

Confidential

Geotechnical Investigation Report

347 Waterloo Road, Manchester

Manchester City Council

MC/CHO/240025/R001

29/04/24

Document History

Issue	Date	Comment	Author	Chk'd	App
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MANCHESTER
CITY COUNCIL

Executive Summary

Site Description	The site is rectangular in shape and is located off 347 Waterloo Rd, Cheetham Hill, Manchester, M8 9DU. The site is centred on National Grid Ref 383942, 400967. The site comprises the rear garden of the residence 347 Waterloo Road. The majority of the site is laid to grass with a path of flagstones noted in the south. The south and west of the site is currently bounded by an existing wall. The fall observed from the gate to the rear of the property was approximately 500mm.
Scope of Work	The scope of works for this investigation was to assist with the assessment of ground conditions with respect to the construction of a retaining wall at 347 Waterloo Rd, Cheetham Hill, Manchester M8 9DU.
Site History	Historical records indicate the site has predominantly remained in use as a residential development with associated gardens with minor changes of infrastructure within the surrounding area. The surrounding area was predominantly residential with local amenities and recreational spaces within the vicinity.
Ground Conditions	Made Ground was encountered in all locations from ground level to depths between 0.25mbgl and 0.83mbgl Underlying the Made Ground was the natural superficial Glaciofluvial Sheet Deposits which were encountered in HP102 and WS101 only between 0.31mbgl to 0.64mbgl to maximum depths between 0.50mbgl to 3.00mbgl. They comprised brownish cream/orange silty gravelly sands with occasional sand gravels and clayey sand pockets and gravel of sandstone. Groundwater was not encountered during the ground investigation works.
Contamination Assessment	Although a human health contamination assessment was not a part of this scope of works, a suspected ACM material was identified within HP01 during the investigation works and some environmental testing had been undertaken primarily for waste classification purposes. Although one sample has identified minor exceedances of polycyclic aromatic hydrocarbons, there is an insufficient amount of contamination testing completed in order to provide a full contamination assessment. It would therefore be recommended that further testing and sampling may be required for future works and a full human health risk assessment. An ACM was identified within HP101 at 0.45mbgl and when a bulk ID analysis was completed it reported to contain chrysotile asbestos cement.
Foundations	4No. foundation inspection pits were carried out against the external walls to ascertain existing foundations of the brick wall. The pits identified foundations (concrete footings), ranging from between 0.10mbgl to 0.58mbgl, however it should be noted that the base of the foundation in HP101 could not be established.

Geotechnical Appraisal	The natural near surface soils are comprised of medium dense silty sands with occasional gravels a depth of c1.20mbgl An allowable bearing pressure of 120kPa for 0.60m wide strip foundations at a depth of 1.20mbgl would be suitable to facilitate the proposed structure. The site can be given a design sulphate class for location of DS-I and an aggressive chemical environment for concrete (ACEC) class for location of AC-I
Waste	2No. soil samples have been assessed, in summary, both samples are classified as non-hazardous (17 05 04) for waste disposal purposes. Further WAC testing may be beneficial in order to assess with the final risk assessment and the potential for inert classification for the material.
Recommendations	It is recommended to advise the homeowner of the exiting contamination present. It should be noted that further sampling and testing may be required in order to complete a full contamination assessment, if it is a requirement to do so. The client must appoint an asbestos consultant to advise on safe handling of asbestos contaminated soils. Appropriate precautionary methods should be adopted when handling the materials. The Asbestos consultant may recommend that soils be kept damp to minimise the potential for dust generation and visual vigilance maintained for suspect materials. Stockpiles may also need to be managed in accordance with the Control of Asbestos Regulations 2012 (CAR:SOIL). A Site Waste Management Plan (SWMP) should be produced by the main contractor, as best practice, prior to the commencement of the project. The SWMP should describe the volumes and types of waste that are likely to be produced during a project, and should set out the actions for recycling, re-use, and disposal for each waste stream. It is also recommended that the client obtains records pertaining to the development of the property. This may provide information on the foundation design and concrete mix.
This sheet is intended as a summary of the assessment of the site in relation to ground contamination and geotechnical conditions. It does not provide a definitive engineering analysis.	

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1. Introduction

1.1 General

Pick Everard was instructed by Manchester City Council (the Client) to undertake a Geotechnical Investigation to assist with the assessment of ground conditions with respect to the construction of a retaining wall at 347 Waterloo Rd, Cheetham Hill, Manchester M8 9DU (the Site).

1.2 Objectives

The ground investigation has been carried out in line with BS5930:2015+A1:2020 [1].

The objectives of the investigation were:

- To provide an evaluation of the ground conditions and overall environmental setting of the site, including a review of the site history and publicly available information;
- To produce a factual report of the ground conditions and site investigations work;
- To provide a geotechnical risk assessment and recommendations for the structures and
- Recommendations for further investigation, if applicable.

We have not undertaken specific surveys related to any environmental elements other than those described above and, if required, such surveys should be undertaken by an accredited organisation. However, where our survey has revealed information that may have implications for the site, such as the obvious presence of invasive species, asbestos or protected species, this has been noted in the report for information.

An appraisal of the geoenvironmental parameters of the soils onsite was beyond the scope of this investigation.

1.3 Scope of Work

In order to achieve the objectives, the following scope of works has been undertaken:

- A review of available data relevant to the site setting and history;
- An intrusive investigation comprising 1 No. Windowless Sample Borehole to maximum depth of 3.00mbgl and 4 No. Hand Pits to maximum depth of 0.83mbgl;
- Geotechnical laboratory testing and a summary of results; and
- Recommendations for further works if applicable.

1.4 Sources of Information

The following sections describe the environmental setting of the site, the site history and the anticipated ground conditions based on information taken from a variety of sources, including;

- Publicly available current maps, plans and photographs;
- Geological maps and records; and
- Websites of relevant authorities and organisations such as The British Geological Survey, the Environment Agency, and Coal Authority.

Only where information is considered significant and relevant in the context of the objectives of the survey has it been included in this assessment.

1.5 Limitations

This report has been prepared for Manchester City Council only and should not be relied upon by any third party without the written permission of Pick Everard. This report should be read in its entirety, including all associated drawings and appendices. Pick Everard cannot be held responsible for any misinterpretation's arising from the use of extracts of this report taken out of context.

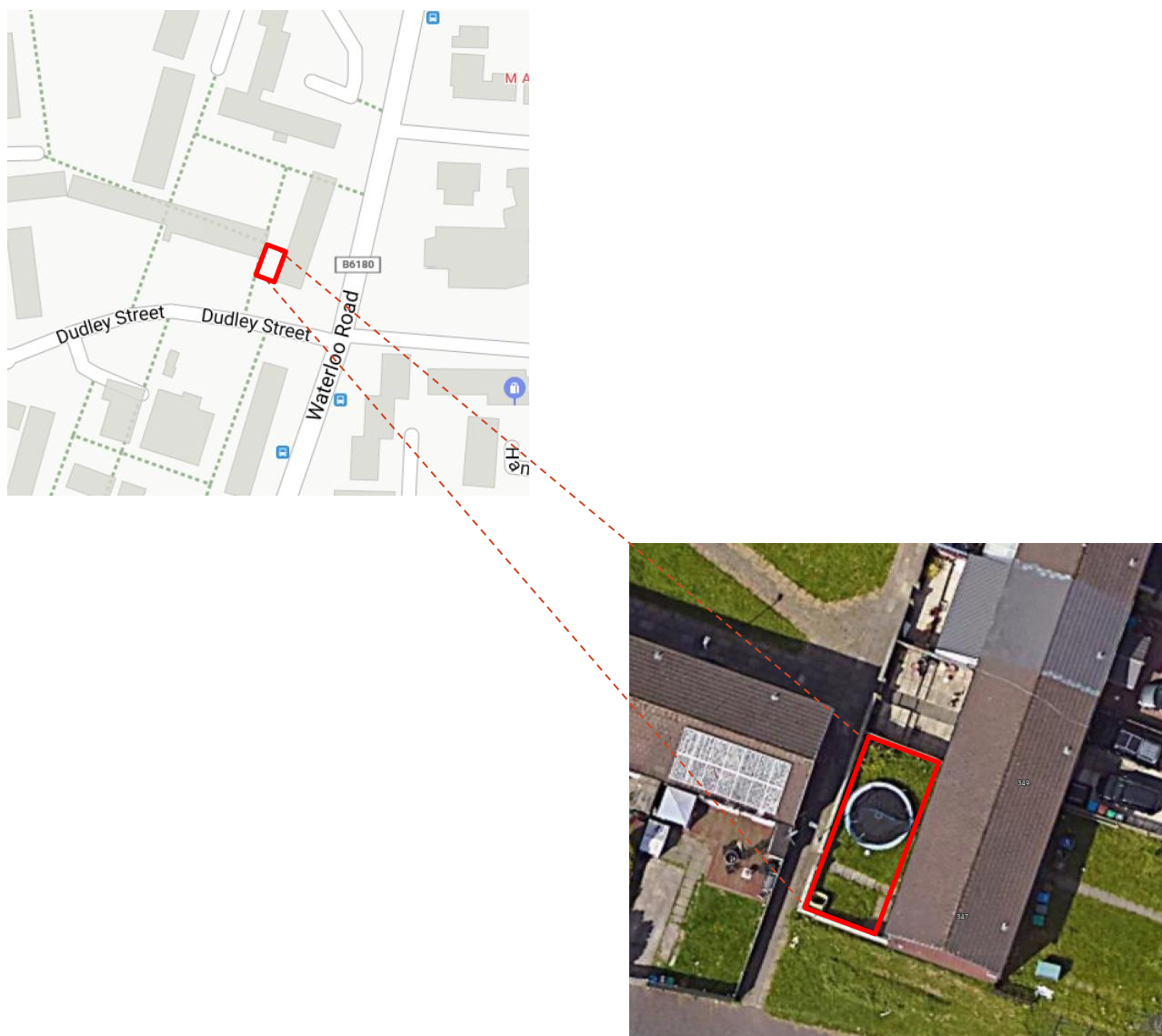
Any recommendations made or opinions expressed in this report are based on the third-party information provided, and it is assumed that Manchester City Council have reliability on this information. All reasonable care and skill have been applied in examining the information supplied, nevertheless Pick Everard cannot and does not guarantee the authenticity or reliability of the information it has relied upon from third parties.

2. Site Details

2.1 Site Location

The site is rectangular in shape and is located off 347 Waterloo Rd, Cheetham Hill, Manchester, M8 9DU. The site is centred on National Grid Ref 383942, 400967.

The site location and layout are shown in Figure 1.



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<http://www.maps.google.com>

Figure 1 – Site Location and Layout

2.2 Site Description

The site comprises the rear garden of the residence 347 Waterloo Road. The majority of the site is laid to grass with a path of flagstones noted in the south. The south and west of the site is currently bounded by an existing wall. The fall observed from the gate to the rear of the property was approximately 500mm.

2.2.1 Surrounding Land Use

The site is bounded by the following:

- North – Fence neighbouring 349 Waterloo Road;
- East – Brick residence of 347 Waterloo Road;
- South – Grass verge directly with Dudley Street beyond; and
- West – a public footpath with residential properties beyond.

3. Site History

3.1 Publicly available sources of information

Available Ordnance Survey (OS) mapping dates back to 1900s [2] on publicly available sources. Historical records indicate the site has predominantly remained in use as a residential development with associated gardens with minor changes of infrastructure within the surrounding area.

The surrounding area was predominantly residential with local amenities and recreational spaces within the vicinity.

4. Geology, Hydrogeology and Hydrology

4.1 Geology

4.1.1 Made Ground

No Made Ground or artificial ground is mapped on site.

4.1.2 Superficial Deposits

The BGS Online GeoIndex [3] identifies that the site is underlain by superficial deposits of Glaciofluvial Shete Deposits of the Devensian period comprising sands and gravels.

4.1.3 Bedrock Deposits

The BGS Online GeoIndex identifies that the site is underlain by the Chester Formation, comprising sandstone.

4.2 Mining Activity

4.2.1 Coal and Non-Coal Mining Activities

The site is located within a coal mining reporting area but not within a high risk-development area. The site is not considered likely to be impacted by coal mining or other, non-coal, mining activity.

4.2.2 Surface and Underground Workings

The BGS Online GeoIndex has not identified any mines and quarries, fireclay, brick clay or chalk workings within 250m of the site. No surface working or underground workings have also been identified within 250m of the site.

4.3 Radon

The site is located in an area where less than 1% of domestic residences (within a 1km radius) are above the National Radiological Protection Board (NRPB) action level for radon of 200Bq m³. Accordingly, radon protection measures are not considered necessary.

