



GEOENVIRONMENTAL ASSESSMENT AND GROUND INVESTIGATION

AT

PROPOSED COMMUNITY HUB, THE GREEN, ROSSETT LL12 0EY

6TH MARCH 2023

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Contaminated Land Assessments, Options Appraisals, Remediation Strategy & Verification,
Geotechnical Design, Earthworks & Materials Reuse, Waste Assessments & Classification

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Issue / Revision	Issue 1	Revision 1	Revision 2
Remarks	For use		
Date	6 th March 2023		
Prepared By	C Eccles		
Job Title	Consultant Engineering Geologist		
Qualifications	BEng MSc FGS CGeol CSci CEnv SiLC RoGEP Adviser, DoWCoP QP020		
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EXECUTIVE SUMMARY

Site Details	
Site Address	Proposed Community Hub, The Green, Rossett LL12 0EY
Grid Reference	SJ 36906 57411
Site Area	Approximately 22mx25m (0.05ha)
Current Site Use	Disused toilet block approximately 5mx13m in plan, set within a park with playground and play equipment
Proposed Use	Community Hub building comprising new “L” shaped single storey building of approximate footprint 17mx18m with green roof system and soakaway drainage.
Geology	River terrace deposits with glacial till below. The bedrock is very deep, and comprises Upper Carboniferous mudstones.
Coal Mining Risk	Very Low
Scope of Works	The investigation comprised the following: • Five hand dug pits to check the absence of buried services and undertake infiltration testing (2 of the pits) • Four boreholes by window sample rig • In situ SPTs • Two soil samples for chemical testing
Summary of Ground Conditions	Topsoil overlying River Terrace gravels/sand. Groundwater is at 2m depth.
Conclusions & Recommendations	
No particular precautions are considered necessary for contamination at the site, apart from standard good hygiene practices during construction. Shallow spread footings are appropriate for the proposed building. The site is likely to be suitable for soakaway drainage.	

1.0 INTRODUCTION

1.1. Background

C Eccles Brownfield Engineering Consultancy has been commissioned by Engineering Assist, who are acting as Project Manager/Designer on behalf of Rossett Community Council, hereafter referred to as “the Client”, to undertake a ground investigation to provide information for the design of a new community hub at The Green, Rossett, LL12 0EY.

1.2. Proposed Development

It is understood that the proposed development comprises the construction of a single storey lightly loaded building for use as a community space. The building will have a “green roof” system and requires a “rain garden” /soakaway drainage.



development (Taken from JAR Architecture drawings provided by Engineering Assist Ltd)

1.3. Objectives

The purpose of the report is to provide a preliminary geotechnical assessment of the foundation requirements for the proposed building and the soil infiltration rates for the proposed soakaways, together with a geoenvironmental assessment for planning purposes.

This report has been devised to generally comply with the relevant principles and requirements of a range of guidance including but not limited to:

- National Planning Policy Framework (HCA, February 2019);
- BS5930:2015+A1 2020: “Code of practice for site investigations”;
- NHBC Standards, 2022;
- The Building Regulations 2010. Part C (HM Government 2013); and
- BS8004: 2015: “Code of Practice for Foundations”.

1.4. Sources of Information

The following sources of information have been used in the preparation of this report:

- Online historical ordnance survey maps
- Online historical aerial imagery from Google Earth
- Information from the British Geological Survey (BGS) website www.bgs.ac.uk
- BGS map 108 Flint 1:50,000 (1999)
- Environmental Information from the Welsh Government datamap.gov.wales
- Environmental Information from the Natural Resources Wales
- Drawings and Plans provided by Engineering Assist A.000 to A503

1.5. Confidentiality

C Eccles Brownfield Engineering Consultancy has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from C Eccles Brownfield Engineering Consultancy. A charge may be levied against such approval.

1.6. Limitations and Scope

The full limitations of this report are presented in Appendix I.

The findings and conclusions of this report have been set out and recommendations given for the proposed construction. If there is a subsequent change in the proposed use the assessments and conclusions should be reviewed to determine whether they are still applicable for the revised end use.

2.0 SITE SETTING

2.1. Site Details

The site is located in Rossett, approximately 10km south west of Chester and to the north of Wrexham. The site is at the northern corner of an elongated triangular shaped park between three roads: the B5102 (to the north west), B5445 (to the south east) and The Green (to the east). A Site Location Plan is presented below.

At the time of the investigation, the site was occupied by a single storey rectangular building of approximately 5m by 13m in plan housing toilet facilities, which were closed, and stores. The building is set in the northern corner of the park, with a play area and playground equipment located just within and to the south of the site's red line boundary. Turf was present at surface, with the area containing playground equipment surfaced with bark chippings. Trees and hedgerows are present to the north west boundary, separating the site from the B5445 Chester Road. A tree is located within the eastern sector of site, and on the south eastern boundary.

The surrounding area is mainly residential, with some commercial use. There is a garage to the north east of the site on the opposite side of The Green.

The site was accessed from a gate onto The Green. Photographs are presented in Appendix III.

