



GROUNDTECH
CONSULTING

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PROJECT 67 CAVENDISH ROAD, DIDSBURY

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REVISION

CLIENT HENDERSON HOMES

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SUMMARY

Site Details

Site Location

The site is located in the suburb of Didsbury, c. 5 miles south of Manchester City Centre and approximately centre on grid reference 84050, 92457.

Site Area

The site is irregular in shape, approximately 0.15 hectares in area and generally topographically level.

Ground Model

Made Ground Soils

Made Ground was encountered in HP02 to HP04, to a maximum depth of 0.67m bgl and comprised reworked topsoil with constituents of brick, concrete, pottery and ash and rare coal.

Topsoil

Topsoil was present in HP01 to 0.55m bgl.

Natural Soils

The natural stratification consisted of light brown to yellow brown slightly gravelly Sand.

Bedrock

Bedrock was not encountered during the ground investigation.

Groundwater

No groundwater was encountered during the ground investigation.

Ground Engineering Assessment

Foundations

A detailed Ground Investigation will be required to determine a foundation solution for the proposed development.

Tier 1 (GQRA) Assessment and Revised (PL) Assessment

Human Health

No elevated Contaminants of Concern were identified through laboratory testing within the Made Ground and Topsoil based on the site's proposed residential end use. Asbestos was not detected in any of the screened samples.

Based on the results of this initial Ground Investigation, the risk to human health is considered to be Low.

Controlled Waters

Significant mobile contamination has not been identified during the Ground Investigation and the at this stage, the risk to controlled waters is considered to be Low.

Permanent Ground Gas

The risks from permanent ground gases is unknown at this stage.

Final Appraisal

The following further work is considered necessary to progress the site to construction phase:

- Preliminary Risk Assessment
- Detailed UXO Risk Assessment
- Detailed Ground Investigation

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Plans

<i>Plan Reference</i>	<i>Revision</i>	<i>Title</i>
GRO-21055-P01	-	Project Location Plan
GRO-21055-P02	-	Exploratory Hole Location Plan

1.0 INTRODUCTION

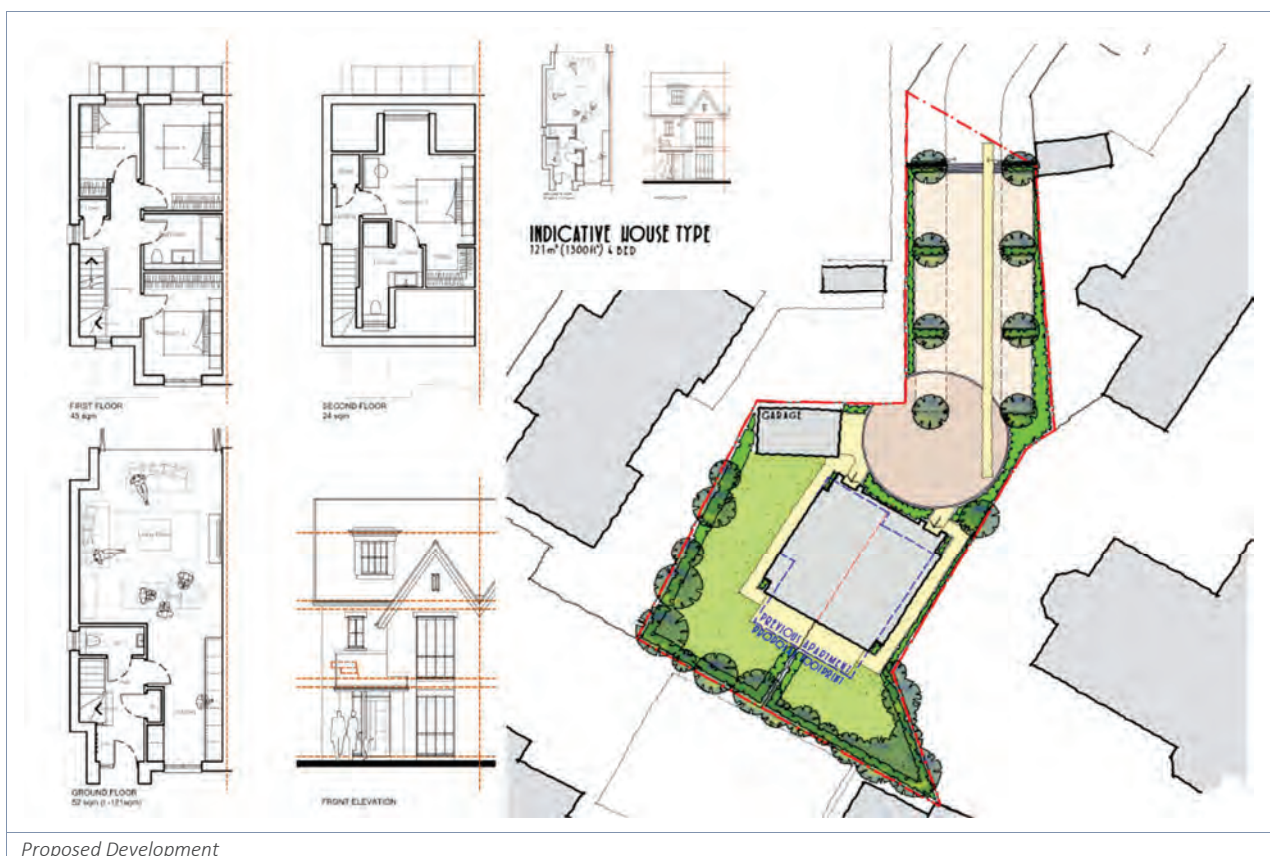
1.1 Project Objectives

Groundtech Consulting Limited have been instructed by Nobel Projects on behalf of Henderson Homes to undertake a Geo-Environmental Appraisal for a site at Cavendish Road, Didsbury.

A main investigation was undertaken in accordance with BS 5930:2015, BS 10175:2013, BS 8576 and BS 22475 to revise the CSM. The Appraisal has been prepared in accordance with current UK Legislation and to discharge Land Quality pre-commencement planning conditions.

1.2 Proposed Development

The proposed development is residential end use comprising a two-storey detached house with associated soft landscaping and a garage.



1.3 Limitations

Other conditions may exist on the site that have not been taken into account in this assessment as they are outside the scope of works. Groundtech Consulting are not responsible for these circumstances that are not outlined in the report.

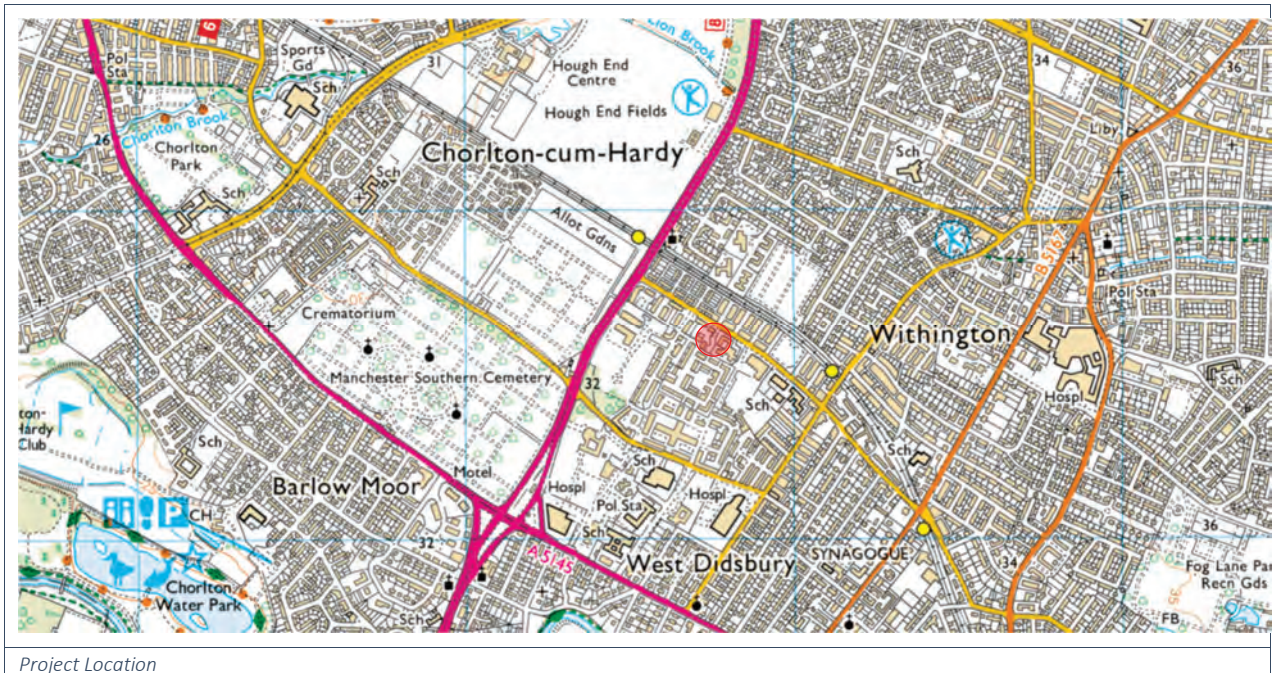
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2.0 SITE SETTING

2.1 Location

The site is located in the suburb of Didsbury circa 5 miles south of Manchester City Centre, as shown on the Project Location Plan GRO-21055-P01 and is approximately centred on National Grid Reference 84050 92457.



Access to the site is gained off Cavendish Road to the south of the site.

2.2 Site Description

The site is irregular in shape, approximately 0.15 hectares in area and is generally topographically level. The entire site is bounded by wooden fences in all orientations across the site.