4.4 Groundwater

The superficial deposits Glaciofluvial Sheet Deposits are mapped as Secondary (undifferentiated) Strata. Secondary undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.

The bedrock deposits are mapped as a Principal Aquifer which are designated by the EA as strategically important rock units that have high permeability and water storage capacity, and are based on geological mapping provided by BGS.

The site is not located within a groundwater Source Protection Zone (SPZ).

5. Fieldwork

5.1 General

Pick Everard attended site on 7th March 2024 to undertake site investigation works comprising the following:

- 1 No. Windowless Sampler Boreholes to a maximum depth of 3.00mbgl, with in-situ SPT testing;
- 4 No. Hand Pits to ascertain existing foundations to a maximum depth of 0.83mgl; and
- Collection of soil samples for laboratory geotechnical analysis.

All locations were spot cleared for utilities in advance of breaking ground. All locations were backfilled with arisings and reinstated with suitable material.

The locations of exploratory holes are shown on the ground investigation location plan. Exploratory holes were supervised, logged and sampled by a Pick Everard Engineer. Fieldworks were undertaken in accordance with BS5930:2015 [1]. Exploratory Hole Logs are presented in Appendix A.

5.2 Laboratory Testing

A summary of the laboratory analysis undertaken on the samples is summarised below:

- Geotechnical Testing:
 - 3 No. Moisture Contents
 - 2 No. Atterberg Limits
 - 1 No. Determination of Particle Size Distribution
 - 2 No. BRE Suite D
- Contamination Testing:
 - 2 No. PE Main Suite
 - Heavy metals (As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn);
 - Water soluble Boron;
 - Cyanide (total and free);
 - Sulphate, Sulphide and water-soluble sulphate;
 - Polycyclic Aromatic Hydrocarbons (PAH, 17);
 - Petroleum Hydrocarbons (C6 – C10, C10 – C25 & C25 – C40); and

- pH & SOM.
- 1 No. Asbestos Bulk ID
- 2 No. Full Waste Acceptance Criteria

Laboratory geotechnical and environmental results are presented in Appendix C and Appendix D, respectively.

6. Encountered Subsurface Conditions

6.1 Made Ground

Made Ground was encountered in all locations from ground level to depths between 0.25mbgl and 0.83mbgl and generally comprised dark grey clayey sand, silt and topsoil with roots and fragments of brick, concrete, ceramic, plastic and other non-natural materials.

6.2 Glaciofluvial Sheet Deposits

The Glaciofluvial Sheet Deposits were encountered in HPI02 and WS101 only between 0.31mbgl to 0.64mbgl to maximum depths between 0.50mbgl to 3.00mbgl.

It comprised brownish cream/orange, silty, gravelly sands with occasional gravels and clayey sand pockets and gravel of sandstone.

6.3 Material Properties

6.4 Standard Penetration Testing

The strength profile within the strata encountered has been assessed by reference to the results of Standard Penetration Tests (SPT's) undertaken within the boreholes. These tests have derived N-Values which have been corrected considering the energy loss induced by the hammer and transmitted by the drive rods. The SPT calibration certificates are presented in Appendix A.

Corrected N_{60} values have been plotted against depth (Appendix B), with the results indicating extrapolated N_{60} values of between 21 and 50 blows, with blows generally increasing with depth.

6.5 Water Content, Liquid and Plastic Limits and Particle Size Distribution

Laboratory testing was undertaken on 3No. samples of cohesive superficial Glaciofluvial Sheet Deposits. Plots of Atterberg Limits against depth, A-Line, volume change potential and grading curves are presented in Appendix B with the results summarised below:

- The Atterberg Limits plots show that both samples are non plastic; and
- The Determination of Particle Size Distribution show that the one sample was a gravellym very clayey sand.

It is important to note that testing was predominantly conducted above the founding depths due to lack of material available to sample or the base of the foundations not being encountered. Therefore, the results of the testing better reflect the ground conditions above the foundations.

6.6 Groundwater

Groundwater was not encountered within any of the locations during the ground investigation works.

6.7 Visual or Olfactory Contamination

Although the ground investigation has focused only on geotechnical aspects, evidence of Asbestos Containing Material was observed during the investigation works within HP101 at 0.45mbgl.

7. Contamination Assessment

7.1 Criteria

Although a human health contamination assessment was not a part of this scope of works, a suspected ACM material was identified within HP01 during the investigation works and some environmental testing had been undertaken primarily for waste classification purposes.

The results of the testing have been compared against Pick Everard's Tier 1 Soil Screening Values (TSV's) for a 'residential with plant uptake' scenario, adopted primarily from the Sutable 4 Use Levels (S4ULs) published by the LQM/CIEH [5]. A copy of these values is included in Appendix E.

7.2 Assessment

Of the two samples tested, exceedances were noted within some Polycyclic Aromatic Hydrocarbons. These are as follows:

Contaminant	Generic Assessment Criteria (mg/kg)	Reported Value (mg/kg)
Benzo(b)fluoranthene	2.60	2.80
Benzo(a)pyrene	2.20	2.70
Dibenz(a,h)anthracene	0.24	0.33

Table 1 – Exceedances of contaminants

Although one sample has identified minor exceedances of polycyclic aromatic hydrocarbons, there is an insufficient amount of contamination testing completed in order to provide a full contamination assessment. It would therefore be recommended that further testing and sampling may be required for future works and a full human health risk assessment.

An ACM was identified within HP101 at 0.45mbgl and when a bulk ID analysis was completed it reported to contain chrysotile asbestos cement.

7.3 Recommendations

As exceedances of contaminants have been identified within the underlying soils, it is recommended to advise the property owner and residents of the existing contamination present. It should be noted that further sampling and testing may be required in order to complete a full contamination assessment and provide remedial recommendations.

The client must appoint an asbestos consultant to advise on safe handling of asbestos contaminated soils. Appropriate precautionary methods should be adopted when handling the materials. The Asbestos consultant may recommend

that during construction soils be kept damp to minimise the potential for dust generation and visual vigilance maintained for suspect materials. Stockpiles may also need to be managed in accordance with the Control of Asbestos Regulations 2012 (CAR:SOIL).

8. Waste

2No. soil samples have been assessed against the European Waste Catalogue using the 'HazWasteOnlineTM' software. This assesses the data against the threshold concentrations applicable to potential hazardous properties in order to assess classification. The classification certificates are presented in Appendix F.

In summary, both samples are classified as non-hazardous (17 05 04) for waste disposal purposes. Further WAC testing may be beneficial in order to assess with the final risk assessment and the potential for inert classification for the material.

However, it should be noted that any material which the developer intends to discard as part of the construction works would be classed as waste and must be appropriately handled and managed in accordance with current waste legislation. The developer should be aware of, and utilise, the waste hierarchy where possible. Where material cannot be retained onsite, and disposal is the only option the waste must be classified (in accordance with EA technical guidance note WM3) and subsequent Waste Acceptance Criteria testing would be required by the receiving waste facility prior to disposal.

This assessment should be considered as preliminary only, and additional testing (classification and WAC) will be required by the receiving landfill depending on the volume of material proposed for disposal. Any suspected contaminated material identified during the development will need to be tested prior to disposal, or risk being rejected by the receiving site.

Any visible asbestos fragments present in the soils will result in the entire load being classified as hazardous and therefore rejected by receiving site. Care should be taken to remove these prior to disposal.

It should also be noted that landfilling is a private enterprise, and receiving sites are at liberty to set their own, more stringent, assessment criteria and may refuse waste that would otherwise meet their permit requirements. It is therefore recommended that early consultation with an appropriate waste management organisation be undertaken to reduce disposal costs.

8.1.1 Recommendations

A Site Waste Management Plan (SWMP) should be produced by the main contractor, as best practice, prior to the commencement of the project. The SWMP should describe the volumes and types of waste that are likely to be produced during a project, and should set out the actions for recycling, re-use, and disposal for each waste stream.

9. Geotechnical Assessment

9.1 General

An assessment of the geotechnical properties and ground conditions is given below with comments made relating to existing foundations and other structures, geotechnical constraints and concrete assessment.

9.2 Existing Foundations

4No. foundation inspection pits were carried out against the external walls to ascertain existing foundations of the brick wall. The pits identified foundations (concrete footings), ranging from between 0.10mbgl to 0.58mbgl, however it should be noted that the base of the foundation in HPI01 could not be established. Foundation sketches can be found in Appendix A.

A thin layer of concrete was encountered within HPI02 between 0.55mbgl to 0.58mbgl, extending laterally 0.30m, with a thickness of 0.03m. It is possible that this concrete layer is not structural and may be concrete overspill.

The base of foundation in HPI01 could not be found as at 0.45mbgl an ACM was encountered. The foundations in all the locations sat on top of the Made Ground and stepped out from the brick walls by 0.12m to 0.24m at depths of between 0.10m and 0.34mbgl.

9.3 Foundation Design

The natural near surface soils are comprised of medium dense silty sands with occasional gravels a depth of c1.20mbgl taken from SPT results and as plotted in Appendix B.

Based on the ground conditions, it is considered that the below ground natural sands will comprise a suitable founding horizon for the proposed foundations.

Based on the above information it is considered that an allowable bearing pressure of 120kPa for 0.60m wide strip foundations at a depth of 1.20mbgl would be suitable to facilitate the proposed structure.

In accordance with BS 8004:2015 [6] shallow foundations should have a minimum thickness of 150mm. Layers of concrete have been identified in the pits of thicknesses as low as 60mm.

9.4 Buried Concrete

Sulphate and pH testing has been undertaken on 2No. samples, one within the Made Ground (HPI01 at 0.35mbgl) and one within the superficial deposits (WSI01 at 0.50mbgl).

Within the Made Ground and Glaciofluvial Sheet Deposits, the results show maximum water-soluble sulphate concentrations of up to 42.7mg/l and minimum pH values of 7.8. As the site is greenfield with assumed mobile groundwater, the site can be given a design sulphate class for location of DS-I and an aggressive chemical environment for concrete (ACEC) class for location of AC-I.

10. Recommended Further Works

It is recommended to advise the property owner and residents of the existing contamination present. It should be noted that further sampling and testing may be required in order to complete a full contamination assessment and provide remedial recommendations.

The client must appoint an asbestos consultant to advise on safe handling of asbestos contaminated soils. Appropriate precautionary methods should be adopted when handling the materials. The Asbestos consultant may recommend that during construction soils be kept damp to minimise the potential for dust generation and visual vigilance maintained for suspect materials. Stockpiles may also need to be managed in accordance with the Control of Asbestos Regulations 2012 (CAR:SOIL).

A Site Waste Management Plan (SWMP) should be produced by the main contractor, as best practice, prior to the commencement of the project. The SWMP should describe the volumes and types of waste that are likely to be produced during a project, and should set out the actions for recycling, re-use, and disposal for each waste stream.

11. References

1. BS5930:2015+A1:2020 Code of Practice for Site Investigations, British Standards Institution, 2020.
2. National Library of Scotland, <https://www.nls.uk/>
3. GeoIndex Onshore, <https://mapapps2.bgs.ac.uk/geoindex/home.html>
4. Magic Map Application, <https://magic.defra.gov.uk/magicmap.aspx>
5. LQM/CIEH S4ULs for Human Health Risk Assessment, 2015.
6. BS8004:2015+A1:2020 'Code of Practice for Foundations', British Standards Institution, 2020.
7. Special Digest I:2005 'Concrete in Aggressive Ground', 3rd Edition BRE, 2005.