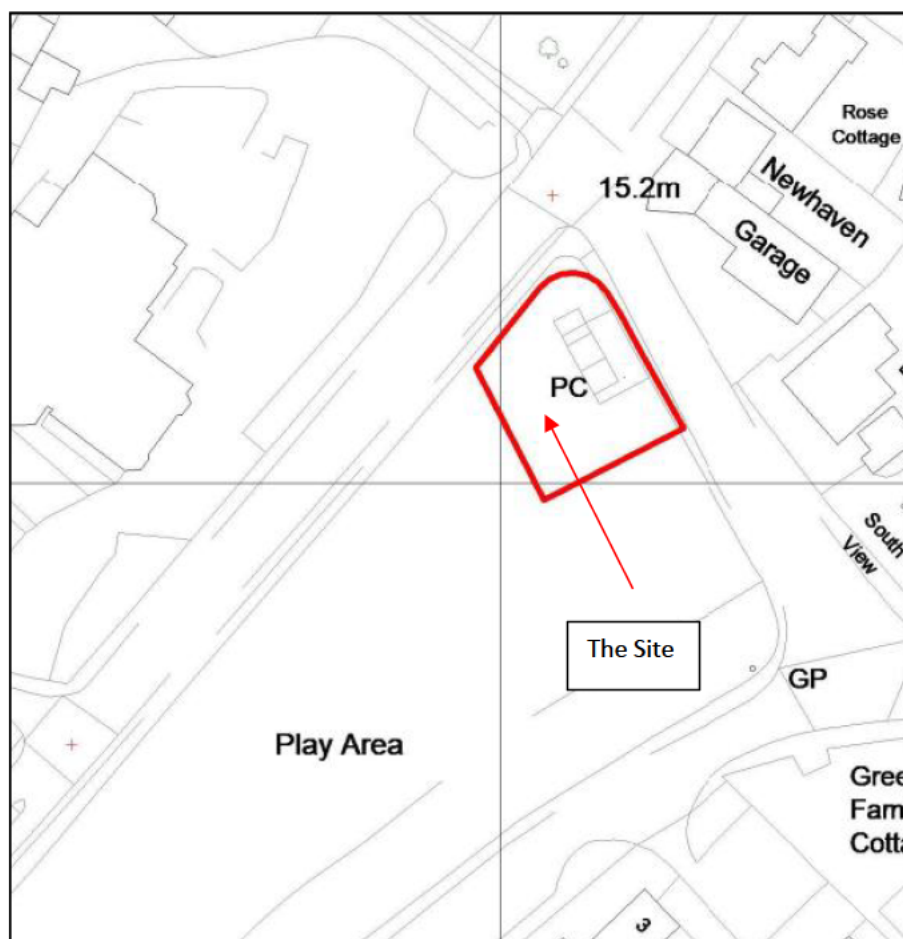


Figure 2 Site Location

2.2. Site History

The history of the site has been determined from readily available online sources. The earliest available historical map is of 1870 and indicates the roads currently surrounding the site to be present, with the park indicated by shading as "gardens". Trees are shown to the north eastern and south eastern boundaries. Ponds are indicated at

the SW end of the park, and opposite the site to the east on The Green. A building opposite the park on The Green, to the north (at the location of the existing garage) is marked as “Smithy”.

The ponds are no longer shown by 1914. The Smithy is shown on the 1954 sheet, but is no longer shown by 1968. The aerial image of 1945 shows more trees than there are currently, in the northern end of the park.

An aerial image of 2006 shows the garage, the toilet block, and some construction activity at the location of the current play area.

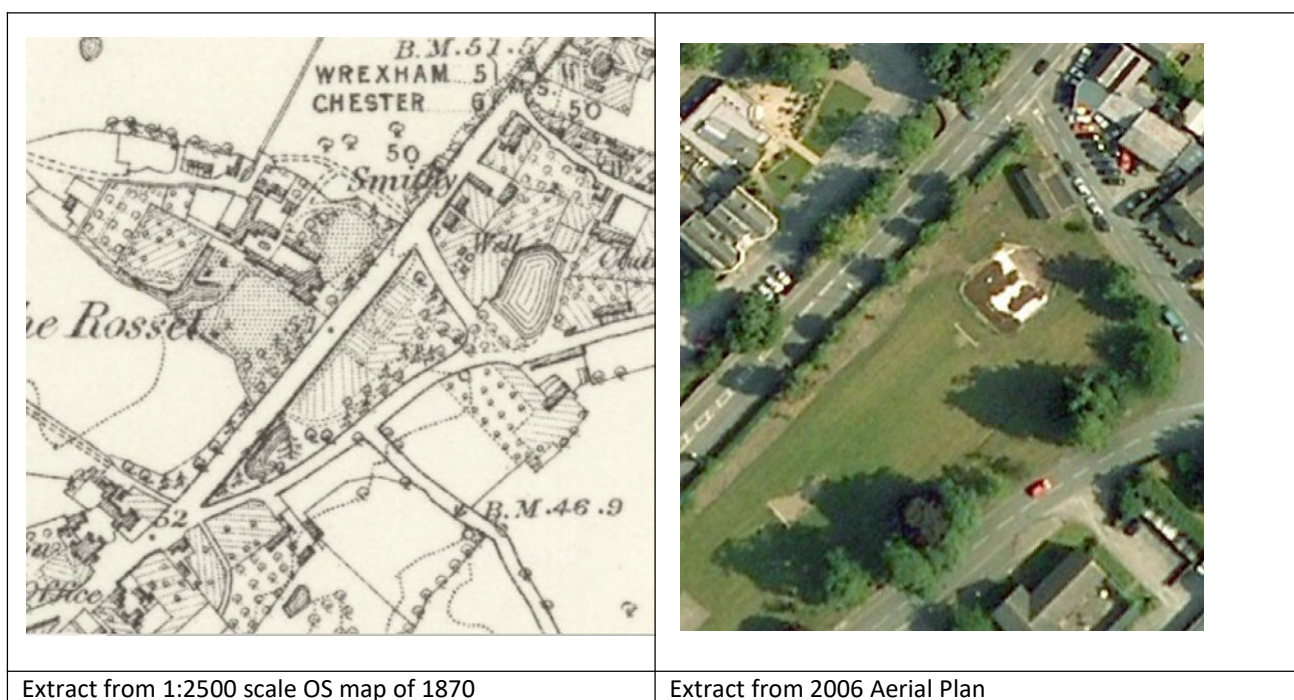


Figure 3: Extracts from Historical Data

2.3. Geology

The geology of the site has been determined from online information available from the British Geological Survey (BGS).

