site during the construction period should be encouraged to maintain a high standard of personal hygiene and on-site washing facilities should be available.

Due diligence is required during the construction period, and should any further evidence of contamination be found, appropriate investigation and / or action should be taken. The significance of any contamination not discovered by this investigation is outside the scope of this report.

APPENDIX 1

GROUNDSURE REPORT

Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

WINFORD GROVE, BEDMINSTER DOWN, BRISTOL, BS13 7DY

Order Details

Date: 13/11/2023

Your ref: B3305

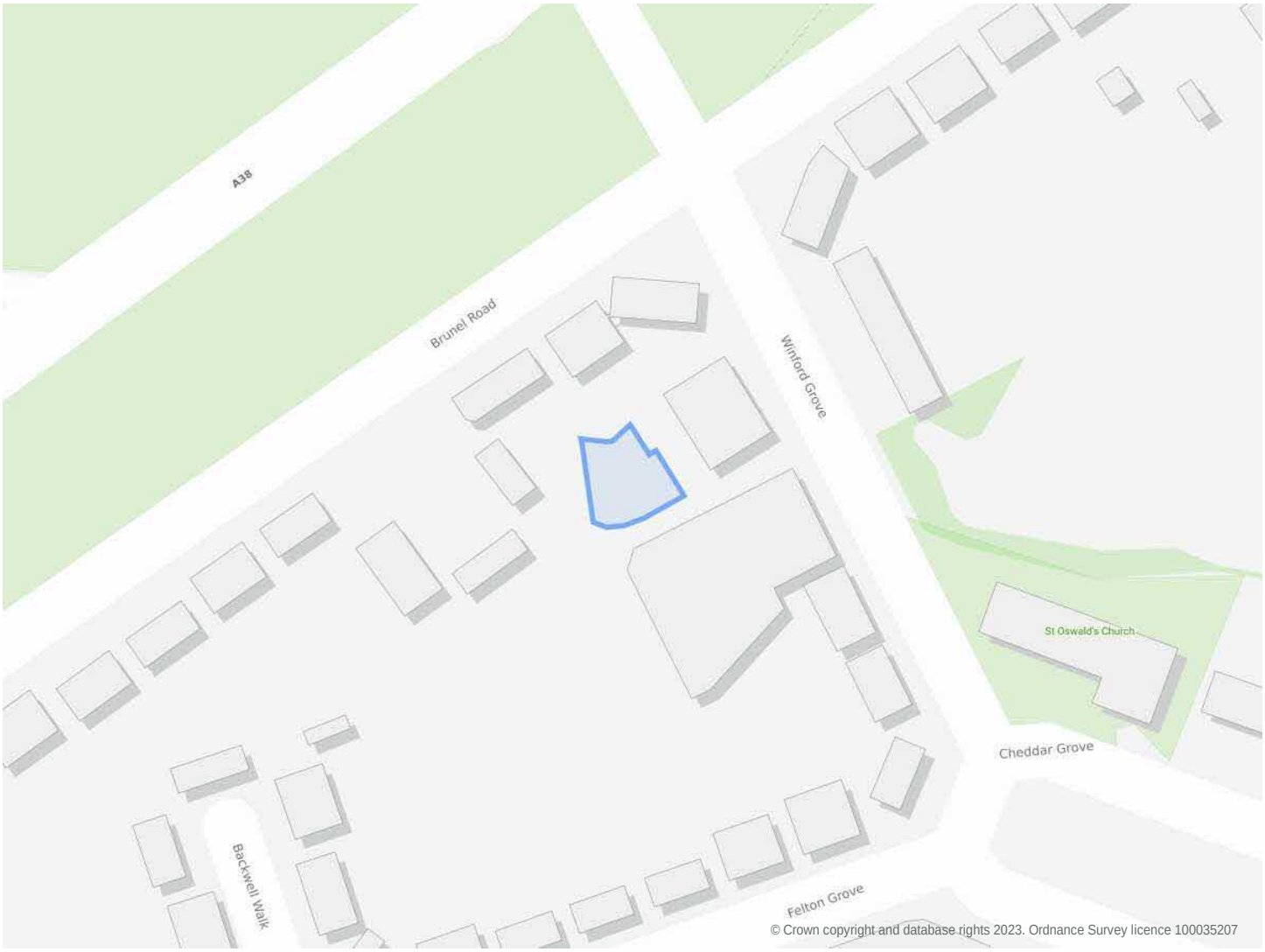
Our Ref: GS-9C5-1U7-M 32-933

Site Details

Location: 357054 169737

Area: 0.03 ha

Authority: Bristol City Council ↗



Contact us with any questions at:
info@groundsure.com ↗
01273 257 755

Certified B Corporation

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	4	10	43	36	-
19 >	1.2 >	Historical tanks >	0	0	1	4	-
20 >	1.3 >	Historical energy features >	0	2	2	6	-
20	1.4	Historical petrol stations	0	0	0	0	-
21 >	1.5 >	Historical garages >	0	0	0	3	-
21	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
22 >	2.1 >	Historical industrial land uses >	6	13	57	45	-
27 >	2.2 >	Historical tanks >	0	0	1	15	-
28 >	2.3 >	Historical energy features >	0	3	4	14	-
29	2.4	Historical petrol stations	0	0	0	0	-
29 >	2.5 >	Historical garages >	0	0	0	4	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
30	3.1	Active or recent landfill	0	0	0	0	-
30 >	3.2 >	Historical landfill (BGS records) >	0	0	0	1	-
31 >	3.3 >	Historical landfill (LA/mapping records) >	0	0	0	3	-
31 >	3.4 >	Historical landfill (EA/NRW records) >	0	0	1	1	-
32 >	3.5 >	Historical waste sites >	0	0	0	1	-
32	3.6	Licensed waste sites	0	0	0	0	-
32 >	3.7 >	Waste exemptions >	0	0	0	32	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
36 >	4.1 >	Recent industrial land uses >	0	1	1	-	-
37 >	4.2 >	Current or recent petrol stations >	0	0	0	1	-
37	4.3	Electricity cables	0	0	0	0	-
37	4.4	Gas pipelines	0	0	0	0	-
37	4.5	Sites determined as Contaminated Land	0	0	0	0	-

37	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
38	4.7	Regulated explosive sites	0	0	0	0	-
38	4.8	Hazardous substance storage/usage	0	0	0	0	-
38	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
38	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
38 >	4.11 >	Licensed pollutant release (Part A(2)/B) >	0	0	0	1	-
39 >	4.12 >	Radioactive Substance Authorisations >	0	0	0	1	-
39 >	4.13 >	Licensed Discharges to controlled waters >	0	0	0	1	-
40	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
40	4.15	Pollutant release to public sewer	0	0	0	0	-
40	4.16	List 1 Dangerous Substances	0	0	0	0	-
40	4.17	List 2 Dangerous Substances	0	0	0	0	-
40 >	4.18 >	Pollution Incidents (EA/NRW) >	0	0	0	1	-
41	4.19	Pollution inventory substances	0	0	0	0	-
41	4.20	Pollution inventory waste transfers	0	0	0	0	-
41	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
42	5.1	Superficial aquifer	None (within 500m)				
43 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
45 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
46 >	5.4 >	Groundwater vulnerability- soluble rock risk >	Identified (within 0m)				
46	5.5	Groundwater vulnerability- local information	None (within 0m)				
47	5.6	Groundwater abstractions	0	0	0	0	0
47	5.7	Surface water abstractions	0	0	0	0	0
47	5.8	Potable abstractions	0	0	0	0	0
47	5.9	Source Protection Zones	0	0	0	0	-
48	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
49	6.1	Water Network (OS MasterMap)	0	0	0	-	-

49	6.2	Surface water features	0	0	0	-	-
50 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
50 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
51	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
52	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
52	7.2	Historical Flood Events	0	0	0	-	-
52	7.3	Flood Defences	0	0	0	-	-
53	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
53	7.5	Flood Storage Areas	0	0	0	-	-
54	7.6	Flood Zone 2	None (within 50m)				
54	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
55 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
57 >	9.1 >	Groundwater flooding >	Negligible (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
58	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	0
59	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
59	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
59	10.4	Special Protection Areas (SPA)	0	0	0	0	0
59	10.5	National Nature Reserves (NNR)	0	0	0	0	0
60 >	10.6 >	Local Nature Reserves (LNR) >	0	0	0	1	1
60 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	1
60	10.8	Biosphere Reserves	0	0	0	0	0
61	10.9	Forest Parks	0	0	0	0	0
61	10.10	Marine Conservation Zones	0	0	0	0	0
61 >	10.11 >	Green Belt >	0	0	1	0	8
62	10.12	Proposed Ramsar sites	0	0	0	0	0

62	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
62	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
62	10.15	Nitrate Sensitive Areas	0	0	0	0	0
63	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
64 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
65	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
66	11.1	World Heritage Sites	0	0	0	-	-
67	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
67	11.3	National Parks	0	0	0	-	-
67 >	11.4 >	Listed Buildings >	0	0	1	-	-
68	11.5	Conservation Areas	0	0	0	-	-
68	11.6	Scheduled Ancient Monuments	0	0	0	-	-
68	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
69 >	12.1 >	Agricultural Land Classification >	Urban (within 250m)				
70 >	12.2 >	Open Access Land >	0	2	0	-	-
70	12.3	Tree Felling Licences	0	0	0	-	-
70	12.4	Environmental Stewardship Schemes	0	0	0	-	-
70	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
71	13.1	Priority Habitat Inventory	0	0	0	-	-
71	13.2	Habitat Networks	0	0	0	-	-
71	13.3	Open Mosaic Habitat	0	0	0	-	-
71	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
72 >	14.1 >	10k Availability >	Identified (within 500m)				
73 >	14.2 >	Artificial and made ground (10k) >	1	0	4	5	-
75	14.3	Superficial geology (10k)	0	0	0	0	-

75 >	14.4 >	Landslip (10k) >	0	0	1	2	-
77 >	14.5 >	Bedrock geology (10k) >	1	0	4	12	-
78 >	14.6 >	Bedrock faults and other linear features (10k) >	0	0	0	3	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
79 >	15.1 >	50k Availability >	Identified (within 500m)				
80 >	15.2 >	Artificial and made ground (50k) >	1	0	4	3	-
81 >	15.3 >	Artificial ground permeability (50k) >	1	0	-	-	-
82	15.4	Superficial geology (50k)	0	0	0	0	-
82	15.5	Superficial permeability (50k)	None (within 50m)				
83 >	15.6 >	Landslip (50k) >	0	0	1	1	-
83	15.7	Landslip permeability (50k)	None (within 50m)				
84 >	15.8 >	Bedrock geology (50k) >	1	0	4	2	-
85 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
85 >	15.10 >	Bedrock faults and other linear features (50k) >	0	0	0	3	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
86	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence >					
87 >	17.1 >	Shrink swell clays >	Negligible (within 50m)				
88 >	17.2 >	Running sands >	Very low (within 50m)				
90 >	17.3 >	Compressible deposits >	Moderate (within 50m)				
92 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
93 >	17.5 >	Landslides >	Very low (within 50m)				
94 >	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
96 >	18.1 >	BritPits >	0	1	3	1	-
97 >	18.2 >	Surface ground workings >	4	13	52	-	-
100 >	18.3 >	Underground workings >	0	0	0	6	2
101	18.4	Underground mining extents	0	0	0	0	-
101	18.5	Historical Mineral Planning Areas	0	0	0	0	-

101 >	18.6 >	Non-coal mining >	0	0	0	0	2
102	18.7	JPB mining areas	None (within 0m)				
102	18.8	The Coal Authority non-coal mining	0	0	0	0	-
102	18.9	Researched mining	0	0	0	0	-
103	18.10	Mining record office plans	0	0	0	0	-
103	18.11	BGS mine plans	0	0	0	0	-
103 >	18.12 >	Coal mining >	Identified (within 0m)				
103	18.13	Brine areas	None (within 0m)				
104	18.14	Gypsum areas	None (within 0m)				
104	18.15	Tin mining	None (within 0m)				
104	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
105	19.1	Natural cavities	0	0	0	0	-
105	19.2	Mining cavities	0	0	0	0	0
105	19.3	Reported recent incidents	0	0	0	0	-
105	19.4	Historical incidents	0	0	0	0	-
106	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
107 >	20.1 >	Radon >	Between 3% and 5% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
109 >	21.1 >	BGS Estimated Background Soil Chemistry >	1	2	-	-	-
109	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
109	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
110	22.1	Underground railways (London)	0	0	0	-	-
110	22.2	Underground railways (Non-London)	0	0	0	-	-
111	22.3	Railway tunnels	0	0	0	-	-
111 >	22.4 >	Historical railway and tunnel features >	3	0	0	-	-
111	22.5	Royal Mail tunnels	0	0	0	-	-

111	22.6	Historical railways	0	0	0	-	-
112	22.7	Railways	0	0	0	-	-
112	22.8	Crossrail 1	0	0	0	0	-
112	22.9	Crossrail 2	0	0	0	0	-
112	22.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 06/05/2020

Site Area: 0.03ha

Recent site history - 2017 aerial photograph

Capture Date: 14/06/2017

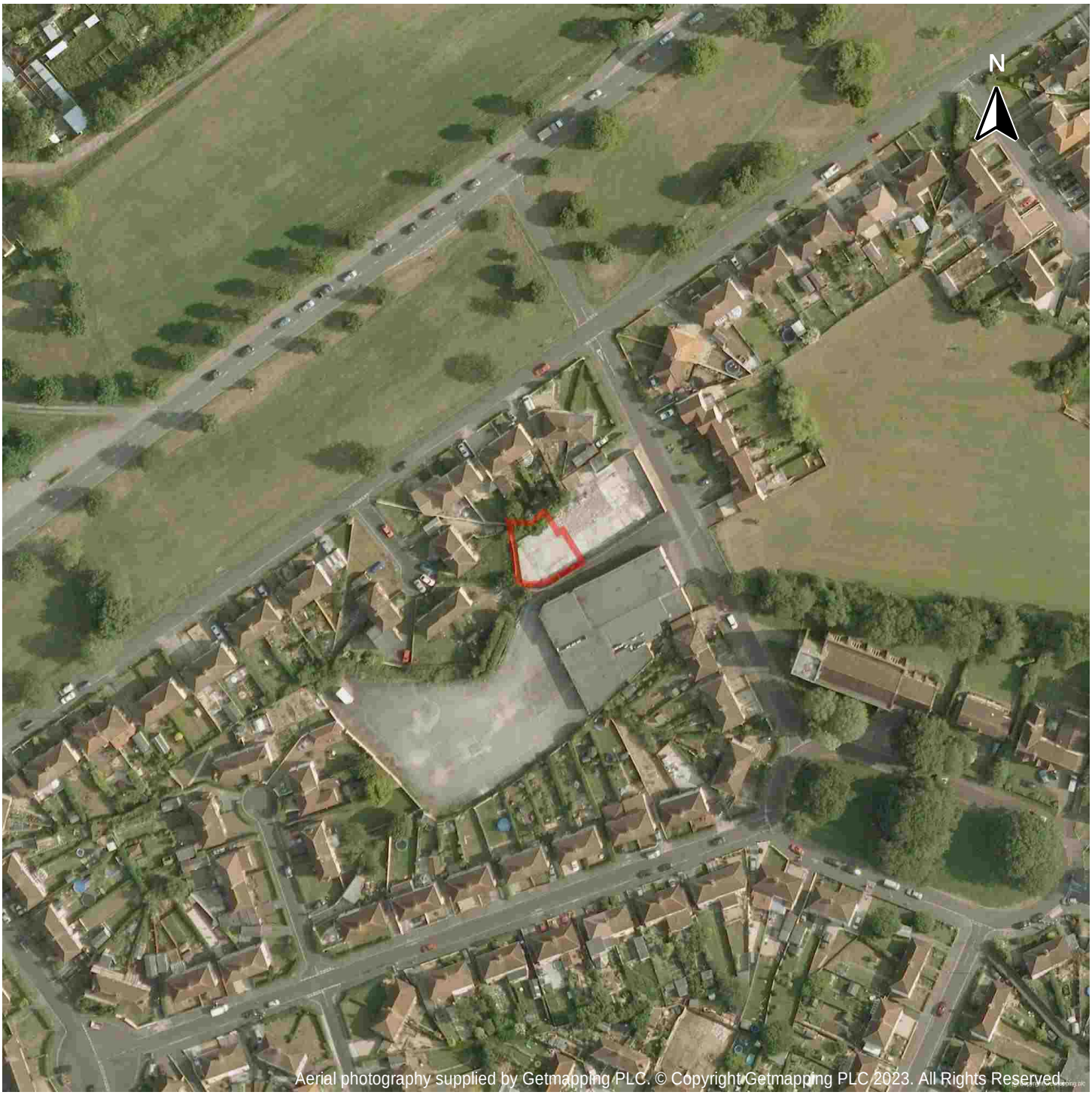
Site Area: 0.03ha

Recent site history - 2014 aerial photograph

Capture Date: 09/09/2014

Site Area: 0.03ha

Recent site history - 2006 aerial photograph



Capture Date: 08/06/2006

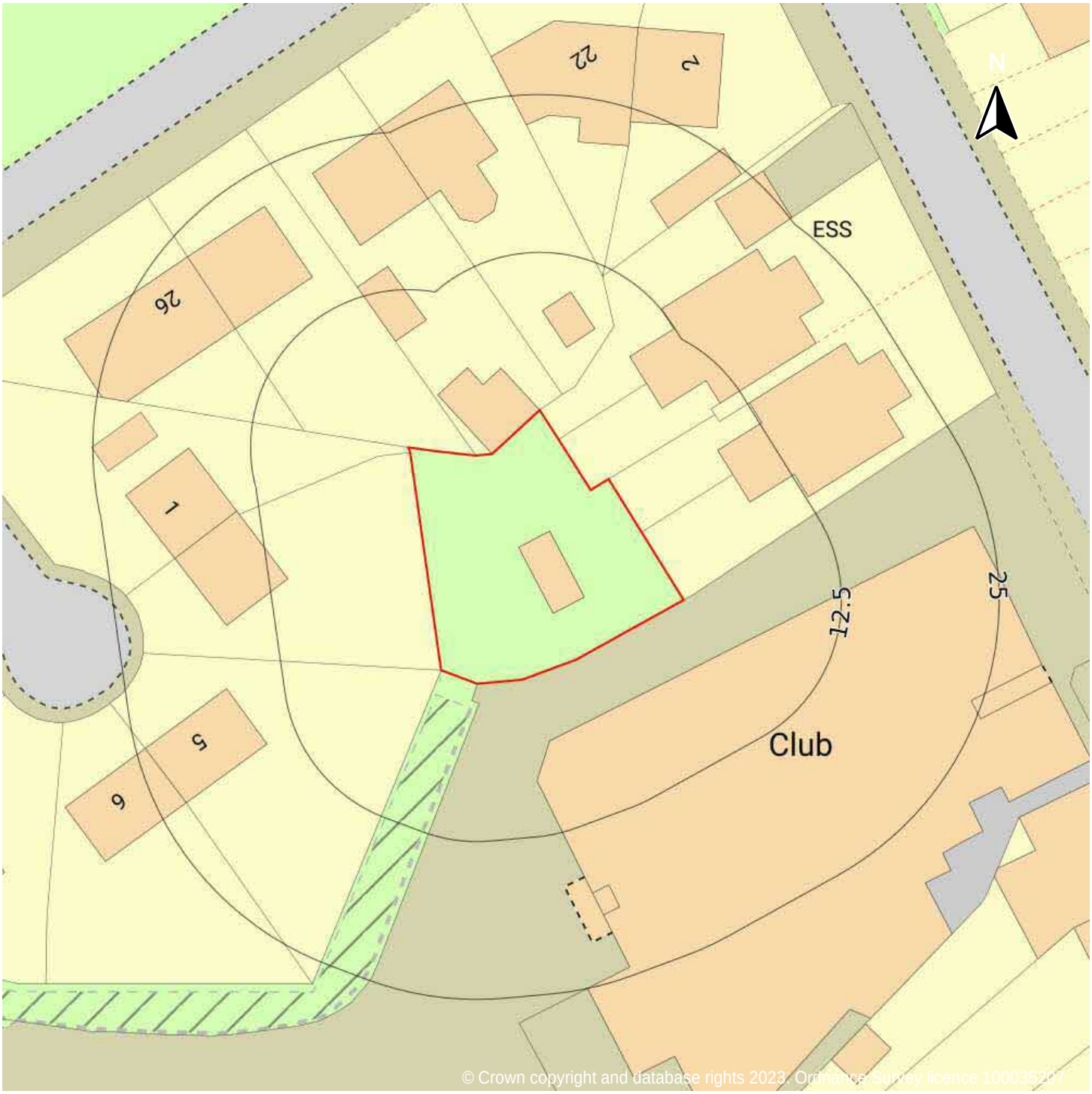
Site Area: 0.03ha

Recent site history - 1999 aerial photograph

Capture Date: 24/07/1999

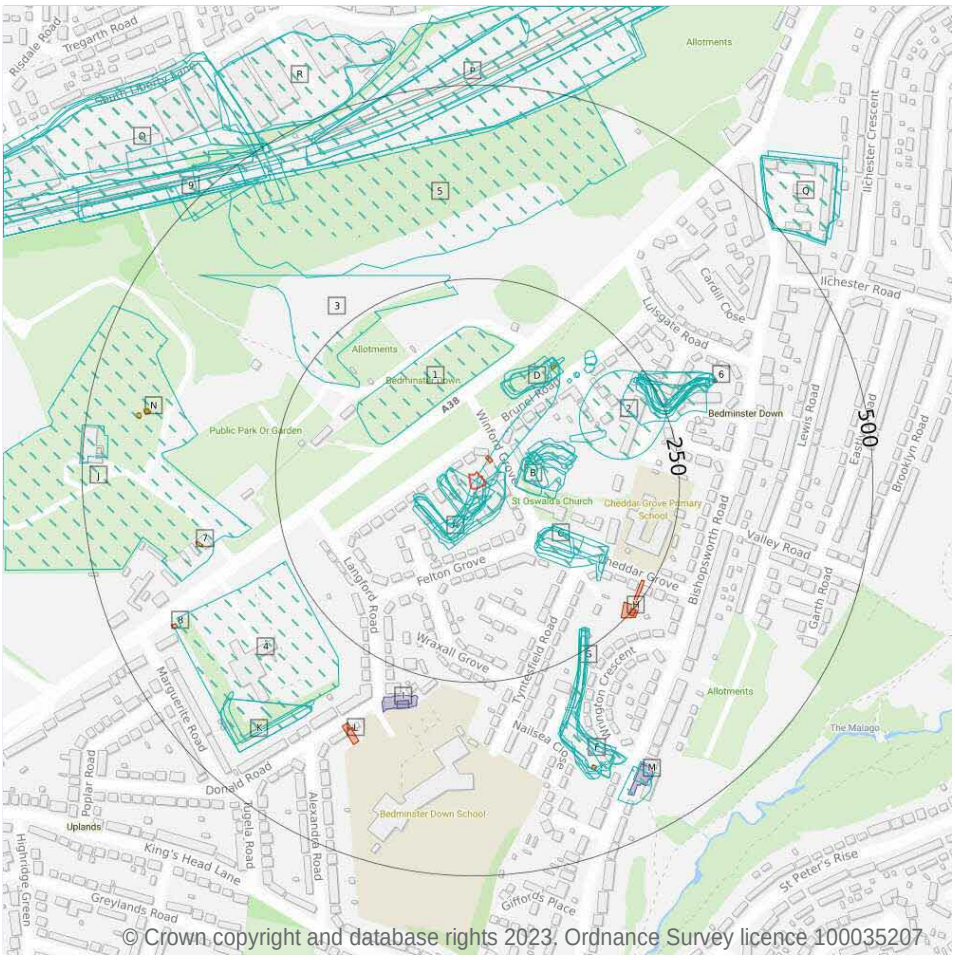
Site Area: 0.03ha

OS MasterMap site plan



Site Area: 0.03ha

1 Past land use



1.1 Historical industrial land uses

Records within 500m	93

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

Features are displayed on the Past land use map on page 15 >

ID	Location	Land use	Dates present	Group ID
A	On site	Unspecified Pit	1953	1186414