Drawings

PEV-SK-C-0001 – Exploratory Hole Location Plan



LEGEND

Site Boundary

 Site Boundary

Locations

 Hand Pit Locations

 Window Sample Locations

Drawing Title: Exploratory Hole Location Plan

Project Name: Waterloo Road, Manchester

Project ID: 240025

Client: MCC

Drawing No: PE-SK-C-0001

Drawn By: CHO

Checked By: RHG

Date: 25/04/2024

Rev No: 01

Scale: 1:94

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Appendix A – Fieldwork Records

Dynamic Sampling Uk Ltd
Unit 8 Victory Park
Victory Road
Derby
DE248ZF

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref: 110.71
Test Date: 12/07/2023
Report Date: 12/07/2023
File Name: 110.71.spt
Test Operator: B.HUNTER

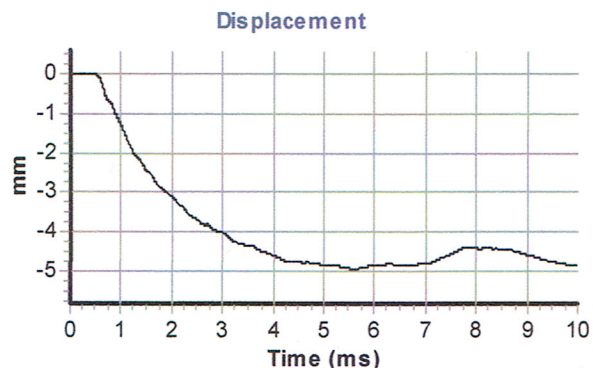
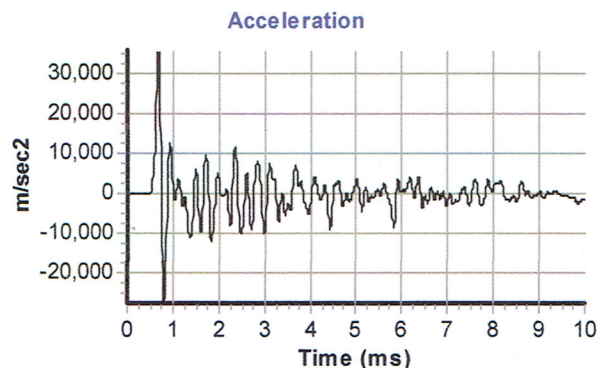
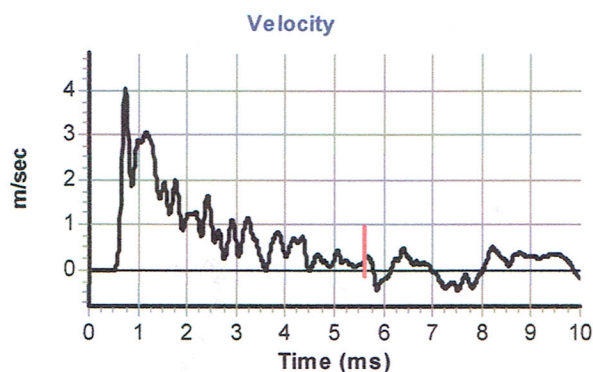
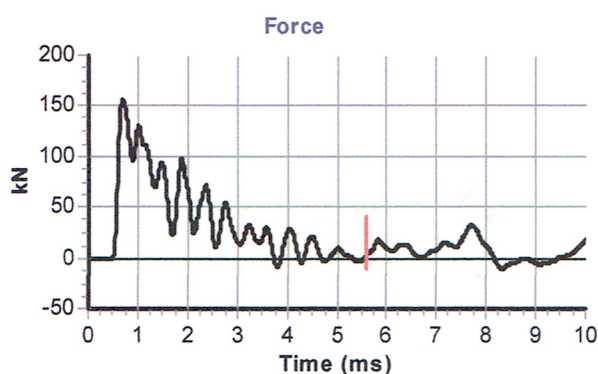
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.6
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 62901
Accelerometer No.2: 62902

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location



Calculations

Area of Rod A (mm^2): 983
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 365

Energy Ratio E_r (%): **77**

Signed: B.Hunter
Title: Operations Manager

Tel: 0345 045 0050,
email consultants@pickeverard.co.uk

Trial Pit Record

Project No.

HP101

240025

Project: 347 Waterloo Road

Client: Manchester City Council

Date Start: 07/03/2024

Plant: Insulated Hand Digging Tools

Date End: 07/03/2024

Logged by

Checked by

Ground Level:

JBI

MHH

Coordinates:	383935.71(E) 400959.92(N)
---------------------	------------------------------

Sheet

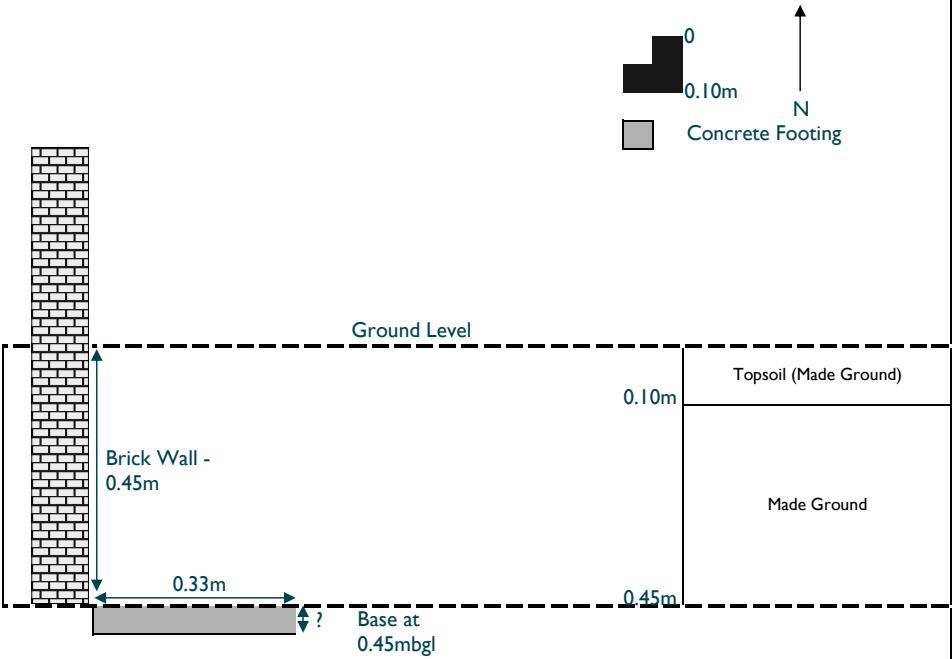
Scale

[illegible]

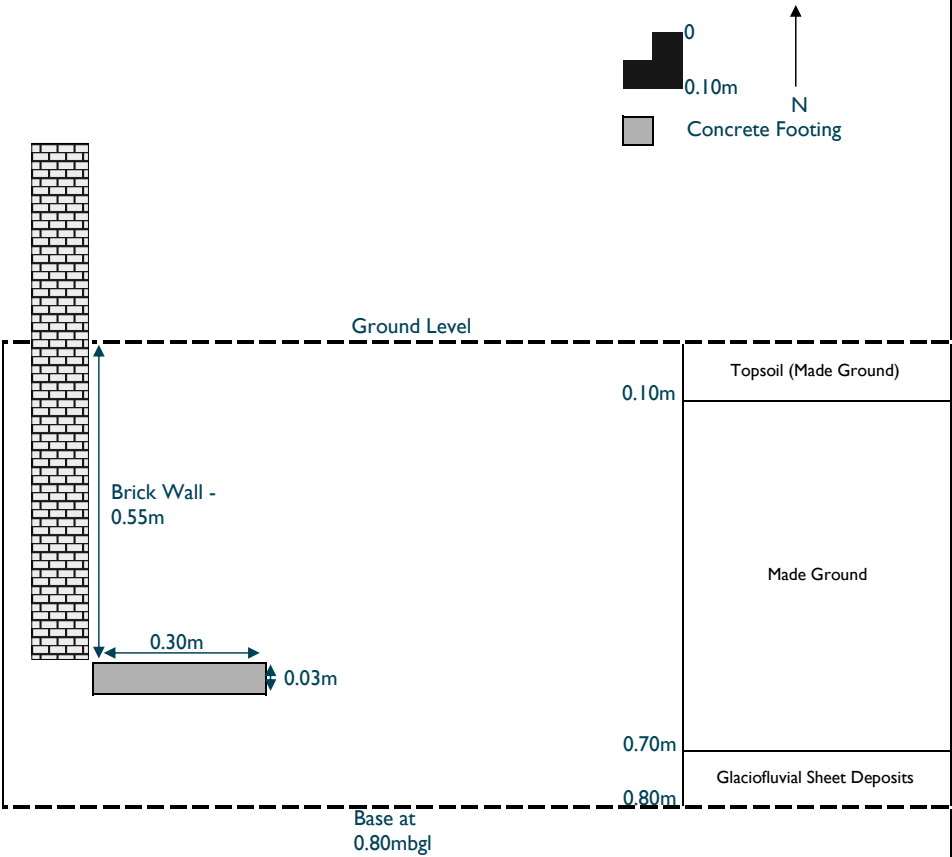
PICK EVERARD Head Office: Halford House, Charles Street, Leicester, LE1 1HA Tel: 0345 045 0050, email consultants@pickeverard.co.uk	Trial Pit Record					Project No. HP102			
	Project: 347 Waterloo Road					240025			
	Client: Manchester City Council					Date Start: 07/03/2024			
	Plant: Insulated Hand Digging Tools					Date End: 07/03/2024			
	Logged by		Checked by		Ground Level:				
	JBL		MHH		Coordinates: 383936.21(E) 400961.14(N)				
	Sheet		Scale						
1 of 1		1:15							
Stratum Description	Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well	
				Type	Depth (m)	Results			
Dark grey slightly silty sandy clayey TOPSOIL with fine to medium roots and rootlets. Gravel comprises fine to coarse subrounded to angular brick, concrete, ceramic, plastic and rare metal. Made Ground		0.10		ES	0.10				
			ES	0.20					
Soft dark grey and black speckled slightly slightly sandy gravelly SILT with pockets of sandy clay. Gravel comprises fine to coarse silty sandstone, brick, ceramic and rubber. Made Ground		0.40							
Soft dark grey sandy clayey gravelly SILT. Gravel comprises fine to coarse occasional sandstone, brick, ceramic and plastic. Made Ground				ES D	0.50 0.55				
Brownish cream slightly gravelly silty fine to medium SAND with occasional fine clayey sand pockets. Gravel comprises fine subrounded to angular sandstone. Glaciofluvial Sheet Deposits		0.70		B	0.75				
		0.80		B ES	0.75 0.80				
End of Borehole at 0.800m									
		1							
		2							
		3							
Dimensions		Pit Stability			Groundwater				
Pit Length	Pit Width	Stable			Depth Strike	Rising to	Time	Remarks	
Remarks									
1. Location cleared using radiodetection. 2. Location to ascertain existing foundations. 3. Location hand dug to 0.80mbgl. 4. Location backfilled with arisings.									

PICK EVERARD Head Office: Halford House, Charles Street, Leicester, LE1 1HA Tel: 0345 045 0050, email consultants@pickeverard.co.uk	Trial Pit Record					Project No. HP103			
	Project: 347 Waterloo Road					240025			
	Client: Manchester City Council					Date Start: 07/03/2024			
	Plant: Insulated Hand Digging Tools					Date End: 07/03/2024			
	Logged by		Checked by		Ground Level:				
	JBL		MHH		Coordinates: 383936.79(E) 400956.83(N)				
	Sheet		Scale						
1 of 1		1:15							
Stratum Description	Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well	
				Type	Depth (m)	Results			
Dark grey slightly clayey silty gravelly fine to medium SAND. Gravel comprises fine to coarse subrounded to angular brick and rare concrete and ceramic. Made Ground		0.30		ES	0.15				
Dark brown clayey silty gravelly fine to medium SAND. Gravel comprises fine to coarse subrounded angular brick. Made Ground				D	0.35				
Rare dark grey fine to medium subrounded to angular slate encountered at 0.50mbgl.				ES	0.50				
				B	0.60				
End of Borehole at 0.830m		0.83							
		1							
		2							
		3							
Dimensions		Pit Stability			Groundwater				
Pit Length	Pit Width	Stable			Depth Strike	Rising to	Time	Remarks	
Remarks									
1. Location cleared using radiodetection. 2. Location to ascertain existing foundations. 3. Location hand dug to 0.83mbgl. 4. Location backfilled with arisings.									

