

CO-OP ACADEMY NORTH MANCHESTER

GEO-ENVIRONMENTAL SITE INVESTIGATION REPORT

Job Number: LKC 21 1558
Date: 17th November 2021
Client: Co-Op Academy North Manchester



INCREASING LAND VALUE

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Site Address	300 Victoria Avenue East, Manchester M9 7SS		
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EXECUTIVE SUMMARY

Site Details

Site Location:	To the south of Victoria Avenue East, Blackley, Manchester. National Grid Reference 387595E 403276N.
Site Area:	781m ²
Current Land Use:	Field within the grounds of Co-Op Academy.
Proposed Development:	Tarmacadam Multi-Use Games Area with perimeter fencing.
Purpose of Report:	Contamination and Geotechnical Assessment.

Site Setting

History:	Site undeveloped from early mapping, possibly within the grounds of a school. Sports pitch on site on 2009 satellite imagery.
Geology / Hydrogeology:	Glacial Till in southern and western area of site. Peat in northern and eastern area of site (Unproductive Aquifer). Pennine Middle Coal Measures Formation (Secondary A Aquifer).
Mining:	Within a coal reporting area. Not within a DHRA.

Ground Investigation Work

Date of Investigation:	25 th October 2021.
Intrusive Investigation Work Undertaken:	10no. window sample boreholes (WS101-WS108 & WS101A, WS108A). 9no. hand dug pits (HD101-HD109).
Soil Sampling:	3no. samples tested for metals, speciated PAHs, cyanide, pH, sulphate, asbestos, phenol, TPHCWG, BTEX, SOM and WAC.
Insitu and Laboratory Geotechnical Testing:	SPTs, pocket penetrometer tests, Clegg Hammer Tests.

Ground Conditions and Geotechnical Assessment

General Ground conditions	Made Ground to approx. 1.6mbgl. Firm to very stiff gravelly sandy CLAY to the end of borehole. Refusal in Made Ground on the S, E and N of the site. Groundwater at 0.95mbgl.
Allowable Bearing Pressure	An ABC value in excess of 100kN/m ² from a depth of 0.3mbgl was derived from the CBR value.
Other Considerations	Temporary supports of excavations may be required. Detailed design should be carried out by structural engineer. Concrete Requirements DS1-AC-1. A design CBR of 23% is recommended. If peat deposits are encountered in the upper 300mm it should be removed and replaced with granular fill material.

Contamination and Waste Assessment

Soil results have been compared to the relevant assessment criteria and no elevated concentrations of contaminants were identified. Given the site setting and absence of significant potentially mobile contamination within the soils, the site is not considered to pose a risk to controlled waters.

WAC testing identified that due to elevated TOC results the made ground in WS102 0-0.2m is classified as non-hazardous and WS104 0.2-0.5m as hazardous waste. This information should be confirmed with the landfill operator.

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- Appendix B: Profile Logs
- Appendix C: Certificate of Analysis - Soil
- Appendix D: Generic Assessment Criteria Values
- Appendix E: HazWasteOnline Output Sheets

1 Introduction

1.1 Background

LK Consult Ltd (LKC) has been commissioned by Co-Op Academy, North Manchester to carry out a Geo-Environmental Site Investigation for Co-Op Academy, North Manchester. The assessment was undertaken in order to confirm ground conditions for a proposed Multi Use Games Area.

A brief overview of site history, geology, hydrogeology, hydrology, mineral search and a landfill search has been gathered from open access data to help identify potential geotechnical constraints associated with the redevelopment of the site.

This investigation has been undertaken to confirm the ground conditions below the site and provide a contamination and geotechnical information.

A summary of the site details is presented in Table 1-1. Figure 1 indicates the site location and boundary. Figure 2 indicates the proposed development.

Location	To the south of Victoria Avenue East, Blackley, Manchester. National Grid Reference 387595E 403276N.
Area	781m ² .
Topography	103 metres above ordnance datum (AOD). Site is approximately level.
Land Use	Field within the grounds of Co-Op Academy.
Proposed Development	Tarmacadam Multi Use Games Area with perimeter fencing.

Table 1-1. Summary of site details.

2 Site Setting

2.1 Site History

LKC have undertaken a brief review of available public domain historical mapping.

The site remained vacant from 1880s mapping until 1950 mapping. On early mapping, the site is vacant, with a footpath to the west of site and a field boundary to the east. 3no. ponds are within 250m of site between these map dates.

1950 mapping shows terraced houses to the north of the site (in the location of the current Co-Op Academy school building), and 3no. school buildings to the south, west and south east of site. It is possible that the site was located within the grounds of the school to the west. The 3no. ponds have since been potentially infilled. The terraced houses to the north of site were demolished by 1978 mapping. The 3no. school buildings were demolished by 1999 mapping and a new primary school to the south constructed. Google Earth satellite imagery dated 2009 shows a sports pitch on site, which is no longer present by 2013 imagery. The Co-Op Academy building is now located to the north of site.

The surrounding area (greater than 250m from site) was largely occupied by fields, with sand pits and collieries shown on early mapping. The surrounding area has since largely been developed for residential housing.

2.2 Environmental Setting

The environmental setting of the site is summarised below from a review of public domain information including the British Geological Survey, Defra Magic Map and the Coal Authority. A summary of environmental settings is presented in Table 2-1 below.

Categories		Details
Geology ^{1,2}	Artificial	- Made Ground (artificially raised ground including soil tips and landfills) recorded on the northern and eastern perimeter.
	Superficial	- Peat in north and east of site. - Till (Diamicton) in south and west.
	Bedrock	- Pennine Middle Coal Measures (Mudstone, Siltstone and Sandstone).
	BGS Logs	- None within 50m.
Hydro-geology ³	Aquifer Designation	- Superficial - Unproductive.
		- Bedrock - Secondary A Aquifer.
	Source Protection Zone (SPZ)	- Not within SPZ.
Hydrology ³	Nearest Surface Water	- None within 250m.
	Flooding	- Flood Zone 1.

Table 2-1: Summary of the environmental setting.

Data Sources:

1 – BGS Sheet 85 1:50,000

2 – BGS GeoIndex <http://mapapps2.bgs.ac.uk/geoindex/home.html>

3 – Defra Magic Map <https://magic.defra.gov.uk/magicmap.aspx>

4 – The Coal Authority Web Mapping Services (WMS) and Interactive Map Viewer

<http://coal.decc.gov.uk/en/coal/cms/publications/data/map/map.aspx>

5 – UK Radon <https://www.ukradon.org/>

6 – Zetica UXO Unexploded Bomb Risk Map and Pre-Desk Study Assessment (Appendix A).

Categories		- Details
Minerals & Mining ⁴	Coal Report	- Within a coal reporting area.
	Coal Mining Development High Risk Area (DHRA)	- Not within DHRA.
	Cheshire Brine Compensation District	- N/A.
Landfill Sites	Known / Registered ³	- None within 250m.
	Potentially Infilled Features	- 3no. ponds (see Section 2.1).
Radon ⁵		- <1% of homes above Action Level. - No protective measures are necessary in the construction of new dwellings or extensions
Unexploded Bomb Risk (UXO)	Zetica Risk Map ⁶	- Moderate.
	Zetica Pre Desk Study Assessment ⁶	- A detailed desk study, whilst always prudent, is not considered essential in this instance.

Table 2-1 (continued): Summary of the environmental setting.

Data Sources:

1 – BGS Sheet 85 1:50,000

2 – BGS GeoIndex <http://mapapps2.bgs.ac.uk/geoindex/home.html>

3 – Defra Magic Map <https://magic.defra.gov.uk/magicmap.aspx>

4 – The Coal Authority Web Mapping Services (WMS) and Interactive Map Viewer
<http://coal.decc.gov.uk/en/coal/cms/publications/data/map/map.aspx>

5 – UK Radon <https://www.ukradon.org/>

6 – Zetica UXO Unexploded Bomb Risk Map and Pre-Desk Study Assessment (Appendix A).

Peat is mapped below the northern and north-eastern area of site. Glacial Till is mapped beneath the remainder of the site. An extract from the British Geological Survey (BGS) map is shown in Plate 2-2, showing the extent of the peat.



Plate 2-2: Extract from BGS 1:50,000 Superficial Mapping.

The results of site investigations undertaken in 2008 and 2010 prior to the construction of the Co-Op Academy North Manchester school are summarised in the report 'Manchester Creative and Media Academy Environmental Impact Assessment' (document reference 2483.004) undertaken by TEP, dated September 2010.

Made ground was recorded to depths of between 0.60-1.05m below ground level (bgl). Peat was encountered from ground level / beneath the made ground and was recorded to a maximum depth of 1.75mbgl. The peat was recorded to be underlain

by soft consistency silty clay / clayey silt to depths of 2.50mbgl, which was underlain by firm to stiff consistency slightly gravelly sandy silty clay.

2.3 Site Reconnaissance

A site reconnaissance was undertaken on 25th October 2021 during the site investigation, and is summarised below:

- » Site is accessed through the car park, located to the west of the school building.
- » Site is located within a field within the school grounds, to the south of the school building. Wooden benches were located on site at the time of the site investigation.
- » Site is relatively level.
- » An electricity cable runs beneath the site.
- » A manhole cover was identified close to the north of the northern site boundary.
- » A light is located close to the northern site boundary (off site).

The surrounding area comprises:

- » North: Co-Op Academy North Manchester school building.
- » East: Sports pitch and residential properties beyond.
- » South: Charlestown Primary School.
- » West: Fields.

Relevant photographs are provided in Plate 2-3.



Plate 2-3: Site photographs

	
Photograph 3: Manhole present to the north of the northern site boundary and school building to the north.	Photograph 4: Light present to the north of site.

Plate 2-3 (continued): Site photographs.

3 Ground Investigation

3.1 Site Investigation Design and Methodology

In order to assess the ground conditions at the site and to investigate the potential pollutant linkages identified in the preliminary contamination conceptual model an intrusive investigation was undertaken.

The investigation was carried out on 25th October 2021 and comprised the following:

- » 10no. window sample boreholes drilled to 4.1-4.45 metres below ground level (mbgl) (ref. WS101 to WS108 & WS101A, WS108A). Clegg Hammer Tests were undertaken at 0.30mbgl and 0.60mbgl in window sample boreholes WS102, WS103 and WS104.
- » 9no. hand pits (using hand auger / spade) excavated to 0.5-1.0mbgl (ref. HD101 to HD109) to undertake Clegg Hammer Tests at 0.30mbgl and 0.60mbgl.

The window sample boreholes were undertaken to make an assessment of ground conditions, allow in-situ geotechnical testing and obtain samples for contamination testing.

The Clegg Hammer tests were undertaken to determine the characteristic strength of the shallow ground. Tests were undertaken at 0.30mbgl and 0.60mbgl.

WS101 had to be repositioned due to tarmacadam encountered at 0.60mbgl. The repositioned borehole is referenced WS101A. WS108 had to be repositioned due to an obstruction encountered at 0.30mbgl. The repositioned borehole is referenced WS108A.

Shallow refusals were also encountered in WS103-WS108 within made ground strata. Additional locations were probed next to WS104 (ref. WS104A, WS104B, WS104C), WS105 (ref. WS105A, WS105B), WS106 (ref. WS106A), WS107 (ref. WS107A) and WS108 (ref. WS108A) to confirm the depths to refusals.

All site investigation locations are shown in Figure 3. All profile logs are provided in Appendix B and are in line with BS14688-1¹ and BS5930².

The locations were chosen to allow good coverage across the site. WS106, WS106A, WS107, WS107, WS108 and WS108A were drilled outside of the site boundary due to the number of shallow refusals encountered on site.

The number of site investigation points corresponds to approximately one location per 12m square centres. This is considered to be a conservative sampling density and is in line with BS10175³ for a 'detailed investigation'.

¹ British Standards (2002) Geotechnical investigation and testing – Identification and Classification of Soil. Part 1: Identification and description. BS EN ISO 14688-1:2002.

² British Standard (2015). "Code of Practice for Ground Investigations". BS5930:2015.

³ British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.

3.2 Sampling Protocol

3.2.1 Soil Sampling (Contamination)

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation⁴.

Soil was collected for onsite testing. A plastic zip bag was half filled with soil allowing a suitably sized headspace. The bag was sealed and stored for at least 20 minutes before being tested for total volatile organic compounds (TVOCs) using a PhoCheck Tiger photoionisation detector (PID). Results of the PID readings are presented on the profile logs (Appendix B). The on-site monitoring was carried out in line CIRIA C665⁵ to aid in screening samples for volatile analysis.

Soil samples of approximately 500g were recovered in amber jars, amber vials for volatile analysis and plastic tubs. All the samples were labelled and stored in cool boxes prior to being collected by courier at the end of the day for delivery to the Chemtest laboratory in Newmarket for chemical testing. If collection was not possible the same day then samples were stored in the sample storage fridge at the LK Group offices below 4°C. Samples were tracked using appropriate Chain of Custody forms provided by Chemtest.

Many of the contamination tests are UKAS or MCERTS accredited and further details are given in the Certificate of Analysis presented in Appendix C. Table 3-1 shows the soil testing undertaken.

Suites and Contaminants	No. Samples	Location & Depth	Justification
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, SOM, asbestos screen and WAC (Waste Acceptance Criteria) testing	2	WS102 0.0-0.2m WS104 0.2-0.5m	Detailed suite and WAC testing undertaken on shallow soils to confirm the contamination risk and to allow for offsite disposal.

Table 3-1. Summary of soil sample testing undertaken.

Notes:

If asbestos present during screen identification and quantification will be undertaken.

Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc and boron; TPHCWG=carbon banded and aromatic/aliphatic split petroleum hydrocarbons; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene and xylenes; MTBE=Methyl tert-butyl ether, PCB=polychlorinated biphenyls, SOM=Soil Organic Matter.

3.3 Geotechnical Testing

3.3.1 In-situ Onsite Geotechnical Testing

In-situ geotechnical tests were performed in the boreholes to further characterise the sub-soil conditions. The following tests were undertaken:

- Standard Penetration Tests (SPTs) were performed in the window sample boreholes at approximately 1m intervals, generally within the natural strata.

⁴ EA (2000). "Technical Aspects of Site Investigation. Volumes 1 & 2 Text Supplements Research and Development Technical Report." P5-065/Tr.

⁵ CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

- Pocket Penetrometer tests (giving undrained shear strength) were performed in the window sample boreholes within the natural clay strata.
- Clegg Hammer Tests were undertaken at 12no. locations at 0.30 and 0.60mbgl.

The SPT, pocket penetrometer and Clegg Hemmer Test readings are provided within the profile logs (Appendix B).

3.3.2 *Clegg Hammer Tests*

The Clegg Hammer Tests were undertaken to determine the characteristic strength of the shallow ground associated with the proposed MUGA. Equivalent CBR values are automatically calculated on the instrument.