BGS maps indicate the site is underlain by river terrace deposits with glacial till below. The bedrock is shown to be Erbistock Formation of the Upper Carboniferous. The strata are described as *“Red purple and maroon mudstones and seatearths, with thin sandstones and “spirorbis” limestone.”* The site is within the Denbighshire Coalfield. A borehole (“Trevalyn Borehole”) was drilled approximately 0.8km to the east of the site in 1980 to 1353m depth to prove the coal measures. The hole showed the base of the drift at 100m depth, underlain by red brown mudstones. Traces of coal were from about 400m depth. Any Coal mining is therefore very deep and not expected to affect the site.

2.4. Geoenvironmental Setting

Natural Resources Wales online data indicates the underlying solid and drift strata as Secondary Aquifers. The site is within a source protection zone around a drinking water extraction.

The are no historic landfills near the site.

No other sensitive environmental receptors were identified during the site visit.

3.0 SITE INVESTIGATION

3.1 Site Investigation Rationale

The location of the exploratory holes was decided on site by C Eccles Brownfield Engineering Consultancy to give a spread of positions around the new building in areas clear of current underground services, and to investigate the areas proposed for soakaway drainage. The purpose of the holes was to prove the thickness of the made ground, describe the underlying natural strata, collect samples for contamination testing and undertake infiltration tests at approximate soakaway formation depths.

3.2 Fieldwork

Fieldworks were conducted on the 20th February 2023. C Eccles Brownfield Engineering Consultancy supervised the works, describe the ground encountered and carried out the in-situ testing.

Fieldwork procedures were undertaken in accordance with the relevant sections of: BS5930:2015 + A1:2020 "Code of Practice for Site Investigations."

The investigation comprised the following:

- Five hand dug pits to check the absence of buried services and undertake infiltration testing (2 of the pits)
- Four boreholes by window sample rig
- In situ SPTs in
- Soakaway testing in WS01 and a hand dug pit (HP01)
- Two soil samples for chemical testing

The depths of exploratory holes, descriptions of strata encountered and comments on groundwater conditions are described in Section 4. The trial pit logs are presented in Appendix II. The borehole positions together with existing and proposed site features are shown in Figure 4.



Figure 4: Exploratory Hole Location Plan

4.0 GROUND CONDITIONS

4.1 Ground Conditions

The ground investigation confirmed the published geology and identified the strata set out in Table 1 below. Exploratory hole logs and photographs are provided within Appendix II.

Table 1: Ground Conditions Encountered					
Stratum	WS1	WS2	WS3	WS4	HP1
Made Ground (topsoil) thickness (m)	0.30	0.40	0.50	0.30	0.40
Loose becoming dense gravelly sand / sandy gravel with cobbles and clay pockets (base of hole) (m bgl)	(4.45)	(3.45)	(3.45)	(2.44)	(1.00)
Groundwater depth bgl (m)	2.00	2.00	2.00	2.00	Dry

4.2 Topsoil/Made Ground

All five positions encountered a surface layer of topsoil to between 0.30m and 0.50m depth which had fragments of brick and ceramic in it.

4.3 River Terrace Gravels

Granular strata were encountered below the topsoil in all five positions. The soils were generally assessed as a gravel, with varying subordinate fractions of clay, silt, sand and cobbles. Clay pockets were noted, and a distinct clay layer 0.6-0.7m in WS3, which may also represent a shallow clay pocket. The SPT N values indicate generally loose materials, to around 2m to 3m depth, becoming medium dense or dense.

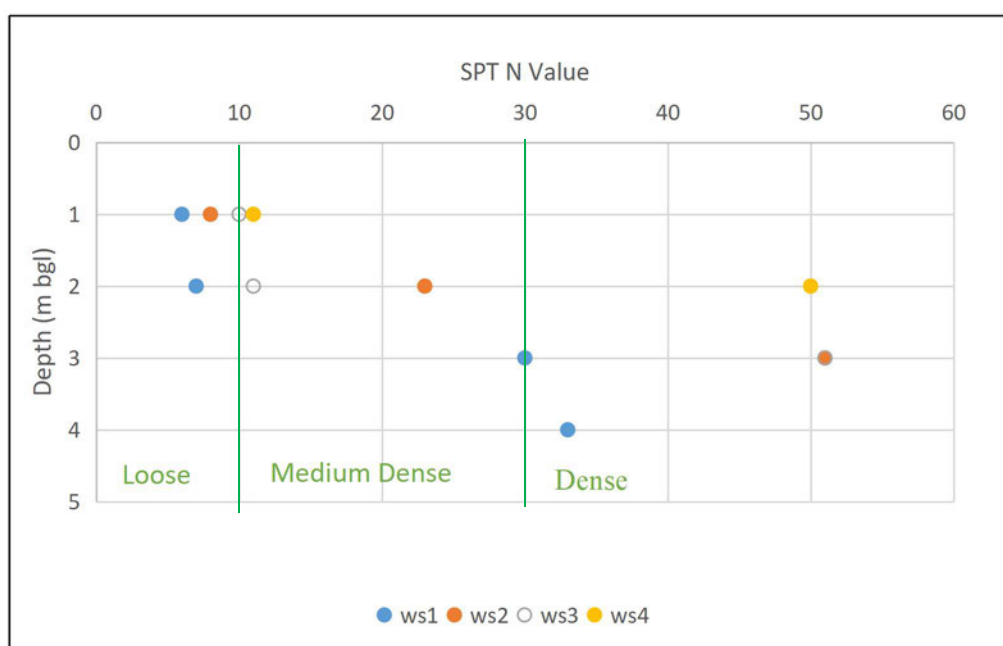


Figure 5: SPT N V Depth

4.4 Groundwater

Groundwater encountered at 2m depth in the boreholes.

4.5 Infiltration Tests

Infiltration tests were carried out in the hand dug pit of WS1 and in HDP1. Three tests were undertaken in each pit in general accordance with BRE365. The results are shown in Figures 5 and 6.