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Unspecified Old Quarries**	**1913 - 1930**	**1209827**
A	**On site**	**Unspecified Quarries**	**1887**	**1220220**
A	**On site**	**Railway Sidings**	**1902 - 1905**	**1250739**
A	0m E	Unspecified Quarry	1938	1169944
A	5m SE	Unspecified Old Quarries	1913	1195798
A	9m SW	Unspecified Quarries	1883 - 1884	1270758
A	11m S	Unspecified Quarries	1902	1205659
A	11m SE	Unspecified Quarries	1905	1226254
A	18m S	Unspecified Quarries	1883	1223381
B	37m E	Unspecified Quarries	1883	1213649
B	39m E	Unspecified Quarries	1884	1196546
B	48m E	Unspecified Quarries	1887	1271329
B	50m E	Unspecified Quarries	1883	1253122
B	58m E	Unspecified Old Quarries	1913	1166491
B	61m E	Unspecified Quarries	1902	1265734
B	64m NE	Unspecified Quarry	1913 - 1930	1254315
B	68m NE	Old Quarries	1905	1177215
B	70m E	Unspecified Quarry	1938	1242674
C	93m SE	Unspecified Quarries	1905	1222144
C	96m SE	Unspecified Quarries	1902	1198748
1	97m NW	Unspecified Pit	1953	1186413
C	97m SE	Unspecified Old Quarries	1913 - 1930	1260408
C	99m SE	Unspecified Quarries	1883 - 1887	1195490
C	100m SE	Unspecified Quarries	1883	1215597
C	102m SE	Unspecified Old Quarries	1913	1236013
D	104m NE	Unspecified Quarry	1883	1265019
D	106m NE	Unspecified Quarry	1883 - 1884	1217892
D	111m N	Unspecified Old Quarries	1902 - 1905	1248523

ID	Location	Land use	Dates present	Group ID
D	117m N	Unspecified Quarry	1887	1261258
B	122m NE	Unspecified Heap	1975	1163030
2	140m NE	Pottery	1913	1171509
D	165m NE	Lime Kiln	1883	1188417
D	166m NE	Lime Kiln	1884	1212540
D	176m NE	Lime Kiln	1887	1213482
D	178m NE	Lime Kiln	1883	1192436
3	182m NW	Refuse Heap	1975	1231141
D	191m NE	Unspecified Pit	1913	1205965
D	198m NE	Unspecified Old Quarries	1902 - 1905	1209788
D	198m NE	Unspecified Pit	1913 - 1930	1270727
E	205m NE	Unspecified Pit	1953	1186415
F	223m SE	Unspecified Quarry	1930	1217934
F	224m SE	Unspecified Old Quarry	1902 - 1913	1202414
G	224m SE	Unspecified Ground Workings	1938	1217291
G	224m SE	Unspecified Ground Workings	1883	1255541
F	227m SE	Unspecified Quarry	1884	1223210
E	229m NE	Unspecified Heap	1913	1204930
E	231m NE	Unspecified Ground Workings	1884	1240824
F	233m SE	Unspecified Old Quarry	1913	1261481
E	236m NE	Unspecified Ground Workings	1913	1198243
E	236m NE	Unspecified Heap	1930	1227138
E	237m NE	Unspecified Heap	1883	1225927
E	237m NE	Unspecified Heap	1938	1269408
E	237m NE	Unspecified Ground Workings	1902	1211942
E	239m NE	Unspecified Old Quarries	1905	1166492
E	242m NE	Unspecified Heap	1883	1223022
E	243m NE	Unspecified Ground Workings	1887	1246292

ID	Location	Land use	Dates present	Group ID
4	256m SW	Water Works	1975	1165493
5	286m N	Refuse Heap	1973	1241088
J	289m W	Cemetery	1975	1189336
F	314m S	Unspecified Quarry	1883	1213580
F	323m S	Unspecified Quarry	1938	1253268
K	341m SW	Unspecified Ground Workings	1913 - 1938	1241815
K	350m SW	Unspecified Ground Workings	1938	1227440
K	350m SW	Unspecified Ground Workings	1913	1247933
M	411m SE	Garage	1975	1189842
M	412m SE	Unspecified Heap	1953	1163031
O	421m NW	Colliery	1883	1217543
P	426m N	Railway Sidings	1955 - 1963	1229029
O	428m NW	Colliery	1905	1208174
P	432m N	Railway Sidings	1973 - 1990	1237305
P	432m N	Railway Sidings	1967	1212838
P	446m N	Railway Sidings	1938	1199463
P	446m N	Railway Sidings	1913	1245913
P	452m N	Railway Sidings	1938	1232080
9	459m NW	Railway Sidings	1930 - 1938	1214443
O	464m NW	Colliery	1938	1197594
O	464m NW	Colliery	1913	1227488
P	465m N	Railway Sidings	1967	1260954
J	468m W	Crematorium	1975	1174074
P	471m NW	Railway Sidings	1913 - 1930	1218740
O	474m NW	Railway Sidings	1938	1202321
O	474m NW	Railway Sidings	1913	1232313
O	489m NW	Railway Sidings	1883	1207728
O	491m NW	Railway Sidings	1902	1220108

ID	Location	Land use	Dates present	Group ID
O	491m NW	Colliery	1902	1221876
Q	493m NE	Water Works	1883	1209672
Q	495m NE	Water Works	1883 - 1884	1216163
O	496m NW	Colliery	1913	1236177
R	496m NW	Unspecified Heap	1967	1246171
Q	496m NE	Pumping Station	1902	1197436
Q	496m NE	Pumping Station	1913 - 1930	1222064
R	497m NW	Unspecified Heap	1955 - 1963	1218610

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	5

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

Features are displayed on the Past land use map on page 15 >

ID	Location	Land use	Dates present	Group ID
D	164m NE	Tanks	1903	170251
7	354m W	Unspecified Tank	1948 - 1963	189185
N	419m W	Septic Tank	1948 - 1963	191073
N	421m W	Septic Tank	1948	182193
N	430m W	Unspecified Tank	1948 - 1963	179334

This data is sourced from Ordnance Survey / Groundsure.

1.3 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, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on page 15 >

ID	Location	Land use	Dates present	Group ID
A	20m NE	Electricity Substation	1972 - 1992	108691
A	21m NE	Electricity Substation	1989	97793
H	235m SE	Electricity Substation	1948 - 1989	111770
H	248m SE	Electricity Substation	1992	104614
6	323m NE	Electricity Substation	1972 - 1992	111117
L	343m SW	Electricity Substation	1952 - 1992	112902
L	345m SW	Electricity Substation	1975	97792
L	347m SW	Electricity Substation	1952	106415
F	388m S	Electricity Substation	1985 - 1992	108669
8	420m SW	Electricity Substation	1973 - 1992	106049

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

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

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	3

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

Features are displayed on the Past land use map on page 15 >

ID	Location	Land use	Dates present	Group ID
I	277m S	Garage	1989	32977
I	286m S	Garage	1992	34222
M	414m SE	Garage	1963	34880

This data is sourced from Ordnance Survey / Groundsure.

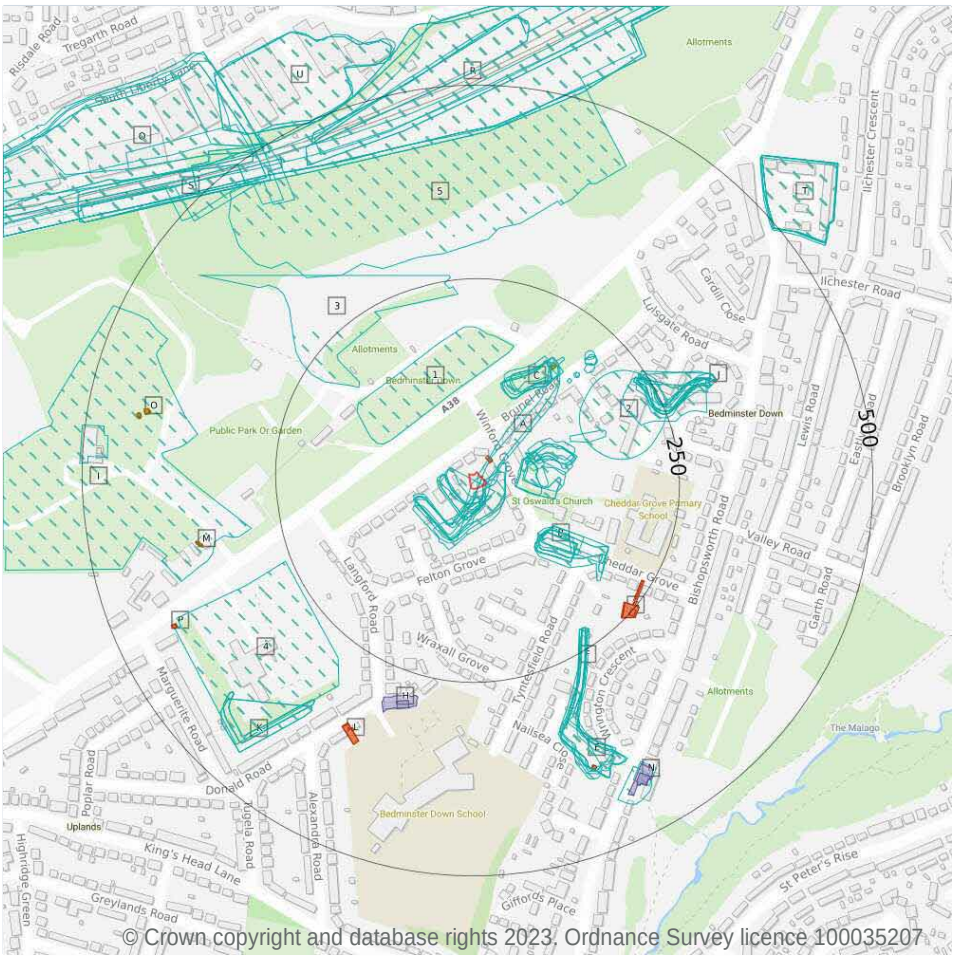
1.6 Historical military land

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



2.1 Historical industrial land uses

Records within 500m	121

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

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

ID	Location	Land Use	Date	Group ID
A	On site	Railway Sidings	1905	1250739
A	On site	Railway Sidings	1902	1250739
A	On site	Unspecified Quarries	1887	1220220

ID	Location	Land Use	Date	Group ID
A	**On site**	**Unspecified Pit**	**1953**	**1186414**
A	**On site**	**Unspecified Old Quarries**	**1930**	**1209827**
A	**On site**	**Unspecified Old Quarries**	**1913**	**1209827**
A	0m E	Unspecified Quarry	1938	1169944
A	5m SE	Unspecified Old Quarries	1913	1195798
A	9m SW	Unspecified Quarries	1883	1270758
A	11m S	Unspecified Quarries	1902	1205659
A	11m SE	Unspecified Quarries	1905	1226254
A	18m S	Unspecified Quarries	1884	1270758
A	18m S	Unspecified Quarries	1884	1270758
A	18m S	Unspecified Quarries	1883	1223381
A	37m E	Unspecified Quarries	1883	1213649
A	39m E	Unspecified Quarries	1884	1196546
A	39m E	Unspecified Quarries	1884	1196546
A	48m E	Unspecified Quarries	1887	1271329
A	50m E	Unspecified Quarries	1883	1253122
A	58m E	Unspecified Old Quarries	1913	1166491
A	61m E	Unspecified Quarries	1902	1265734
A	64m NE	Unspecified Quarry	1930	1254315
A	64m NE	Unspecified Quarry	1913	1254315
A	68m NE	Old Quarries	1905	1177215
A	70m E	Unspecified Quarry	1938	1242674
B	93m SE	Unspecified Quarries	1905	1222144
B	96m SE	Unspecified Quarries	1902	1198748
1	97m NW	Unspecified Pit	1953	1186413
B	97m SE	Unspecified Old Quarries	1930	1260408
B	97m SE	Unspecified Old Quarries	1913	1260408
B	99m SE	Unspecified Quarries	1887	1195490

ID	Location	Land Use	Date	Group ID
B	99m SE	Unspecified Quarries	1883	1195490
B	99m SE	Unspecified Quarries	1884	1195490
B	99m SE	Unspecified Quarries	1884	1195490
B	100m SE	Unspecified Quarries	1883	1215597
B	102m SE	Unspecified Old Quarries	1913	1236013
C	104m NE	Unspecified Quarry	1883	1265019
C	106m NE	Unspecified Quarry	1884	1217892
C	106m NE	Unspecified Quarry	1884	1217892
C	111m N	Unspecified Old Quarries	1902	1248523
C	117m N	Unspecified Quarry	1887	1261258
C	117m N	Unspecified Old Quarries	1905	1248523
C	118m NE	Unspecified Quarry	1883	1217892
A	122m NE	Unspecified Heap	1975	1163030
2	140m NE	Pottery	1913	1171509
C	165m NE	Lime Kiln	1883	1188417
C	166m NE	Lime Kiln	1884	1212540
C	166m NE	Lime Kiln	1884	1212540
C	176m NE	Lime Kiln	1887	1213482
C	178m NE	Lime Kiln	1883	1192436
3	182m NW	Refuse Heap	1975	1231141
C	191m NE	Unspecified Pit	1913	1205965
C	198m NE	Unspecified Old Quarries	1902	1209788
C	198m NE	Unspecified Pit	1930	1270727
C	198m NE	Unspecified Pit	1913	1270727
C	203m NE	Unspecified Old Quarries	1905	1209788
D	205m NE	Unspecified Pit	1953	1186415
E	223m SE	Unspecified Quarry	1930	1217934
E	224m SE	Unspecified Old Quarry	1902	1202414

ID	Location	Land Use	Date	Group ID
F	224m SE	Unspecified Ground Workings	1938	1217291
F	224m SE	Unspecified Ground Workings	1883	1255541
E	224m SE	Unspecified Old Quarry	1913	1202414
E	227m SE	Unspecified Quarry	1884	1223210
E	227m SE	Unspecified Quarry	1884	1223210
D	229m NE	Unspecified Heap	1913	1204930
D	231m NE	Unspecified Ground Workings	1884	1240824
D	231m NE	Unspecified Ground Workings	1884	1240824
E	233m SE	Unspecified Old Quarry	1913	1261481
D	236m NE	Unspecified Ground Workings	1913	1198243
D	236m NE	Unspecified Heap	1930	1227138
D	237m NE	Unspecified Heap	1938	1269408
D	237m NE	Unspecified Heap	1883	1225927
D	237m NE	Unspecified Ground Workings	1902	1211942
D	239m NE	Unspecified Old Quarries	1905	1166492
D	242m NE	Unspecified Heap	1883	1223022
D	243m NE	Unspecified Ground Workings	1887	1246292
4	256m SW	Water Works	1975	1165493
5	286m N	Refuse Heap	1973	1241088
I	289m W	Cemetery	1975	1189336
E	314m S	Unspecified Quarry	1883	1213580
E	323m S	Unspecified Quarry	1938	1253268
K	341m SW	Unspecified Ground Workings	1938	1241815
K	341m SW	Unspecified Ground Workings	1930	1241815
K	341m SW	Unspecified Ground Workings	1913	1241815
K	350m SW	Unspecified Ground Workings	1938	1227440
K	350m SW	Unspecified Ground Workings	1913	1247933
N	411m SE	Garage	1975	1189842

ID	Location	Land Use	Date	Group ID
N	412m SE	Unspecified Heap	1953	1163031
Q	421m NW	Colliery	1883	1217543
R	426m N	Railway Sidings	1963	1229029
R	426m N	Railway Sidings	1955	1229029
Q	428m NW	Colliery	1905	1208174
R	432m N	Railway Sidings	1990	1237305
R	432m N	Railway Sidings	1973	1237305
R	432m N	Railway Sidings	1967	1212838
R	446m N	Railway Sidings	1938	1199463
R	446m N	Railway Sidings	1913	1245913
R	452m N	Railway Sidings	1938	1232080
S	459m NW	Railway Sidings	1938	1214443
S	459m NW	Railway Sidings	1930	1214443
Q	464m NW	Colliery	1938	1197594
Q	464m NW	Colliery	1913	1227488
R	465m N	Railway Sidings	1967	1260954
I	468m W	Crematorium	1975	1174074
R	471m NW	Railway Sidings	1930	1218740
R	471m NW	Railway Sidings	1913	1218740
Q	474m NW	Railway Sidings	1938	1202321
Q	474m NW	Railway Sidings	1913	1232313
Q	489m NW	Railway Sidings	1883	1207728
Q	491m NW	Colliery	1902	1221876
Q	491m NW	Railway Sidings	1902	1220108
T	493m NE	Water Works	1883	1209672
T	495m NE	Water Works	1884	1216163
T	495m NE	Water Works	1884	1216163
Q	496m NW	Colliery	1913	1236177

ID	Location	Land Use	Date	Group ID
U	496m NW	Unspecified Heap	1967	1246171
T	496m NE	Pumping Station	1930	1222064
T	496m NE	Pumping Station	1913	1222064
T	496m NE	Pumping Station	1902	1197436
U	497m NW	Unspecified Heap	1963	1218610
U	497m NW	Unspecified Heap	1955	1218610

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	16

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

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

ID	Location	Land Use	Date	Group ID
C	164m NE	Tanks	1903	170251
M	354m W	Unspecified Tank	1948	189185
M	354m W	Unspecified Tank	1952	189185
M	355m W	Unspecified Tank	1963	189185
M	355m W	Unspecified Tank	1952	189185
M	355m W	Unspecified Tank	1948	189185
O	419m W	Septic Tank	1963	191073
O	419m W	Septic Tank	1952	191073
O	419m W	Septic Tank	1948	191073
O	419m W	Septic Tank	1952	191073
O	421m W	Septic Tank	1948	182193
O	430m W	Unspecified Tank	1963	179334
O	430m W	Unspecified Tank	1952	179334
O	430m W	Unspecified Tank	1948	179334

ID	Location	Land Use	Date	Group ID
O	430m W	Unspecified Tank	1952	179334
O	431m W	Unspecified Tank	1948	179334

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	21

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

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

ID	Location	Land Use	Date	Group ID
A	20m NE	Electricity Substation	1992	108691
A	21m NE	Electricity Substation	1972	108691
A	21m NE	Electricity Substation	1989	97793
G	235m SE	Electricity Substation	1989	111770
G	236m SE	Electricity Substation	1972	111770
G	237m SE	Electricity Substation	1948	111770
G	248m SE	Electricity Substation	1992	104614
J	323m NE	Electricity Substation	1989	111117
J	324m NE	Electricity Substation	1992	111117
J	324m NE	Electricity Substation	1972	111117
L	343m SW	Electricity Substation	1952	112902
L	343m SW	Electricity Substation	1989	112902
L	343m SW	Electricity Substation	1992	112902
L	345m SW	Electricity Substation	1975	97792
L	347m SW	Electricity Substation	1952	106415
E	388m S	Electricity Substation	1992	108669
E	388m S	Electricity Substation	1985	108669
E	388m S	Electricity Substation	1989	108669

ID	Location	Land Use	Date	Group ID
P	420m SW	Electricity Substation	1973	106049
P	420m SW	Electricity Substation	1992	106049
P	421m SW	Electricity Substation	1989	106049

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	4

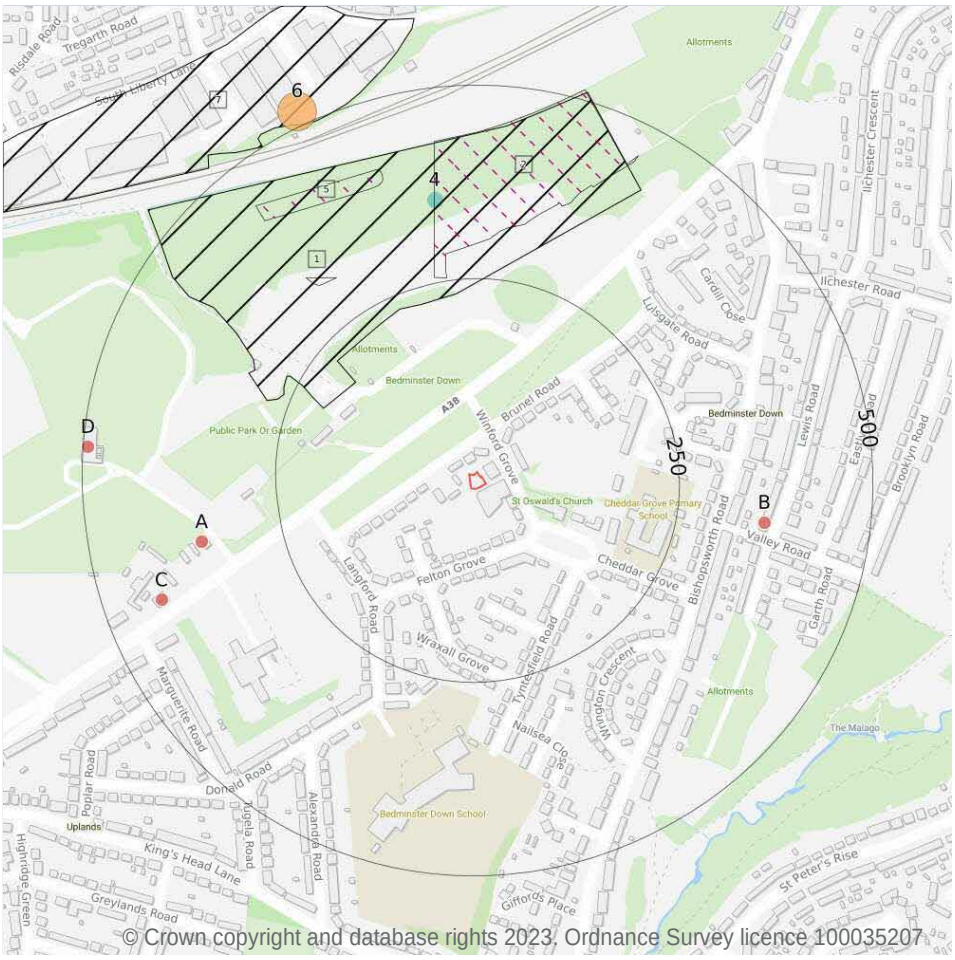
Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

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

ID	Location	Land Use	Date	Group ID
H	277m S	Garage	1989	32977
H	286m S	Garage	1992	34222
N	414m SE	Garage	1963	34880
N	423m SE	Garage	1963	34880

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



3.1 Active or recent landfill

Records within 500m	0

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

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

3.2 Historical landfill (BGS records)

Records within 500m	1

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

Features are displayed on the Waste and landfill map on page 30 >

ID	Location	Address	BGS Number	Risk	Waste Type
4	356m N	Bedminster Down, Bristol	2580	No risk to aquifer	N/A

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	3

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

Features are displayed on the Waste and landfill map on page 30 >

ID	Location	Site address	Source	Data type
2	254m N	Refuse Tip	1971 mapping	Polygon
3	307m NW	Refuse Tip	1972 mapping	Polygon
5	390m N	Refuse Tip	1970 mapping	Polygon

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

3.4 Historical landfill (EA/NRW records)

Records within 500m	2

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 30 >

ID	Location	Details		
1	188m NW	Site Address: Bedminster Down, Bristol, Avon Licence Holder Address: -	Waste Licence: - Site Reference: A 004 Waste Type: Industrial, Commercial, Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Bristol Corporation Licence Holder: - First Recorded 31/12/1968 Last Recorded: 31/12/1978

ID	Location	Details		
7	497m NW	Site Address: South Liberty Lane Brickworks, Bedminster Licence Holder Address: -	Waste Licence: - Site Reference: - 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	1