A shallow hand dug pit was advanced to 0.30mbg and then to 0.60mbgl before undertaking each test.

The CBR values are provided within the profile logs (Appendix B).

4 Ground Conditions

4.1 Geology – Generalised Sequence

The ground conditions beneath the site comprised made ground underlain by natural very clayey sand / gravelly sandy clay. A summary section of the window sample borehole log is provided in Plate 4-1, with additional comments below.

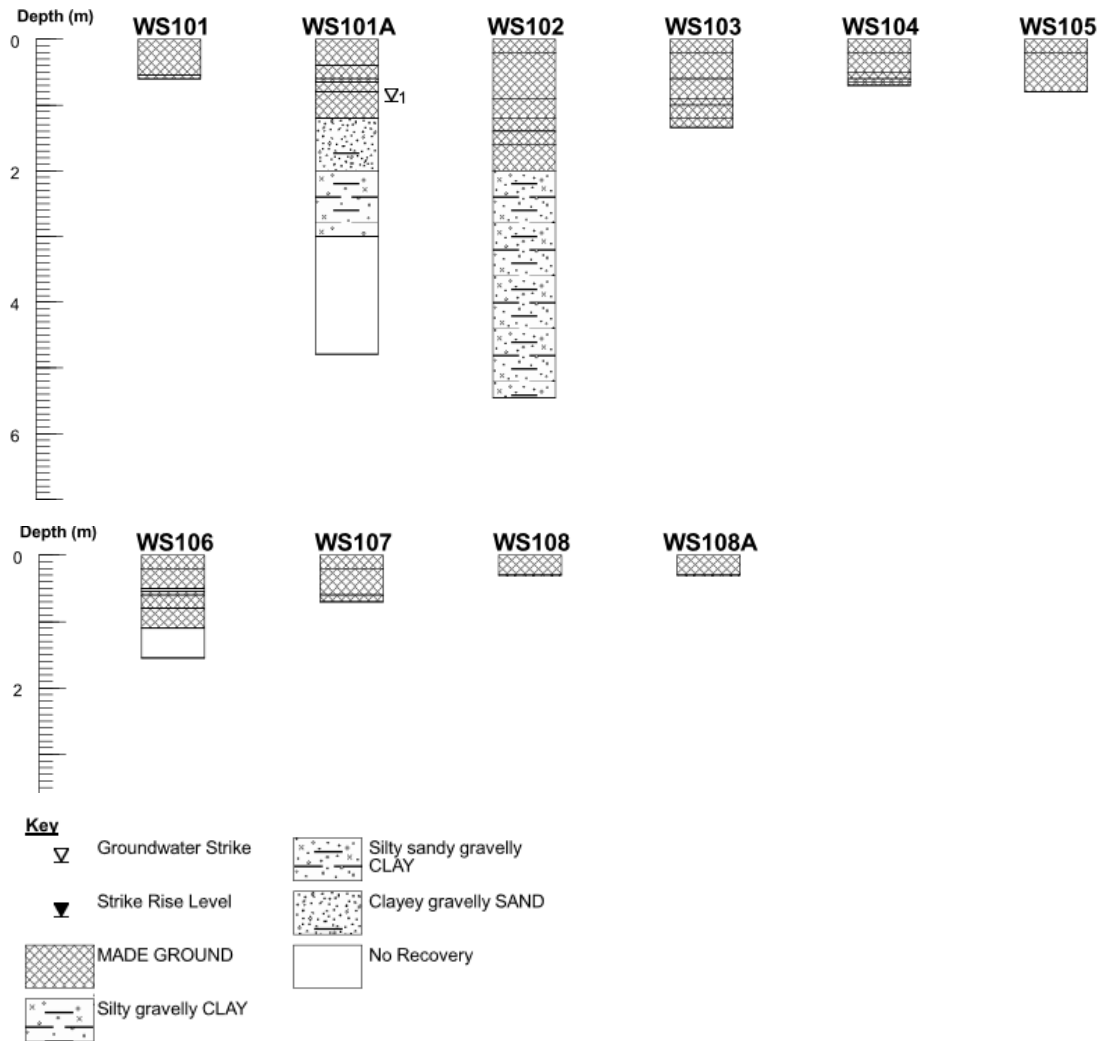


Plate 4-1: Summary of ground conditions.

Additional information on ground conditions:

- Made ground was recorded from depths of 1.2-2.0mbgl and generally consisted of sand / silt / clay / sand and gravel with brick fragments, tarmacadam, concrete and coal.
- The depth of made ground was not proven in WS101, WS103 & WS103-WS108 due to refusals on obstructions. Made ground was recorded to the bases of all hand dug pits (HD101-HD109).
- Tarmacadam was encountered at 0.55mbgl in WS101, 0.60mbgl in WS101A, 0.90mbgl in WS103, 0.50mbgl in WS104, 0.55mbgl in WS106 and 0.50mbgl in WS107.
- Concrete was encountered at 0.30mbgl in WS108 and WS108A.

- Probable MOT was encountered in WS101A between 0.65-0.80mbgl, WS102 between 1.20-1.40mbgl, WS103 between 1.00-1.20mbgl and WS104 between 0.60-0.65mbgl.
- A slight bitumen type odour was noted in WS102 between 1.40-1.60mbgl. No visual / olfactory evidence of hydrocarbons or volatile contaminants in any other location.
- Natural superficial deposits were encountered in WS101A and WS102 and comprised firm to very stiff consistency gravelly /sandy / silty clay. Very clayey sand was encountered in WS101A between 1.20-2.00mbgl.

4.2 Groundwater

4.2.1 Groundwater Levels

Groundwater strikes were recorded during the investigation in boreholes.

Groundwater was encountered at 0.95mbgl in WS101A. No groundwater was encountered in the remainder of boreholes / hand dug pits. Perched water was noted to be pooling in base of pit at 0.60mbgl in WS104.

4.3 In-Situ Geotechnical Testing

4.3.1 Standard Penetration Tests

In-situ standard penetration tests (SPTs) were undertaken, predominantly in the natural ground. The results are summarised in Table 4-2 and provided within the profile logs in Appendix B.

Approximate Depth (mbgl)	SPT 'N' Values			
	WS101A	WS102	WS103	WS106
1-2	25 (S)	35 (MG)	50 over 190mm (MG)	50 (NR)
2-3	25 (C)	8 (C)	-	-
3-3.45	14 (NR)	21 (C)	-	-
3.45-3.90	24 (NR)	-	-	-
4-5	50 over 285mm (NR)	30 (C)	-	-
5-6		26 (C)	-	-
GW Level	0.95	Dry	Dry	Dry

Table 4-2: Summary of SPT (N) values.

Notes:

MG=Made Ground; NR=No recovery; C=Clay.

Groundwater level based on strikes during investigation.

4.3.2 Pocket Penetrometer Tests

Pocket Penetrometer tests, recording undrained shear strength (s_u), were taken within the clay strata in WS101A and WS102. The results are summarised in Table 4-3 and provided within the profile logs in Appendix B. Natural strata was not encountered in the remainder of boreholes due to shallow refusals in made ground.

Approximate Depth (mbgl)	Average Undrained Shear Strength (kN/m ²)	
	WS101A	WS102
2-3	88.9	138.4
3-4	-	150.7-181.4
4-5	-	143.0
GW Level	0.95	Dry

Table 4-3: Summary of average pocket penetrometer readings.

Notes:

Groundwater level based on strikes during investigation.

Pocket penetrometer readings can be influenced by coarse material including silt.

4.3.3 Clegg Hammer Tests

Clegg Hammer test locations are presented in Figure 3 and the data below in Table 4-4. Exceptionally high or low CBR results are most likely due to the driving of coarse gravel or cobble sized particles or encountering localised very loose or soft unconsolidated strata.

Location	Depth (mbgl)	CBR (%)
WS102	0.3	30
	0.6	100*
WS103	0.3	10
	0.6	71
WS104	0.3	98
	0.6	47
HD101	0.3	7
	0.6	17
HD102	0.3	19
	0.6	19
HD103	0.3	31
	0.6	17
HD104	0.3	7
	0.6	9
HD105	0.3	23
	0.6	4
HD106	0.3	9
	0.5	23
HD107	0.3	28
	0.6	43
HD108	0.3	100*
	0.6	49
HD109	0.3	5
	0.6	59

Table 4-4: Summary of CBR values obtained from Clegg Hammer Tests.

*where CBR recorded as maximum of 100% but calculated as greater than 100%.

4.4 Geotechnical Laboratory Testing

Water soluble sulphate and pH tests were carried out on soil samples. Full results are presented in Appendix C and summarised in Table 4-5.

Strata	pH	Sulphate (g/l)
Made Ground	8.3-8.5	0.030-0.041

Table 4-5: Summary of pH and sulphate results.

5 Geotechnical Assessment

Based on the information gathered during the site investigation the geotechnical considerations for the site are presented in Table 5-1 below:

Allowable Bearing Capacity (ABC)	- The made ground thickness is variable on site and varies from 0.3 to 1.0m and mostly consisting of dense gravelly silty sand. - A CBR value of 7% was obtained during site investigation from 0.3mbgl within the dense sand of the Made ground. An ABC value in excess of 100kN/m² can be achieved at the proposed MUGA site and this is considered suitable for the proposed infrastructures at the site. - This is subject to water entry control to formation level, proof roll and inspection. Soft spots to be removed by a minimum of 300mm and backfilled with suitable granular material. - At borehole location WS108 and WS109, there was refusal at 0.3mbgl potentially on a concrete slab. Any ABC values below this depth, could not be determined. - Layers of peat were not encountered during site investigation and its presence cannot be discounted, in particular on the northern and north-eastern side of the proposed site. - Soft spots and large areas of thin layers of PEAT can be removed by a minimum of 300mm and backfilled with suitable granular material.
Angle of Internal Friction (ϕ')	37° in dense sand of the Made ground at a depth of approximately 1.0mbgl and 31° in medium dense SAND of the natural strata.
Concrete Requirements	Based on BRE Digest 2005 ⁶ – DS-1 AC-1s recommended in the Made ground.
Preliminary Design CBR	- Based on the CD225 Revision 1 (2020)⁷, the anticipated CBR values are estimated to be 10% within the gravelly silty sand of the Made ground to a depth of 0.3mbgl. A CBR value of 15% is suitable for the slightly silty sandy gravel of the MOT Made ground from a depth of 0.5mbgl. - No peat was found within the exploratory boreholes as they were terminated due to refusal within the made ground. The presence of peat at the base of the made ground cannot be discounted. It is expected that the site is covered in Made ground; however if any peat is encountered at ground level, it should be stripped off and replaced with granular fill at least for the top 300mm.
Other Considerations	- Detailed design should be carried out by the structural engineer. - Peat deposits are carbon storage sinks and their removal should be avoided when possible.

Table 5-1: Preliminary Geotechnical Assessment.

⁶ BRE (2005). "Concrete in Aggressive Ground." Special Digest 1.

⁷ CD225. Design for new pavement foundations. Revision 1, April 2020.

6 Generic Risk Assessment

6.1 Introduction

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (LCRM⁸).

6.2 Soil Risk Assessment

6.2.1 Methodology

With regards to the soil risk assessment LKC will use the following hierarchy:

- Category 4 Screening Levels (C4SLs).
- LQM Suitable 4 Use Levels (S4ULs).
- ATRISK Soil Screening Values (SSVs) and CL:AIRE Generic Assessment Criteria (GACs).

C4SLs were published in 2013^{9,10}. The recent change to the contaminated land guidance has changed the evaluation of risk from 'minimal' (referred to as Health Criteria values (HCVs))¹¹ used to generate Soil Guideline Values (SGVs) to 'low' (referred to as Lowest Level of Toxicological Concern (LLTCs)). The policy companion document and supporting letter by Defra, dated 3rd September 2014, states that C4SLs '*could be used under the planning regime, as well as within Part 2A*'. Based on these comments LKC considers the justifications and assumptions used to generate 'low' risk are suitable for the planning regime.

Where no C4SLs have been generated LKC will use the LQM S4ULs¹². Similar assumptions and land uses to C4SLs have been used. However, toxicological information has been based on 'minimal risk' as per previous guidelines and assumptions^{13,14,15,16}.

If contaminants are not present as C4SLs and S4ULs then LKC will use ATRISK SSVs or CL:AIRE GACs¹⁷. These follow the 'minimal' risk principle and more stringent exposure parameters and will be conservative.

The proposed development is for a Multi Use Games Area within the grounds of a school, therefore, a conservative assessment criteria for residential without plant uptake has been used.

⁸ Land Contamination Risk Management (LCRM) <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

⁹ Defra (2014). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Policy Companion Document."

¹⁰ CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."

¹¹ EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.

¹² LQM (2014). "The LQM/CIEH S4ULs for Human Health Risk Assessment."

¹³ EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.

¹⁴ EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.

¹⁵ EA (2008). "A Review of Body Weight and Height Data used within the Contaminated Land Exposure Assessment Model (CLEA)." Project SC050021/Technical Review 1.

¹⁶ EA (2009). "Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values." Science report SC050021/SR7.

¹⁷ CL:AIRE (2009). "The Soil Generic Assessment Criteria for Human Health Risk Assessment."

All criteria have been generated using the CLEA V1.06 model¹⁸ based either on 1%, 2.5% or 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

An assessment of the data should be undertaken to confirm B(a)P is a suitable surrogate marker by assessing the ratios of carcinogenic PAHs to BaP. However, as the majority of the PAHs were recorded as less than detection limits, the assessment could not be undertaken.

A summary of the generic assessment criteria is provided in Appendix D. ATRISK SSVs and CL:AIRE GACs were not required for this dataset and have not been included.

No elevated levels of contaminants were recorded in the soil sample analyses when compared to residential without plant uptake generic assessment criteria. No asbestos was identified in the soil sample analyses.

6.3 Controlled Water Assessment

Based on a review of available information, LKC considers the site to have a low sensitivity with regards to controlled waters.

Groundwater was recorded in one investigation location. The site investigation did not identify any significant sources of likely mobile contamination within the soils. No elevated concentrations of mobile contaminants were identified within the soil samples and no visual or olfactory evidence of significant mobile contamination was noted.

Based on the above, LKC considers it unlikely that the development area represents a significant risk to controlled waters.

6.4 Waste Disposal Assessment

The soil contamination results as presented in Appendix C have been used to help determine the disposal route should any material be earmarked for off-site disposal.

As an initial screen the soil results were inputted into Hazwaste Online™. This is a web-based facility that allows an assessment waste as either hazardous or non-hazardous waste based on relevant guidance and legislation^{19, 20, 21, 22, 23, 24, 25, 26, 27}.

Hazwaste Online™. has been designed to cover, amongst other waste types, the European Waste List of Waste (LoW) code number 17 "Construction and Demolition Waste (Including Excavated Soil from Contaminated Sites)".