The site currently comprises an area of grass with some overgrown shrubbery to the south west of the site.

The boundary of the site is formed by a wooden fence.

The site is surrounded by following features/land uses:

- North - Cavendish Road immediately north
- East - Nursing Home
- South - Residential properties
- West - Residential properties

Site photographs are presented in *Appendix 2*.

3.0 SCOPE OF INVESTIGATION AND RATIONALE

3.1 Project Objectives

The aim of the fieldwork was to:

Determine the stratification beneath the site.
Maintain a watching brief for visual and olfactory evidence of contamination.
Obtain samples using methodology in current guidance for contamination analysis.

3.2 Scope of Works

The following scope of works was completed on the 12th March 2021:

- 4 hand excavated pits to depths of between 0.6m and 0.85m bgl.

The exploratory hole locations are presented on Groundtech Plan GRO-21055-P02 and the exploratory hole logs are presented in Appendix 3.

The exploratory holes were positioned to establish the general stratification beneath the site.

The exploratory holes were logged by a suitably experienced geo-environmental engineer in general accordance with the following current guidance:

- BS 5930 'Code of Practice for Site Investigations' 2015.
- BS EN 14688-1:2002 'Geotechnical Investigation and Testing – Identification and classification of soil'.
- BS EN ISO 14689:2002 'Geotechnical investigation and testing – Identification and classification of rock'.

3.3 Soil Sampling

During the intrusive investigation, representative samples were taken at regular intervals, changes of strata and where evidence of contamination existed. Laboratory analysis was scheduled on the samples obtained.

The samples obtained are summarised in the table below:

Soil Sample	Number
Environmental Sample	9

The samples have been obtained in accordance with current environmental and geotechnical guidance. The sampling plan has been designed to obtain samples from all required strata using the correct methodology.

Disturbed samples of soil for chemical analysis were placed in the correct sampling containers as required by the laboratory in accordance with their MCERTS and UKAS Accreditation. Transportation was arranged in a timely manner and the samples were at the correct temperature.

The sample locations and depths are recorded on the exploratory logs.

3.4 Geo-Environmental Analysis

To inform the Tier I Generic Quantitative Risk Assessment, the following geo-environmental testing was scheduled to assess the risk from contamination on the site. The testing is based on the potential sources identified in the PRA and observations during the ground investigation.

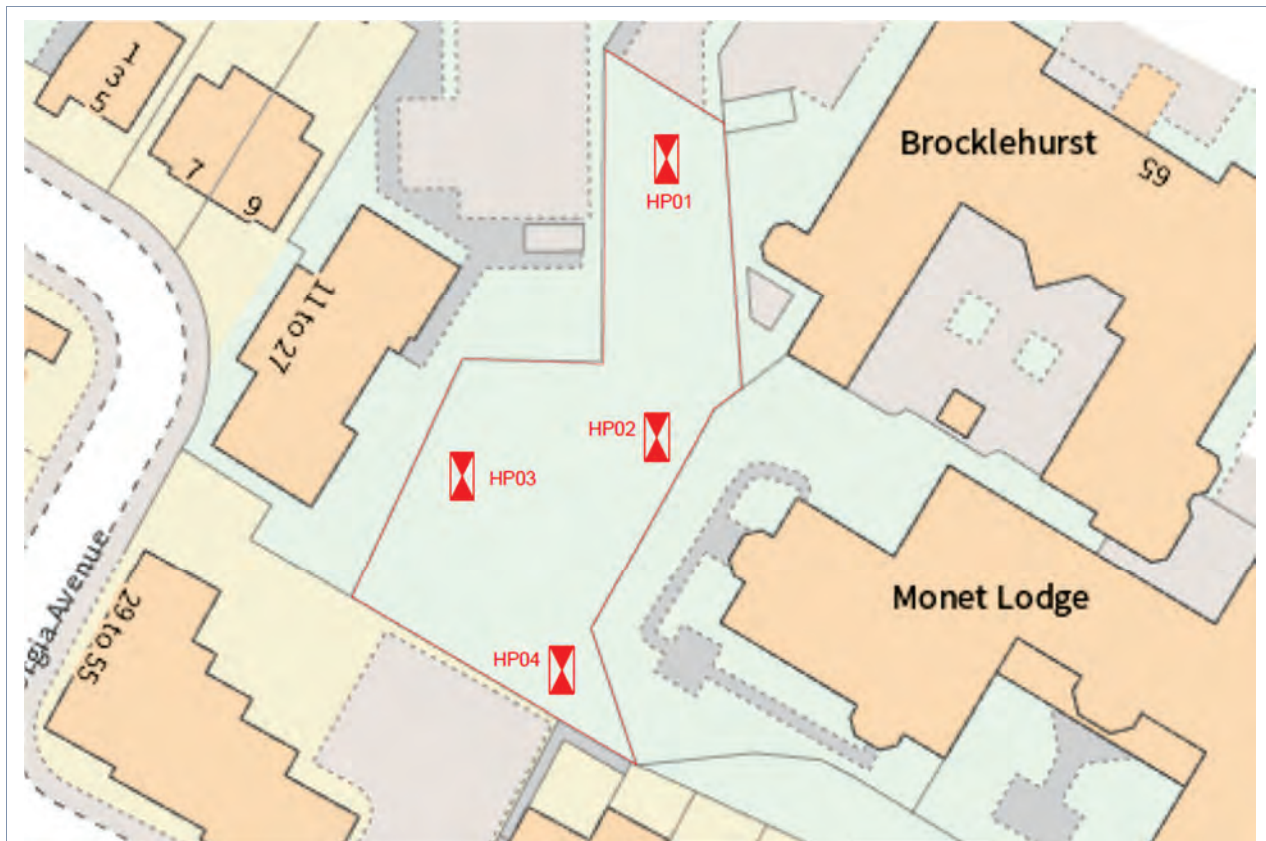
Contaminants of Concern	Matrix	Number
<i>Arsenic, cadmium, chromium (total and hexavalent), copper, lead, mercury, nickel, selenium, zinc and pH.</i>	<i>Soil</i>	<i>4</i>
<i>Speciated PAHs</i>	<i>Soil</i>	<i>4</i>
<i>Asbestos</i>	<i>Soil</i>	<i>4</i>

The Geo-Environmental Laboratory Testing Results are presented in *Appendix 4*.

4.0 GROUND MODEL

4.1 Made Ground

Made Ground was encountered in HP02 to HP04 to depths of between 0.35m and 0.67m bgl and generally consisted of dark brown to black slightly silty slightly gravelly clayey sandy topsoil with minor constituents of brick, concrete, pottery, ash and rare coal.



Exploratory Hole Locations

4.2 Topsoil

Brown sandy Topsoil was present in HP01 to a depth of 0.55m bgl.

4.3 Natural Ground

The natural stratification beneath the site consisted of light brown to yellow brown slightly gravelly Sand.

4.4 Bedrock

Bedrock was not encountered in this investigation.

4.5 Groundwater

Groundwater strikes were not observed in this investigation.

4.6 Watching Brief

A watching brief was maintained during the ground investigation for visual and olfactory evidence of contamination. No significant contamination was noted in the soils that were recovered.

5.0 GROUND ENGINEERING

5.1 Preliminary Foundation Assessment

At this stage, it is assumed that the site is to be developed residentially comprising three storey apartments or dwellings.

Foundations must be taken below Made Ground across the site which, at present, has been encountered to a maximum depth of 0.67m. The underlying natural strata comprises Sand. Ground Investigation works comprising boreholes will need to be carried out to determine foundation recommendations.

5.2 Additional Limitations

Coal Mining

Geological records and Coal Authority information indicates there is no risk from historic coal mining.

UXO

Zetica bomb risk maps indicate there is a moderate risk from UXO and a preliminary UXO Risk Assessment has been commissioned, a copy of which is in *Appendix 5*.

During WWII, the site was situated within the County Borough of Manchester, which according to official Home Office bombing statistics sustained an overall low density of bombing, resulting in a total of 738 items of ordnance, or an average of 27.1 per 1,000 acres. Whilst no bombing incidents are recorded on site, available mapping indicates the sites surroundings were subject to a number of fire bombs.

Given the sites open wartime composition, it would not be possible to distinguish any bomb damage, if sustained, by comparing pre- and post-war OS mapping. Likewise, though the Withington Hospital is understood to have been functional throughout the war period, periods of temporary evacuation may have occurred given the number of bombs recorded across the vicinity. Infrequent access may increase the likelihood that indicator of UXO, such as entry holes or craters, would have gone unseen and unreported.

In addition to the above, an in-house geo-dataset records a WWII-era military camp, the Spath Road Camp, approximately 300m west of the site. The exact usage, location and size of the camp could not be determined at this preliminary stage. Evidence also indicates Withington Hospital was used as a military hospital. Further research may help better confirm the military presence across the site area, and whether this impacted the proposed site.

Although the risk from UXO is not considered to be high at this stage, it has not been possible to confidently discount the risk from the information available in-house. It is therefore recommended that Further Research is undertaken in the form of a Detailed UXO Risk Assessment in accordance with CIRIA guidelines.

This is recommended in order to better assess the wartime conditions within and around the proposed area of works. Further research would include the acquisition and analysis of additional records such as high-resolution WWII-era imagery and local ARP incident records, if available. Upon the analysis of such materials, it may be possible to determine the extent and the cause of any damage within the proposed site. If it can be demonstrated that the proposed site was not historically utilised by the military and that incendiary bombing did not create conditions obstructive to the observation of UXO, it is possible that risk of the site may be reduced.