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

Features are displayed on the Waste and landfill map on page 30 >

ID	Location	Address	Further Details	Date
6	494m NW	Site Address: 121 South Liberty Lane, Ashton, BRISTOL, Avon, BS3 2SZ	Type of Site: Waste Recycling Station (Conversion) Planning application reference: 02/00095 Description: Scheme comprises change of use from Calss B2/B8 to waste recycling station (Sui Generis). An application (ref: 02/00095) for Detailed Planning permission was submitted to Bristol C.C. on 18th February 2002. Data source: Historic Planning Application Data Type: Point	-

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

3.6 Licensed waste sites

Records within 500m	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	32

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 30 >

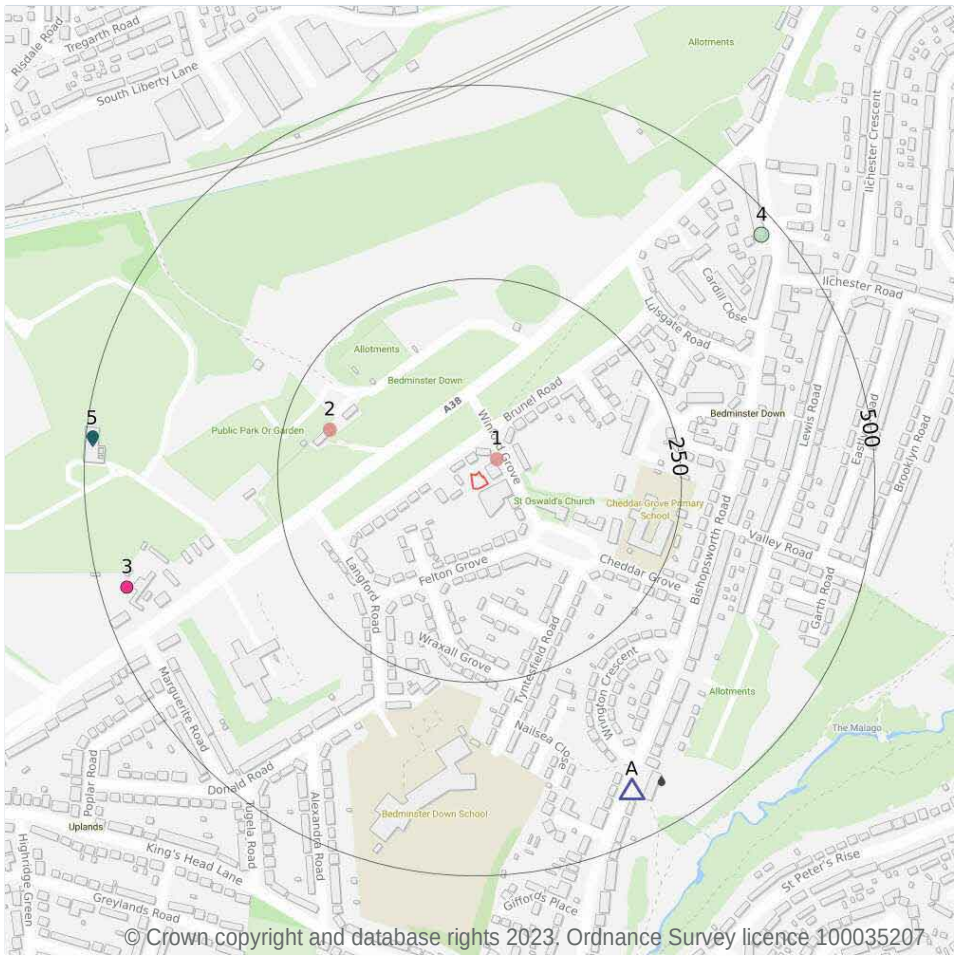
ID	Location	Site	Reference	Category	Sub-Category	Description
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in secure containers
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of waste in a secure place
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Treating waste exemption	Non-Agricultural Waste Only	Aerobic composting and associated prior treatment
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Treating waste exemption	Non-Agricultural Waste Only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste in construction
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Using waste exemption	Non-Agricultural Waste Only	Spreading waste on non-agricultural land to confer benefit
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Using waste exemption	Non-Agricultural Waste Only	Use of mulch
A	355m W	South Bristol Cemetery and Crematorium Bridgwater Road Bedminster Down BS13 7AS	EPR/EE5349KL/A001	Using waste exemption	Non-Agricultural Waste Only	Spreading of plant matter to confer benefit
B	363m E	1-3, LEWIS ROAD, BRISTOL, BS13 7JD	WEX234217	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

ID	Location	Site	Reference	Category	Sub-Category	Description
B	363m E	1-3, LEWIS ROAD, BRISTOL, BS13 7JD	WEX206917	Storing waste exemption	Not on a farm	Storage of waste in secure containers
B	363m E	1-3, LEWIS ROAD, BRISTOL, BS13 7JD	WEX206917	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
B	363m E	1-3, LEWIS ROAD, BRISTOL, BS13 7JD	WEX090766	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
B	363m E	1-3, LEWIS ROAD, BRISTOL, BS13 7JD	WEX061036	Storing waste exemption	Not on a farm	Storage of waste in secure containers
B	363m E	1-3, LEWIS ROAD, BRISTOL, BS13 7JD	WEX061058	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Storing waste exemption	Not on a farm	Storage of waste in secure containers
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Storing waste exemption	Not on a farm	Storage of waste in a secure place
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Treating waste exemption	Not on a farm	Aerobic composting and associated prior treatment
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Treating waste exemption	Not on a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Using waste exemption	Not on a farm	Use of waste in construction
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Using waste exemption	Not on a farm	Spreading waste on non-agricultural land to confer benefit

ID	Location	Site	Reference	Category	Sub-Category	Description
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Using waste exemption	Not on a farm	Use of mulch
C	426m W	South Bristol Cemetery and Crematorium, Bridgwater Road, Bedminster Down, Bristol, BS13 7AS	WEX114119	Using waste exemption	Not on a farm	Spreading of plant matter to confer benefit
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Using waste exemption	Not on a farm	Use of waste in construction
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Disposing of waste exemption	Not on a farm	Disposal by incineration
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Disposing of waste exemption	Not on a farm	Burning waste in the open
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Storing waste exemption	Not on a farm	Storage of waste in a secure place
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Storing waste exemption	Not on a farm	Storage of waste in secure containers
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Treating waste exemption	Not on a farm	Aerobic composting and associated prior treatment
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Treating waste exemption	Not on a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Using waste exemption	Not on a farm	Spreading of plant matter to confer benefit
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Using waste exemption	Not on a farm	Use of mulch
D	494m W	BRIDGWATER ROAD, BRISTOL, BS13 7AS	WEX254729	Using waste exemption	Not on a farm	Spreading waste on non-agricultural land to confer benefit

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

4 Current industrial land use



Site Outline

Search buffers in metres (m)

- Recent industrial land uses
- Current or recent petrol stations
- Licensed pollutant release (Part A(2)/B)
- Radioactive Substance Authorisations
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	2

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on page 36 >

ID	Location	Company	Address	Activity	Category
1	29m NE	Electricity Sub Station	Bristol, BS13	Electrical Features	Infrastructure and Facilities
2	192m W	I G Payton & Son	4 Hills Cottages, Bridgwater Road, Bedminster Down, Bristol, Bristol, BS13 7AW	Vehicle Repair, Testing and Servicing	Repair and Servicing

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	1

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on page 36 >

ID	Location	Company	Address	LPG	Status
A	436m SE	UNBRANDED	263-273, Bishopsworth Road, Bishopsworth, Bristol, Bristol, City Of, BS13 7JR	Not Applicable	Obsolete

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 36 >

ID	Location	Address	Details	
5	492m W	South Bristol Crematorium, Bridgewater Road, Bristol, BS13 7AS	Process: Crematoria Processes Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notice Date of enforcement: No Enforcement Notice Comment: No Enforcement Notice

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m 1

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

Features are displayed on the Current industrial land use map on page 36 >

ID	Location	Address	Details	
3	465m W	Magnox Electric Ltd, Bridgwater Road, Bristol, Avon, BS13 8AN	Operator: Magnox Electric Ltd Type: Disposal Of Radioactive Waste (was Rsa60 Section 6). Permission number: AC2772 Date of approval: 31/03/1991	Effective from: 31/03/1991 Last date of update: 01/01/2015 Status: Revoked/cancelled

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

4.13 Licensed Discharges to controlled waters

Records within 500m 1

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 36 >

ID	Location	Address	Details	
A	444m SE	BISHOPSWORTH ROAD, REAR GARAGE NEXT TO 261, BRISTOL, BS13 7LH	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: 011260 Permit Version: 1 Receiving Water: RIVER MALAGO	Status: REVOKED - UNSPECIFIED Issue date: - Effective Date: 12/09/1989 Revocation Date: 30/03/2002

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	1

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

Features are displayed on the Current industrial land use map on page 36 >

ID	Location	Details	
4	475m NE	Incident Date: 25/05/2002 Incident Identification: 81103 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

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

4.19 Pollution inventory substances

Records within 500m	0

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

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

4.20 Pollution inventory waste transfers

Records within 500m	0

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

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

4.21 Pollution inventory radioactive waste

Records within 500m	0

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

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

5 Hydrogeology - Superficial aquifer

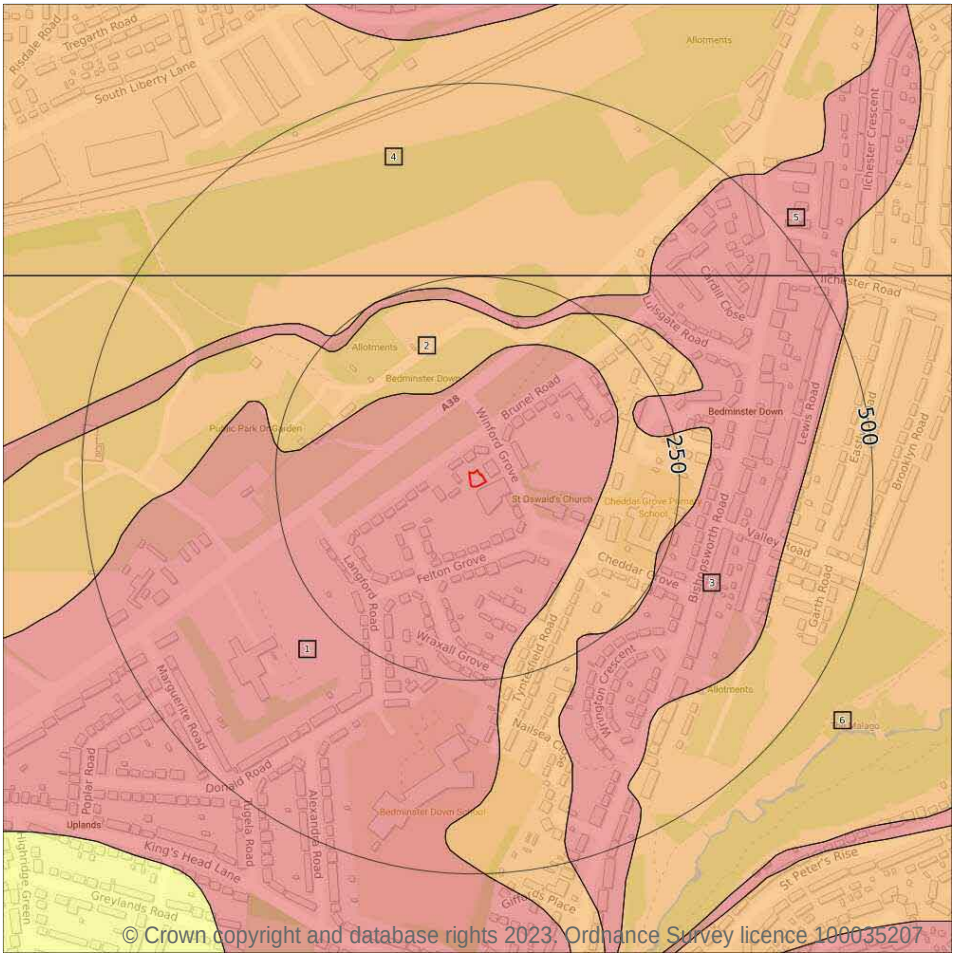
5.1 Superficial aquifer

Records within 500m	0

Aquifer status of groundwater held within superficial geology.

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

Bedrock aquifer



5.2 Bedrock aquifer

Records within 500m	6

Aquifer status of groundwater held within bedrock geology.

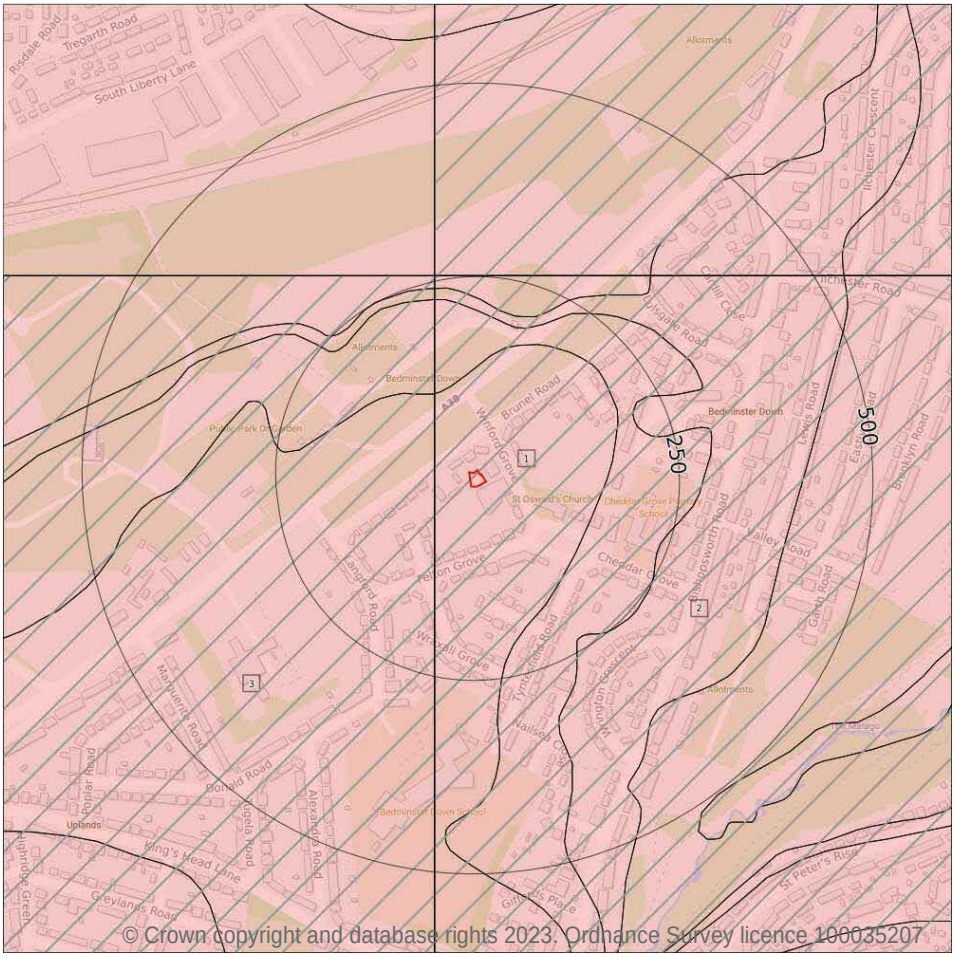
Features are displayed on the Bedrock aquifer map on page 43 >

ID	Location	Designation	Description
1	**On site**	**Secondary A**	**Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers**
2	110m N	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers

ID	Location	Designation	Description
3	191m N	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	251m N	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers
5	337m NE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
6	369m SE	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-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 vulr
- 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 45 >

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: Intermediate Infiltration value: 40-70% Dilution value: 300-550mm/year**	**Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
3	44m W	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: 300-550mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High 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	1

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

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
2	**Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.**	**18.0%**

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

5.6 Groundwater abstractions

Records within 2000m	0

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

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

5.7 Surface water abstractions

Records within 2000m	0

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.

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

5.8 Potable abstractions

Records within 2000m	0

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

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

5.9 Source Protection Zones

Records within 500m	0

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

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

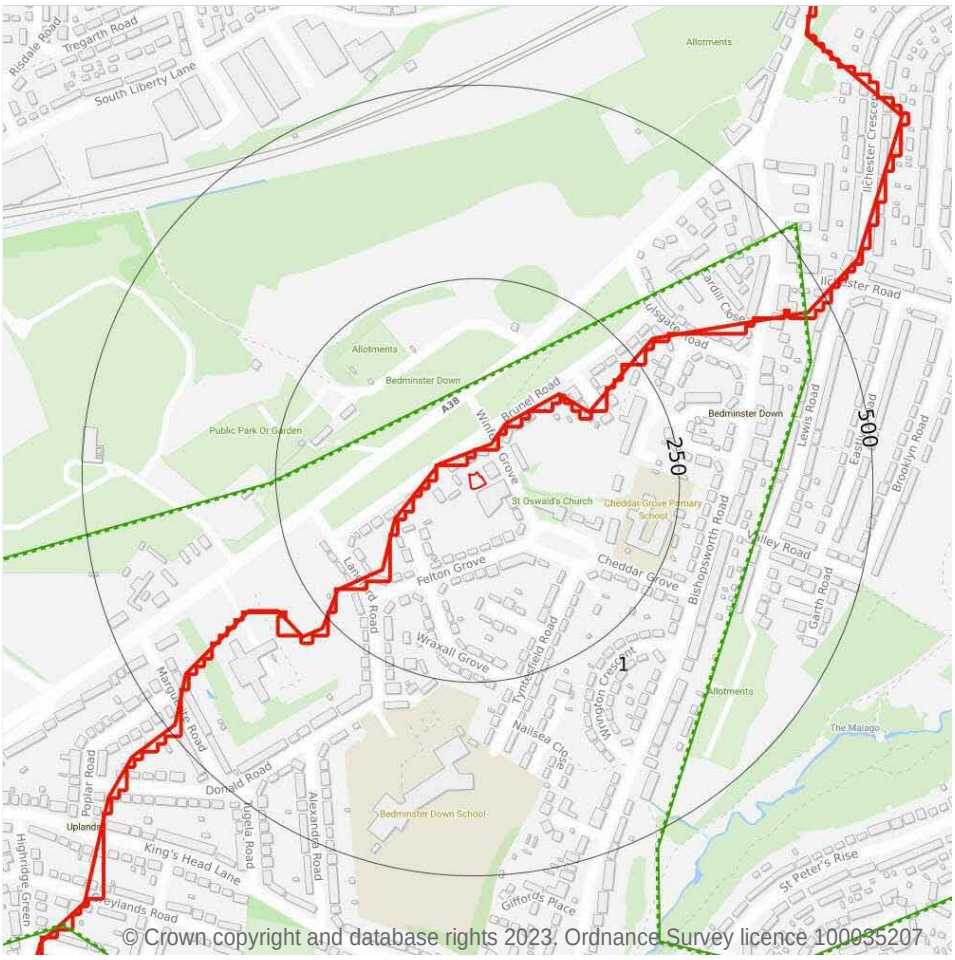
5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

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

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

6 Hydrology



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

6.1 Water Network (OS MasterMap)

Records within 250m	0

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

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	0

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

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

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

Features are displayed on the Hydrology map on page 49 >

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River**	**The Malago - source to conf R Avon (Brist New Cut)**	**GB109053021970**	**Avon Bristol Urban**	**Avon Bristol and Somerset Nort**

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 49 >

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	1026m E	River	The Malago - source to conf R Avon (Brist New Cut)	GB109053021970 ↗	Moderate	Fail	Moderate	2019

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

6.5 WFD Groundwater bodies

Records on site	0

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

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

7 River and coastal flooding

7.1 Risk of flooding from rivers and 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.

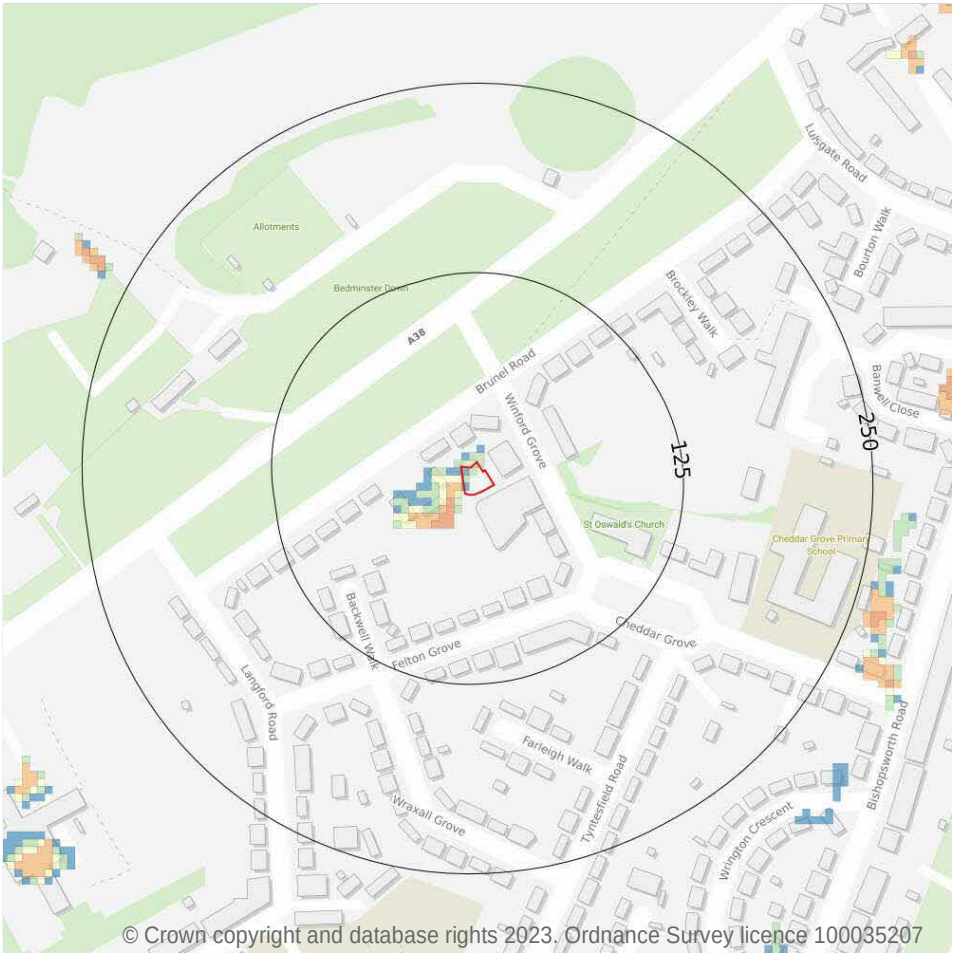
7.7 Flood Zone 3

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 250 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 55 >

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	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding

Site Outline

Search buffers in metres (m)

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

9.1 Groundwater flooding

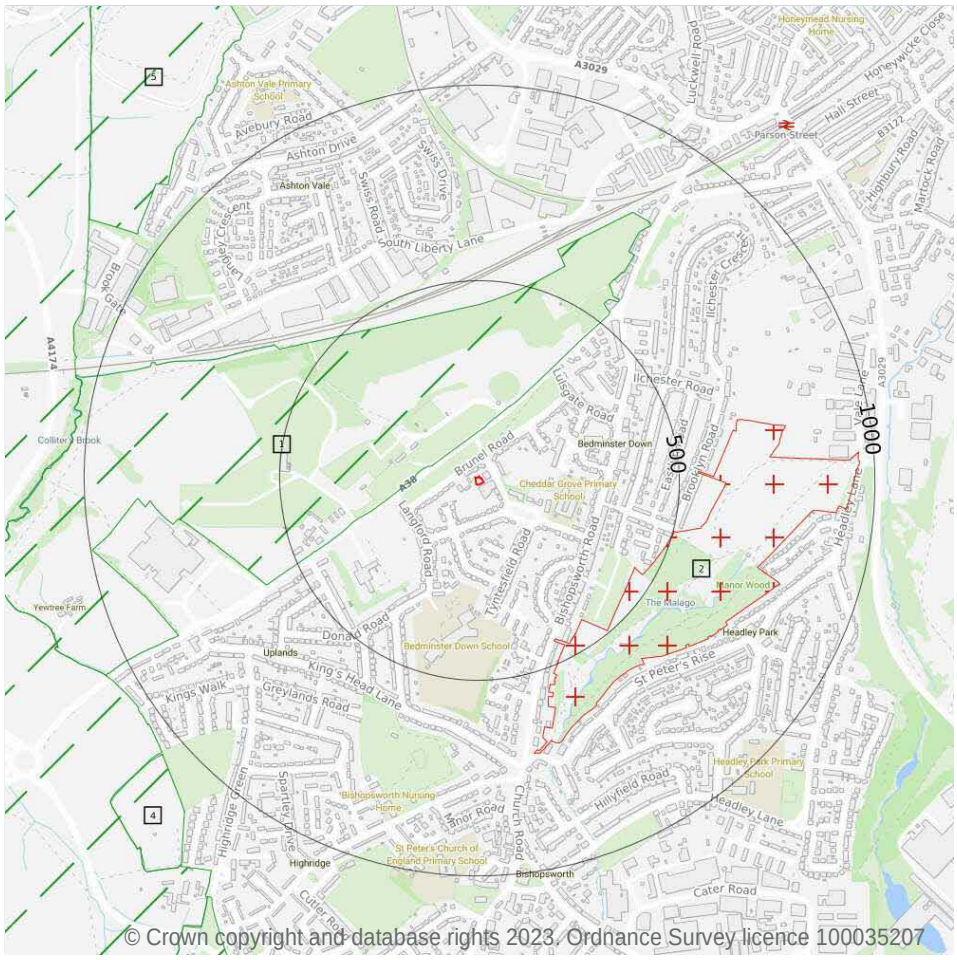
Highest risk on site	Negligible
Highest risk within 50m	Negligible

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

Features are displayed on the Groundwater flooding map on page 57 >

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	0

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

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

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

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

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

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

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

10.4 Special Protection Areas (SPA)

Records within 2000m	0

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

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

10.5 National Nature Reserves (NNR)

Records within 2000m	0

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

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

10.6 Local Nature Reserves (LNR)

Records within 2000m	2

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.