Where less than limits of detection (LOD) were recorded, the value of the LOD was inputted.

¹⁸ EA (2008). "CLEA Software (Version 1.05) Handbook." Science Report – SC050021/SR4.

¹⁹ EA (2018). "Guidance on the Classification and Assessment of Waste (1st Edition v1.1)". Technical Guidance WM3.

²⁰ CLP Regulation - Regulation 1272/2008/EC of 16 December 2008.

²¹ 1st ATP - Regulation 790/2009/EC of 10 August 2009

²² Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

²³ WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

²⁴ Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

²⁵ 13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

²⁶ POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004

²⁷ 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Where applicable, appropriate metal species based on hazard statements/ molecular weight, site history, ground conditions and likely species present in soils were used (e.g. metal oxides relating to an ash based source).

The output sheet is presented in Appendix E and summarised in Table 6-1.

Sampling Location	Hazardous Waste Y/N	LoW Code	Hazard (Risk Phrase)	Contaminants
WS102	N	17 05 04	N/A	N/A
WS104	Y	17-05-03	HP3 (Flammable) HP7 (Carcinogenic) HP11 (Mutagenic)	TPH (C6-C40)

Table 6-1: Summary of Hazwaste Online™ findings.

Hazardous waste has been identified. The soil onsite (WS104 0.2-0.5m) should be classified as **HAZARDOUS WASTE** based on the hazards listed in Table 6-1 and LoW code “17-05-03 - soil and stones containing hazardous substances”.

Waste Acceptance Criteria (WAC) testing was also undertaken on the 2no. samples representative of material likely to be earmarked for off-site disposal. WAC test results are included in Appendix C.

The WAC limits cannot be used to make an assessment of whether a waste is hazardous. Landfills are classified according to whether they can accept hazardous or non-hazardous wastes. Wastes can only be accepted at a landfill if they meet the WAC for that class of landfill.

With regards to non-hazardous waste, material can only be designated to an inert cell of a non-hazardous landfill based on WAC testing. With regards to hazardous waste, material can only be designated as Stable Non-Reactive Hazardous (SNRH) waste cell within a non-hazardous landfill or hazardous landfill from WAC testing.

The above potential designation if disposed to a licenced landfill are summarised in Table 6-2. It should be noted that the licenced landfill operator would determine the designation, which may differ to this assessment.

Sampling Location	Soil Designation		Potential Landfill Designation				Designation
	Non-haz.	Haz.	Inert	Non-Haz	SNRH	Haz.	
WS102 0-0.2m	x	-	-	x	-	-	Non-Hazardous
WS104 0.2-0.5m	-	x	-	-	-	x	Hazardous

Table 6-2: Summary of Waste Acceptance Criteria classification.

Both samples exceed the assessment criteria for Total Organic Carbon (TOC). Environment Agency²⁸ guidance includes a potential derogation to allow soils up to two times the TOC limits to be deposited at landfills for inert waste in certain circumstances.

Landfill operators wishing to pursue this approach will need to apply to vary their permit. The application must be waste-specific and must specify what limit of TOC is being applied for. It must include a risk assessment considering whether the landfill is

²⁸ EA 2010 “Waste Acceptance at Landfills” Guidance on Waste Acceptance Procedures and Criteria.

designed such that it can cope with any gas and/or leachate that may be produced as a result of accepting this waste.

The producer will need to make a case for an increased TOC up to 2 x the WAC limit.

7 Conclusions

7.1 Summary Conclusions

A ground investigation was carried out to assess the ground conditions at Co-Op Academy, North Manchester for the construction of a Multi-Use Games Area (MUGA).

Window sample boreholes and Clegg hammer tests within hand dug pits were undertaken at the site.

Geotechnical Assessment

Ground conditions of the proposed site area generally comprised made ground to depths of 1.2-2.0mbgl. Made ground was recorded to the base of all hand dug pits and was not proven in several window sample boreholes due to shallow refusals. Natural superficial deposits were encountered in WS101A and WS102 and comprised firm to very stiff consistency gravelly /sandy / silty clay. Very clayey sand was encountered in WS101A between 1.20-2.00mbgl.

Due to the made ground present (which may be the mapped artificial deposits) it was not possible to determine the presence of peat in the northern and eastern areas of the site. However, no peat was identified within the upper 300mm of ground. The extent of mapped peat on site is limited and it is not considered likely that significant peat removal would be required as part of the construction of the MUGA.

An allowable bearing pressure of 100kN/m² can be achieved within the gravelly silty sand from a depth of 0.3mbgl. This is subject to water entry control to formation level, proof roll and inspection. Soft spots and layers of peat to be removed by a minimum of 300mm and backfilled with suitable granular material.

A CBR design value of 23% is recommended for the granular fill of the Made ground, assuming the peat is stripped off.

The concrete classification in accordance with BRE Special Digest 1 (2005) is DS-1 AC-1 within the Made ground.

Contamination Assessment

Laboratory testing has not identified a significant risk to human health.

WAC testing identified that due to elevated TOC results the made ground in WS102 0-0.2m is classified as non-hazardous and WS104 0.2-0.5m as hazardous waste. This information should be confirmed with the landfill operator.

7.2 Additional Considerations

7.2.1 Unexpected Contamination

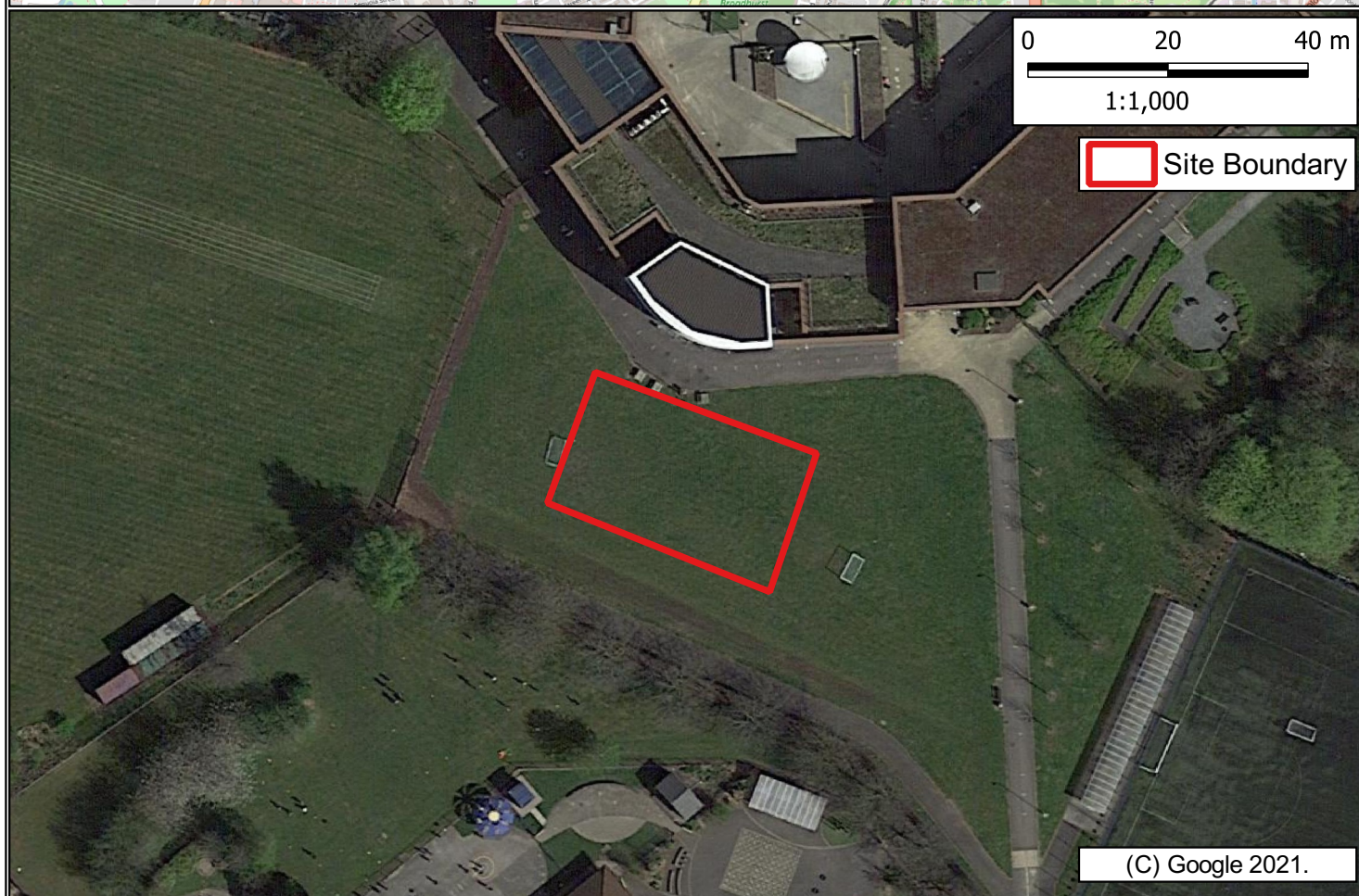
The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination be encountered at the site, LKC and the Local Authority should be informed and further assessment of the material may be required.

7.2.2 Health and Safety Considerations

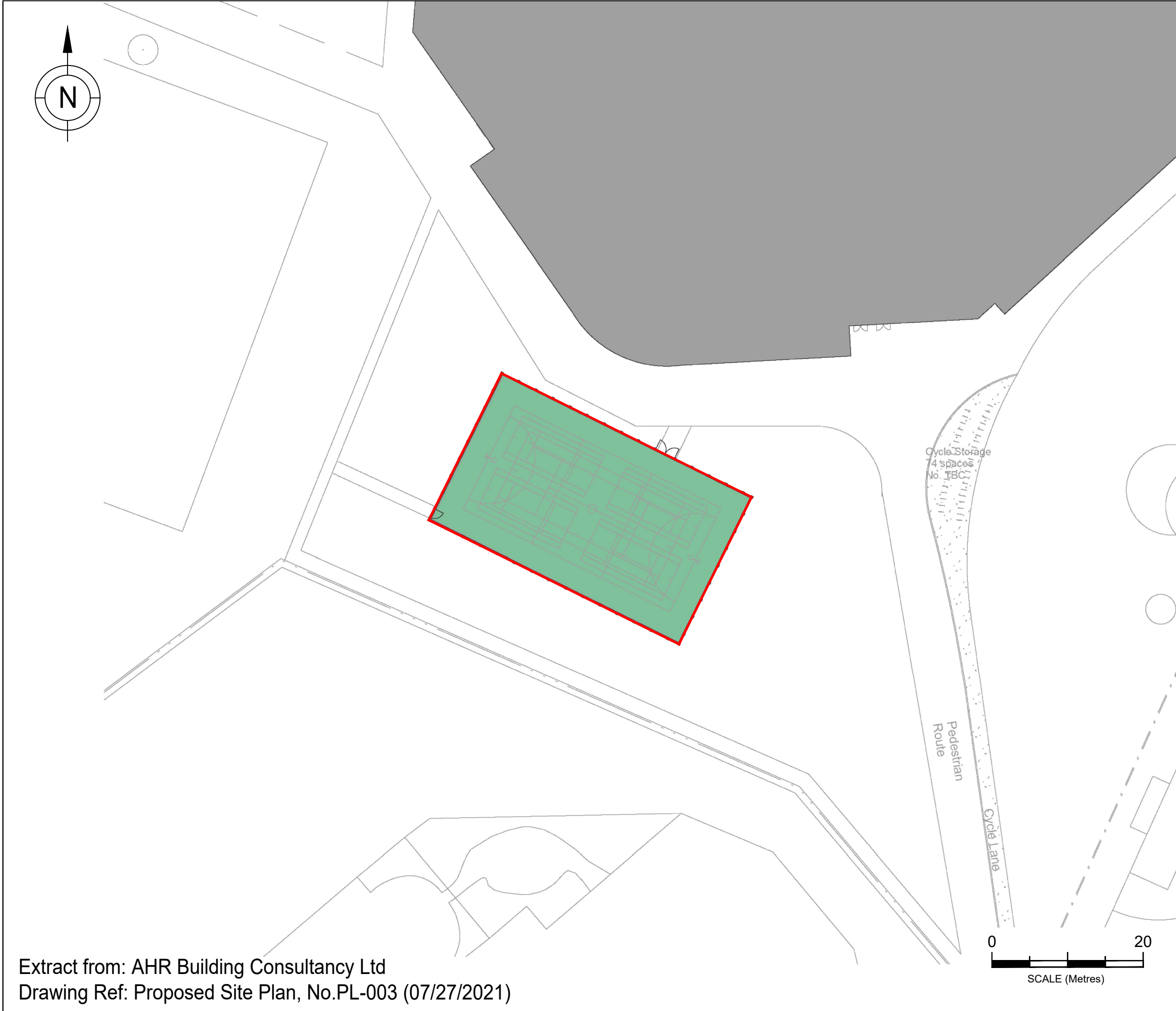
In working with, removing or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance²⁹) should be adopted by all workers involved with site enabling and construction works.

²⁹ HSE (1991). "Protection of workers and the general public during development of contaminated land" London HMSO.