6.0 LAND QUALITY

6.1 Geo-Environmental Testing Results - Soils

Samples of Made Ground and Topsoil have been tested for a range of relevant Contaminants of Concern. In accordance with CLR11 (DEFRA & EA, 2004), a Generic Quantitative Risk Assessment (GQRA) has been undertaken to determine the significance of the concentrations as derived through Geo-Environmental analysis.

The GQRA process comprises the comparison of the actual concentrations measured on site with Generic Assessment Criteria (GACs) for the protection of human health.

The GACs used for the assessment of soil concentrations have been derived using the CLEA model. The GACs used and their ranking of importance are listed below:

- *Soil Guideline Values (SGVs) which demonstrate minimal risk.*
- *LQM/CIEH S4ULs which use the same toxicological data as the SGVs but different exposure criteria.*
- *C4SLs which demonstrate low risk.*

In deriving the GACs for use on Brownfield sites, we have assumed a 1.0% Soil Organic Matter unless the results indicate otherwise.

The proposed end-use for the site is a residential development comprising housing with private domestic gardens with associated driveways, pavements and access roads. We have therefore undertaken the GQRA on the basis that the proposed development site falls under the Residential (with Plant Uptake) land-use scenario as defined in SR3 (EA, 2009b).

The strata or sources of contamination targeted by the laboratory testing scheduled is summarised in the table below:

Strata	Number of Samples Tested	Locations
<i>Granular Made Ground (Population 1)</i>	<i>3</i>	<i>TP02 – T04</i>
<i>Natural Topsoil</i>	<i>1</i>	<i>TP01</i>

A summary of the Geo-Environmental Testing results is presented below and the GQRA Tier I screening Values are presented in *Appendix 6*:

Contaminant	Metals			Locations
	Range (mg/kg)	Screening Values (mg/kg)	Exceedances	
<i>Arsenic</i>	<i>6.7 - 17.6</i>	<i>32</i>	<i>0</i>	<i>-</i>
<i>Cadmium</i>	<i><0.1 - 0.2</i>	<i>10</i>	<i>0</i>	<i>-</i>
<i>Chromium</i>	<i>48.8 - 63.2</i>	<i>910</i>	<i>0</i>	<i>-</i>
<i>Copper</i>	<i>10 - 33</i>	<i>2400</i>	<i>0</i>	<i>-</i>
<i>Lead</i>	<i>14 - 59</i>	<i>200</i>	<i>0</i>	<i>-</i>
<i>Mercury</i>	<i><0.1 - 0.2</i>	<i>1</i>	<i>0</i>	<i>-</i>

Nickel	5.6 - 17.4	130	0	-
Selenium	<1	350	0	-
Zinc	46 - 70	3700	0	-
Polycyclic Aromatic Hydrocarbons (PAHs)				
Contaminant	Range (mg/kg)	Screen Values (mg/kg)	Exceedances	Locations
Naphthalene	<0.04	2.3	0	-
Acenaphthylene	<0.03 - 0.04	170	0	-
Acenaphthene	<0.05 - 0.48	210	0	-
Fluorene	<0.04 - 0.40	170	0	-
Phenanthrene	<0.03 - 2.8	95	0	-
Anthracene	<0.04 - 0.71	2400	0	-
Fluoranthene	0.12 - 3.89	280	0	-
Pyrene	0.1 - 3.05	620	0	-
Benzo(a)anthracene	0.1 - 1.45	7.2	0	-
Chrysene	0.06 - 1.48	15	0	-
Benzo(b)fluoranthene	0.07 - 1.87	2.6	0	-
Benzo(k)fluoranthene	0.03 - 0.73	77	0	-
Benzo(a)pyrene	0.05 - 1.45	2.2	0	-
Indeno(123cd)pyrene	<0.04 - 0.83	27	0	-
Dibenzo(ah)anthracene	<0.04 - 0.13	0.24	0	-
Benzo(ghi)perylene	<0.04 - 0.8	320	0	-
Asbestos Screen				
Position	Depth (m bgl)	Result		
HP01	0.10	None Detected		
HP02	0.60	None Detected		
HP03	0.30	None Detected		
HP04	0.10	None Detected		

6.2 Tier I Generic Quantitative Risk Assessment - Soils

Made Ground was encountered in the majority of the exploratory hole locations to a maximum depth of 0.67m bgl and generally consisted of reworked topsoil with minor constituents of brick, concrete pottery, ash and rare coal. It is thought to be associated with the former onsite hospital building.

Metals

No elevated concentrations of metals have been recorded within any of the samples that were tested.

Speciated Polycyclic Aromatic Hydrocarbons (PAHs)

No elevated PAHs were recorded based on the site having residential with plant uptake end use.

Asbestos

Asbestos was not detected in any of the four samples that were screened.

6.3 Health and Safety - Construction and Ground Workers

During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. The risk to construction and ground workers is assessed in the table below:

Pollution Linkage Ref	Potential Source	Pollution Linkage	Likelihood	Severity	Level of Risk
PL8	Made Ground	Ingestion, direct contact, inhalation of dusts.	Unlikely	Medium	Low

Based on the results of geo-environmental testing, no elevated Contaminants of Concern have been recorded in the underlying soils and no asbestos was detected. The risk to ground workers is considered to *Low*.

General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.
- Hand-washing and boot-washing facilities should be provided.
- Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

6.4 Waste Classification by Assessment

We have reviewed the testing results and inputted them into the HazWasteOnline model which allows users to code and classify waste as defined in the EWC (European Waste Catalogue 2002) based on EC Regulation 1272/2008 on the Classification, labelling and packaging of substances and mixtures (CLP) and latest Environment Agency guidance (WM3 "Guidance on the classification and assessment of waste (1st edition 2015)-Technical Guidance").

This is a useful tool as waste producers have the legal responsibility to classify any waste they produce.

Eight samples were tested to assess whether they contained any contaminants in the hazardous range when screened against assessment criteria within WM3. The results are in the Waste Classification Report presented in *Appendix 7*.

Sample Name	Depth (m bgl)	Classification Result	Hazardous Properties
HP01	0.1	Non-Hazardous	-
HP02	0.6	Non-Hazardous	-
HP03	0.3	Non-Hazardous	-

Sample Name	Depth (m bgl)	Classification Result	Hazardous Properties
HP04	0.1	Non-Hazardous	-

Based on the HazWasteOnline assessment tool the Made Ground and Topsoil have been classified as Non-Hazardous for waste disposal purposes.

Total testing was not undertaken on the natural soils and are assumed to be Non-Hazardous.

6.5 Waste Acceptance Criteria (WAC) Results

Waste Acceptance Criteria (WAC) testing was outside the scope of this investigation and the guidance given below is general.

The Landfill Directive (Directive 1999/31/EC on the landfilling of waste) led to the establishment of a methodology for classifying wastes. Wastes can only be accepted at a landfill if they meet the relevant Waste Acceptance Criteria (WAC) for that type of landfill. There are three different WAC, these are for:

- Inert waste
- Non-Hazardous waste
- Hazardous waste

Wastes should first be classified based on their total concentrations as detailed in the previous section. WAC testing is then required if the end disposal route is a landfill.

The possibility of automatic inert classification of the natural soils should be explored in accordance with Section 4.3 of the EA guidance document. The Council Decision includes a list of wastes in Section 2.1.1 of the document that are assumed to be inert and therefore acceptable at a landfill for inert waste without testing, this is the case if:

- They are single stream waste of a single waste type (although different waste types from the list may be accepted together if they are from a single source) and
- There is no suspicion of material or substances such as metals, asbestos, plastics, chemicals, etc to an extent which increases the risk associated with the waste sufficiently to justify contamination and they do not contain other their disposal in other classes of landfill.

If any organic contaminated material is encountered during the construction phase, it is possible that this may be classified as hazardous and testing should be undertaken at that time.

Materials should be segregated and where necessary sufficient time is allowed to further classify the material properly, including discussion with landfill sites and waste transfer stations to find the best disposal route. It is recommended that where possible, the soils could be recycled at a suitable local waste treatment plant or transfer station rather than a landfill disposal route.

The reuse of soils on the site this should be done in accordance with the CL:AIRE “Development Industry Code of Practice for the Definition of Waste” (CL:AIRE CoP). Any re-use scheme should be designed to minimise disposal costs.

After a cut and fill balance plan/volume calculation has been carried out, a U1 and T5 exemption could be registered. This will allow the use of the following soils without a waste permit or under Dow CoP MMP:

- 1,000 tonnes (c.600m³) of non-hazardous soil.
- 5,000 tonnes (c.3,000m³) of natural sand and gravels.
- 50,000 tonnes (c.25,000m³) of bituminous material to be used in roadways.
- 5,000 tonnes (c.3,000m³) of crushed concrete / stone.

7.0 FINAL APPRAISAL

7.1 Land Quality

Made Ground and Topsoil was encountered within all of the hand excavated pits to a maximum depth of 0.67m bgl.

No elevated Contaminants of Concern were identified through laboratory testing within the Made Ground and Topsoil based on the site's proposed residential end use. Asbestos was not detected in any of the screened samples.

Based on the results of this initial Ground Investigation, the risk to human health is considered to be *Low*.

Significant mobile contamination has not been identified during the Ground Investigation and the at this stage, the risk to controlled waters is considered to be *Low*.

The risks from permanent ground gases is unknown at this stage.

7.2 Ground Engineering

A detailed Ground Investigation will be required to determine a foundation solution for the proposed development.