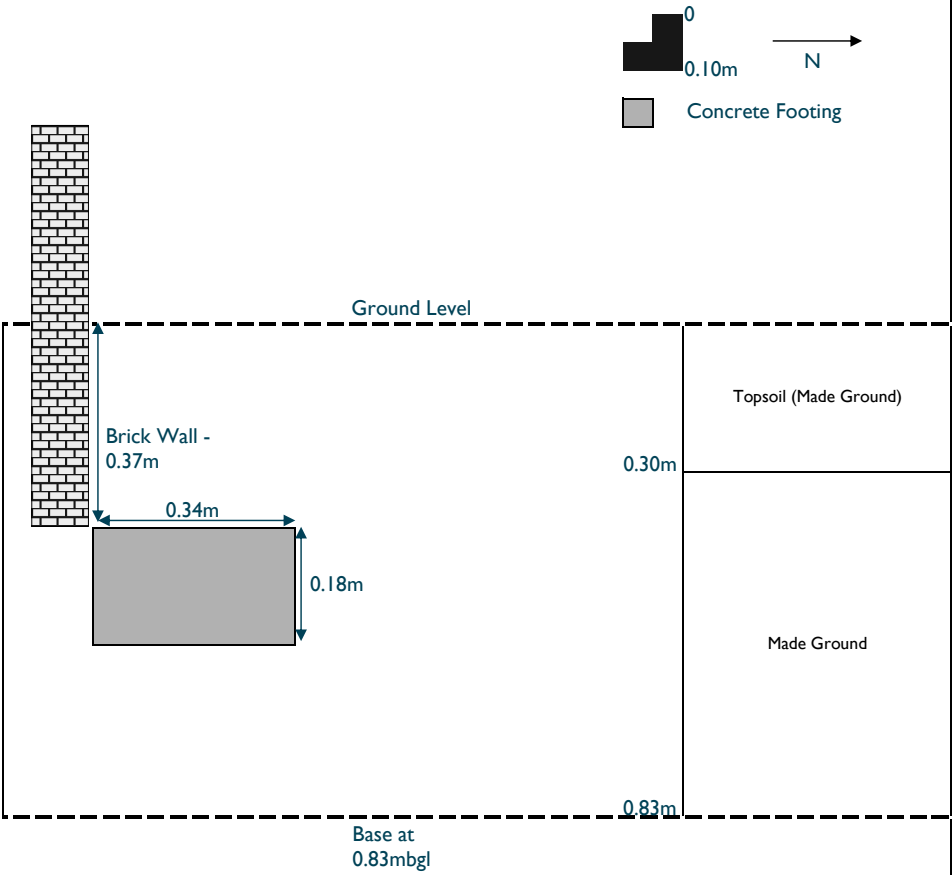
Foundation Profile - HP101



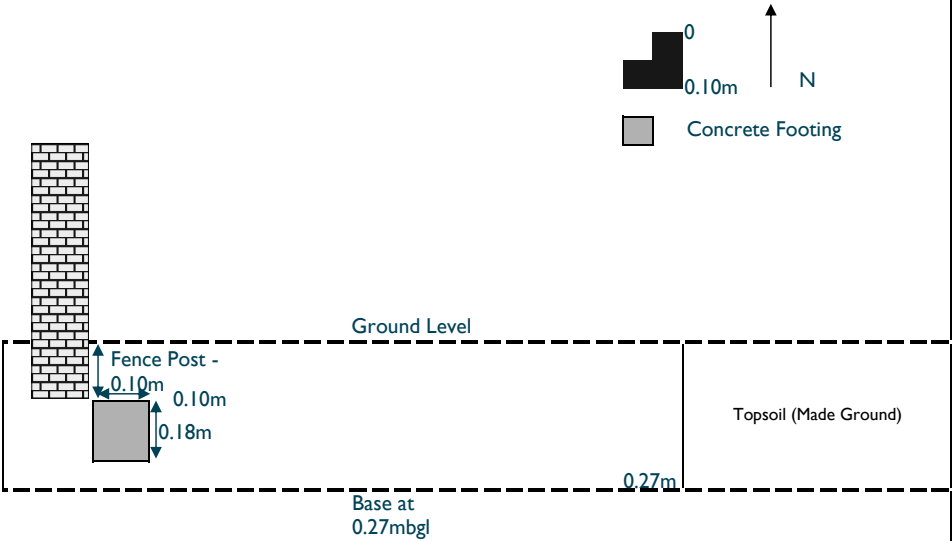
Foundation Profile - HP102



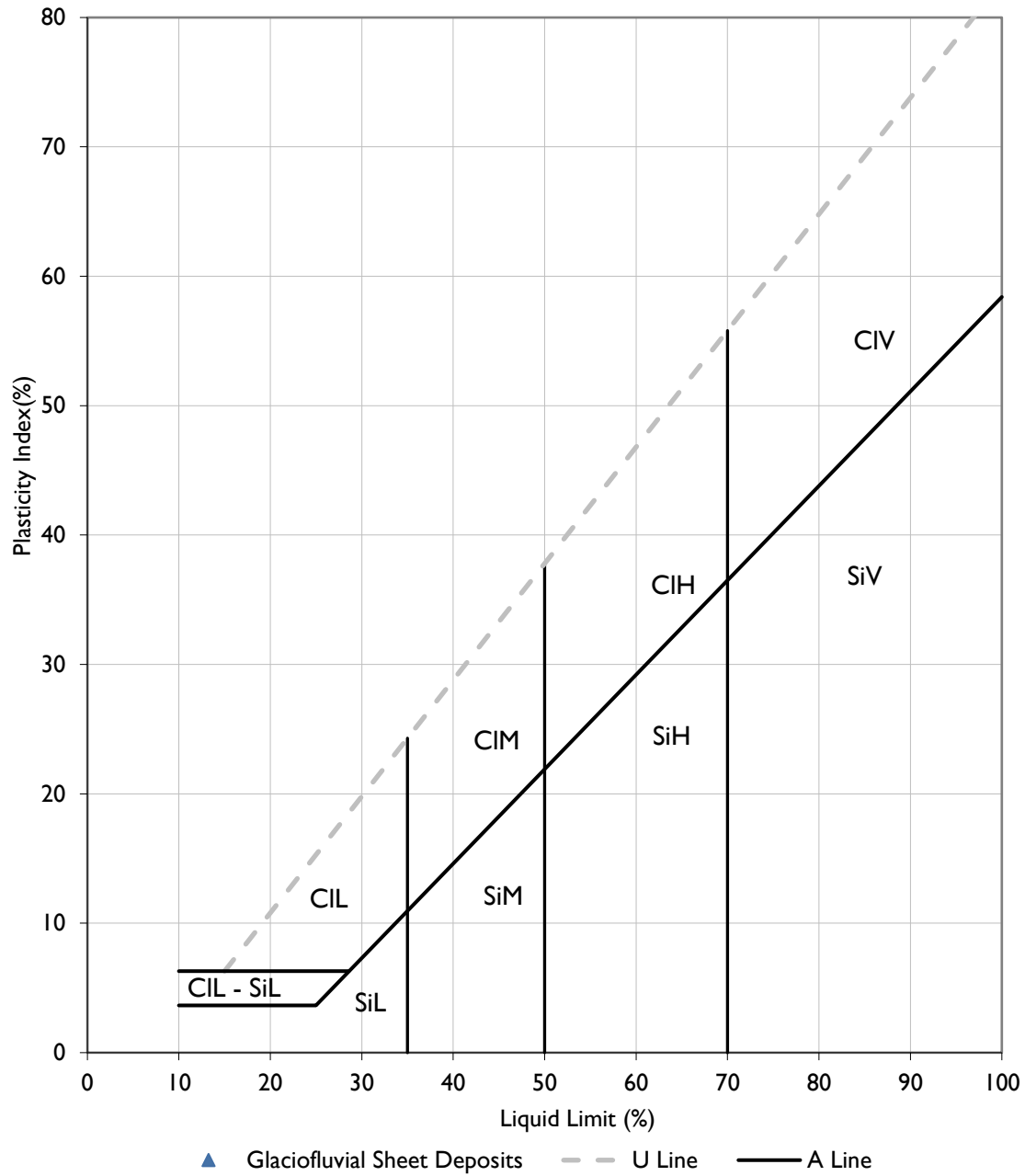
Foundation Profile - HP103



Foundation Profile - HP104



Appendix B – Geotechnical Plots



Notes: Plasticity Index not modified for % passing 425µm sieve.

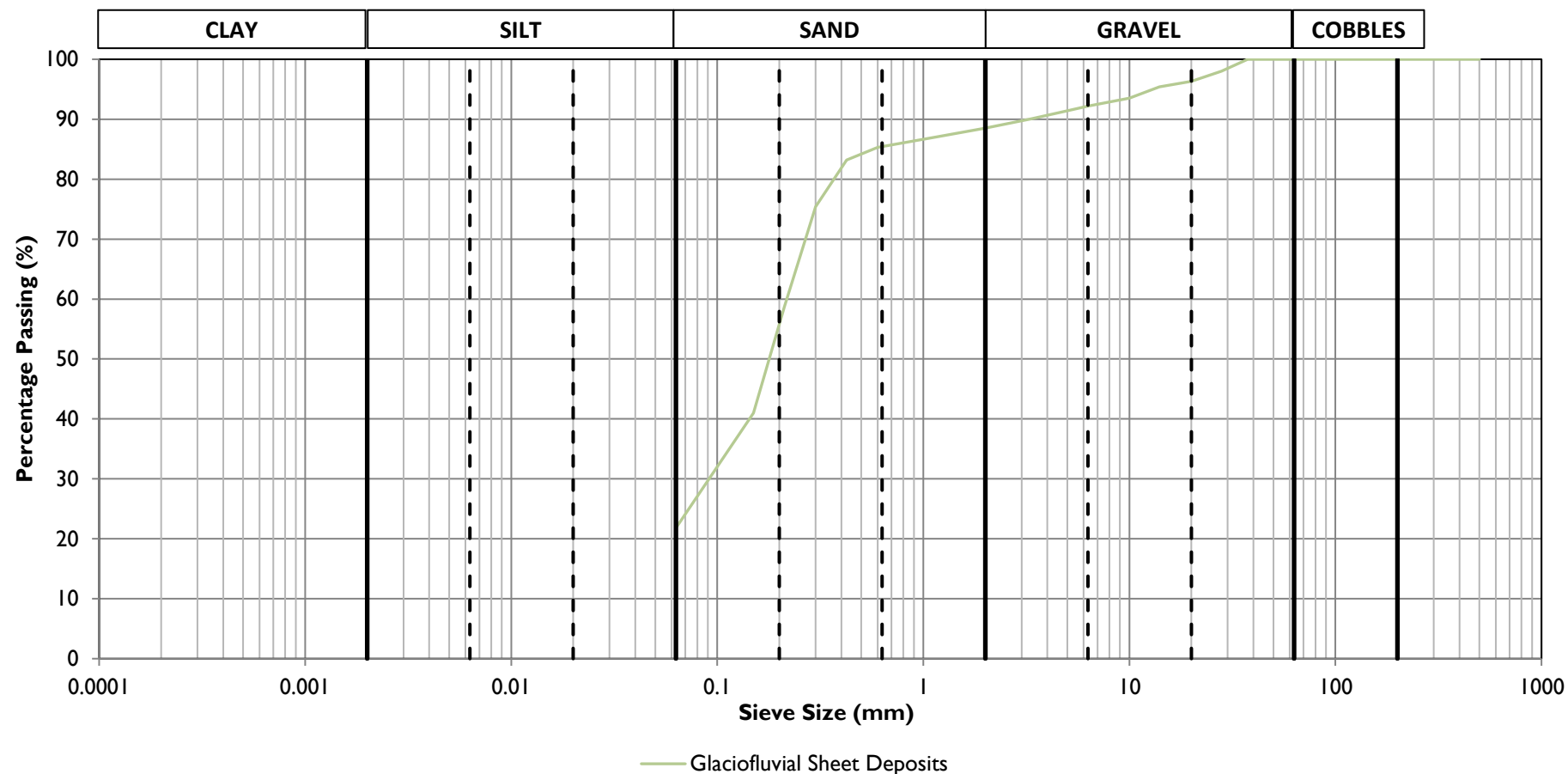
Plot No.

3

Particle Size Distribution

0

Project:	240025 347 Waterloo Road
Client:	Manchester City Council



Notes:

Plot No.