Figures



Client: Co-Op Academy, North Manchester				Title: Site Location & Boundary Plan		
Site: Co-Op Academy, North Manchester				Scale (see scale bar): 1:25,000 & 1:1,000 @ A4		
Job No.: LKC 21 1558	Drawn By: EM	Checked By: MT	Drawn: Nov 2021	Figure: 1	Revision:	



KEY

 Site Boundary

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



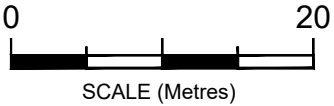
Client:
Co-Op Academy, North Manchester

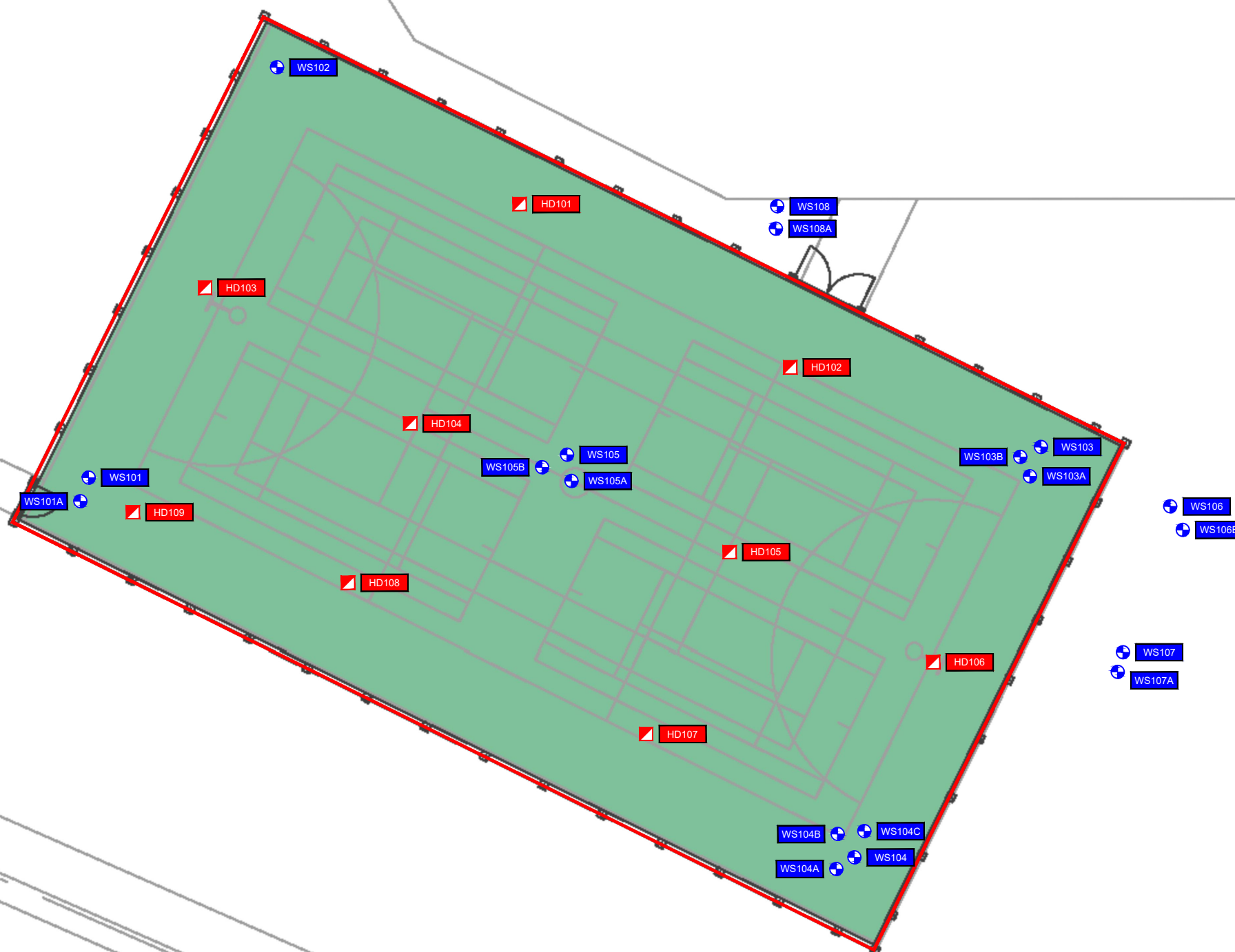
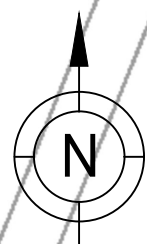
Site:
Co-Op Academy, North Manchester

Title:
Proposed Development Plan

Job No.:	Scale (See Scale Bar):		Figure:	Revision:
LKC 21 1558	1:500 @ A3		2	
Drawn By:	Checked By:	Drawn:		
AC	EM	Oct 2021		

Extract from: AHR Building Consultancy Ltd
Drawing Ref: Proposed Site Plan, No.PL-003 (07/27/2021)





KEY



Site Boundary



Window Sample Borehole (WS)



Hand Dug Trial Pit (HD)

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



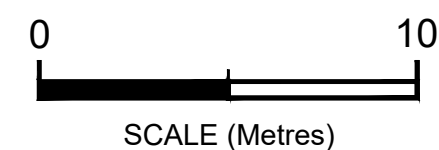
Client:
Co-Op Academy, North Manchester

Site:
Co-Op Academy, North Manchester

Title:
Site Investigation Location Plan

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 21 1558	See Scale Bar	3	
Drawn By:	Checked By:	Drawn:	
AC	EM	Oct 2021	

Extract from: AHR Building Consultancy Ltd
Drawing Ref: Proposed Site Plan, No.PL-003 (07/27/2021)



Appendix A

Zetica UXO Risk Map and Pre-Desk Study Assessment

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Map Centre: 387620,403351



LEGEND

- **High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- **Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- **Low:** Areas indicated as having 15 bombs per 1000acre or less.

- | | | |
|------------------|----------------------|--------------------------|
| military | industry | UXO find |
| transport | dock | Luftwaffe targets |
| utilities | Bombing decoy | other |

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

Pre-Desk Study Assessment

Site:	Co-op Academy North Manchester, 300 Victoria Avenue East, Manchester
Client:	The LK Group
Contact:	Helen Finch
Date:	19 th October 2021
Pre-WWI Military Activity on or Affecting the Site	None identified.
WWI Military Activity on or Affecting the Site	None identified.
WWI Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: ■ Transport infrastructure and public utilities. ■ Industries important to the war effort, including munitions factories, aircraft manufacturing and engineering works. ■ Military camps and training areas. ■ Anti-Aircraft (AA) guns.
WWI Bombing	None identified on the Site.
Interwar Military Activity on or Affecting the Site	None identified.
WWII Military Activity on or Affecting the Site	None identified.
WWII Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: ■ Transport infrastructure and public utilities. ■ Industries important to the war effort, including munitions factories, aircraft manufacturing and engineering works. ■ Military camps, depots and training areas. ■ AA and anti-invasion defences.
WWII Bombing Decoys (within 5km of Site)	None.
WWII Bombing	During WWII the Site was located in the County Borough (CB) of Manchester, adjacent to the boundaries with the Municipal Borough (MB) of Middleton and the Urban District (UD) of Chadderton. Manchester CB officially recorded 737No. High Explosive (HE) bombs with a bombing density of 27.0 bombs per 405 hectares (ha). Middleton MB officially recorded 37No. HE bombs with a bombing density of 7.2 bombs per 405 ha. Chadderton UD officially recorded 12No. HE bombs with a bombing density of 4.0 bombs per 405 ha. No readily available records have been found to indicate that the Site was bombed.
Post-WWII Military Activity on or Affecting the Site	None identified.
Recommendation	A detailed desk study, whilst always prudent, is not considered essential in this instance.
Further information	For information about Zetica's detailed UXO desk studies and other UXO services, please visit our website: www.zeticauxo.com. Details and downloadable resources covering the most common sources of UXO hazard affecting sites in the UK can be found here. If you have any further queries, please don't hesitate to get in contact with us at uxo@zetica.com or 01993 886 682.

This summary is based on a cursory review of readily available records. Caution is advised if you plan to action work based on this summary.

It should be noted that where a potentially significant source of UXO hazard has been identified on the Site, the requirement for a detailed desk study and risk assessment has been confirmed and no further research will be undertaken at this stage. It is possible that further in-depth research as part of a detailed UXO desk study and risk assessment may identify other potential sources of UXO hazard on the Site.

Pre-Desk Study Assessment

Site:	Co-op Academy North Manchester, 300 Victoria Avenue East, Manchester
Client:	The LK Group
Contact:	Helen Finch
Date:	19 th October 2021
Pre-WWI Military Activity on or Affecting the Site	None identified.
WWI Military Activity on or Affecting the Site	None identified.
WWI Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: ■ Transport infrastructure and public utilities. ■ Industries important to the war effort, including munitions factories, aircraft manufacturing and engineering works. ■ Military camps and training areas. ■ Anti-Aircraft (AA) guns.
WWI Bombing	None identified on the Site.
Interwar Military Activity on or Affecting the Site	None identified.
WWII Military Activity on or Affecting the Site	None identified.
WWII Strategic Targets (within 5km of Site)	The following strategic targets were located in the vicinity of the Site: ■ Transport infrastructure and public utilities. ■ Industries important to the war effort, including munitions factories, aircraft manufacturing and engineering works. ■ Military camps, depots and training areas. ■ AA and anti-invasion defences.
WWII Bombing Decoys (within 5km of Site)	None.
WWII Bombing	During WWII the Site was located in the County Borough (CB) of Manchester, adjacent to the boundaries with the Municipal Borough (MB) of Middleton and the Urban District (UD) of Chadderton. Manchester CB officially recorded 737No. High Explosive (HE) bombs with a bombing density of 27.0 bombs per 405 hectares (ha). Middleton MB officially recorded 37No. HE bombs with a bombing density of 7.2 bombs per 405 ha. Chadderton UD officially recorded 12No. HE bombs with a bombing density of 4.0 bombs per 405 ha. No readily available records have been found to indicate that the Site was bombed.
Post-WWII Military Activity on or Affecting the Site	None identified.
Recommendation	A detailed desk study, whilst always prudent, is not considered essential in this instance.
Further information	For information about Zetica's detailed UXO desk studies and other UXO services, please visit our website: www.zeticauxo.com. Details and downloadable resources covering the most common sources of UXO hazard affecting sites in the UK can be found here. If you have any further queries, please don't hesitate to get in contact with us at uxo@zetica.com or 01993 886 682.

This summary is based on a cursory review of readily available records. Caution is advised if you plan to action work based on this summary.

It should be noted that where a potentially significant source of UXO hazard has been identified on the Site, the requirement for a detailed desk study and risk assessment has been confirmed and no further research will be undertaken at this stage. It is possible that further in-depth research as part of a detailed UXO desk study and risk assessment may identify other potential sources of UXO hazard on the Site.

Appendix B

Profile Logs

Window Sample Logs

Hand Dug Pit Logs

Excavation Method Drive-in Windowless Sampler	Dimensions 	Ground Level (mOD) 103.00	Client Co-Op Academy North Manchester	Job Number LKC 21 1558
	Location (Handheld GPS) 387580 E 403282 N	Dates 25/10/2021	Engineer LKC	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						MADE GROUND: Dark brown very sandy clayey SILT with occasional brick fragments, tarmacadam fragments, concrete fragments, coal, rootlets and rare sub-angular sandstone cobbles. Sand is fine to medium. Frequent rootlets in upper 0.10m.		
				102.45 102.40	0.55 (0.05)	MADE GROUND: Tarmacadam.		
						Complete at 0.60m		

Remarks

Hand dug refusal at 0.60mbgl on tarmacadam.
Borehole re-positioned approximately 1.00m S (ref. WS101A).
Pit dry and stable.

Scale (approx)

1:20

Logged
By

EM

Figure No.

LKC 21 1558.WS101

Excavation Method

Drive-in Windowless Sampler
driven to 4.785mbgl.

Dimensions
Location (Handheld GPS)
387580 E 4032825 N

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

Job
Number
LKC 21 1558

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.40	ES1				(0.40)	MADE GROUND: Dark brown very sandy clayey SILT with occasional brick fragments, concrete fragments, tarmacadam fragments, coal, rootlets, rare pottery and plastic. Sand is fine to medium.		
0.40-0.60	ES2			102.60	0.40 (0.20)	MADE GROUND: Brown gravelly silty SAND with occasional brick fragments, slate, coal and concrete fragments.		
				102.40	0.60 (0.65)			
				102.35	0.80			
				102.20				
			Water strike(1) at 0.95m.		(0.40)	MADE GROUND: Tarmacadam.		
1.20-1.65	SPT N=25		6,7/7,6,6,6	101.80	1.20	MADE GROUND: Very light grey slightly silty very sandy GRAVEL (probable MOT). Sand is fine to coarse. Gravel is fine to coarse, sub-angular comprising limestone.		
1.70-2.00	B3				(0.80)	MADE GROUND: Brown silty SAND and GRAVEL with occasional brick fragments and coal. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
2.00-2.45	SPT N=25		6,7/7,7,6,5	101.00	2.00	Greyish brown gravelly very clayey SAND with occasional lenses of very sandy clay. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
2.50-3.00	PP 88.9kPa				(1.00)	Firm consistency high strength greyish brown slightly gravelly silty CLAY with occasional light grey silty sand lenses. Sand is fine to medium. Gravel is fine to medium, sub-angular to sub-rounded comprising coal.		
2.80-3.00	B4							
3.00-3.45	SPT N=14		3,3/3,3,4,4	100.00	3.00	NO RECOVERY (continuous SPTs undertaken).		
3.45-3.90	SPT N=24		6,6/6,6,6,6					
3.90-4.35	SPT N=29		7,7/7,7,7,8		(1.79)			
4.35-4.79	SPT 50/285		10,11/12,13,13,12					
				98.21	4.79	Complete at 4.79m		

Remarks

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Water strike at 0.95mbgl.
Borehole collapsing from 1.00mbgl.
Borehole drilled to 3.00mbgl. Continuous SPTs undertaken from 3.00-4.785mbgl due to instability of borehole.
Location estimated from handheld GPS, accurate to 3.00m.
SPT refusal at 4.785mbgl.

Scale
(approx)

1:40

Logged
By

EM

Figure No.

LKC 21 1558.WS101A

Excavation Method

Drive-in Windowless Sampler
driven to 5.45mbgl.

Dimensions
Location (Handheld GPS)
387590 E 403295 N

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

Job
Number
LKC 21 1558

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	ES1				(0.20)	MADE GROUND: Dark brown slightly gravelly silty SAND with occasional rootlets. Sand is fine to medium. Frequent rootlets in upper 0.10m.		
0.20-0.90	ES2		CBR at 0.30mbgl =30%	102.80	0.20			
			CBR at 0.60mbgl =100%*		(0.70)	MADE GROUND: Brown silty very gravelly SAND with occasional brick fragments, concrete fragments, coal and tarmacadam fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
				102.10	0.90			
1.20-1.65	SPT N=35		2,3/7,9,9,10	101.80	(0.30)	MADE GROUND: Brown and greyish brown very sandy silty CLAY with occasional brick fragments and coal. Sand is fine to medium.		
1.40-1.60	ES3			101.60	1.20			
1.60-2.00	ES4			101.40	(0.20)	MADE GROUND: Very light grey very sandy GRAVEL (probable MOT). Sand is fine to coarse. Gravel is fine to coarse. Gravel is fine to coarse, sub-angular comprising limestone.		
					1.60			
2.00-2.45	SPT N=8		2,2/2,2,2,2	101.00	(0.40)	MADE GROUND: Blackish brown very gravelly SAND with frequent ash and occasional brick fragments. Slight bitumen type odour. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
2.00-2.45	D5				2.00			
2.50-3.00	PP 138.4kPa					MADE GROUND: Greyish brown gravelly very sandy CLAY with occasional coal, rare brick fragments and rootlets. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
2.70-3.00	B6							
3.00-3.45	SPT N=21		3,3/4,5,6,6			Firm to very stiff consistency high to very high strength brown and light grey slightly gravelly sandy silty CLAY with rare rootlets, becoming less sandy with depth. Sand is fine to medium. Gravel is fine to medium, sub-angular to sub-rounded comprising coal.		
3.00-3.45	D7					Stiff consistency from 3.00mbgl.		
3.00-3.50	PP 150.7kPa							
3.50-4.00	PP 181.4kPa				(3.45)	Very stiff consistency between 3.50-4.00mbgl.		
4.00-4.45	SPT N=30		3,4/5,7,9,9			Rare bands of brownish grey sand between 4.00-5.45mbgl.		
4.00-4.45	D8							
4.00-5.00	PP 143kPa							
5.00-5.45	SPT N=26		4,5/5,6,7,8					
				97.55	5.45	Complete at 5.45m		

Remarks

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
CBR values obtained from Clegg Hammer Tests.
*where CBR recorded as maximum of 100% but calculated as greater than 100%.
Location estimated from handheld GPS, accurate to 3.00m.
Strata damp between 1.40-1.60mbgl.
Borehole stable.