7.3 Required Supplementary Investigation

The following further work is considered necessary to progress the site to construction phase:

Preliminary Risk Assessment
Detailed UXO Risk Assessment
Detailed Ground Investigation

8.0 RELEVANT INDUSTRY REFERENCES

- British Standards Institution. *Investigation of Potentially Contaminated sites - code of practice*. BS 10175:2017.
- British Standards Institution '*Code of Practice for Site Investigations*' BS 5930:2015
- British Standards Institution "*Geotechnical investigation and testing – Identification and classification of soil*" BS EN ISO 14688:2002.
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- BRE Special Digest 1: "*Concrete in Aggressive Ground*" 3rd Ed 2005.
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- Card & Steve Wilson in "*A pragmatic approach to ground gas risk assessment for the 21st Century*" - CIRIA/Environmental Protection UK Ground gas seminar 2011
- BS 8576:2013 '*Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)*'
- BS 8485:2015 '*Code of practise for the design of protective measures for methane and carbon dioxide ground gases for new buildings*'
- The Hazardous Waste (England) Regulations 2005.
- Environment Agency Hazardous Waste: "*Guidance on the classification and assessment of waste*" WM3 ver 1 May 2015.
- The National Planning Policy Framework (NPPF) March 2012
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- Environment Agency, 2009 'Using Soil Guideline Values'.
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- Water Framework Directive.
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Environment Agency "Guidance on the classification and assessment of waste (1st edition 2015) Technical Guidance WM3"

NHBC Standards 2019

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CIRIA "*Asbestos in soil and made ground: a guide to understanding and managing risks*" C733 2014

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Harris, M R, Herbert, S. M, Smith, M A 'Remedial Treatment for Contaminated Land' (twelve volumes), special publications 101-112, CIRIA 1996.

Department of the Environment. 1995. Industry Profiles - 48 separate publications available from The Stationery Office, London

BRE Digest 365 "Soakaway Design" 2015.

Environment Agency. R&D Publication 20. Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources. 1999.

Environment Agency Technical Guidance Note 01. Hydrogeological Risk Assessment for Landfills.

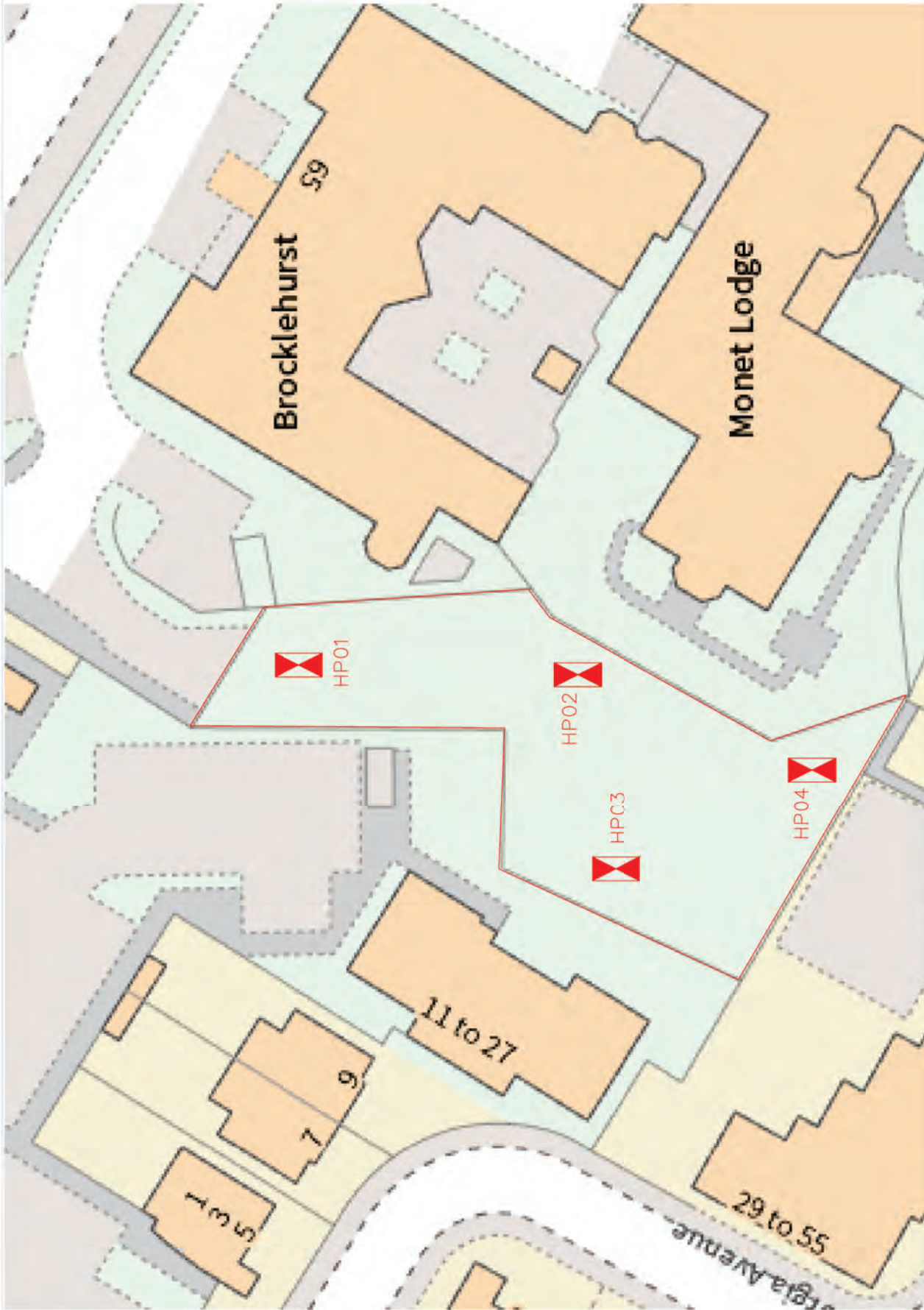
Specification for Highways Works – Series 600 Earthworks November 2017.

APPENDIX 1 - Plans



GROUNDTECH CONSULTING		CLIENT HENDERSON HOMES		DATE APRIL 2021		Status		Notes	
PROJECT TITLE CAVENDISH ROAD, DIDSBURY		SCALE NTS		PLAN NUMBER GRO-21055-P01		Preliminary		SITE LOCATION	
PLAN TITLE PROJECT LOCATION PLAN						Draft		●	
						Issued			
						For Comment			
						Approved			
						Rev.		Details	
								Date	





CLIENT

HENDERSON HOMES

PROJECT TITLE

CAVENDISH ROAD, DIDSBURY

PLAN TITLE

EXPLORATORY HOLE LOCATION PLAN

DATE

APRIL 2021

SCALE

NTS

PLAN NUMBER

GRO-21055-P02

Rev.

Details

Date

For Comment

Approved

Status

Preliminary

Draft

Issued

For Comment

Approved

Notes

Hand dug mail pits



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APPENDIX 2 - Site Photographs



Photograph 1 – Northern extent of the site.



Photograph 2 – Southern extent of the site.



Photograph 3 – South Western area



Photograph 4 - Western extent of the site.

APPENDIX 3 – Exploratory Hole Logs



Trial Pit Log

Trialpit No

HP02

Sheet 1 of 1

Project Name: CAVENDISH ROAD

Project No.
GRO-21055

Co-ords: -
Level:

Date
12/03/2021

Location: DIDSBURY

Dimensions
(m):

Depth
0.80

Scale
1:25

Logged
HH

Client: HENDERSON HOMES

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES					MADE GROUND: Dark brown slightly silty gravelly sandy topsoil. Sand is fine to medium. Gravel is angular to subangular fine to coarse of mixed lithologies including brick, cement, ash, plastic, coal and sandstone.
	0.60	ES		0.67 0.80			
							Orange slightly silty slightly clayey slightly gravelly SAND. Gravel is subangular to subrounded fine to medium of mixed lithologies.
							End of pit at 0.80 m

1

2

3

4

5

Remarks: 1. Hand dug pit to 0.8m bgl. 2. No groundwater encountered.

Stability: Stable



Trial Pit Log

Trialpit No
HP03
Sheet 1 of 1

Project Name: CAVENDISH ROAD

Project No.
GRO-21055

Co-ords: -
Level:

Date
12/03/2021

Location: DIDSBURY

Dimensions
(m):

Scale
1:25

Client: HENDERSON HOMES

Depth
0.85

Logged
HH

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	ES					MADE GROUND: Dark brown black slightly silty slightly gravelly clayey sandy topsoil. Gravel is subangular to subrounded fine to coarse of mixed lithologies including brick, concrete, pottery and coal.	
	0.50	ES		0.60				
	0.75	ES		0.85			Dark brown slightly silty slightly clayey gravelly SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies.	
							End of pit at 0.85 m	

Remarks: 1. Hand dug pit to 0.85m bgl. 2. No groundwater encountered.

Stability: Stable





Trialpit No

HP04

Sheet 1 of 1

Project Name: CAVENDISH ROAD

Project No.	GRO-21055
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Co-ords: -
Level:

Date
12/03/2021

Location: DIDSBURY

Dimensions
(m):

Scale
1:25

Client: HENDERSON HOMES

Depth
0.60

Logged
HH

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	ES		0.35			MADE GROUND: Dark brown black slightly silty gravelly sandy topsoil. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and concrete.
	0.55	ES		0.60			Orange brown slightly silty slightly clayey gravelly SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies.
							End of pit at 0.60 m

Remarks: 1. Hand dug pit to 0.6m bgl. 2. No groundwater encountered.