Features are displayed on the Environmental designations map on page 58 >

ID	Location	Name	Data source
2	431m SE	Manor Woods Valley	Natural England
-	1916m E	Northern Slopes	Natural England

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

10.7 Designated Ancient Woodland

Records within 2000m	1

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 58 >

ID	Location	Name	Woodland Type
-	1276m W	Hanging Hill Wood	Ancient & Semi-Natural Woodland

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

10.8 Biosphere Reserves

Records within 2000m	0

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

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

10.9 Forest Parks

Records within 2000m	0

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

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

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

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

10.11 Green Belt

Records within 2000m	9

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

Features are displayed on the Environmental designations map on page 58 >

ID	Location	Name	Local Authority name
1	90m NW	Bath and Bristol	Bristol, City of
3	1021m W	Bath and Bristol	North Somerset
4	1058m SW	Bath and Bristol	Bristol, City of
5	1064m NW	Bath and Bristol	Bristol, City of
6	1255m SW	Bath and Bristol	Bristol, City of
-	1537m NW	Bath and Bristol	North Somerset
-	1539m NW	Bath and Bristol	North Somerset
-	1789m NW	Bath and Bristol	Bristol, City of
-	1976m SW	Bath and Bristol	Bristol, City of

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.

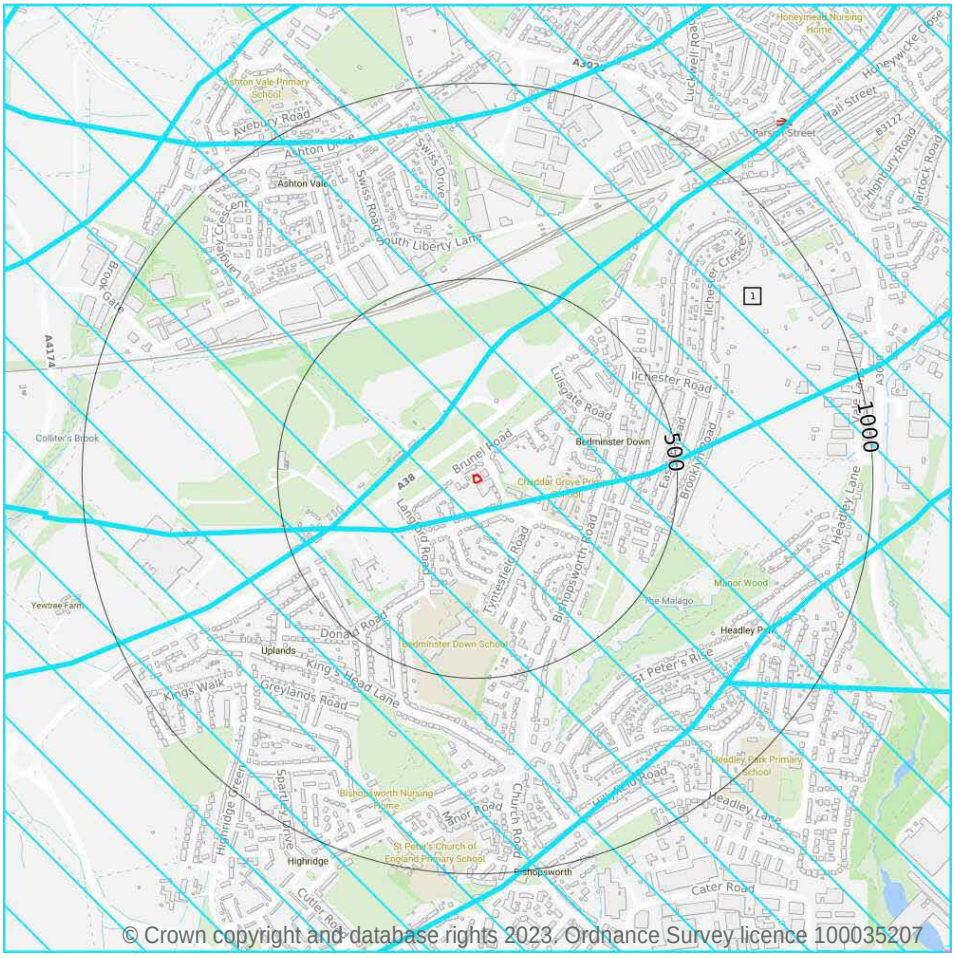
10.16 Nitrate Vulnerable Zones

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



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 64 >

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. 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 Discharges - Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream.

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

Site Outline

Search buffers in metres (m)

- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

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

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

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

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

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

11.3 National Parks

Records within 250m	0

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

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

11.4 Listed Buildings

Records within 250m	1

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

Features are displayed on the Visual and cultural designations map on page 66 >

ID	Location	Name	Grade	Reference Number	Listed date
1	89m E	Church Of St Oswald	II	1280903	30/12/1994

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	1

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

Features are displayed on the Agricultural designations map on page 69 >

ID	Location	Classification	Description
1	On site	Urban	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	2

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

Features are displayed on the Agricultural designations map on page 69 >

ID	Location	Name	Classification	Other relevant legislation
A	36m NW	Bedminster Down	Section 15 Land	S.193 - Urban Borough District
A	36m NW	Bedminster Down	Section 4 Conclusive Registered Common Land	-

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.

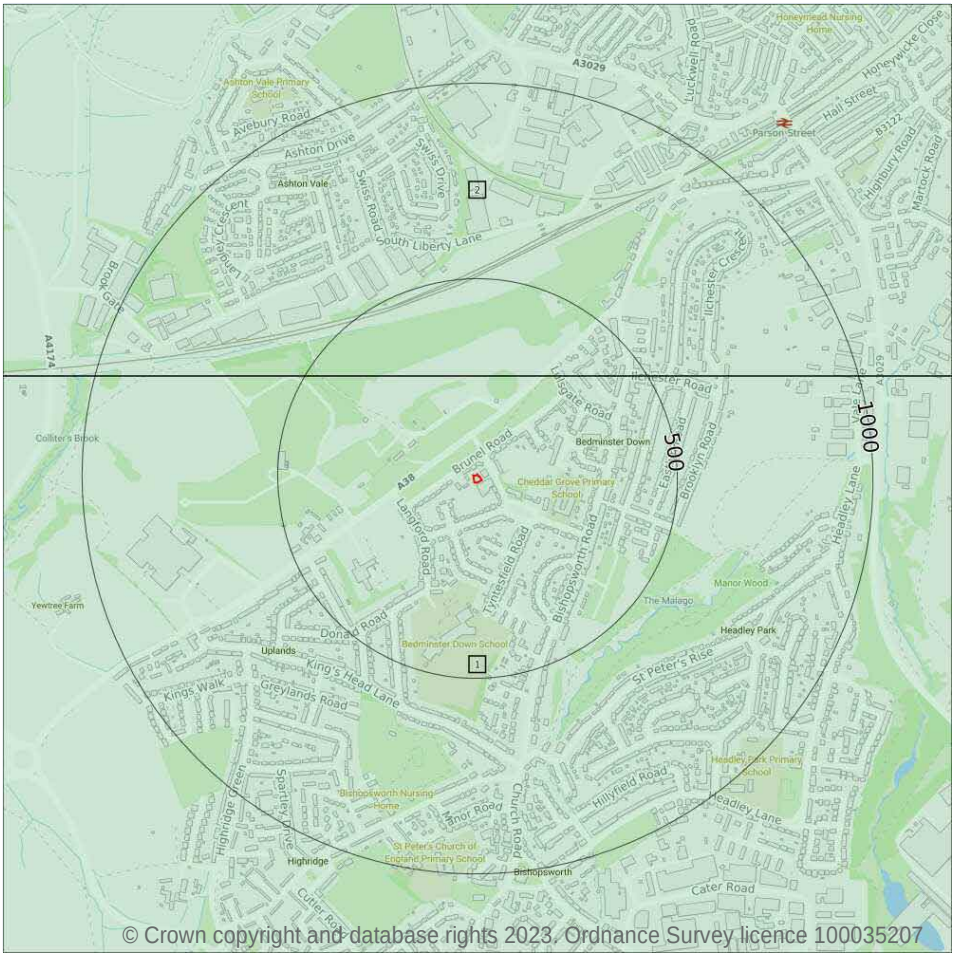
13.4 Limestone Pavement Orders

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.

14 Geology 1:10,000 scale - Availability



Site Outline

Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m	2

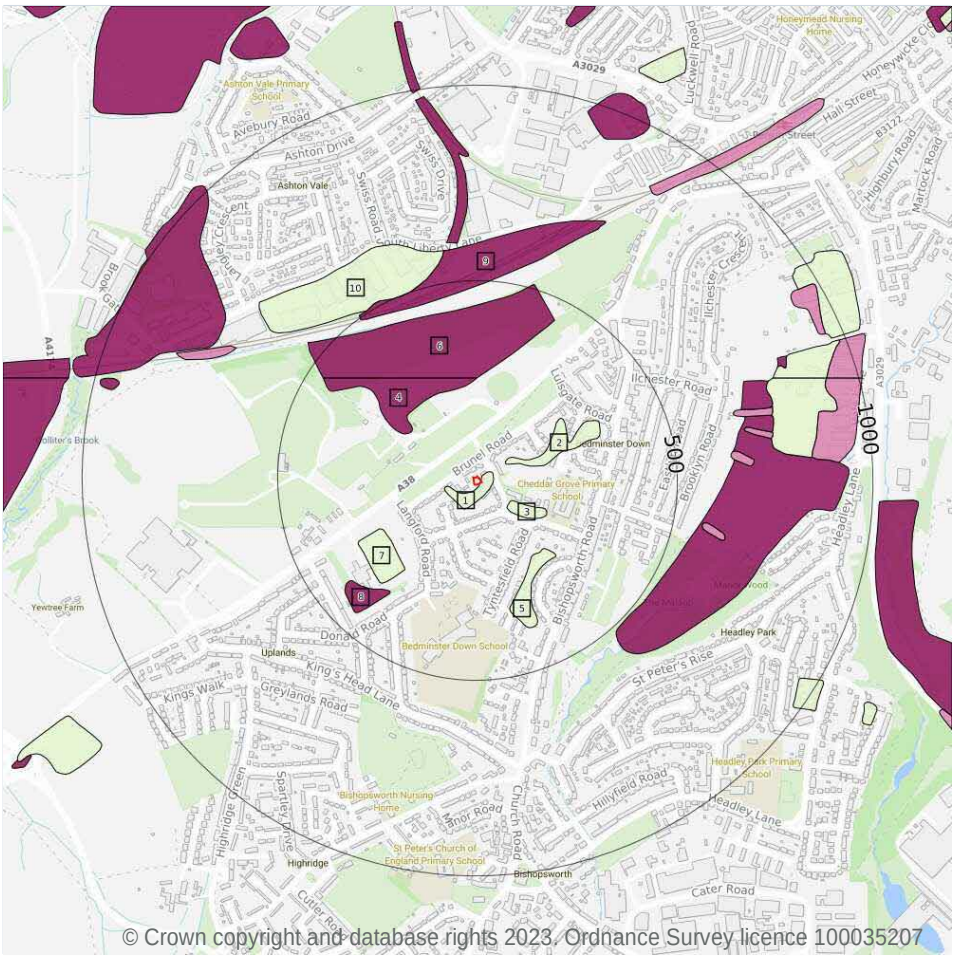
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on page 72 >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**ST56NE**
2	251m N	Full	Full	Full	Full	ST57SE

This data is sourced from the British Geological Survey.

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



14.2 Artificial and made ground (10k)

Records within 500m	10

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.

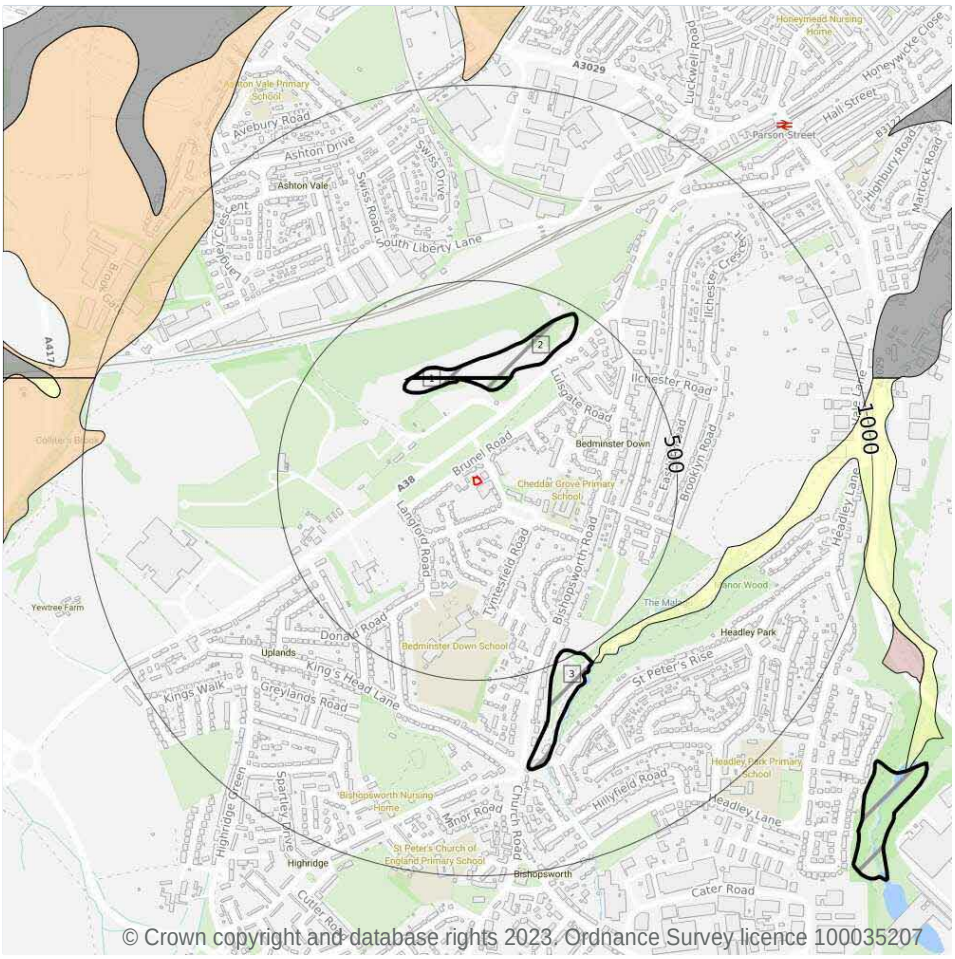
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on page 73 >

ID	Location	LEX Code	Description	Rock description
1	**On site**	**WMGR-ARTDP**	**Infilled Ground**	**Artificial Deposit**
2	77m NE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
3	88m SE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
4	197m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
5	228m SE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
6	251m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7	257m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
8	348m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
9	461m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
10	499m N	WMGR-ARTDP	Infilled Ground	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m	0

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

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m	3

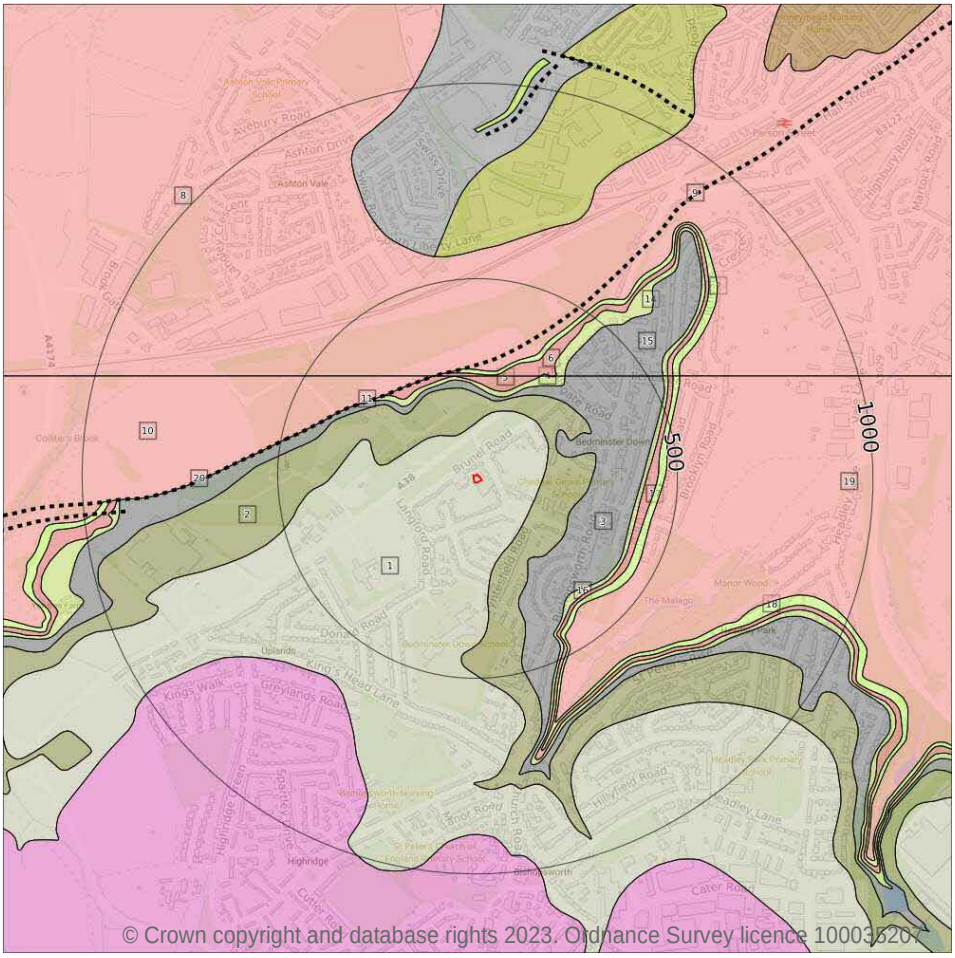
Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

Features are displayed on the Geology 1:10,000 scale - Superficial map on page 75 >

ID	Location	LEX Code	Description	Rock description
1	223m N	SLIP-UKNOWN	Landslide Deposits	Unknown/unclassified Entry
2	251m N	SLIP-UKNOWN	Landslide Deposits	Unknown/unclassified Entry
3	478m SE	SLIP-UKNOWN	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 17

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 77 >

ID	Location	LEX Code	Description	Rock age
1	**On site**	**RLS-LSM D**	**Rugby Limestone Member - Interbedded Limestone And Mudstone**	**Sinemurian Age - Hettangian Age**
2	111m N	SASH-MDST	Saltford Shale Member - Mudstone	Hettangian Age - Rhaetian Age
3	193m N	WCT-LMST	Wilmcote Limestone Member - Limestone	Hettangian Age - Rhaetian Age

ID	Location	LEX Code	Description	Rock age
4	205m N	LPMB-LMST	Langport Member - Limestone	Rhaetian Age
5	219m N	WBCT-MDST	Westbury Formation And Cotham Member (undifferentiated) - Mudstone	Rhaetian Age
6	251m N	WBCT-MDST	Westbury Formation And Cotham Member (undifferentiated) - Mudstone	Rhaetian Age
7	255m N	BAN-MDST	Blue Anchor Formation - Mudstone	Rhaetian Age - Norian Age
8	265m N	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
10	274m NW	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch
12	299m NE	LPMB-LMST	Langport Member - Limestone	Rhaetian Age
13	311m NE	WBCT-MDST	Westbury Formation And Cotham Member (undifferentiated) - Mudstone	Rhaetian Age
14	321m NE	LPMB-LMST	Langport Member - Limestone	Rhaetian Age
15	337m NE	WCT-LMST	Wilmcote Limestone Member - Limestone	Hettangian Age - Rhaetian Age
16	368m SE	LPMB-LMST	Langport Member - Limestone	Rhaetian Age
17	390m SE	WBCT-MDST	Westbury Formation And Cotham Member (undifferentiated) - Mudstone	Rhaetian Age
18	398m SE	BAN-MDST	Blue Anchor Formation - Mudstone	Rhaetian Age - Norian Age
19	408m SE	MMG-MDST	Mercia Mudstone Group - Mudstone	Rhaetian Age - Early Triassic Epoch