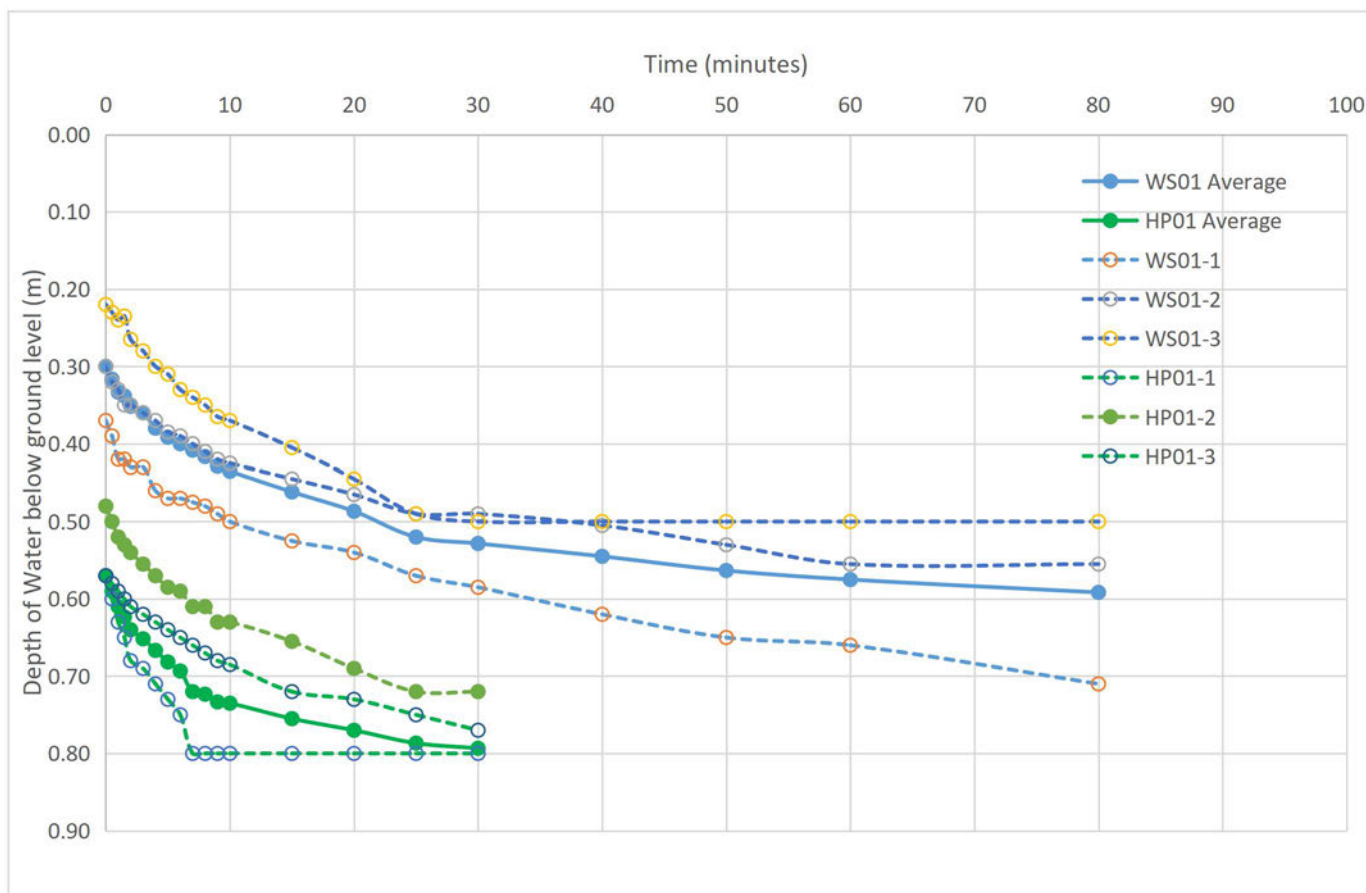


Figure 6: Infiltration Tests

Calculations in general accordance with BRE 365 indicate average infiltration rates of 5.8×10^{-5} m/s for HP01 and 1.1×10^{-5} m/s for WS01, indicating a medium permeability material and a low to medium permeability, respectively. This is likely to be reflective of the varying amounts of clay present in this material. A design value of 1×10^{-5} m/s is considered appropriate for this site.