Stability: Stable



APPENDIX 4 – Geo-Environmental Testing

Groundtech Consulting Limited
PO Box 499
Manchester
M28 8EE



Attention :	Hannah Hammonds
Date :	26th March, 2021
Your reference :	GRO-21055
Our reference :	Test Report 21/3889 Batch 1
Location :	Cavendish Road, Didsbury
Date samples received :	17th March, 2021
Status :	Final report
Issue :	1

Nine samples were received for analysis on 17th March, 2021 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Hayley Prowse

Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Groundtech Consulting Limited
Reference: GRO-21055
Location: Cavendish Road, Didsbury
Contact: Hannah Hammonds
EMT Job No: 21/3889

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	10-12	13-15	22-24							Please see attached notes for all abbreviations and acronyms		
Sample ID	HP01	HP02	HP03	HP04									
Depth	0.10	0.60	0.30	0.10									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	12/03/2021	12/03/2021	12/03/2021	12/03/2021									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	17/03/2021	17/03/2021	17/03/2021	17/03/2021									
Arsenic #	6.7	17.6	8.2	10.7							<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	0.1	0.2							<0.1	mg/kg	TM30/PM15
Chromium #	56.3	63.2	48.8	49.4							<0.5	mg/kg	TM30/PM15
Copper #	32	10	26	33							<1	mg/kg	TM30/PM15
Lead #	59	14	55	51							<5	mg/kg	TM30/PM15
Mercury #	0.2	<0.1	<0.1	0.1							<0.1	mg/kg	TM30/PM15
Nickel #	12.9	5.6	17.4	17.4							<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1							<1	mg/kg	TM30/PM15
Zinc #	46	47	70	69							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	0.04	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.48	<0.05	0.33	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	0.40	<0.04	0.24	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	2.80	<0.03	1.85	0.15							<0.03	mg/kg	TM4/PM8
Anthracene #	0.71	<0.04	0.50	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	3.89	0.12	2.38	0.45							<0.03	mg/kg	TM4/PM8
Pyrene #	3.05	0.10	1.99	0.41							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	1.45	0.10	1.07	0.34							<0.06	mg/kg	TM4/PM8
Chrysene #	1.48	0.06	1.00	0.27							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	2.60	0.10	1.88	0.51							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	1.45	0.05	1.08	0.26							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.83	<0.04	0.66	0.21							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.13	<0.04	0.13	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.80	<0.04	0.63	0.18							<0.04	mg/kg	TM4/PM8
PAH 16 Total	20.1	<0.6	13.8	2.8							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	1.87	0.07	1.35	0.37							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.73	0.03	0.53	0.14							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	91	93	92							<0	%	TM4/PM8
Natural Moisture Content	22.6	18.8	19.1	17.6							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0048	0.0103	0.0712	<0.0015							<0.0015	g/l	TM38/PM20
Organic Matter	5.7	0.8	2.7	6.5							<0.2	%	TM21/PM24
pH #	6.46	8.31	8.41	8.03							<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Groundtech Consulting Limited
Reference: GRO-21055
Location: Cavendish Road, Didsbury
Contact: Hannah Hammonds

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/3889

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 21/3889

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/IS ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009; SOILS by Modified USEP	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

APPENDIX 5 – Preliminary UXO Report



Express Preliminary UXO Risk Assessment

www.1stlinedefence.co.uk

Client	Groundtech Consulting Limited
Project	67 Cavendish Road, Didsbury
Site Address	67 Cavendish Road, Didsbury, Manchester, M20 1JG
Report Reference	EP12957-00
Date	02/03/21
Originator	AS

Assessment Objective

This preliminary risk assessment is a qualitative screening exercise to assess the likely potential of encountering unexploded ordnance (UXO) at the 67 Cavendish Road, Didsbury site. The assessment involves the consideration of the basic factors that affect the potential for UXO to be present at a site as outlined in Stage One of the UXO risk management process.

Background

This assessment uses the sources of information available in-house to 1st Line Defence Ltd to enable the placement of a development site in context with events that may have led to the presence of German air-delivered or Allied military UXO. The report will identify any immediate necessity for risk mitigation or additional research in the form of a Detailed UXO Risk Assessment. It makes use of 1st Line Defence's extensive historical archives, library and unique geo-databases, as well as internet resources, and is researched and compiled by UXO specialists and graduate researchers.

The assessment directly follows CIRIA C681 guidelines "Unexploded Ordnance, a Guide for the Construction Industry". The document will therefore assess the following factors:

- Basic Site Data
- Previous Military Use
- Indicators of potential aerial delivered UXO threat
- Consideration of any Mitigating Factors
- Extent of Proposed Intrusive Works
- Any requirement for Further Work

It should be noted that the vast majority of construction sites in the UK will have a low or negligible risk of encountering UXO and should be able to be screened out at this preliminary stage. The report is meant as a common sense 'first step' in the UXO risk management process. The content of the report and conclusions drawn are based on basic, preliminary research using the information available to 1st Line Defence at the time this report was produced. It should be noted that the only way to entirely negate risk from UXO to a project would be to support the works proposed with appropriate UXO risk mitigation measures. It is rarely possible to state that there is absolutely 'no' risk from UXO to a project.





Risk Assessment Considerations	
Site location and description/current use	The site is located in Didsbury, Greater Manchester. According to recent aerial imagery the site consists of an area of grassland. The site is bound by a carpark to the north, a nursing home to the east, as well as another car park and residential housing to the south and west. The site is approximately centred on the OS grid reference: SJ 83740 92590. 
Are there any indicators of current/historical military activity on/close to the site?	In-house records note a WWII-era military camp, the Spath Road Camp, approximately 300m west of the site. At this stage, the camp is believed to have housed bomb disposal personnel during the war. It has not been possible to determine the exact usage, location and size of the camp at this preliminary stage. There is also evidence to suggest the hospital to the south of the site, Withington Hospital, was used as a military hospital in WWI.¹ The closest recorded Heavy Anti-Aircraft (HAA) battery was situated approximately 1km north-west of the site. The conditions in which unexploded anti-aircraft ordnance may have fallen unrecorded are analogous to that of aerial delivered German bombs.
What was the pre- and post-WWII history of the site?	Pre-WWII OS mapping dated 1938 shows the site to consist open, undeveloped land, and be immediately bound by a similar composition of land in all directions. To the north of the site is <i>Cavendish Road</i>, and to the south-east and south is a <i>Hospital</i> and <i>Chortlon P.A. Institute</i>. It appears the site was within the grounds of the <i>Hospital</i>. Post-WWII OS mapping dated 1956-1958 shows the site and its immediate surroundings to be unchanged, still occupied by open land. Structures to the south-east and south of the site, associated with the hospital, appear largely structurally unchanged.
Was the area subject to bombing during WWII?	During WWII the site was situated within the County Borough of Manchester. According to official Home Office bombing statistics, Manchester sustained an overall low density of bombing, totalling 738 items of ordnance, or an average of 27.1 per 1,000 acres. This consisted 712 HE bombs, 18 parachute mines, seven oil bombs, and one V-1 pilotless aircraft bomb. According to Manchester bomb plot mapping from the Manchester Central Library, the site was not subject to any direct bomb strikes. However, there are a number of fire bombs recorded in the wider vicinity. Specifically, several fire bomb incidents are plotted to the north on <i>Cavendish Road</i>, as well as many more to the south on the <i>Withington Hospital</i> and <i>Institution</i> at this location. Bombs plotted look to have mainly been recorded across structures. The nearest HE bomb is reported to have fallen at <i>Rhodes Memorial Homes</i>, approximately 260m south-east of the site. An additional interactive map which shows bomb strikes that resulted in fatalities during the Manchester Blitz was consulted. This map does not show any bombs on site, with the nearest strike recorded approximately 80m north-east of the site.

¹ <http://www.bbc.co.uk/history/ww2peopleswar/stories/53/a2836253.shtml>



Is there any evidence of bomb damage on/close to the site?	As the site consisted open, undeveloped land throughout and following the war it is not possible to identify indicators of bomb damage by comparing pre and post-war historic mapping, such as missing or ruined structures.
To what degree would the site have been subject to access?	Given the site appears to be on the grounds of a hospital during WWII, which is believed to have been functional throughout the war period, it is anticipated access would generally have been frequent. However, following bombing incidents in the area, some periods of evacuation may have occurred. Infrequent access may increase the likelihood that indicators of UXO, such as entry holes or craters, would have gone unseen and unreported.
To what degree has the site been developed post-WWII?	Post-war development appears to have occurred on and surrounding the site. Historic OS mapping dated 1989-1990 shows the site to be partially occupied by two structures, which have since been demolished. The sites immediate surroundings have undergone redevelopment to include the development of residential properties and associated car parking areas and infrastructure. The risk of encountering UXO is only considered to be mitigated at the locations of, and to the depths of post-war foundation
What is the nature and extent of the intrusive works proposed?	The nature and extent of works proposed was not available at the time of writing.

Summary and Conclusions

During WWII the site was situated within the County Borough of Manchester, which according to official Home Office bombing statistics sustained an overall low density of bombing, resulting in a total of 738 items of ordnance, or an average of 27.1 per 1,000 acres. Whilst no bombing incidents are recorded on site, available mapping indicates the sites surroundings were subject to a number of fire bombs.

Given the sites open wartime composition, it would not be possible to distinguish any bomb damage, if sustained, by comparing pre and post-war OS mapping. Likewise, though the Withington Hospital, the ground of which the site looks to have been situated, is understood to have been functional throughout the war period, periods of temporary evacuation may have occurred given the amount of bombs recorded across the vicinity. Infrequent access may increase the likelihood that indicator of UXO, such as entry holes or craters, would have gone unseen and unreported.