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m 3

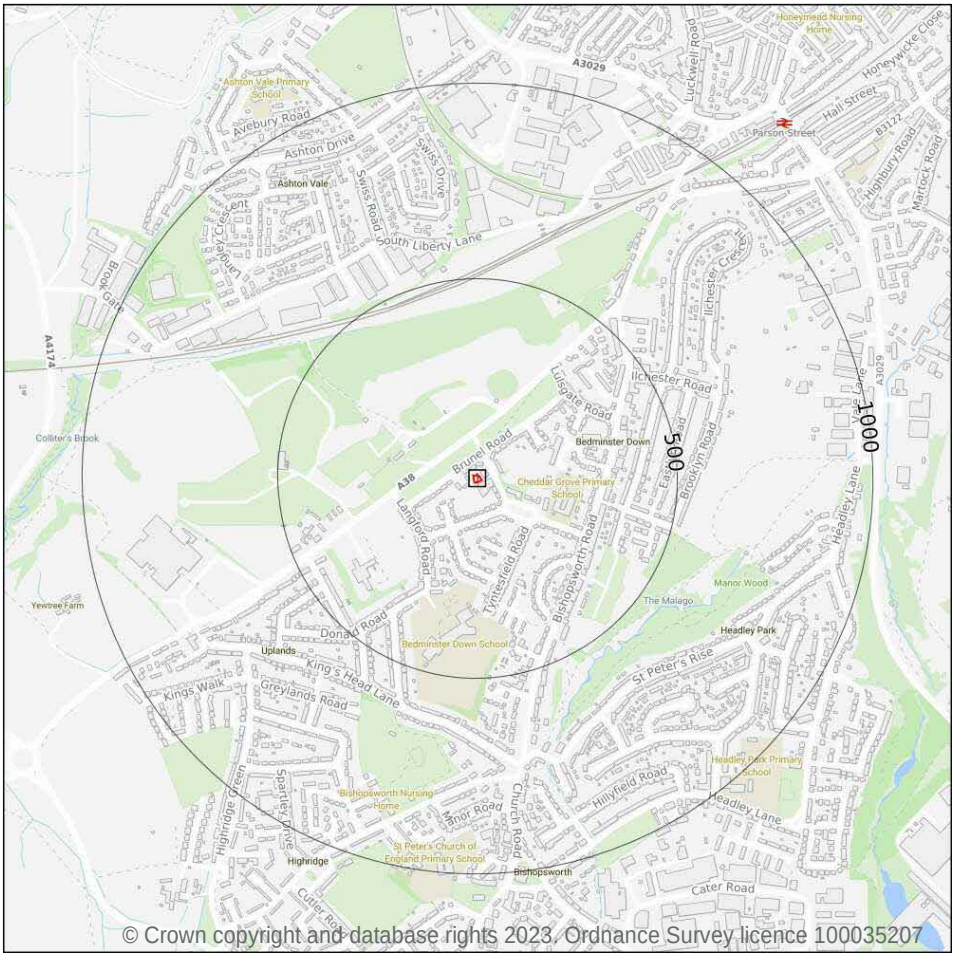
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on page 77 >

ID	Location	Category	Description
9	271m N	FAULT	Normal fault, inferred
11	274m NW	FAULT	Normal fault, inferred
20	490m W	FAULT	Normal fault, observed

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	1

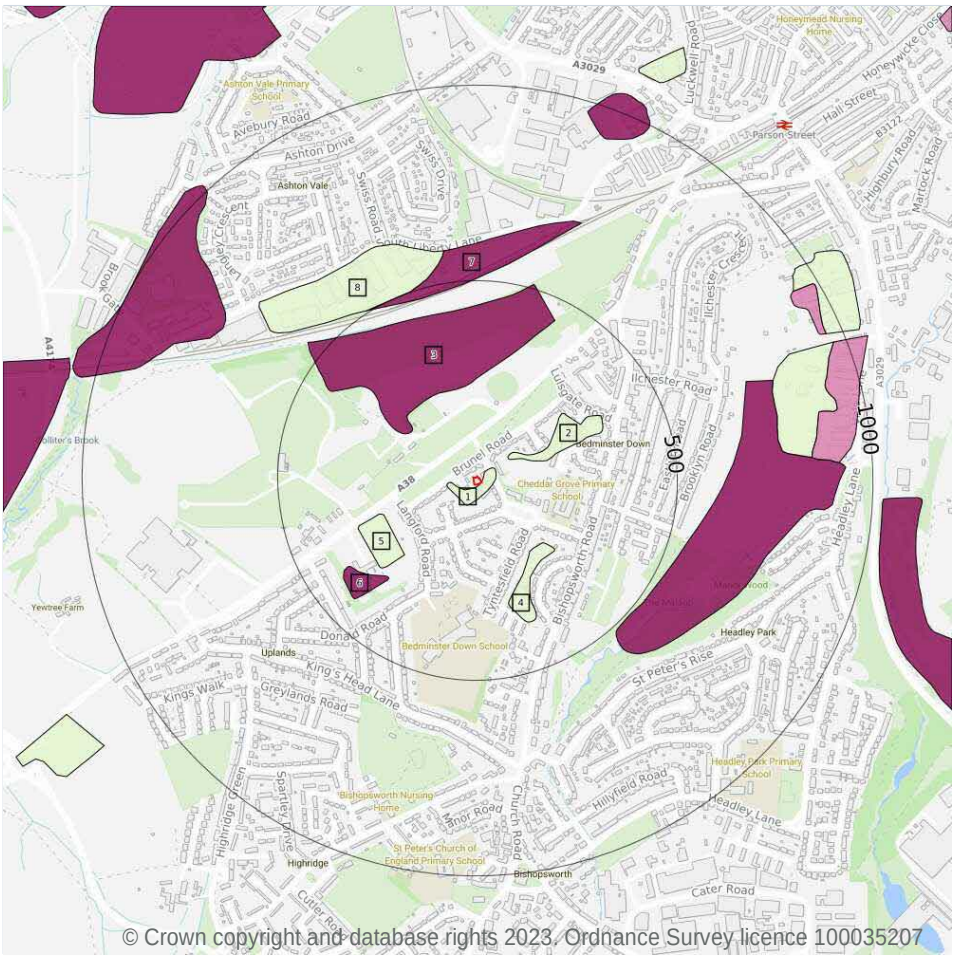
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on page 79 >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW264_bristol_v4

This data is sourced from the British Geological Survey.

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



15.2 Artificial and made ground (50k)

Records within 500m 8

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 80 >

ID	Location	LEX Code	Description	Rock description
1	**On site**	**WMGR-ARTDP**	**INFILLED GROUND**	**ARTIFICIAL DEPOSIT**
2	89m NE	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
3	197m NW	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
4	214m SE	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

ID	Location	LEX Code	Description	Rock description
5	241m SW	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT
6	324m SW	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
7	475m N	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
8	499m NW	WMGR-ARTDP	INFILLED GROUND	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

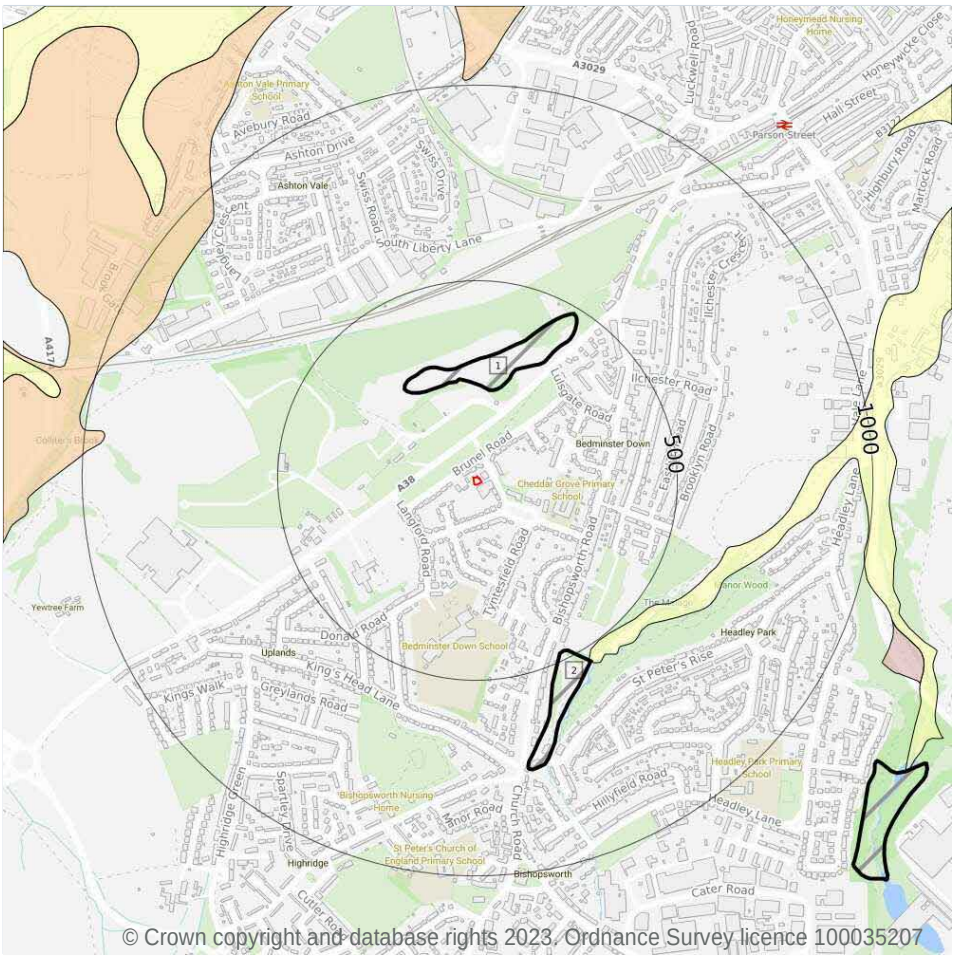
Records within 50m	1

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

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

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	0

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.

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	0

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

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	2

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.

Features are displayed on the Geology 1:50,000 scale - Superficial map on page 82 >

ID	Location	LEX Code	Description	Rock description
1	222m N	SLIP-UK NOWN	LANDSLIDE DEPOSITS	UNKNOWN/UNCLASSIFIED ENTRY
2	479m SE	SLIP-UKNOWN	LANDSLIDE DEPOSITS	UNKNOWN/UNCLASSIFIED ENTRY

This data is sourced from the British Geological Survey.

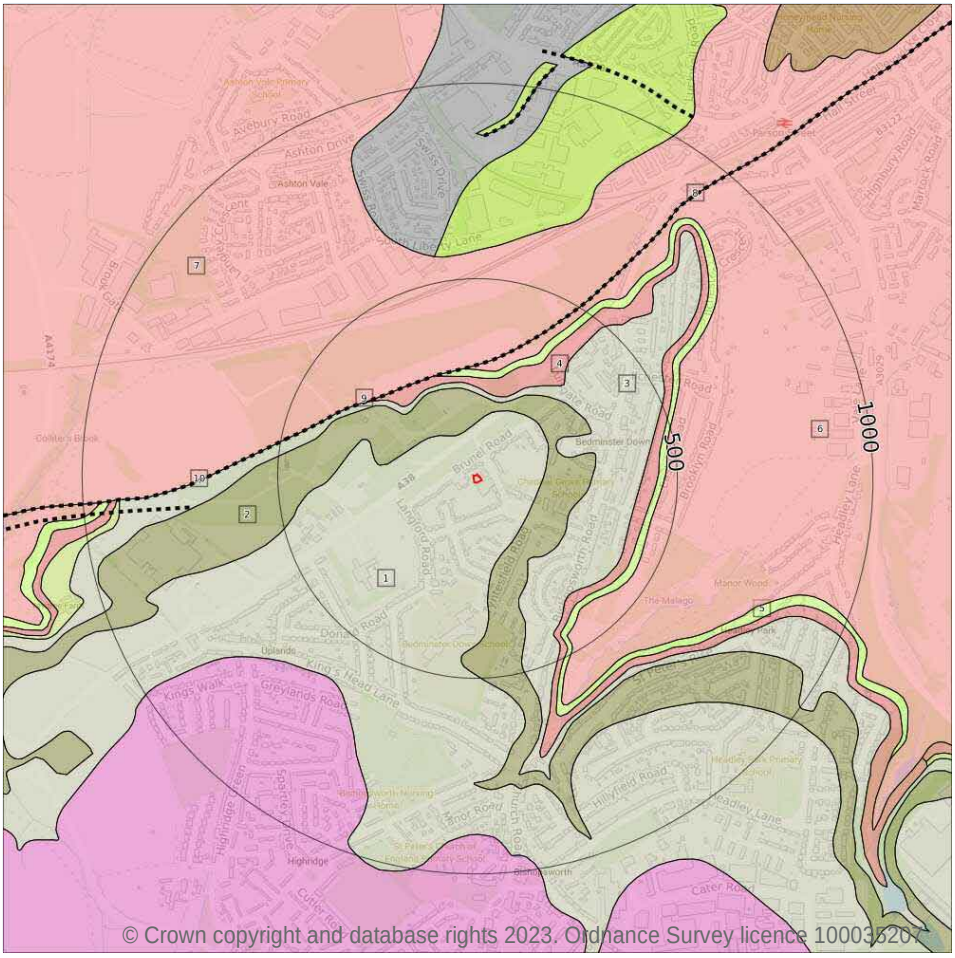
15.7 Landslip permeability (50k)

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 7

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 84 >

ID	Location	LEX Code	Description	Rock age
1	**On site**	**RLS-LSM D**	**RUGBY LIMESTONE MEMBER - LIMESTONE AND MUDSTONE, INTERBEDDED**	**HETTANGIAN**
2	110m N	SASH-MDST	SALTFORD SHALE MEMBER - MUDSTONE	RHAETIAN
3	191m N	WCT-LSMD	WILMCOTE LIMESTONE MEMBER - LIMESTONE AND MUDSTONE, INTERBEDDED	RHAETIAN

ID	Location	LEX Code	Description	Rock age
4	205m N	WBCT-MDLM	WESTBURY FORMATION AND COTHAM MEMBER (UNDIFFERENTIATED) - MUDSTONE AND LIMESTONE, INTERBEDDED	RHAETIAN
5	246m N	BAN-MDST	BLUE ANCHOR FORMATION - MUDSTONE	NORIAN
6	265m N	MMG-MDHA	MERCIA MUDSTONE GROUP - MUDSTONE AND HALITE-STONE	-
7	271m N	MMG-MDHA	MERCIA MUDSTONE GROUP - MUDSTONE AND HALITE-STONE	-

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m **1**

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

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

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m **3**

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 84 >

ID	Location	Category	Description
8	271m N	FAULT	Fault, inferred, displacement unknown
9	273m NW	FAULT	Fault, inferred, displacement unknown
10	489m W	FAULT	Fault, observed, displacement unknown

This data is sourced from the British Geological Survey.

16 Boreholes

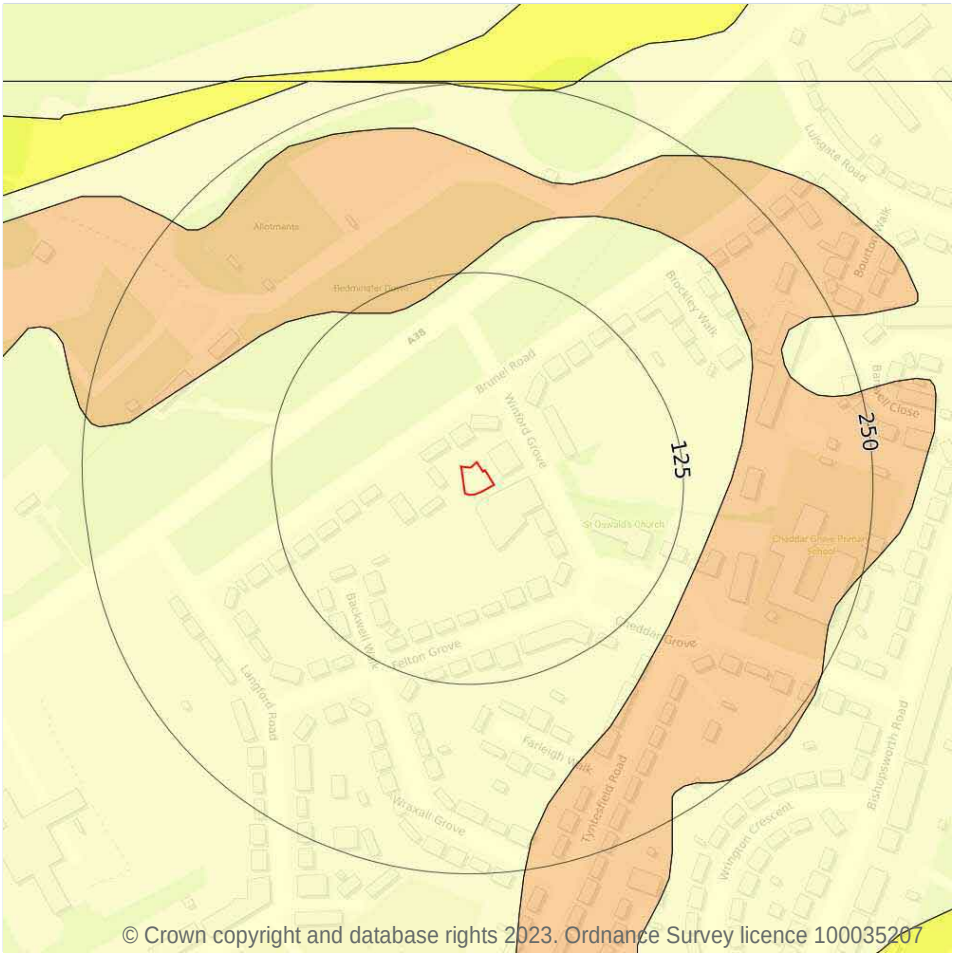
16.1 BGS Boreholes

Records within 250m	0

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

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



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 87 >

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands

Site Outline

Search buffers in metres (m)

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

17.2 Running sands

Records within 50m	2

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.

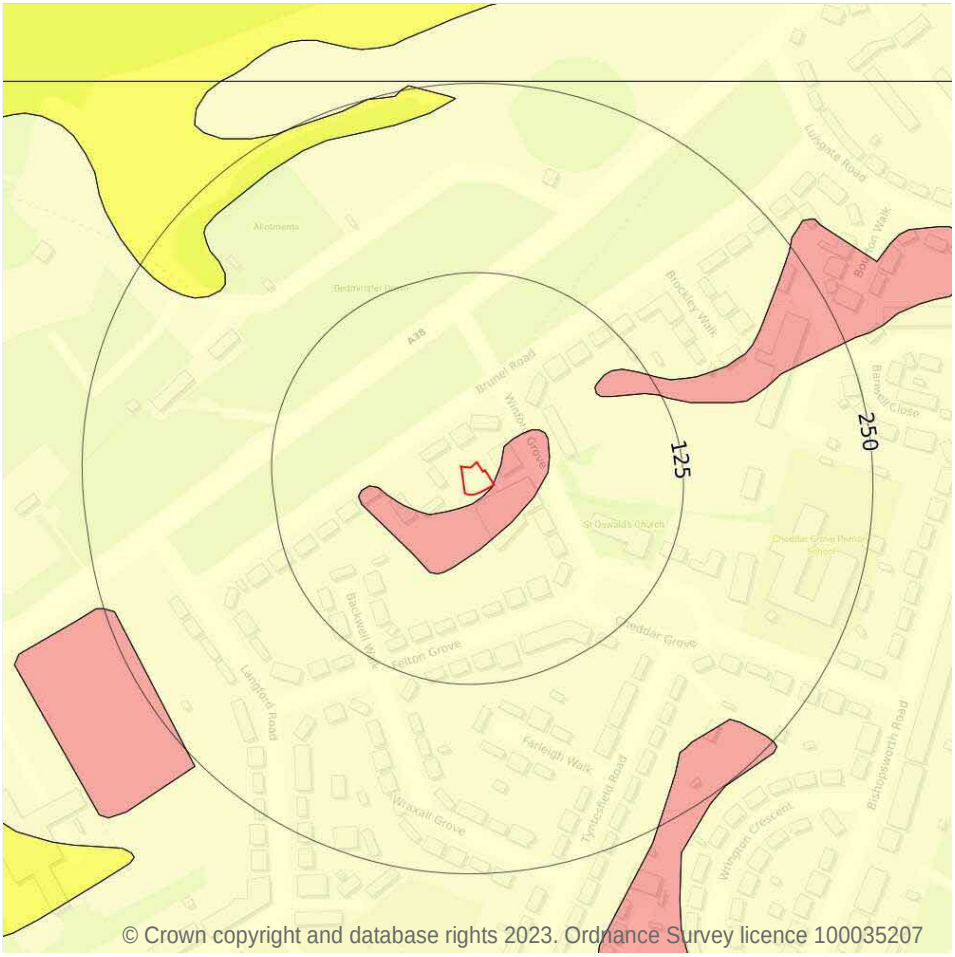
Features are displayed on the Natural ground subsidence - Running sands map on page 88 >

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

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	2

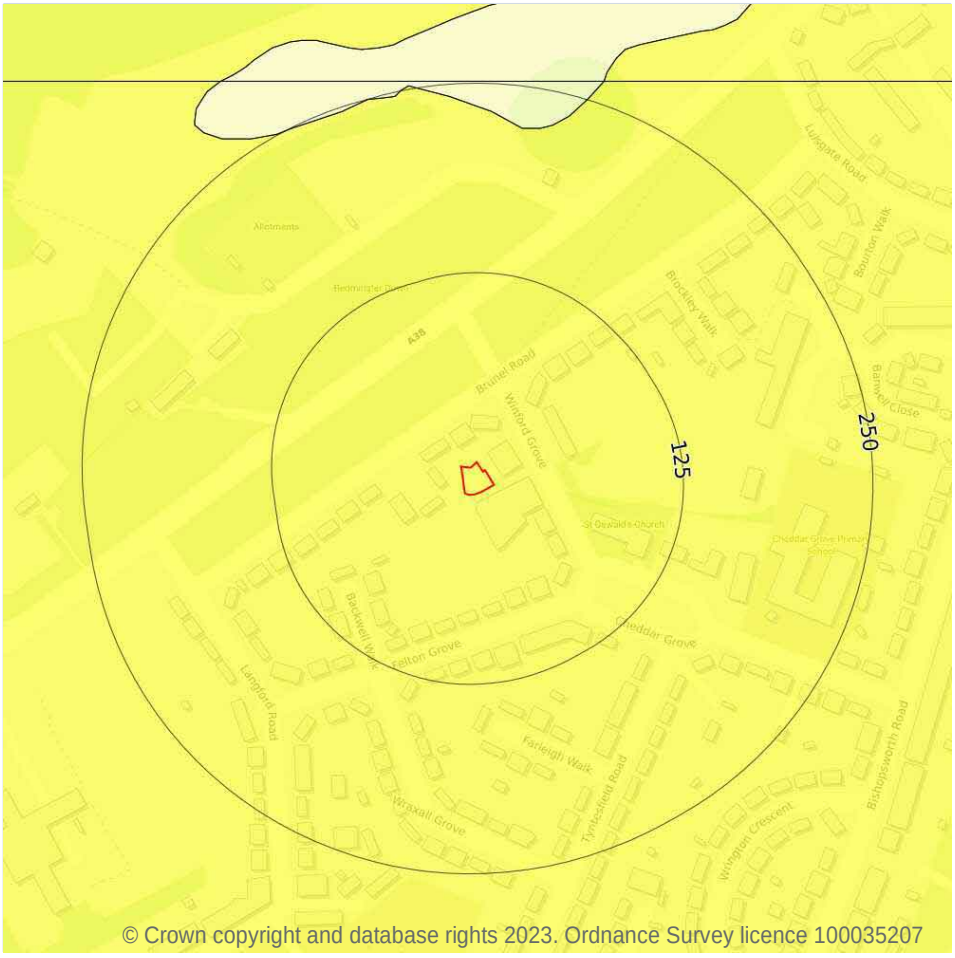
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on page 90 >

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**
On site	**Moderate**	**Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