Scale
(approx)

1:40

Logged
By

EM

Figure No.

LKC 21 1558.WS102

Excavation Method

Drive-in Windowless Sampler
driven to 1.34mbgl.

Dimensions
Location (Handheld GPS)
387607 E 403283 N

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

Job
Number
LKC 21 1558

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	ES1				(0.20)	MADE GROUND: Dark brown silty SAND with occasional rootlets. Sand is fine to medium. Frequent rootlets in upper 0.10m.		
0.20-0.60	ES2		CBR at 0.30mbgl =10%	102.80	0.20	MADE GROUND: Dark brown slightly silty SAND with occasional rootlets, brick fragments and sub-angular sandstone cobbles. Sand is fine to coarse.		
			CBR at 0.60mbgl =71%	102.40	0.60	MADE GROUND: Brown slightly gravelly clayey SAND with occasional brick fragments, tarmacadam fragments and coal. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
1.00-1.34	SPT 50/190		10,11/19,19,12	102.10	0.90 (0.10)	MADE GROUND: Tarmacadam.		
				102.00	1.00	MADE GROUND: Very light grey slightly silty sandy GRAVEL (probable MOT). Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising limestone.		
1.20-1.30	ES3			101.80	1.20	MADE GROUND: Brown slightly silty SAND with frequent brick fragments, tarmacadam fragments, occasional coal and rare metal. Sand is fine to coarse.		
				101.66	1.34	Complete at 1.34m		

Remarks

CBR values obtained from Clegg Hammer Tests.
SPT refusal at 1.34mbgl. Two additional locations probed approximately 1.00m SW and 1.00m S to confirm depth to refusal (ref. WS103A & WS101B). WS101A and WS101B refusal at 1.20mbgl.
Borehole dry and stable.
Location estimated from handheld GPS, accurate to 3.00m.
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>

Scale
(approx)

1:20

Logged
By

EM

Figure No.

LKC 21 1558.WS103

Excavation Method

Drive-in Windowless Sampler

Dimensions
Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

Job
Number
LKC 21 1558

Location (Handheld GPS)

387602 E 403269 N

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	ES1				(0.20)	MADE GROUND: Dark brown silty SAND with frequent rootlets and rare brick fragments. Sand is fine to medium.		
0.20-0.50	ES2		CBR at 0.30mbgl =98%	102.80	0.20	MADE GROUND: Dark brown gravelly silty SAND with occasional brick fragments, coal, sub-angular sandstone cobbles, rare tarmacadam fragments and concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
					(0.30)			
				102.50	0.50	MADE GROUND: Tarmacadam.		
					(0.10)			
			CBR at 0.60mbgl =47%	102.40	0.60	MADE GROUND: Very light grey slightly silty sandy GRAVEL (probable MOT). Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising limestone.		
				102.35	(0.05)			
				102.30	(0.05)	MADE GROUND: Brown silty SAND with frequent brick fragments and rare timber. Sand is fine to coarse.		
					(0.70)	Complete at 0.70m		

Remarks

Hand dug refusal at 0.70mbgl. Three additional locations probed approximately 1.00m N, 1.00m SW and 1.00m NW to confirm depth to refusal (ref. WS104A, WS104B & WS104C). All refused at 0.70mbgl.
Perched water pooling in base of pit at 0.60mbgl.
Location estimated from handheld GPS, accurate to 3.00m.
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
CBR values obtained from Clegg Hammer Tests.

Scale
(approx)

1:20

Logged
By

EM

Figure No.

LKC 21 1558.WS104

Excavation Method

Drive-in Windowless Sampler

Dimensions
Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

Job
Number
LKC 21 1558

Location (Handheld GPS)

387608 E 403270 N

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.20	ES1				(0.20)	MADE GROUND: Dark brown silty SAND with frequent rootlets, rare brick fragments and rare glass. Sand is fine to medium.		
0.20-0.80	ES2			102.80	0.20	MADE GROUND: Dark brown gravelly silty SAND with occasional brick fragments, sub-angular sandstone cobbles, clay lenses, coal, rare timber, glass and tarmacadam fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies. Membrane identified at 0.20mbgl.		
					(0.60)			
				102.20	0.80	Complete at 0.80m		

Remarks

Hand dug refusal at 0.80mbgl. Two additional locations probed approximately 1.00m SE and 1.50m SW to confirm depth to refusal (ref. WS105A & WS105B). WS105A and WS105B refusal at 0.80mbgl.
Location estimated from handheld GPS, accurate to 3.00m.
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Pit dry and stable.

Scale (approx)

1:20

Logged By

EM

Figure No.

LKC 21 1558.WS105

Excavation Method

Drive-in Windowless Sampler

Dimensions
Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

Job
Number
LKC 21 1558

Location (Handheld GPS)

387620 E 4032781 N

Dates

25/10/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.10-1.55	SPT(C) N=50		10,11/23,27	102.80	(0.20)	MADE GROUND: Dark brown silty SAND with occasional rootlets. Sand is fine to medium.		
					0.20	MADE GROUND: Dark brown gravelly silty SAND with occasional brick fragments, concrete fragments and tarmacadam fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
					(0.30)			
					102.50	NO RECOVERY.		
					102.45			
					102.40	MADE GROUND: Tarmacadam.		
					(0.20)	MADE GROUND: Dark brown gravelly very silty SAND with occasional concrete fragments, coal and brick fragments.		
					102.20	MADE GROUND: Tarmacadam and concrete fragments.		
					(0.30)			
					101.90	NO RECOVERY.		
					(0.45)			
					101.45	Complete at 1.55m		

Remarks

Sampler refusal at 1.10mbgl. SPT refusal at 1.55mbgl. No recovery as cone used. Borehole dry and stable.

An additional location probed approximately 1.00m SE to confirm depth to refusal (ref. WS106A). WS105A refusal at 0.80mbgl.

Location estimated from handheld GPS, accurate to 3.00m.

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
Scale (approx)

1:20

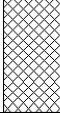
Logged By

EM

Figure No.

LKC 21 1558.WS106

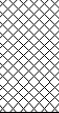
Site Co-Op Academy, North Manchester	Number WS108
Client Co-Op Academy North Manchester	Job Number LKC 21 1558
Engineer LKC	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				102.70	(0.30) 0.30	MADE GROUND: Dark brown very silty SAND with occasional rootlets, rare brick fragments and coal. Sand is fine to medium. Complete at 0.30m		

Scale (approx)	Logged By
1:20	EM

Figure No.
LKC 21 1558.WS108

Site Co-Op Academy, North Manchester	Number WS108A
Client Co-Op Academy North Manchester	Job Number LKC 21 1558
Engineer LKC	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				102.70	0.30	MADE GROUND: Dark brown very silty SAND with occasional rootlets, rare brick fragments and coal. Sand is fine to medium.		
						Complete at 0.30m		

Scale (approx)	Logged By
1:20	

Figure No.
LKC 21 1558.WS108A

Excavation Method

Hand dug pit to 0.60mbgl.

Dimensions

0.30m x 0.30m x 0.60m

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

**Job
Number**
LKC 21 1558

Location (Grid reference finder,)

387593 E 403287 N

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl =7%	102.80	(0.20) 0.20	MADE GROUND: Dark brown slightly gravelly silty SAND with occasional rootlets, rare brick fragments and pieces of rubber. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
			CBR at 0.60mbgl =17%	102.40	(0.40) 0.60	MADE GROUND: Dark brown silty very gravelly SAND with frequent brick fragments, sub-angular sandstone cobbles, rare plastic, occasional concrete fragments and rare timber. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
						Complete at 0.60m		


Remarks

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
CBR values obtained from Clegg Hammer Tests at 0.30m and 0.60m.
Location estimated from <https://gridreferencefinder.com>.
Hand dug pit dry and stable.

Scale (approx)

1:20

Logged By

MP

Figure No.

LKC 21 1558.HD101

Excavation Method

Hand dug pits to 0.60mbgl.

Dimensions

0.30m x 0.30m x 0.60m

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

**Job
Number**
LKC 21 1558

Location (Grid reference finder,)

387598 E 403285 N

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl =19%	102.90	(0.10) 0.10	MADE GROUND: Dark brown slightly gravelly silty SAND with frequent rootlets and rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub angular to sub rounded comprising mixed lithologies.		
			CBR at 0.60mbgl =19%	102.40	(0.50) 0.60	MADE GROUND: Dark brown silty very gravelly SAND with frequent brick fragments, rootlets, tarmac, occasional plastics and concrete cobbles. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
						Complete at 0.60m		


Remarks

Hand dug pit dry and stable.
Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
CBR values obtained from Clegg Hammer Tests at 0.30m and 0.60m.
Location estimated from <https://gridreferencefinder.com>
Scale (approx)

1:20

Logged By

MP

Figure No.

LKC 21 1558.HD102

Excavation Method

Hand dug pit to 0.60mbgl.

Dimensions

0.30m x 0.30m x 0.30m

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

**Job
Number**

LKC 21 1558

Location (Grid reference finder,)

387583 E 403287 N

Dates

25/10/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl =31%	102.90	(0.10) 0.10	MADE GROUND: Dark brown slightly gravelly silty SAND with frequent rootlets and occasional brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
			CBR at 0.60mbgl =17%	102.40	(0.50) 0.60	MADE GROUND: Dark brown silty very gravelly SAND with large frequent brick fragments, rootlets, tarmac and abundant poor condition yellow/light brown concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub rounded comprising mixed lithologies.		
						Complete at 0.60m		


Remarks

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
CBR values obtained from Clegg Hammer Tests at 0.30m and 0.60m.
Location estimated from <https://gridreferencefinder.com>.
Hand dug pit dry and stable.

Scale (approx)

1:20

Logged By

MP

Figure No.

LKC 21 1558.HD103

Excavation Method

Hand dug pit to 0.60mbgl.

Dimensions

0.30m x 0.30m x 0.60m

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

**Job
Number**
LKC 21 1558

Location (Grid reference finder,)

387591 E 403284 N

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl = 7%	102.80	(0.20) 0.20	MADE GROUND: Dark brown slightly gravelly silty SAND with occasional brick fragments and frequent rootlets. Sand is fine to coarse. Gravel is fine coarse, sub-angular to sub-rounded comprising mixed lithologies.		
			CBR at 0.60mbgl = 9%	102.40	(0.40) 0.60	MADE GROUND: Dark brown silty very gravelly SAND with occasional concrete cobbles, plastics, frequent black concrete fragments and occasional bands of dark grey clay. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
						Complete at 0.60m		


Remarks

Elevation estimated from <https://www.freemaptools.com/elevationfinder.htm>
CBR values obtained from Clegg Hammer Tests at 0.30m and 0.60m.
Location estimated from <https://gridreferencefinder.com>.
Hand dug pit dry and stable.

Scale (approx)

1:20

Logged By

MP

Figure No.

LKC 21 1558.HD104

Excavation Method

Hand dug pit to 0.50mbgl.

Dimensions

0.30m x 0.30m x 0.50m

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

**Job
Number**

LKC 21 1558

Location (Grid reference finder,)

387596 E 403282 N

Dates

25/10/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl =23% CBR at 0.50mbgl =4%	102.50	(0.50) 0.50	MADE GROUND: Dark brown silty very gravelly SAND with abundant mottling, rootlets, occasional brick fragments, concrete cobbles, rare pottery and glass. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies. Orange/greyclay inclusions at 0.30-0.50m. Complete at 0.50m		


Remarks

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>
 CBR values obtained from Clegg Hammer Tests at 0.30m and 0.50m.
 Location estimated from <https://gridreferencefinder.com>.
 Hand dug pits dry and stable.

Scale (approx)

1:20

Logged By

MP

Figure No.

LKC 21 1558.HD105

Excavation Method

Hand dug pit to 0.60mbgl.

Dimensions

0.30m x 0.30m x 0.60m

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

**Job
Number**
LKC 21 1558

Location (Grid reference finder,)

387600 E 403281 N

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl =9%	102.80	(0.20) 0.20	MADE GROUND: Dark brown slightly gravelly silty SAND with frequent rootlets and numerous brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
			CBR at 0.60mbgl =23%	102.40	(0.40) 0.60	MADE GROUND: Dark brown silty slightly gravelly SAND with frequent timber, concrete cobbles and brick fragments. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies. Bands of sandy clay at 0.30-0.40mbgl		
						Complete at 0.60m		


Remarks

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>.
CBR values obtained from Clegg Hammer Tests at 0.30m and 0.60m.
Location estimated from <https://gridreferencefinder.com>.
Hand dug pit dry and stable.

Scale (approx)

1:20

Logged By

MP

Figure No.

LKC 21 1558.HD106

Excavation Method

Hand dug pit to 0.60mbgl.

Dimensions

0.30.m x 0.30m x 0.50m

Ground Level (mOD)

103.00

Client

Co-Op Academy North Manchester

**Job
Number**
LKC 21 1558

Location (Grid reference finder,)

387595 E 403278 N

Dates

25/10/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl =28%		(0.50)	MADE GROUND: Dark brown silty very gravelly SAND with frequent rootlets, occasional brick fragments, black tarmac and rare textile fabric. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising mixed lithologies.		
			CBR at 0.60mbgl =43%	102.50 102.40	0.50 (0.10) 0.60	MADE GROUND: Very light grey slightly silty sandy GRAVEL (probable MOT). Sand is fine to coarse. Gravel is fine to coarse, sub-angular to sub-rounded comprising limestone. Complete at 0.60m		


Remarks

Elevation estimated from <https://www.freemaptools.com/elevation-finder.htm>.
CBR values obtained from Clegg Hammer Tests at 0.30m and 0.60m.
Location estimated from <https://gridreferencefinder.com>.
Hand dug pit dry and stable.

Scale (approx)

1:20

Logged By

MP

Figure No.