In addition to the above, an in-house geo-dataset records a WWII-era military camp, the Spath Road Camp, approximately 300m west of the site. The exact usage, location and size of the camp could not be determined at this preliminary stage. Evidence also indicates Withington Hospital was used as a military hospital. Further research may help better confirm the military presence across the site area, and whether this impacted the proposed site.





Recommendations

Although the risk from UXO is not considered to be high at this stage, it has not been possible to confidently discount the risk from the information available in-house. It is therefore recommended that **Further Research** is undertaken in the form of a **Detailed UXO Risk Assessment** in accordance with CIRIA guidelines.

This is recommended in order to better assess the wartime conditions within and around the proposed area of works. Further research would include the acquisition and analysis of additional records such as high resolution WWII-era imagery and local ARP incident records, if available. Upon the analysis of such materials it may be possible to determine the extent and the cause of any damage within the proposed site. If it can be demonstrated that the proposed site was not historically utilised by the military and that incendiary bombing did not create conditions obstructive to the observation of UXO, it is possible that risk of the site may be reduced.

If the client has any anecdotal or empirical evidence of UXO risk on site, please contact 1st Line Defence.



APPENDIX 6 - Tier 1 Generic Screening Values

Proposed End Use	Unit	Residential with Plant Uptake			Commercial			Source
SOM	%	1	2.5	6	1	2.5	6	
Arsenic	mg/kg	32	32	32	640	640	640	SGVs
Beryllium	mg/kg	1.7	1.7	1.7	12	12	12	LQM S4ULs
Boron (water soluble)	mg/kg	290	290	290	240000	240000	240000	LQM S4ULs
Cadmium	mg/kg	10	10	10	230	230	230	SGVs
Chromium (Total)	mg/kg	910	910	910	8600	8600	8600	LQM S4ULs
Chromium (VI)	mg/kg	21	21	21	49	49	49	DEFRA C4SLs
Copper	mg/kg	2400	2400	2400	68000	68000	68000	LQM S4ULs
Lead	mg/kg	200	200	200	2300	2300	2300	DEFRA C4SLs
Organic Mercury	mg/kg	1.2	1.2	1.2	26	26	26	LQM S4ULs
Nickel	mg/kg	130	130	130	1800	1800	1800	SGVs
Selenium	mg/kg	350	350	350	13000	13000	13000	SGVs
Vanadium	mg/kg	410	410	410	9000	9000	9000	LQM S4ULs
Zinc	mg/kg	3700	3700	3700	730000	730000	730000	LQM S4ULs
Aliphatic EC 5 - 6	mg/kg	42	78	160	3200 (304) ^{sol}	5900 (558) ^{sol}	12000 (1150) ^{sol}	LQM S4ULs
Aliphatic EC 6 - 8	mg/kg	100	230	530	7800 (144) ^{sol}	17000 (322) ^{sol}	40000 (736) ^{sol}	LQM S4ULs
Aliphatic EC 8 - 10	mg/kg	27	65	150	2000 (78) ^{sol}	4800 (190) ^{sol}	11000 (451) ^{vsp}	LQM S4ULs
Aliphatic EC 10 - 12	mg/kg	130 (48) ^{vsp}	330 (118) ^{vsp}	760 (283) ^{vsp}	9700 (48) ^{sol}	23000 (118) ^{vsp}	47000 (283) ^{vsp}	LQM S4ULs
Aliphatic EC 12 - 16	mg/kg	1100 (24) ^{sol}	2400 (59) ^{sol}	4300 (142) ^{sol}	59000 (24) ^{sol}	82000 (59) ^{sol}	90000 (142) ^{sol}	LQM S4ULs
Aliphatic EC 16 - 35	mg/kg	65000 (8.48) ^{f, sol}	92000 (21) ^{f, sol}	110000 ^f	1600000 ^f	1700000 ^f	1800000 ^f	LQM S4ULs
Aliphatic EC 35 - 44	mg/kg	65000 (8.48) ^{f, sol}	92000 (21) ^{f, sol}	110000 ^f	1600000 ^f	1700000 ^f	1800000 ^f	LQM S4ULs
Aromatic EC 5 - 7	mg/kg	70	140	300	26000 (1220) ^{sol}	46000 (2260) ^{sol}	86000 (4710) ^{sol}	LQM S4ULs
Aromatic EC 7 - 8	mg/kg	130	290	660	56000 (869) ^{vsp}	110000 (1920) ^{vsp}	180000 (4360) ^{vsp}	LQM S4ULs
Aromatic EC 8 - 10	mg/kg	34	83	190	3500 (613) ^{vsp}	8100 (1500) ^{vsp}	17000 (3580) ^{vsp}	LQM S4ULs
Aromatic EC 10 - 12	mg/kg	74	180	380	16000 (364) ^{sol}	28000 (899) ^{sol}	34000 (2150) ^{sol}	LQM S4ULs
Aromatic EC 12 - 16	mg/kg	140	330	660	36000 (169) ^{sol}	37000	38000	LQM S4ULs
Aromatic EC 16 - 21	mg/kg	260 ^f	540 ^f	930 ^f	28000 ^f	28000 ^f	28000 ^f	LQM S4ULs
Aromatic EC 21 - 35	mg/kg	1100 ^f	1500 ^f	1700 ^f	28000 ^f	28000 ^f	28000 ^f	LQM S4ULs
Aromatic EC 35 - 44	mg/kg	1100 ^f	1500 ^f	1700 ^f	28000 ^f	28000 ^f	28000 ^f	LQM S4ULs
Benzene	mg/kg	0.33	0.33	0.33	95	95	95	SGVs
Toluene	mg/kg	610	610	610	4400	4400	4400	SGVs
Ethyl Benzene	mg/kg	350	350	350	2800	2800	2800	SGVs
Xylene - o	mg/kg	250	250	250	2600	2600	2600	SGVs
Xylene - m	mg/kg	240	240	240	3500	3500	3500	SGVs
Xylene - p	mg/kg	230	230	230	3200	3200	3200	SGVs
MTBE (methyl tert-butyl)	mg/kg	49	84	160	7900	13000	24000	CL:AIRE 2010
Acenaphthene	mg/kg	210	510	1100	84000 (57) ^{sol}	97000 (141) ^{sol}	100000	LQM SAULs
Acenaphthylene	mg/kg	170	420	920	83000 (86.1) ^{sol}	97000 (212) ^{sol}	100000	LQM S4ULs
Anthracene	mg/kg	2400	5400	11000	520000	540000	540000	LQM S4ULs
Benz(a)anthracene	mg/kg	7.2	11	13	170	170	180	LQM S4ULs
Benzo(a)pyrene	mg/kg	2.2	2.7	5*	35	35	77*	DEFRA C4SL*/LQM
Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	44	44	45	LQM S4ULs
Benzo(ghi)perylene	mg/kg	320	340	350	3900	4000	4000	LQM S4ULs
Benzo(k)fluoranthene	mg/kg	77	93	100	1200	1200	1200	LQM S4ULs
Chrysene	mg/kg	15	22	27	350	350	350	LQM S4ULs
Dibenz(ah)anthracene	mg/kg	0.24	0.28	0.3	3.5	3.6	3.6	LQM S4ULs
Fluoranthene	mg/kg	280	560	890	23000	23000	23000	LQM S4ULs
Fluorene	mg/kg	170	400	860	63000 (30.9) ^{sol}	68000	71000	LQM S4ULs
Indeno(123-cd)pyrene	mg/kg	27	36	41	500	510	510	LQM S4ULs
Naphthalene	mg/kg	2.3 ^f	5.6 ^f	13 ^f	190 ^f (76.4) ^{sol}	460 ^f (183) ^{sol}	1100 ^f (432) ^{sol}	LQM S4ULs
Phenanthrene	mg/kg	95	220	440	22000	22000	23000	LQM S4ULs
Pyrene	mg/kg	620	1200	2000	54000	54000	54000	LQM S4ULs