17.4 Collapsible deposits

Records within 50m	1

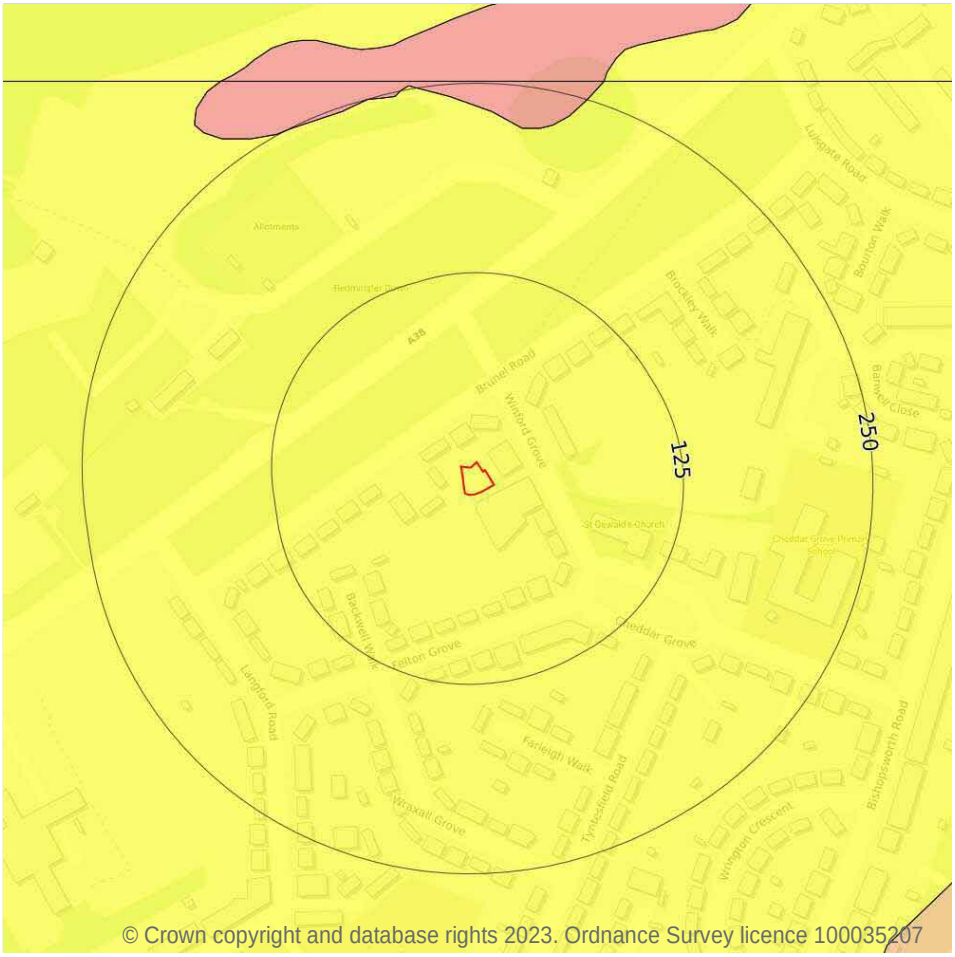
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on page 92 >

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

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

17.5 Landslides

Records within 50m	1

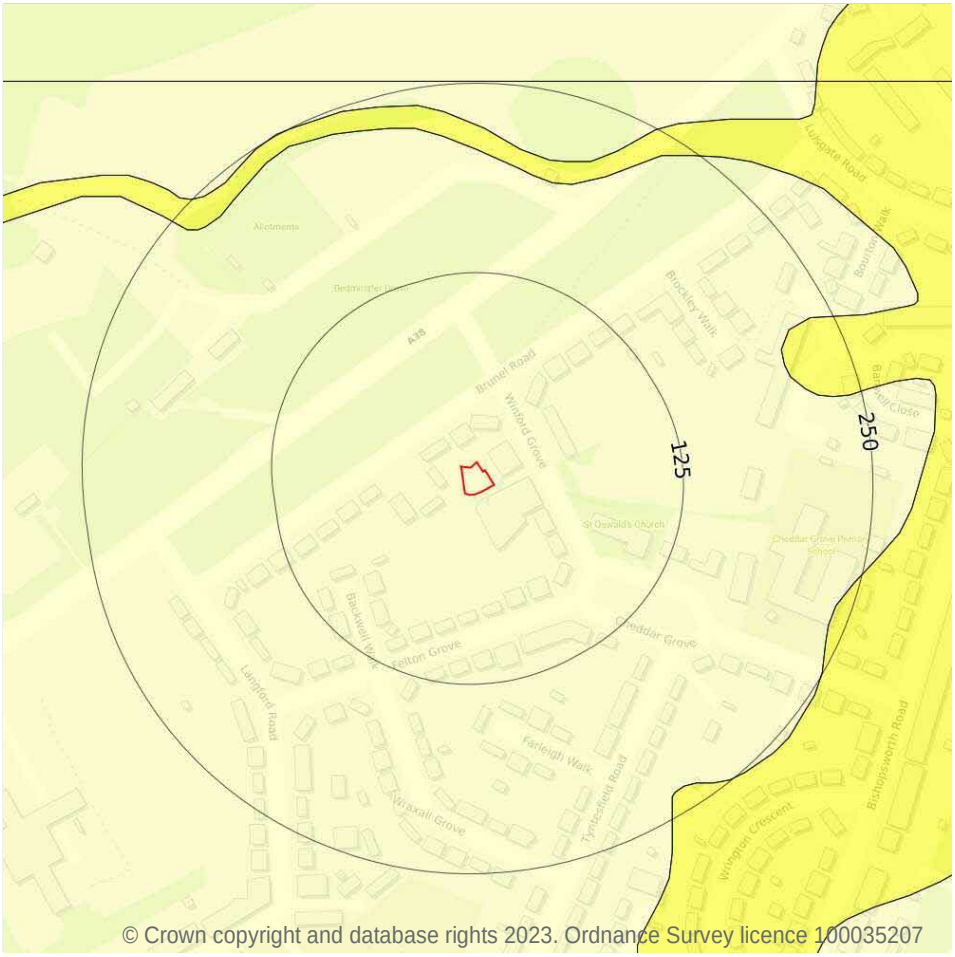
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on page 93 >

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

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m	1

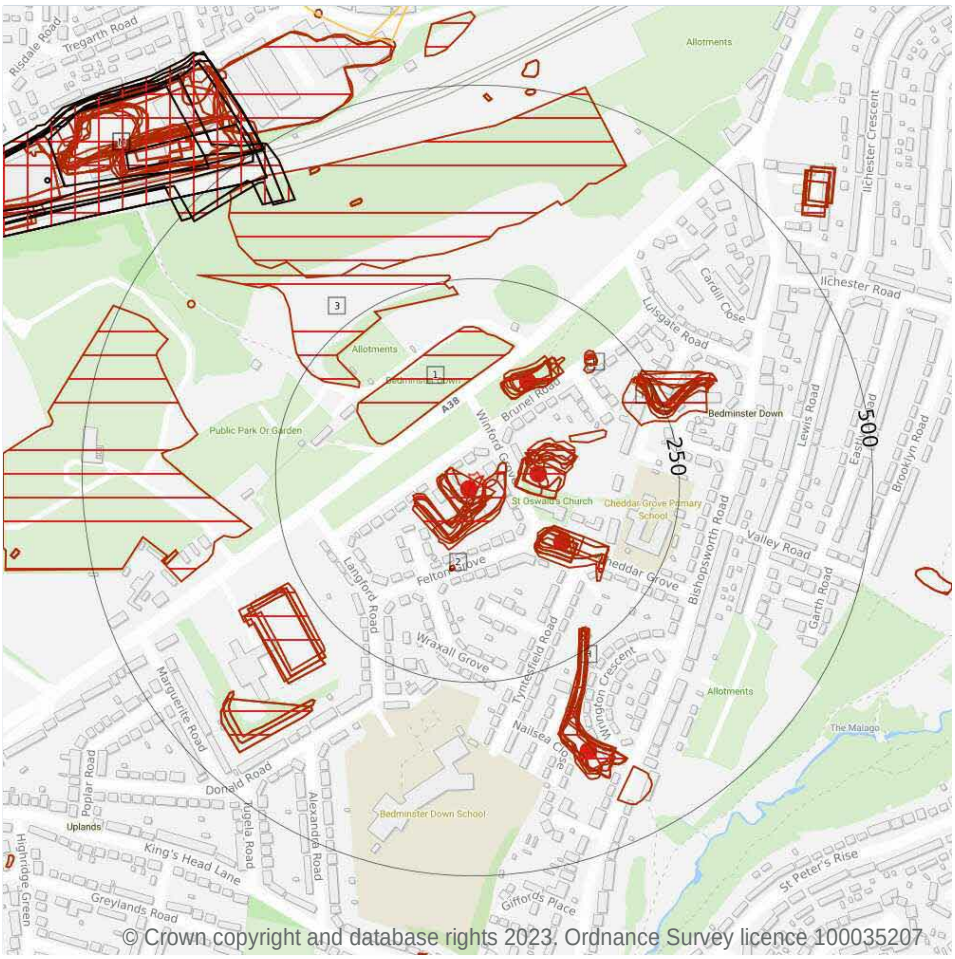
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on page 94 >

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

This data is sourced from the British Geological Survey.

18 Mining and ground workings



Site Outline

Search buffers in metres (m)

- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m	5

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

Features are displayed on the Mining and ground workings map on page 96 >

ID	Location	Details	Description
A	2m SW	Name: Bedminster Down Address: Headley, BRISTOL, Avon Commodity: Limestone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
B	68m E	Name: Bedminster Down Address: BRISTOL, Avon Commodity: Limestone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
C	123m SE	Name: Bedminster Down Address: Bedminster, BRISTOL, Avon Commodity: Limestone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
D	133m NE	Name: Bedminster Down Address: Bedminster Down, BRISTOL, Avon Commodity: Limestone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
G	368m SE	Name: Bedminster Down Address: Bedminster Down, BRISTOL, Avon Commodity: Limestone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	69

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 96 >

ID	Location	Land Use	Year of mapping	Mapping scale
A	**On site**	**Unspecified Old Quarries**	**1930**	**1:10560**
A	**On site**	**Unspecified Old Quarries**	**1913**	**1:10560**
A	**On site**	**Unspecified Pit**	**1953**	**1:10560**
A	**On site**	**Unspecified Quarries**	**1887**	**1:10560**
A	0m E	Unspecified Quarry	1938	1:10560
A	5m SE	Unspecified Old Quarries	1913	1:10560
A	9m SW	Unspecified Quarries	1883	1:10560
A	11m S	Unspecified Quarries	1902	1:10560
A	11m SE	Unspecified Quarries	1905	1:10560
A	18m S	Unspecified Quarries	1884	1:10560
A	18m S	Unspecified Quarries	1884	1:10560
A	18m S	Unspecified Quarries	1883	1:10560
B	37m E	Unspecified Quarries	1883	1:10560
B	39m E	Unspecified Quarries	1884	1:10560
B	39m E	Unspecified Quarries	1884	1:10560
B	48m E	Unspecified Quarries	1887	1:10560
B	50m E	Unspecified Quarries	1883	1:10560
B	58m E	Unspecified Old Quarries	1913	1:10560
B	61m E	Unspecified Quarries	1902	1:10560
B	64m NE	Unspecified Quarry	1930	1:10560
B	64m NE	Unspecified Quarry	1913	1:10560
B	68m NE	Old Quarries	1905	1:10560
B	70m E	Unspecified Quarry	1938	1:10560
C	93m SE	Unspecified Quarries	1905	1:10560
C	96m SE	Unspecified Quarries	1902	1:10560
1	97m NW	Unspecified Pit	1953	1:10560
C	97m SE	Unspecified Old Quarries	1930	1:10560
C	97m SE	Unspecified Old Quarries	1913	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
C	99m SE	Unspecified Quarries	1887	1:10560
C	99m SE	Unspecified Quarries	1883	1:10560
C	99m SE	Unspecified Quarries	1884	1:10560
C	99m SE	Unspecified Quarries	1884	1:10560
C	100m SE	Unspecified Quarries	1883	1:10560
2	102m S	Pond	1913	1:10560
C	102m SE	Unspecified Old Quarries	1913	1:10560
D	104m NE	Unspecified Quarry	1883	1:10560
D	106m NE	Unspecified Quarry	1884	1:10560
D	106m NE	Unspecified Quarry	1884	1:10560
D	111m N	Unspecified Old Quarries	1902	1:10560
D	117m N	Unspecified Quarry	1887	1:10560
D	117m N	Unspecified Old Quarries	1905	1:10560
D	118m NE	Unspecified Quarry	1883	1:10560
B	122m NE	Unspecified Heap	1975	1:10000
3	182m NW	Refuse Heap	1975	1:10000
E	191m NE	Unspecified Pit	1913	1:10560
E	198m NE	Unspecified Old Quarries	1902	1:10560
E	198m NE	Unspecified Pit	1930	1:10560
E	198m NE	Unspecified Pit	1913	1:10560
E	203m NE	Unspecified Old Quarries	1905	1:10560
F	205m NE	Unspecified Pit	1953	1:10560
G	223m SE	Unspecified Quarry	1930	1:10560
G	224m SE	Unspecified Old Quarry	1902	1:10560
H	224m SE	Unspecified Ground Workings	1938	1:10560
H	224m SE	Unspecified Ground Workings	1883	1:10560
G	224m SE	Unspecified Old Quarry	1913	1:10560
G	227m SE	Unspecified Quarry	1884	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
G	227m SE	Unspecified Quarry	1884	1:10560
F	229m NE	Unspecified Heap	1913	1:10560
F	231m NE	Unspecified Ground Workings	1884	1:10560
F	231m NE	Unspecified Ground Workings	1884	1:10560
G	233m SE	Unspecified Old Quarry	1913	1:10560
F	236m NE	Unspecified Ground Workings	1913	1:10560
F	236m NE	Unspecified Heap	1930	1:10560
F	237m NE	Unspecified Heap	1938	1:10560
F	237m NE	Unspecified Heap	1883	1:10560
F	237m NE	Unspecified Ground Workings	1902	1:10560
F	239m NE	Unspecified Old Quarries	1905	1:10560
F	242m NE	Unspecified Heap	1883	1:10560
F	243m NE	Unspecified Ground Workings	1887	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m	8

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 96 >

ID	Location	Land Use	Year of mapping	Mapping scale
M	421m NW	Colliery	1883	1:10560
M	428m NW	Colliery	1905	1:10560
M	464m NW	Colliery	1938	1:10560
M	464m NW	Colliery	1913	1:10560
M	491m NW	Colliery	1902	1:10560
M	496m NW	Colliery	1913	1:10560
M	519m NW	Colliery	1883	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
M	661m NW	Unspecified Old Shaft	1930	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m	0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	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	2

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

Features are displayed on the Mining and ground workings map on page 96 >

ID	Location	Name	Commodity	Class	Likelihood
9	567m N	Not available	Iron Ore (Bedded)	B	Underground mine workings may have occurred in the past or current mines may be working at significant depth to modern engineering standards. Potential for difficult ground conditions are unlikely and are at a level where they need not be considered.

ID	Location	Name	Commodity	Class	Likelihood
-	865m N	Not available	Iron Ore (Bedded)	B	Underground mine workings may have occurred in the past or current mines may be working at significant depth to modern engineering standards. 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

19.1 Natural cavities

Records within 500m	0

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

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m	0

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

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m	0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m	0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.

This data is sourced from Groundsure.

19.5 National karst database

Records within 500m	0

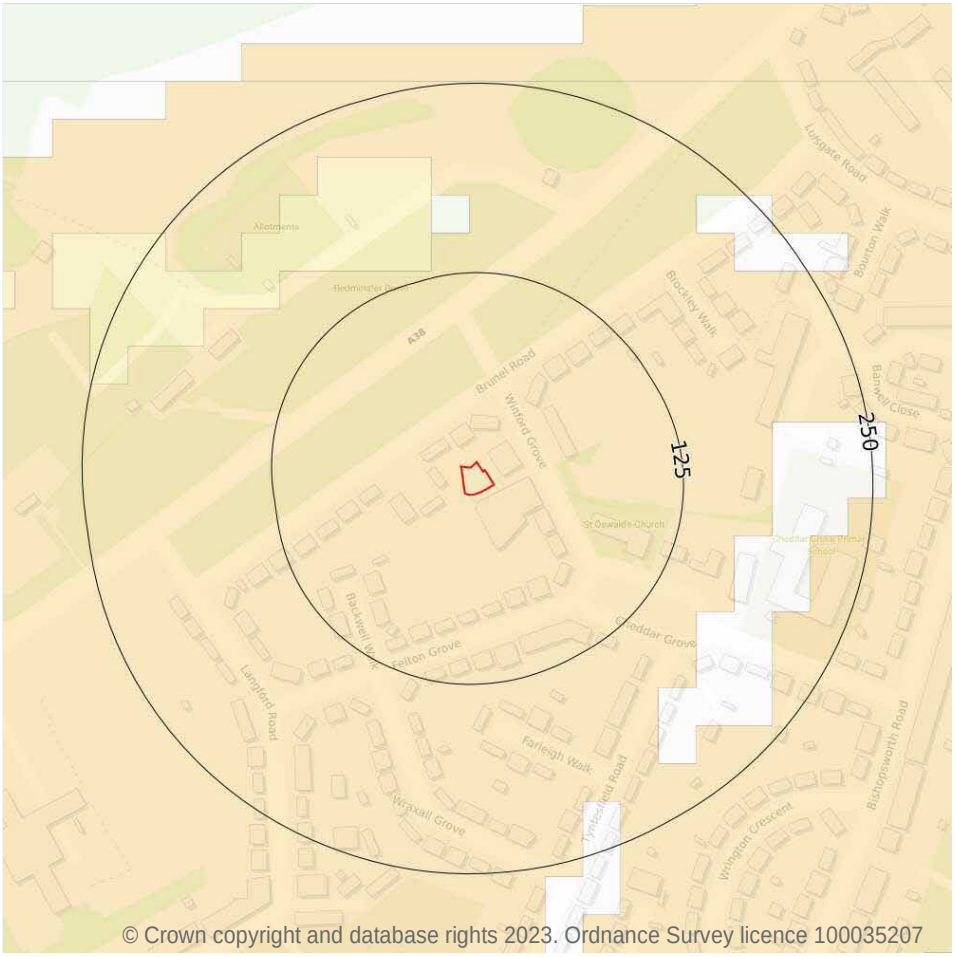
This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.

20 Radon



Site Outline

Search buffers in metres (m)

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

20.1 Radon

Records on site	1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on page 107 >

Location	Estimated properties affected	Radon Protection Measures required
On site	Between 3% and 5%	Basic

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	3

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

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**35 - 45 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**90 - 120 mg/kg**	**30 - 45 mg/kg**
45m W	35 - 45 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
45m W	35 - 45 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 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 km^2).

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 km^2.

This data is sourced from the British Geological Survey.

22 Railway infrastructure and projects

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

22.1 Underground railways (London)

Records within 250m	0

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

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m	0

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

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m	3

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

Features are displayed on the Railway infrastructure and projects map on page 110 >

Location	Land Use	Year of mapping	Mapping scale
On site	Railway Sidings	1903	2500
On site	Railway Sidings	1905	10560
On site	Railway Sidings	1902	10560

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m	0

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

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m	0

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

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m	0

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

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 1

Records within 500m	0

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

This data is sourced from publicly available information by Groundsure.

22.9 Crossrail 2

Records within 500m	0

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

This data is sourced from publicly available information by Groundsure.

22.10 HS2

Records within 500m	0

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

This data is sourced from HS2 ltd.

Data providers

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

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-april-2023/ ↗ .

APPENDIX 2

EXPLORATORY HOLE LOGS


Well


Well


Well


Well

APPENDIX 3

IN SITU TEST RESULTS

Dynamic Probe Test Results Sheet

Site: **WINFORD GROVE, BRISTOL, BS13 7DY** Date: 27-Nov-22

Job Number: **B3305** Test Type: DPSH

Client: Country Developments (Bristol) Ltd Final Depth: 4.60

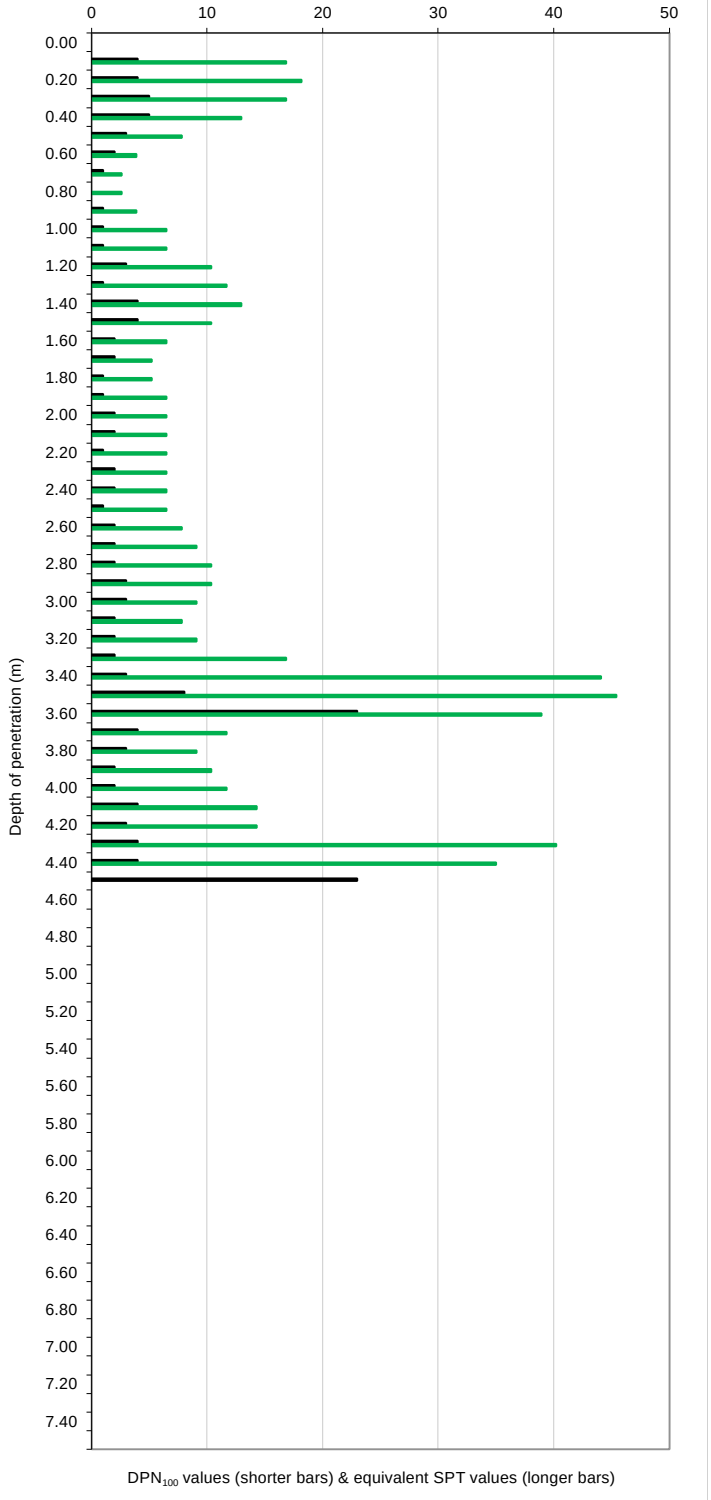
Rig Type: Archway Dart Sheet 1 of 1 DP No: **WS01**

EARTH ENVIRONMENTAL & GEOTECHNICAL

Penetration Test Results			
Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00			
0.10	4	13	17
0.20	4	14	18
0.30	5	13	17
0.40	5	10	13
0.50	3	6	8
0.60	2	3	4
0.70	1	2	3
0.80	0	2	3
0.90	1	3	4
1.00	1	5	6
1.10	1	5	6
1.20	3	8	10
1.30	1	9	12
1.40	4	10	13
1.50	4	8	10
1.60	2	5	6
1.70	2	4	5
1.80	1	4	5
1.90	1	5	6
2.00	2	5	6
2.10	2	5	6
2.20	1	5	6
2.30	2	5	6
2.40	2	5	6
2.50	1	5	6
2.60	2	6	8
2.70	2	7	9
2.80	2	8	10
2.90	3	8	10
3.00	3	7	9
3.10	2	6	8
3.20	2	7	9
3.30	2	13	17
3.40	3	34	44
3.50	8	35	45
3.60	23	30	39
3.70	4	9	12
3.80	3	7	9
3.90	2	8	10
4.00	2	9	12
4.10	4	11	14
4.20	3	11	14
4.30	4	31	40
4.40	4	27	35
4.50	23		
4.60	50/60mm		
4.70			
4.80			
4.90			
5.00			
5.10			
5.20			
5.30			
5.40			
5.50			
5.60			
5.70			
5.80			
5.90			
6.00			
6.10			
6.20			
6.30			
6.40			
6.50			
6.60			
6.70			
6.80			
6.90			
7.00			
7.10			
7.20			
7.30			
7.40			
7.50			