5

Volume Change Potential

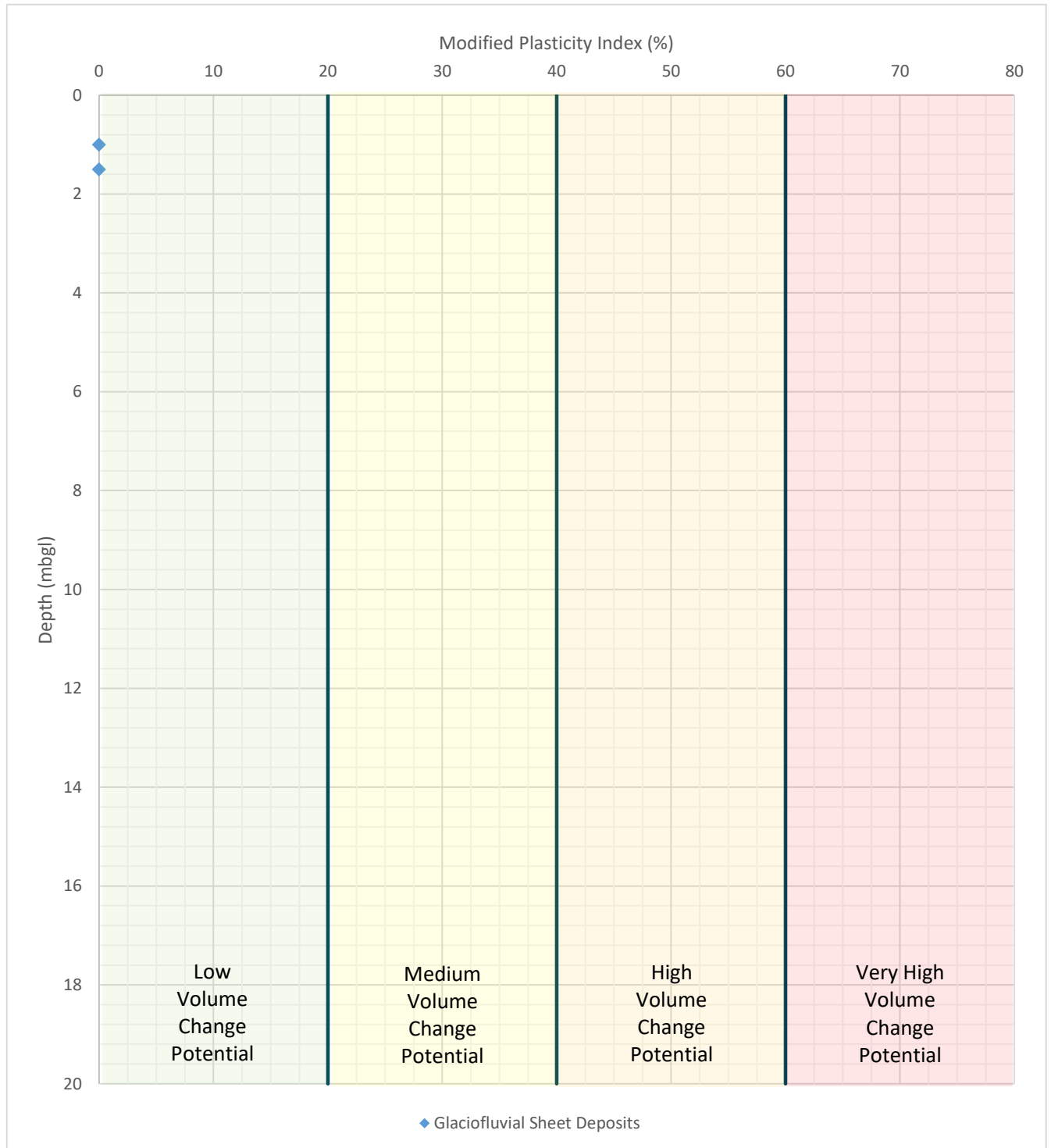
Project:

347 Waterloo Road
240025

Client:

Manchester City Council

0



Notes:

- Modified Plasticity Index and Volume Change Potential calculated in line with BRE Digest 240.
- Approach valid for over consolidated clays. Normally consolidated clays may be more susceptible to volume change.

Plot No.

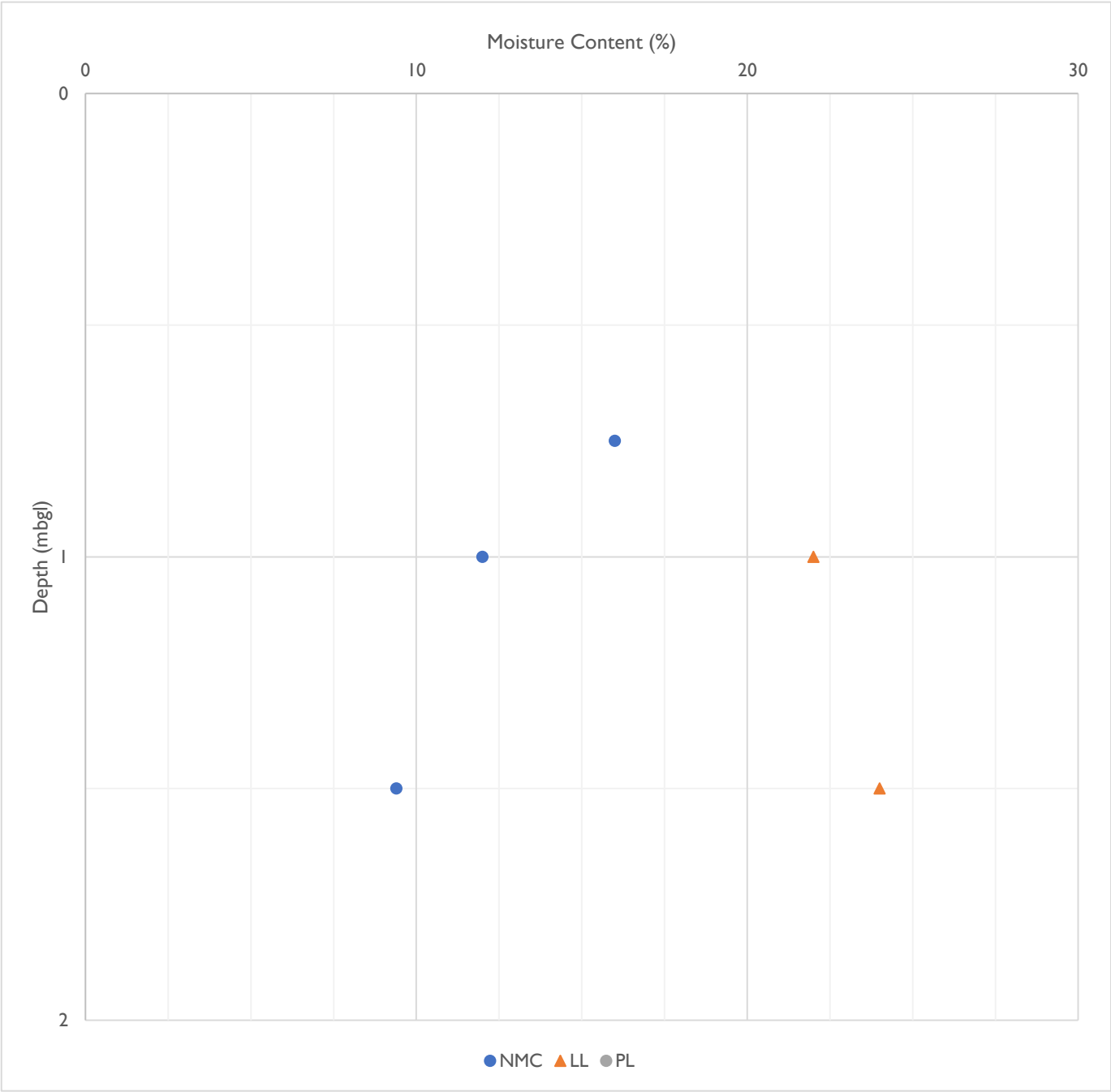
4



Atterberg Limits

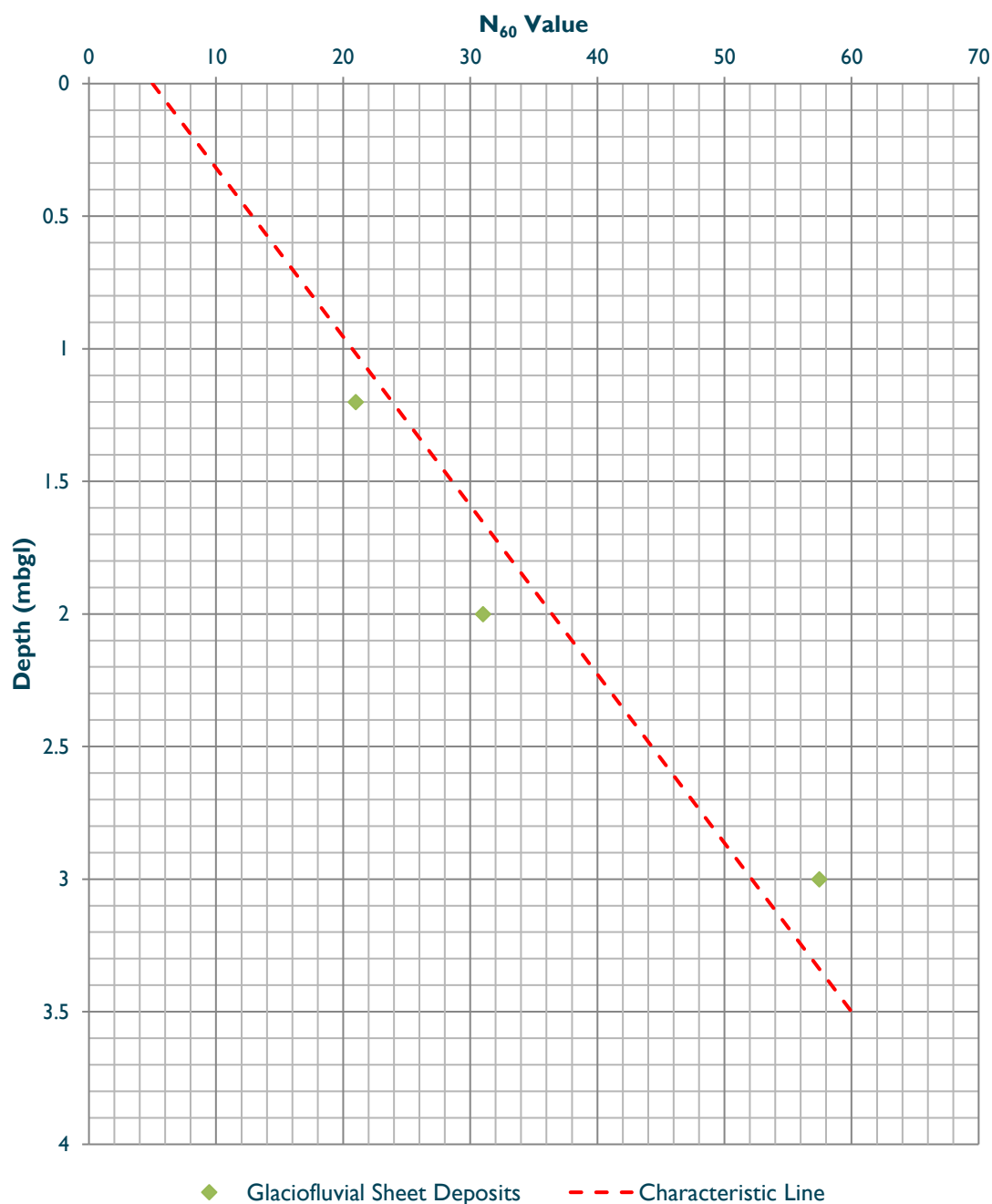
Glaciofluvial Sheet Deposits

Project:	347 Waterloo Road 240025
Client:	Manchester City Council



Notes:

Plot No. 2



Notes:

No. of tests: 2

Min Value: 0.00

Max Value: 0.00

Plot No.