LKC 21 1558.HD107



LK CONSULT LTD
Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Site Co-Op Academy, North Manchester	Trial Pit Number HD109
Client Co-Op Academy North Manchester	Job Number LKC 21 1558

Excavation Method Hand dug pit to 0.60mbgl.	Dimensions 0.30m x 0.30m x 0.60m	Ground Level (mOD) 103.00
	Location (Handheld GPS) 387579 E 403276 N	Dates 25/10/2021

Engineer LKC	Sheet 1/1
------------------------	---------------------

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
			CBR at 0.30mbgl = 5%	102.80	(0.20)	MADE GROUND: Dark brown slightly gravelly silty SAND with occasional rootlets. Sand is fine to medium.		
			CBR at 0.60mbgl = 59.6%	102.40	(0.40)	MADE GROUND: Dark brown very sandy silty CLAY with occasional brick fragments, timber, concrete fragments, coal and tarmacadam fragments. Sand is fine to coarse.		
					0.60	Complete at 0.60m		

Plan											Remarks			
												CBR values obtained from Clegg Hammer Tests at 0.30 and 0.60m. Pit dry and stable. Location estimated from https://gridreferencefinder.com/ Elevation estimated from https://www.freemaptools.com/elevation-finder.htm		
												</		

Appendix C

Certificates of Analysis – Soil



Final Report

Report No.: 21-37409-1
Initial Date of Issue: 03-Nov-2021
Client LK Consult
Client Address: Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Manchester
Lancashire
M26 2ZS
Contact(s): Contaminated Land
Michelle Thorniley
Project LKC 21 1558 Co-Op Academy, North
Manchester

Quotation No.:		Date Received:	27-Oct-2021
Order No.:	739755	Date Instructed:	27-Oct-2021
No. of Samples:	2		
Turnaround (Wkdays):	5	Results Due:	02-Nov-2021
Date Approved:	03-Nov-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: LKC 21 1558 Co-Op Academy, North Manchester

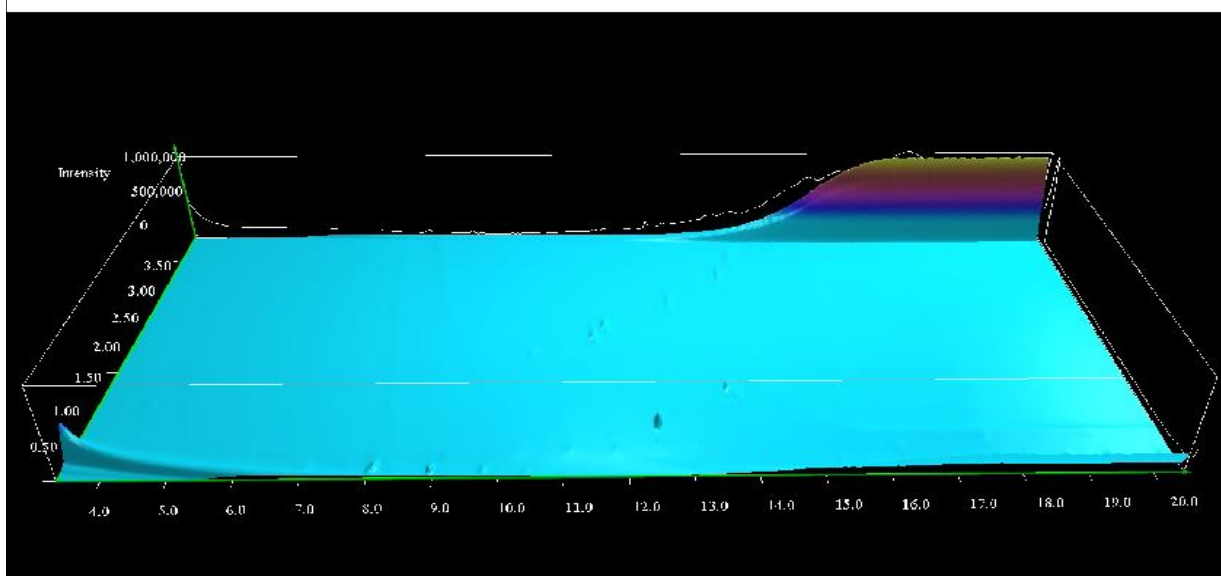
Client: LK Consult	Chemtest Job No.:				21-37409	21-37409
Quotation No.:	Chemtest Sample ID.:				1306949	1306950
Order No.: 739755	Client Sample Ref.:				ES1	ES2
	Client Sample ID.:				WS102	WS104
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.0	0.2
	Bottom Depth (m):				0.2	0.5
	Date Sampled:				25-Oct-2021	25-Oct-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	16	13
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Clay
Chromatogram (TPH)	N			N/A	See Attached	See Attached
pH	M	2010		4.0	8.5	8.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.57	< 0.40
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.030	0.041
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	6.2	5.8
Cadmium	M	2450	mg/kg	0.10	0.15	< 0.10
Chromium	M	2450	mg/kg	1.0	10	20
Copper	M	2450	mg/kg	0.50	49	35
Mercury	M	2450	mg/kg	0.10	0.29	< 0.10
Nickel	M	2450	mg/kg	0.50	12	8.7
Lead	M	2450	mg/kg	0.50	110	13
Selenium	M	2450	mg/kg	0.20	0.25	< 0.20
Vanadium	U	2450	mg/kg	5.0	9.2	13
Zinc	M	2450	mg/kg	0.50	120	26
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	5.5	5.5
Diesel Present	N	2670		N/A	False	False
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	9.1
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	5.1
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	17
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	3.3	16
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	47	120
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	62
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	51	230
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

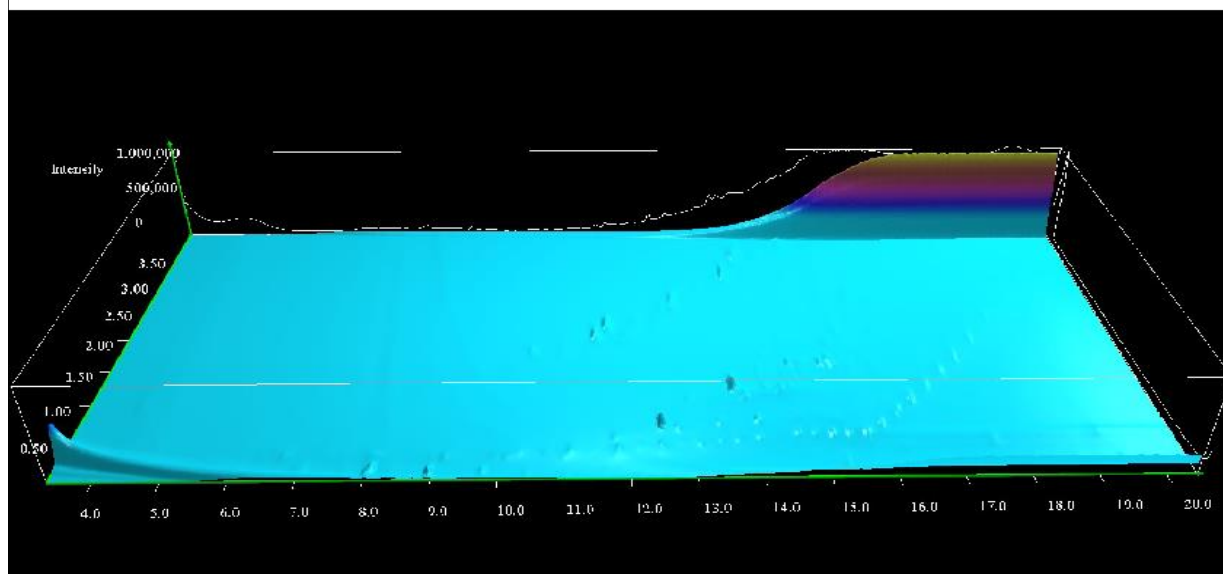
Project: LKC 21 1558 Co-Op Academy, North Manchester

Client: LK Consult	Chemtest Job No.:				21-37409	21-37409
Quotation No.:	Chemtest Sample ID.:				1306949	1306950
Order No.: 739755	Client Sample Ref.:				ES1	ES2
	Client Sample ID.:				WS102	WS104
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.0	0.2
	Bottom Depth (m):				0.2	0.5
	Date Sampled:				25-Oct-2021	25-Oct-2021
	Asbestos Lab:				COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	4.6	15
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	290	1100
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	12	180
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	300	1300
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	360	1600
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10

TPH Chromatogram on Soil Sample: 1306949



TPH Chromatogram on Soil Sample: 1306950



TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
21-37409	1306949	S		ES1	WS102	0.0	No	PAH
21-37409	1306950	S		ES2	WS104	0.2	No	PAH

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

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Sample Retention and Disposal

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If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



Final Report

Report No.: 21-37412-1
Initial Date of Issue: 04-Nov-2021
Client LK Consult
Client Address: Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Manchester
Lancashire
M26 2ZS
Contact(s): Contaminated Land
Michelle Thorniley
Project LKC 21 1558 Co-Op Academy, North
Manchester

Quotation No.:		Date Received:	27-Oct-2021
Order No.:	739755	Date Instructed:	27-Oct-2021
No. of Samples:	2		
Turnaround (Wkdays):	7	Results Due:	04-Nov-2021
Date Approved:	04-Nov-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - 2 Stage WAC

Project: LKC 21 1558 Co-Op Academy, North Manchester

Chemtest Job No: 21-37412							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1306954							Limits			
Sample Ref: ES1							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: WS102										
Sample Location:										
Top Depth(m): 0.0										
Bottom Depth(m): 0.2										
Sampling Date: 25-Oct-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				3.8	3	5	6
Loss On Ignition	2610	M	%				6.9	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				150	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				51	100	--	--
pH	2010	M					8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.018	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0053	0.0050	0.010	0.050	0.5	2	25	
Barium	1455	U	0.032	0.017	0.063	0.18	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0007	0.0006	0.0013	0.0057	0.5	10	70	
Copper	1455	U	0.011	0.0062	0.021	0.0065	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0037	0.0012	0.0072	0.013	0.5	10	30	
Nickel	1455	U	0.0014	0.0008	0.0028	0.0080	0.4	10	40	
Lead	1455	U	0.0048	0.0063	0.0095	0.062	0.5	10	50	
Antimony	1455	U	0.0033	0.0013	0.0064	0.014	0.06	0.7	5	
Selenium	1455	U	0.0008	0.0006	0.0016	0.0057	0.1	0.5	7	
Zinc	1455	U	0.006	0.004	0.012	0.039	4	50	200	
Chloride	1220	U	1.4	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.71	0.34	1.4	3.6	10	150	500	
Sulphate	1220	U	7.0	< 1.0	14	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	150	78	290	820	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	13	19	< 50	190	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	18

Leachate Test Information	
Leachant volume 1st extract/l	0.311
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.104

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: LKC 21 1558 Co-Op Academy, North Manchester

Chemtest Job No: 21-37412							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1306955							Limits			
Sample Ref: ES2							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: WS104										
Sample Location:										
Top Depth(m): 0.2										
Bottom Depth(m): 0.5										
Sampling Date: 25-Oct-2021										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				5.2	3	5	6
Loss On Ignition	2610	M	%				6.0	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				680	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				69	100	--	--
pH	2010	M					8.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.019	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0032	0.0049	0.0064	0.048	0.5	2	25	
Barium	1455	U	0.026	0.015	0.052	0.16	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0012	0.0010	0.0024	0.0098	0.5	10	70	
Copper	1455	U	0.0058	0.0047	0.011	0.0034	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0046	0.0015	0.0091	0.017	0.5	10	30	
Nickel	1455	U	0.0012	0.0010	0.0023	0.011	0.4	10	40	
Lead	1455	U	0.0012	0.0027	0.0025	0.026	0.5	10	50	
Antimony	1455	U	0.0032	0.0013	0.0063	0.015	0.06	0.7	5	
Selenium	1455	U	0.0010	0.0006	0.0019	0.0061	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	3.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.80	0.35	1.6	3.8	10	150	500	
Sulphate	1220	U	17	4.7	34	54	1000	20000	50000	
Total Dissolved Solids	1020	N	140	72	270	750	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	11	29	< 50	280	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.326
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.104

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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Appendix D

Generic Assessment Criteria Values

CATEGORY 4 SCREENING LEVELS

Substance	Residential (with home- grown produce)	Residential (without home- grown produce)	Allotments	Commercial	Public Open Space 1	Public Open Space 2
Arsenic	37 mg/kg	40 mg/kg	49 mg/kg	640 mg/kg	79 mg/kg	170 mg/kg
Benzene	0.87 mg/kg	3.3 mg/kg	0.18 mg/kg	98 mg/kg	140 mg/kg	230 mg/kg
Benzo(a)pyrene	5.0 mg/kg	5.3 mg/kg	5.7 mg/kg	77 mg/kg	10 mg/kg	21 mg/kg
Cadmium	22 mg/kg	150 mg/kg	3.9 mg/kg	410 mg/kg	220 mg/kg	880 mg/kg
Chromium VI	21 mg/kg	21 mg/kg	170 mg/kg	49 mg/kg	21 mg/kg	250 mg/kg
Lead	200 mg/kg	310 mg/kg	80 mg/kg	2300 mg/kg	630 mg/kg	1300 mg/kg

Tetrachlorethene (PCE) – 1% SOM	0.31 mg/kg	0.32 mg/kg	2.0 mg/kg	24 mg/kg	3,200 mg/kg	1,400 mg/kg
Tetrachlorethene (PCE) – 2.5% SOM	0.70 mg/kg	0.71 mg/kg	4.8 mg/kg	55 mg/kg	3,300 mg/kg	1,900 mg/kg
Tetrachlorethene (PCE) – 6% SOM	1.6 mg/kg	1.6 mg/kg	11 mg/kg	130 mg/kg	3,400 mg/kg	2,500 mg/kg
Trichlorethene (TCE) – 1% SOM	0.0093 mg/kg	0.0097 mg/kg	0.032 mg/kg	0.73 mg/kg	76 mg/kg	41 mg/kg
Trichlorethene (TCE) – 2.5% SOM	0.020 mg/kg	0.020 mg/kg	0.072 mg/kg	1.5 mg/kg	78 mg/kg	54 mg/kg
Trichlorethene (TCE) – 6% SOM	0.043 mg/kg	0.045 mg/kg	0.16 mg/kg	3.4 mg/kg	79 mg/kg	69 mg/kg
Vinyl Chloride (VC) – 1%SOM	0.0064 mg/kg	0.015 mg/kg	0.0017 mg/kg	1.1 mg/kg	7.8 mg/kg	18 mg/kg
Vinyl Chloride (VC) – 2.5%SOM	0.010 mg/kg	0.019 mg/kg	0.0031 mg/kg	1.4 mg/kg	7.8 mg/kg	19 mg/kg
Vinyl Chloride (VC) – 6%SOM	0.017 mg/kg	0.029 mg/kg	0.0058 mg/kg	2.2 mg/kg	7.8 mg/kg	19 mg/kg

Summary Table for the Generic Assessment Criteria for Human Health Risk Assessment Land Quality Management (LQM) S4ULs.