Hammer Mass: 63.5 kg Cone Dia: 50.5mm

Drop Height: 750 mm Test by: DH



General Remarks:
DPN_{100} = Dynamic penetration resistance for 100mm penetration.
DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.
* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).
For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.
SPT hammer energy ratio = 77.85%

Dynamic Probe Test Results Sheet

Site: **WINFORD GROVE, BRISTOL, BS13 7DY** Date: 27-Nov-22

Job Number: **B3305** Test Type: DPSH

Client: Country Developments (Bristol) Ltd Final Depth: 5.00

Rig Type: Archway Dart Sheet 1 of 1 DP No: **WS02**

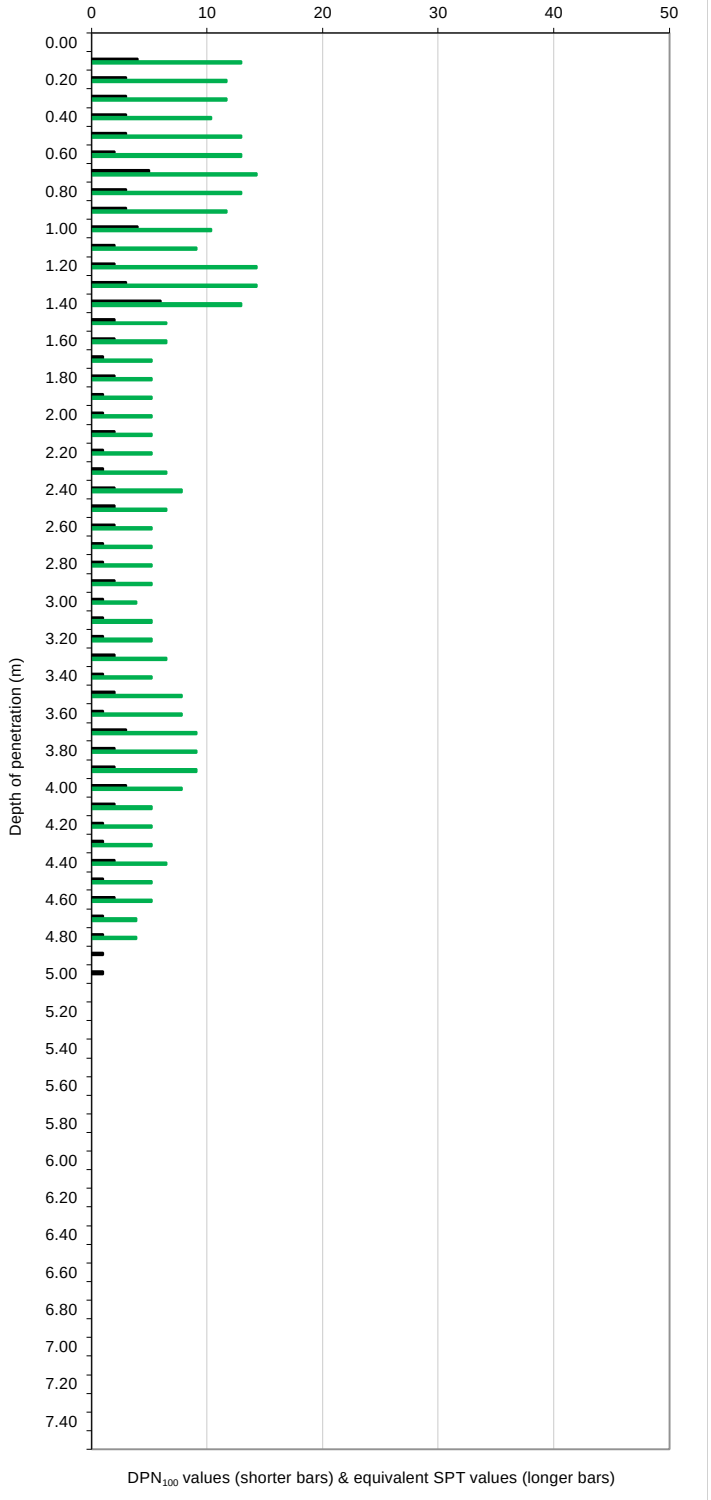
EARTH ENVIRONMENTAL & GEOTECHNICAL

Penetration Test Results

Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00			
0.10	4	10	13
0.20	3	9	12
0.30	3	9	12
0.40	3	8	10
0.50	3	10	13
0.60	2	10	13
0.70	5	11	14
0.80	3	10	13
0.90	3	9	12
1.00	4	8	10
1.10	2	7	9
1.20	2	11	14
1.30	3	11	14
1.40	6	10	13
1.50	2	5	6
1.60	2	5	6
1.70	1	4	5
1.80	2	4	5
1.90	1	4	5
2.00	1	4	5
2.10	2	4	5
2.20	1	4	5
2.30	1	5	6
2.40	2	6	8
2.50	2	5	6
2.60	2	4	5
2.70	1	4	5
2.80	1	4	5
2.90	2	4	5
3.00	1	3	4
3.10	1	4	5
3.20	1	4	5
3.30	2	5	6
3.40	1	4	5
3.50	2	6	8
3.60	1	6	8
3.70	3	7	9
3.80	2	7	9
3.90	2	7	9
4.00	3	6	8
4.10	2	4	5
4.20	1	4	5
4.30	1	4	5
4.40	2	5	6
4.50	1	4	5
4.60	2	4	5
4.70	1	3	4
4.80	1	3	4
4.90	1		
5.00	1		
5.10			
5.20			
5.30			
5.40			
5.50			
5.60			
5.70			
5.80			
5.90			
6.00			
6.10			
6.20			
6.30			
6.40			
6.50			
6.60			
6.70			
6.80			
6.90			
7.00			
7.10			
7.20			
7.30			
7.40			
7.50			

Hammer Mass: 63.5 kg Cone Dia: 50.5mm

Drop Height: 750 mm Test by: DH



General Remarks:
DPN_{100} = Dynamic penetration resistance for 100mm penetration.
DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.
* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).
For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.
SPT hammer energy ratio = 77.85%

Dynamic Probe Test Results Sheet

Site: **WINFORD GROVE, BRISTOL, BS13 7DY** Date: 27-Nov-22

Job Number: **B3305** Test Type: DPSH

Client: Country Developments (Bristol) Ltd Final Depth: 5.00

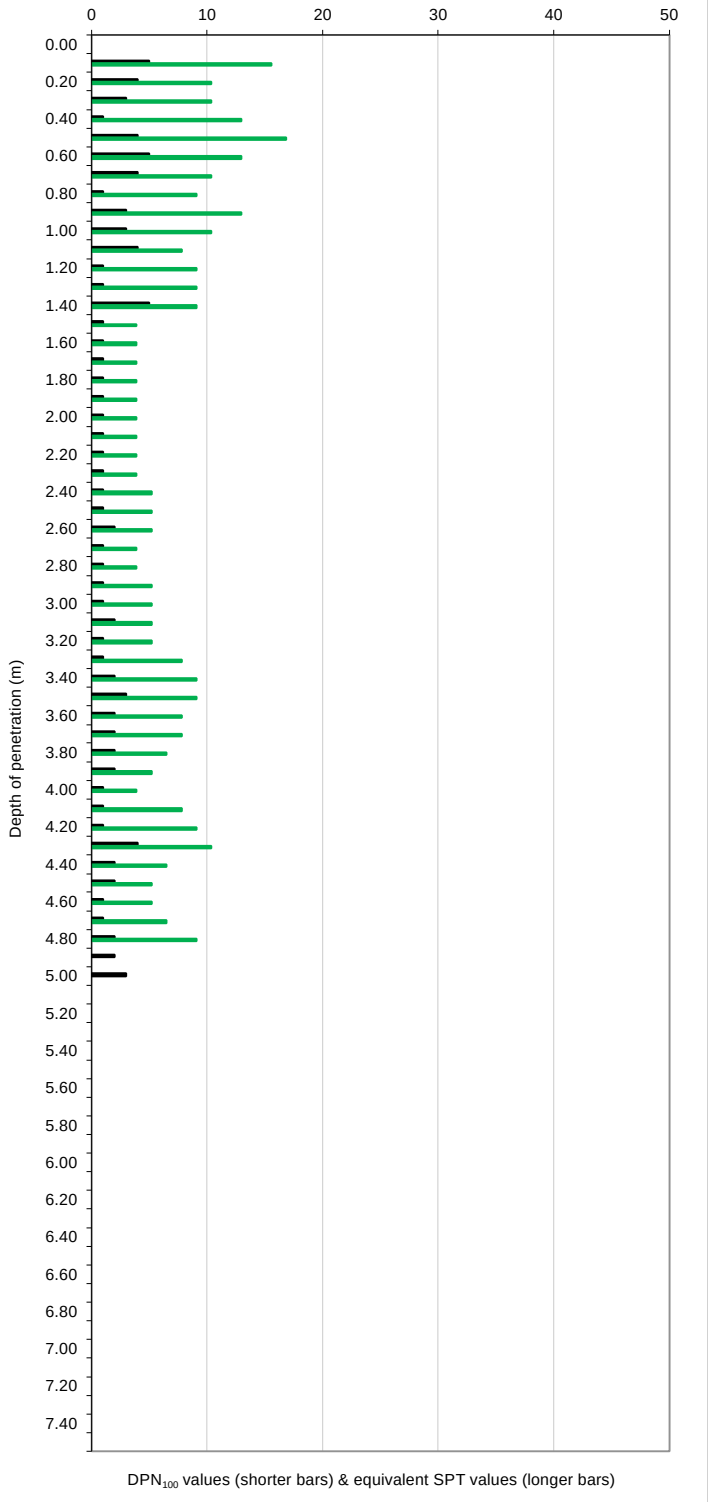
Rig Type: Archway Dart Sheet 1 of 1 DP No: **WS03**

EARTH ENVIRONMENTAL & GEOTECHNICAL

Penetration Test Results			
Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00			
0.10	5	12	16
0.20	4	8	10
0.30	3	8	10
0.40	1	10	13
0.50	4	13	17
0.60	5	10	13
0.70	4	8	10
0.80	1	7	9
0.90	3	10	13
1.00	3	8	10
1.10	4	6	8
1.20	1	7	9
1.30	1	7	9
1.40	5	7	9
1.50	1	3	4
1.60	1	3	4
1.70	1	3	4
1.80	1	3	4
1.90	1	3	4
2.00	1	3	4
2.10	1	3	4
2.20	1	3	4
2.30	1	3	4
2.40	1	4	5
2.50	1	4	5
2.60	2	4	5
2.70	1	3	4
2.80	1	3	4
2.90	1	4	5
3.00	1	4	5
3.10	2	4	5
3.20	1	4	5
3.30	1	6	8
3.40	2	7	9
3.50	3	7	9
3.60	2	6	8
3.70	2	6	8
3.80	2	5	6
3.90	2	4	5
4.00	1	3	4
4.10	1	6	8
4.20	1	7	9
4.30	4	8	10
4.40	2	5	6
4.50	2	4	5
4.60	1	4	5
4.70	1	5	6
4.80	2	7	9
4.90	2		
5.00	3		
5.10			
5.20			
5.30			
5.40			
5.50			
5.60			
5.70			
5.80			
5.90			
6.00			
6.10			
6.20			
6.30			
6.40			
6.50			
6.60			
6.70			
6.80			
6.90			
7.00			
7.10			
7.20			
7.30			
7.40			
7.50			

Hammer Mass: 63.5 kg Cone Dia: 50.5mm

Drop Height: 750 mm Test by: DH



General Remarks:
DPN_{100} = Dynamic penetration resistance for 100mm penetration.
DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.
* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).
For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.
SPT hammer energy ratio = 77.85%

Dynamic Probe Test Results Sheet

Site: **WINFORD GROVE, BRISTOL, BS13 7DY** Date: 27-Nov-22

Job Number: **B3305** Test Type: DPSH

Client: Country Developments (Bristol) Ltd Final Depth: 4.90

Rig Type: Archway Dart Sheet 1 of 1

DP No: **WS04**

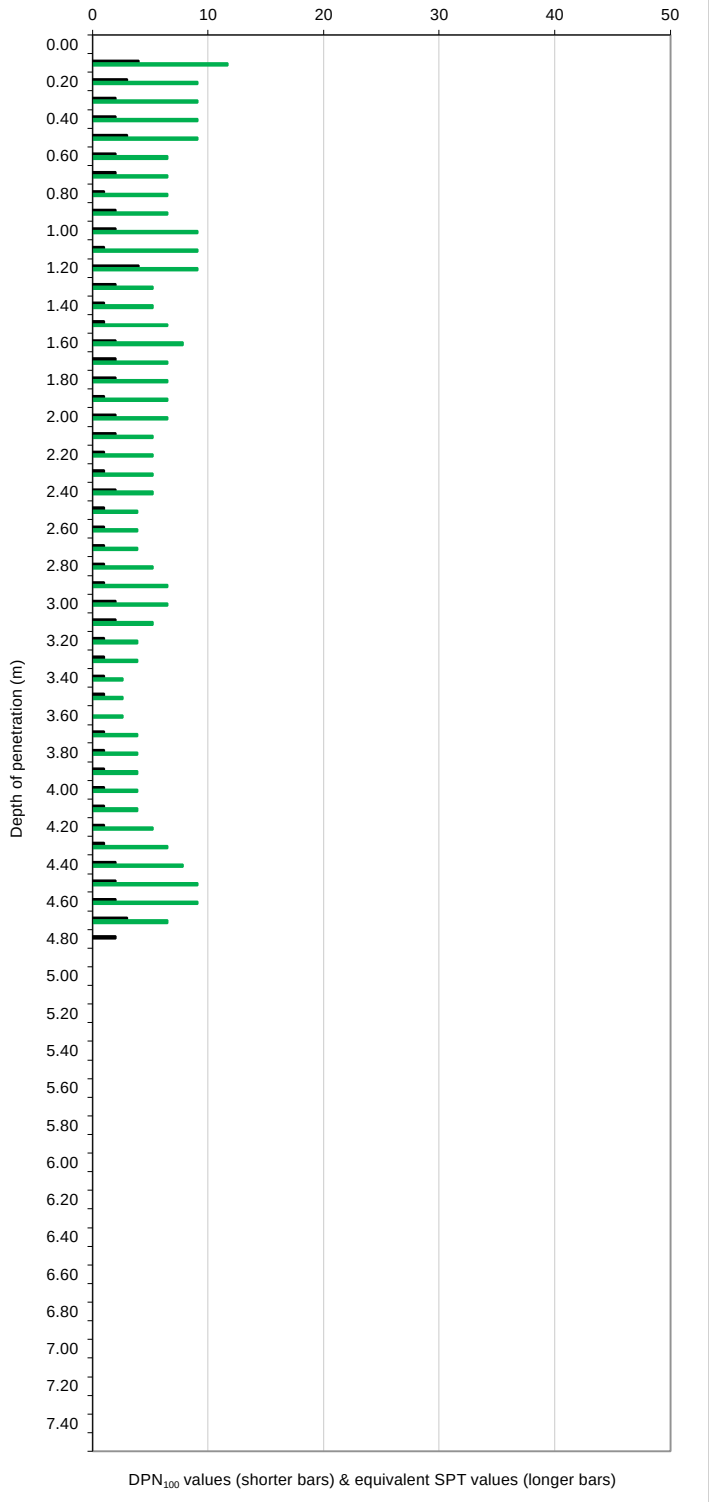
EARTH ENVIRONMENTAL & GEOTECHNICAL

Penetration Test Results

Depth (m)	DPN_{100}	DPN_{300}	SPT N *
0.00			
0.10	4	9	12
0.20	3	7	9
0.30	2	7	9
0.40	2	7	9
0.50	3	7	9
0.60	2	5	6
0.70	2	5	6
0.80	1	5	6
0.90	2	5	6
1.00	2	7	9
1.10	1	7	9
1.20	4	7	9
1.30	2	4	5
1.40	1	4	5
1.50	1	5	6
1.60	2	6	8
1.70	2	5	6
1.80	2	5	6
1.90	1	5	6
2.00	2	5	6
2.10	2	4	5
2.20	1	4	5
2.30	1	4	5
2.40	2	4	5
2.50	1	3	4
2.60	1	3	4
2.70	1	3	4
2.80	1	4	5
2.90	1	5	6
3.00	2	5	6
3.10	2	4	5
3.20	1	3	4
3.30	1	3	4
3.40	1	2	3
3.50	1	2	3
3.60	0	2	3
3.70	1	3	4
3.80	1	3	4
3.90	1	3	4
4.00	1	3	4
4.10	1	3	4
4.20	1	4	5
4.30	1	5	6
4.40	2	6	8
4.50	2	7	9
4.60	2	7	9
4.70	3	5	6
4.80	2		
4.90	50/95mm		
5.00			
5.10			
5.20			
5.30			
5.40			
5.50			
5.60			
5.70			
5.80			
5.90			
6.00			
6.10			
6.20			
6.30			
6.40			
6.50			
6.60			
6.70			
6.80			
6.90			
7.00			
7.10			
7.20			
7.30			
7.40			
7.50			

Hammer Mass: 63.5 kg Cone Dia: 50.5mm

Drop Height: 750 mm Test by: DH



General Remarks:

DPN_{100} = Dynamic penetration resistance for 100mm penetration.

DPN_{300} = Dynamic penetration resistance for 300mm penetration (ie: sum of 3 consecutive DPN_{100} values), starting at the depth given.

* Equivalent SPT N-values (for 300mm penetration) assumed to approximate the DPN_{300} values for dynamic probe "super-heavy" test (DPSH).

For dynamic probe "heavy" test (DPH), equivalent SPT N-values estimated using the theoretical relationship DPN_{300} = 1.5 SPT-N. [see Card,G.B., Roche,D.P. & Herbert,S.M., in Geol. Soc. Special Publication No 6, *Field Testing in Engineering Geology* (1990)]. SPT values are estimated and are for general guidance only.

SPT hammer energy ratio = 77.85%

APPENDIX 4

LABORATORY TEST RESULTS

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.4 & 5.3)

Contract Number	69928
Project Name	Winford Grove, Bristol
Date Tested	14/12/2023

DESCRIPTIONS

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
WS01		D	2.20	-	2.40	Brown/grey silty CLAY
WS02		D	1.20	-	1.40	Brown fine to coarse gravelly silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
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				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

Operator
Darren Bourne

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.4 & 5.3)	
Contract Number	69928	
Project Name	Winford Grove, Bristol	
Date Tested	14/12/2023	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
WS01		D	2.20	-	2.40	27	67	25	42	100	CH High Plasticity
WS02		D	1.20	-	1.40	27	62	23	39	85	CH High Plasticity
				-							
				-							
				-							
				-							
				-							
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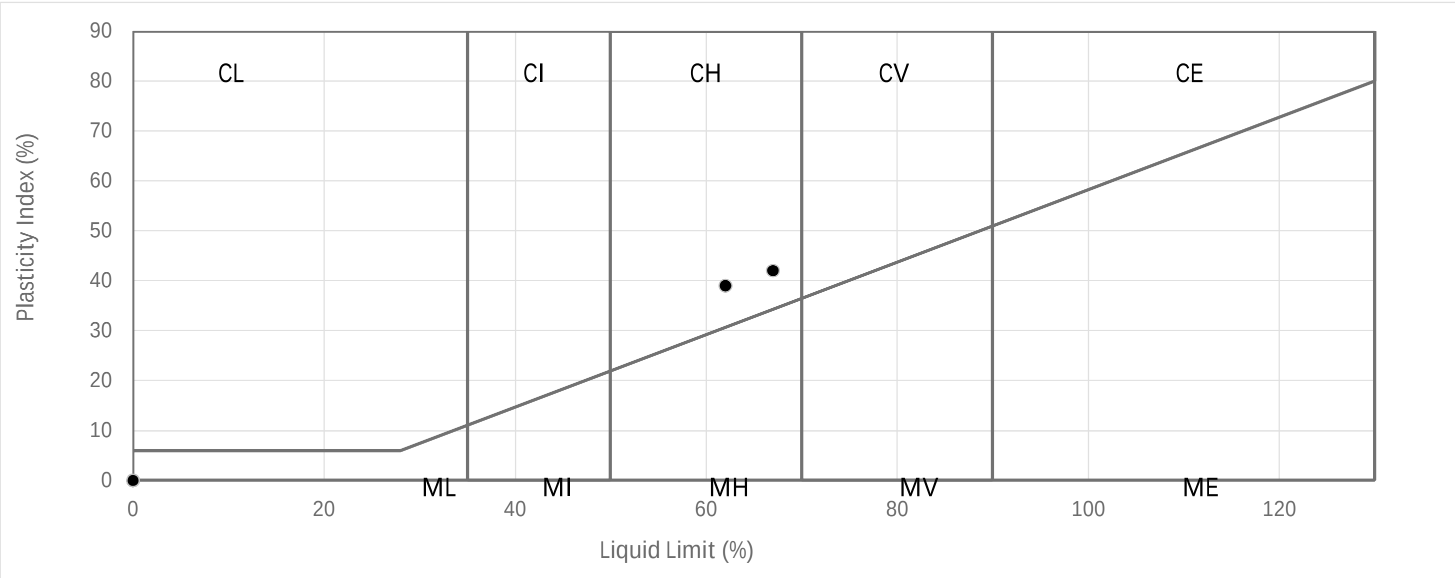
				-							
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Darren Bourne

UKAS TESTING 2788

7 - 11 Harding Street
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SA14 8QN

Analytical Test Report:	L23/07683/GSL - 23-39972

Your Project Reference:	WINFORD GROVE, BRISTOL B3305		
Your Order Number:	69928	Samples Received / Instructed:	07/12/2023 / 07/12/2023
Report Issue Number:	1	Sample Tested:	07/12 to 18/12/2023
Samples Analysed:	2 soil samples	Report issued:	18/12/2023

Signed

James Gane
Analytical Services Manager
CTS Group

Notes

Gene

Please [redacted] aken.

Sampl

Moist [redacted] le Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Date of Issue: 30.10.2023

Issued by: J. Gane

Issue No: 4

Rev No: 5

CTS Group
7 - 11 Harding Street
Leicester
LE1 4DH

L23/07683/GSL - 23-39972

Project Reference - WINFORD GROVE, BRISTOL B3305

Analytical Test Results - Chemical Analysis

Lab Reference			331474	331475
Client Sample ID			-	-
Client Sample Location			WS01	WS04
Client Sample Type			D	D
Client Sample Number			-	-
Depth - Top (m)			0.80	1.40
Depth - Bottom (m)			1.00	1.60
Date of Sampling			-	-
Time of Sampling			-	-
Sample Matrix			Clay	Clay
Determinant	Units	Accreditation		
Water soluble sulphate (as SO_4)	(mg/l)	u	160	69
pH Value	pH Units	MCERTS	8.2	8.3

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Project Reference - WINFORD GROVE, BRISTOL B3305

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
331474	-	WS01	D	-	Made Ground- dark brown gravelly sandy silty clay with occasional slag brick fragments	-	-	59
331475	-	WS04	D	-	Greyish brown slightly gravelly sandy silty clay with rare organic matter	-	-	50

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L23/07683/GSL - 23-39972

Project Reference - WINFORD GROVE, BRISTOL B3305

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
331474	-	WS01	D	-	
331475	-	WS04	D	-	

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L23/07683/GSL - 23-39972

Project Reference - WINFORD GROVE, BRISTOL B3305

Analysis Methodologies

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preperation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis

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L23/07683/GSL - 23-39972

Project Reference - WINFORD GROVE, BRISTOL B3305

Sample Deviations

Deviations are listed below against each sample and associated test method, where deviation(s) are noted it means data may not be representative of the sample at the time of sampling and it is possible that results provided may be compromised.