1

Appendix C – Geotechnical Test Results

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
 Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
 cl 5.2 and 6

i2 Analytical Ltd
 Unit 8 Harrowden Road
 Brackmills Industrial Estate
 Northampton NN4 7EB

Client: Pick Everard
 Client Address: Halford House, Charles Street,
 Leicester, Leicestershire,
 LE1 1HA
 Contact: Jake Bhargal
 Site Address: 347 Waterloo Road

Client Reference: 240025
 Job Number: 24-009155-1
 Date Sampled: 07/03/2024
 Date Received: 11/03/2024
 Date Tested: 04/04/2024
 Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

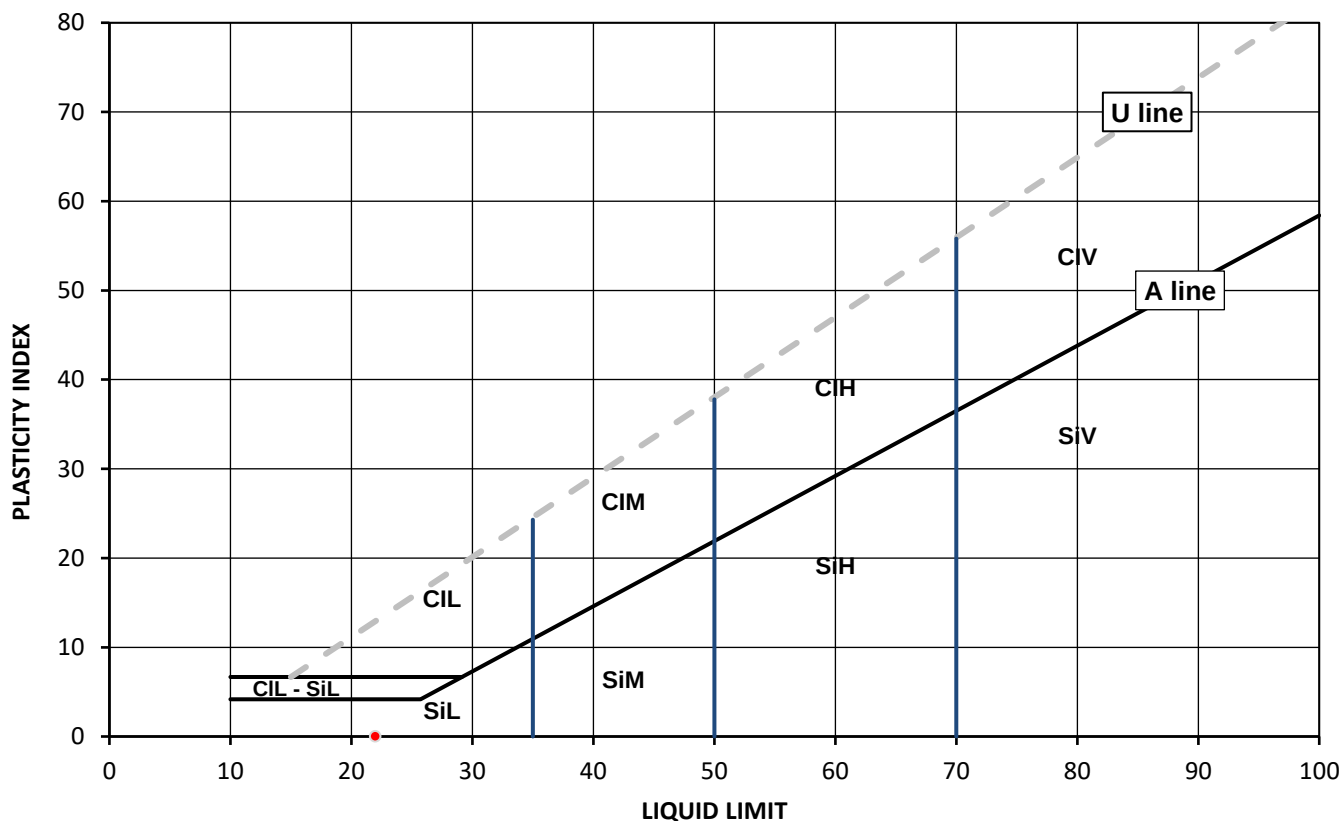
Test Results:

Laboratory Reference: 145666
 Hole No.: WS101
 Sample Reference: Not Given
 Sample Description: Yellowish brown slightly gravelly SAND

Depth Top [m]: 1.00
 Depth Base [m]: Not Given
 Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
 Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
11.6	22	NP	NP	N/A	N/A	98



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Clay	Plasticity	Liquid Limit
Cl	Clay	L Low	below 35
Si	Silt	M Medium	35 to 50
		H High	50 to 70
		V Very high	exceeding 70
		O Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks: NP - non plastic

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:
 Katarzyna Banys

Katarzyna Banys
 Reporting Specialist

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
 Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022,
 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022,
 cl 5.2 and 6

i2 Analytical Ltd
 Unit 8 Harrowden Road
 Brackmills Industrial Estate
 Northampton NN4 7EB

Client: Pick Everard
 Client Address: Halford House, Charles Street,
 Leicester, Leicestershire,
 LE1 1HA
 Contact: Jake Bhargal
 Site Address: 347 Waterloo Road

Client Reference: 240025
 Job Number: 24-009155-1
 Date Sampled: 07/03/2024
 Date Received: 11/03/2024
 Date Tested: 04/04/2024
 Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

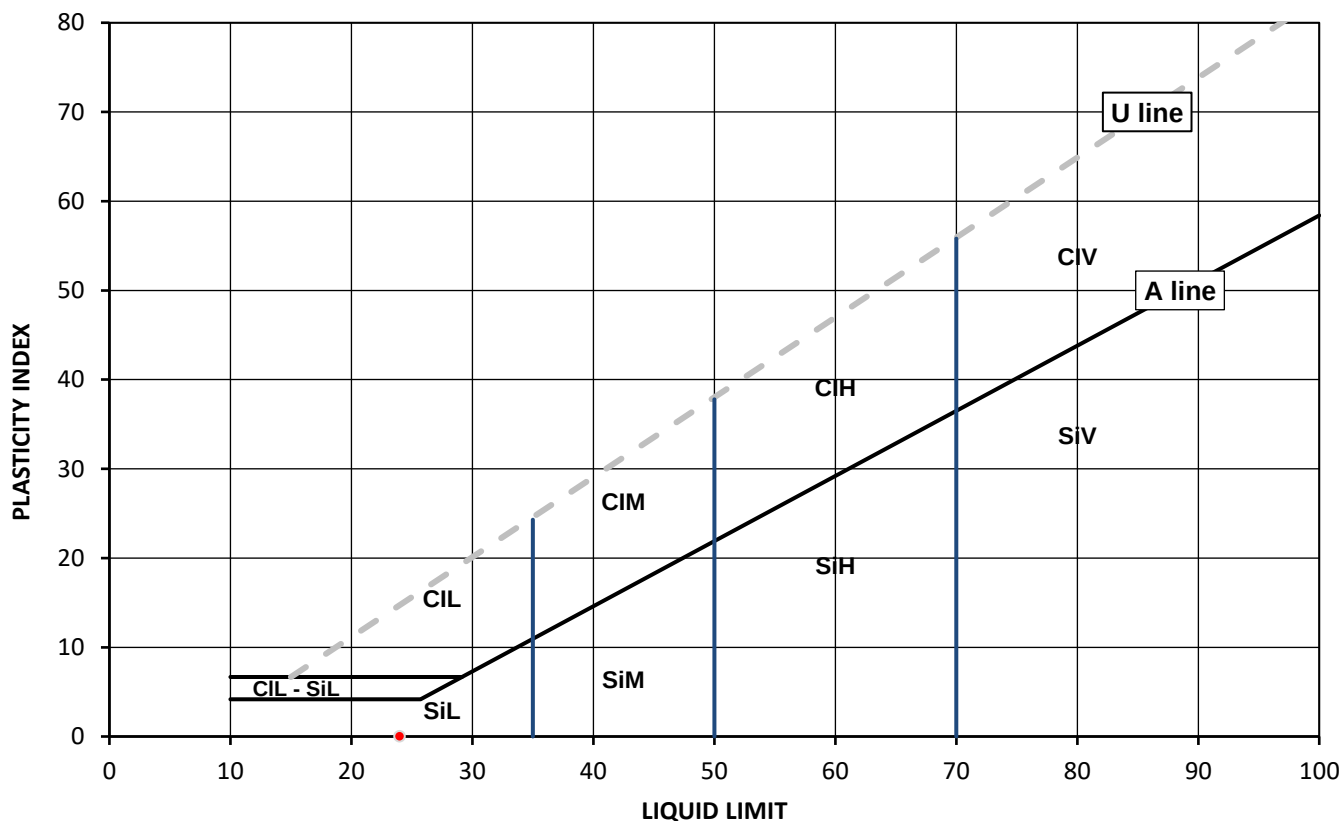
Test Results:

Laboratory Reference: 145667
 Hole No.: WS101
 Sample Reference: Not Given
 Sample Description: Yellowish brown slightly gravelly slightly clayey SAND

Depth Top [m]: 1.50
 Depth Base [m]: Not Given
 Sample Type: D

Sample Preparation: Tested after >0.425mm removed by hand; The water content in the sample was increased
 Cone Type: 80g/30deg

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
9.4	24	NP	NP	N/A	N/A	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks: NP - non plastic

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:
 Katarzyna Banys

Katarzyna Banys
 Reporting Specialist

for and on behalf of i2 Analytical Ltd



SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test,
BS 1377-2:2022, cl 5.2 and 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: Pick Everard
Client Address: Halford House, Charles Street,
Leicester, Leicestershire,
LE1 1HA

W by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes
A.W (1978)

Contact: Jake Bhangal
Site Address: 347 Waterloo Road

Client Reference: 240025
Job Number: 24-009155-1
Date Sampled: 07/03/2024
Date Received: 11/03/2024
Date Tested: 04/04/2024
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit								Density		
		Reference	Depth Top	Depth Base	Type				% Passing 425um	WL*	Correlation Factor	Wp	Ip	Cone type	Sample Preparation	bulk	dry	PD	
			m	m					%	%		%	%			Mg/m3	Mg/m3	Mg/m3	
145666	WS101	Not Given	1.00	Not Given	D	Yellowish brown slightly gravelly SAND	Atterberg 4 Point	11.6	98	22	-	NP	NP	80g/30 deg	R / I				
145667	WS101	Not Given	1.50	Not Given	D	Yellowish brown slightly gravelly slightly clayey SAND	Atterberg 4 Point	9.4	99	24	-	NP	NP	80g/30 deg	R / I				
145668	HP102	Not Given	0.75	Not Given	B	Brown gravelly very clayey SAND		15.9											

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, W - Tested after washing to remove >425mm; I - The water content in the sample was increased ,
D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed:

Katarzyna Banyas

Katarzyna Banyas
Reporting Specialist
for and on behalf of i2 Analytical Ltd



4041

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016,
BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

Client: Pick Everard
Client Address: Halford House, Charles Street,
Leicester, Leicestershire,
LE1 1HA
Contact: Jake Bhargal
Site Address: 347 Waterloo Road

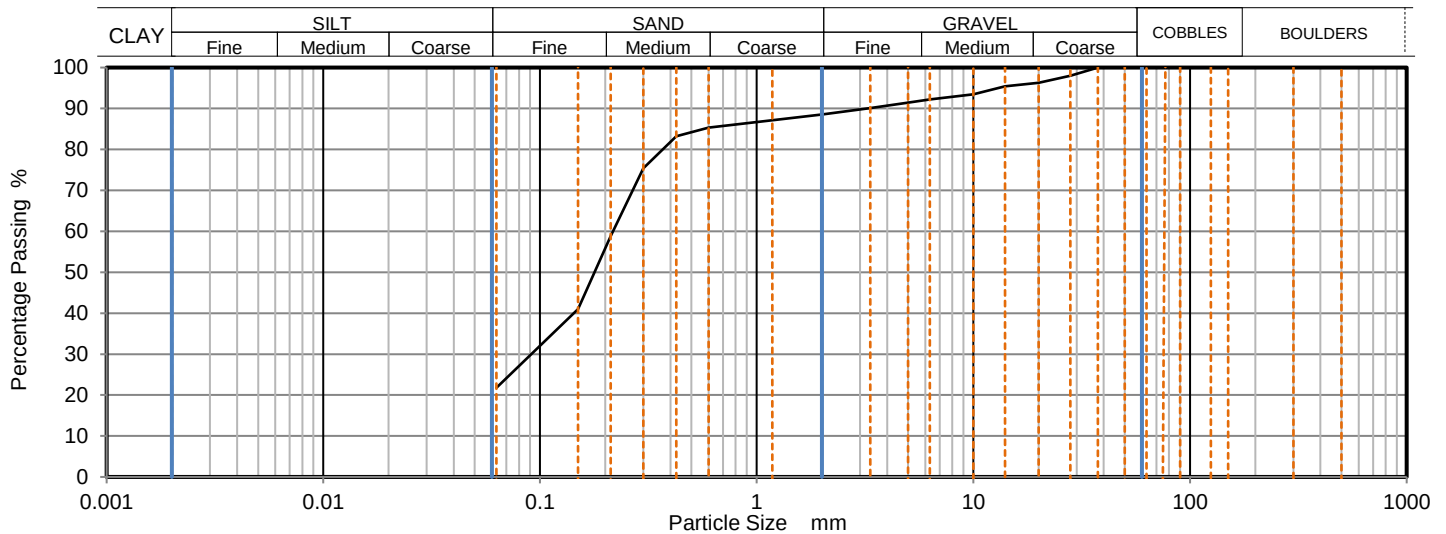
Client Reference: 240025
Job Number: 24-009155-1
Date Sampled: 07/03/2024
Date Received: 11/03/2024
Date Tested: 04/04/2024
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 145668
Hole No.: HP102
Sample Reference: Not Given
Sample Description: Brown gravelly very clayey SAND
Sample Preparation: Sample was quartered, oven dried at 108.5 °C and broken down by hand.