All GAC are based on sandy
loam soils with a pH 7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Metals	Inorganic Arsenic	6%	37	40	43	640	79	170
	Beryllium	6%	1.7	1.7	35	12	2.2	63
	Boron	6%	290	11,000	45	240,000	21,000	46,000
	Cadmium	6%	11	85	1.9	190	120	532
	Chromium (III)	6%	910	910	18,000	8,600	1,500	33,000
	Chromium (VI)	6%	6.0	6.0	1.8	33	7.7	220
	Copper	6%	2,400	7,100	520	68,000	12,000	44,000
	Elemental Mercury	6%	1.2	1.2	21	58 (25.8) ^{vap}	16	30 (25.8) ^{vap}
	Inorganic Mercury	6%	40	56	19	1,100	120	240
	Methylmercury	6%	11	15	6.0	320	40	68
	Nickel (update 2015)	6%	126	181	53	983	231	804
	Selenium	6%	250	430	88	12,000	1,100	1,800
	Vanadium	6%	410	1,200	91	9,000	2,000	5,000
Zinc	6%	3,700	40,000	620	730,000	81,000	170,000	
BTEX Compounds	Benzene	1%	0.087	0.38	0.017	27	72	90
		2.5%	0.17	0.70	0.034	47	72	100
		6%	0.37	1.4	0.075	90	73	110
	Toluene	1%	130	880 (869) ^{vap}	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}
		2.5%	290	1,900	51	110,000 (1,920) ^{vap}	56,000	95,000 (1,920) ^{vap}
		6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360) ^{vap}
	Ethylbenzene	1%	47	83	16	5,700 (518) ^{vap}	24,000	17,000 (518) ^{vap}
		2.5%	110	190	39	13,000 (1,220) ^{vap}	24,000	22,000 (1,220) ^{vap}
		6%	260	440	91	27,000 (2,840) ^{vap}	25,000	27,000 (2,840) ^{vap}
	o-xylene	1%	60	88	28	6,600 (478) ^{sol}	41,000	17,000 (478) ^{sol}
		2.5%	140	210	67	15,000 (1,120) ^{sol}	42,000	24,000 (1,120) ^{sol}
		6%	330	480	160	33,000 (2,620) ^{sol}	43,000	33,000 (2,620) ^{sol}
	m-xylene	1%	59	82	31	6,200 (625) ^{vap}	41,000	17,000 (625) ^{vap}
		2.5%	140	190	74	14,000 (1,470) ^{vap}	42,000	24,000 (1,470) ^{vap}
		6%	320	450	170	31,000 (3,460) ^{vap}	43,000	32,000 (3,460) ^{vap}
	p-xylene	1%	56	79	29	5,900 (576) ^{sol}	41,000	17,000 (576) ^{sol}
		2.5%	130	180	69	14,000 (1,350) ^{sol}	42,000	23,000 (1,350) ^{sol}
		6%	310	430	160	30,000 (3,170) ^{sol}	43,000	31,000 (3,170) ^{sol}

NOTES

^{sol} / ^{vap} = solubility / vapour limit (potentially use if free product identified, although highly conservative).

f = oral, dermal and inhalation exposures compared to oral HCV.

All GAC are based on sandy loam soils with a pH 7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	1%	210	3,000 (57.1) ^{sol}	34	84,000 (57.0) ^{sol}	15,000	29,000
		2.5%	510	4,700 (141) ^{sol}	85	97,000 (141) ^{sol}	15,000	30,000
		6%	1,100	6,000 (336) ^{sol}	200	100,000	15,000	30,000
	Acenaphthylene	1%	170	2,900 (86.1) ^{sol}	28	83,000 (86.1) ^{sol}	15,000	29,000
		2.5%	420	4,600 (212) ^{sol}	69	97,000 (212) ^{sol}	15,000	30,000
		6%	920	6,000 (506) ^{sol}	160	100,000	15,000	30,000
	Anthracene	1%	2,400	31,000 (1.17) ^{vap}	380	520,000	74,000	150,000
		2.5%	5,400	35,000	950	540,000	74,000	150,000
		6%	11,000	37,000	2,200	540,000	74,000	150,000
	Benz(a)anthracene	1%	7.2	11	2.9	170	29	49
		2.5%	11	14	6.5	170	29	56
		6%	13	15	13	180	29	62
	Benzo(a)pyrene (only)	1%	2.2	3.2	0.97	35	5.7	11
		2.5%	2.7	3.2	2.0	35	5.7	12
		6%	3.0	3.2	3.5	36	5.7	13
	Benzo(b)fluoranthene	1%	2.6	3.9	0.99	44	7.1	13
		2.5%	3.3	4.0	2.1	44	7.2	15
		6%	3.7	4.0	3.9	45	7.2	16
	Benzo(ghi)perylene	1%	320	360	290	3,900	640	1,400
		2.5%	340	360	470	4,000	640	1,500
		6%	350	360	640	4,000	640	1,600
	Benzo(k)fluoranthene	1%	77	110	37	1,200	190	370
		2.5%	93	110	75	1,200	190	410
		6%	100	110	130	1,200	190	440
	Chrysene	1%	15	30	4.1	350	57	93
		2.5%	22	31	9.4	350	57	110
		6%	27	32	19	350	57	120
	Dibenzo(ah)anthracene	1%	0.24	0.31	0.14	3.5	0.57	1.1
		2.5%	0.28	0.32	0.27	3.6	0.58	1.3
		6%	0.3	0.32	0.43	3.6	0.58	1.4
	Fluoranthene	1%	280	1,500	52	23,000	3,100	6,300
		2.5%	560	1,600	130	23,000	3,100	6,300
		6%	890	1,600	290	23,000	3,100	6,400
	Fluorene	1%	170	2,800 (36.0) ^{sol}	27	63,000 (30.9) ^{sol}	9,900	20,000
		2.5%	400	3,800 (76.5) ^{sol}	67	68,000	9,900	20,000
		6%	860	4,500 (183) ^{sol}	160	71,000	9,900	20,000
	Indeno(123-cd)pyrene	1%	27	45	9.5	500	82	150
		2.5%	36	46	21	510	82	170
		6%	41	46	39	510	82	180
	Naphthalene	1%	2.3 ^f	2.3 ^f	4.1 ^f	190 ^f (76.4) ^{sol}	4,900 ^f	1,200 ^f (76.4) ^{sol}
		2.5%	5.6 ^f	5.6 ^f	10 ^f	460 ^f (183) ^{sol}	4,900 ^f	1,900 ^f (183) ^{sol}
		6%	13 ^f	13 ^f	24 ^f	1,100 ^f (432) ^{sol}	4,900 ^f	3,000
	Phenanthrene	1%	95	1,300 (36.0) ^{sol}	15	22,000	3,100	6,200
		2.5%	220	1,500	38	22,000	3,100	6,200
		6%	440	1,500	90	22,000	3,100	6,300
	Pyrene	1%	620	3,700	110	54,000	7,400	15,000
		2.5%	1,200	3,800	270	54,000	7,400	15,000
		6%	2,000	3,800	620	54,000	7,400	15,000
Coal Tar (B(a)P as surrogate marker)	1%	0.79	1.2	0.32	15	2.2	4.4	
	2.5%	0.98	1.2	0.67	15	2.2	4.7	
	6%	1.1	1.2	1.2	15	2.2	4.8	

NOTES

^{Sol / vap} = solubility / vapour limit (potentially use if free product identified, although highly conservative).

^f = naphthalene is based on comparison of inhalation exposure with TDI_{Inhal} for localised effect.

All GAC are based on sandy loam soils with a pH 7.

LQM Generic Assessment Criteria (mg/kg) Dry weight soil

Contaminant	SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Aliphatic							
EC 5-6	1%	42	42	730	3,200 (304) ^{sol}	570,000(304) ^{sol}	95,000 (304) ^{sol}
EC>6-8	1%	100	100	2,300	7,800 (144) ^{sol}	600,000	150,000 (144) ^{sol}
EC>8-10	1%	27	27	320	2,000 (78) ^{sol}	13,000	14,000 (78) ^{vap}
EC>10-12	1%	130 (48) ^{vap}	130 (48) ^{vap}	2,200	9,700 (48) ^{sol}	13,000	21,000 (48) ^{vap}
EC>12-16	1%	1,100 (24) ^{sol}	1,100 (24) ^{sol}	11,000	59,000 (24) ^{sol}	13,000	25,000 (24) ^{sol}
EC>16-35	1%	65,000 (8.48) ^{f, sol}	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f
EC>35-44	1%	65,000 (8.48) ^{f, sol}	65,000 (8.48) ^{f, sol}	260,000 ^f	160,000 ^f	250,000 ^f	450,000 ^f
Aliphatic							
EC 5-6	2.5%	78	78	1,700	5,900 (558) ^{sol}	590,000	130,000 (558) ^{sol}
EC>6-8	2.5%	230	230	5,600	17,000 (322) ^{sol}	610,000	220,000 (322) ^{sol}
EC>8-10	2.5%	65	65	770	4,800 (190) ^{vap}	13,000	18,000 (190) ^{vap}
EC>10-12	2.5%	330 (118) ^{vap}	330 (118) ^{vap}	4,400	23,000 (118) ^{vap}	13,000	23,000 (118) ^{vap}
EC>12-16	2.5%	2,400 (59) ^{sol}	2,400 (59) ^{sol}	13,000	82,000 (59) ^{sol}	13,000	25,000 (59) ^{sol}
EC>16-35	2.5%	92,000 (21) ^{f, sol}	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f
EC>35-44	2.5%	92,000 (21) ^{f, sol}	92,000 (21) ^{f, sol}	270,000 ^f	1,700,000 ^f	250,000 ^f	480,000 ^f
Aliphatic							
EC 5-6	6%	160	160	3,900	12,000 (1,150) ^{sol}	600,000	180,000 (1,150) ^{sol}
EC>6-8	6%	530	530	13,000	40,000 (736) ^{sol}	620,000	320,000 (736) ^{sol}
EC>8-10	6%	150	150	1,700	11,000 (451) ^{vap}	13,000	21,000 (451) ^{vap}
EC>10-12	6%	760 (283) ^{vap}	760 (283) ^{vap}	7,300	47,000 (283) ^{vap}	13,000	24,000 (283) ^{vap}
EC>12-16	6%	4,300 (142) ^{sol}	4,400 (142) ^{sol}	13,000	90,000 (142) ^{sol}	13,000	26,000 (142) ^{sol}
EC>16-35	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f
EC>35-44	6%	110,000 ^f	110,000 ^f	270,000 ^f	1,800,000 ^f	250,000 ^f	490,000 ^f
Aromatic							
EC5-7(benzene as non-threshold)	1%	70	370	13	26,000 (1,220) ^{sol}	56,000	76,000 (1,220) ^{sol}
EC>7-8(toluene)	1%	130	860	22	56,000 (869) ^{vap}	56,000	87,000 (869) ^{vap}
EC>8-10	1%	34	47	8.6	3,500 (613) ^{vap}	5,000	7,200 (613) ^{vap}
EC>10-12	1%	74	250	13	16,000 (364) ^{sol}	5,000	9,200 (364) ^{sol}
EC>12-16	1%	140	1,800	23	36,000 (169) ^{sol}	5,100	10,000
EC>16-21	1%	260 ^f	1,900 ^f	46 ^f	28,000 ^f	3,800 ^f	7,600 ^f
EC>21-35	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f
EC>35-44	1%	1,100 ^f	1,900 ^f	370 ^f	28,000 ^f	3,800 ^f	7,800 ^f
Aromatic							
EC5-7(benzene as non-threshold)	2.5%	140	690	27	46,000 (2,260) ^{sol}	56,000	84,000 (2,260) ^{sol}
EC>7-8(toluene)	2.5%	290	1,800	51	110,000 (1,920) ^{sol}	56,000	95,000 (1,920) ^{sol}
EC>8-10	2.5%	83	110	21	8,100 (1,500) ^{vap}	5,000	8,500 (1,500) ^{vap}
EC>10-12	2.5%	180	590	31	28,000 (899) ^{sol}	5,000	9,700 (899) ^{sol}
EC>12-16	2.5%	330	2,300 (419) ^{sol}	57	37,000	5,100	10,000
EC>16-21	2.5%	540 ^f	1,900 ^f	110 ^f	28,000 ^f	3,800 ^f	7,700 ^f
EC>21-35	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f
EC>35-44	2.5%	1,500 ^f	1,900 ^f	820 ^f	28,000 ^f	3,800 ^f	7,800 ^f
Aromatic							
EC5-7(benzene as non-threshold)	6%	300	1,400	57	86,000 (4,710) ^{sol}	56,000	92,000 (4,710) ^{sol}
EC>7-8(toluene)	6%	660	3,900	120	180,000 (4,360) ^{vap}	56,000	100,000 (4,360) ^{vap}
EC>8-10	6%	190	270	51	17,000 (3,580) ^{vap}	5,000	9,300 (3,580) ^{vap}
EC>10-12	6%	380	1,200	74	34,000 (2,150) ^{sol}	5,000	10,000
EC>12-16	6%	660	2,500	130	38,000	5,100	10,000
EC>16-21	6%	930 ^f	1,900 ^f	260 ^f	28,000 ^f	3,800 ^f	7,800 ^f
EC>21-35	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f
EC>35-44	6%	1,700 ^f	1,900 ^f	1,600 ^f	28,000 ^f	3,800 ^f	7,900 ^f
Aliphatic +Aromatic >EC44	1%	1,600 ^f	1,900 ^f	1,200 ^f	28,000 ^f	3,800 ^f	7,800 ^f
	2.5%	1,800 ^f	1,900 ^f	2,100 ^f	28,000 ^f	3,800 ^f	7,800 ^f
	6%	1,900 ^f	1,900 ^f	3,000 ^f	28,000 ^f	3,800 ^f	7,900 ^f

NOTES

Sol / vap = solubility / vapour limit (potentially use if free product identified, although highly conservative).

f = oral, dermal and inhalation exposures compared to oral HCV.