Observations on receipt

A - No date of sampling provided

C - Received in inappropriate container

H - Contains headspace

T - Temperature on receipt exceeds storage temperature

R - Sample(s) received with less than 96 hours for testing to commence/complete, any result formally classed as deviating will be marked with an X against the applicable test (i.e. RX)

Observations whilst in laboratory

X - Exceeds sampling to extraction or analysis timescales

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Test	Deviations
331474	-	WS01	D	-		A
331475	-	WS04	D	-		A

Amelia Samuel
Earth Environmental & Geotechnical (Southern Ltd)
Studio 3,
Tollbridge Studios
Toll Bridge Road
Bath
BA1 7DE

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-14701

Site Reference:	Winford Grove
Project / Job Ref:	3305
Order No:	3305/AS/291123
Sample Receipt Date:	30/11/2023
Sample Scheduled Date:	30/11/2023
Report Issue Number:	1
Reporting Date:	06/12/2023

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

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Maidstone
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Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 23-14701	Date Sampled	28/11/23	28/11/23	28/11/23	28/11/23	
Earth Environmental & Geotechnical (Southern Ltd)	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Winford Grove	TP / BH No	WS01	WS02	WS03	WS04	
Project / Job Ref: 3305	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: 3305/AS/291123	Depth (m)	0.40 - 0.60	0.80 - 1.00	0.30 - 0.40	0.60 - 0.80	
Reporting Date: 06/12/2023	DETS Sample No	688048	688049	688050	688051	

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	
pH	pH Units	N/a	MCERTS	8.1	7.9	8.0	7.7	
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Complex Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Free Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	1814	979	1018	2236	
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.18	0.10	0.10	0.22	
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	57	177	22	27	
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.06	0.18	0.02	0.03	
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	
Organic Matter (SOM)	%	< 0.1	MCERTS	10.9	2.6	6	13.7	
Arsenic (As)	mg/kg	< 2	MCERTS	27	8	20	30	
Barium (Ba)	mg/kg	< 2.5	MCERTS	637	93	547	503	
Beryllium (Be)	mg/kg	< 0.5	MCERTS	1.1	0.8	1	1.4	
W/S Boron	mg/kg	< 1	NONE	1.9	1.2	1.2	2.2	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	1.8	0.3	1.1	1.7	
Chromium (Cr)	mg/kg	< 2	MCERTS	20	17	17	22	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	66	27	61	82	
Lead (Pb)	mg/kg	< 3	MCERTS	457	20	309	248	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	20	27	17	33	
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Vanadium (V)	mg/kg	< 1	MCERTS	31	16	26	31	
Zinc (Zn)	mg/kg	< 3	MCERTS	325	61	361	276	
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Soil Analysis Certificate - Speciated PAHs							
DETS Report No: 23-14701	Date Sampled	28/11/23	28/11/23	28/11/23	28/11/23	
Earth Environmental & Geotechnical (Souther	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Winford Grove	TP / BH No	WS01	WS02	WS03	WS04	
Project / Job Ref: 3305	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: 3305/AS/291123	Depth (m)	0.40 - 0.60	0.80 - 1.00	0.30 - 0.40	0.60 - 0.80	
Reporting Date: 06/12/2023	DETS Sample No	688048	688049	688050	688051	

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	0.31	< 0.1	< 0.1	< 0.1	
Acenaphthylene	mg/kg	< 0.1	MCERTS	0.15	< 0.1	< 0.1	< 0.1	
Acenaphthene	mg/kg	< 0.1	MCERTS	0.20	< 0.1	< 0.1	< 0.1	
Fluorene	mg/kg	< 0.1	MCERTS	0.18	< 0.1	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	3.23	< 0.1	0.37	0.15	
Anthracene	mg/kg	< 0.1	MCERTS	0.81	< 0.1	< 0.1	< 0.1	
Fluoranthene	mg/kg	< 0.1	MCERTS	8.93	0.16	1.08	0.36	
Pyrene	mg/kg	< 0.1	MCERTS	7.85	0.15	1	0.33	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	4.46	< 0.1	0.54	0.15	
Chrysene	mg/kg	< 0.1	MCERTS	3.67	< 0.1	0.57	0.18	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	4.72	< 0.1	0.61	0.20	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	1.59	< 0.1	0.25	< 0.1	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	4.42	< 0.1	0.57	0.17	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	2.04	< 0.1	0.31	< 0.1	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.39	< 0.1	< 0.1	< 0.1	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	1.74	< 0.1	0.27	< 0.1	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	44.7	< 1.6	5.6	< 1.6	

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 23-14701	Date Sampled	28/11/23	28/11/23	28/11/23	28/11/23	
Earth Environmental & Geotechnical (Souther	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Winford Grove	TP / BH No	WS01	WS02	WS03	WS04	
Project / Job Ref: 3305	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: 3305/AS/291123	Depth (m)	0.40 - 0.60	0.80 - 1.00	0.30 - 0.40	0.60 - 0.80	
Reporting Date: 06/12/2023	DETS Sample No	688048	688049	688050	688051	

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	25	< 3	< 3	< 3	
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	33	< 10	< 10	< 10	
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	57	< 21	< 21	< 21	
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	57	< 42	< 42	< 42	

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Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 23-14701	Date Sampled	28/11/23	28/11/23	28/11/23	28/11/23	
Earth Environmental & Geotechnical (Souther	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Winford Grove	TP / BH No	WS01	WS02	WS03	WS04	
Project / Job Ref: 3305	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: 3305/AS/291123	Depth (m)	0.40 - 0.60	0.80 - 1.00	0.30 - 0.40	0.60 - 0.80	
Reporting Date: 06/12/2023	DETS Sample No	688048	688049	688050	688051	

Determinand	Unit	RL	Accreditation					
Benzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Toluene : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Ethylbenzene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
p & m-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
o-xylene : HS 1D MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
MTBE : HS 1D MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 23-14701	
Earth Environmental & Geotechnical (Southern Ltd)	
Site Reference: Winford Grove	
Project / Job Ref: 3305	
Order No: 3305/AS/291123	
Reporting Date: 06/12/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
688048	WS01	None Supplied	0.40 - 0.60	18.2	Brown sandy clay with brick
688049	WS02	None Supplied	0.80 - 1.00	18	Grey clay
688050	WS03	None Supplied	0.30 - 0.40	16	Brown sandy clay with stones
688051	WS04	None Supplied	0.60 - 0.80	18.9	Brown sandy clay with brick

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-14701
Earth Environmental & Geotechnical (Southern Ltd)
Site Reference: Winford Grove
Project / Job Ref: 3305
Order No: 3305/AS/291123
Reporting Date: 06/12/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

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List of HWOL Acronyms and Operators
DETS Report No: 23-14701
Earth Environmental & Geotechnical (Southern Ltd)
Site Reference: Winford Grove
Project / Job Ref: 3305
Order No: 3305/AS/291123
Reporting Date: 06/12/2023

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aliphatic C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

APPENDIX 5

WASTE CLASSIFICATION REPORT

Waste Classification Report

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

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

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

S5NCZ-TUQE5-YKEBD

Job name

Winford Grove, Bristol

Description/Comments

Project

B3305

Site

Classified by

Name:
Simon Leat
Date:
03 Jan 2024 19:10 GMT
Telephone:
0161 975 6088

Company:
Earth Environmental & Geotechnical Ltd
Houldsworth Mill Business & Arts Centre
Houldsworth Street
Stockport
SK5 6DA

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

HazWasteOnline™ Certification: -

Course	Date
Hazardous Waste Classification	-

Purpose of classification

2 - Material Characterisation

Address of the waste

Winford Grove, Bristol **Post Code** BS13 7DY

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Private developer

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

Groundworks

Description of the waste

Made Ground, natural clay

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01	0.40-0.60	Non Hazardous		3
2	WS02	0.80-1.00	Non Hazardous		6
3	WS03	0.30-0.40	Non Hazardous		8
4	WS04	0.60-0.80	Non Hazardous		10
5	WS1	0.3	Non Hazardous		12
6	WS2	0.4	Non Hazardous		15

Related documents

#	Name	Description
1	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Simon Leat

Created date: 03 Jan 2024 19:10 GMT

Classification of sample: WS01

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

Sample details

Sample name:
WS01
Sample Depth:
0.40-0.60 m
Moisture content:
18.2%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18.2% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		27	mg/kg	1.32	29.161	mg/kg	0.00292 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.9	mg/kg	3.22	5.004	mg/kg	0.0005 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.8	mg/kg	1.142	1.682	mg/kg	0.000168 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20	mg/kg	1.462	23.911	mg/kg	0.00239 %	✓	
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		66	mg/kg	1.126	60.784	mg/kg	0.00608 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	457	mg/kg	1.56	583.099	mg/kg	0.0374 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		20	mg/kg	2.976	48.692	mg/kg	0.00487 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		325	mg/kg	2.774	737.507	mg/kg	0.0738 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		57	mg/kg		46.626	mg/kg	0.00466 %	✓	
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
19		pH			PH		8.1	pH		8.1	pH	8.1 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		0.31	mg/kg		0.254	mg/kg	0.0000254 %	✓	
21		acenaphthylene		205-917-1	208-96-8		0.15	mg/kg		0.123	mg/kg	0.0000123 %	✓	
22		acenaphthene		201-469-6	83-32-9		0.2	mg/kg		0.164	mg/kg	0.0000164 %	✓	
23		fluorene		201-695-5	86-73-7		0.18	mg/kg		0.147	mg/kg	0.0000147 %	✓	
24		phenanthrene		201-581-5	85-01-8		3.23	mg/kg		2.642	mg/kg	0.000264 %	✓	
25		anthracene		204-371-1	120-12-7		0.81	mg/kg		0.663	mg/kg	0.0000663 %	✓	
26		fluoranthene		205-912-4	206-44-0		8.93	mg/kg		7.305	mg/kg	0.00073 %	✓	
27		pyrene		204-927-3	129-00-0		7.85	mg/kg		6.421	mg/kg	0.000642 %	✓	
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		4.46	mg/kg		3.648	mg/kg	0.000365 %	✓	
29		chrysene	601-048-00-0	205-923-4	218-01-9		3.67	mg/kg		3.002	mg/kg	0.0003 %	✓	
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		4.72	mg/kg		3.861	mg/kg	0.000386 %	✓	
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.59	mg/kg		1.301	mg/kg	0.00013 %	✓	
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		4.42	mg/kg		3.616	mg/kg	0.000362 %	✓	
33		indeno[123-cd]pyrene		205-893-2	193-39-5		2.04	mg/kg		1.669	mg/kg	0.000167 %	✓	
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.39	mg/kg		0.319	mg/kg	0.0000319 %	✓	
35		benzo[ghi]perylene		205-883-8	191-24-2		1.74	mg/kg		1.423	mg/kg	0.000142 %	✓	
36		phenol	604-001-00-2	203-632-7	108-95-2		<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
											Total:	0.138 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No free phase present

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00466%)

Classification of sample: WS02

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

Sample details

Sample name:
WS02
Sample Depth:
0.80-1.00 m
Moisture content:
18%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8 mg/kg	1.32	8.661 mg/kg	0.000866 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.1 mg/kg	2.775	2.503 mg/kg	0.00025 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.2 mg/kg	3.22	3.168 mg/kg	0.000317 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3 mg/kg	1.142	0.281 mg/kg	0.0000281 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17 mg/kg	1.462	20.374 mg/kg	0.00204 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27 mg/kg	1.126	24.927 mg/kg	0.00249 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	20 mg/kg	1.56	25.581 mg/kg	0.00164 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<**LOD**
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		27 mg/kg	2.976	65.895 mg/kg	0.00659 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2 mg/kg	2.554	<5.108 mg/kg	<0.000511 %		<**LOD**
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		61 mg/kg	2.774	138.763 mg/kg	0.0139 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<42 mg/kg		<42 mg/kg	<0.0042 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**

#		Determinand	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number											
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
20		pH				7.9	pH		7.9	pH	7.9 pH		
				PH									
21		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
23		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
24		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
25		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
26		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
27		fluoranthene				0.16	mg/kg		0.131	mg/kg	0.0000131 %	✓	
			205-912-4	206-44-0									
28		pyrene				0.15	mg/kg		0.123	mg/kg	0.0000123 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
37		phenol				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.034 %		

Key

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

Classification of sample: WS03

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

Sample details

Sample name:
WS03
Sample Depth:
0.30-0.40 m
Moisture content:
16%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20 mg/kg	1.32	22.181 mg/kg	0.00222 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.8 mg/kg	2.775	1.865 mg/kg	0.000187 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.2 mg/kg	3.22	3.246 mg/kg	0.000325 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1 mg/kg	1.142	1.056 mg/kg	0.000106 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17 mg/kg	1.462	20.871 mg/kg	0.00209 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		61 mg/kg	1.126	57.691 mg/kg	0.00577 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	309 mg/kg	1.56	404.866 mg/kg	0.026 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<**LOD**
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17 mg/kg	2.976	42.501 mg/kg	0.00425 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2 mg/kg	2.554	<5.108 mg/kg	<0.000511 %		<**LOD**
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		361 mg/kg	2.774	841.232 mg/kg	0.0841 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<42 mg/kg		<42 mg/kg	<0.0042 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
20		pH			PH		8	pH		8	pH	8pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
23		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
24		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
25		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
26		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
27		fluoranthene		205-912-4	206-44-0		1.08	mg/kg		0.907	mg/kg	0.0000907 %	✓	
28		pyrene		204-927-3	129-00-0		1	mg/kg		0.84	mg/kg	0.000084 %	✓	
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.54	mg/kg		0.454	mg/kg	0.0000454 %	✓	
30		chrysene	601-048-00-0	205-923-4	218-01-9		0.57	mg/kg		0.479	mg/kg	0.0000479 %	✓	
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.61	mg/kg		0.512	mg/kg	0.0000512 %	✓	
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.25	mg/kg		0.21	mg/kg	0.000021 %	✓	
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.57	mg/kg		0.479	mg/kg	0.0000479 %	✓	
34		indeno[123-cd]pyrene		205-893-2	193-39-5		0.31	mg/kg		0.26	mg/kg	0.000026 %	✓	
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
36		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
37		phenol	604-001-00-2	203-632-7	108-95-2		<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
											Total:	0.131 %		

Key

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

Classification of sample: WS04

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

Sample details

Sample name:
WS04
Sample Depth:
0.60-0.80 m
Moisture content:
18.9%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		30 mg/kg	1.32	32.124 mg/kg	0.00321 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1 mg/kg	2.775	2.251 mg/kg	0.000225 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		2.2 mg/kg	3.22	5.745 mg/kg	0.000574 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.7 mg/kg	1.142	1.575 mg/kg	0.000157 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	26.077 mg/kg	0.00261 %	✓	
6	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<**LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		82 mg/kg	1.126	74.874 mg/kg	0.00749 %	✓	
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	248 mg/kg	1.56	313.723 mg/kg	0.0201 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<**LOD**
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		33 mg/kg	2.976	79.654 mg/kg	0.00797 %	✓	
11	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2 mg/kg	2.554	<5.108 mg/kg	<0.000511 %		<**LOD**
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		276 mg/kg	2.774	620.954 mg/kg	0.0621 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<42 mg/kg		<42 mg/kg	<0.0042 %		<**LOD**
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
20		pH			PH		7.7	pH		7.7	pH	7.7 pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
23		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
24		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
25		phenanthrene		201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
26		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
27		fluoranthene		205-912-4	206-44-0		0.36	mg/kg		0.292	mg/kg	0.0000292 %	✓	
28		pyrene		204-927-3	129-00-0		0.33	mg/kg		0.268	mg/kg	0.0000268 %	✓	
29		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.15	mg/kg		0.122	mg/kg	0.0000122 %	✓	
30		chrysene	601-048-00-0	205-923-4	218-01-9		0.18	mg/kg		0.146	mg/kg	0.0000146 %	✓	
31		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.2	mg/kg		0.162	mg/kg	0.0000162 %	✓	
32		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
33		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.17	mg/kg		0.138	mg/kg	0.0000138 %	✓	
34		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
35		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
36		benzo[ghi]perylene		205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
37		phenol	604-001-00-2	203-632-7	108-95-2		<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
											Total:	0.11 %		

Key

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

Classification of sample: WS1

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

Sample details

Sample name:
WS1
Sample Depth:
0.3 m
Moisture content:
18%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		4.1 mg/kg	1.32	4.439 mg/kg	0.000444 %	✓	
2	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4 mg/kg	2.775	3.186 mg/kg	0.000319 %	✓	
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.9 mg/kg	3.22	2.376 mg/kg	0.000238 %	✓	
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.5 mg/kg	1.142	3.278 mg/kg	0.000328 %	✓	
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		76 mg/kg	1.462	91.084 mg/kg	0.00911 %	✓	
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		177 mg/kg	1.126	163.411 mg/kg	0.0163 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17 mg/kg	1.56	21.744 mg/kg	0.00139 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		3.2 mg/kg	1.353	3.552 mg/kg	0.000355 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		10 mg/kg	2.976	24.405 mg/kg	0.00244 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		5.1 mg/kg	2.554	10.68 mg/kg	0.00107 %	✓	
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		69 mg/kg	2.774	156.961 mg/kg	0.0157 %	✓	
12	TPH (C6 to C40) petroleum group			TPH		6.3 mg/kg		5.166 mg/kg	0.000517 %	✓	
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
16	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2]	95-47-6 [1] 106-42-3 [2]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
			203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		pH 	 	 PH		7.9	pH		7.9	pH	7.9 pH		
19		naphthalene 601-052-00-2	 202-049-5	 91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
20		acenaphthylene 	 205-917-1	 208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
21		acenaphthene 	 201-469-6	 83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
22		fluorene 	 201-695-5	 86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
23		phenanthrene 	 201-581-5	 85-01-8		0.3	mg/kg		0.246	mg/kg	0.0000246 %	✓	
24		anthracene 	 204-371-1	 120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
25		fluoranthene 	 205-912-4	 206-44-0		0.7	mg/kg		0.574	mg/kg	0.0000574 %	✓	
26		pyrene 	 204-927-3	 129-00-0		0.6	mg/kg		0.492	mg/kg	0.0000492 %	✓	
27		benzo[a]anthracene 601-033-00-9	 200-280-6	 56-55-3		0.7	mg/kg		0.574	mg/kg	0.0000574 %	✓	
28		chrysene 601-048-00-0	 205-923-4	 218-01-9		0.8	mg/kg		0.656	mg/kg	0.0000656 %	✓	
29		benzo[b]fluoranthene 601-034-00-4	 205-911-9	 205-99-2		0.9	mg/kg		0.738	mg/kg	0.0000738 %	✓	
30		benzo[k]fluoranthene 601-036-00-5	 205-916-6	 207-08-9		0.6	mg/kg		0.492	mg/kg	0.0000492 %	✓	
31		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	 200-028-5	 50-32-8		0.5	mg/kg		0.41	mg/kg	0.000041 %	✓	
32		indeno[123-cd]pyrene 	 205-893-2	 193-39-5		0.9	mg/kg		0.738	mg/kg	0.0000738 %	✓	
33		dibenz[a,h]anthracene 601-041-00-2	 200-181-8	 53-70-3		0.2	mg/kg		0.164	mg/kg	0.0000164 %	✓	
34		benzo[ghi]perylene 	 205-883-8	 191-24-2		0.2	mg/kg		0.164	mg/kg	0.0000164 %	✓	
35		phenol 604-001-00-2	 203-632-7	 108-95-2		<5	mg/kg		<5	mg/kg	<0.0005 %		<**LOD**
										Total:	0.0495 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No free phase present

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00051%)

Classification of sample: WS2

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

Sample details

Sample name:
WS2
Sample Depth:
0.4 m
Moisture content:
14.6%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 14.6% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3.1	mg/kg	1.32	3.495	mg/kg	0.00035 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.8	mg/kg	3.22	2.2	mg/kg	0.00022 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		4.5	mg/kg	1.142	4.39	mg/kg	0.000439 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		55	mg/kg	1.462	68.649	mg/kg	0.00686 %	✓	
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		65	mg/kg	1.126	62.498	mg/kg	0.00625 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	36	mg/kg	1.56	47.955	mg/kg	0.00307 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.2	mg/kg	1.353	1.387	mg/kg	0.000139 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		20	mg/kg	2.976	50.835	mg/kg	0.00508 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		12.1	mg/kg	2.554	26.39	mg/kg	0.00264 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		73	mg/kg	2.774	172.946	mg/kg	0.0173 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		6.5	mg/kg		5.551	mg/kg	0.000555 %	✓	
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
13	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
14	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
15	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
17		pH			PH		8.1	pH		8.1	pH	8.1 pH		
18		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
19		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
20		acenaphthene		201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
21		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		phenanthrene		201-581-5	85-01-8		0.8	mg/kg		0.683	mg/kg	0.0000683 %	✓	
23		anthracene		204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
24		fluoranthene		205-912-4	206-44-0		1.5	mg/kg		1.281	mg/kg	0.000128 %	✓	
25		pyrene		204-927-3	129-00-0		1.6	mg/kg		1.366	mg/kg	0.000137 %	✓	
26		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.2	mg/kg		1.025	mg/kg	0.000102 %	✓	
27		chrysene	601-048-00-0	205-923-4	218-01-9		0.5	mg/kg		0.427	mg/kg	0.0000427 %	✓	
28		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1	mg/kg		0.854	mg/kg	0.0000854 %	✓	
29		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1	mg/kg		0.854	mg/kg	0.0000854 %	✓	
30		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.9	mg/kg		0.769	mg/kg	0.0000769 %	✓	
31		indeno[123-cd]pyrene		205-893-2	193-39-5		0.9	mg/kg		0.769	mg/kg	0.0000769 %	✓	
32		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.3	mg/kg		0.256	mg/kg	0.0000256 %	✓	
33		benzo[ghi]perylene		205-883-8	191-24-2		0.3	mg/kg		0.256	mg/kg	0.0000256 %	✓	
34		phenol	604-001-00-2	203-632-7	108-95-2		<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
											Total:	0.0445 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No free phase present

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00055%)

Appendix A: Classifier defined and non GB MCL determinands

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

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

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

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

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

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

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

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

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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

boron {diboron trioxide}

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

cadmium {cadmium oxide}

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

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

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

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

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

copper {dicopper oxide; copper (I) oxide}

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

lead {lead chromate}

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

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

selenium {nickel selenate}

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

zinc {zinc chromate}

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

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

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

beryllium {beryllium oxide}

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

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.356.5870.10868 (22 Dec 2023)
HazWasteOnline Database: 2023.356.5870.10868 (22 Dec 2023)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1stEditionv1.2.GB-Oct2021
CLP Regulation - Regulation1272/2008/ECof16December2008
1st ATP - Regulation790/2009/ECof10August2009
2nd ATP - Regulation286/2011/ECof10March2011
3rd ATP - Regulation618/2012/EUof10July2012
4th ATP - Regulation487/2013/EUof8May2013
Correction to 1st ATP - Regulation758/2013/EUof7August2013
5th ATP - Regulation944/2013/EUof2October2013
6th ATP - Regulation605/2014/EUof5June2014
WFD Annex III replacement - Regulation1357/2014/EUof18December2014
Revised List of Waste 2014 - Decision2014/955/EUof18December2014
7th ATP - Regulation2015/1221/EUof24July2015
8th ATP - Regulation(EU)2016/918of19May2016
9th ATP - Regulation(EU)2016/1179of19July2016
10th ATP - Regulation(EU)2017/776of4May2017
HP14 amendment - Regulation(EU)2017/997of8June2017
13th ATP - Regulation(EU)2018/1480of4October2018
14th ATP - Regulation(EU)2020/217of4October2019
15th ATP - Regulation(EU)2020/1182of19May2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK:2020No.1567of16thDecember2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version1.1of09June2021
GB MCL List v2.0 - version2.0of20thOctober2023

APPENDIX 6

REPORT LIMITATIONS

REPORT LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget and staff resources allocated to the project.

Other than that expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2024 and should be read in light of any subsequent changes in legislation, statutory requirements and industry best practices. Ground conditions can also change over time and further investigations or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site.