Depth Top [m]: 0.75
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	96		
14	95		
10	94		
6.3	92		
5	91		
3.35	90		
2	89		
1.18	87		
0.6	85		
0.425	83		
0.3	75		
0.212	59		
0.15	41		
0.063	22		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	11.00
Sand	67.00
Fines <0.063 mm	22.00

Grading Analysis	
D100	mm 37.5
D60	mm 0.218
D30	mm 0.0914
D10	mm
Uniformity Coefficient	3.5
Curvature Coefficient	

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

Katarzyna Banys

Katarzyna Banys
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

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WD18 8YS

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f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 24-009154

Project / Site name:	347 Waterloo Road	Samples received on:	11/03/2024
Your job number:	240025	Samples instructed on/ Analysis started on:	15/03/2024
Your order number:	105790	Analysis completed by:	22/03/2024
Report Issue Number:	1	Report issued on:	22/03/2024
Samples Analysed:	2 soil samples		



Signed:

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

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

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

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

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

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

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

Analytical Report Number: 24-009154
 Project / Site name: 347 Waterloo Road
 Your Order No: 105790

Lab Sample Number				145664	145665
Sample Reference				WS101	HP103
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.35
Date Sampled				07/03/2024	07/03/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)					
	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	43.3	< 0.1
Moisture Content	%	0.01	NONE	12	12
Total mass of sample received	kg	0.1	NONE	0.9	0.5

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.8	8.2
Total Sulphate as SO ₄	%	0.005	MCERTS	0.026	0.032
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	14	85
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	7.04	42.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.5	1.8
Total Sulphur	mg/kg	50	MCERTS	130	230
Total Sulphur	%	0.005	MCERTS	0.013	0.023
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	6.9
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	3.9

Heavy Metals / Metalloids

Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	4.1
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	8.2

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

Analytical Report Number : 24-009154
Project / Site name: 347 Waterloo Road

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
145664	WS101	None Supplied	0.5	Brown sand with stones
145665	HP103	None Supplied	0.35	Brown sand with gravel

Analytical Report Number : 24-009154
Project / Site name: 347 Waterloo Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

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

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

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

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

Appendix D – Environmental Test Results

Pick Everard
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Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 24-008070

Project / Site name:	347 Waterloo Road	Samples received on:	11/03/2024
Your job number:	240025	Samples instructed on/ Analysis started on:	11/03/2024
Your order number:	105789	Analysis completed by:	15/03/2024
Report Issue Number:	1	Report issued on:	18/03/2024
Samples Analysed:	2 soil samples - 1 bulk sample		



Signed: _____

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

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

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

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

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

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

Analytical Report Number: 24-008070
Project / Site name: 347 Waterloo Road
Your Order No: 105789

Lab Sample Number				140448	140449
Sample Reference				HP102	WS101
Sample Number				2	2
Depth (m)				0.20	0.50
Date Sampled				07/03/2024	07/03/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	8.4
Total mass of sample received	kg	0.1	NONE	0.4	0.8

Asbestos

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

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.4	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	39	6.2
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	19.2	3.12
Organic Matter (automated)	%	0.1	MCERTS	1.6	0.3

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.2	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.25	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.29	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.34	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.2	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	6.1	< 0.05
Pyrene	mg/kg	0.05	MCERTS	5.9	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.7	< 0.05
Chrysene	mg/kg	0.05	MCERTS	3.1	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.8	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.4	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.7	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.3	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.33	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.5	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	34.1	< 0.80
-----------------------------	-------	-----	-----------	------	--------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	3.4
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	1.9	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	4.7
Copper (aqua regia extractable)	mg/kg	1	MCERTS	54	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	6.7
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	6
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	22



Analytical Report Number: 24-008070
 Project / Site name: 347 Waterloo Road
 Your Order No: 105789

Lab Sample Number				140448	140449
Sample Reference				HP102	WS101
Sample Number				2	2
Depth (m)				0.20	0.50
Date Sampled				07/03/2024	07/03/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection
				Accreditation Status	

Petroleum Hydrocarbons

Petroleum Range Organics (C6 - C10) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0
TPH (C10 - C25) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	22	< 10
TPH (C25 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	11	< 10

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



4041



Analytical Report Number: 24-008070
Project / Site name: 347 Waterloo Road
Your Order No: 105789

Lab Sample Number				140447
Sample Reference				HP101
Sample Number				3
Depth (m)				0.45
Date Sampled				07/03/2024
Time Taken				None Supplied
Analytical Parameter (Bulk Analysis)	Units	Limit of detection	Accreditation Status	

Asbestos

Asbestos in bulks	Type	N/A	ISO 17025	Detected
Asbestos Analyst ID	N/A	N/A	N/A	WEM
Actinolite detected	Type	N/A	ISO 17025	Not-detected
Amosite detected	Type	N/A	ISO 17025	Not-detected
Anthophyllite detected	Type	N/A	ISO 17025	Not-detected
Chrysotile detected	Type	N/A	ISO 17025	Detected
Crocidolite detected	Type	N/A	ISO 17025	Not-detected
Tremolite detected	Type	N/A	ISO 17025	Not-detected

Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	Asbestos Cement
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 24-008070
Project / Site name: 347 Waterloo Road

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
140448	HP102	2	0.2	Brown loam and sand with gravel and vegetation
140449	WS101	2	0.5	Brown sand with gravel

Analytical Report Number : 24-008070
Project / Site name: 347 Waterloo Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Bulks	Asbestos Identification in bulk material with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	W	ISO 17025
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

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

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

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

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

Analytical Report Number : 24-008070
Project / Site name: 347 Waterloo Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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



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Analytical Report Number : 24-008071

Project / Site name:	347 Waterloo Road	Samples received on:	11/03/2024
Your job number:	240025	Samples instructed on/ Analysis started on:	11/03/2024
Your order number:	105789	Analysis completed by:	18/03/2024
Report Issue Number:	1	Report issued on:	18/03/2024
Samples Analysed:	10:1 WAC sample		

Signed:

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

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

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

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

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

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

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



4041



Environmental Science

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Waste Acceptance Criteria Analytical Results

Report No:	24-008071					
				Client: PICKEVERARD		
Location	347 Waterloo Road					
Lab Reference (Sample Number)	140450			Landfill Waste Acceptance Criteria		
				Limits		
Sampling Date	07/03/2024			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	HP102 2					
Depth (m)	0.20					
Solid Waste Analysis						
TOC (%)**	0.9			3%	5%	6%
Loss on Ignition (%) **	2.6			--	--	10%
BTEX (µg/kg) **	< 5.0			6000	--	--
Sum of PCBs (mg/kg) **	< 0.007			1	--	--
Mineral Oil (mg/kg) EH, ID, CU, AL	< 10			500	--	--
Total PAH (WAC-17) (mg/kg)	34.6			100	--	--
pH (units)**	7.9			--	>6	--
Acid Neutralisation Capacity (mmol / kg)	11			--	To be evaluated	To be evaluated
Eluate Analysis	10:1		10:1	Limit values for compliance leaching test		
				using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg			
Arsenic *	0.00506		0.0506	0.5	2	25
Barium *	0.0310		0.310	20	100	300
Cadmium *	< 0.000100		< 0.00100	0.04	1	5
Chromium *	0.0051		0.051	0.5	10	70
Copper *	0.019		0.19	2	50	100
Mercury *	< 0.000500		< 0.00500	0.01	0.2	2
Molybdenum *	0.00119		0.0119	0.5	10	30
Nickel *	0.0024		0.024	0.4	10	40
Lead *	0.014		0.14	0.5	10	50
Antimony *	< 0.0017		< 0.017	0.06	0.7	5
Selenium *	< 0.0040		< 0.040	0.1	0.5	7
Zinc *	0.022		0.22	4	50	200
Chloride *	0.71		7.1	800	15000	25000
Fluoride*	0.37		3.7	10	150	500
Sulphate *	1.4		14	1000	20000	50000
TDS*	35		350	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-
DOC	8.90		89.0	500	800	1000
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	0.7					
Dry Matter (%)	88					
Moisture (%)	12					
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCFRTS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Analytical Report Number : 24-008071
Project / Site name: 347 Waterloo Road

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
140450	HP102	2	0.2	Brown loam and sand with gravel and vegetation

Analytical Report Number : 24-008071
Project / Site name: 347 Waterloo Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with hexane followed by GC-MS	In-house method based on USEPA 8082	L027B	D	MCERTS
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1 ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	NONE
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Sample Preparation		In-house method	L043B	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance	L046B	W	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088	D/W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025

Analytical Report Number : 24-008071
Project / Site name: 347 Waterloo Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
WAC Leachate 10:1		In-house method	L043B	W	NONE

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

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

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

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

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

Appendix E – Generic Assessment Criteria

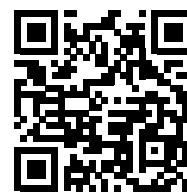
		SOIL - TIER ONE HUMAN HEALTH SCREENING VALUES			
Status	End Use		Issue No		Issue Date
DRAFT	Residential With Plant Uptake		I		04/07/16
Determinand	Units	SOIL ORGANIC MATTER			SOURCE
		1%	2.5%	6%	
pH		<5, >9			
Asbestos	%	Presence			
HEAVY METALS/METALLOIDS					
Arsenic	mg/kg	37			C4SL & CIEH/LQM S4UL
Cadmium*	mg/kg	11			CIEH/LQM S4ULs
Chromium (III)	mg/kg	910			CIEH/LQM S4ULs
Chromium (VI) *	mg/kg	6			CIEH/LQM S4ULs
Lead	mg/kg	200			C4SL
Mercury (Elemental)	mg/kg	1.2			CIEH/LQM S4ULs
Mercury (Inorganic)	mg/kg	40			CIEH/LQM S4ULs
Mercury (Methyl)	mg/kg	11			CIEH/LQM S4ULs
Nickel	mg/kg	130			CIEH/LQM S4ULs
Selenium	mg/kg	250			CIEH/LQM S4ULs
Berylium	mg/kg	1.7			CIEH/LQM S4ULs
Boron	mg/kg	290			CIEH/LQM S4ULs
Vanadium	mg/kg	410			CIEH/LQM S4ULs
Copper	mg/kg	2,400			CIEH/LQM S4ULs
Zinc	mg/kg	3,700			CIEH/LQM S4ULs
GENERAL INORGANICS					
Easily Liberatable Cyanide (free)	mg/kg	36			Acute effects infant 1 dose 3g soil
US EPA PRIORITY PAHs					
Acenaphthene	mg/kg	210	510	1100	CIEH/LQM S4ULs
Acenaphthylene	mg/kg	170	420	920	CIEH/LQM S4ULs
Anthracene	mg/kg	2,400	5,400	11000	CIEH/LQM S4ULs
Benzo(a)Anthracene	mg/kg	7.2	11	13	CIEH/LQM S4ULs
Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	CIEH/LQM S4ULs
Benzo(k)fluoranthene	mg/kg	77	93	100	CIEH/LQM S4ULs
Benzo(g,h,i)perylene	mg/kg	320	340	350	CIEH/LQM S4ULs
Benzo(a)Pyrene*	mg/kg	2.2	2.7	3.0	CIEH/LQM S4ULs
Chrysene	mg/kg	15	22	27	CIEH/LQM S4ULs
Di-benzo(a,h)anthracene	mg/kg	0.24	0.28	0.30	CIEH/LQM S4ULs
Fluoranthene	mg/kg	280	560	890	CIEH/LQM S4ULs
Fluorene	mg/kg	170	400	860	CIEH/LQM S4ULs
Indeno(1,2,3-cd)pyrene	mg/kg	27	36	41	CIEH/LQM S4ULs
Naphthalene	mg/kg	2.3	5.6	13	CIEH/LQM S4ULs
Phenanthrene	mg/kg	95	220	440	CIEH/LQM S4ULs
Pyrene	mg/kg	620	1200	2000	CIEH/LQM S4ULs
Coal Tar (Bap as surrogate marker)	mg/kg	0.79	0.98	1.1	CIEH/LQM S4ULs
Chlorinated Solvents					
1,2-Dichloroethane (1,2 DCA)	mg/kg	0.0071	0.011	0.019	CIEH/LQM S4ULs
1,1,1-Trichloroethane (1,1,1 TCA)	mg/kg	8.8	18	39	CIEH/LQM S4ULs
1,1,1,2-Tetrachloroethane (1,1,1,2 PCA)	mg/kg	1.2	2.8	6.40	CIEH/LQM S4ULs
1,1,2,2-Tetrachloroethane (1,1,2,2 PCA)	mg/kg	1.6	3.4	7.5	CIEH/LQM S4ULs
Tetrachloroethene (PCE)	mg/kg	0.18	0.39	0.90	CIEH/LQM S4ULs
Tetrachloromethane (Carbon Tetrachloride)	mg/kg	0.026	0.056	0.13	CIEH/LQM S4ULs
Trichloroethene (TCE)	mg/kg	0.016	0.034	0.075	CIEH/LQM S4ULs
Trichloromethane (Chloroform)	mg/kg	0.91	1.7	3.4	CIEH/LQM S4ULs
Vinyl Chloride (VC)	mg/kg	0.00064	0.00087	0.0014	CIEH/LQM S4ULs
Phenolics					
Phenol	mg/kg	120	200	380	CIEH/LQM S4ULs
TPH					
TPH Aliphatic >C5-6	mg/kg	42	78	160	CIEH/LQM S4ULs
TPH Aliphatic >C6-8	mg/kg	100	230	530	CIEH/LQM S4ULs
TPH Aliphatic >C8-10	mg/kg	27	65	150	CIEH/LQM S4ULs
TPH Aliphatic >C10-12	mg/kg	130 (48) ^{vap}	330 (118) ^{vap}	770 (283) ^{vap}	CIEH/LQM S4ULs
TPH Aliphatic >C12-16	mg/kg	1,100 (24) ^{sol}	2,400 (59) ^{sol}	4,400 (142) ^{sol}	CIEH/LQM S4ULs
TPH Aliphatic >C16-35	mg/kg	65,000 (8.48) ^{sol}	92,000 (21) ^{sol}	110,000	CIEH/LQM S4ULs
TPH Aliphatic >C35-44	mg/kg	65,000 (8.48) ^{sol}	92,000 (21) ^{sol}	110,000	CIEH/LQM S4ULs
TPH Aromatic >EC5-7 (Benzene)*	mg/kg	70	140	300	CIEH/LQM S4ULs
TPH Aromatic >EC7-8	mg/kg	130	290	660	CIEH/LQM S4ULs
TPH Aromatic >EC8-10	mg/kg	34	83	190	CIEH/LQM S4ULs
TPH Aromatic >EC10-12	mg/kg	74	180	380	CIEH/LQM S4ULs
TPH Aromatic >EC12-16	mg/kg	140	330	660	CIEH/LQM S4ULs
TPH Aromatic >EC16-21	mg/kg	260	540	930	CIEH/LQM S4ULs
TPH Aromatic >EC21-35	mg/kg	1,100	1,500	1,700	CIEH/LQM S4ULs
TPH Aromatic >EC35-44	mg/kg	1,100	1,500	1,700	CIEH/LQM S4ULs
TPH Aliphatic & Aromatic >EC44-70	mg/kg	1,600	1,800	1,900	CIEH/LQM S4ULs
Total TPH	mg/kg	No Sum	No Sum	No Sum	
BTEX					
Benzene*	mg/kg	0.087	0.17	0.37	CIEH/LQM S4ULs
Toluene	mg/kg	130	290	660	CIEH/LQM S4ULs
Ethylbenzene	mg/kg	47	110	260	CIEH/LQM S4ULs
m-Xylene	mg/kg	59	140	320	CIEH/LQM S4ULs
o-Xylene	mg/kg	60	140	330	CIEH/LQM S4ULs
p-Xylene	mg/kg	56	130	310	CIEH/LQM S4ULs
Xylenes (mixed isomers)	mg/kg	56	130	310	CIEH/LQM S4ULs