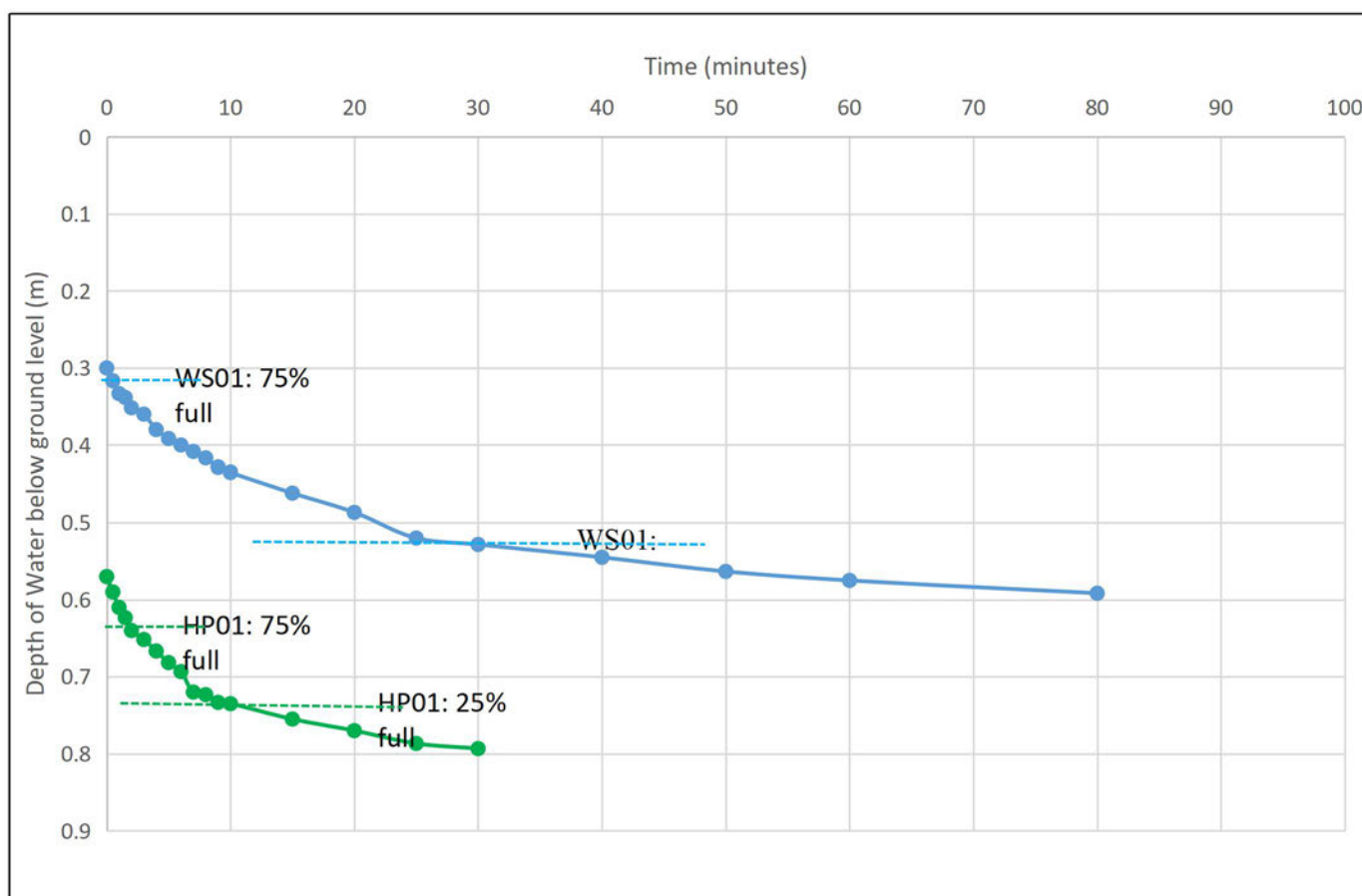


Figure 7: Infiltration Tests: Average Results

4.6 Contamination

The history of the site indicated a low risk of contamination being present but the site was opposite a former smithy/garage and there was always a risk of materials having been brought onto this site

There was no olfactory or visual evidence of contamination present in any of the exploratory holes, just a limited amount of inert anthropogenic material (brick and ceramic) in the topsoil.

The chemical test results are presented in Appendix IV and indicate low concentrations of potential contaminants typical of natural background conditions for this area with the exception of lead and zinc in the sample from WS2 which are slightly elevated. At these concentrations they do not pose a risk to potential users of the site or to groundworkers during construction. Note that lead and zinc concentrations may be present due to some materials having historically been spread on the site from the former smithy or from soils brought in from areas in North Wales relatively close to the site where the natural concentrations of lead and zinc which are higher than is normal in the Rossett area. No remedial measures are required for this development.

5.0 GEOTECHNICAL ASSESSMENT

5.1 Foundation Conditions & Bearing Capacity

The proposed building is assumed to be lightly loaded. Foundations for lightly loaded structures can be placed in the shallow natural soils present. Loose strata are anticipated at shallow depths, with groundwater below 2m. It would be preferable to limit excavations to above the water table for stability and practicality. It is anticipated that pads up to 1m square at 1.5m depth could support loads of up to 100 kN/m² with anticipated settlements in the order of 10-20mm. For shallower 1m square pads at a depth of 1.0 m the allowable bearing pressure would be 85 kN/m²

The formation for ground bearing floor slabs should be proof rolled and any soft spots over excavated and replaced with a suitably engineered granular fill.

5.2 Drainage, Excavations & Stability

A soil infiltration rate design value of 1×10^{-5} m/s (m/s is sometimes presented as m³/m²/s) is considered appropriate for this site for soakaways in the shallow river terrace sands and gravels.

Granular material is present with a varying clay content. Although shallow excavations through these soils may remain stable for short periods, particularly where the clay content is higher, this is highly variable and should any seepages, very loose pockets or cobbles occur, stability could be adversely affected. Provision should be made for temporary support to excavations.

Groundwater was encountered at around 2m depth during the investigation which was carried out after a relatively dry period so groundwater could be encountered at much shallower depths after periods of heavy rainfall. It is anticipated that any groundwater in excavations could be controlled by sump pumping but full face support would be needed for any excavations below the water table.

All excavations should be carried out in accordance with CIRIA Report 97 “Trenching Practice” and BS6031: 2009: Code of Practice for Earthworks. Further guidance on this aspect of site works is given in the British Standards for “Workmanship on Building Sites”, BS 8000, Parts 1 and 14, and in the Construction Industry Training Board’s Site Safety Note 10.

6.0 CONCLUSION

No particular precautions are considered necessary for contamination at the site, apart from standard good hygiene practices during construction.

Shallow spread footings are appropriate for the proposed building.

The site is likely to be suitable for soakaway drainage.