All GAC are based on sandy loam soils with a pH 7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Chloalkanes and Alkenes & Explosives	1,2 Dichloroethane (DCA)	1%	7.1E-03	9.2E-03	4.6E-03	0.67	29	21
		2.5%	1.1E-02	1.3E-02	8.3E-03	0.97	29	24
		6%	1.9E-02	2.3E-02	1.6E-02	1.7	29	28
	1,1,1 Trichloroethane (TCA)	1%	8.8	9.0	48	660	140,000	57,000 (1,425) ^{vap}
		2.5%	18	18	110	1,300	140,000	76,000 (2,915) ^{vap}
		6%	39	40	240	3,000	140,000	100,000 (6,392) ^{vap}
	1,1,2,2-Tetrachloroethanes (PCA)	1%	1.6	3.9	0.41	270	1,400	1,800
		2.5%	3.4	8.0	0.89	550	1,400	2,100
		6%	7.5	17	2.0	1,100	1,400	2,300
	1,1,1,2-Tetrachloroethanes (PCA)	1%	1.2	1.5	0.79	110	1,400	1,500
		2.5%	2.8	3.5	1.9	250	1,400	1,800
		6%	6.4	8.2	4.4	560	1,400	2,100
	Tetrachloroethene (PCE)	1%	0.18	0.18	0.65	19	1,400	810 (424) ^{sol}
		2.5%	0.39	0.40	1.5	42	1,400	1,100 (951) ^{sol}
		6%	0.90	0.92	3.6	95	1,400	1,500
	Tetrachloromethane (carbon tetrachloride)	1%	2.6E-02	2.6E-02	0.45	2.9	890	190
		2.5%	5.6E-02	5.6E-02	1.0	6.3	920	270
		6%	0.13	0.13	2.4	14	950	400
	Trichloroethene (TCE)	1%	1.6E-02	1.7E-02	4.1E-02	1.2	120	70
		2.5%	3.4E-02	3.6E-02	9.1E-02	2.6	120	91
		6%	7.5E-02	8.0E-02	0.21	5.7	120	120
	Trichloromethane (chloroform)	1%	0.91	1.2	0.42	99	2,500	2,600
		2.5%	1.7	2.1	0.83	170	2,500	2,800
		6%	3.4	4.2	1.7	350	2,500	3,100
	Chloroethene (vinyl chloride)	1%	6.4E-04	7.7E-04	5.5E-04	5.9E-02	3.5	4.8
		2.5%	8.7E-04	1.0E-03	1.0E-03	7.7E-02	3.5	5.0
		6%	1.4E-03	1.5E-03	1.8E-03	0.12	3.5	5.4
	2,4,6-Trinitrotoluene (TNT)	1%	1.6	65	0.24	1,000	130	260
		2.5%	3.7	66	0.58	1,000	130	270
		6%	8.1	66	1.4	1,000	130	270
	RDX	1%	120	13,000	17	210,000	26,000	49,000 (18.7) ^{sol}
		2.5%	250	13,000	38	210,000	26,000	51,000
		6%	540	13,000	85	210,000	27,000	53,000
	HMX	1%	5.7	6,700	0.86	110,000	13,000	23,000 (0.35) ^{vap}
		2.5%	13	6,700	1.9	110,000	13,000	23,000 (0.39) ^{vap}
		6%	26	6,700	3.9	110,000	13,000	24,000 (0.48) ^{vap}
Pesticides	Aldrin	1%	5.7	7.3	3.2	170	18	30
		2.5%	6.6	7.4	6.1	170	18	31
		6%	7.1	7.5	9.8	170	18	31
	Dieldrin	1%	0.97	7.0	0.17	170	18	30
		2.5%	2.0	7.3	0.41	170	18	30
		6%	3.5	7.4	0.96	170	18	31
	Atrazine	1%	3.3	610	0.5	9,300	1,200	2,300
		2.5%	7.8	620	1.2	9,400	1,200	2,400
		6%	17.4	620	2.7	9,400	1,200	2,400
	Dichlorvos	1%	3.2E-02	6.4	4.9E-03	140	16	26
		2.5%	6.6E-02	6.5	1.0E-02	140	16	26
		6%	0.14	6.6	2.2E-02	140	16	27
	Endosulfanns (2 isomers)	1%	7.4	160 (3.0E-03) ^{vap}	1.2	5,600 (3.0E-03) ^{vap}	1,200	2,300
		2.5%	18	280 (7.0E-03) ^{vap}	2.9	7,400 (7.0E-03) ^{vap}	1,200	2,400
		6%	41	410 (1.6E-02) ^{vap}	6.8	8,400 (1.6E-02) ^{vap}	1,200	2,500
	Hexachlorocyclohexane (3 isomers), inc Lindane	1%	8.5E-02	3.7	1.3E-02	65	8.1	15
		2.5%	0.2	3.8	3.2E-02	65	8.1	15
		6%	0.46	3.8	7.7E-02	65	8.1	16

NOTES

Sol / vap = solubility / vapour limit (potentially use if free product identified, although highly conservative).

All GAC are based on
sandy loam soils with a pH
7.

All GAC are based on sandy loam soils with a pH 7.			LQM Generic Assessment Criteria (mg/kg) Dry weight soil					
Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS _{resi}	POS _{park}
Chlorobenzenes	Chlorobenzene	1%	0.46	0.46	5.9	56	11,000	1,300 (675) ^{sol}
		2.5%	1.0	1.0	14	130	13,000	2,000 (1,520) ^{sol}
		6%	2.4	2.4	32	290	14,000	2,900
	Dichlorobenzenes (3 isomers)	1%	23	24	94	2,000 (571) ^{sol}	90,000	24,000 (571) ^{sol}
		2.5%	55	57	230	4,800 (1,370) ^{sol}	95,000	36,000 (1,370) ^{sol}
		6%	130	130	540	11,000 (3,240) ^{sol}	98,000	51,000 (3,270) ^{sol}
	Trichlorobenzenes (3 isomers)	1%	2.6	2.6	55	220	15,000	1,700 (318) ^{vap}
		2.5%	6.4	6.4	140	530	17,000	2,600 (786) ^{vap}
		6%	15	15	320	1,300	19,000	4,000 (1,880) ^{vap}
	Tetrachlorobenzenes (3 isomers)	1%	0.66	0.75	0.38	49 (39.4) ^{vap}	78	110 (39) ^{vap}
		2.5%	1.6	1.9	0.90	120 (98.1) ^{vap}	79	120
		6%	3.7	4.3	2.2	240 (235) ^{vap}	79	130
	Pentachlorobenzene	1%	5.8	19	1.2	640 (43.0) ^{sol}	100	190
		2.5%	12	30	3.1	770 (107) ^{sol}	100	190
		6%	22	38	7.0	830	100	190
	Hexachlorobenzene	1%	1.8 (0.20) ^{vap}	4.1 (0.20) ^{vap}	0.47	110 (0.20) ^{vap}	16	30
		2.5%	3.3 (0.50) ^{vap}	5.7 (0.50) ^{vap}	1.1	120	16	30
		6%	4.9	6.7 (1.2) ^{vap}	2.5	120	16	30
Chlorophenol	Chlorophenols (4 congeners)	1%	0.87 ^g	94	0.13 ^g	3,500	620	1,100
		2.5%	2.0	150	0.30	4,000	620	1,100
		6%	4.5	210	0.70	4,300	620	1,100
	Pentachlorophenol	1%	0.22	27 (16.4) ^{vap}	3.0E-02	400	60	110
		2.5%	0.52	29	8.0E-02	400	60	120
		6%	1.2	31	0.19	400	60	120
Others	Carbon Disulphide	1%	0.14	0.14	4.8	11	11,000	1,300
		2.5%	0.29	0.29	10	22	11,000	1,900
		6%	0.62	0.62	23	47	11,000	2,700
	Hexachlorobutadiene	1%	0.29	0.32	0.25	31	25	48
		2.5%	0.7	0.78	0.61	66	25	50
		6%	1.6	1.8	1.4	120	25	51
	Phenol	1%	280	750	66	760 ^{dir} (31,000)	760 ^{dir} (11,000)	760 ^{dir} (8,600)
		2.5%	550	1,300	140	1,500 ^{dir} (35,000)	1,500 ^{dir} (11,000)	1,500 ^{dir} (9,700)
		6%	1,100	2,300	280	3,200 ^{dir} (37,000)	3,200 ^{dir} (11,000)	3,200 ^{dir} (11,000)

NOTES

^{sol} / ^{vap} = solubility / vapour limit (potentially use if free product identified, although highly conservative).

^{dir} = S4uls based on threshold protective of direct skin contact with phenol (brackets long term exposure for illustration purposes).

^g = derived based on 2,3,4,6-tetrachlorophenol.

Appendix E

HazWasteOnline Output Sheets

Waste Classification Report

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

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



Q2L82-CWP10-PWPST

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

Job name

LKC 21 1558

Description/Comments

Project

LKC 21 1558

Site

Co-op Academy, North Manchester

Classified by

Name: **Peter Dunn**
Company: **LK Group**
Date: **11 Nov 2021 11:48 GMT**
Telephone: **0161 763 7200**

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

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

18 Sep 2019

Next 3 year Refresher due by Sep 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS102-25/10/2021-0.0	0.0-0.2	Non Hazardous		2
2	WS104-25/10/2021-0.2	0.2-0.5	Hazardous	HP 3(i), HP 7, HP 11	5

Related documents

#	Name	Description
1	HWOL_21-37409-20211103 122401.hwol	.hwol file used to create the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Peter Dunn

Created date: 11 Nov 2021 11:48 GMT

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Classification of sample: WS102-25/10/2021-0.0

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

Sample details

Sample name:	LoW Code:
WS102-25/10/2021-0.0	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.0-0.2 m	
Moisture content:	
16%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 16% Wet 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 trioxide }				6.2	mg/kg	1.32	6.876	mg/kg	0.000688 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				0.57	mg/kg	3.22	1.542	mg/kg	0.000154 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.15	mg/kg	1.142	0.144	mg/kg	0.0000144 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				10	mg/kg	1.462	12.277	mg/kg	0.00123 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<0.5	mg/kg	2.27	<1.135	mg/kg	<0.000113 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				49	mg/kg	1.126	46.342	mg/kg	0.00463 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	110	mg/kg	1.56	144.127	mg/kg	0.00924 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				0.29	mg/kg	1.353	0.33	mg/kg	0.000033 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				12	mg/kg	2.976	30.001	mg/kg	0.003 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				0.25	mg/kg	2.554	0.536	mg/kg	0.0000536 %	✓	
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				120	mg/kg	2.774	279.634	mg/kg	0.028 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	TPH (C6 to C40) petroleum group				360	mg/kg		302.4	mg/kg	0.0302 %	✓	
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
16	ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
17	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
18	 cyanides {  salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
19	 pH		PH		8.5 pH		8.5 pH	8.5 pH			
20	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
21	 acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
22	 acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
23	 fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
24	 phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
25	 anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
26	 fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
27	 pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
29	chrysene 601-048-00-0	205-923-4	218-01-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
33	 indeno[123-cd]pyrene 205-893-2		193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
35	 benzo[ghi]perylene 205-883-8		191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
36	 vanadium {  divanadium pentaoxide;  vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		9.2 mg/kg	1.785	13.796 mg/kg	0.00138 %	✓		
37	 monohydric phenols		P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.079 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0302%)

Classification of sample: WS104-25/10/2021-0.2

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:
WS104-25/10/2021-0.2	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2-0.5 m	Entry:
Moisture content:	17 05 03 * (Soil and stones containing hazardous substances)
13%	
(wet weight correction)	

Hazard properties

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

Force this Hazardous property to hazardous because Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.139%)

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.139%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.139%)

Determinands

Moisture content: 13% Wet 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 trioxide }				5.8 mg/kg	1.32	6.662 mg/kg	0.000666 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<LOD
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				20 mg/kg	1.462	25.431 mg/kg	0.00254 %	✓	
		215-160-9	1308-38-9							

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }			1	<0.5	mg/kg	2.27	<1.135	mg/kg	<0.000113 %		<LOD
	024-017-00-8											
6	copper { dicopper oxide; copper (I) oxide }				35	mg/kg	1.126	34.283	mg/kg	0.00343 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	13	mg/kg	1.56	17.642	mg/kg	0.00113 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				8.7	mg/kg	2.976	22.527	mg/kg	0.00225 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { nickel selenate }				<0.2	mg/kg	2.554	<0.511	mg/kg	<0.0000511 %		<LOD
	028-031-00-5	239-125-2	15060-62-5									
11	zinc { zinc chromate }				26	mg/kg	2.774	62.751	mg/kg	0.00628 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	TPH (C6 to C40) petroleum group				1600	mg/kg		1392	mg/kg	0.139 %	✓	
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
14	benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
15	toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
16	ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4									
17	xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.884	<0.942	mg/kg	<0.0000942 %		<LOD
	006-007-00-5											
19	pH				8.3	pH		8.3	pH	8.3 pH		
			PH									
20	naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
21	acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8									
22	acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9									
23	fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		201-695-5	86-73-7									
24	phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		201-581-5	85-01-8									
25	anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		204-371-1	120-12-7									
26	fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		205-912-4	206-44-0									
27	pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		204-927-3	129-00-0									
28	benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	601-033-00-9	200-280-6	56-55-3									
29	chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	601-048-00-0	205-923-4	218-01-9									
30	benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
	601-034-00-4	205-911-9	205-99-2									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value		MC Applied	Conc. Not Used	
		CLP index number	EC Number	CAS Number											
31		benzo[k]fluoranthene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %			<LOD	
	601-036-00-5	205-916-6	207-08-9												
32		benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %			<LOD	
	601-032-00-3	200-028-5	50-32-8												
33	●	indeno[123-cd]pyrene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %			<LOD	
			205-893-2	193-39-5											
34		dibenz[a,h]anthracene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %			<LOD	
	601-041-00-2	200-181-8	53-70-3												
35	●	benzo[ghi]perylene				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %			<LOD	
			205-883-8	191-24-2											
36	🧪	vanadium { divanadium pentaoxide; vanadium pentoxide }				13 mg/kg		1.785	20.19 mg/kg		0.00202 %		✓		
		023-001-00-8	215-239-8	1314-62-1											
37	●	monohydric phenols				<0.1 mg/kg			<0.1 mg/kg		<0.00001 %			<LOD	
				P1186											
Total:												0.158 %			

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	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

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

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

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

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

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

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

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

Data source date: 21 Aug 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

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

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

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

Data source date: 23 Jul 2015

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

• **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Acute Tox. 3 H301 , Acute Tox. 3 H311 , Acute Tox. 3 H331 , Skin Corr. 1B H314 , Skin Corr. 1B H314 >= 3 % , Skin Irrit. 2 H315 1 E conc. < 3 % , Eye Irrit. 2 H319 1 E conc. < 3 % , Muta. 2 H341 , STOT RE 2 H373 , Aquatic Chronic 2 H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

boron {diboron trioxide; boric oxide}

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

cadmium {cadmium oxide}

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

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

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

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

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

copper {dicopper oxide; copper (I) oxide}

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

lead {lead chromate}

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

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

selenium {nickel selenate}

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

zinc {zinc chromate}

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

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

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

vanadium {divanadium pentaoxide; vanadium pentoxide}

worst case/most likely scenario

Appendix C: Version

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

HazWasteOnline Classification Engine Version: 2021.293.4891.9295 (20 Oct 2021)

HazWasteOnline Database: 2021.293.4891.9295 (20 Oct 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

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