Appendix F – Waste Classification

Waste Classification Report

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

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



THMJQ-SVEMS-221WZ

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

Job name

347 Waterloo Road

Description/Comments

Preliminary waste classification on soils obtained during SI

Project

240025

Site

347 Waterloo Road

Classified by

Name:

Ross Goodband

Date:

21 Mar 2024 14:46 GMT

Telephone:

Company:

Pick Everard

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:

CERTIFIED

Course

Hazardous Waste Classification

Most recent 3 year Refresher

Date

18 Sep 2019

02 Aug 2022

Next 3 year Refresher due by Aug 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

347 Waterloo Road

Post Code N/A

SIC for the process giving rise to the waste

42990 Construction of other civil engineering projects n.e.c.

Description of industry/producer giving rise to the waste

Construction of retaining wall

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

Waste soils during foundation excavation

Description of the waste

Made Ground and topsoil

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	HP102	0.2	Non Hazardous		3
2	WS101	0.5	Non Hazardous		5

Related documents

#	Name	Description
1	ESPO Leicester	waste stream template used to create this Job

Report

Created by: Ross Goodband

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Classification of sample: HP102

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

Sample details

Sample name:	LoW Code:	
HP102	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m		
Moisture content:		
12%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 12% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	• pH		PH		8.4	pH		8.4	pH	8.4 pH		
2	arsenic { arsenic trioxide }				14	mg/kg	1.32	16.504	mg/kg	0.00165 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	boron { boric acid; [1] boric acid; [2] }				0.2	mg/kg	5.719	1.021	mg/kg	0.000102 %	✓	
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]									
4	cadmium { cadmium carbonate }			1	0.6	mg/kg	1.534	0.822	mg/kg	0.0000536 %	✓	
	048-012-00-5	208-168-9	513-78-0									
5	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				54	mg/kg	1.779	85.791	mg/kg	0.00858 %	✓	
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]									
6	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24	mg/kg	1.462	31.319	mg/kg	0.00313 %	✓	
		215-160-9	1308-38-9									
7	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				1.9	mg/kg	2.27	3.851	mg/kg	0.000385 %	✓	
	024-017-00-8											
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	130	mg/kg		116.071	mg/kg	0.0116 %	✓	
	082-001-00-6											
9	mercury { mercury dichloride }				0.7	mg/kg	1.353	0.846	mg/kg	0.0000846 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel(II) carbonate }				14	mg/kg	2.022	25.28	mg/kg	0.00253 %	✓	
	028-010-00-0	222-068-2 [1] 240-408-8 [2] 265-748-4 [3] 235-715-9 [4]	8333-67-3 [1] 16337-84-1 [2] 65405-96-1 [3] 12607-70-4 [4]									
11	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
12	zinc { zinc bis(orthophosphate) }				100	mg/kg	1.968	175.75	mg/kg	0.0176 %	✓	
	030-011-00-6	231-944-3	7779-90-0									
13	acenaphthene				0.29	mg/kg		0.259	mg/kg	0.0000259 %	✓	
		201-469-6	83-32-9									
14	acenaphthylene				0.25	mg/kg		0.223	mg/kg	0.0000223 %	✓	
		205-917-1	208-96-8									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	anthracene				1 mg/kg		0.893 mg/kg	0.0000893 %	✓	
		204-371-1	120-12-7							
16	benz[a]anthracene				2.7 mg/kg		2.411 mg/kg	0.000241 %	✓	
	601-033-00-9	200-280-6	56-55-3							
17	benzo[a]pyrene; benzo[def]chrysene				2.7 mg/kg		2.411 mg/kg	0.000241 %	✓	
	601-032-00-3	200-028-5	50-32-8							
18	benzo[b]fluoranthene				2.8 mg/kg		2.5 mg/kg	0.00025 %	✓	
	601-034-00-4	205-911-9	205-99-2							
19	benzo[ghi]perylene				1.5 mg/kg		1.339 mg/kg	0.000134 %	✓	
		205-883-8	191-24-2							
20	benzo[k]fluoranthene				1.4 mg/kg		1.25 mg/kg	0.000125 %	✓	
	601-036-00-5	205-916-6	207-08-9							
21	chrysene				3.1 mg/kg		2.768 mg/kg	0.000277 %	✓	
	601-048-00-0	205-923-4	218-01-9							
22	dibenz[a,h]anthracene				0.33 mg/kg		0.295 mg/kg	0.0000295 %	✓	
	601-041-00-2	200-181-8	53-70-3							
23	fluoranthene				6.1 mg/kg		5.446 mg/kg	0.000545 %	✓	
		205-912-4	206-44-0							
24	fluorene				0.34 mg/kg		0.304 mg/kg	0.0000304 %	✓	
		201-695-5	86-73-7							
25	indeno[123-cd]pyrene				1.3 mg/kg		1.161 mg/kg	0.000116 %	✓	
		205-893-2	193-39-5							
26	naphthalene				0.2 mg/kg		0.179 mg/kg	0.0000179 %	✓	
	601-052-00-2	202-049-5	91-20-3							
27	phenanthrene				4.2 mg/kg		3.75 mg/kg	0.000375 %	✓	
		201-581-5	85-01-8							
28	pyrene				5.9 mg/kg		5.268 mg/kg	0.000527 %	✓	
		204-927-3	129-00-0							
29	TPH (C6 to C40) petroleum group				33 mg/kg		29.464 mg/kg	0.00295 %	✓	
			TPH							
30	asbestos				<		<	<		ND
	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5							
Total:								0.0518 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
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 Soil is a free draining solid with no evidence of free phase hydrocarbons reported on site.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00295%)

Classification of sample: WS101

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

Sample details

Sample name:	LoW Code:	
WS101	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m		
Moisture content:		
8.4%		
(dry weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 8.4% Dry Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	pH				8.5 pH		8.5 pH	8.5 pH		
2	arsenic { arsenic trioxide }				3.4 mg/kg	1.32	4.141 mg/kg	0.000414 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	boron { boric acid; [1] boric acid; [2] }				<0.2 mg/kg	5.719	<1.144 mg/kg	<0.000114 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]							
4	cadmium { cadmium carbonate }			1	<0.2 mg/kg	1.534	<0.307 mg/kg	<0.00002 %		<LOD
	048-012-00-5	208-168-9	513-78-0							
5	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				10 mg/kg	1.779	16.415 mg/kg	0.00164 %	✓	
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]							
6	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				4.7 mg/kg	1.462	6.337 mg/kg	0.000634 %	✓	
		215-160-9	1308-38-9							
7	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
	024-017-00-8									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	6.7 mg/kg		6.181 mg/kg	0.000618 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	nickel { nickel(II) carbonate }				6 mg/kg	2.022	11.194 mg/kg	0.00112 %	✓	
	028-010-00-0	222-068-2 [1] 240-408-8 [2] 265-748-4 [3] 235-715-9 [4]	8333-67-3 [1] 16337-84-1 [2] 65405-96-1 [3] 12607-70-4 [4]							
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
12	zinc { trizinc bis(orthophosphate) }				22 mg/kg	1.968	39.949 mg/kg	0.00399 %	✓	
	030-011-00-6	231-944-3	7779-90-0							
13	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
14	acenaphthylene				<		<	<		ND
		205-917-1	208-96-8							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	anthracene	204-371-1	120-12-7		<		<	<		ND
16	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<		<	<		ND
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<		<	<		ND
18	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<		<	<		ND
19	benzo[ghi]perylene	205-883-8	191-24-2		<		<	<		ND
20	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<		<	<		ND
21	chrysene	601-048-00-0	205-923-4	218-01-9	<		<	<		ND
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<		<	<		ND
23	fluoranthene	205-912-4	206-44-0		<		<	<		ND
24	fluorene	201-695-5	86-73-7		<		<	<		ND
25	indeno[123-cd]pyrene	205-893-2	193-39-5		<		<	<		ND
26	naphthalene	601-052-00-2	202-049-5	91-20-3	<		<	<		ND
27	phenanthrene	201-581-5	85-01-8		<		<	<		ND
28	pyrene	204-927-3	129-00-0		<		<	<		ND
29	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
30	asbestos	650-013-00-6	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<		<	<		ND
Total:								0.0102 %		

Key

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

Appendix A: Classifier defined and non GB MCL determinands

• pH (CAS Number: PH)

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

• 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

• lead compounds with the exception of those specified elsewhere in this Annex (worst case)

GB MCL index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

• 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

• 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

• 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

• 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

• 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

• 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

• 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

■ **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

■ **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

■ **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Most likely worst case compound

boron {boric acid; [1] boric acid; [2]}

Most likely worst case compound

cadmium {cadmium carbonate}

Most likely worst case compound

copper {tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2]}

Most likely worst case compound

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

Most likely worst case compound

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

Most likely worst case compound

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Most likely worst case compound

mercury {mercury dichloride}

Most likely worst case compound

nickel {nickel(II) carbonate}

Most likely worst case compound

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

Most likely worst case compound

zinc {zinc bis(orthophosphate)}

Most likely worst case compound

Appendix C: Version

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

HazWasteOnline Classification Engine Version: 2024.80.5988.11077 (20 Mar 2024)

HazWasteOnline Database: 2024.80.5988.11077 (20 Mar 2024)

This classification utilises the following guidance and legislation:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

GB MCL List v2.0 - version 2.0 of 20th October 2023

GB MCL List v4.0 - version 4.0 of 2nd March 2024



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