END OF REPORT

APPENDIX I – LIMITATIONS

APPENDIX I - LIMITATIONS

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between C Eccles Brownfield Engineering Consultancy and the Client as indicated in Section 1.0.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency/Natural Resources Wales. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. In addition to the above C Eccles Brownfield Engineering Consultancy note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.
7. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
8. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
9. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
10. This report presents an interpretation of the geotechnical information established by excavation, observation, and testing. Whilst every effort is made in interpretative reporting to assess the soil conditions over the Site it should be noted that natural strata vary from point to point and that man-made deposits are subject to an even greater diversity. Groundwater conditions are dependent on seasonal and other factors. Consequently, there may be conditions present not revealed by this investigation.
11. C Eccles Brownfield Engineering Consultancy cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by C Eccles Brownfield Engineering Consultancy is owned by them and no such plans or documents may be reproduced, published, or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by C Eccles Brownfield Engineering Consultancy in this connection without their explicit written agreement there to by C Eccles Brownfield Engineering Consultancy.
12. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.
13. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

APPENDIX II – BOREHOLE LOGS

APPENDIX II - BOREHOLE LOGS

PROBEHOLE RECORD – WINDOW SAMPLING

Contract No:	Proposed Community Hub	Drilling Method:	Window Sampling	Co-ordinates:
Contract Name:	The Green, Rossett	Core Diameter:	600-700mm	Ground Level:
Client:	Rossett Community Council	Casing Depth:	0m	Date:
				20/02/2023

Description of Strata	Depth (m)	Samples	Water	Legend	Run /Recovery N Value
MADE GROUND: Grass onto dark brown slightly gravelly fine to coarse SAND. Gravel is rounded quartz and sandstone and angular brick. Occasional rootlets. (TOPSOIL)	0.30				Hand Excavated Pit GL to 1.0m
Loose becoming dense orangish brown and brown sandy fine to coarse GRAVEL with low cobble content. Gravel and cobbles are rounded sandstone and quartz with rare dolerite.					SPT 1.00-1.45m: 1,2,1,2,1,2 N=6
....From 0.80m: slightly clayey					Run 1 1.0m to 2.0m 100% REC
					SPT 2.00-2.45m: 4,3,2,2,2,1 N=7
					Run 2 2.0m to 3.0m 100% REC
					SPT 3.00-3.45m: 7,7,8,8,7,7 N=30
					Run 3 3.00-4.00 100% REC
					CPT 4.00-4.45m: 7,8,8,7,8,10 N=33
	4.45				
Probehole terminated at 4.45m bgl					

Key:	B. Bulk Disturbed Sample	D. Small Disturbed Sample	N. SPT 'N' value
	W. Water	E. Environmental Sample	HP. Hand Penetrometer reading, KPa
	SPT. Standard Penetration Test	REC Recovery	HV Hand Vane Reading, KPa

Water Level Observations During Boring					Seepage Rate	Depth Sealed	Daily Log of water levels		
Depth Observed	after 5 mins	after 10 mins	after 15 mins	after 20 mins			Date / Time	Water Level	Depth of Casing
Water encountered at 2.00m depth									

Services	Prior to excavation, the borehole position was scanned using a Cable Avoidance Tool. An inspection pit was excavated by hand to 1.00m bgl to check the absence of shallow services.
Backfill	Upon completion, the borehole position was backfilled with the arisings in reverse order of excavation, with the topsoil and turf replaced at surface.
Soakaway	Infiltration test undertaken in hand dug pit 0.30m x 0.30m x 1.00m deep. 20L of water added x 3 tests.

N/R - Not Required	N/A - Not Applicable	Logged By:	CAK
All depths in metres below ground level; all diameters in millimetres		Approved By:	CSE

PROBEHOLE RECORD – WINDOW SAMPLING

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Client:	Rossett Community Council	Casing Depth:	0m	Date:
				20/02/2023

Photograph



TOP

BASE

Run 3
3.00-4.00

Run 2
2.00to 3.00
SPT
2.00-2.45

Run 1
1.00 to 2.00
SPT
1.00-1.45

PROBEHOLE RECORD – WINDOW SAMPLING

Contract No:	Proposed Community Hub	Drilling Method:	Window Sampling	Co-ordinates:
Contract Name:	The Green, Rossett	Core Diameter:	600-700mm	Ground Level:
Client:	Rossett Community Council	Casing Depth:	0m	Date:
				20/02/2023

Description of Strata	Depth (m)	Samples	Water	Legend	Run /Recovery N Value				
MADE GROUND: Grass onto dark brown silty slightly gravelly fine to coarse SAND. Gravel is rounded quartz and sandstone, angular brick and ceramic. Occasional rootlets. (TOPSOIL)	0.40		ES1 0.20-0.40		Hand Excavated Pit GL to 1.0m				
Loose orangish brown and brown slightly clayey silty gravelly SAND. Gravel is rounded sandstone and quartz. From 0.80m: clayey	1.60								
Medium dense becoming very dense brown slightly clayey very sandy fine to coarse GRAVEL with low cobble content. Gravel and cobbles are rounded sandstone and quartz. 2.60-3.45: Becoming with occasional very stiff reddish brown slightly sandy slightly gravelly CLAY pockets	3.45				SPT 1.00-1.45m: 1,1,2,2,2,2 N=8 Run 1 1.0m to 2.0m 100% REC SPT 2.00-2.45m: 4,4,5,5,6,7 N=23 Run 2 2.0m to 3.0m 100% REC SPT 3.00-3.45m: 5,6,12,13,13,13 N=51				
Probehole terminated at 3.45m bgl at refusal									
Key: B. Bulk Disturbed Sample D. Small Disturbed Sample N. SPT 'N' value W. Water E. Environmental Sample HP. Hand Penetrometer reading, KPa SPT. Standard Penetration Test REC Recovery HV Hand Vane Reading, KPa									
Water Level Observations During Boring					Daily Log of water levels				
Depth Observed	after 5 mins	after 10 mins	after 15 mins	after 20 mins	Seepage Rate	Depth Sealed	Date / Time	Water Level	Depth of Casing
Water encountered at 2.00m depth									
Services Prior to excavation, the borehole position was scanned using a Cable Avoidance Tool. An inspection pit was excavated by hand to 1.00m bgl to check the absence of shallow services.									
Backfill Upon completion, the borehole position was backfilled with the arisings in reverse order of excavation, with the topsoil and turf replaced at surface.									
N/R - Not Required			N/A - Not Applicable			Logged By:		CAK	
All depths in metres below ground level; all diameters in millimetres						Approved By:		CSE	