Proposed End Use	Unit	Residential with Plant Uptake			Commercial			Source
SOM	%	1	2.5	6	1	2.5	6	
Phenol	mg/kg	420	420	420	3200	3200	3200	SGVs
Chlorophenols	mg/kg	0.87 ^g	2	4.5	3500	4000	4300	LQM S4ULs
Pentachlorophenol	mg/kg	0.22	0.52	1.2	400	400	400	LQM S4ULs
Carbon disulphide	mg/kg	0.14	0.29	0.62	11	22	47	LQM S4ULs
Hexachlorobutadiene	mg/kg	0.29	0.7	1.6	31	66	120	LQM S4ULs
1,1,1,2 Tetrachloroethane	mg/kg	1.6	3.4	7.5	270	550	1100	LQM S4ULs
1,1,1 Trichloroethane	mg/kg	8.8	18	39	660	1300	3000	LQM S4ULs
Trichloroethene	mg/kg	0.016	0.034	0.075	1.2	2.6	5.7	LQM S4ULs
Tetrachloromethane	mg/kg	0.026	0.056	0.13	2.9	6.3	14	LQM S4ULs
1,2-Dichloroethane	mg/kg	0.0071	0.011	0.019	0.67	0.97	1.7	LQM S4ULs
Chloroethene (Vinyl)	mg/kg	0.00064	0.00087	0.0014	0.059	0.077	0.12	LQM S4ULs
Trichloromethane	mg/kg	0.91	1.7	3.4	99	170	350	LQM S4ULs
Tetrachloroethene	mg/kg	0.18	0.39	0.9	19	42	95	LQM S4ULs
Hexachlorobenzene	mg/kg	1.8 (0.2) ^{vop}	3.3 (0.5) ^{vop}	4.9	110 (0.2) ^{vop}	120	120	LQM S4ULs
Pentachlorobenzene	mg/kg	5.8	12	22	640 (43) ^{scl}	770 (107) ^{scl}	830	LQM S4ULs
1,2,4,5-Tetrachlorobenzene	mg/kg	0.33	0.77	1.6	42 (19.7) ^{scl}	72 (49.1) ^{scl}	96	LQM S4ULs
1,2,3,5-Tetrachlorobenzene	mg/kg	0.66	1.69	3.7	49 (39.4) ^{vop}	120 (98.1) ^{vop}	240 (235) ^{vop}	LQM S4ULs
1,2,3,4-Tetrachlorobenzene	mg/kg	15	36	78	1700 (122) ^{vop}	3080 (304) ^{vop}	4400 (728) ^{vop}	LQM S4ULs
1,3,5-Trichlorobenzene	mg/kg	0.33	0.81	1.9	23	55	130	LQM S4ULs
1,2,4-Trichlorobenzene	mg/kg	2.6	6.4	15	220	530	1300	LQM S4ULs
1,2,3-Trichlorobenzene	mg/kg	1.5	3.6	8.6	102	250	590	LQM S4ULs
1,4-dichlorobenzene	mg/kg	61 ^f	150 ^f	350 ^f	4400 ^f (224) ^{vop}	10000 ^f (540) ^{vop}	25000 ^f (1280) ^{vop}	LQM S4ULs
1,3-dichlorobenzene	mg/kg	0.4	1	2.3	30	73	170	LQM S4ULs
1,2-Dichlorobenzene	mg/kg	23	55	130	2000 (571) ^{scl}	4800 (1370) ^{scl}	11000 (3240) ^{scl}	LQM S4ULs
Chlorobenzene	mg/kg	0.46	1	2.4	56	130	290	LQM S4ULs
Gamma-	mg/kg	0.06	0.14	0.33	67	69	70	LQM S4ULs
Beta-	mg/kg	0.085	0.2	0.46	65	65	65	LQM S4ULs
Alpaha -	mg/kg	0.23	0.55	1.2	170	180	180	LQM S4ULs
Beta -Endosulfan	mg/kg	7	17	39	6300 (0.00007) ^{vop}	7800 (0.0002) ^{vop}	8700	LQM S4ULs
Alpha-Endosulfan	mg/kg	7.4	18	41	5600 (0.003) ^{vop}	7400 (0.007) ^{vop}	8400 (0.016) ^{vop}	LQM S4ULs
Dichlorvos	mg/kg	0.032	0.066	0.14	140	140	140	LQM S4ULs
Atrazine	mg/kg	3.3	7.6	17.4	9300	9400	9400	LQM S4ULs
Dieldrin	mg/kg	0.97	2	3.5	170	170	170	LQM S4ULs
Aldrin	mg/kg	5.7	6.6	7.1	170	170	170	LQM S4ULs
HMX	mg/kg	5.7	13	26	110000	110000	110000	LQM S4ULs
2,4,6-Trinitrotoulene	mg/kg	1.6	3.7	8.1	1000	1000	1000	LQM S4ULs
RDX	mg/kg	120	250	540	210000	210000	210000	LQM S4ULs

^{scl} S4UL exceeds the solubility saturation limit (which is presented in brackets)

^{vop} S4ULs presented exceeds the vapour saturation limit, which is presented in brackets

^f For naphthalene, the S4UL is based on a comparison of inhalation exposure with the TDI_{inhal} for localised affects

^f S4UL based on comparison of inhalation exposure with inhalation TDI for localised effects

^{dir} S4ULs based on a threshold protective direct skin contact with phenol (guideline in brackets based on health effects following long term exposure provided for illustration only)

APPENDIX 7 – HazWasteOnline Classification Report

Waste Classification Report



F6YN6-8U4ST-DGTLJ

Job name

EMT-21-3889-Batch-1-File-1

Description/Comments

Project

GRO-21055

Site

Cavendish Road, Didsbury

Related Documents

#	Name	Description
1	EMT-21-3889-Batch-1-File-1.hwol	.hwol file used to create the Job

Waste Stream Template

Waste Stream template not used when importing the .hwol file

Classified by

Name: Sam Flaherty	Company: Groundtech Consulting Limited	HazWasteOnline™ Training Record:	
Date: 28 Apr 2021 15:16 GMT	PO Box 499 Salford, Manchester M28 8EE	Course	Date
Telephone: 0800 1613730		Hazardous Waste Classification	-
		Advanced Hazardous Waste Classification	-

Report

Created by: Sam Flaherty
Created date: 28 Apr 2021 15:16 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	HP01-12/03/2021-0.10m		Non Hazardous		2
2	HP02-12/03/2021-0.60m		Non Hazardous		4
3	HP03-12/03/2021-0.30m		Non Hazardous		6
4	HP04-12/03/2021-0.10m		Non Hazardous		8

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	10
Appendix B: Rationale for selection of metal species	11
Appendix C: Version	12

Classification of sample: HP01-12/03/2021-0.10m

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

Sample details

Sample Name:	LoW Code:
HP01-12/03/2021-0.10m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
22.6%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22.6% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		6.7 mg/kg		5.465 mg/kg	0.000546 %	✓	
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
3	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		32 mg/kg	1.126	29.387 mg/kg	0.00294 %	✓	
4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	59 mg/kg		48.124 mg/kg	0.00481 %	✓	
5	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		0.2 mg/kg		0.163 mg/kg	0.0000163 %	✓	
6	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	12.9 mg/kg		10.522 mg/kg	0.00105 %	✓	
7	selenium { selenium }	034-001-00-2	231-957-4	7782-49-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
8	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		46 mg/kg	1.245	46.702 mg/kg	0.00467 %	✓	
9	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
12	acenaphthene		201-469-6	83-32-9		0.48 mg/kg		0.392 mg/kg	0.0000392 %	✓	
13	fluorene		201-695-5	86-73-7		0.4 mg/kg		0.326 mg/kg	0.0000326 %	✓	

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		2.8 mg/kg		2.284 mg/kg	0.000228 %	✓	
15	anthracene	204-371-1	120-12-7		0.71 mg/kg		0.579 mg/kg	0.0000579 %	✓	
16	fluoranthene	205-912-4	206-44-0		3.89 mg/kg		3.173 mg/kg	0.000317 %	✓	
17	pyrene	204-927-3	129-00-0		3.05 mg/kg		2.488 mg/kg	0.000249 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		1.45 mg/kg		1.183 mg/kg	0.000118 %	✓	
19	chrysene	601-048-00-0	205-923-4		1.48 mg/kg		1.207 mg/kg	0.000121 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.45 mg/kg		1.183 mg/kg	0.000118 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		0.83 mg/kg		0.677 mg/kg	0.0000677 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.13 mg/kg		0.106 mg/kg	0.0000106 %	✓	
23	benzo[ghi]perylene	205-883-8	191-24-2		0.8 mg/kg		0.653 mg/kg	0.0000653 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.87 mg/kg		1.525 mg/kg	0.000153 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.73 mg/kg		0.595 mg/kg	0.0000595 %	✓	
26	pH		PH		6.46 pH		6.46 pH	6.46 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		56.3 mg/kg	1.462	67.117 mg/kg	0.00671 %	✓	
Total:								0.0226 %		

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

Classification of sample: HP02-12/03/2021-0.60m

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

Sample details

Sample Name:	LoW Code:
HP02-12/03/2021-0.60m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
18.8%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18.8% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value		MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number										
1		arsenic { arsenic }			1	17.6	mg/kg		14.815	mg/kg	0.00148 %	✓		
		033-001-00-X	231-148-6	7440-38-2										
2		cadmium {  cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD	
		048-001-00-5												
3		copper { dicopper oxide ; copper (I) oxide }			1	10	mg/kg	1.126	9.477	mg/kg	0.000948 %	✓		
		029-002-00-X	215-270-7	1317-39-1										
4		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	14	mg/kg		11.785	mg/kg	0.00118 %	✓		
		082-001-00-6												
5		mercury { mercury }			1	<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD	
		080-001-00-0	231-106-7	7439-97-6										
6		nickel { nickel }			7	5.6	mg/kg		4.714	mg/kg	0.000471 %	✓		
		028-002-00-7	231-111-4	7440-02-0										
7		selenium { selenium }			1	<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD	
		034-001-00-2	231-957-4	7782-49-2										
8		zinc { zinc oxide }			1	47	mg/kg	1.245	49.244	mg/kg	0.00492 %	✓		
		030-013-00-7	215-222-5	1314-13-2										
9		chromium in chromium(VI) compounds { chromium(VI) oxide }			1	<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0										
10		naphthalene			1	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD	
		601-052-00-2	202-049-5	91-20-3										
11		acenaphthylene			1	<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD	
			205-917-1	208-96-8										
12		acenaphthene			1	<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD	
			201-469-6	83-32-9										
13		fluorene			1	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD	
			201-695-5	86-73-7										

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
15	anthracene	204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
16	fluoranthene	205-912-4	206-44-0		0.12 mg/kg		0.101 mg/kg	0.0000101 %	✓	
17	pyrene	204-927-3	129-00-0		0.1 mg/kg		0.0842 mg/kg	0.00000842 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.1 mg/kg		0.0842 mg/kg	0.00000842 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.06 mg/kg		0.0505 mg/kg	0.00000505 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.05 mg/kg		0.0421 mg/kg	0.00000421 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
23	benzo[ghi]perylene	205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.07 mg/kg		0.0589 mg/kg	0.00000589 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.03 mg/kg		0.0253 mg/kg	0.00000253 %	✓	
26	pH		PH		8.31 pH		8.31 pH	8.31 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		63.2 mg/kg	1.462	77.753 mg/kg	0.00778 %	✓	
Total:								0.017 %		

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

Classification of sample: HP03-12/03/2021-0.30m

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

Sample details

Sample Name:	LoW Code:
HP03-12/03/2021-0.30m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
19.1%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19.1% Dry Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic }	033-001-00-X	231-148-6	7440-38-2		8.2 mg/kg		6.885 mg/kg	0.000688 %	✓	
2	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }	048-001-00-5			1	0.1 mg/kg		0.084 mg/kg	0.0000084 %	✓	
3	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26 mg/kg	1.126	24.579 mg/kg	0.00246 %	✓	
4	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	55 mg/kg		46.18 mg/kg	0.00462 %	✓	
5	mercury { mercury }	080-001-00-0	231-106-7	7439-97-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
6	nickel { nickel }	028-002-00-7	231-111-4	7440-02-0	7	17.4 mg/kg		14.61 mg/kg	0.00146 %	✓	
7	selenium { selenium }	034-001-00-2	231-957-4	7782-49-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
8	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		70 mg/kg	1.245	73.157 mg/kg	0.00732 %	✓	
9	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		0.04 mg/kg		0.0336 mg/kg	0.00000336 %	✓	
12	acenaphthene		201-469-6	83-32-9		0.33 mg/kg		0.277 mg/kg	0.0000277 %	✓	
13	fluorene		201-695-5	86-73-7		0.24 mg/kg		0.202 mg/kg	0.0000202 %	✓	

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		1.85 mg/kg		1.553 mg/kg	0.000155 %	✓	
15	anthracene	204-371-1	120-12-7		0.5 mg/kg		0.42 mg/kg	0.000042 %	✓	
16	fluoranthene	205-912-4	206-44-0		2.38 mg/kg		1.998 mg/kg	0.0002 %	✓	
17	pyrene	204-927-3	129-00-0		1.99 mg/kg		1.671 mg/kg	0.000167 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		1.07 mg/kg		0.898 mg/kg	0.0000898 %	✓	
19	chrysene	601-048-00-0	205-923-4		1 mg/kg		0.84 mg/kg	0.000084 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.08 mg/kg		0.907 mg/kg	0.0000907 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		0.66 mg/kg		0.554 mg/kg	0.0000554 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.13 mg/kg		0.109 mg/kg	0.0000109 %	✓	
23	benzo[ghi]perylene	205-883-8	191-24-2		0.63 mg/kg		0.529 mg/kg	0.0000529 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.35 mg/kg		1.134 mg/kg	0.000113 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.53 mg/kg		0.445 mg/kg	0.0000445 %	✓	
26	pH				8.41 pH		8.41 pH	8.41 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		48.8 mg/kg	1.462	59.886 mg/kg	0.00599 %	✓	
Total:								0.0239 %		

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

Classification of sample: HP04-12/03/2021-0.10m

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

Sample details

Sample Name:	LoW Code:
HP04-12/03/2021-0.10m	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
17.6%	Entry:
(dry weight correction)	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17.6% Dry Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value		MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number										
1		arsenic { arsenic }			1	10.7	mg/kg		9.099	mg/kg	0.00091 %	✓		
		033-001-00-X	231-148-6	7440-38-2										
2		cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.2	mg/kg		0.17	mg/kg	0.000017 %	✓		
		048-001-00-5												
3		copper { dicopper oxide ; copper (I) oxide }			1	33	mg/kg	1.126	31.594	mg/kg	0.00316 %	✓		
		029-002-00-X	215-270-7	1317-39-1										
4		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	51	mg/kg		43.367	mg/kg	0.00434 %	✓		
		082-001-00-6												
5		mercury { mercury }			1	0.1	mg/kg		0.085	mg/kg	0.0000085 %	✓		
		080-001-00-0	231-106-7	7439-97-6										
6		nickel { nickel }			7	17.4	mg/kg		14.796	mg/kg	0.00148 %	✓		
		028-002-00-7	231-111-4	7440-02-0										
7		selenium { selenium }			7	<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD	
		034-001-00-2	231-957-4	7782-49-2										
8		zinc { zinc oxide }			7	69	mg/kg	1.245	73.032	mg/kg	0.0073 %	✓		
		030-013-00-7	215-222-5	1314-13-2										
9		chromium in chromium(VI) compounds { chromium(VI) oxide }			7	<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD	
		024-001-00-0	215-607-8	1333-82-0										
10		naphthalene			7	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD	
		601-052-00-2	202-049-5	91-20-3										
11		acenaphthylene			7	<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD	
			205-917-1	208-96-8										
12		acenaphthene			7	<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD	
			201-469-6	83-32-9										
13		fluorene			7	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD	
			201-695-5	86-73-7										

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	phenanthrene	201-581-5	85-01-8		0.15 mg/kg		0.128 mg/kg	0.0000128 %	✓	
15	anthracene	204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
16	fluoranthene	205-912-4	206-44-0		0.45 mg/kg		0.383 mg/kg	0.0000383 %	✓	
17	pyrene	204-927-3	129-00-0		0.41 mg/kg		0.349 mg/kg	0.0000349 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.34 mg/kg		0.289 mg/kg	0.0000289 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.27 mg/kg		0.23 mg/kg	0.000023 %	✓	
20	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.26 mg/kg		0.221 mg/kg	0.0000221 %	✓	
21	indeno[123-cd]pyrene	205-893-2	193-39-5		0.21 mg/kg		0.179 mg/kg	0.0000179 %	✓	
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
23	benzo[ghi]perylene	205-883-8	191-24-2		0.18 mg/kg		0.153 mg/kg	0.0000153 %	✓	
24	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.37 mg/kg		0.315 mg/kg	0.0000315 %	✓	
25	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.14 mg/kg		0.119 mg/kg	0.0000119 %	✓	
26	pH		PH		8.03 pH		8.03 pH	8.03 pH		
27	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		49.4 mg/kg	1.462	61.395 mg/kg	0.00614 %	✓	
Total:								0.0238 %		

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 CLP determinands

arsenic (EC Number: 231-148-6, CAS Number: 7440-38-2)

CLP index number: 033-001-00-X

Description/Comments: Worst Case: IARC considers arsenic Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

cadmium compounds, with the exception of cadmium sulposelenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex

CLP index number: 048-001-00-5

Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

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

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - 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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

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

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

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

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

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

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

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

• **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic}

Arsenic results not speciated.

cadmium {cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Cadmium results not speciated.

copper {dicopper oxide; copper (I) oxide}

Copper results not speciated.

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

Lead results not speciated.

mercury {mercury}

Mercury results not speciated.

nickel {nickel}

Nickel results not speciated.

selenium {selenium}

Selenium results not speciated.

zinc {zinc oxide}

Zinc results not speciated.

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

Chromium(VI) compounds not speciated.

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

Chromium (III) compounds not speciated.

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2021.117.4756.9097 (27 Apr 2021)

HazWasteOnline Database: 2021.117.4756.9097 (27 Apr 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

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 2019 - UK: 2019 No. 720 of 27th March 2019

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

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

APPENDIX 8 - Limitations

Limitations

This contract was completed by Groundtech Consulting on the basis of a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with due skill and care, taking into consideration the project brief provided, project objectives, agreed scope of works, prevailing site conditions and budget allocation.

Other than that defined in the paragraph above, Groundtech Consulting provides no other accountability or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted industry practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Groundtech Consulting. A third party who relies on this report, does so at their own and sole risk and no liability to such parties is provided by Groundtech Consulting.

It is the understanding of Groundtech Consulting that this report is to be used for the intended purpose as set out in the introduction. The purpose was instrumental in determining the scope and level of the services provided. Should the purpose of the report or the proposed end use of the site change, this report will no longer be directly applicable, and its validity readdressed. No reliance upon the report in the revised situation should be assumed by the client without the permission of Groundtech Consulting.

The report was written in 2021, later changes in legislation, statutory requirements and industry best practices have not been considered and this should be allowed for. Ground conditions can also change and should be investigated if there is any significant delay in acting on the findings of this report. The period of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions in this report should not be relied upon in the future without the written confirmation from Groundtech Consulting that it is safe to do so.

The observations and conclusions outlined in this report are based exclusively on the services that were provided as set out in the agreement between the client and Groundtech Consulting.

Groundtech Consulting are not liable for the existence of any condition, the discovery of which would require additional investigation outside the agreed scope of works or core competency. The services provided are based upon Groundtech Consulting observations of existing physical conditions at the site gained from site reconnaissance together with interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and Groundtech Consulting assume the information to be correct.

No responsibility can be accepted for errors for third party information presented in this report. Groundtech Consulting were not authorised to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Groundtech Consulting are not liable for any inaccurate information, misrepresentation of data or conclusions, which may inform the scope of investigation undertaken by Groundtech Consulting and forms the contract with the client.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable due to its heterogeneous properties and as investigation exploratory locations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report, particularly between exploratory holes. The extent of the limited area depends on the soil and groundwater conditions, together with other constraints such as the position of any existing structures and underground utilities. Geo-Environmental testing was carried out for a limited number of parameters [as stipulated in the contract] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The groundwater level often has not had time to reach equilibrium and a monitoring period is required. Furthermore, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

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