PROBEHOLE RECORD – WINDOW
SAMPLING

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Client:	Rossett Community Council.	Casing Depth:	0m	Date:
				20/02/2023

Photograph



	Run 2 2.00-3.00 SPT 3.00-3.45	Run 1 1.00to 2.00 SPT 2.00-2.45	SPT 1.00-1.45	Hand Dug Pit 0.00-1.00
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PROBEHOLE RECORD – WINDOW SAMPLING

Contract No:	Proposed Community Hub	Drilling Method:	Window Sampling	Co-ordinates:
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Client:	Rossett Community Council	Casing Depth:	0m	Date:
				20/02/2023

Description of Strata	Depth (m)	Samples	Water	Legend	Run /Recovery N Value			
MADE GROUND: Grass onto dark brown slightly clayey silty slightly gravelly fine to coarse SAND. Gravel is rounded quartz and sandstone, angular brick and ceramic. Occasional rootlets. (TOPSOIL)	0.50 0.60 0.70 1.00		ES1 0.20-0.40		Hand Excavated Pit GL to 1.0m			
Orangish brown and brown slightly clayey slightly gravelly fine to coarse SAND with low cobble content. Gravel and cobbles are rounded sandstone and quartz.								
Stiff orange brown with light grey mottling, slightly sandy slightly gravelly CLAY. Gravel is fine to coarse rounded sandstone.								
Orange brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse rounded quartz and sandstone.					SPT 1.00-1.45m: 2,2,2,3,3,2 N=10			
Medium dense becoming very dense orangish brown very clayey sandy fine to coarse GRAVEL with low cobble content. Gravel and cobbles are rounded sandstone and quartz.				3.45				Run 1 1.0m to 2.0m 100% REC
....2.00-3.00: No recovery – suspected to have pushed a cobble down	SPT 2.00-2.45m: 2,4,2,3,3,3 N=11 N/R Run 2 2.0m to 3.0m 0% REC							
3.00-3.45: (Recovered as firm) reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse rounded quartz and sandstone (probable clay pocket, within dense gravel and cobble horizon)	SPT 3.00-3.45m: 6,7,12,13,13,13 N=51							
Probehole terminated at 3.45m bgl at refusal								
Key: B. Bulk Disturbed Sample W. Water SPT. Standard Penetration Test		D. Small Disturbed Sample E. Environmental Sample REC Recovery		N. SPT 'N' value HP. Hand Penetrometer reading, KPa HV Hand Vane Reading, KPa				
Water Level Observations During Boring			Seepage Rate	Depth Sealed	Daily Log of water levels			
Depth Observed	after 5 mins	after 10 mins	after 15 mins	after 20 mins		Date / Time	Water Level	Depth of Casing
Water encountered at 2.00m depth								
Services		Prior to excavation, the borehole position was scanned using a Cable Avoidance Tool. An inspection pit was excavated by hand to 1.00m bgl to check the absence of shallow services.						
Backfill		Upon completion, the borehole position was backfilled with the arisings in reverse order of excavation, with the topsoil and turf replaced at surface.						
N/R - Not Required		N/A - Not Applicable			Logged By: CAK			
All depths in metres below ground level; all diameters in millimetres					Approved By: CSE			

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Contract No:	Proposed Community Hub	Drilling Method:	Window Sampling	Co-ordinates:
Contract Name:	The Green, Rossett	Core Diameter:	600-700mm	Ground Level:
Client:	Rossett Community Council.	Casing Depth:	0m	Date: 20/02/2023

Photograph



	Run 2 No Recovery SPT 3.00-3.45	Run 1 1.00to 2.00 SPT 2.00-2.45 No Recovery	SPT 1.00-1.45	Hand Dug Pit 0.00-1.00
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PROBEHOLE RECORD – WINDOW SAMPLING

Contract No:	Proposed Community Hub	Drilling Method:	Window Sampling	Co-ordinates:
Contract Name:	The Green, Rossett	Core Diameter:	600-700mm	Ground Level:
Client:	Rossett Community Council	Casing Depth:	0m	Date:
				20/02/2023

Description of Strata					Depth (m)	Samples	Water	Legend	Run /Recovery N Value
MADE GROUND: Grass onto brown silty slightly gravelly fine to coarse SAND. Gravel is rounded quartz and sandstone. Occasional rootlets. (TOPSOIL)					0.30		ES1 0.30-0.50		Hand Excavated Pit GL to 1.0m
Medium dense becoming very dense orangish brown and brown slightly clayey slightly silty very sandy fine to coarse GRAVEL. Gravel is rounded sandstone and quartz.									
.....from 1.30m: becoming sandy and with occasional small clay pockets									
					2.44				SPT 1.00-1.45m: 2,2,2,3,3,3 N=11
								Run 1 1.0m to 2.0m 100% REC	
									SPT 2.00-2.45m: 4,4,15,13,13,9/60mm N=50 for 285mm

PROBEHOLE RECORD – WINDOW
SAMPLING

Contract No:	Proposed Community Hub	Drilling Method:	Window Sampling	Co-ordinates:	
Contract Name:	The Green, Rossett	Core Diameter:	600-700mm	Ground Level:	
Client:	Rossett Community Council.	Casing Depth:	0m	Date:	20/02/2023

Photograph



TOP

BASE

	SPT 2.00-2.45		SPT 1.00-1.4	5
		Run 1 1.00-2.00		

TRIAL HOLE RECORD

Contract No:	Proposed Community Hub	Drilling Method:	Hand Dug	Co-ordinates:	
Contract Name:	The Green, Rossett	Core Diameter:		Ground Level:	
Client:	Rossett Community Council.	Casing Depth:		Date:	20/02/2023

Photograph



Infiltration test undertaken in hand dug pit 0.30m x 0.30m x 1.00m deep. 20L of water added x 3 tests.

0.00-0.40m

MADE GROUND: Grass onto brown slightly clayey silty slightly gravelly fine to coarse SAND. Gravel is rounded quartz and sandstone, angular brick and ceramic. Occasional rootlets. (TOPSOIL)

0.40m – 1.00m

Orangish brown and brown very sandy fine to coarse GRAVEL with low cobble content. Gravel and cobbles are rounded sandstone and quartz.



APPENDIX III – SITE PHOTOGRAPHS

APPENDIX III – SITE PHOTOGRAPHS





APPENDIX IV – CHEMICAL TEST RESULTS

APPENDIX IV – CHEMICAL TEST RESULTS



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 23-46886

Issue: 1

Date of Issue: 01/03/2023

Contact: Chris Eccles

Customer Details: Mr C S Eccles
55 St Catherine Drive
Hartford
Cheshire CW8 2FE

Quotation No: Q22-03549

Order No: Not Supplied

Customer Reference: Contam Testing & Lytham Suites

Date Received: 22/02/2023

Date Approved: 01/03/2023

Details: The Green, Rossett

Approved by:

Tim Reeve, Quality Officer

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

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Sample Summary

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Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
313193	WS2 0.20 - 0.40	20/02/2023	22/02/2023	Silty loam	
313194	WS4 0.30 - 0.50	20/02/2023	22/02/2023	Sandy silty loam	

Results Summary

Report No.: 23-46886, issue number 1

ELAB Reference	313193	313194
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS2	WS4
Sample Depth (m)	0.20 - 0.40	0.30 - 0.50
Sampling Date	20/02/2023	20/02/2023

Determinand	Codes	Units	LOD		
Soil sample preparation parameters					
Moisture Content	N	%	0.1	13.5	8.6
Material removed	N	%	0.1	33.3	40.7
Description of Inert material removed	N		0	Stones	Stones
Metals					
Arsenic	M	mg/kg	1	27.5	8.7
Cadmium	M	mg/kg	0.5	4.9	< 0.5
Chromium	M	mg/kg	5	22.9	21.1
Copper	M	mg/kg	5	44.3	19.8
Lead	M	mg/kg	5	371	67.5
Mercury	M	mg/kg	0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	25.2	19.9
Selenium	M	mg/kg	1	< 1.0	< 1.0
Zinc	M	mg/kg	5	948	127
Miscellaneous					
pH	M	pH units	0.1	7.5	7.7
Total Organic Carbon	N	%	0.01	2.7	0.65
Polyaromatic hydrocarbons					
Naphthalene	N	mg/kg	0.1	0.1	< 0.1
Acenaphthylene	N	mg/kg	0.1	< 0.1	< 0.1
Acenaphthene	N	mg/kg	0.1	< 0.1	< 0.1
Fluorene	N	mg/kg	0.1	< 0.1	< 0.1
Phenanthrene	N	mg/kg	0.1	0.3	< 0.1
Anthracene	N	mg/kg	0.1	0.1	< 0.1
Fluoranthene	N	mg/kg	0.1	1.6	< 0.1
Pyrene	N	mg/kg	0.1	1.4	< 0.1
Benzo(a)anthracene	N	mg/kg	0.1	0.9	< 0.1
Chrysene	N	mg/kg	0.1	1.1	< 0.1
Benzo(b)fluoranthene	N	mg/kg	0.1	1.3	< 0.1
Benzo(k)fluoranthene	N	mg/kg	0.1	1.3	< 0.1
Benzo(a)pyrene	N	mg/kg	0.1	1.5	< 0.1
Indeno(1,2,3-cd)pyrene	N	mg/kg	0.1	1.1	< 0.1
Dibenzo(a,h)anthracene	N	mg/kg	0.1	0.2	< 0.1
Benzo[g,h,i]perylene	N	mg/kg	0.1	0.9	< 0.1
Total PAH(16)	N	mg/kg	0.4	11.8	< 0.4

Results Summary

Report No.: 23-46886, issue number 1

ELAB Reference	313193	313194
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS2	WS4
Sample Depth (m)	0.20 - 0.40	0.30 - 0.50
Sampling Date	20/02/2023	20/02/2023

Determinand	Codes	Units	LOD		
BTEX					
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0
MTBE	N	ug/kg	10	< 10.0	< 10.0
TPH CWG					
>C5-C6 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C6-C8 Aliphatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0
>C35-C40 Aliphatic (EH_CU_1D_AL)	N	mg/kg	1	< 1.0	< 1.0
>C5-C7 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C7-C8 Aromatic (HS_1D_MS)	N	mg/kg	0.01	< 0.01	< 0.01
>C8-C10 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0
>C10-C12 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0
>C12-C16 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0
>C16-C21 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0
>C21-C35 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	23.9	< 1.0
>C35-C40 Aromatic (EH_CU_1D_AR)	N	mg/kg	1	< 1.0	< 1.0



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Results Summary

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Asbestos Results

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

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
313193	0.20 - 0.40	WS2	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t
313194	0.30 - 0.50	WS4	Brown Sandy Soil, Stones	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

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Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	28/02/2023	113	Electromeric
Aqua regia extractable metals	M	Air dried sample	27/02/2023	300	ICPMS
PAH (GC-FID)	N	As submitted sample	24/02/2023	133	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	27/02/2023	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	27/02/2023	181	GC-MS
BTEX in solids	M	As submitted sample	27/02/2023	181A	GC-MS
Total organic carbon/Total sulphur	N	Air dried sample	27/02/2023	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	01/03/2023	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	01/03/2023	214	GC-FID
Asbestos identification	U	Air dried sample	01/03/2023	281	Microscopy

Tests marked N are not UKAS accredited

Report Information

Report No.: 23-46886, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination. Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed. ELAB are unable to provide an interpretation or opinion on the content of this report. The results relate only to the sample received. PCB congener results may include any coeluting PCBs Uncertainty of measurement for the determinands tested are available upon request Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

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

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

Sample Retention and Disposal

All soil samples will be retained for a period of one month
 All water samples will be retained for 7 days following the date of the test report
 Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

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
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry