

OSBORNE'S YARD MANCHESTER

PHASE 2 GEO-ENVIRONMENTAL INVESTIGATION, RISK ASSESSMENT AND REMEDIATION STRATEGY

Job Number: LKC 20 1913

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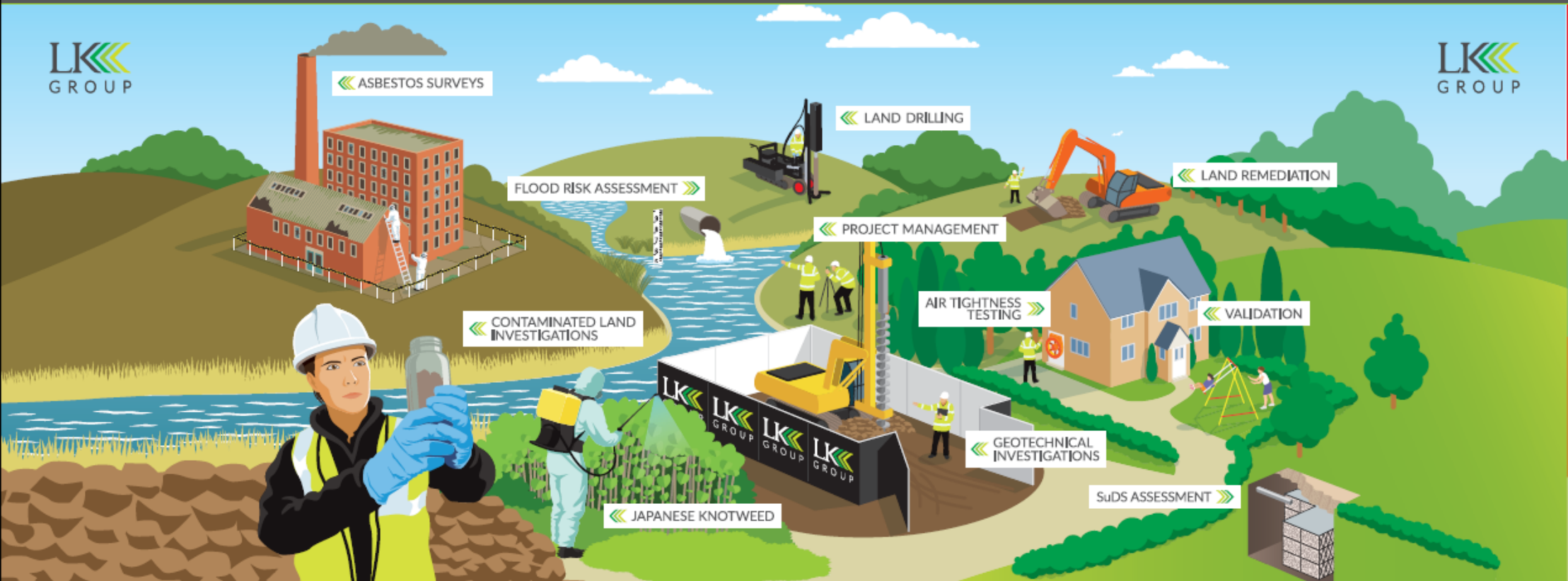
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EXECUTIVE SUMMARY

Site Details

Site Location:	West of Oldham Road, south of Helga Street, Miles Platting, Manchester. Centred at approximate National Grid Reference 385594E 399565N.
Site Area:	2,500m ² .
Current Land Use:	Vacant, overgrown land to the northeast and southwest. Former hand car wash/petrol station with concrete and tarmacadam hardstanding in the centre of the site with a single storey building.
Proposed Development:	5no. storey apartment building including car parking and limited soft landscaping.
Purpose of Report:	Contamination and Geotechnical Assessment.

Preliminary Risk Assessment

PRA Details:	Undertaken by Renaissance in August 2020. Ref: 2006-06.
History:	Church school/Mission Hall in S from 1850-2009, Public House and terraced housing across the site from 1850-2009, Chimney in centre on 1891 mapping only, garage forecourt in centre from 1989-present.
Geology / Hydrogeology:	Made ground adjacent NW, Glacial Till (Secondary undifferentiated Aquifer) over Pennine Upper Coal Measures (Secondary A Aquifer).
Mining:	Northern part of the site within DHRA. Likely influence of working from 15 seams of coal 77-932m depth, last worked 1967. Coal believed to be at or close to the surface. Closest known coal outcrop is the Bradford Three Quarters Seam outcropping 22.1m N of the site and dipping below the site. No hafts recorded within 20m of the site.
Relevant Environmental Setting:	River Irk 705m NW. No surface water or groundwater abstractions within 500m. Not within Source Protection Zone.
Preliminary Conceptual Model: PL=Pollutant Linkage	PL1 Direct Contact (Human Health): Moderate Risk (asbestos, metals, PAHs, petroleum hydrocarbons, solvents, surfactants). PL2 Inhalation of Vapours: Moderate Risk (volatile contaminants). PL3 Gas: Moderate Risk (hazardous and ground gas). PL4 Controlled waters: Moderate Risk (mobile contaminants). PL5 Sulphate Attack: Moderate/Low Risk (sulphate). PL6 Water Pipelines: Moderate Risk (organic contaminants). PL7 Phytotoxic: Very Low Risk (metals).
Recommendations:	Site Investigation was recommended to further assess all the pollutant linkages.

Ground Investigation Work Undertaken

Date of Investigation:	27 th April 2021, 10 th -14 th May 2021 and 2 nd February 2022.
Intrusive Investigation Work Undertaken:	3no. cable percussive boreholes (CP101-CP103). 3no. rotary boreholes (RB101-RB103). 10no. mechanically excavated trial pits (TP101-TP107, TP201-TP203). 3no. foundation pits (FP101-FP103).
Monitoring Wells:	Installed in CP101, CP102 and CP103.
Soil Sampling:	3no. samples tested for metals, speciated PAHs, pH, sulphate, asbestos and SOM. 3no. samples tested for metals, speciated PAHs, cyanide, pH, sulphate, asbestos, phenol, TPHCWG, BTEX, MTBE and SOM. 2no. samples tested for metals, speciated PAHs, cyanide, pH, sulphate, asbestos, phenol, TPHCWG, BTEX, MTBE, VOCs, SVOCs, surfactants and SOM. 1no. samples tested for TPHCWG, BTEX, MTBE and SOM.

Groundwater Sampling:	2no samples tested for metals, speciated PAHs, cyanide, pH, sulphate, hardness, phenol, TPHCWG, BTEX and MTBE.
Insitu and Laboratory Geotechnical Testing:	SPTs, shear vanes, single stage triaxials.

Contamination Risk Assessment

The table below shows a summary of the risk assessments undertaken for each pollutant linkage, the revised conceptual model and recommendation for either remediation and / or further investigation.

Pollutant Linkage		Risk	Recommendations
1	Contaminants posing a risk to site users via dermal contact, ingestion and inhalation (of soil, dust and fibres).	Moderate (metals, PAHS)	-Elevated arsenic and lead identified across the site and localised PAHs. Recommendations: Remediation of soft landscaped areas.
		Moderate (ACM, TPH) (Localised)	-Elevated TPH and asbestos identified within the former petrol station/hand car wash forecourt. Recommendations: Delineation and removal of TPH contamination and remediation of soft landscaped areas.
		Low (surfactants)	-Only low levels identified, remediation for TPH will sufficiently reduce the risk. Recommendations: No further remediation required.
2	Volatile contaminants posing a risk to site users via the inhalation of vapours.	Moderate (Localised)	-Volatile contamination identified in the former forecourt area. Recommendations: Localised remediation required.
3	Gas posing a risk to buildings and site users via the migration of gas into building causing explosion and asphyxiation.	Moderate / Low	-A significant source of gas has not been identified. Recommendations: No remediation required.
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	Moderate (Localised)	-Elevated TPH identified in the soil and free product (surface sheen) noted within trial pits. Significant thickness of clay deposits and groundwater tested did not identify elevations. However precautionary source removal recommended. Recommendations: Localised remediation required.
5	Sulphate posing a risk to building via direct contact (sulphate attack).	Moderate / Low	-Elevated sulphate identified in made ground. Recommendations: Sulphate resistant concrete (DS-2 AC-2).
6	Organic contaminants posing a risk to water pipes.	Moderate	-Organic contamination identified at potable pipe depth of 0.75-1.35mbgl. Recommendations: UU risk assessment to be completed. The site will likely require barrier piping.
7	Phytotoxic metals posing a risk to flora via root uptake.	Low	-Elevated copper and zinc in one location. Recommendations: Remediation as per PL1.

Based on individual locations hazardous waste has been identified. The soil onsite should be classified as HAZARDOUS WASTE in the area of TP104 and TP202 and LoW code "17-05-03 - soil and stones containing hazardous substances".

The soils across the remainder of the site are classified as NON-HAZARDOUS WASTE and LoW code "17-05-04 - soil and stones other than those mentioned in 17 05 03" is suitable.

Recommendations and Remedial Strategy

The table below shows the remediation and validation requirements for the site. This information should be documented in a Site Completion Report for submission to the Local Authority.

Phase	PL	Remediation Requirements	Validation Requirements
Pre-Construction	All	<u>Earthworks Inspections / Unexpected Contamination</u> 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 (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required. Should visible pieces of asbestos be identified during groundworks, precautions should be taken to ensure the safety of the construction workers and nearby land users. It would be advisable to introduce an asbestos management strategy in line with CIRIA C733 ¹ .	Log of work undertaken including photographs. Details of any sampling undertaken and validation of any potential additional remedial work.
	2	<u>Hydrocarbon Removal</u> Impacted soils (based on visual / olfactory evidence and the use of a PID (nominal 50ppm)) should be excavated and removed. Impacted soils should be placed on an impermeable surface to await removal from site (this may be subject to chemical testing to confirm suitable waste facility). The work should be done under the supervision and instruction of an environmental consultant. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.	Details of work undertaken including photographs. Confirmatory samples of the remaining in-situ soils. Validation of the sides and base to demonstrate grossly impacted material has been removed. Consignment notes confirming the removal of impacted soil
	4	<u>Controlled Waters</u> In combination with the hydrocarbon contamination excavation the pumping of shallow (likely perched water) ground water to either external tankers for removal from site or IBCs for onsite treatment and discharge to sewer under a discharge consent. Pumping should continue until the ground water runs clear and no sheen is noted.	Confirmatory testing of groundwater samples. Disposal tickets for water removed from site.

¹ CIRIA (2014). "Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks". C733.

Phase	PL	Remediation Requirements	Validation Requirements
Build-Phase Construction	1 and 7	If all or some of the made ground remains in place in soft landscaping areas, an environmental cover system will be required. The environmental cover system should be as follows: Shared Landscaping: 450mm thick environmental cover system comprising: Either 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 350mm comprising clean inert fill and sufficient topsoil for a growing medium. Or geotextile membrane and at least 450mm comprising clean inert fill and sufficient topsoil for a growing medium. The subsoil layer can be replaced by additional topsoil. A diagram of a typical environmental cover system is shown in Appendix H.	Measuring depth of environmental cover system using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer will also be collected. Chemical validation of imported soils: See Table 9-2.
	1 and 7	<u>Vapour Membrane (If required)</u> Elevated petroleum hydrocarbons are present on site. This material is likely to be removed as part of the 'hydrocarbon hotspot' removal works. If it is not possible to remove the entirety of the impacted ground then precautionary vapour protection measures to include a vapour resistant membrane should be installed.	Plan including foundation design. Photographic evidence showing installation of membrane and presence of sub-floor void.
	4	<u>Controlled Waters</u> In combination with the hydrocarbon contamination excavation the pumping of shallow ground water to external tankers and removal from site for disposal. Pumping should continue until the ground water runs clear and no sheen is noted.	Confirmatory testing of groundwater samples. Disposal tickets for water removed from site.
	5	<u>Sulphate Resistant Concrete (made ground only)</u> Sulphate Resistant Concrete in line with DS-2 AC-2 recommended.	N/A
	6	<u>Potable Water Pipes</u> It is recommended that a Water Pipeline Assessment is undertaken once the location and depth of potable water pipes are known. It is likely that barrier pipe will be required.	Delivery Notes of Pipe Material. Photographs of the Installed Pipe.
	3	No remediation anticipated with respect to PL3 (gas).	N/A.

As asbestos has been identified within the soils on site, it is also recommended that an Asbestos Management Plan is adopted during construction work.

The remediation recommended in the table above should be validated to ensure it has been carried out appropriately. This should be documented in a Completion/Validation Report and submitted to the Local Authority for completion.

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APPENDICES

Appendix A:	Risk Matrix
Appendix B:	Profile Logs
Appendix C:	Certificates of Analysis - Soil
Appendix D:	Certificates of Analysis - Geotechnical
Appendix E:	Certificates of Analysis - Water
Appendix F:	Generic Assessment Criteria Values
Appendix G:	HazWaste Online Classification Report
Appendix H:	JIWG Output Sheets
Appendix I:	Typical Environmental Cover System

1 Introduction

1.1 Background

LK Consult Ltd (LKC) has been commissioned by MPH Ancoats Ltd to carry out a Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy for Osborne's Yard, Manchester. The investigation was undertaken in support of a planning application to develop the site for residential end use.

The following work has previously been undertaken:

- Geo-investigation and Risk Assessment Report, undertaken by LKC (Ref: CL1502-02[FINAL], dated 25th September 2009)
- Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC 14 1403, dated 20th August 2014).

This investigation has been undertaken to confirm the ground conditions below the site and to allow a contamination and geotechnical assessment to be undertaken.

The investigation will aim to confirm the risks of the potential pollutant linkages identified in the PRA and recommend further assessment / remediation, as required.

1.2 Site Details

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	West of Oldham Road, south of Helga Street, Miles Platting, Manchester. Centred at approximate National Grid Reference 385594E 399565N.
Area	2,500m ² .
Topography	60 metres above ordnance datum (AOD). Site slopes upwards to northeast.
Land Use	<u>Site</u> Vacant, overgrown land to the northeast and southwest. A former hand car wash/petrol station with concrete and tarmacadam hardstanding in the centre of the site with a single storey building. <u>Surrounding Area</u> Southwest: Garage and commercial building. Northwest: Retaining wall with compound beyond. Northeast: Helga Street and vacant overgrown land. Southeast: Oldham Road with St Cuthbert's church beyond.
Proposed Development	5no. storey apartment building including car parking and limited soft landscaping.

Table 1-1: Summary of site details.

2 Previous Work

2.1 Summary of Existing Information

A PRA report (Ref: 2006-06, dated August 2020) has previously been undertaken by Renaissance and is summarised in Section 2.2-2.4. Supplementary information comprising a Petroleum Officer Search and a Zetica Detailed UXO desk study has been obtained by LKC and are summarised in Sections 2.5 and 2.6 respectively.

The conceptual model (Section 2.7) has been updated to be in line with LKC current risk assessment methodology and to take into consideration additional information obtained by LKC.

2.2 Site History

The site history is summarised in Table 2-1.

Site Features	Location	Map Dates Present	Comments
Church school / mission hall	S	1850-2009	- Club from 1922 to 1931. - Depot from 1965-1970.
Public house and terraced housing.	Across site	1850-2009	- Terraced houses replaced by cinema.
Chimney	Centre	1891 only	
Garage forecourt	Centre	1989 - present	- Hand car wash currently utilises this area.
Surrounding Area Features	Distance/ Location	Map Dates Present	Comments
Depot / garage	Adj S	1964-present	
Smithy	5m S	1891 only	
Railway line and siding	10m NW	1850-present	
Timber yard	35m E	1850 only	
Machine works	35m E	1908-1964	

Table 2-1: Summary of significant historical features.

2.3 Environmental Setting

The environmental setting is summarised in Table 2-2.

Categories			Details
Geology	Artificial		- Made Ground adjacent NW.
	Superficial		- Till.
	Bedrock		- Pennine Upper Coal Measures.
Hydro-geology	Aquifer Designation	Superficial	- Secondary Aquifer – undifferentiated.
		Bedrock	- Secondary A.
	Source Protection Zone (SPZ)		- Site is not within an SPZ.
	Groundwater Abstractions		- None within 500m.
Hydrology	Nearest Surface Water		- River Irk 705m NW.
	Surface Water Abstractions		- None within 500m.

Table 2-2: Summary of the environmental setting.

Categories		Details
Minerals / Mining	Coal Mining Development High Risk Area (DHRA)	- Northern part of the site is within DHRA associated with 'Probable Shallow Coal Mine Workings'.
	Coal Report	- Likely zone of influence from workings in 15 seams of coal at 77-932m depth, last worked 1967. - Coal believed to be at or close to the surface, which may have been worked in the past. Closest known coal outcrop is the Bradford Three Quarters Seam outcropping 22.1m N of the site and dipping below the site. - No shafts present within 20m of the site.
Ground Stability ¹ (on-site)	Collapsible Ground	- Very low hazard.
	Compressible Ground	- No hazard.
	Landslide	- Very low hazard.
	Running Sand	- Very low hazard.
	Shrinking / Swelling Clay	- Very low hazard.
	Ground Dissolution	- No hazard.
Landfill Sites	Known/Registered	- None within 250m.
	Potential	- Infilling former basements on site.
Radon		- Probability of <1% of homes above Action Level. No further action required.
UXO		- Moderate Risk.

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

2.4 Site Reconnaissance

Site was visited by staff from Renaissance on 15th July 2020. The central part of the site was in use as a hand car wash in an area resembling a garage forecourt. Manhole covers in this area indicate the presence of an interceptor. A single storey brick building (used as an office) and a caravan were also noted in this area. IBCs storing chemicals used in the car wash were noted on a concrete area. A telecoms mast was also noted in the centre-west of the site.

The remainder of the site was largely overgrown with vegetation and contained some hardstanding and concrete blocks. A linear soil bund approximately 1m high was noted in the northeast of the site.

Fly tipping and evidence of bonfires were noted on site. In addition, a 5m high brick retaining wall is present on the western site boundary.

2.5 Petroleum Officer Search

A petroleum officer search was obtained by LKC, which confirmed that the site was first licensed in April 1990 to store 108,000 Litres of Petroleum Spirit and the licence expired in April 2003. 5no. tanks were present on site in 1990, 4no, containing petroleum and 1no. containing diesel.

There is a record of a leak on file in May 1990. Tank 1 had apparently lost 161 Gallons (728 litres) of Petroleum which apparently flowed into the drain and through to the sewers. The drains on the site were jetted down until there was no trace of Petroleum left.

There is also a record on file of a 500 Gallon Tank containing Petroleum, which was kept adjacent to the petrol station site. It is understood that this tank was water filled and plugged in May 1990.

It is understood that on closing the petrol station site in 2003, the tanks were filled with water. The petrol pumps were removed from site in 2008 but there is no record that the tanks have been removed.

2.6 Zetica Detailed UXO Desk Study

The detailed assessment undertaken by Zetica has not identified any bombing or military activity during World War I. In addition, no records have been found that the site was bombed during World War II. The nearest bomb strike recorded was 0.1km from site. No records of military activity on site post World War II have been found.

Zetica have classified the site as having a low risk from UXO.

2.7 Contamination Sources / Pathways and Receptors

Potential contamination sources are detailed in Table 2-3.

Source	Contaminants
Onsite former buildings	- Asbestos Containing Material (ACM).
Onsite Made Ground (general made ground, infill former basements)	- Ash and clinker (e.g. from hearths and boilers, often historically used for site raising / levelling): Heavy metals, sulphates and PAHs. - Other unknown inorganic / organic contaminants (dependant on fill material source). - If significant depth of organic / putrescible material: Hazardous gas (principally carbon dioxide and methane).
Onsite filling station	- Petroleum hydrocarbons, oils.
Hand car wash	- Surfactants, oils.
Chimney	- Heavy metals and PAHs.
Surrounding Industries (depot, garage, smithy, railway, timber yard, machine works)	- Metals, PAHs, petroleum hydrocarbons, solvents, asbestos. - Not expected to be as significant as sources identified on site.
Underlying Pennine Upper Coal Measures	- Ground Gas (principally carbon dioxide and methane).

Table 2-3: Potential contamination sources.

Potential receptors are detailed in Table 2-4.

Receptors	
Human Health	- Future site users (including residents, visitors and site workers). - Offsite land users.
Controlled Waters	- Secondary A Aquifer. - Surface water is not considered to be a significant receptor given the distance from the site.
Buildings and structures.	
Potable water pipes.	
Flora within future gardens/landscaping.	

Table 2-4: Potential receptors.

Potential pathways are detailed in Table 2-5.

Pathways		
Soil	Human Health ² (residential land use: apartments with shared landscaping).	- Ingestion of soil. - Ingestion of soil-derived indoor dust. - Dermal contact with soil. - Dermal contact with soil-derived indoor dust. - Inhalation of soil-derived outdoor dust. - Inhalation of soil-derived indoor dust. - Inhalation of vapours outside. - Inhalation of vapours inside.
		- Omitted as no private gardens: ingestion of contaminated vegetables and ingestion of soil attached to vegetables.
		- Windblown dust / fibres to adjacent receptors.
		- Direct contact with receptors (building foundations, services).
Water		- Root uptake.
		- Surface run-off over impermeable surface.
		- Infiltration into the ground, through potentially contaminated material (contamination possibly going into solution).
		- Migration through potentially permeable strata and preferential pathways. - Superficial (Till) likely to be low permeability. - Bedrock (mudstone, siltstone, sandstone) likely to variable permeable. - Preferential pathways: services, possible shallow worked coal seams.
Gas		- Migration through potentially permeable strata and preferential pathways. - Superficial (Till) likely to be low permeability. - Bedrock (mudstone, siltstone, sandstone) likely to variable permeable. - Preferential pathways: services, possible shallow worked coal seams.
		- Migration into buildings (e.g. via services) and accumulation of gases in confined spaces (potentially causing explosion if methane is present).

Table 2-5: Potential pathways.

2.8 LKC Preliminary Contamination Conceptual Model

The preliminary contamination conceptual model in the Renaissance report has been updated to be in line with LKC current risk assessment methodology (detailed below). The model is based on the contamination sources, pathways and receptors identified in the original report. LKC also consider the following should be considered:

The preliminary contamination conceptual model using contaminant-pathway-receptor linkages based on guidance in LCRM³ has been summarised in Table 2-6.

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the site and determine what site investigation work is required.

The preliminary contamination conceptual model has identified seven generic potential pollutant linkages. Each linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552⁴.

² EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.

³ Land Contamination Risk Management (LCRM) <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

⁴ CIRIA (2001). "Contaminated land risk assessment: A guide to good practice". C552.

In order to assess the potential risk for each pollutant linkage, an assessment of the magnitude of the potential consequence (severity) of the risk occurring and the magnitude of the probability (likelihood) of the risk occurring has been considered and classified. This is based on the guidance provided in CIRIA C552 and further details including a risk matrix is provided in Appendix A.

Where LKC identified a low to very low risk, limited intrusive investigation work, a watching brief (during construction work) or no investigation work will be recommended. This will be dependent on the nature of the site and the proposed development.

Where the risk falls into the moderate/low risk, LKC will undertake an assessment to establish what category the pollutant linkage will fall into (i.e. moderate or low risk will be chosen).

Where LKC identifies a moderate or higher risk, intrusive work or precautionary remedial measures will be recommended.

The conceptual model is based on the future use of the site (post development), in line with proposed development scheme.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers during development work. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors associated with the future use of the site. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance⁵) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

2.9 Recommendations

Based upon the Preliminary Contamination Conceptual Model a site investigation was recommended to assess the potential pollutant linkages further.

⁵ HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

Pollutant Linkage	Pathway	Receptor	Contaminant (source)	Probability	Consequence	Risk	Assessment and Recommendations
PL1	- Dermal contact. - Inhalation of soil, fibres and dust. - Ingestion of soils, dust. - Windblown dust.	- Future site users. - Offsite receptors.	- ACM (former buildings, potentially in made ground). - Heavy metals, PAHs (made ground). - Petroleum hydrocarbons, (filling station). - Surfactants (hand car wash).	Likely	Medium	Moderate	- Likely probability given history of site, due to age of buildings, date of demolition, site usage and potential pathway to receptors in landscaping. - Recommendation: Intrusive investigation required.
PL2	- Inhalation of vapours. - Migration through permeable strata and preferential pathways.	- Future site users. - Offsite receptors.	- Volatile contaminants such as hydrocarbons (filling station).	Likely	Medium	Moderate	- Likely probability given former site use as petrol filling station. - Recommendation: Intrusive investigation required.
PL3	- Inhalation of gas. - Migration through permeable strata and preferential pathways. - Explosion in confined spaces.	- Future site users. - Buildings. - Offsite land users.	- Methane, carbon dioxide. (potentially infilled basements, underlying coal measures).	Low Likelihood	Severe	Moderate	- Low likelihood due to viable source of gas identified but not considered to be significant and sensitive nature of development (residential). - Recommendation: Intrusive investigation to confirm ground conditions. If significant gas source and pathway identified, gas monitoring required.
PL4	- Surface run-off. - Migration through permeable strata and preferential pathways. - Perched waters migration.	- Groundwater (Secondary A Aquifer).	- Mobile contaminants such as metals, PAHs, hydrocarbons, surfactants, (made ground, filling station, hand car wash).	Likely	Medium	Moderate	- Likely probability given sources of mobile contamination identified on site in particular former use as a petrol station and recent use as a car wash. - Recommendation: Intrusive investigation required.
PL5	- Sulphate attack on concrete.	- Building structure.	- Sulphate (ash in made ground, chimney).	Likely	Mild	Moderate / Low	- Likely probability of ash made ground, which may be in contact with concrete used in future buildings. - Moderate risk assumed at this stage. - Recommendation: Intrusive investigation required as part of PL1.
PL6	- Ingestion of tainted water supply.	- Future site users. - Water pipes.	- Organic contaminants such as hydrocarbons (made ground, filling station).	Likely	Medium	Moderate	- Contamination considered possible at pipeline depth. - Recommendation: Intrusive investigation required.
PL7	- Direct contact (plant uptake).	- Flora.	- Phytotoxic contaminants (made ground).	Low Likelihood	Minor	Very Low	- Low probability as contamination considered possible, which may be taken up by flora in limited proposed soft landscaping area. - Recommendation: Investigation work as part of PL1.

Table 2-6: Preliminary Contamination Conceptual Model.

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 27th April 2021, 10th to 14th May 2021 and 2nd February 2022 and comprised the following:

- 3no. cable percussion boreholes drilled to 15.01-15.23mbgl (ref. CP101 to CP103).
- 3no. rotary boreholes drilled to 40.00mbgl (ref. RB101 to RB103).
- 10no. trial pits (using mechanical excavator) excavated to 0.70-1.90mbgl (ref. TP101 to TP107, TP201 to TP203).
- 3no. foundation pits (using JCB) excavated to 1.00-1.40mbgl (ref. FP101-FP103).

All site investigation locations are shown in Figure 3.

The locations were chosen to allow a good spread across the site as well as target areas of concern. Table 3-1 details the targeted and general coverage (non-targeted) site investigation locations.

Site Investigation Locations	Rationale
TP101-TP104	General site coverage.
TP105-TP107	To identify ground conditions near to the adjacent retaining wall and general site coverage.
TP201-TP203	To identify ground conditions within the footprint of the former petrol station/hand car wash forecourt.
CP101-CP103	Boreholes to confirm deeper ground conditions and to allow for general site coverage for gas monitoring and groundwater sampling.
RB101-RB103	Rotary boreholes to confirm the presence/absence of shallow coal mining.
FP101-FP103	Trial pits undertaken adjacent to the retaining wall to determine existing foundations.

Table 3-1: Summary of sampling locations.

The site investigation is considered to have a sufficient sampling density in line with BS10175⁶ for a 'detailed investigation'.

3.2 Well Installations

All cable percussive boreholes (CP101-CP103) were installed with monitoring wells for gas and groundwater monitoring and groundwater sampling. Monitoring wells were installed in accordance with BS10175 and CIRIA C665⁷ and generally comprised approximately 1m plain pipe over a length of slotted pipe surrounded by pea gravel and sealed at the top with bentonite and concrete. The response zones for the boreholes were installed along the entire length of the borehole. Well installation details are provided in Profile Logs in Appendix B.

⁶ British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.

⁷ CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

3.3 Sampling Protocol

3.3.1 Soil Sampling (Contamination)

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation⁸.

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 C665⁹ 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 3-2 shows the soil testing undertaken.

Suites and Contaminants	No. Samples	Location & Depth	Justification
Metals / metalloids, pH, water soluble sulphate, speciated PAHs, SOM and asbestos screen.	3	TP101 0.0-1.1m TP102 0.15-0.6m TP104 0.0-1.0m	A basic suite with a broad selection of contaminants tested on samples across the site where no significant evidence of contamination was identified (with the exception of ash and coal) and no TVOCs identified from the PID tests.
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, SOM and asbestos screen.	3	TP103 0.55-0.8m TP203 0.1-0.7m TP203 1.2m	A slight hydrocarbon odour was noted in TP103 0.55-0.80m and a strong odour at TP203 1.20m therefore detailed suite undertaken. Although no notable odour noted at TP203 0.1-0.7m
TPHCWG, BTEX, MTBE and SOM.	1	TP103 0.8-1.0m	TP103 0.8-1.0m tested to confirm the absence of hydrocarbon contamination which was noted in the above sample.

Table 3-2: 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, SOM=Soil Organic Matter.

⁸ EA (2000). "Technical Aspects of Site Investigation. Volumes 1 & 2 Text Supplements Research and Development Technical Report." P5-065/Tr.

⁹ CIRIA (2007). "Assessing Risks Posed by Hazardous Ground Gases to Buildings." CIRIA C665.

Suites and Contaminants	No. Samples	Location & Depth	Justification
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, VOCs, SVOCs, SOM, asbestos screen and Surfactants (MBAS).	2	TP201 0.7m TP202 1.2m	Although no hydrocarbon contamination identified in TP201 0.70m, detailed suite undertaken to confirm the absence. Hydrocarbon odour noted in TP202 1.20mbgl therefore detailed suite undertaken. Although no significant evidence of VOC/SVOCs, a more detailed suite including volatile contaminants and surfactants included to confirm the contamination risk from the hand car wash/petrol station.

Table 3-2 (continued): 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, SOM=Soil Organic Matter, VOC=Volatile organic Compounds, SVOC= Semi Volatile Organic Compounds.

3.3.2 Water Sampling

To establish the condition of groundwater LKC undertook 2no. groundwater samples. The groundwater samples were collected a minimum of 1 week after drilling had finished and following well development. Sample collection was undertaken using a low flow sampling pump using thin walled tubing to encourage laminar flow and minimise the potential loss of volatiles during sampling. The borehole was purged of all standing water and the sample collected from the recharged water. The sample was collected in glass and plastic bottles and a glass vial. A water meter was used to test the pH, temperature and conductivity before sampling until equilibrium conditions were met, as per BS10175¹⁰ guidelines.

All water samples were placed in glass bottles, plastic bottles and septum topped vials and stored in ice packed cool boxes. The samples were sent to Chemtest on the same day for analysis.

Sampling was carried out in accordance with BS5930¹¹ and BS5667-11¹².

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

Suites and Contaminants	No. Samples	Location	Justification
Metals / metalloids, pH, sulphate, cyanide suite, TPHCWG, BTEX, MTBE, speciated PAHs, phenol and hardness.	2	CP102 CP103	Detailed suite undertaken in CP102 and CP103 due to proximity of former petrol station in the centre of the site and to confirm the absence of contamination.

Table 3-3: Summary of groundwater sampling tests undertaken.

Notes: 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.

¹⁰ British Standard (2017). "Investigation of Potentially Contaminated Sites – Code of Practice." BS10175:2017.

¹¹ British Standard (2015). "Code of Practice for Ground Investigations". BS5930:2015.

¹² British Standard (2009). "Water Quality – Sampling. Part 11: Guidance on Sampling of Groundwaters". BS ISO 5667-11:2009.

3.4 Gas Monitoring

Gas monitoring was not carried out as part of this investigation.

Although a moderate risk was identified in the preliminary contamination conceptual model for gas (pollutant linkage 3), the site works have not identified a significant source of gas furthermore, thick deposits of clay were noted in the boreholes. This is discussed further in Sections 6.3.

3.5 Geotechnical Testing

3.5.1 *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 cable percussion boreholes at approximately 1m intervals, generally within the natural strata.
- Shear Vane tests (giving undrained shear strength) were performed in the trial pits at approximately 1m intervals, within the natural clay strata.
- Continuous equivalent SPTs were performed in the dynamic probes (strata not determined).

The SPT and shear vane readings are provided within the profile logs (Appendix B).

3.5.2 *Laboratory Geotechnical Testing*

Soil samples taken during the investigation were collected in sealed U100 tubes and sent to Murray Rix Laboratories for geotechnical testing.

Many of the tests are UKAS accredited and further details are given in the laboratory report presented in Appendix D. Table 3-4 shows the geotechnical testing undertaken.

Suites and Contaminants	No. Samples	Location	Justification
Single Stage Triaxial	6	CP101 2.20-2.65m CP101 7.00-7.45m CP102 4.30-4.75m CP102 8.30-8.75m CP103 3.30-3.75m CP103 10.00-10.45m	Undertaken to confirm the strength of the clay strata.

Table 3-4: Summary of geotechnical testing undertaken.

4 Ground Conditions

4.1 Geology – Generalised Sequence

The ground conditions beneath the site comprised made ground underlain by natural slightly gravelly slightly sandy CLAY. A summary section of the logs is provided in Plate 4-1, with additional comments below.

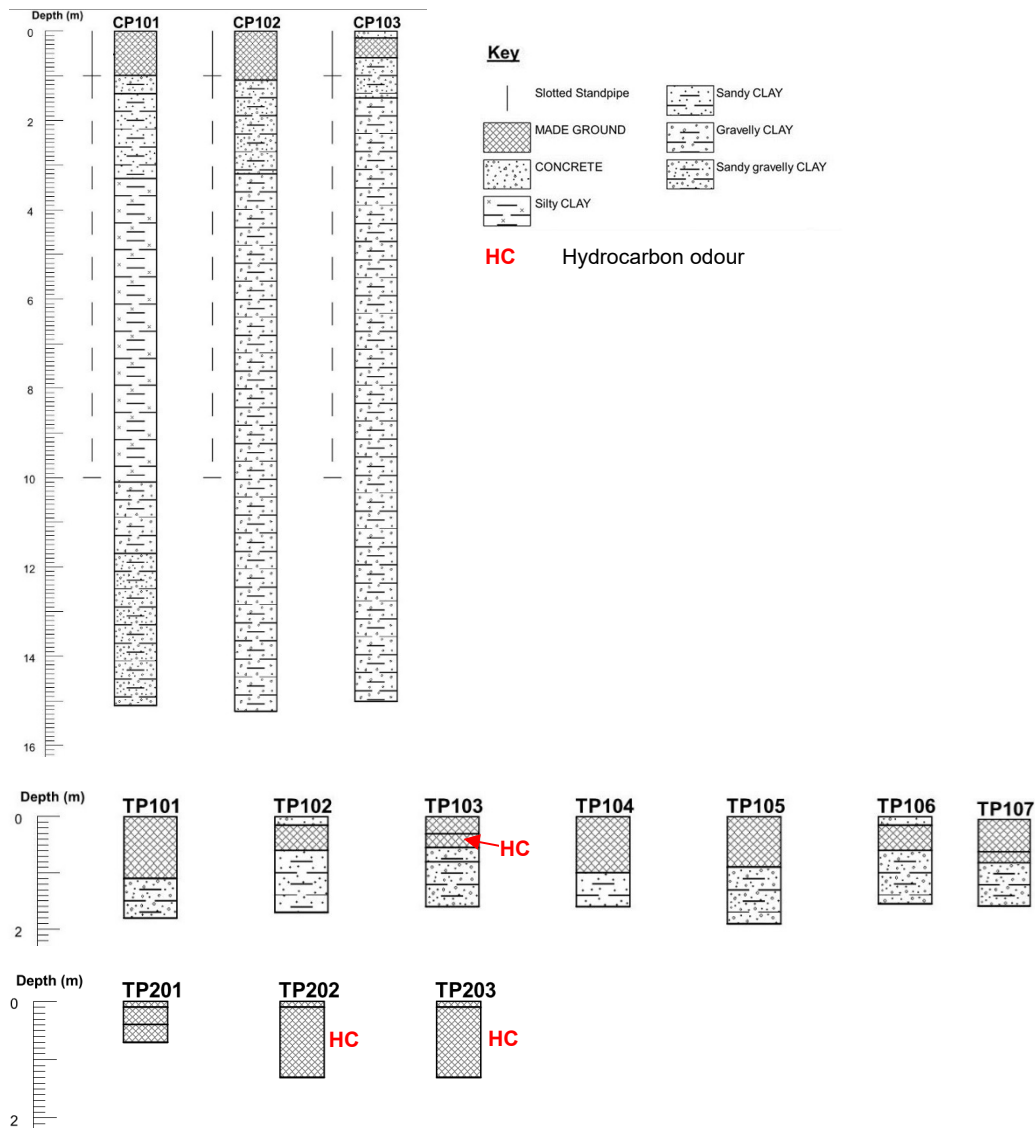


Plate 4-1: Summary of ground conditions.

Additional information on ground conditions:

- Made ground was recorded from depths of 0.55->1.3mbgl and generally consisted of gravelly sandy SILT with brick, ash and clinker. Exceptions to this were:
 - TP107 0.0-0.6mbgl – gravelly silty SAND with frequent timber, wire, paint containers, plastic, polystyrene, brick and ash (appears to be waste from former building fire).
 - TP202 0.1-1.3mbgl – relic brick and concrete foundations with clay fill.
- Visual / olfactory evidence of hydrocarbons identified in TP103 at 0.55-0.8mbgl (slight odour), TP202 0.10->1.30mbgl (strong odour) and TP203 0.10-

>1.30mbgl (slight odour) only. The hydrocarbon contamination in TP202 and TP203 was not bottomed due to the presence of services.

» In-ground structures were identified in:

- TP101 (relic brick foundation to 1.2mbgl in southern side of pit).
- TP104 (relic brick and slate channel running across the central width of pit at 0.9-1.3mbgl).
- TP105 (relic brick foundation in northern side of pit).
- TP107 (concrete obstruction at 0.45mbgl).
- TP202 (relic brick and concrete foundations).

4.2 Groundwater

4.2.1 Groundwater Levels

Groundwater strikes were recorded during the investigation in trial pits and boreholes. In addition, groundwater monitoring within the borehole wells has been undertaken on one occasion. An oil-water interface probe (approximately 1cm detection limit) was used to detect the presence of free phase hydrocarbons within each borehole.

Results are summarised in Table 4-1.

BH/TP	Water Strike Depths (mbgl)	Well Response Zone (mbgl)	Monitoring Depths (mbgl)		Sample Taken?	Evidence of Contam?
			Level	Base		
CP101	Dry	1.0-10.0 (C)	7.16	9.58	No	N/A
CP102	Dry	1.0-10.0 (C)	0.53	9.54	Yes	No
CP103	Dry	1.0-10.0 (C)	2.90	9.57	Yes	No
TP101	Dry	Not Installed				
TP102	1.7	Not Installed				
TP103	Dry	Not Installed				
TP104	Dry	Not Installed				
TP105	1.0	Not Installed				
TP106	Dry	Not Installed				
TP107	Dry	Not Installed				
TP201	Dry	Not Installed				
TP202	1.3*	Not Installed				
TP203	1.3*	Not Installed				

Table 4-1: Summary of water strike depths within boreholes and trial pits.

Response Zones: C=Clay * = possibly perched water with a hydrocarbon sheen.

High standing water was identified in CP102, LKC advise this is taken into consideration for the development.

4.3 In-Situ Geotechnical Testing

4.3.1 Standard Penetration Tests

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

Approximate Depth (mbgl)	SPT 'N' Values		
	CP101	CP102	CP103
1.2	13	15	18
2.3	-	16	20
3.2-3.3	21	20	-
4.3	21	-	19
5.3-5.4	15	19	19
6.9-7.0	-	19	20
8.5-8.6	16	-	20
10.0-10.1	24	21	-
11.6-11.7	50 for 245mm	50 for 245 mm	37
13.1-13.2	39	39	40
14.6-14.8	50 for 170mm	50 for 275mm	50 for 255mm
GW Level	7.16-Dry	0.53-Dry	2.90-Dry

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

Notes: Groundwater level based on strikes during investigation.

4.3.2 Shear Vanes

Hand shear vane readings, recording undrained shear strength (USS), were taken within the clay strata. The results are summarised in Table 4-3 and provided within the profile logs in Appendix B.

Approximate Depth (mbgl)	Average Undrained Shear Strength (kN/m ²)						
	TP101	TP102	TP103	TP104	TP105	TP106	TP107
0.6-0.8	-	28.01	21.45	-	-	80.80	65.50
1.0-1.1	120.58	136.95	145.11	73.58 / 76.00	86.75 / 91.97	89.00	77.75
1.4-1.5	-	-	-	-	-	135.67	104
GW Level	Dry	1.7	Dry	Dry	1.0	Dry	Dry

Table 4-3: Summary of average hand shear vane readings.

Notes:

Groundwater level based on strikes during investigation and monitoring data.

Shear vane readings can be influenced by coarse material including coarse silt.

4.4 Geotechnical Laboratory Testing

4.4.1 Single Stage Triaxial Test

Single stage triaxial testing has been undertaken on six samples of the natural clay strata. The results are presented in Appendix D and summarised in Table 4.4.

Location	Depth (mbgl)	Material Description	Undrained Shear Strength (kPa)
CP101	2.20-2.65	Stiff brown silty sandy clay	136
CP101	7.00-7.45	Firm brown silty sandy clay	62
CP102	4.30-4.75	Stiff brown silty sandy clay	178
CP102	8.30-8.75	Firm to stiff brown silty sandy clay	76
CP103	3.30-3.75	Firm to stiff brown silty sandy clay	150
CP103	10.00-10.45	Firm to stiff brown silty sandy clay	114

Table 4-4: Summary of single stage triaxial results.

4.4.2 Sulphate and pH

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

Strata	pH		Sulphate	
	Soil	Groundwater	Soil (g/l)	Groundwater (mg/l)
Made Ground	7.2-9.7	8.0-8.1	<0.01-1.1	89-150
Natural	7.1		0.02	

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

5 Geotechnical Assessment

5.1 Proposed Development

It is understood that the proposed development will comprise a 5-storey apartment block with car parking and limited soft landscaping.

The finished ground levels have not been provided and it is therefore anticipated that they will not vary significantly from current levels. However, should the development proposals or finished levels be altered then the comments/recommendations in this section may require revising.

The depths of any underground engineering works (sewers etc.) are unknown and therefore have not been taken into account in the following assessment. It is considered that any such works will be designed so as not to have an effect on, or compromise, proposed or existing foundations or ground stability.

Given the nature of the proposed development it is considered that the structure meets the criteria of Geotechnical Category 2 of Euro Code 7.

5.2 Summary of Ground Conditions

Ground conditions identified at the site are detailed in Section 4.1, and typically comprises Made Ground up to 1.50mbgl to depths of circa 15.5-16.0mbgl. Bedrock comprises Pennine Lower Coal Measures.

5.3 Retaining Wall Foundations

Three machine excavated foundation pits were undertaken adjacent to the current retaining wall on site. In FP101 the brick wall continued to 0.85mbgl where a concrete footing was encountered stepping out 0.12m and was 0.15m in thickness. In FP102 and FP103 the brick wall continued to 1.4 and 1.3mbgl respectively. No concrete footing was encountered. All foundations were laid within natural clay. Foundation pit cross-sections are provided in Appendix 4.

5.4 Site Preparation

The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the Specification for Highway Works. This should include:

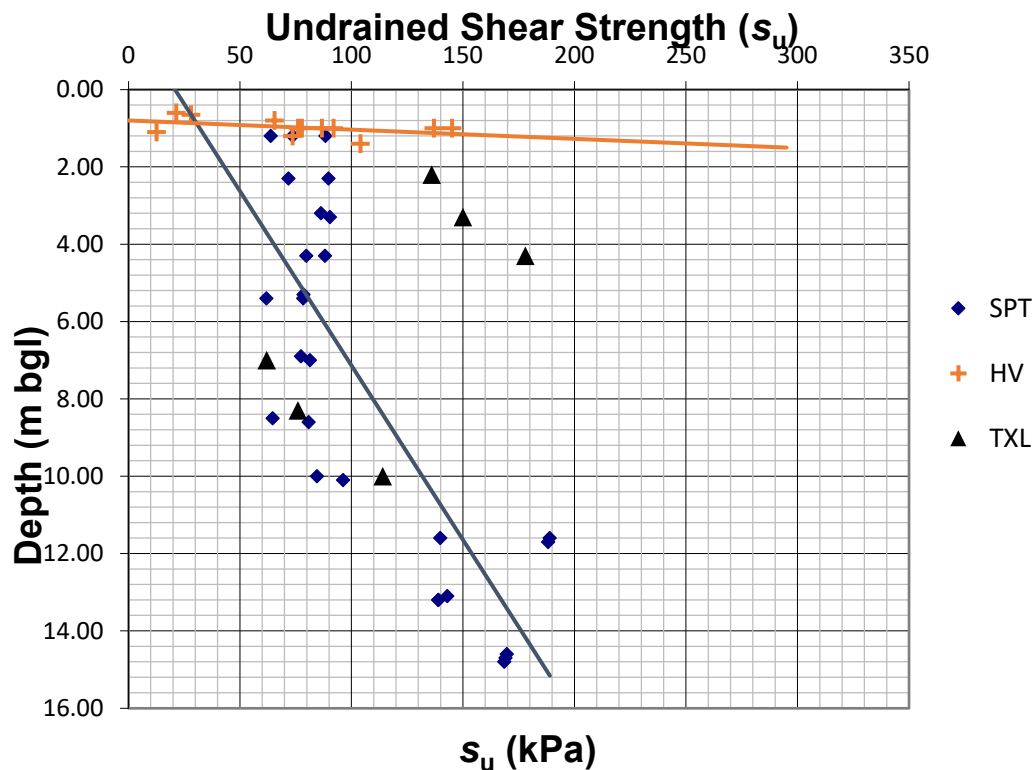
- Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill;
- Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill; and,
- Buried structures and old foundations can be anticipated on site. These should be excavated from below the proposed development footprint with the resulting void backfilled.

5.5 Foundation Conditions and Bearing Capacity

5.5.1 General

It is considered that the Made Ground is not suitable for a founding material due to the inherent variability of the material.

Strength of the natural cohesive material has been assessed using in-situ testing by SPT, pocket penetrometer and Hand Shear Vane (HV) as well as laboratory triaxial testing. The results of the testing have been plotted against depth as is shown in Graph 5-1.



Graph 5-1: Summary of s_u vs depth from in-situ SPT, PP, HV and laboratory triaxial testing.

From Graph 5-1 it can be seen that the strength of the cohesive deposits typically increase with depth from results of the in-situ SPTs. The laboratory triaxial tests indicate the shallower Clays are more competent In-situ pocket penetrometer and hand shear vane tests undertaken within the cohesive material return comparable values but were limited to the shallow deposits within the trial pits.

A conservative s_u of 65kPa is assigned to the cohesive material from a depth of c. 1.2mbgl for the natural superficial deposits, returning an allowable bearing capacity (ABC) of 133kN/m² for shallow strip/trench fill foundations.

The s_u value remains relatively constant to a depth of c. 11.00mbgl, increasing to 140kPa to the completion depths of the cable percussive boreholes.

5.5.2 Strip Foundations

Strip foundations supporting cladding walls should be constructed at least 150mm into the underlying stiff clay. At a depth of 1.20mbgl an allowable bearing capacity of 133kN/m² has been calculated using a Factor of safety of 3 and an undrained shear strength (s_u) of 65kPa taken from Graph 5-1.

5.5.3 Pad Foundations

Based upon the s_u obtained from the in-situ and laboratory testing of the Glacial Till material, an assessment has been made on a pad foundation supporting column loads. For preliminary assessment purposes, two sizes of pad (1m^2 and 2m^2) have been considered at a depth of 1.5mbgl. The bearing capacity assessment has been made in line with combination 1 (partial factors on Actions) and Combination 2 (partial factors on materials), results are shown in Table 5-1.

Pad Size	Pad Depth (mbgl)	Allowable Load (kN)
1m^2 (1.00m x 1.00m)	1.50	152
2m^2 (1.42m x 1.42m)		313
3m^2 (1.73m x 1.73m)		470

Table 5-1: Summary of pad Allowable Load.

The pads show an ABC of 152kN for a 1m^2 pad increasing to 470kN for a 3m^2 pad foundation placed at a depth of 1.5mbgl in the target stratum stiff clay (Glacial Till). Strip foundations supporting cladding walls should be able to support loadings of 133kN/m^2 .

It can be seen that increasing the size of the foundation results in a greater ABC.

The above is for assessment purposes only, foundation design should be undertaken by a specialist contractor.

5.5.4 Piled Foundations

For preliminary purposes the following initial pile carrying capacities have been calculated. When undertaking these preliminary calculations the following parameters have been used:

- » Undrained shear strength values from Graph 5-1;
- » Adhesion Factor of 0.45 based on CFA piles;
- » Factors of safety of 1.5 on side resistance and 3 on base resistance; and,
- » Global Factor of safety of 2.5.

Depth	Pile Carrying Capacity (kN)		
	300mm dia	450mm dia	600mm dia
5	55	95	143
10	110	178	254
15	184	303	440

Table 5-1: Preliminary Pile Carrying Capacity.

Pile design should be undertaken by a specialist contractor to allow them to reduce the factor of safety based on their extensive pile testing data.

During the investigation a maximum thickness of Made Ground to 1.50mbgl was recorded and it is considered that this will mostly be excavated out when constructing the pile caps thus removing any adverse effects of negative skin friction.

5.6 Recommendation

It is considered that pad foundations supporting column loads and strip foundations supporting cladding walls will provide a reliable and cost effective option for this site.

Should a piling solution be preferred then consideration must be given to the method of emplacement of the piles and the proximity of the retaining wall so as not to cause any adverse effects upon existing structures.

5.7 Ground Floor Slabs

Due to the presence of varying thickness' up to 1.5m depth of Made Ground across the site it is considered that suitable preparation of the sub-grade, by a combination of excavation and re-compaction, a ground bearing floor slab could prove suitable for the proposed building. Floor slabs should be designed by a suitably experienced structural engineer.

5.8 Pavement Construction

It is considered that the topsoil is not suitable for use as a sub-grade. Untreated Made Ground is considered unsuitable as a sub-grade due to its potential variability and potentially low strength/high compressibility. It should be removed to a depth of 0.5m below formation level and sorted to remove any unsuitable or deleterious materials. The sub formation should be rolled and suitable excavated material can then be replaced, up to formation level, in fully compacted thin layers. Any deficit should be made up with suitable imported fill compacted as above. Following this treatment an overall design CBR of 2-5% should be available, although this will require confirmation at a later date through in-situ CBR tests.

5.9 Drainage

The presence of substantial depths of Made Ground across the site may result in settlement. It is therefore recommended that drain runs are designed using steeper gradients and flexible joints to allow for some differential settlement.

5.10 Concrete Durability

Based upon the results of the chemical analyses undertaken to date and summarised in Table 4-5, it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS-2, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-2 assuming mobile water in accordance with the recommendations provided in BRE Special Digest 1 (2005).

5.11 Excavations

Site observations indicated that excavations should be feasible in the near surface with normal plant, however obstructions can be anticipated in the near surface including former foundations and former floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced level dig for the sub structure works.

Groundwater seepage was recorded in a number of the Trial Holes, evident of isolated perched water in the Made Ground. Generally trial pits were stable.

Due to the variability of the Made Ground it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97¹³.

¹³ CIRIA Report 97 – Trenching Practice – Second Edition (2001 revision)

5.12 Construction Activity and Inspection

The following activities and inspections should be incorporated into the site works:

- » It is recommended that sufficient allowance is made for the inspection of formation and sub formations to foundations and pavement construction;
- » Excavations where access is required should be subject to a risk assessment from a competent person and where appropriate mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97 utilised;
- » It is considered that de-watering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to provision of space for settling tanks or an attenuation pond;
- » Where access to confined spaces is required appropriate mitigation measures should be addressed within the Construction Stage Health and Safety Plan. Particular account should be taken of the gas results;
- » The presence of potential contamination and mitigation measures should be addressed as part of the Construction Stage Health and Safety Plan and should include measures to design out the risks, reduce their impact and finally the use of Personnel Protective Equipment (PPE).

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 (LCRM¹⁴). Information gathered from the risk assessment has been collated in the revised contamination conceptual model in Section 6.6.

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^{15,16}. The change to the contaminated land guidance has changed the evaluation of risk from 'minimal' (referred to as Health Criteria values (HCVs))¹⁷ 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 S4ULs¹⁸. 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^{19,20,21,22}.

If contaminants are not present as C4SLs and S4ULs then LKC will use ATRISK SSVs or CL:AIRE GACs²³. These follow the 'minimal' risk principle and more stringent exposure parameters and will be conservative.

LKC consider the main risk drivers for PAHs are benzo(a)pyrene (B(a)P) and naphthalene. This is due to B(a)P possibly being a carcinogen and most toxic of the

¹⁴ Land Contamination Risk Management (LCRM) <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

¹⁵ Defra (2014). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Policy Companion Document."

¹⁶ CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."

¹⁷ EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.

¹⁸ LQM (2014). "The LQM/CIEH S4ULs for Human Health Risk Assessment."

¹⁹ EA (2008). "Updated Technical Background to the CLEA Model." Science Report – SC050021/SR3.

²⁰ EA (2008). "Human Health Toxicological Assessment of Contaminants in Soils." Science Report – SC050021/SR2.

²¹ EA (2008). "A Review of Body Weight and Height Data used within the Contaminated Land Exposure Assessment Model (CLEA)." Project SC050021/Technical Review 1.

²² EA (2009). "Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values." Science report SC050021/SR7.

²³ CL:AIRE (2009). "The Soil Generic Assessment Criteria for Human Health Risk Assessment."

PAHs^{24,25} and naphthalene the most volatile and soluble²⁶. The new C4SLs indicate B(a)P as a surrogate marker for carcinogenic PAHs, if it falls within appropriate limits, since the risk from other non-carcinogenic PAHs are considered negligible²⁷. For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)²⁸ and CL:AIRE (2013). Naphthalene will be treated separately using the LQM S4ULs.

The proposed development is for residential apartments with limited shared soft landscaping, therefore the assessment criteria for residential without plant uptake has been used.

All criteria have been generated using the CLEA V1.06 model²⁹ based either on 1%, 2.5% and 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

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

B(a)P as Surrogate Marker

Based on the above assumption for PAHs, LKC undertook an assessment of the data for the site with regards to using B(a)P as a surrogate marker for carcinogenic PAHs as per HPA and CL:AIRE guidelines. The primary toxicological study related to Culp *et al.*³⁰, which was based on coal tar mixtures (>80,000mg/kg of total PAHs) fed in food to mice over a two-year carcinogenicity study.

Graph 6-1 summarises the study site data with respect to how the ratios of carcinogenic PAHs relate to B(a)P, within the confidence limits provided in the HPA document.

²⁴ EA (2002). "Contaminants in Soils: Collation of Toxicological Data and Intake Values for Humans. Benzo[a]pyrene." R&D Publication TOX2.

²⁵ USEPA (1984). "Health Effects Assessment of Polycyclic Aromatic Hydrocarbons (PAHs). EPA 540/1-86-013."

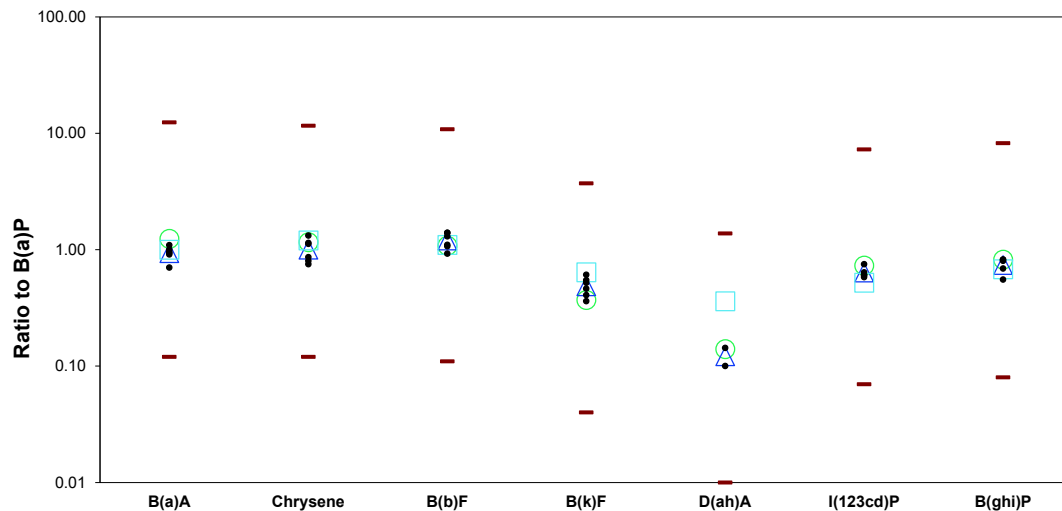
²⁶ EA (2003). "Review of the Fate and Transport of Selected Contaminants in the Soil Environment." Draft technical report P5- 079/TR1.

²⁷ CL:AIRE (2013). "SP1010: Development of Category 4 Screening Levels and Assessment of Land Affected by Contamination – Final project Report."

²⁸ HPA (2010). "HPA Contaminated Land Information Sheet: Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)." Version 3.

²⁹ EA (2008). "CLEA Software (Version 1.05) Handbook." Science Report – SC050021/SR4.

³⁰ Culp, S; Gaylor, D; Sheldon, W; Goldstein, L and Beland, F (1998). "A Comparison of Tumours Induced by Coal Tar and Benzo-a-pyrene in a 2-Year Bioassay." Carcinogenesis. **Vol 19**, no. 1, pp. 117-124.



Graph 6-1: The ratio of PAH to B(a)P in soil for all available data at the site based on 6 out of 7 samples (where values were >LOD to allow the calculation of a ratio).

Notes:

B(a)P = Benzo(a)pyrene; D(ah)A = Dibenzo(ah)anthracene; B(a)A = Benzo(a)anthracene; B(b)F = Benzo(b)fluoranthene; B(k)F = benzo(k)fluoranthene; I(123cd)P = Indeno(123cd)pyrene; B(ghi)P = Benzo(ghi)perylene

● = Ratio to B(a)P for all data ○ = Mean ratio to B(a)P for Culp data △ = Mean ratio to B(a)P from all data at the site □ = Mean ratio to B(a)P for UK data presented by HPA — = Upper and Lower limits (order of magnitude from Culp data)

All the data points that could be used to calculate ratios fall inside the upper or lower limits.

Based on this distribution of data LKC considers B(a)P can be used as a surrogate marker for carcinogenic PAHs and the C4SL criteria is suitable for this dataset.

Other Contaminants with no C4SLs, LQM S4ULs, ATRISK SSVs or CL:AIRE GACs

- MBAS – historically used as an indicator for level of contaminants from vehicle washing. There are no current assessment criteria values available for MBAS. Therefore, further qualitative assessment will be considered where they are above Limits of Detection.

6.2.2 Soil Results Comparison against Assessment Criteria

All analysis sheets are presented in Appendix C. Elevated and pertinent results are presented in Table 6-1.

Contaminant	Units	No. of samples	Elevated Results	Sample Location	Criteria	Source of Criteria
Metals						
Arsenic	mg/kg	8	64	TP104 (0.8-1.0m)	40	C4SL
Lead	mg/kg	8	340	TP101 (0.0-1.1m)	310	C4SL
			400	TP102 (0.15-0.6m)		
			3,400	TP104 (0.0-1.0m)		
PAHs						
Benzo(a)pyrene	mg/kg	8	15	TP203 (0.1-0.7m)	5.3	C4SL

Table 6-1: Summary of elevated and pertinent analytical results.

Notes:

Only results that exceeded assessment criteria have been shown and results from **all depths** are noted. Results have been compared to the nearest appropriate SOM.

Contaminant	Units	No. of samples	Elevated Results	Sample Location	Criteria	Source of Criteria
TPHs						
Aliphatic EC8-10	mg/kg	6	1100	TP202 (1.20m)	150	S4UL 6% SOM
Aliphatic EC10-12	mg/kg	6	2900	TP202 (1.20m)	760	
Aliphatic EC12-16	mg/kg	6	9900	TP202 (1.20m)	4300	
Aromatic EC12-16	mg/kg	6	4800	TP202 (1.20m)	2500	
GENERAL						
pH	pH	9	Range 7.1 to 9.7			
SOM	%	9	Range 0.98 to 19			
Asbestos	N/A	9	Detected (see Table 6-2)			

Table 6-1 (continued): Summary of elevated and pertinent analytical results.

Notes:

Only results that exceeded assessment criteria have been shown and results from **all depths** are noted. Results have been compared to the nearest appropriate SOM.

Asbestos was identified, as detailed in Table 6-2.

Sample Location	ID	Type	Total Asbestos (%)
TP202 (1.2m)	Chrysotile	Fibres/Clumps	0.002

Table 6-2: Details of asbestos identified.

6.2.3 Direct Contact Risk – Pollutant Linkage 1

Elevated PAHs, hydrocarbons, metals (arsenic and lead) and measurable ACM have been identified on site. Given the number and location of elevated samples, the contamination is considered to be site wide for metals (lead) and localised to the centre of the site for ACMs and hydrocarbons where the former petrol station is located. The other samples exceeding for PAH and arsenic appear sporadic and identified in one location.

PAHs and Heavy Metals

Elevated PAHs and metals (arsenic and lead) have been identified on site. The source of the contamination is expected to the ash, clinker and coal noted in the made ground.

At the concentrations identified, the contaminants are considered to pose a potential risk to future site users (residents) in soft landscaped areas, where made ground may be exposed. The principal pathways are the ingestion pathways (soil and dust) and dermal contact. Therefore, if areas of impact are under hardstanding, then a risk to human health is not present.

The probability of PAH and metal contamination affecting site users is likely. With a medium consequence, the risk is considered to be moderate and remediation is recommended in areas of proposed landscaping.

Petroleum Hydrocarbons

Elevated aliphatic EC8-10, EC10-12, EC12-16 and aromatic EC12-16 were identified in TP202 1.2mbgl.

Visual / olfactory evidence (slight odours) of hydrocarbon contamination was also identified in TP103 0.55-0.80mbgl and TP203 1.2mbgl. Samples taken from these locations did not identify levels of TPH that exceed the assessment criteria.

The chromatograms provided as part of the chemical analysis indicate that the source of the contamination is heavy-end petroleum hydrocarbons such as weathered diesel. The principal pathways associated with these heavier end hydrocarbon fractions are ingestion (of soil and dust), dermal contact (indoor and outdoor) and to a lesser degree the inhalation of indoor vapours.

LKC considers the probability of hydrocarbon contamination affecting site users (via ingestion and dermal contact) across the centre of the site in the location of the former petrol station as likely. Given a medium consequence a moderate risk is considered appropriate and remediation is recommended.

The risk associated with the inhalation of vapours is discussed in Section 6.2.4 below.

No visual or olfactory evidence of hydrocarbons were identified in the other locations across the site. Therefore, the probability of these contaminants posing a risk to site users is unlikely. With a medium consequence, the risk is considered to be low and no further remediation with respect to petroleum hydrocarbons is required across the remainder of the site.

VOCs and SVOCs

No VOCs or SVOCs above detection limits were identified in the samples tested. Therefore, the probability of these contaminants posing a risk to site users is unlikely. With a medium consequence, the risk is considered to be low and no specific remediation is required with regards to VOCs and SVOCs.

Surfactants (as MBAS)

Detectable concentrations of MBAS were identified in TP201 0.70mbgl and TP202 1.2mbgl. This indicated some short term/localised use on site in these areas which is within the area of the former hand car wash. The main pathway associated with surfactants and human health is ingestion and the bioaccumulation in the body. Given the proposed use of the site (residential apartments) and the remediation required with regards to PAHs, heavy metals and hydrocarbons, it is not anticipated that site users will have significant exposure to made ground on site to allow for ingestion of the contaminants in the soil.

Therefore, the probability of surfactants as MBAS posing a risk to future site residents is considered to be low likelihood. With a medium consequence, the risk is considered to be moderate/low with an assumed low risk due to the remediation required for other elevated contaminants identified on the site.

Asbestos

Asbestos (Chrysotile fibres/clumps) was identified in TP202 at 1.2mbgl. The source of the asbestos is likely to be a possible ACM fire blanket noted in the trial pit.

Asbestos may affect site users in soft landscaping in localised areas of the site, via the inhalation of fibres. The probability is considered to be likely. With a medium

consequence the risk as assumed to be moderate and remediation is recommended in line with other contaminants.

LKC have utilised the Joint Industry Working Group (JIWG) Decision Support Tool for receptor risk ranking of ACM onsite. This model incorporates guidance from CL:AIRE CAR-SOIL³¹ and CIRIA C733³².

In this model a child of school age playing in the landscaped area for 1 hour was assumed in close proximity to the source. A low respirable index was assumed based on the ACM identified onsite as per RIVM³³.

The assessment was carried out assuming 'minimal disturbance' based on ACM at a shallow depth.

For added conservatism, the model does not take into account moisture content, which can significantly reduce the potential for airborne fibre release from soil in a typical UK climate. AGS interim guidance³⁴, based on work by Addison et al³⁵, notes that the addition of 10% water to soil decreases the risk of potential fibre release by a factor of between 2 and 10. The moisture content of the soil from this area was 28% making fibre release unlikely.

Data from Addison *et al* shows that a sandy soil with Chrysotile fibre concentrations of 0.01%w/w (1 order of magnitude lower recorded) when agitated in a moderately aggressive way, produced between 0.01fibres/ml and no recordable fibres at moisture contents of 5% and above. It should be noted that the clearance level is 0.01f/ml.

The JIWG model output sheet is presented in Appendix H. A **low risk** was identified to key receptors based on general worst case scenario, such as some ground disturbance.

Asbestos may affect site users in landscaped areas of the site, via the inhalation of fibres. Considering limited fibre within the soil (1/9 samples) and evidence of a probable ACM fire blanket within the location of the exceedance the probability is considered to be low and with a medium consequence the risk is considered moderate / low. The removal of the source and hand picking any visible pieces will mitigate the risk. Furthermore, there will be a clean capping layer in landscaped areas to remove any direct contact pathway.

Additional consideration should also be given to the risk to workers and offsite receptors during groundworks and construction. This is discussed further in Section 9.1.

6.2.4 Risk from Inhalation of Vapours – Pollutant Linkage 2

Visual and olfactory evidence of hydrocarbon contamination was identified during the investigation in the location of the former petrol station forecourt. In addition, elevated hydrocarbons fractions were identified in the soil sample collected from TP202 1.2mbgl.

³¹ CL:AIRE (2016). "CAR-SOIL Controlled Asbestos Regulations 2012: Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials" Industry Guidelines.

³² CIRIA (2014). "Asbestos in Soil and Made Ground: A guide to Understanding and Managing Risks." CIRIA C733.

³³ RIVM (2003). "Assessment of the Risks of Soil Contamination with Asbestos" CIRIA C733." RIVM Report 711701034/2003.

³⁴ AGS (2013). "Site Investigation Asbestos Risk Assessment." AGS Interim Guidance, Feb 2013, Ver 2.4.

³⁵ Addison et al (1988). "The Release of Dispersed Asbestos Fibres from Soils." Institute of Occupational Medicine Report No. TM/88/14.

Therefore, LKC consider the probability of volatile contaminants affecting the site users as likely localised to within the footprint of the former petrol station. The consequence is expected to be medium, giving a moderate risk and remediation is required with respect to pollutant linkage 2.

With regards to the remainder of the site, LKC consider the probability of volatile contaminants affecting site users as unlikely. With a medium consequence the risk is low and no remediation is required with respect to pollutant linkage 2.

6.3 Gas Risk Assessment

Gas monitoring was not carried out as part of this assessment. The PRA identified a high risk from probable shallow coal workings and potentially former infilled basements. However, no shallow coal workings have been identified during the rotary drilling undertaken on site. Therefore, a significant source of ground gas has not been identified.

In addition, significant infilling of the site has not been identified in the site works undertaken to date. Made ground was identified to depths of between 0.55-1.5mbgl with an average depth of 0.9mbgl was encountered across the site. Furthermore, a substantial thickness of clay was noted in the boreholes.

In line with CL:AIRE Research Bulletin 17³⁶ where made ground is 1m or less and no significant organic/putrescible material is present, the site can be classified as Characteristic Situation 1 and no gas protection measures are required.

Deeper areas of made ground may be present in the central part of the site associated with the below ground tanks present in this area. The made ground was recorded to >1.3mbgl within the former petrol station forecourt. These tanks will require decommissioning and removal off site along with any associated impacted soil materials. Excavations will then be backfilled with engineered clean material, which will not pose a risk of gas generation.

LKC therefore confirm the probability of gas affecting receptors is unlikely. With a severe consequence, the risk is moderate to low. Given the ground conditions identified, LKC consider a low risk would be appropriate and no remediation is required.

6.4 Controlled Water Assessment

LKC considers the Secondary A Aquifer as the primary receptor.

LKC have compared results above Limits of Detection (LOD). Where relevant the review of priority substances takes precedence considering threshold values for groundwater cannot be used '*as part of site-specific investigations*'. The hierarchy is as follows:

- » River Basin District Standards³⁷ and updated Water Framework Directive³⁸ for Annual Average / Maximum Allowable Concentration Environmental Quality Standards (AA-MAC-EQS) for priority substances (surface water risk).

³⁶ CL:AIRE Research Bulletin (RB17) "A Pragmatic Approach to Ground Gas Risk Assessment" November 2012.

³⁷ Defra (2010). "The River Basin Districts Typology, Standards and Groundwater Threshold Values". Water Framework Directive (England and Wales) Directions 2010.

³⁸ Defra (2015). "Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015".

- 2016 private water supply standards (UKDWS potable)³⁹.
- 2001 Environment Agency Values for Environmental Quality Standards (EQS) and UK Drinking Water Standard (UKDWS)⁴⁰.

With regards to hydrocarbon mixtures (TPHCWG) for UKDWS, LKC will use the CL:AIRE guidance on petroleum hydrocarbons in groundwater⁴¹ based on WHO guidelines.

No criteria values have been presented for surface waters (EQS) except the odour, visual evidence and taste test for fish⁴². However, criteria for each banding has been presented by WHO within the CL:AIRE report for drinking water and will be used in the assessment.

The risk from List 2 compound (EC Dangerous Substance Directive 76/464/EEC) in a freshwater ecosystem is governed by the hardness of the water. Where applicable the hardness was taken into account for these contaminants. However, substantial thickness of clay and no groundwater identifying hydrocarbons in deeper water indicate negligible migration.

No elevated contaminants above detection limits were identified in any water sample.

Although no contaminants were identified in the water samples tested to date, free product (surface sheen) was noted within the trail pits excavated within the former petrol station forecourt.

Based on the above, LKC considers the probability of contaminants on site affecting the Secondary A Aquifer as low. Given the medium consequence, a moderate/low risk is anticipated (Pollutant Linkage 4) and precautionary remediation is required.

6.5 Additional Risk Assessments

6.5.1 Concrete (Pollutant Linkage 5)

As stated in Section 5, sulphate resistant concrete will not be required at the site. The site was classified as DS-2 AC-2.

Based on the above, the probability of sulphate concentrations affecting buildings is likely. Given the consequence is considered to be mild, the risk (pollutant linkage 5) is anticipated to be moderate risk and remediation (sulphate resistant concrete) is required. This should be confirmed with the structural engineer.

6.5.2 Potable Water Supply (Pollutant Linkage 6)

The following elevated contaminants were identified:

- Elevated petroleum hydrocarbons in the area of the former petrol station forecourt.

It is likely that barrier pipe will be required across the site subject to the depth and location of the water pipes and in consultation with UU.

³⁹ Statutory Instruments (2016). "The Private Water Supplies Regulation 2016." No. 614

⁴⁰ EA (2002). "Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the Environment Protection Act 1990."

⁴¹ CL:AIRE (2017). "Petroleum Hydrocarbons in Groundwater: Guidance on Assessing Petroleum Hydrocarbons Using Existing Hydrological Risk Assessment Methodologies."

⁴² EA (2009). "Petroleum Hydrocarbons in Groundwater: Supplementary Guidance for Hydrological Risk Assessment."

It should be noted typical pipework depths are 0.75mbgl to 1.35mbgl. Once details of the pipeline location and depths are known a UU Risk Assessment should be undertaken.

At this stage, the probability of organic contaminants affecting potable water pipes is likely. Given the consequence is considered to be moderate; the risk (pollutant linkage 5) is anticipated to be moderate risk and remediation (i.e. barrier pipe) likely to be required (subject to further risk assessment).

6.5.3 *Phytotoxicity (Pollutant Linkage 7)*

Elevated zinc (maximum concentration 330mg/kg) and copper (maximum concentration 320mg/kg) were identified in one location. The probability of phytotoxic contaminants affecting vegetation is considered to be likely. With a minor consequence, the risk (pollutant linkage 7) is anticipated to be low. The remediation associated with PL1 (cover system) will mitigate the risk to flora.

6.6 **Revised Contamination Conceptual Model**

The preliminary contamination conceptual model (Table 2-6) has been revised following the risk assessments undertaken in Sections 6.1-6.5. The revised contamination conceptual model follows the same methodology and guidance used in the preliminary contamination conceptual model. The risk matrix is provided in Appendix A.

The revised contamination conceptual model is presented in Table 6-3.

2

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk is identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

Further details of the remedial proposals and a remedial option appraisal are given in Section 9.

Pollutant Linkage	Pathway	Receptor	Contaminant	Probability	Consequence	Risk	Assessment and Recommendations
PL1	-Dermal contact. -Inhalation of soil, fibres and dust. -Ingestion of soils, dust. -Windblown dust.	-Future site users. -Offsite receptors.	-Arsenic, lead, PAHs.	Likely	Medium	Moderate	-Likely probability as elevated metals (arsenic and lead) and PAHs, identified in the made ground in the investigation undertaken to date. -Recommendation*1: Remediation required. Likely to include an environmental cover system in soft landscaping areas.
			-Chrysotile ACM -Petroleum hydrocarbons (Aliphatic EC8-10, EC10-12, EC12-16 and aromatic EC12-16).	Likely (localised)	Medium	Moderate (localised)	-Likely probability in localised areas of the site as elevated petroleum hydrocarbons and ACMs detected in the ground which could come into contact with site users in landscaped areas. Likely to be localised to the footprint of the former petrol station/hand car wash forecourt. -Recommendation: Localised remediation required. Likely to include an environmental cover system in soft landscaping areas, delineation of the hydrocarbon contamination and removal where required.
			-Surfactants (MBAS).	Unlikely	Medium	Low	-Unlikely probability as no elevated VOCs/SVOCs identified in the soil samples tested. Although detectable levels of MBAS encountered within the former petrol station and hand car wash forecourt, not considered to post a risk due to the remediation required for hydrocarbon contamination. -Recommendation: No further remediation required.
PL2	-Inhalation of vapours. -Migration through permeable strata and preferential pathways.	-Future site users. -Offsite receptors.	-Petroleum hydrocarbons (<EC16)	Likely (localised)	Medium	Moderate (localised)	-Likely probability in localised areas of the site as TPH fractions detected in TP202 which includes some lighter end volatile fractions. -Recommendation: Localised remediation required. Likely include excavation and removal of hydrocarbon contaminated ground or the installation of a vapour barrier in the proposed development.
PL3	-Inhalation of gas. -Migration through permeable strata and preferential pathways. -Explosion in confined spaces.	-Future site users. -Buildings. -Offsite land users.	-Methane, carbon dioxide.	Unlikely	Severe	Moderate / Low	-Gas monitoring was not carried out as part of this assessment. No significant depth of putrescible made ground was identified and no shallow coal workings have been identified. -Unlikely probability as a significant gas source has not been identified. -Recommendation: No remediation required.
PL4	-Surface Run-off. -Migration through permeable strata and preferential pathways -Perched waters migration.	-Groundwater (Secondary A Aquifer).	Mobile contaminants: -Petroleum hydrocarbons.	Likely	Medium	Moderate	-No elevated dissolved phase contamination and substantial clay superficial deposits limiting any residual migration of contaminants. However, surface sheen noted in TP202 and TP203. Therefore, precautionary removal of hydrocarbon impacted soil to remove source. -Recommendation: Localised remediation required. Likely to include the excavation and removal of hydrocarbon contaminated soils. Pumping and removal of ground water.
PL5	-Sulphate attack on concrete.	-Building structure.	-Sulphate.	Likely	Mild	Moderate / Low	-Elevated sulphate identified in the made ground (max. 1,100mg/l) therefore moderate risk considered appropriate assuming mobile water within the soils. -Recommendation: Sulphate resistant concrete in line with DS-2 AC-2 within made ground.

Table 6-3: Revised Contamination Conceptual Model.

Notes

*1 Although no ACM identified, contractors should be vigilant during earthworks of any potential ACM.

Pollutant Linkage	Pathway	Receptor	Contaminant	Probability	Consequence	Risk	Assessment and Recommendations
PL6	- Ingestion of tainted water supply.	- Future site users. - Water pipes.	Organic contaminants: - Petroleum hydrocarbons.	Likely	Medium	Moderate	- Likely probability as elevated TPH encountered which could permeate water pipes and contaminate water supply. - Recommendation: UU risk assessment undertaken. Barrier piping likely to be required.
PL7	- Direct Contact (plant uptake).	- Flora.	- Phytotoxic Contaminants.	Likely	Minor	Low	- Elevated copper and zinc concentrations in one location. - Recommendation: Remediation for PL1 will mitigate the risk to flora.

Table 6-3 (continued): Revised Contamination Conceptual Model.

7 Waste Disposal Assessment

The soil contamination results as presented in Appendix C have been used to help determine the waste classification of material 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^{43, 44, 45, 46, 47, 48, 49, 50, 51}.

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.

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 G and summarised in Table 7-1.

Sampling Location	Hazardous Waste?	LoW Code	Hazard (Risk Phrase)	Contaminants
TP101 0.0-1.1	No	17-05-04	N/A	N/A
TP102 0.15-0.6	No	17-05-04	N/A	N/A
TP103 0.55-0.8	No	17-05-04	N/A	N/A
TP103 0.8-1.0	No	17-05-04	N/A	N/A
TP104 0.0-1.0	Yes	17 05 03	HP14 (ecotoxic)	Lead
TP201 0.7m	No	17-05-04	N/A	N/A
TP202 1.2m	Yes	17 05 03	HP7 (carcinogenic) HP11 (mutagenic) HP14 (ecotoxic) HP3(i) (flammable)	TPH (C6-C40)
TP203 0.1-0.7m	No	17-05-04	N/A	N/A
TP203 1.2m	No	17-05-04	N/A	N/A

Table 7-1: Summary of HazWaste Online™ findings.

⁴³ EA (2018). "Guidance on the Classification and Assessment of Waste (1st Edition v1.1)". Technical Guidance WM3.

⁴⁴ CLP Regulation - Regulation 1272/2008/EC of 16 December 2008.

⁴⁵ 1st ATP - Regulation 790/2009/EC of 10 August 2009

⁴⁶ Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

⁴⁷ WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

⁴⁸ Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

⁴⁹ 13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

⁵⁰ POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004

⁵¹ 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Based on individual locations hazardous waste has been identified. The soil onsite should be classified as HAZARDOUS WASTE based on carcinogenic, mutagenic ecotoxic and flammable properties in the area of TP104 and TP202 and LoW code "17-05-03 - soil and stones containing hazardous substances".

The soils across the remainder of the site are classified as NON-HAZARDOUS WASTE and LoW code "17-05-04 - soil and stones other than those mentioned in 17 05 03" is suitable.

8 Conclusions

8.1 Geotechnical

Geotechnical observations and conclusions are summarised in Table 8-1 below (more detail provided in Section 5).

Proposed Development	- 5 Storey residential apartment block with car parking and limited soft landscaping.
General Ground Conditions / Geotechnical Testing	- Made Ground up to 1.50m typically comprising concrete over variably sandy gravelly silt containing anthropogenic material including brick, ash, clinker etc. - Natural superficial deposits comprise stiff, becoming very stiff CLAY (Glacial Till) to depths of between 15.50m and 16.0mbgl. - Bedrock comprised mudstone, siltstone and sandstone of the Pennine Lower Coal Measures. - No groundwater encountered.
Undrained Shear Strength (s_u)	- 65kPa between 1.20mbgl and 11.0mbgl in the Glacial Till. - 140kPa below 11.00mbgl in the Glacial Till.
Anticipated Foundation Type	- Piled foundations. The appointed specialist piling contractor will be able to optimise pile design such as pile grouping per pile cap, pile diameter & pile spacing, installation methodology, pile cap settlement, and socket lengths to suit from the SI data.
Retaining Walls	- A retaining wall is located along the western boundary of the site. Consideration must be given to the method of emplacement of foundations so as not to have an adverse effect upon the existing retaining wall.
Shallow Groundwater	- Not encountered.
Concrete Requirements	- Based on BRE Digest 2005 ⁵² – DS-2 AC-2 recommended.
Services	- Services – consideration to the presence of services running through the site. Services may need to be re-routed.
Coal Mining	- A mining investigation has been carried out and will be reported under separate cover. Coal workings were not identified within the rotary boreholes undertaken on site.
Temporary Support of Excavation	- May be required; however, trial pits were generally recorded as stable.

Table 8-1: Summary Geotechnical Observations and Conclusions.

⁵² BRE (2005). "Concrete in Aggressive Ground." Special Digest 1.

8.2 Contamination Assessment

A revised contamination conceptual model has been produced by LKC which is summarised in Table 8-2 below (more detailed model provided in Section 6).

Pollutant Linkage		Risk	Recommendations
1	Contaminants posing a risk to site users via dermal contact, ingestion and inhalation (of soil, dust and fibres).	Moderate (metals, PAHS)	- Elevated arsenic and lead identified across the site and localised PAHs. - Recommendations: Remediation of soft landscaped areas.
		Moderate (ACM, TPH) (Localised)	- Elevated TPH and asbestos identified within the former petrol station/hand car wash forecourt. - Recommendations: Delineation and removal of TPH contamination and remediation of soft landscaped areas.
		Low (surfactants)	- Only low levels identified, remediation for TPH will sufficiently reduce the risk. - Recommendations: No further remediation required.
2	Volatile contaminants posing a risk to site users via the inhalation of vapours.	Moderate (Localised)	- Volatile contamination identified in the former forecourt area. - Recommendations: Localised remediation required.
3	Gas posing a risk to buildings and site users via the migration of gas into building causing explosion and asphyxiation.	Moderate / Low	- A significant source of gas has not been identified. - Recommendations: No remediation required.
4	Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	Moderate (Localised)	- Elevated TPH identified in the soil and free product (surface sheen) noted within trial pits. Significant thickness of clay deposits and groundwater tested did not identify elevations. However precautionary source removal recommended. - Recommendations: Localised remediation required.
5	Sulphate posing a risk to building via direct contact (sulphate attack).	Moderate / Low	- Elevated sulphate identified in made ground. - Recommendations: Sulphate resistant concrete (DS-2 AC-2).
6	Organic contaminants posing a risk to water pipes.	Moderate	- Organic contamination identified at potable pipe depth of 0.75-1.35mbgl. - Recommendations: UU risk assessment to be completed. The site will likely require barrier piping.
7	Phytotoxic metals posing a risk to flora via root uptake.	Low	- Elevated copper and zinc in one location. - Recommendations: Remediation as per PL1.

Table 8-2: Summary Risk Table.

Based on individual locations hazardous waste has been identified. The soil onsite should be classified as HAZARDOUS WASTE in the area of TP104 and TP202 and LoW code "17-05-03 - soil and stones containing hazardous substances".

The soils across the remainder of the site are classified as NON-HAZARDOUS WASTE and LoW code "17-05-04 - soil and stones other than those mentioned in 17 05 03" is suitable.

Remedial recommendations are presented in Section 9.

9 Recommendations and Remedial Strategy

The recommendations provided below are considered appropriate for the site based on the site investigation work undertaken. LKC should stress that no remediation, enabling works or designing works should take place until Regulatory approval has been obtained.

9.1 Remediation and Validation Recommendations

Table 9-1 details the further works and remedial recommendations / requirements. The table shows work required pre-construction (i.e. during earthworks) and during / post construction.

Phase	PL	Remediation Requirements	Validation Requirements
Pre-Construction	All	<u>Earthworks Inspections / Unexpected Contamination</u> 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 (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required. Should visible pieces of asbestos be identified during groundworks, precautions should be taken to ensure the safety of the construction workers and nearby land users. It would be advisable to introduce an asbestos management strategy in line with CIRIA C733 ⁵³ .	Log of work undertaken including photographs. Details of any sampling undertaken and validation of any potential additional remedial work.
	2	<u>Hydrocarbon Removal</u> Impacted soils (based on visual / olfactory evidence and the use of a PID (nominal 50ppm)) should be excavated and removed. Impacted soils should be placed on an impermeable surface to await removal from site (this may be subject to chemical testing to confirm suitable waste facility). The work should be done under the supervision and instruction of an environmental consultant. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.	Details of work undertaken including photographs. Confirmatory samples of the remaining in-situ soils. Validation of the sides and base to demonstrate grossly impacted material has been removed. Consignment notes confirming the removal of impacted soil
	4	<u>Controlled Waters</u> In combination with the hydrocarbon contamination excavation the pumping of shallow (likely perched water) ground water to either external tankers for removal from site or IBCs for onsite treatment and discharge to sewer under a discharge consent. Pumping should continue until the ground water runs clear and no sheen is noted.	Confirmatory testing of groundwater samples. Disposal tickets for water removed from site.

Table 9-1: Further work, remediation and validation requirements.

Notes: See Table 6-3 for pollutant linkage (PL) details.

⁵³ CIRIA (2014). "Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks". C733.

Phase	PL	Remediation Requirements	Validation Requirements
Build-Phase Construction	1 and 7	If all or some of the made ground remains in place in soft landscaping areas, an environmental cover system will be required. The environmental cover system should be as follows: Shared Landscaping: 450mm thick environmental cover system comprising: Either 100mm physical break layer (MOT type 1 material, 20-30mm, minimal fines) and at least 350mm comprising clean inert fill and sufficient topsoil for a growing medium. Or geotextile membrane and at least 450mm comprising clean inert fill and sufficient topsoil for a growing medium. The subsoil layer can be replaced by additional topsoil. A diagram of a typical environmental cover system is shown in Appendix I.	Measuring depth of environmental cover system using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer will also be collected. Chemical validation of imported soils: See Table 9-2.
	2	<u>Vapour Membrane (If required)</u> Elevated petroleum hydrocarbons are present on site. This material is likely to be removed as part of the 'hydrocarbon hotspot' removal works. If it is not possible to remove the entirety of the impacted ground, then precautionary vapour protection measures to include a vapour resistant membrane should be installed.	Plan including foundation design. Photographic evidence showing installation of membrane and presence of sub-floor void.
	4	<u>Controlled Waters</u> In combination with the hydrocarbon contamination excavation the pumping of shallow ground water to external tankers and removal from site for disposal. Pumping should continue until the ground water runs clear and no sheen is noted.	Confirmatory testing of groundwater samples. Disposal tickets for water removed from site.
	5	<u>Sulphate Resistant Concrete (made ground only)</u> Sulphate Resistant Concrete in line with DS-2 AC-2 recommended.	N/A
	6	<u>Potable Water Pipes</u> It is recommended that a Water Pipeline Assessment is undertaken once the location and depth of potable water pipes are known. It is likely that barrier pipe will be required.	Delivery Notes of Pipe Material. Photographs of the Installed Pipe.
	3	No remediation anticipated with respect to PL3 (gas).	N/A.

Table 9-1 (continued): Further work, remediation and validation requirements.

Notes: See Table 6-3 for pollutant linkage (PL) details.

Other Considerations	Grubbing Out of In-Ground Structures It is recommended that in-ground structures are grubbed out as part of the groundworks.
	Asbestos Management Plan Due to the presence of asbestos containing material (1/54 in soil and 3no. visible pieces), it is recommended that additional precautions are taken during site clearance, earthworks and construction in the area of concern. The presence of asbestos in the made ground at the site presents a potential risk of generation of airborne fibres if this material is disturbed, such as for excavations to construct new foundations. This risk can be managed by careful procedures and site monitoring to reduce the risk of airborne fibres, such as wetting techniques and it is recommended that an appropriate 'Asbestos Management Strategy' is developed and adopted for all intrusive ground works which disturb the made ground in the area of concern. This should be carried out in line with CIRIA C733. This may include asbestos awareness training for all site staff, provision of suitable personal and respiratory protective equipment and air monitoring. With regards to cement bound asbestos, this can be handpicked, doubled bagged and disposed of appropriately to a licenced landfill. Guidance on removing asbestos cement is described in HSE (2012). If ACM is identified in soil arisings, then soil should be placed directly into covered skips and disposed of at a suitable licenced landfill, after further testing to quantify the extent of asbestos contamination of the soils. It should be considered that blue asbestos is notifiable (if present) and must be removed by a licenced contractor. Given that a possible ACM fire blanket was noted in TP202, it is recommended that hand picking of the ACM is undertaken in this area. The ACM should be doubled bagged and disposed of accordingly. The JIWG model (presented in Appendix H) identified this work to be classed as <u>Non-Licensed Work (RPE to conform to EN140 with P3 filter half mask, localised dust suppression and localised and enhanced personal decontamination facilities)</u>. Re-use of site won material To ensure material is compliant with appropriate waste regulations, any site won material re-used onsite should be in recourse to appropriate exemptions. A U1 and T5 exemption should be registered. This will allow the following to be used onsite or brought in for use onsite (refer to guidance for types of waste that can be used ⁵⁴): 5,000 tonnes (c. 2,500m³) <u>treatment</u> of crushed concrete / stone. 1,000 tonnes (c. 500m³) <u>use of</u> non-hazardous soil. 5,000 tonnes (c. 2,500m³) <u>use of</u> clays, sand, gravel, brick, concrete, stone etc. 50,000 tonnes (c. 25,000m³) <u>use of</u> bituminous material to be used in roadways. A Materials Management Plan (MMP) with recourse to the CL:AIRE Code of Practice may be required if volumes exceed exemption limits. This must be registered <u>before</u> material movement starts onsite. If an MMP is required, this needs to be registered by a Qualified Person (QP) and there must be 'certainty of use' for any material re-used onsite or exported to site to ensure there is no 'sham recovery'. For all the above material will need to be tested at the rate and analytical suites presented in Table 9-2.

Table 9-1 (continued): Further work, remediation and validation requirements.

Notes: See Table 6-3 for pollutant linkage (PL) details.

⁵⁴ <https://www.gov.uk/guidance/waste-exemptions-using-waste>

Other Considerations	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 guidance ⁵⁵) should be adopted by all workers involved with site enabling and construction works.
	Piling in Contaminated Land It is understood that the building will be piled into the bedrock. This may provide a preferential pathway for contaminants to the Secondary B Aquifer. Once the method of piling has been determined, good practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency ⁵⁶ .

Table 9-1 (continued): Further work, remediation and validation requirements.

Notes: See Table 6-3 for pollutant linkage (PL) details.

9.2 Validation of Subsoil / Topsoil

Chemical validation of all imported soils to be used on site in gardens and soft landscaping areas should be undertaken. Imported soils should be accompanied by a certificate of analysis and source details.

A summary of the required imported material sampling requirements is presented in Table 9-2. Ideally, the material should be sampled at source to prevent double handling if soil fails, with confirmatory sampling undertaken on importation to site. However, where this is not possible then material imported should be segregated based on source and soil type. Validation samples should be taken prior to placement in gardens to ensure suitability for use.

Material Type	Source	Suite of Analysis	Sampling Rate (min. 3 per source) *		
			Garden	Landscape	Other **
Topsoil / subsoil / Fill material	Greenfield	Suite A	200m ³	200m ³	200m ³
	Remediated	Suite A / B dependent upon original SI	100m ³	150m ³	200m ³
	Brownfield / Unknown	Suite B	50m ³	150m ³	200m ³
Quarried Fill	First Generation i.e. quarried sand (subsoil) or stone (break layer)	No testing is required. Certification of material provenance is required.			

Table 8-3: Sampling requirements for imported soils.

Notes:

Suite A - Heavy metals, pH, water soluble sulphate, speciated PAH, soil organic matter and asbestos screen.

Suite B - Heavy metals, pH, water soluble sulphate, speciated PAH, phenol, total and free cyanide, soil organic matter, asbestos screen, banded petroleum hydrocarbons (TPH CWG), BTEX, MTBE.

** Other assumed to be stone / 6F2 etc.

Any soil with visual or olfactory evidence of hydrocarbons should be rejected.

In addition, it should be ensured that the matrix of the topsoil is suitable as a growing medium and no undesirable material is present (in line with BS3882⁵⁷). LKC advise this information is provided by the supplier before material is imported onto site.

⁵⁵ HSE (1991). "Protection of Workers and the General Public During Development of Contaminated Land" London HMSO.

⁵⁶ Environment Agency (2001) Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention.

⁵⁷ BS (2015). "Specifications for Topsoil and Requirements for use." BS3882:2015.

Imported material to be used in gardens will be compared against residential with plant uptake criteria (as used in the contamination risk assessment (Section 6-1)). Appropriate remedial target criteria are presented in Appendix F.

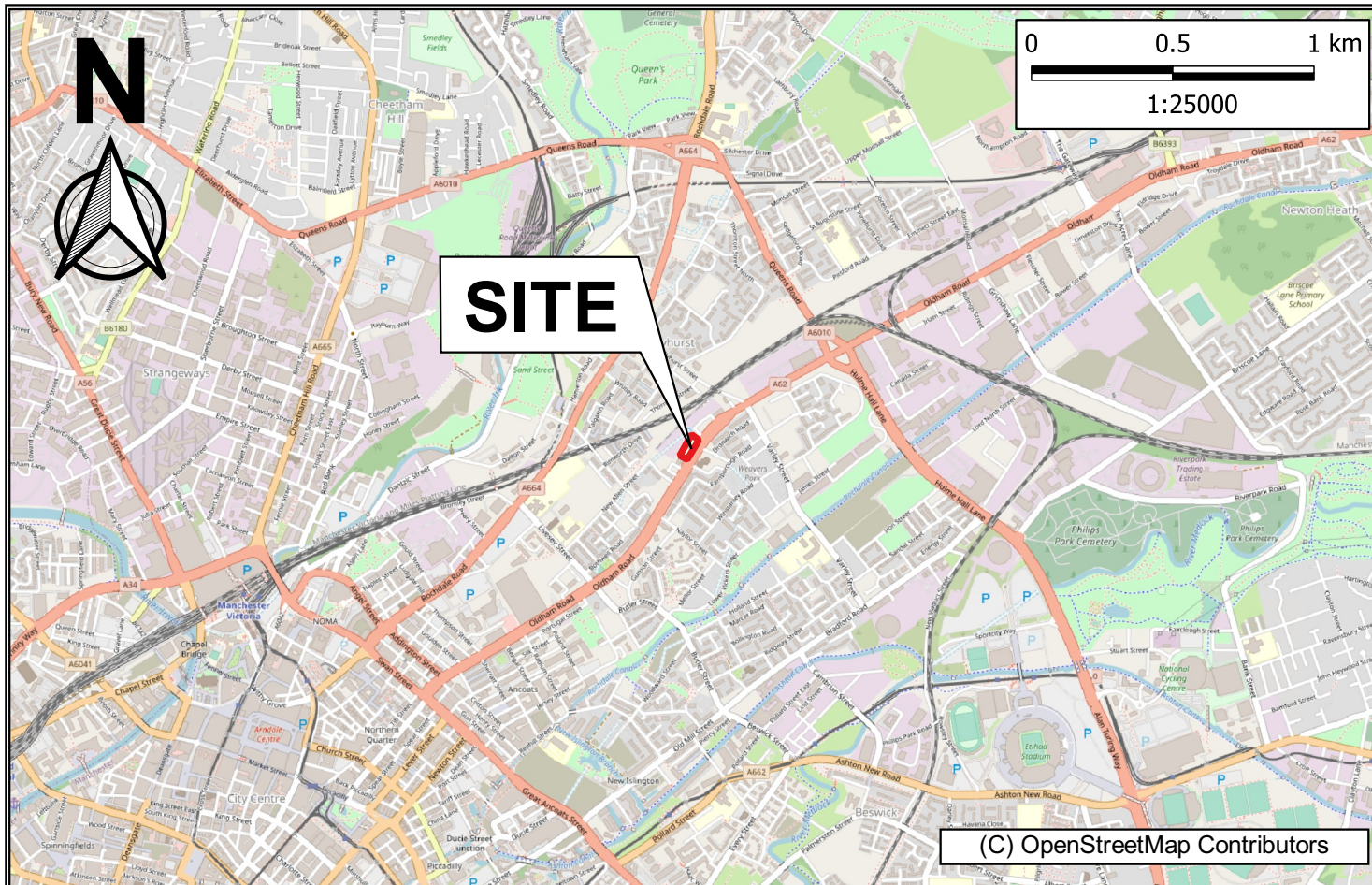
9.3 Site Completion Report

It is recommended that any remediation carried out on the site is validated by a third party and suitable documentary evidence provided in a Site Completion Report, such as photographs, consignment documents and analytical results. This should include as a minimum:

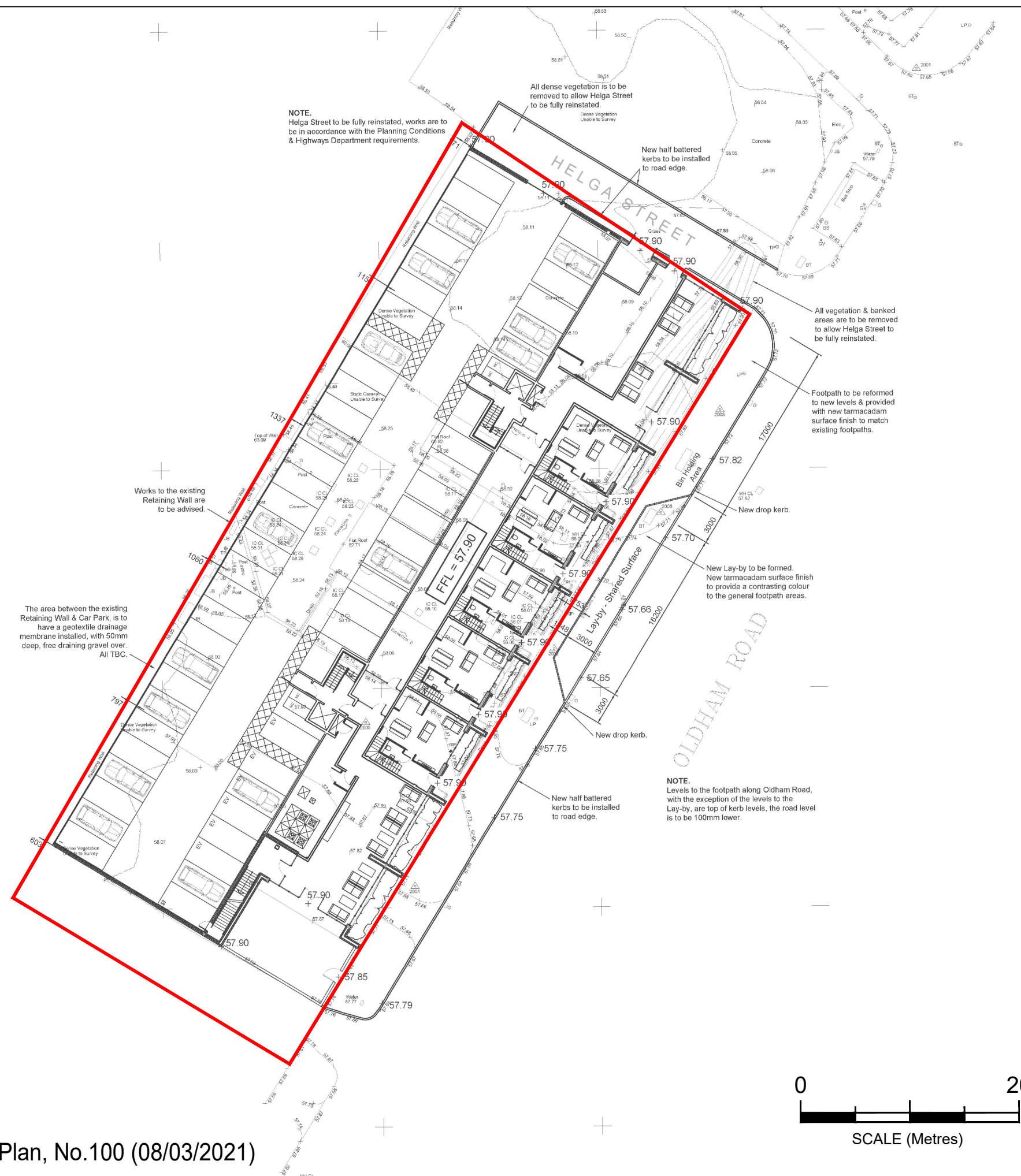
- » Information on decommissioning and removal of buried tanks and associated infrastructure.
- » Validation of the hydrocarbon hotspot removal.
- » Provision of waste transfer documents.
- » Verification testing of all imported soil for soft landscaping areas.
- » Validation of environmental cover system.
- » Information on the water pipeline selection and installation.
- » Details of any unexpected contamination identified onsite, suitably risk assessed and / or validated.

The Site Completion Report will assist the Local Authority in the discharge of any future relevant planning condition and will also be of use to solicitors acting on behalf of any prospective conveyancer who may have concerns over the former use of the site.

Figures



Client: MPH Ancoats Ltd				Title: Site Location & Boundary Plan			
Site: Osborne's Yard, Miles Platting				Scale (see scale bar): 1:25,000 & 1:1,000 @ A4			
Job No.: LKC 20 1913	Drawn By: RP	Checked By: CC	Drawn: Apr 2021	Figure: 1	Revision:		

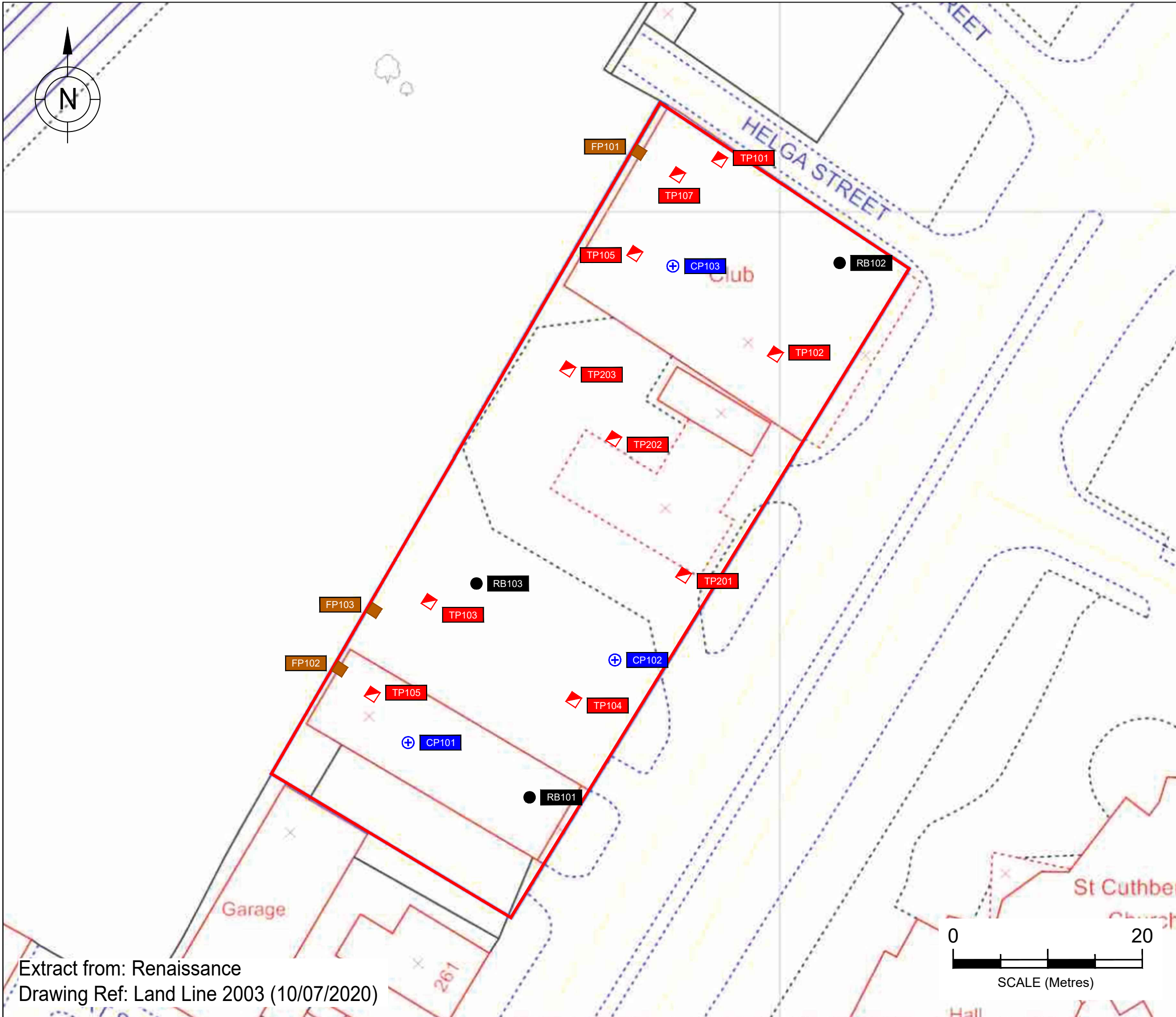


Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing 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.



Title: **Proposed Site Use**

Job No.: LKC 20 1913		Scale (See Scale Bar): See Scale Bar		Figure: 2	Revision:
Drawn By: AC	Checked By: RP	Drawn: May 2021			



KEY

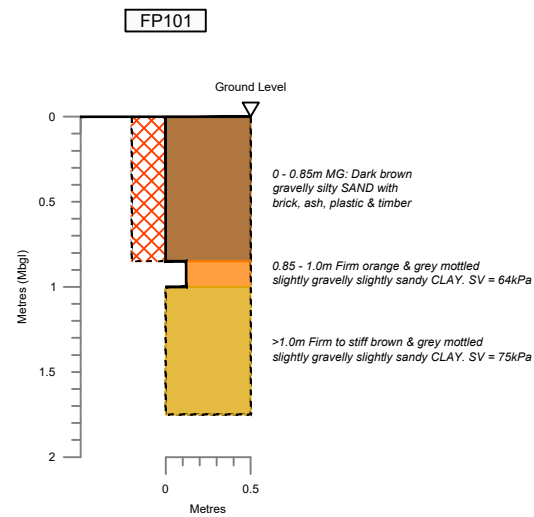
- Site Boundary
- Trial Pit (TP)
- Cable Percussive Borehole (CP)
- Rotary Borehole (RB)
- Foundation Pit (FP)

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.

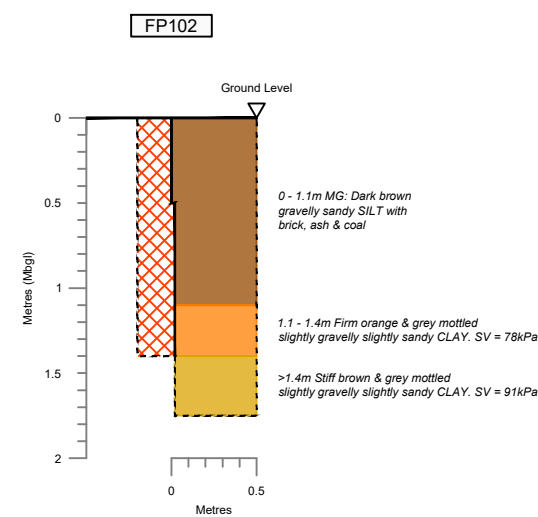


Client:		MPH Ancoats Ltd	
Site:		Osborne's Yard, Miles Platting	
Title:		Site Investigation Location Plan	
Job No.:	LKC 20 1913	Scale (See Scale Bar):	See Scale Bar
Drawn By:	AC	Checked By:	RP
Figure:		Revision:	
3		A	

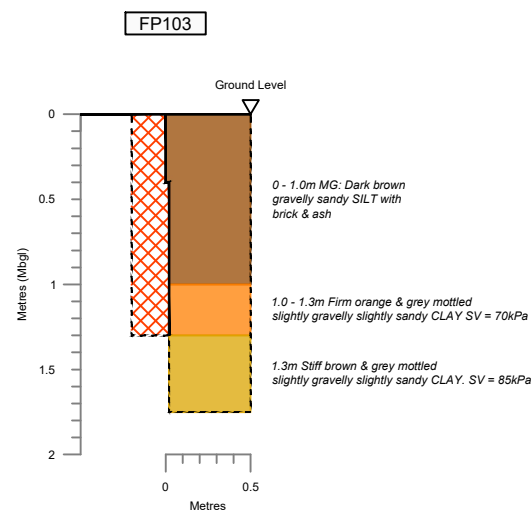
FP101



FP102



FP103



KEY



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:			
MPH Ancoats Ltd			
Site:			
Osborne's Yard, Miles Platting			
Title:			
Foundation Pit Sections			
Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC 20 1913	See Scale Bar	4	
Drawn By:	Checked By:	May 2021	
AC	RP		

Appendix A

Risk Matrix

Risk Evaluation

The method for risk evaluation is a qualitative method of interpreting the output from the risk estimation stage of the assessment, based on CIRIA 552⁵⁸. It involves the classification of the:

- » Magnitude of the potential consequence (severity) of the risk occurring (Table A).
- » Magnitude of the probability (likelihood) of the risk occurring (Table B).

Consequence (Severity)		
Classification	Definition	Example
Severe	- Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. - Short term risk of pollution (note: water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. - Catastrophic damage to buildings/properties. - A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definition of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	- High Concentrations of cyanide on the surface of an informal recreation area. - Major spillage of contaminants from site into controlled waters. - Explosion, causing building collapse (can also equate to short term human health risk if buildings are occupied).
Medium	- Chronic damage to Human Health ('significant harm' as defined in DETR, 2000). - Pollution of sensitive water resources (note Water Resources Act contains no scope for considering significance of pollution). - A significant change in a particular ecosystem, or organism forming part of such ecosystem.	- Concentrations of a contaminant from site exceed generic, or site-specific assessment criteria. - Leaching of contaminants from a site to a major or minor aquifer (Principal and Secondary). - Death of a species within a designated nature reserve.
Mild	- Pollution of non-sensitive water resources. - Significant damage to crops, buildings, structures and services ('significant harm' as defined in DETR, 2000). - Damage to sensitive buildings/structures/services or the environment.	- Pollution of non-classified groundwater. - Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	- Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. - Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). - Easily repairable damage to buildings, structures and services.	- The presence of contaminants at such concentrations that protective equipment is required during site works. - The loss of plants in a landscaping scheme. - Discoloration of concrete.

Table A: Classification of Consequence.

Probability (Likelihood)	
Classification	Definition
High Likelihood	- There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	- There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. - Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	- There is a pollutant linkage and circumstances are possible under which an event could occur. - However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	- There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur in the very long term.

Table B: Classification of Probability.

⁵⁸ CIRIA C552 (2001) Contaminated Land Risk Assessment - A Guide to Good Practice.

These classifications are then compared to indicate the risk presented by each pollutant linkage (Table C). It is important that this classification is only applied where there is a possibility (which can range from high likelihood to unlikely) of a pollutant linkage existing.

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk
	Likely	High Risk	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table C: Comparison of Consequence against Probability.

Once the risk has been determined the corresponding action can be assessed (Table D).

Risk	Action Required
Very High Risk	- There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. - This risk, if realised, is likely to result in a substantial liability. - Urgent investigation (if not already undertaken) and remediation are likely to be required.
High Risk	- Harm is likely to arise to a designated receptor from an identified hazard. - Realisation of the risk is likely to present a substantial liability. - Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	- It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. - Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	- It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	- There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table D: Description of the Classification and Likely Action Required.

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

Appendix B

Profile Logs

Excavation Method

JCB 3CX

Dimensions

2.0m x 0.8m x 1.8m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**
LKC 20 1913

Location (Handheld GPS)

385596 E 399606 N

Dates

27/04/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.10 0.00-1.10	B 0.1ppm ES				(1.10)	MADE GROUND: Dark brown gravelly sandy SILT with frequent brick, ash and occasional plastic. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.		
1.10-1.80 1.10-1.80 1.10	B <0.1ppm ES PP 120.58kPa		36.79, 134.89, 122.62, 134.89, 134.89, 159.41/Av. 120.58		1.10 (0.70) 1.80	Firm to stiff consistency high strength brown and grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subangular to subrounded. Complete at 1.80m		


Remarks

Trial Pit stable.
Perched water entering the pit from 1.2mbgl (below relic foundations).
Relic brick foundation leading to stanchion noted across southern side of the pit to 1.2mbgl.
GPS Co-ordinates taken from GB Converter app (+/-6m accuracy).

Scale (approx)

1:20

Logged By

RP

Figure No.

LKC 20 1913.TP101

Excavation Method

JCB 3CX

Dimensions

0.7m x 2.4m x 1.7m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location (Handheld GPS)

385594 E 399589 N

Dates

27/04/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-0.60 0.15-0.60	B 0.1pm ES				(0.15) 0.15	MADE GROUND: CONCRETE underlain by blue plastic membrane.		
0.60-1.70 0.60-1.70	B <0.1ppm ES		24.5, 36.8, 36.8, 24.5, 24.5, 24.5, 24.5/Av. 28.01		(0.45) 0.60	MADE GROUND: Dark brown sandy gravelly SILT with frequent coal and occasional ash and brick fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.		
0.65	PP 28.01kPa					Soft to firm consistency low to high strength brown slightly sandy CLAY. Sand is fine to medium.		
1.00	PP 136.95kPa		122.6, 147.2, 147.2, 122.6, 134.9, 147.2/Av. 136.95		(1.10) 1.70			
			Water strike(1) at 1.70m.			Complete at 1.70m		∇1


Remarks

Trail Pit stable.
Trial Pit wet at base.
GPS Co-ordinates taken from GB Converter app (+/-6m accuracy).

Scale (approx)

1:20

Logged By

RP

Figure No.

LKC 20 1913.TP102

Excavation Method

JCB 3CX

Dimensions

0.7m x 2.5m x 1.6m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**
LKC 20 1913

Location (Handheld GPS)

385563 E 399564 N

Dates

27/04/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30-0.55 0.30-0.55	B 0.1ppm ES				(0.30)	MADE GROUND: Concrete and bricks.		
0.55-0.80 0.55-0.80	B 0.2pm ES				0.30 (0.25)	MADE GROUND: Dark brown gravelly sandy SILT with frequent ash, brick and coal fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to angular.		
0.60 0.80-1.00 0.80-1.00	PP 21.45kPa B 0.1ppm ES		24.5, 12.26, 36.79, 12.26/Av. 21.45		0.55 (0.25)	Soft to firm consistency low strength dark grey slightly gravelly slightly sandy CLAY with slight hydrocarbon odour. Sand is fine to medium. Gravel is fine to medium subangular to subrounded.		
1.00 1.40-1.60 1.40-1.60	 PP 145.11kPa B 0.1ppm ES		98.1, 110.36, 147.15, 159.41, 171.68, 183.94/Av. 145.11		0.80 (0.80)	Firm to stiff consistency high strength orange and grey mottled slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is fine to medium subangular to subrounded.		
					1.60	Complete at 1.60m		


Remarks

Trial Pit stable and dry.
Relic clay pipe north western end of pit with slight hydrocarbon odour noted.
GPS Co-ordinates taken from GB Converter app (+/-6m accuracy).

Scale (approx)

1:20

Logged By

RP

Figure No.

LKC 20 1913.TP103

Excavation Method

JCB 3CX

Dimensions

0.7m x 2.3m x 1.6m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location (Handheld GPS)

385572 E 399546 N

Dates

28/04/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00 0.00-1.00	B <0.1ppm ES					MADE GROUND: Dark brown gravelly sandy SILT with frequent ash, brick, occasional clay pipe and slate, rare oyster shells. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.		
1.00-1.40 1.00-1.40 1.00 1.00	B <0.1ppm ES PP 73.58kPa SV 76kPa		110.36, 49.05, 49.05, 36.79, 159.41, 73.58, 36.79/Av. 73.58 74, 106, 40, 84/Av. 76.00		(1.00) 1.00 (0.60) 1.60	Brick and slate channel runs across central width of trial pit from 0.9-1.3mbgl and is 0.2m wide. Possible relic drainage channel. Firm to stiff consistency medium to high strength orange and grey mottled slightly sandy CLAY. Sand is fine to medium.		
						Complete at 1.60m		


Remarks

Trial Pit stable and dry.
Natural clay encountered from 0.7mbgl in the northern end of pit.
GPS Co-ordinates taken from GB Converter app (+/-6m accuracy).

Scale (approx)

1:20

Logged By

RP

Figure No.

LKC 20 1913.TP104

Excavation Method JCB 3CX	Dimensions 0.7m x 2.5m x 1.9m	Ground Level (mOD)	Client MPH Ancoats Ltd	Job Number LKC 20 1913
	Location (Handheld GPS) 385560 E 399552 N	Dates 28/04/2021	Engineer LKC	Sheet 1/1

[illegible]

Remarks

Trial Pit collapsing between 0.0-0.8mbgl.
Slow water seepage at 1.0mbgl from below relic brick wall northern end of pit.
Relic brick wall northern end of pit will possible former clay pipe seeping water.
GPS Co-ordinates taken from GB Converter app (+/-6m accuracy).

Scale (approx)

1:20

Logged By

RP

Figure No.

LKC 20 1913.TP105

Excavation Method

JCB 3CX

Dimensions

0.7m x 1.9m x 1.55m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location (Handheld GPS)

385583 E 399597 N

Dates

28/04/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-0.60 0.15-0.60	B 0.1ppm ES				(0.15) 0.15	MADE GROUND: CONCRETE underlain by blue plastic membrane.		
					(0.45)	MADE GROUND: Dark brown sandy silty GRAVEL with relic brick and concrete conglomerate foundation and frequent ash, clinker and brick fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.		
0.60 0.60-1.00	SV 80.8kPa B 0.3ppm		68, 85, 86, 83, 82/Av. 80.80		0.60	Firm to stiff consistency medium to high strength orange and grey mottled slightly gravelly slightly sandy CLAY becoming brown and grey mottled from 1mbgl. Sand is fine to medium. Gravel is fine to medium subangular to subrounded.		
1.00	SV 89kPa		95, 85, 87/Av. 89.00		(0.95)			
1.40-1.55 1.50	B 0.0ppm SV 135.67kPa		126, 142, 139/Av. 135.67		1.55	Complete at 1.55m		


Remarks

Trial Pit stable and dry.
GPS Co-ordinates taken from GB Converter app (+/-6m accuracy).

Scale (approx)

1:20

Logged By

RP

Figure No.

LKC 20 1913.TP106

Excavation Method

JCB 3CX

Dimensions

1.6 x 2.5m x 1.6m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**
LKC 20 1913

Location (Handheld GPS)

385591 E 399605 N

Dates

28/04/2021

Engineer

LKC

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-0.60 0.00-0.60	B 0.1ppm ES				(0.60)	MADE GROUND: Dark brown gravelly silty SAND with frequent timber, wires, paint container, plastic, polystyrene, brick and ash. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.		
0.80 0.80-1.00	SV 65.5kPa B <0.1ppm		63, 67, 74, 58/Av. 65.50		0.60 (0.20) 0.80	MADE GROUND: Relic brick and concrete conglomerate foundation.		
1.00	SV 77.75kPa		73, 71, 90, 77/Av. 77.75		(0.80)	Firm to stiff consistency medium to high strength orange and grey mottled slightly gravelly slightly sandy CLAY becoming brown and grey mottled from 1mbgl .		
1.40	SV 104kPa		97, 101, 94, 118, 110/Av. 104.00		1.60	Complete at 1.60m		


Remarks

Trial Pit stable and dry.
Trial Pit widened to avoid underground concrete obstruction at 0.45mbgl.
GPS Co-ordinates taken from GB Converter app (+/-6m accuracy).

Scale (approx)

1:20

Logged By

RP

Figure No.

LKC 20 1913.TP107

Excavation Method

Slow scrape with 13T tracked excavator

Dimensions

0.70m x 1.00m x 0.70m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location (Observed measurements)

Dates

02/02/2022

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.70-0.70	ES1 <0.1ppm				(0.10)	MADE GROUND: TARMACADAM.		
					0.10	MADE GROUND: Reddish brown sandy clayey gravel comprising brick, ash, tarmacadam and concrete. Highly compacted.		
					(0.30)			
					0.40	MADE GROUND: Brown sandy gravelly CLAY with abundant whole brick, brick fragments and concrete fragments.		
					(0.30)			
					0.70	Terminated at 0.70m		
				</				


Remarks

TP terminated as 2no. services encountered at 0.7mbgl.
TP stable and dry.

Scale (approx)

1:20

Logged By

BS

Figure No.

LKC 20 1913.TP201

Excavation Method

Slow scrape with 13T tracked excavator

Dimensions
Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location (Observed measurements)

Dates

02/02/2022

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.20-1.20	ES1 195ppm				(0.10) 0.10	MADE GROUND: TARMACADAM.		
					(1.20)	MADE GROUND: Brick and concrete foundations with brick rubble, gravel and clay backfill between. Possible ACM fire blanket noted in amongst the brick rubble. Strong hydrocarbon odour from 0.90mbgl.		
					1.30	Terminated at 1.30m		


Remarks

TP terminated on influx of visually contaminated groundwater at 1.30mbgl. TP stable.

Scale (approx)

1:20

Logged By

BS

Figure No.

LKC 20 1913.TP202

Excavation Method

Slow scrape with 13T tracked excavator

Dimensions

0.70m x 1.50m x 1.30m

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location (Observed measurements)

Dates

02/02/2022

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.70	ES1 0.1ppm				(0.10) 0.10	MADE GROUND: TARMACADAM.		
					(1.20)	MADE GROUND: Reddish brown sandy gravelly CLAY with abundant brick rubble, gravel and concrete.		
						Slight hydrocarbon odour from 1.10mbgl.		
1.20-1.20	ES2 173ppm				1.30	Terminated at 1.30m		


Remarks

TP stable.
TP terminated on influx of visually contaminated groundwater at 1.30mbgl.

Scale (approx)

1:20

Logged By

BS

Figure No.

LKC 20 1913.TP203

Boring Method

Cable Percussion

Casing Diameter

150mm to

Ground Level (mOD)
Client

MPH Ancoats Ltd

Job Number

LKC 20 1913

Location
Dates

10/05/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1					(1.00)	MADE GROUND: Dark brown gravelly silty SAND with brick, and ash. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.			
0.90	D2					1.00				
1.20-1.65	SPT N=13			1,2/2,3,4,4		(0.40)	Firm consistency orangish brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.			
1.20-1.65	X3					1.40				
1.70-2.00	B4									
2.20-2.65	U5					(1.90)	Firm consistency brown slightly sandy CLAY. Sand is fine to coarse.			
2.70	D6									
3.30-3.75	SPT N=21			3,3/4,5,5,7		3.30	Firm to stiff consistency brown silty CLAY.			
3.30-3.75	X7									
4.00-4.30	B8			3,4/5,5,5,6						
4.30-4.75	SPT N=21									
4.30-4.75	X9									
5.40-5.85	SPT N=15			3,3/3,4,4,4			Soft to firm consistency noted in bulk sample taken at 5.4-5.85mbgl.			
5.40-5.85	X10									
						(6.80)				
7.00-7.45	U11									
7.50	D12									
8.50-8.95	SPT N=16			3,4/4,4,4,4						
8.50-8.75	X13									
10.10-10.55	SPT N=24			3,5/5,6,6,7		10.10	Firm to stiff consistency brown slightly gravelly CLAY. Gravel is fine subangular to subrounded of coal.			
10.10-10.55	X14					(1.60)				
11.70-12.10	SPT 50/245			6,9/11,16,18,5		11.70	Stiff consistency greyish brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to medium subangular to subrounded of coal and mudstone.			
11.70-12.10	X15									
12.50-12.80	B16									
13.20-13.65	SPT N=39			6,7/10,10,10,9		(3.32)				
13.20-13.65	X17									
14.70-15.02	SPT 50/170			7,10/18,22,10		15.02	Complete at 15.02m			
14.70-15.00	X18									

Remarks

Borehole dry.

Scale (approx)

1:100

Logged By

RP

Figure No.

LKC 20 1913.CP101

Boring Method

Cable Percussion

Casing Diameter

150mm to

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location
Dates

13/05/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1					(1.10)	MADE GROUND: Dark brown gravelly sandy SILT with ash and brick fragments. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.			
1.00	D2					1.10				
1.20-1.65	SPT N=15			3,3/3,4,4,4			Stiff consistency orangish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.			
1.20-1.65	X3									
1.70-2.00	B4					(2.10)				
2.30-2.75	SPT N=16			3,3/4,4,4,4						
2.30-2.75	X5									
3.20-3.65	SPT N=20			4,4/5,5,5,5		3.20	Stiff consistency brown slightly gravelly CLAY. Gravel is fine to medium of coal.			
3.20-3.65	X6									
4.30-4.75	U7									
4.80	D8									
5.00-5.30	B9			3,4/4,4,5,6						
5.30-5.75	SPT N=19									
5.30-5.75	X10									
6.90-7.35	SPT N=19			3,4/4,4,5,6						
6.90-7.35	X11									
8.30-8.75	U12									
8.80	D13					(12.03)				
10.00-10.45	SPT N=21			3,4/5,5,5,6						
10.00-10.45	X14									
11.60-12.00	SPT 50/245			7,8/10,14,20,6						
11.60-12.00	X15									
12.00-12.30	B16									
13.20-13.65	SPT N=39			7,8/9,10,10,10						
13.20-13.65	X17									
14.80-15.23	SPT 50/275			8,9/11,14,14,11		15.23	Complete at 15.23m			
14.80-15.23	X18									

Remarks

Borehole dry.

**Scale
(approx)**

1:100

**Logged
By**

RP

Figure No.

LKC 20 1913.CP102

Boring Method

Cable Percussion

Casing Diameter

150mm to

Ground Level (mOD)
Client

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location
Dates

11/05/2021

Engineer

LKC

Sheet

1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1					0.15 (0.45) 0.60	MADE GROUND: CONCRETE.			
0.80	D2					(0.90)	MADE GROUND: Dark brown sandy silty GRAVEL with brick, ash and concrete. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.			
1.20-1.65 1.20-1.65	SPT N=18 X3			1,3/3,4,4,7		1.50	Stiff consistency orangish brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded.			
2.00-2.30 2.30-2.75 2.30-2.80	B4 SPT N=20 X5			2,3/4,5,5,6			Stiff to very stiff brown slightly gravelly CLAY. Gravel is fine to medium subangular to angular of coal.			
3.30-3.80 3.80	U6 D7									
4.30-4.75 4.30-4.80	SPT N=19 X8			3,4/4,5,5,5						
5.40-5.85 5.40-5.85	SPT N=19 X9			4,4/4,5,5,5						
7.00-7.45 7.00-7.45	SPT N=20 X10			3,4/4,5,5,6						
8.60-9.05 8.60-9.05	SPT N=20 X11			3,3/4,4,5,7		(13.51)				
10.00-10.45 10.50	U12 D13									
11.60-12.05 11.60-12.05 12.00-12.30	SPT N=37 X14 B15			7,7/8,9,10,10						
13.10-13.55 13.10-13.55	SPT N=40 X16			6,8/9,10,10,11						
14.60-15.01 14.60-15.01	SPT 50/255 X17			10,12/13,15,15,7		15.01	Brown very sandy CLAY noted in SPT at 14.6-15.0m. Complete at 15.01m			

Remarks
Borehole dry.

**Scale
(approx)**
1:100

**Logged
By**
RP

Figure No.
LKC 20 1913.CP103

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

Osborne's Yard, Miles Platting

**Borehole
Number****RB101****Machine** : Comacchio 205**Flush** : Water - mist**Core Dia** : mm**Method** : Rotary Openhole**Casing Diameter****Ground Level (mOD)****Client**

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location**Dates**

10/05/2021

Engineer

LKC

Sheet

1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.50) 1.50	MADE GROUND: Brick.		
								Brown CLAY with sand bands.		
							(14.30)			
							15.80 (1.00) 16.80	Red MUDSTONE.		
							(2.70)	Dark grey MUDSTONE.		
							19.50 (3.10)	Light grey MUDSTONE.		
							22.60 (9.00)	Light grey SILTSTONE.		
							31.60 (8.40)	Brown/red SILTSTONE with red sandstone bands.		
							40.00			

Remarks

Driller's description.

**Scale
(approx)**

1:200

**Logged
By**

DT

Figure No.

LKC 20 1913.RB101



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

Site
Osborne's Yard, Miles Platting

Borehole Number
RB102

Machine : Comacchio 205 Flush : Water - mist Core Dia : mm Method : Rotary Openhole	Casing Diameter	Ground Level (mOD)	Client MPH Ancoats Ltd	Job Number LKC 20 1913
	Location	Dates 11/05/2021	Engineer LKC	Sheet 1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.80) 0.80	MADE GROUND: Brick. Light brown CLAY with sand bands.		
							(14.70)			
							15.50	Light grey MUDSTONE.		
							(4.30)			
							19.80 20.20	COAL - intact. Light grey MUDSTONE.		
							(3.30)			
							23.50	Light grey SANDSTONE.		
							(2.40)			
							25.90	Dark grey SILTSTONE.		
							(3.60)			
							29.50	Light grey SILTSTONE.		
							(8.00)			
							37.50	Brown/red SILTSTONE.		
							(2.50)			
							40.00			

Remarks Driller's description.	Scale (approx)	Logged By
	1:200	DT
	Figure No. LKC 20 1913.RB102	

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

Osborne's Yard, Miles Platting

**Borehole
Number****RB103****Machine** : Comacchio 205**Flush** : Water mist**Core Dia** : mm**Method** : Rotary Openhole**Casing Diameter****Ground Level (mOD)****Client**

MPH Ancoats Ltd

**Job
Number**

LKC 20 1913

Location**Dates**

14/05/2021

Engineer

LKC

Sheet

1/1

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.60) (0.60) (0.60) (1.20)	MADE GROUND: Brick. Dark grey silty CLAY. Brown CLAY with sand bands.	  	
							(14.80)			
							16.00 (3.50)	Light grey MUDSTONE.		
							19.50 (14.90)	Red/brown SILTSTONE with red sandstone bands.		
							34.40 (2.60)	Light grey SANDSTONE.		
							37.00 (3.00)	Light grey MUDSTONE.		
							40.00			

Remarks

Driller's description.

**Scale
(approx)**

1:200

**Logged
By**

DT

Figure No.

LKC 20 1913.RB103

Appendix C

Certificates of Analysis – Soil



Final Report

Report No.: 21-14038-1
Initial Date of Issue: 07-May-2021
Client LK Consult
Client Address: Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Manchester
Lancashire
M26 2ZS
Contact(s): Contaminated Land
Rachel Peart
Project LKC 20 1913 Osborne's Yard, Miles
Platting

Quotation No.:		Date Received:	29-Apr-2021
Order No.:	738610	Date Instructed:	30-Apr-2021
No. of Samples:	5		
Turnaround (Wkdays):	5	Results Due:	07-May-2021
Date Approved:	07-May-2021		

Approved By:

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Miles Platting

Client: LK Consult	Chemtest Job No.:				21-14038	21-14038	21-14038	21-14038	21-14038
Quotation No.:	Chemtest Sample ID.:				1189825	1189827	1189829	1189830	1189832
	Client Sample ID.:				TP101	TP102	TP103	TP103	TP104
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.00	0.15	0.55	0.80	0.00
	Bottom Depth (m):				1.10	0.60	0.80	1.00	1.00
	Date Sampled:				27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	28-Apr-2021
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD					
ACM Type	U	2192		N/A	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-
Moisture	N	2030	%	0.020	23	18	21	19	18
Soil Colour	N	2040		N/A	Brown	Grey	Grey	Grey	Black
Other Material	N	2040		N/A	Roots and Stones	Stones	Stones	None	Stones
Soil Texture	N	2040		N/A	Loam	Clay	Clay	Clay	Sand
Chromatogram (TPH)	N			N/A			See Attached		
pH	M	2010		4.0	7.3	7.2	7.1		7.3
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40			0.73		
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	0.020		< 0.010
Cyanide (Free)	M	2300	mg/kg	0.50			< 0.50		
Cyanide (Total)	M	2300	mg/kg	0.50			< 0.50		
Arsenic	M	2450	mg/kg	1.0	30	36	20		64
Cadmium	M	2450	mg/kg	0.10	0.71	0.48	0.50		0.63
Chromium	M	2450	mg/kg	1.0	26	23	24		32
Copper	M	2450	mg/kg	0.50	160	110	65		320
Mercury	M	2450	mg/kg	0.10	0.42	1.3	0.25		13
Nickel	M	2450	mg/kg	0.50	39	33	30		80
Lead	M	2450	mg/kg	0.50	340	400	66		3400
Selenium	M	2450	mg/kg	0.20	0.23	1.1	0.54		3.3
Vanadium	U	2450	mg/kg	5.0	73	46	38		< 5.0
Zinc	M	2450	mg/kg	0.50	200	130	99		330
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50		< 0.50
Organic Matter	M	2625	%	0.40	19	8.9	11	0.98	17
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	< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0			< 1.0	< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0			< 1.0	< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0			< 1.0	< 1.0	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0			< 1.0	< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0			< 1.0	< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0			< 5.0	< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0			< 1.0	< 1.0	

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Miles Platting

Client: LK Consult	Chemtest Job No.:				21-14038	21-14038	21-14038	21-14038	21-14038
Quotation No.:	Chemtest Sample ID.:				1189825	1189827	1189829	1189830	1189832
	Client Sample ID.:				TP101	TP102	TP103	TP103	TP104
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.00	0.15	0.55	0.80	0.00
	Bottom Depth (m):				1.10	0.60	0.80	1.00	1.00
	Date Sampled:				27-Apr-2021	27-Apr-2021	27-Apr-2021	27-Apr-2021	28-Apr-2021
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
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			< 1.0	< 1.0	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0			< 1.0	< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0			< 1.0	< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0			< 5.0	< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0			< 10	< 10	
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	< 0.10		0.27
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10		0.16
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10		0.17
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10		0.17
Phenanthrene	M	2800	mg/kg	0.10	0.57	0.53	0.17		1.9
Anthracene	M	2800	mg/kg	0.10	< 0.10	0.11	< 0.10		0.35
Fluoranthene	M	2800	mg/kg	0.10	0.56	0.57	0.16		1.8
Pyrene	M	2800	mg/kg	0.10	0.57	0.72	0.16		1.9
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.28	0.30	< 0.10		0.84
Chrysene	M	2800	mg/kg	0.10	0.37	0.37	< 0.10		0.88
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.39	0.46	< 0.10		1.0
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.17	0.18	< 0.10		0.40
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.28	0.33	< 0.10		0.77
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.21	0.20	< 0.10		0.49
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10		0.11
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.23	0.27	< 0.10		0.53
Total Of 16 PAH's	N	2800	mg/kg	2.0	3.6	4.0	< 2.0		12
Total Phenols	M	2920	mg/kg	0.10			< 0.10		

TPH Chromatogram on Soil Sample: 1189829

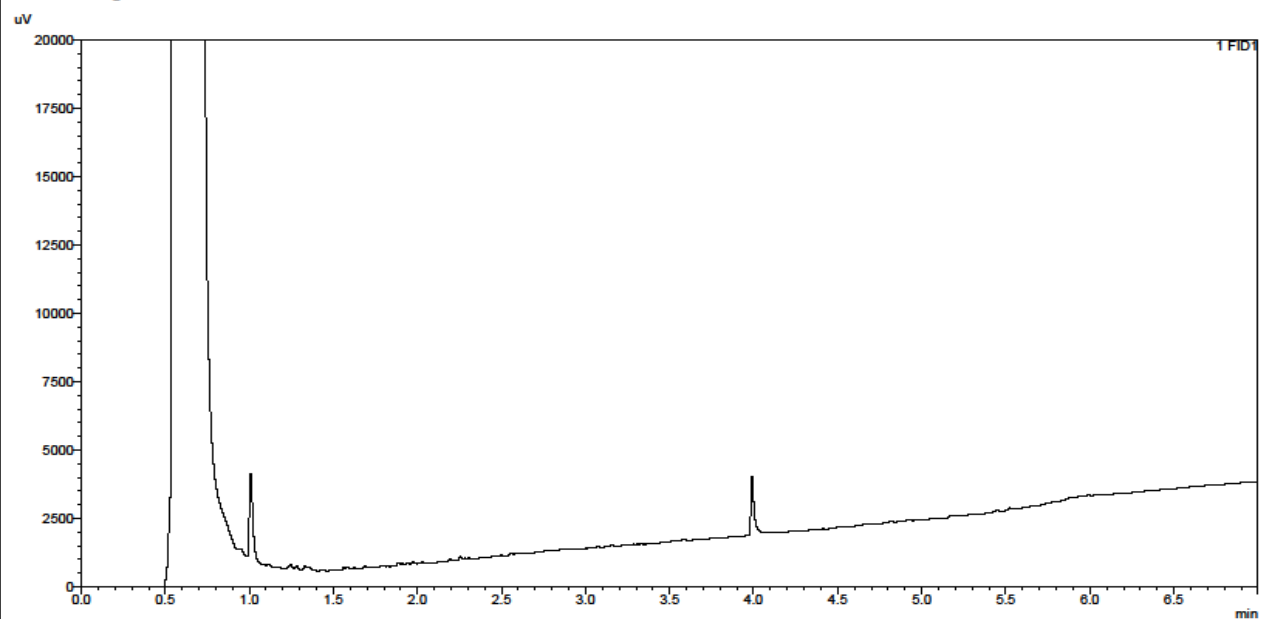
<Sample Information>

Sample Name : 1189829 21-14038
Data Filename : 2021-05-02_02052021_1189829 21-14038_027.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 14
Date Acquired : 02/05/2021 17:25:46
Date Processed : 02/05/2021



Chemtest

<Chromatogram>



TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
21-14038	1189829	S			TP103	0.55	No	N/A
21-14038	1189830	S			TP103	0.80	No	N/A

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*; Dibenz[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.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

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

customerservices@chemtest.com



Amended Report

Report No.:	22-03808-2		
Initial Date of Issue:	11-Feb-2022	Date of Re-Issue:	23-Feb-2022
Client	LK Consult		
Client Address:	Unit 29 Eton Business Park Eton Hill Road Radcliffe Manchester Lancashire M26 2ZS		
Contact(s):	Contaminated Land Rachel Peart		
Project	LKC 20 1913 Osborne's Yard, Manchester		
Quotation No.:		Date Received:	03-Feb-2022
Order No.:	739970	Date Instructed:	03-Feb-2022
No. of Samples:	4		
Turnaround (Wkdays):	5	Results Due:	09-Feb-2022
Date Approved:	23-Feb-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				22-03808	22-03808	22-03808	22-03808
Quotation No.:	Chemtest Sample ID.:				1364482	1364483	1364484	1364485
	Client Sample ID.:				TP201	TP202	TP203	TP203
	Sample Location:				TP201	TP202	TP203	TP203
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.7	1.2	0.1	1.2
	Bottom Depth (m):				0.7	1.2	0.7	1.2
	Date Sampled:				02-Feb-2022	02-Feb-2022	02-Feb-2022	02-Feb-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
ACM Type	U	2192		N/A	-	Fibres/Clumps	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001		0.002		
Total Asbestos	U	2192	%	0.001		0.002		
Moisture	N	2030	%	0.020	22	28	8.2	22
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown
MBAS	N	N/A	mg/kg	0.20	2.2	2.9		
Other Material	N	2040		N/A	None	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Sand	Sand	Sand
Chromatogram (TPH)	N			N/A			See Attached	See Attached
pH	M	2010		4.0	8.3	9.0	9.4	9.7
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.2	1.8	0.79	1.1
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.016	0.64	0.060	1.1
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2450	mg/kg	1.0	6.1	6.5	4.7	12
Cadmium	M	2450	mg/kg	0.10	< 0.10	0.41	0.27	0.19
Chromium	M	2450	mg/kg	1.0	22	14	21	17
Copper	M	2450	mg/kg	0.50	11	170	20	32
Mercury	M	2450	mg/kg	0.10	< 0.10	0.22	< 0.10	0.28
Nickel	M	2450	mg/kg	0.50	13	13	23	21
Lead	M	2450	mg/kg	0.50	16	270	44	74
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20	0.33
Vanadium	U	2450	mg/kg	5.0	37	18	16	22
Zinc	M	2450	mg/kg	0.50	24	160	50	66
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	1.9	6.7	2.5	7.8
Diesel Present	N	2670		N/A	False	True	False	False
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	100	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	1100	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	2900	< 1.0	140
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	9900	< 1.0	340
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	12000	< 1.0	460
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	2300	770	210
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				22-03808	22-03808	22-03808	22-03808
Quotation No.:	Chemtest Sample ID.:				1364482	1364483	1364484	1364485
	Client Sample ID.:				TP201	TP202	TP203	TP203
	Sample Location:				TP201	TP202	TP203	TP203
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.7	1.2	0.1	1.2
	Bottom Depth (m):				0.7	1.2	0.7	1.2
	Date Sampled:				02-Feb-2022	02-Feb-2022	02-Feb-2022	02-Feb-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	28000	770	1200
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	950	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	4800	< 1.0	73
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	1600	14	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	550	800	15
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	7900	810	88
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	36000	1600	1200
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0		
Chloromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Vinyl Chloride	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Bromomethane	M	2760	µg/kg	20	< 20	< 20		
Chloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0		
Trichlorofluoromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,1-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,1-Dichloroethane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0	< 5.0		
Trichloromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Tetrachloromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	M	2760	µg/kg	2.0	< 2.0	< 2.0		
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	< 1.0		
1,2-Dichloropropane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Dibromomethane	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Bromodichloromethane	M	2760	µg/kg	5.0	< 5.0	< 5.0		
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10		
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10		
1,1,2-Trichloroethane	M	2760	µg/kg	10	< 10	< 10		
Tetrachloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0		

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				22-03808	22-03808	22-03808	22-03808
Quotation No.:	Chemtest Sample ID.:				1364482	1364483	1364484	1364485
	Client Sample ID.:				TP201	TP202	TP203	TP203
	Sample Location:				TP201	TP202	TP203	TP203
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.7	1.2	0.1	1.2
	Bottom Depth (m):				0.7	1.2	0.7	1.2
	Date Sampled:				02-Feb-2022	02-Feb-2022	02-Feb-2022	02-Feb-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0	< 2.0		
Dibromochloromethane	U	2760	µg/kg	10	< 10	< 10		
1,2-Dibromoethane	M	2760	µg/kg	5.0	< 5.0	< 5.0		
Chlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	< 2.0	< 2.0		
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0		
Isopropylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Bromobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50		
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
2-Chlorotoluene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	< 50		
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		
Hexachlorobutadiene	U	2760	µg/kg	1.0	< 1.0	< 1.0		
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	< 2.0		
Carbon Disulphide	N	2760	µg/kg	50	< 50	< 50		
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Phenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2-Chlorophenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Bis-(2-Chloroethyl)Ether	M	2790	mg/kg	0.50	< 0.50	< 0.50		
1,3-Dichlorobenzene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50	< 0.50		

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				22-03808	22-03808	22-03808	22-03808
Quotation No.:	Chemtest Sample ID.:				1364482	1364483	1364484	1364485
	Client Sample ID.:				TP201	TP202	TP203	TP203
	Sample Location:				TP201	TP202	TP203	TP203
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.7	1.2	0.1	1.2
	Bottom Depth (m):				0.7	1.2	0.7	1.2
	Date Sampled:				02-Feb-2022	02-Feb-2022	02-Feb-2022	02-Feb-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
1,2-Dichlorobenzene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2-Methylphenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Bis(2-Chloroisopropyl)Ether	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50	< 0.50		
N-Nitrosodi-n-propylamine	M	2790	mg/kg	0.50	< 0.50	< 0.50		
4-Methylphenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Nitrobenzene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Isophorone	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50		
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50	< 0.50		
Bis(2-Chloroethoxy)Methane	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2,4-Dichlorophenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
1,2,4-Trichlorobenzene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Naphthalene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50		
Hexachlorobutadiene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
4-Chloro-3-Methylphenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2-Methylnaphthalene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50		
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50	< 0.50		
2,4,6-Trichlorophenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2,4,5-Trichlorophenol	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2-Chloronaphthalene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2-Nitroaniline	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Acenaphthylene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Dimethylphthalate	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2,6-Dinitrotoluene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Acenaphthene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50		
Dibenzofuran	M	2790	mg/kg	0.50	< 0.50	< 0.50		
4-Chlorophenylphenylether	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2,4-Dinitrotoluene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Fluorene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Diethyl Phthalate	M	2790	mg/kg	0.50	< 0.50	< 0.50		
4-Nitroaniline	M	2790	mg/kg	0.50	< 0.50	< 0.50		
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50		
Azobenzene	M	2790	mg/kg	0.50	< 0.50	< 0.50		

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				22-03808	22-03808	22-03808	22-03808
Quotation No.:	Chemtest Sample ID.:				1364482	1364483	1364484	1364485
	Client Sample ID.:				TP201	TP202	TP203	TP203
	Sample Location:				TP201	TP202	TP203	TP203
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.7	1.2	0.1	1.2
	Bottom Depth (m):				0.7	1.2	0.7	1.2
	Date Sampled:				02-Feb-2022	02-Feb-2022	02-Feb-2022	02-Feb-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
4-Bromophenylphenyl Ether	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Hexachlorobenzene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50		
Phenanthrene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Anthracene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Carbazole	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Di-N-Butyl Phthalate	M	2790	mg/kg	0.50	< 0.50	1.1		
Fluoranthene	M	2790	mg/kg	0.50	< 0.50	3.2		
Pyrene	M	2790	mg/kg	0.50	< 0.50	3.6		
Butylbenzyl Phthalate	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Benzo[a]anthracene	M	2790	mg/kg	0.50	< 0.50	1.4		
Chrysene	M	2790	mg/kg	0.50	< 0.50	1.5		
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50	1.5		
Di-N-Octyl Phthalate	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Benzo[b]fluoranthene	M	2790	mg/kg	0.50	< 0.50	2.2		
Benzo[k]fluoranthene	M	2790	mg/kg	0.50	< 0.50	0.72		
Benzo[a]pyrene	M	2790	mg/kg	0.50	< 0.50	2.0		
Indeno(1,2,3-c,d)Pyrene	M	2790	mg/kg	0.50	< 0.50	1.2		
Dibenz(a,h)Anthracene	M	2790	mg/kg	0.50	< 0.50	< 0.50		
Benzo[g,h,i]perylene	M	2790	mg/kg	0.50	< 0.50	1.6		
Naphthalene	M	2800	mg/kg	0.10			0.38	0.48
Acenaphthylene	N	2800	mg/kg	0.10			0.35	0.27
Acenaphthene	M	2800	mg/kg	0.10			6.2	0.33
Fluorene	M	2800	mg/kg	0.10			4.8	1.1
Phenanthrene	M	2800	mg/kg	0.10			34	2.2
Anthracene	M	2800	mg/kg	0.10			7.5	0.36
Fluoranthene	M	2800	mg/kg	0.10			34	1.4
Pyrene	M	2800	mg/kg	0.10			29	1.6
Benzo[a]anthracene	M	2800	mg/kg	0.10			14	0.62
Chrysene	M	2800	mg/kg	0.10			12	0.56
Benzo[b]fluoranthene	M	2800	mg/kg	0.10			16	0.60
Benzo[k]fluoranthene	M	2800	mg/kg	0.10			6.1	0.30
Benzo[a]pyrene	M	2800	mg/kg	0.10			15	0.65
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10			8.7	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10			1.5	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10			8.3	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0			200	11

Results - Soil

Project: LKC 20 1913 Osborne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				22-03808	22-03808	22-03808	22-03808
Quotation No.:	Chemtest Sample ID.:				1364482	1364483	1364484	1364485
	Client Sample ID.:				TP201	TP202	TP203	TP203
	Sample Location:				TP201	TP202	TP203	TP203
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.7	1.2	0.1	1.2
	Bottom Depth (m):				0.7	1.2	0.7	1.2
	Date Sampled:				02-Feb-2022	02-Feb-2022	02-Feb-2022	02-Feb-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

TPH Chromatogram on Soil Sample: 1364484

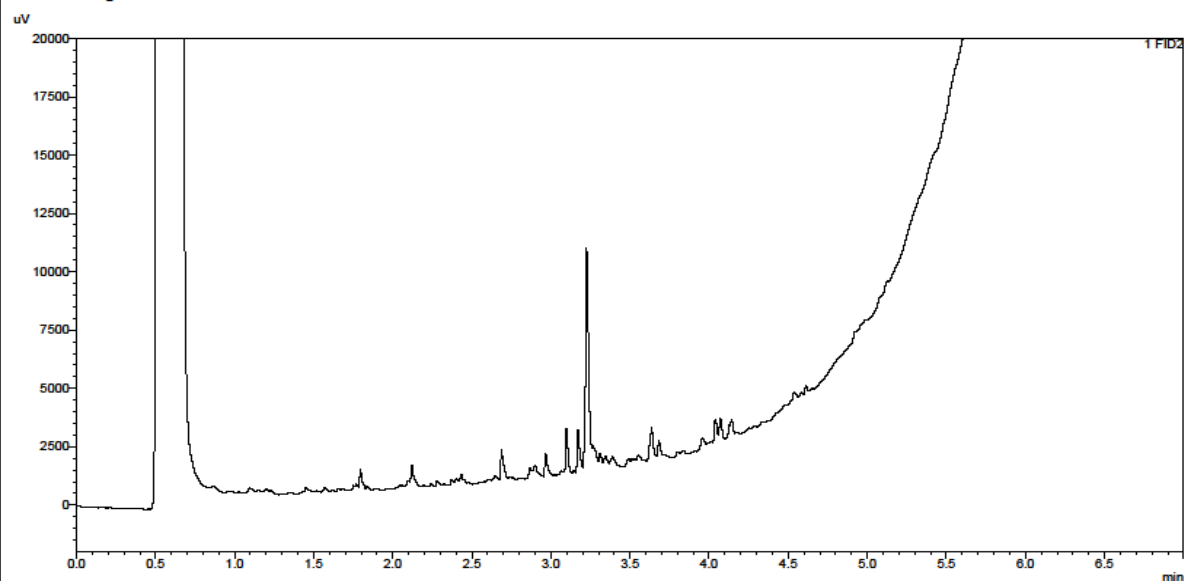
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Sample Name : 1364484 22-03808
Data Filename : 2022-02-03_03022022_1364484 22-03808_076.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 113
Date Acquired : 03/02/2022 23:37:13
Date Processed : 03/02/2022



Chemtest

<Chromatogram>



TPH Chromatogram on Soil Sample: 1364485

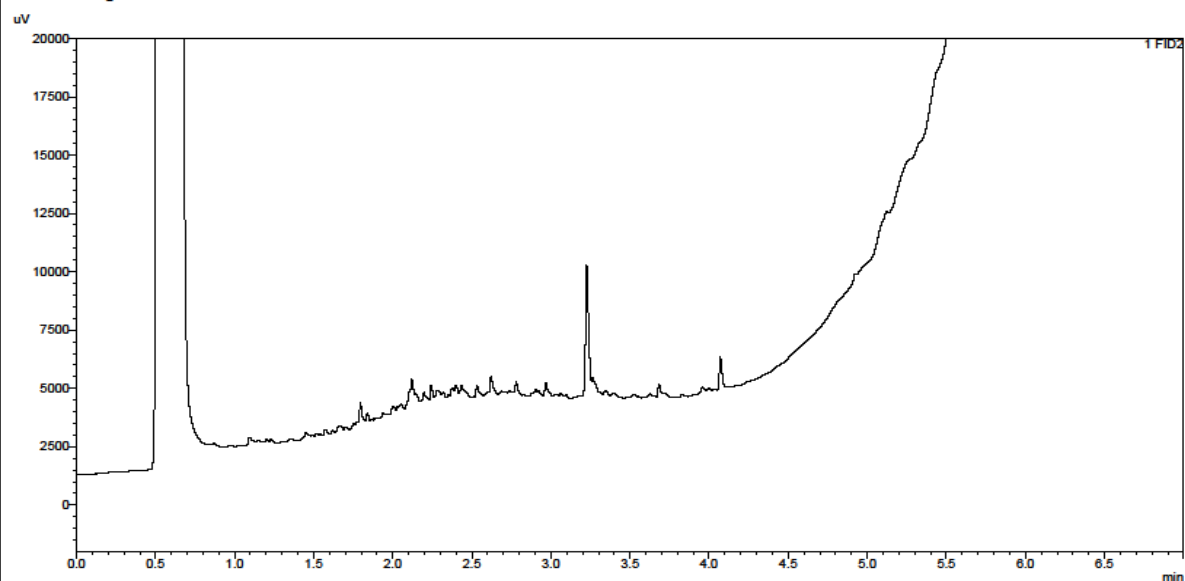
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Sample Name : 1364485 22-03808
Data Filename : 2022-02-03_03022022_1364485 22-03808_078.gcd
Method Filename : TPH 12m Fast OSv2.gcm
Sample # : 114
Date Acquired : 03/02/2022 23:49:50
Date Processed : 03/02/2022



Chemtest

<Chromatogram>



TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
22-03808	1364482	S	TP201		TP201	0.7	No	N/A
22-03808	1364483	S	TP202		TP202	1.2	Yes	Weathered Diesel
22-03808	1364484	S	TP203		TP203	0.1	No	N/A
22-03808	1364485	S	TP203		TP203	1.2	No	N/A

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.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
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.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

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

customerservices@chemtest.com

Appendix D

Certificates of Analysis - Geotechnical



TEST REPORT

Client LK Consult Ltd

Address Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Contract LKC 20 1913 -
Osbourne's Yard, Miles Platting

Job Number MRN 4066/98
Date of Issue 09 June 2021
Page 1 of 7

Approved Signatories

S J Hutchings, O P Davies

Notes

- 1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.
- 2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.
- 3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation
- 4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted. This does not, however, guarantee the balance of the materials from which the tested samples have been taken to be of equal quality.



Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

Murray Rix is the trading name of Murray Rix (Northern) Limited. Registered in England 2878361

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

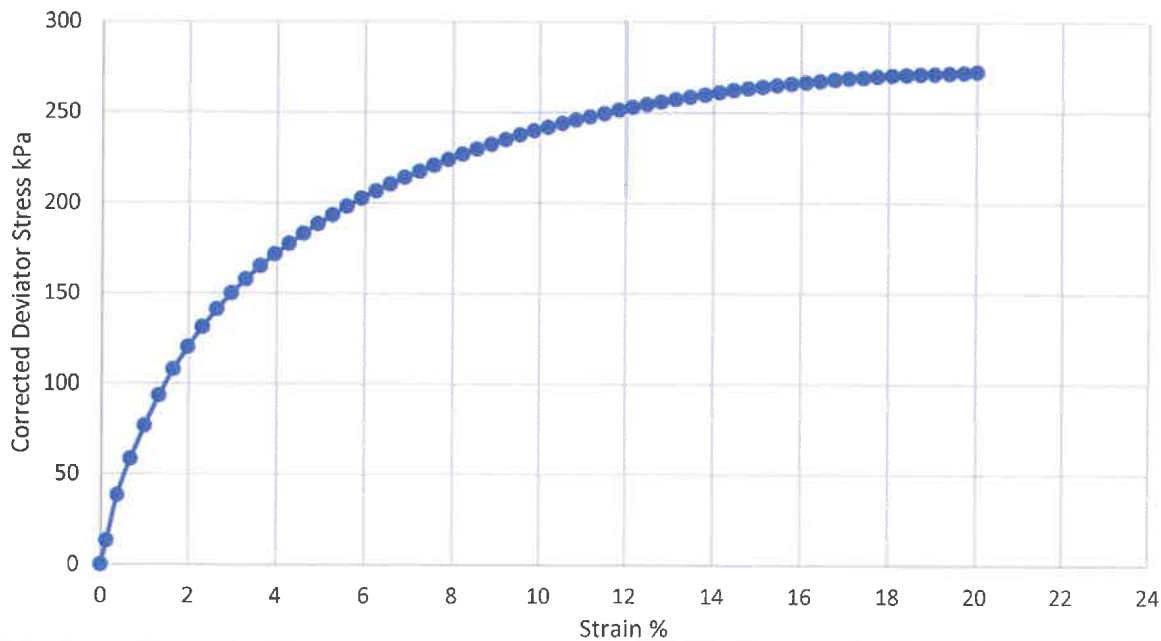
UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	LK Consult Ltd
SITE	LKC 20 1913 - Osborne's Yard, Miles Platting
JOB NUMBER	MRN 4066/98

SAMPLE LABEL	CP1 2.20-2.65m	DATE SAMPLED	Not advised
LAB SAMPLE No.	99088	DATE RECEIVED	18-May-21
DATE TESTED	04-Jun-21	SAMPLED BY	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

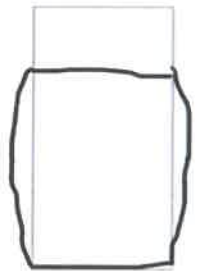
INITIAL CONDITIONS

Specimen Location		Sample Length (mm)	450	Specimen depth from top of Sample (mm)	20
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	203	Specimen Moisture Content (%)	18
		Specimen Diameter (mm)	102	Specimen Bulk Density (Mg/m3)	2.11
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.79
		Membrane Correction	1.48		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN

TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength c_u (kPa)
44	20	2	272	136

Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 09 June 2021

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TEL 0161 475 0870

TEST CERTIFICATE

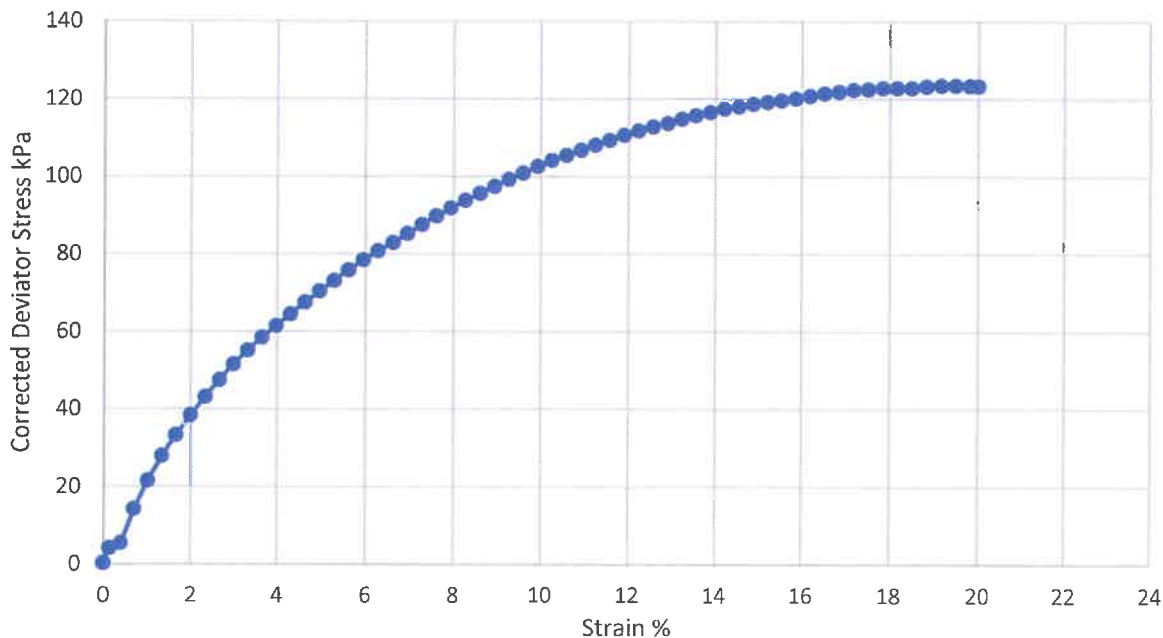
UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	LK Consult Ltd
SITE	LKC 20 1913 - Osborne's Yard, Miles Platting
JOB NUMBER	MRN 4066/98

SAMPLE LABEL	CP1 7.00-7.45m	DATE SAMPLED	Not advised
LAB SAMPLE No.	99089	DATE RECEIVED	18-May-21
DATE TESTED	04-Jun-21	SAMPLED BY	Client
MATERIAL	Firm brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

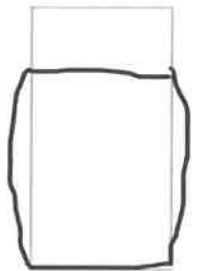
INITIAL CONDITIONS

Specimen Location 	Sample Length (mm)	450	Specimen depth from top of Sample (mm)	40
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	202	Specimen Moisture Content (%)	19
	Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m ³)	2.1
	Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m ³)	1.76
	Membrane Correction	1.49		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN

TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength c_u (kPa)
140	20	2	123	62

Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 09 June 2021

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TEL 0161 475 0870

TEST CERTIFICATE

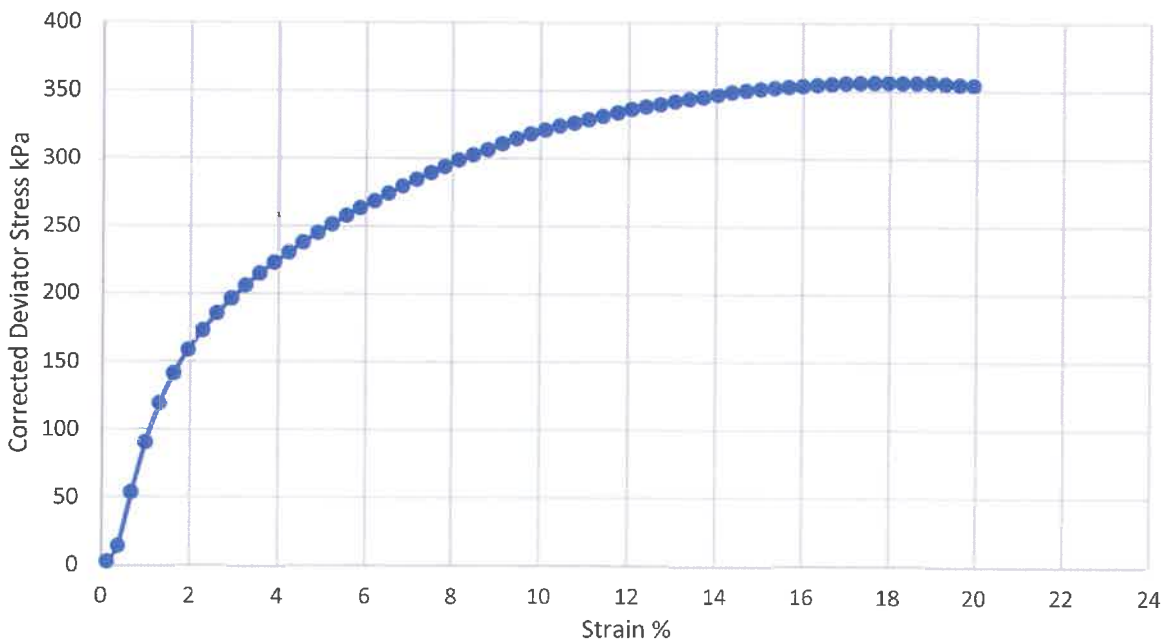
UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	LK Consult Ltd
SITE	LKC 20 1913 - Osborne's Yard, Miles Platting
JOB NUMBER	MRN 4066/98

SAMPLE LABEL	CP2 4.30-4.75m	DATE SAMPLED	Not advised
LAB SAMPLE No.	99090	DATE RECEIVED	18-May-21
DATE TESTED	04-Jun-21	SAMPLED BY	Client
MATERIAL	Stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

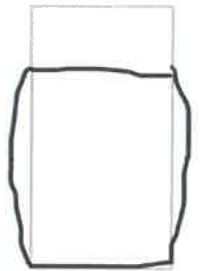
INITIAL CONDITIONS

Specimen Location		Sample Length (mm)	450	Specimen depth from top of Sample (mm)	40
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	203	Specimen Moisture Content (%)	19
		Specimen Diameter (mm)	102	Specimen Bulk Density (Mg/m3)	2.11
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.77
		Membrane Correction	1.53		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN

TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength C_u (kPa)
90	18	2	356	178

Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 09 June 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

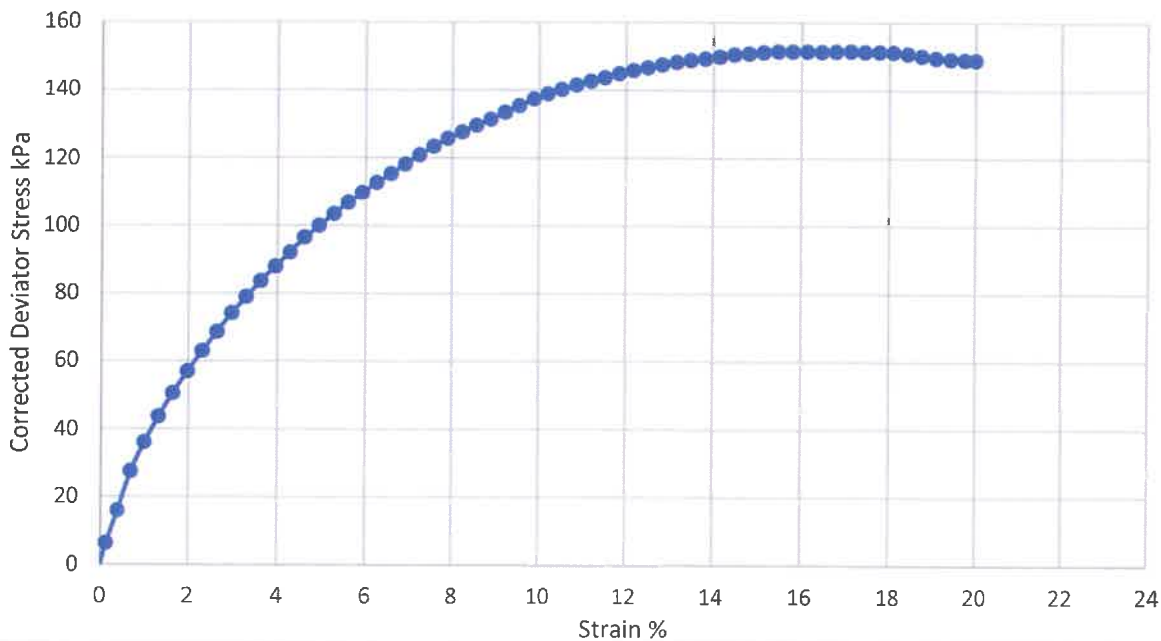
BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	LK Consult Ltd
SITE	LKC 20 1913 - Osborne's Yard, Miles Platting
JOB NUMBER	MRN 4066/98

SAMPLE LABEL	CP2 8.30-8.75m	DATE SAMPLED	Not advised
LAB SAMPLE No.	99091	DATE RECEIVED	18-May-21
DATE TESTED	04-Jun-21	SAMPLED BY	Client
MATERIAL	Firm to stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

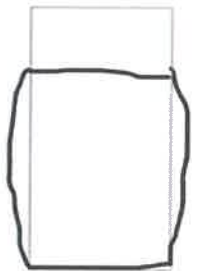
INITIAL CONDITIONS

Specimen Location		Sample Length (mm)	450	Specimen depth from top of Sample (mm)	75
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	203	Specimen Moisture Content (%)	19
		Specimen Diameter (mm)	103	Specimen Bulk Density (Mg/m3)	2.08
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.75
		Membrane Correction	1.47		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN

TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength c_u (kPa)
170	17	2	152	76

Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 09 June 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

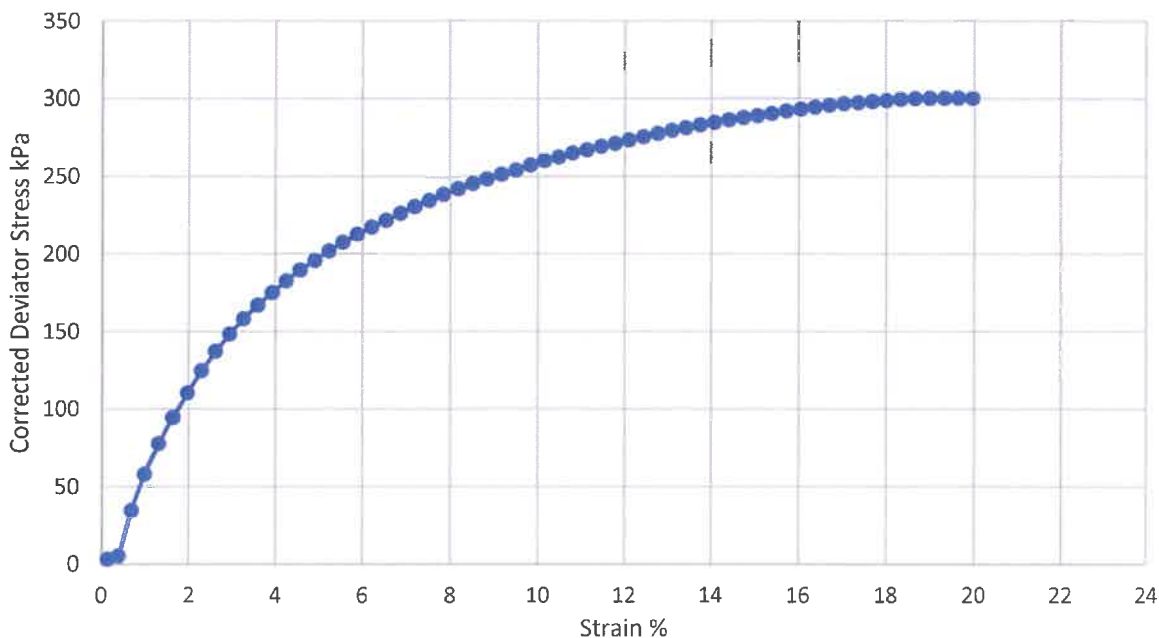
BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	LK Consult Ltd
SITE	LKC 20 1913 - Osborne's Yard, Miles Platting
JOB NUMBER	MRN 4066/98

SAMPLE LABEL	CP3 3.30-3.75m	DATE SAMPLED	Not advised
LAB SAMPLE No.	99092	DATE RECEIVED	18-May-21
DATE TESTED	04-Jun-21	SAMPLED BY	Client
MATERIAL	Firm to stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

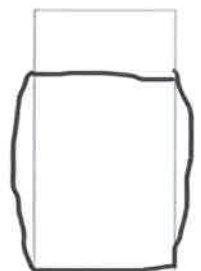
INITIAL CONDITIONS

Specimen Location		Sample Length (mm)	450	Specimen depth from top of Sample (mm)	60
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	203	Specimen Moisture Content (%)	19
		Specimen Diameter (mm)	102	Specimen Bulk Density (Mg/m3)	2.11
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.77
		Membrane Correction	1.48		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN

TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
70	20	2	300	150

Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed



Date 09 June 2021

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

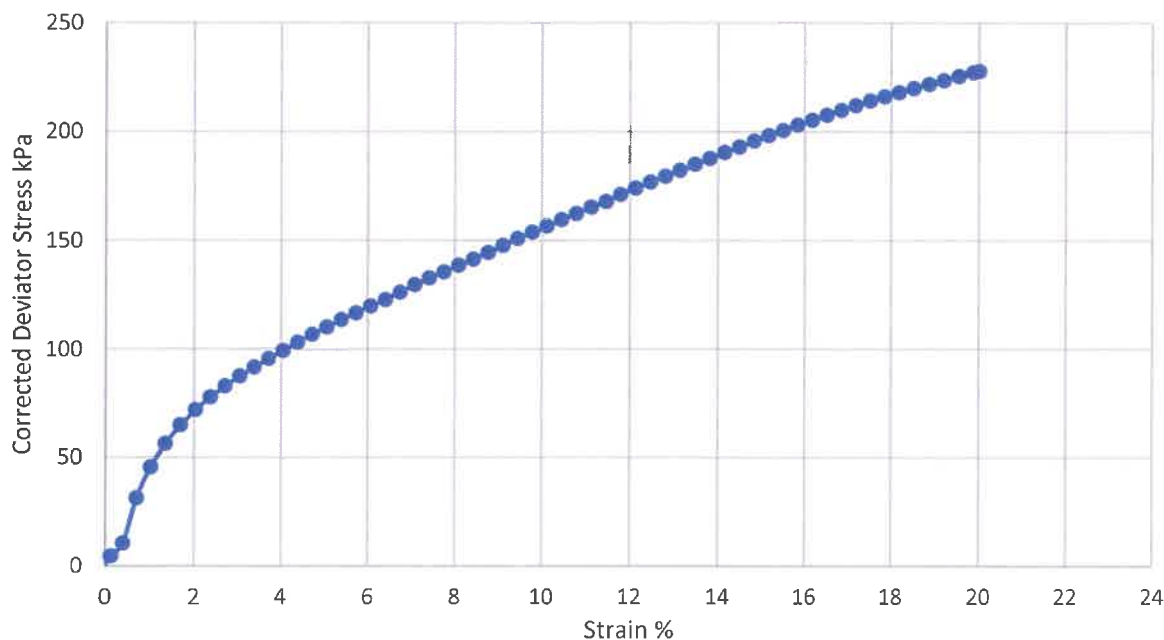
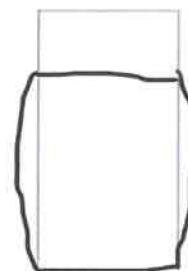
BS 1377 : PART 7: Clause 8 Single Stage

CLIENT	LK Consult Ltd
SITE	LKC 20 1913 - Osborne's Yard, Miles Platting
JOB NUMBER	MRN 4066/98

SAMPLE LABEL	CP3 10.00-10.45m	DATE SAMPLED	Not advised
LAB SAMPLE No.	99093	DATE RECEIVED	18-May-21
DATE TESTED	04-Jun-21	SAMPLED BY	Client
MATERIAL	Firm to stiff brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location		Sample Length (mm)	450	Specimen depth from top of Sample (mm)	30
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	203	Specimen Moisture Content (%)	16
		Specimen Diameter (mm)	104	Specimen Bulk Density (Mg/m3)	2.08
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.79
		Membrane Correction	1.46		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN**TEST TYPE**
SINGLE STAGE**SKETCH OF SPECIMEN AT FAILURE**

PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
200	20	2	227	114

Remarks/Abnormalities

Name O.P Davies BA (Hons)
(Laboratory Manager)

Signed 

Date 09 June 2021

Appendix E

Certificates of Analysis – Water



2183

Final Report

Report No.: 21-18827-1
Initial Date of Issue: 14-Jun-2021
Client LK Consult
Client Address: Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Manchester
Lancashire
M26 2ZS
Contact(s): Colin Crompton
Contaminated Land
Project LKC 20 1913 Osbourne's Yard,
Manchester

Quotation No.:		Date Received:	04-Jun-2021
Order No.:	738718	Date Instructed:	07-Jun-2021
No. of Samples:	2		
Turnaround (Wkdays):	5	Results Due:	11-Jun-2021
Date Approved:	14-Jun-2021		

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Water

Project: LKC 20 1913 Osbourne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				21-18827	21-18827
Quotation No.:	Chemtest Sample ID.:				1214426	1214427
	Client Sample ID.:				CP102	CP103
	Sample Location:				CP102	CP103
	Sample Type:				WATER	WATER
	Date Sampled:				03-Jun-2021	03-Jun-2021
Determinand	Accred.	SOP	Units	LOD		
Diesel Present	N	1670		N/A	False	False
pH	U	1010		N/A	8.1	8.0
Sulphate	U	1220	mg/l	1.0	98	150
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050	< 0.050
Calcium	U	1455	mg/l	2.00	83	100
Total Hardness as CaCO3	U	1270	mg/l	15	500	820
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.66	0.60
Boron (Dissolved)	U	1455	µg/l	10.0	73	160
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	1.3	1.3
Nickel (Dissolved)	U	1455	µg/l	0.50	0.70	0.70
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	2.2	1.9
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	< 2.5	3.0
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010
Chromium (Hexavalent)	U	1490	µg/l	20	[B] < 20	[B] < 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	6.0	2.8
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10

Results - Water

Project: LKC 20 1913 Osbourne's Yard, Manchester

Client: LK Consult	Chemtest Job No.:				21-18827	21-18827
Quotation No.:	Chemtest Sample ID.:				1214426	1214427
	Client Sample ID.:				CP102	CP103
	Sample Location:				CP102	CP103
	Sample Type:				WATER	WATER
	Date Sampled:				03-Jun-2021	03-Jun-2021
Determinand	Accred.	SOP	Units	LOD		
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0
Naphthalene	N	1800	µg/l	0.010	< 0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010	< 0.010	< 0.010
Acenaphthene	N	1800	µg/l	0.010	< 0.010	< 0.010
Fluorene	N	1800	µg/l	0.010	< 0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010	< 0.010	< 0.010
Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010
Fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010
Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010
Chrysene	N	1800	µg/l	0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010
Benzo[a]pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	1800	µg/l	0.010	< 0.010	< 0.010
Total Of 16 PAH's	N	1800	µg/l	0.20	< 0.20	< 0.20
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030

TPH Interpretation

Job	Sample	Matrix	Location	Sample Ref	Sample ID	Sample Depth (m)	Gasoline / Diesel Present	TPH Interpretation
21-18827	1214426	W	CP102		CP102		No	N/A
21-18827	1214427	W	CP103		CP103		No	N/A

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1214426		CP102	CP102	03-Jun-2021	B	Coloured Winchester 1000ml
1214426		CP102	CP102	03-Jun-2021	B	EPA Vial 40ml
1214426		CP102	CP102	03-Jun-2021	B	Plastic Bottle 1000ml
1214427		CP103	CP103	03-Jun-2021	B	Coloured Winchester 1000ml
1214427		CP103	CP103	03-Jun-2021	B	EPA Vial 40ml
1214427		CP103	CP103	03-Jun-2021	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH 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.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
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).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	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	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters 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	Pentane extraction / GCMS detection
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.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"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

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

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

customerservices@chemtest.com

Appendix F

Generic Assessment Criteria Values

Summary of Category 4 Screening Levels: 2015

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

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.

		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	6%	180	180	230	980	230	3,400
	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	1%	1,600 ^f	1,900 ^f	1,200 ^f	28,000 ^f	3,800 ^f	7,800 ^f
+Aromatic	2.5%	1,800 ^f	1,900 ^f	2,100 ^f	28,000 ^f	3,800 ^f	7,800 ^f
>EC44	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.

		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
	Endosulfans (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.

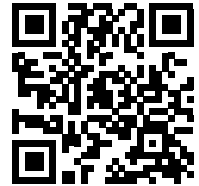
Appendix G

HazWaste Online Classification Report

Waste Classification Report

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

- 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)



QCWUS-0XVB0-60XUF

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

Job name

LKC 20 1913

Description/Comments

Project

LKC 20 1913

Site

Osborne's Yard

Classified by

Name: **Peter Dunn**
Company: **LK Group**
Date: **17 Feb 2022 17:25 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	TP201-02/02/2022-0.7	0.7-0.7	Non Hazardous		2
2	TP202-02/02/2022-1.2	1.2-1.2	Hazardous	HP 3(i), HP 7, HP 11, HP 14	8
3	TP203-02/02/2022-0.1	0.1-0.7	Non Hazardous		15
4	TP203-02/02/2022-1.2	1.2-1.2	Non Hazardous		18
5	TP101-27/04/2021-0.00	0.00-1.10	Non Hazardous		21
6	TP102-27/04/2021-0.15	0.15-0.60	Non Hazardous		23
7	TP103-27/04/2021-0.55	0.55-0.80	Non Hazardous		25
8	TP103-27/04/2021-0.80	0.80-1.00	Non Hazardous		28
9	TP104-28/04/2021-0.00	0.00-1.00	Hazardous	HP 14	29

Related documents

#	Name	Description
1	HWOL_22-03808-20220211 082243.hwol	.hwol file used to create the Job
2	HWOL_21-14038-20210507 163912.hwol	.hwol file used to create the Job
3	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Peter Dunn

Created date: 17 Feb 2022 17:25 GMT

Appendices

	Page
Appendix A: Classifier defined and non GB MCL determinands	31
Appendix B: Rationale for selection of metal species	35
Appendix C: Version	36

Classification of sample: TP201-02/02/2022-0.7

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

Sample details

Sample name:	LoW Code:
TP201-02/02/2022-0.7	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)
0.7-0.7 m	
Moisture content:	
22%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.1	mg/kg	1.32	6.282	mg/kg	0.000628 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				1.2	mg/kg	3.22	3.014	mg/kg	0.000301 %	✓	
	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) }				22	mg/kg	1.462	25.08	mg/kg	0.00251 %	✓	
		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 }				11	mg/kg	1.126	9.66	mg/kg	0.000966 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	16	mg/kg		12.48	mg/kg	0.00125 %	✓	
	082-001-00-6											
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 }				13	mg/kg	2.976	30.179	mg/kg	0.00302 %	✓	
	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 }				24	mg/kg	2.774	51.932	mg/kg	0.00519 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	TPH (C6 to C40) petroleum group		TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
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									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
17	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
19	pH		PH		8.3 pH		8.3 pH	8.3 pH		
20	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
21	acenaphthylene 205-917-1		208-96-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
22	acenaphthene 201-469-6		83-32-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
23	fluorene 201-695-5		86-73-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
24	phenanthrene 201-581-5		85-01-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
25	anthracene 204-371-1		120-12-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
26	fluoranthene 205-912-4		206-44-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
27	pyrene 204-927-3		129-00-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
29	chrysene 601-048-00-0	205-923-4	218-01-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
33	indeno[123-cd]pyrene 205-893-2		193-39-5		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
35	benzo[ghi]perylene 205-883-8		191-24-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
36	phenol 604-001-00-2	203-632-7	108-95-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
37	1,1-dichloroethane and 1,2-dichloroethane (combined) 203-458-1, 200-863-5		107-06-2, 75-34-3		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %		<LOD
38	tetrachloroethylene 602-028-00-4	204-825-9	127-18-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
39	carbon tetrachloride; tetrachloromethane 602-008-00-5	200-262-8	56-23-5		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
40	trichloroethylene; trichloroethene 602-027-00-9	201-167-4	79-01-6		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
41	vinyl chloride; chloroethylene 602-023-00-7	200-831-0	75-01-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
42	hexachlorobenzene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
	602-065-00-6	204-273-9	118-74-1								
43	vanadium {divanadium pentaoxide; vanadium pentoxide}				37 mg/kg	1.785	51.52 mg/kg	0.00515 %		✓	
	023-001-00-8	215-239-8	1314-62-1								
44	dichlorodifluoromethane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
		200-893-9	75-71-8								
45	chloromethane; methyl chloride				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-001-00-7	200-817-4	74-87-3								
46	bromomethane; methylbromide				<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
	602-002-00-2	200-813-2	74-83-9								
47	chloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	602-009-00-0	200-830-5	75-00-3								
48	trichlorofluoromethane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
		200-892-3	75-69-4								
49	1,1-dichloroethylene; vinylidene chloride				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-025-00-8	200-864-0	75-35-4								
50	bromochloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
		200-826-3	74-97-5								
51	chloroform; trichloromethane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-006-00-4	200-663-8	67-66-3								
52	1,1,1-trichloroethane; methyl chloroform				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-013-00-2	200-756-3	71-55-6								
53	1,1-dichloropropene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-031-00-0	209-253-3	563-58-6								
54	1,2-dichloropropane; propylene dichloride				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-020-00-0	201-152-2	78-87-5								
55	dibromomethane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-003-00-8	200-824-2	74-95-3								
56	bromodichloromethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
		200-856-7	75-27-4								
57	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]								
58	trans-1,3-dichloropropene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		431-460-4	10061-02-6								
59	1,1,2-trichloroethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	602-014-00-8	201-166-9	79-00-5								
60	1,3-dichloropropane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
		205-531-3	142-28-9								
61	dibromochloromethane				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		204-704-0	124-48-1								
62	1,2-dibromoethane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	602-010-00-6	203-444-5	106-93-4								
63	chlorobenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-033-00-1	203-628-5	108-90-7								
64	1,1,1,2-tetrachloroethane				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
		211-135-1	630-20-6								
65	styrene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-026-00-0	202-851-5	100-42-5								
66	bromoform; tribromomethane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-007-00-X	200-854-6	75-25-2								
67	bromobenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	602-060-00-9	203-623-8	108-86-1								
68	1,2,3-trichloropropane				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	602-062-00-X	202-486-1	96-18-4								
69	mesitylene; 1,3,5-trimethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-025-00-5	203-604-4	108-67-8								
70	tert-butylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
		202-632-4	98-06-6								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
71	1,2,4-trimethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-043-00-3	202-436-9	95-63-6							
72	sec-butylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		205-227-0	135-98-8							
73	1,3-dichlorobenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-067-00-7	208-792-1	541-73-1							
74	4-isopropyltoluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		202-796-7	99-87-6							
75	1,4-dichlorobenzene; p-dichlorobenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-035-00-2	203-400-5	106-46-7							
76	n-butylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		203-209-7	104-51-8							
77	1,2-dichlorobenzene; o-dichlorobenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-034-00-7	202-425-9	95-50-1							
78	1,2-dibromo-3-chloropropane				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	602-021-00-6	202-479-3	96-12-8							
79	1,2,4-trichlorobenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	602-087-00-6	204-428-0	120-82-1							
80	hexachlorobutadiene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		201-765-5	87-68-3							
81	1,2,3-trichlorobenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		201-757-1	87-61-6							
82	carbon disulphide				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	006-003-00-3	200-843-6	75-15-0							
83	dimethylnitrosoamine; N-nitrosodimethylamine				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	612-077-00-3	200-549-8	62-75-9							
84	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-008-00-0	202-433-2 [1] 203-402-6 [2] 203-582-6 [3] 246-691-4 [4]	95-57-8 [1] 106-48-9 [2] 108-43-0 [3] 25167-80-0 [4]							
85	bis(2-chloroethyl) ether				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	603-029-00-2	203-870-1	111-44-4							
86	hexachloroethane				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		200-666-4	67-72-1							
87	nitrosodipropylamine				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	612-098-00-8	210-698-0	621-64-7							
88	nitrobenzene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	609-003-00-7	202-716-0	98-95-3							
89	3,5,5-trimethylcyclohex-2-enone; isophorone				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	606-012-00-8	201-126-0	78-59-1							
90	2-nitrophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		201-857-5	88-75-5							
91	3,4-xenol; [1] 2,5-xenol; [2] 2,4-xenol; [3] 2,3-xenol; [4] 2,6-xenol; [5] xenol; [6] 2,4(or 2,5)-xenol [7]				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-006-00-X	202-439-5 [1] 202-461-5 [2] 203-321-6 [3] 208-395-3 [4] 209-400-1 [5] 215-089-3 [6] 276-245-4 [7]	95-65-8 [1] 95-87-4 [2] 105-67-9 [3] 526-75-0 [4] 576-26-1 [5] 1300-71-6 [6] 71975-58-1 [7]							
92	bis(2-chloroethoxy)methane				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		203-920-2	111-91-1							
93	2,4-dichlorophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
94	4-chloroaniline				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	612-137-00-9	203-401-0	106-47-8							
95	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-014-00-3	200-431-6	59-50-7							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
96	2-methyl naphthalene	202-078-3	91-57-6		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
97	4-nitrophenol; p-nitrophenol	609-015-00-2	202-811-7	100-02-7	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
98	hexachlorocyclopentadiene	602-078-00-7	201-029-3	77-47-4	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
99	2,4,6-trichlorophenol	604-018-00-5	201-795-9	88-06-2	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
100	2,4,5-trichlorophenol	604-017-00-X	202-467-8	95-95-4	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
101	2-chloronaphthalene	202-079-9	91-58-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
102	dimethyl phthalate	205-011-6	131-11-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
103	2,6-dinitrotoluene	609-049-00-8	210-106-0	606-20-2	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
104	dibenzofuran	205-071-3	132-64-9		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
105	4-chlorophenylphenylether	230-281-7	7005-72-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
106	2,4-dinitrotoluene; [1] dinitrotoluene [2]	609-007-00-9	204-450-0 [1] 246-836-1 [2]	121-14-2 [1] 25321-14-6 [2]	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
107	diethyl phthalate	201-550-6	84-66-2		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
108	DNOC (ISO); 4,6-dinitro-o-cresol	609-020-00-X	208-601-1	534-52-1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
109	azobenzene	611-001-00-6	203-102-5	103-33-3	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
110	4-bromophenylphenylether	202-952-4	101-55-3		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
111	pentachlorophenol	604-002-00-8	201-778-6	87-86-5	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
112	carbazole	201-696-0	86-74-8		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
113	dibutyl phthalate; DBP	607-318-00-4	201-557-4	84-74-2	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
114	BBP; benzyl butyl phthalate	607-430-00-3	201-622-7	85-68-7	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
115	bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP	607-317-00-9	204-211-0	117-81-7	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
116	di-n-octyl phthalate	204-214-7	117-84-0		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
117	monohydric phenols		P1186		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
118	m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4]	604-004-00-9	203-577-9 [1] 202-423-8 [2] 203-398-6 [3] 215-293-2 [4]	108-39-4 [1] 95-48-7 [2] 106-44-5 [3] 1319-77-3 [4]	<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
119	1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]	602-026-00-3	208-750-2 [1] 205-859-7 [2] 205-860-2 [3]	540-59-0 [1] 156-59-2 [2] 156-60-5 [3]	<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
120	cumene; [1] propylbenzene [2]	601-024-00-X	202-704-5 [1] 203-132-9 [2]	98-82-8 [1] 103-65-1 [2]	<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
121	2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	602-040-00-X	202-424-3 [1]	95-49-8 [1]							
		203-580-5 [2]	108-41-8 [2]							
		203-397-0 [3]	106-43-4 [3]							
		246-698-2 [4]	25168-05-2 [4]							
122	o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3]				<1.5 mg/kg		<1.5 mg/kg	<0.00015 %		<LOD
	612-012-00-9	201-855-4 [1]	88-74-4 [1] 99-09-2							
		202-729-1 [2]	[2] 100-01-6 [3]							
		202-810-1 [3]								
Total:								0.0232 %		

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
- This determinand is defined in the EU CLP Table 3
- <LOD** Below limit of detection
- ND** Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP202-02/02/2022-1.2

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

Sample details

Sample name:	LoW Code:	
TP202-02/02/2022-1.2	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 03 * (Soil and stones containing hazardous substances)
1.2-1.2 m		
Moisture content:		
28%		
(wet weight correction)		

Hazard properties

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.: 2.592%)

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.: 2.592%)

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 2; H411 "Toxic to aquatic life with long lasting effects."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 2.592%)

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 2.592%)

Determinands

Moisture content: 28% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				6.5	mg/kg	1.32	6.179	mg/kg	0.000618 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				1.8	mg/kg	3.22	4.173	mg/kg	0.000417 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.41	mg/kg	1.142	0.337	mg/kg	0.0000337 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14	mg/kg	1.462	14.732	mg/kg	0.00147 %	✓	
		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 }				170	mg/kg	1.126	137.809	mg/kg	0.0138 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	270	mg/kg		194.4	mg/kg	0.0194 %	✓	
	082-001-00-6											
8	mercury { mercury dichloride }				0.22	mg/kg	1.353	0.214	mg/kg	0.0000214 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				13	mg/kg	2.976	27.858	mg/kg	0.00279 %	✓	
	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 }				160	mg/kg	2.774	319.582	mg/kg	0.032 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	TPH (C6 to C40) petroleum group		TPH		36000	mg/kg		25920	mg/kg	2.592 %	✓	
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		PH		9	pH		9	pH	9pH		
20	naphthalene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
21	acenaphthylene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		205-917-1	208-96-8									
22	acenaphthene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		201-469-6	83-32-9									
23	fluorene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		201-695-5	86-73-7									
24	phenanthrene				<0.5	mg/kg		<0.5	mg/kg	<0.00005 %		<LOD
		201-581-5	85-01-8									

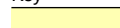
#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
25	anthracene	204-371-1	120-12-7		<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
26	fluoranthene	205-912-4	206-44-0		3.2 mg/kg		2.304 mg/kg	0.00023 %		✓	
27	pyrene	204-927-3	129-00-0		3.6 mg/kg		2.592 mg/kg	0.000259 %		✓	
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	1.4 mg/kg		1.008 mg/kg	0.000101 %		✓	
29	chrysene	601-048-00-0	205-923-4	218-01-9	1.5 mg/kg		1.08 mg/kg	0.000108 %		✓	
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	2.2 mg/kg		1.584 mg/kg	0.000158 %		✓	
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.72 mg/kg		0.518 mg/kg	0.0000518 %		✓	
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	2 mg/kg		1.44 mg/kg	0.000144 %		✓	
33	indeno[123-cd]pyrene	205-893-2	193-39-5		1.2 mg/kg		0.864 mg/kg	0.0000864 %		✓	
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
35	benzo[ghi]perylene	205-883-8	191-24-2		1.6 mg/kg		1.152 mg/kg	0.000115 %		✓	
36	phenol	604-001-00-2	203-632-7	108-95-2	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
37	1,1-dichloroethane and 1,2-dichloroethane (combined)	203-458-1, 200-863-5	107-06-2, 75-34-3		<0.003 mg/kg		<0.003 mg/kg	<0.0000003 %			<LOD
38	tetrachloroethylene	602-028-00-4	204-825-9	127-18-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
39	carbon tetrachloride; tetrachloromethane	602-008-00-5	200-262-8	56-23-5	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
40	trichloroethylene; trichloroethene	602-027-00-9	201-167-4	79-01-6	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
41	vinyl chloride; chloroethylene	602-023-00-7	200-831-0	75-01-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
42	hexachlorobenzene	602-065-00-6	204-273-9	118-74-1	<0.5 mg/kg		<0.5 mg/kg	<0.00005 %			<LOD
43	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	18 mg/kg	1.785	23.136 mg/kg	0.00231 %		✓	
44	dichlorodifluoromethane	200-893-9	75-71-8		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
45	chloromethane; methyl chloride	602-001-00-7	200-817-4	74-87-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
46	bromomethane; methylbromide	602-002-00-2	200-813-2	74-83-9	<0.02 mg/kg		<0.02 mg/kg	<0.000002 %			<LOD
47	chloroethane	602-009-00-0	200-830-5	75-00-3	<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
48	trichlorofluoromethane	200-892-3	75-69-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
49	1,1-dichloroethylene; vinylidene chloride	602-025-00-8	200-864-0	75-35-4	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
50	bromochloromethane	200-826-3	74-97-5		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
51	chloroform; trichloromethane	602-006-00-4	200-663-8	67-66-3	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
52	1,1,1-trichloroethane; methyl chloroform	602-013-00-2	200-756-3	71-55-6	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
53	1,1-dichloropropene	602-031-00-0	209-253-3	563-58-6	<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
54	1,2-dichloropropane; propylene dichloride									
	602-020-00-0	201-152-2	78-87-5		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
55	dibromomethane									
	602-003-00-8	200-824-2	74-95-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
56	bromodichloromethane									
		200-856-7	75-27-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
57	1,3-dichloropropene; [1] (Z)-1,3-dichloropropene [2]									
	602-030-00-5	208-826-5 [1] 233-195-8 [2]	542-75-6 [1] 10061-01-5 [2]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
58	trans-1,3-dichloropropene									
		431-460-4	10061-02-6		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
59	1,1,2-trichloroethane									
	602-014-00-8	201-166-9	79-00-5		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
60	1,3-dichloropropane									
		205-531-3	142-28-9		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
61	dibromochloromethane									
		204-704-0	124-48-1		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
62	1,2-dibromoethane									
	602-010-00-6	203-444-5	106-93-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
63	chlorobenzene									
	602-033-00-1	203-628-5	108-90-7		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
64	1,1,1,2-tetrachloroethane									
		211-135-1	630-20-6		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
65	styrene									
	601-026-00-0	202-851-5	100-42-5		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
66	bromoform; tribromomethane									
	602-007-00-X	200-854-6	75-25-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
67	bromobenzene									
	602-060-00-9	203-623-8	108-86-1		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
68	1,2,3-trichloropropane									
	602-062-00-X	202-486-1	96-18-4		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
69	mesitylene; 1,3,5-trimethylbenzene									
	601-025-00-5	203-604-4	108-67-8		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
70	tert-butylbenzene									
		202-632-4	98-06-6		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
71	1,2,4-trimethylbenzene									
	601-043-00-3	202-436-9	95-63-6		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
72	sec-butylbenzene									
		205-227-0	135-98-8		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
73	1,3-dichlorobenzene									
	602-067-00-7	208-792-1	541-73-1		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
74	4-isopropyltoluene									
		202-796-7	99-87-6		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
75	1,4-dichlorobenzene; p-dichlorobenzene									
	602-035-00-2	203-400-5	106-46-7		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
76	n-butylbenzene									
		203-209-7	104-51-8		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
77	1,2-dichlorobenzene; o-dichlorobenzene									
	602-034-00-7	202-425-9	95-50-1		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
78	1,2-dibromo-3-chloropropane									
	602-021-00-6	202-479-3	96-12-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
79	1,2,4-trichlorobenzene									
	602-087-00-6	204-428-0	120-82-1		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
80	hexachlorobutadiene									
		201-765-5	87-68-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
81	1,2,3-trichlorobenzene									
		201-757-1	87-61-6		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
82	carbon disulphide									
	006-003-00-3	200-843-6	75-15-0		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
83	dimethylnitrosoamine; N-nitrosodimethylamine				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	612-077-00-3	200-549-8	62-75-9							
84	2-chlorophenol; [1] 4-chlorophenol; [2] 3-chlorophenol; [3] chlorophenol [4]				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-008-00-0	202-433-2 [1]	95-57-8 [1]							
		203-402-6 [2]	106-48-9 [2]							
		203-582-6 [3]	108-43-0 [3]							
		246-691-4 [4]	25167-80-0 [4]							
85	bis(2-chloroethyl) ether				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	603-029-00-2	203-870-1	111-44-4							
86	hexachloroethane				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		200-666-4	67-72-1							
87	nitrosodipropylamine				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	612-098-00-8	210-698-0	621-64-7							
88	nitrobenzene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	609-003-00-7	202-716-0	98-95-3							
89	3,5,5-trimethylcyclohex-2-enone; isophorone				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	606-012-00-8	201-126-0	78-59-1							
90	2-nitrophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		201-857-5	98-75-5							
91	3,4-xyleneol; [1] 2,5-xyleneol; [2] 2,4-xyleneol; [3] 2,3-xyleneol; [4] 2,6-xyleneol; [5] xyleneol; [6] 2,4(or 2,5)-xyleneol [7]				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-006-00-X	202-439-5 [1]	95-65-8 [1]							
		202-461-5 [2]	2 [2] 105-67-9 [3]							
		203-321-6 [3]	526-75-0 [4]							
		208-395-3 [4]	576-26-1 [5]							
		209-400-1 [5]	1300-71-6 [6]							
		215-089-3 [6]	71975-58-1 [7]							
		276-245-4 [7]								
92	bis(2-chloroethoxy)methane				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		203-920-2	111-91-1							
93	2,4-dichlorophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-011-00-7	204-429-6	120-83-2							
94	4-chloroaniline				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	612-137-00-9	203-401-0	106-47-8							
95	chlorocresol; 4-chloro-m-cresol; 4-chloro-3-methylphenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-014-00-3	200-431-6	59-50-7							
96	2-methyl naphthalene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		202-078-3	91-57-6							
97	4-nitrophenol; p-nitrophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	609-015-00-2	202-811-7	100-02-7							
98	hexachlorocyclopentadiene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	602-078-00-7	201-029-3	77-47-4							
99	2,4,6-trichlorophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-018-00-5	201-795-9	88-06-2							
100	2,4,5-trichlorophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	604-017-00-X	202-467-8	95-95-4							
101	2-chloronaphthalene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		202-079-9	91-58-7							
102	dimethyl phthalate				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		205-011-6	131-11-3							
103	2,6-dinitrotoluene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	609-049-00-8	210-106-0	606-20-2							
104	dibenzofuran				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		205-071-3	132-64-9							
105	4-chlorophenylphenylether				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		230-281-7	7005-72-3							
106	2,4-dinitrotoluene; [1] dinitrotoluene [2]				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
	609-007-00-9	204-450-0 [1]	121-14-2 [1]							
		246-836-1 [2]	25321-14-6 [2]							
107	diethyl phthalate				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD
		201-550-6	84-66-2							

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
108		DNOC (ISO); 4,6-dinitro-o-cresol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD	
		609-020-00-X	208-601-1	534-52-1								
109		azobenzene				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD	
		611-001-00-6	203-102-5	103-33-3								
110	■	4-bromophenylphenylether				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD	
			202-952-4	101-55-3								
111		pentachlorophenol				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD	
		604-002-00-8	201-778-6	87-86-5								
112	■	carbazole				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD	
			201-696-0	86-74-8								
113		dibutyl phthalate; DBP				1.1 mg/kg		0.792 mg/kg	0.0000792 %	✓		
		607-318-00-4	201-557-4	84-74-2								
114		BBP; benzyl butyl phthalate				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD	
		607-430-00-3	201-622-7	85-68-7								
115		bis(2-ethylhexyl) phthalate; di-(2-ethylhexyl) phthalate; DEHP				1.5 mg/kg		1.08 mg/kg	0.000108 %	✓		
		607-317-00-9	204-211-0	117-81-7								
116	■	di-n-octyl phthalate				<0.5 mg/kg		<0.5 mg/kg	<0.00005 %		<LOD	
			204-214-7	117-84-0								
117	■	monohydric phenols				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD	
				P1186								
118		asbestos				20 mg/kg		14.4 mg/kg	0.00144 %	✓		
		650-013-00-6	-----	12001-28-4								
				132207-32-0								
				12172-73-5								
				77536-66-4								
				77536-68-6								
				77536-67-5								
				12001-29-5								
119		m-cresol; [1] o-cresol; [2] p-cresol; [3] mix-cresol [4]				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD	
		604-004-00-9	203-577-9 [1]	108-39-4 [1]								
			202-423-8 [2]	95-48-7 [2]								
			203-398-6 [3]	106-44-5 [3]								
			215-293-2 [4]	1319-77-3 [4]								
120		1,2-dichloroethylene; [1] cis-dichloroethylene; [2] trans-dichloroethylene [3]				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD	
		602-026-00-3	208-750-2 [1]	540-59-0 [1]								
			205-859-7 [2]	156-59-2 [2]								
			205-860-2 [3]	156-60-5 [3]								
121		cumene; [1] propylbenzene [2]				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD	
		601-024-00-X	202-704-5 [1]	98-82-8 [1]								
			203-132-9 [2]	103-65-1 [2]								
122		2-chlorotoluene; [1] 3-chlorotoluene; [2] 4-chlorotoluene; [3] chlorotoluene [4]				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD	
		602-040-00-X	202-424-3 [1]	95-49-8 [1]								
			203-580-5 [2]	108-41-8 [2]								
			203-397-0 [3]	106-43-4 [3]								
			246-698-2 [4]	25168-05-2 [4]								
123		o-nitroaniline; [1] m-nitroaniline; [2] p-nitroaniline [3]				<1.5 mg/kg		<1.5 mg/kg	<0.00015 %		<LOD	
		612-012-00-9	201-855-4 [1]	88-74-4 [1]								
			202-729-1 [2]	99-09-2 [2]								
			202-810-1 [3]	100-01-6 [3]								
Total:								2.67 %				

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
	This determinand is defined in the EU CLP Table 3
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP203-02/02/2022-0.1

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

Sample details

Sample name:	LoW Code:
TP203-02/02/2022-0.1	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.1-0.7 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.2%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.2% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				4.7 mg/kg	1.32	5.697 mg/kg	0.00057 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.79 mg/kg	3.22	2.335 mg/kg	0.000234 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.27 mg/kg	1.142	0.283 mg/kg	0.0000283 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				21 mg/kg	1.462	28.176 mg/kg	0.00282 %	✓	
		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 }				20 mg/kg	1.126	20.671 mg/kg	0.00207 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	44 mg/kg		40.392 mg/kg	0.00404 %	✓	
	082-001-00-6									
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 }				23 mg/kg	2.976	62.841 mg/kg	0.00628 %	✓	
	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 }				50 mg/kg	2.774	127.333 mg/kg	0.0127 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
12	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
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							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
17	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
19	pH		PH		9.4 pH		9.4 pH	9.4 pH			
20	naphthalene 601-052-00-2	202-049-5	91-20-3		0.38 mg/kg		0.349 mg/kg	0.0000349 %		✓	
21	acenaphthylene 205-917-1	208-96-8			0.35 mg/kg		0.321 mg/kg	0.0000321 %		✓	
22	acenaphthene 201-469-6	83-32-9			6.2 mg/kg		5.692 mg/kg	0.000569 %		✓	
23	fluorene 201-695-5	86-73-7			4.8 mg/kg		4.406 mg/kg	0.000441 %		✓	
24	phenanthrene 201-581-5	85-01-8			34 mg/kg		31.212 mg/kg	0.00312 %		✓	
25	anthracene 204-371-1	120-12-7			7.5 mg/kg		6.885 mg/kg	0.000689 %		✓	
26	fluoranthene 205-912-4	206-44-0			34 mg/kg		31.212 mg/kg	0.00312 %		✓	
27	pyrene 204-927-3	129-00-0			29 mg/kg		26.622 mg/kg	0.00266 %		✓	
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		14 mg/kg		12.852 mg/kg	0.00129 %		✓	
29	chrysene 601-048-00-0	205-923-4	218-01-9		12 mg/kg		11.016 mg/kg	0.0011 %		✓	
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		16 mg/kg		14.688 mg/kg	0.00147 %		✓	
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		6.1 mg/kg		5.6 mg/kg	0.00056 %		✓	
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		15 mg/kg		13.77 mg/kg	0.00138 %		✓	
33	indeno[123-cd]pyrene 205-893-2	193-39-5			8.7 mg/kg		7.987 mg/kg	0.000799 %		✓	
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		1.5 mg/kg		1.377 mg/kg	0.000138 %		✓	
35	benzo[ghi]perylene 205-883-8	191-24-2			8.3 mg/kg		7.619 mg/kg	0.000762 %		✓	
36	vanadium { divanadium pentaoxide; vanadium pentoxide } 023-001-00-8	215-239-8	1314-62-1		16 mg/kg	1.785	26.221 mg/kg	0.00262 %		✓	
37	monohydric phenols P1186				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.0508 %		

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
	This determinand is defined in the EU CLP Table 3
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Classification of sample: TP203-02/02/2022-1.2

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

Sample details

Sample name:	LoW Code:
TP203-02/02/2022-1.2	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)
1.2-1.2 m	
Moisture content:	
22%	
(wet weight correction)	

Hazard properties

None identified

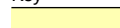
Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }			12	mg/kg	1.32	12.358	mg/kg	0.00124 %	✓		
	033-003-00-0	215-481-4	1327-53-3										
2		boron { diboron trioxide; boric oxide }			1.1	mg/kg	3.22	2.763	mg/kg	0.000276 %	✓		
	005-008-00-8	215-125-8	1303-86-2										
3		cadmium { cadmium oxide }			0.19	mg/kg	1.142	0.169	mg/kg	0.0000169 %	✓		
	048-002-00-0	215-146-2	1306-19-0										
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }			17	mg/kg	1.462	19.38	mg/kg	0.00194 %	✓		
		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 }			32	mg/kg	1.126	28.102	mg/kg	0.00281 %	✓		
	029-002-00-X	215-270-7	1317-39-1										
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	74	mg/kg		57.72	mg/kg	0.00577 %	✓	
	082-001-00-6												
8		mercury { mercury dichloride }			0.28	mg/kg	1.353	0.296	mg/kg	0.0000296 %	✓		
	080-010-00-X	231-299-8	7487-94-7										
9		nickel { nickel chromate }			21	mg/kg	2.976	48.751	mg/kg	0.00488 %	✓		
	028-035-00-7	238-766-5	14721-18-7										
10		selenium { nickel selenate }			0.33	mg/kg	2.554	0.657	mg/kg	0.0000657 %	✓		
	028-031-00-5	239-125-2	15060-62-5										
11		zinc { zinc chromate }			66	mg/kg	2.774	142.813	mg/kg	0.0143 %	✓		
	024-007-00-3	236-878-9	13530-65-9										
12		TPH (C6 to C40) petroleum group			<10	mg/kg		<10	mg/kg	<0.001 %		<LOD	
			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										

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
17	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %		<LOD
19	pH		PH		9.7 pH		9.7 pH	9.7 pH		
20	naphthalene 601-052-00-2	202-049-5	91-20-3		0.48 mg/kg		0.374 mg/kg	0.0000374 %	✓	
21	acenaphthylene 205-917-1		208-96-8		0.27 mg/kg		0.211 mg/kg	0.0000211 %	✓	
22	acenaphthene 201-469-6		83-32-9		0.33 mg/kg		0.257 mg/kg	0.0000257 %	✓	
23	fluorene 201-695-5		86-73-7		1.1 mg/kg		0.858 mg/kg	0.0000858 %	✓	
24	phenanthrene 201-581-5		85-01-8		2.2 mg/kg		1.716 mg/kg	0.000172 %	✓	
25	anthracene 204-371-1		120-12-7		0.36 mg/kg		0.281 mg/kg	0.0000281 %	✓	
26	fluoranthene 205-912-4		206-44-0		1.4 mg/kg		1.092 mg/kg	0.000109 %	✓	
27	pyrene 204-927-3		129-00-0		1.6 mg/kg		1.248 mg/kg	0.000125 %	✓	
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.62 mg/kg		0.484 mg/kg	0.0000484 %	✓	
29	chrysene 601-048-00-0	205-923-4	218-01-9		0.56 mg/kg		0.437 mg/kg	0.0000437 %	✓	
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.6 mg/kg		0.468 mg/kg	0.0000468 %	✓	
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.3 mg/kg		0.234 mg/kg	0.0000234 %	✓	
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.65 mg/kg		0.507 mg/kg	0.0000507 %	✓	
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		22 mg/kg	1.785	30.634 mg/kg	0.00306 %	✓	
37	monohydric phenols P1186				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0364 %		

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
	This determinand is defined in the EU CLP Table 3
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP101-27/04/2021-0.00

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

Sample details

Sample name:	LoW Code:
TP101-27/04/2021-0.00	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00-1.10 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				30 mg/kg	1.32	30.5 mg/kg	0.00305 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.71 mg/kg	1.142	0.625 mg/kg	0.0000625 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				26 mg/kg	1.462	29.26 mg/kg	0.00293 %	✓		
		215-160-9	1308-38-9								
4	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										
5	copper { dicopper oxide; copper (I) oxide }				160 mg/kg	1.126	138.709 mg/kg	0.0139 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	340 mg/kg		261.8 mg/kg	0.0262 %	✓		
	082-001-00-6										
7	mercury { mercury dichloride }				0.42 mg/kg	1.353	0.438 mg/kg	0.0000438 %	✓		
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				39 mg/kg	2.976	89.377 mg/kg	0.00894 %	✓		
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { nickel selenate }				0.23 mg/kg	2.554	0.452 mg/kg	0.0000452 %	✓		
	028-031-00-5	239-125-2	15060-62-5								
10	zinc { zinc chromate }				200 mg/kg	2.774	427.219 mg/kg	0.0427 %	✓		
	024-007-00-3	236-878-9	13530-65-9								
11	pH		PH		7.3 pH		7.3 pH	7.3 pH			
12	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
14	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
15	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	phenanthrene	201-581-5	85-01-8		0.57 mg/kg		0.439 mg/kg	0.0000439 %	✓		
17	anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
18	fluoranthene	205-912-4	206-44-0		0.56 mg/kg		0.431 mg/kg	0.0000431 %	✓		
19	pyrene	204-927-3	129-00-0		0.57 mg/kg		0.439 mg/kg	0.0000439 %	✓		
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.28 mg/kg		0.216 mg/kg	0.0000216 %	✓		
21	chrysene	601-048-00-0	205-923-4	218-01-9	0.37 mg/kg		0.285 mg/kg	0.0000285 %	✓		
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.39 mg/kg		0.3 mg/kg	0.00003 %	✓		
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.17 mg/kg		0.131 mg/kg	0.0000131 %	✓		
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.28 mg/kg		0.216 mg/kg	0.0000216 %	✓		
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.21 mg/kg		0.162 mg/kg	0.0000162 %	✓		
26	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
27	benzo[ghi]perylene	205-883-8	191-24-2		0.23 mg/kg		0.177 mg/kg	0.0000177 %	✓		
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	73 mg/kg	1.785	100.345 mg/kg	0.01 %	✓		
Total:									0.108 %		

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
- This determinand is defined in the EU CLP Table 3
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP102-27/04/2021-0.15

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

Sample details

Sample name:	LoW Code:
TP102-27/04/2021-0.15	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.15-0.60 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
18%	
(wet weight correction)	

Hazard properties

None identified

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				36 mg/kg	1.32	38.976 mg/kg	0.0039 %	✓		
	033-003-00-0	215-481-4	1327-53-3								
2	cadmium { cadmium oxide }				0.48 mg/kg	1.142	0.45 mg/kg	0.000045 %	✓		
	048-002-00-0	215-146-2	1306-19-0								
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				23 mg/kg	1.462	27.565 mg/kg	0.00276 %	✓		
		215-160-9	1308-38-9								
4	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										
5	copper { dicopper oxide; copper (I) oxide }				110 mg/kg	1.126	101.555 mg/kg	0.0102 %	✓		
	029-002-00-X	215-270-7	1317-39-1								
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	400 mg/kg		328 mg/kg	0.0328 %	✓		
	082-001-00-6										
7	mercury { mercury dichloride }				1.3 mg/kg	1.353	1.443 mg/kg	0.000144 %	✓		
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				33 mg/kg	2.976	80.538 mg/kg	0.00805 %	✓		
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { nickel selenate }				1.1 mg/kg	2.554	2.304 mg/kg	0.00023 %	✓		
	028-031-00-5	239-125-2	15060-62-5								
10	zinc { zinc chromate }				130 mg/kg	2.774	295.724 mg/kg	0.0296 %	✓		
	024-007-00-3	236-878-9	13530-65-9								
11	pH				7.2 pH		7.2 pH	7.2 pH			
			PH								
12	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
14	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
15	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	phenanthrene	201-581-5	85-01-8		0.53 mg/kg		0.435 mg/kg	0.0000435 %	✓	
17	anthracene	204-371-1	120-12-7		0.11 mg/kg		0.0902 mg/kg	0.00000902 %	✓	
18	fluoranthene	205-912-4	206-44-0		0.57 mg/kg		0.467 mg/kg	0.0000467 %	✓	
19	pyrene	204-927-3	129-00-0		0.72 mg/kg		0.59 mg/kg	0.000059 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.3 mg/kg		0.246 mg/kg	0.0000246 %	✓	
21	chrysene	601-048-00-0	205-923-4	218-01-9	0.37 mg/kg		0.303 mg/kg	0.0000303 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.46 mg/kg		0.377 mg/kg	0.0000377 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.18 mg/kg		0.148 mg/kg	0.0000148 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.33 mg/kg		0.271 mg/kg	0.0000271 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.2 mg/kg		0.164 mg/kg	0.0000164 %	✓	
26	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
27	benzo[ghi]perylene	205-883-8	191-24-2		0.27 mg/kg		0.221 mg/kg	0.0000221 %	✓	
28	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	46 mg/kg	1.785	67.337 mg/kg	0.00673 %	✓	
Total:								0.0949 %		

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
- This determinand is defined in the EU CLP Table 3
- <LOD Below limit of detection
- ND Not detected
- CLP: Note 1 Only the metal concentration has been used for classification

Classification of sample: TP103-27/04/2021-0.55

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

Sample details

Sample name:	LoW Code:
TP103-27/04/2021-0.55	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.55-0.80 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				20 mg/kg	1.32	20.861 mg/kg	0.00209 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.73 mg/kg	3.22	1.857 mg/kg	0.000186 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.5 mg/kg	1.142	0.451 mg/kg	0.0000451 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24 mg/kg	1.462	27.711 mg/kg	0.00277 %	✓	
		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 }				65 mg/kg	1.126	57.814 mg/kg	0.00578 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	66 mg/kg		52.14 mg/kg	0.00521 %	✓	
	082-001-00-6									
8	mercury { mercury dichloride }				0.25 mg/kg	1.353	0.267 mg/kg	0.0000267 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				30 mg/kg	2.976	70.537 mg/kg	0.00705 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { nickel selenate }				0.54 mg/kg	2.554	1.089 mg/kg	0.000109 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
11	zinc { zinc chromate }				99 mg/kg	2.774	216.966 mg/kg	0.0217 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
12	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
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							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
16	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
17	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
19	pH		PH		7.1 pH		7.1 pH	7.1 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			0.17 mg/kg		0.134 mg/kg	0.0000134 %	✓		
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			0.16 mg/kg		0.126 mg/kg	0.0000126 %	✓		
27	pyrene 204-927-3	129-00-0			0.16 mg/kg		0.126 mg/kg	0.0000126 %	✓		
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		38 mg/kg	1.785	53.591 mg/kg	0.00536 %	✓		
37	monohydric phenols P1186				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
Total:									0.0517 %		

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
	This determinand is defined in the EU CLP Table 3
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Classification of sample: TP103-27/04/2021-0.80

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

Sample details

Sample name:	LoW Code:
TP103-27/04/2021-0.80	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)
0.80-1.00 m	
Moisture content:	
19%	
(wet weight correction)	

Hazard properties

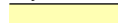
None identified

Determinands

Moisture content: 19% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
				TPH							
2		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							
3		benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2							
4		toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3							
5	●	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4							
6		xylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1]	95-47-6 [1]							
			203-396-5 [2]	106-42-3 [2]							
			203-576-3 [3]	108-38-3 [3]							
			215-535-7 [4]	1330-20-7 [4]							
Total:									0.001 %		

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)
<LOD	Below limit of detection
ND	Not detected

Classification of sample: TP104-28/04/2021-0.00

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

Sample details

Sample name:	LoW Code:
TP104-28/04/2021-0.00	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
0.00-1.00 m	
Moisture content:	
18%	
(wet weight correction)	

Hazard properties

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex: (Note 1 conc.: 0.279%)

Determinands

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

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				64 mg/kg	1.32	69.291 mg/kg	0.00693 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.63 mg/kg	1.142	0.59 mg/kg	0.000059 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				32 mg/kg	1.462	38.351 mg/kg	0.00384 %	✓	
		215-160-9	1308-38-9							
4	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									
5	copper { dicopper oxide; copper (I) oxide }				320 mg/kg	1.126	295.433 mg/kg	0.0295 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
6	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	3400 mg/kg		2788 mg/kg	0.279 %	✓	
	082-001-00-6									
7	mercury { mercury dichloride }				13 mg/kg	1.353	14.428 mg/kg	0.00144 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				80 mg/kg	2.976	195.243 mg/kg	0.0195 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { nickel selenate }				3.3 mg/kg	2.554	6.911 mg/kg	0.000691 %	✓	
	028-031-00-5	239-125-2	15060-62-5							
10	zinc { zinc chromate }				330 mg/kg	2.774	750.684 mg/kg	0.0751 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
11	pH				7.3 pH		7.3 pH	7.3 pH		
12	naphthalene				0.27 mg/kg		0.221 mg/kg	0.0000221 %	✓	
	601-052-00-2	202-049-5	91-20-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
13	• acenaphthylene	205-917-1	208-96-8		0.16 mg/kg		0.131 mg/kg	0.0000131 %	✓	
14	• acenaphthene	201-469-6	83-32-9		0.17 mg/kg		0.139 mg/kg	0.0000139 %	✓	
15	• fluorene	201-695-5	86-73-7		0.17 mg/kg		0.139 mg/kg	0.0000139 %	✓	
16	• phenanthrene	201-581-5	85-01-8		1.9 mg/kg		1.558 mg/kg	0.000156 %	✓	
17	• anthracene	204-371-1	120-12-7		0.35 mg/kg		0.287 mg/kg	0.0000287 %	✓	
18	• fluoranthene	205-912-4	206-44-0		1.8 mg/kg		1.476 mg/kg	0.000148 %	✓	
19	• pyrene	204-927-3	129-00-0		1.9 mg/kg		1.558 mg/kg	0.000156 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.84 mg/kg		0.689 mg/kg	0.0000689 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.88 mg/kg		0.722 mg/kg	0.0000722 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		1 mg/kg		0.82 mg/kg	0.000082 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.4 mg/kg		0.328 mg/kg	0.0000328 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.77 mg/kg		0.631 mg/kg	0.0000631 %	✓	
25	• indeno[123-cd]pyrene	205-893-2	193-39-5		0.49 mg/kg		0.402 mg/kg	0.0000402 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.11 mg/kg		0.0902 mg/kg	0.00000902 %	✓	
27	• benzo[ghi]perylene	205-883-8	191-24-2		0.53 mg/kg		0.435 mg/kg	0.0000435 %	✓	
28	• vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8		<5 mg/kg	1.785	<8.926 mg/kg	<0.000893 %		<LOD
Total:								0.418 %		

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
	This determinand is defined in the EU CLP Table 3
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Appendix A: Classifier defined and non GB MCL determinands

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

• **lead compounds with the exception of those specified elsewhere in this Annex**

GB MCL index number: 082-001-00-6

Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers many simple lead compounds to be Carcinogenic category 2

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium

www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

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

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

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

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

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

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

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

GB MCL index number: 006-007-00-5

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

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

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

• **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

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

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

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

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

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

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

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

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

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

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

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

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

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

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

■ **1,1-dichloroethane and 1,2-dichloroethane (combined)** (EC Number: 203-458-1, 200-863-5, CAS Number: 107-06-2, 75-34-3)

Description/Comments: Combines the hazard statements and risk phrases for 1,1-dichloroethane and 1,2-dichloroethane
Data source: N/A
Data source date: 14 Oct 2016
Hazard Statements: Flam. Liq. 2; H225 , Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 1B; H350 , Aquatic Chronic 3; H412

■ **divanadium pentaoxide; vanadium pentoxide** (EC Number: 215-239-8, CAS Number: 1314-62-1)

EU CLP index number: 023-001-00-8
Description/Comments:
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Hazard Statements: Muta. 2; H341 , Repr. 2; H361d , STOT RE 1; H372 , Acute Tox. 4; H332 , Acute Tox. 4; H302 , STOT SE 3; H335 , Aquatic Chronic 2; H411

■ **dichlorodifluoromethane** (EC Number: 200-893-9, CAS Number: 75-71-8)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Aquatic Chronic 3; H412 , Ozone 1; H420 , Press. Gas; H280

■ **trichlorofluoromethane** (EC Number: 200-892-3, CAS Number: 75-69-4)

Description/Comments: VOC; Data from C&L Inventory Database
Data source: <https://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 02 Mar 2017
Hazard Statements: Acute Tox. 4; H312 , Ozone 1; H420

▪ **bromochloromethane** (EC Number: 200-826-3, CAS Number: 74-97-5)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H312 , Skin Corr. 1B; H314 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Ozone 1; H420

▪ **bromodichloromethane** (EC Number: 200-856-7, CAS Number: 75-27-4)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 1A; H360

▪ **trans-1,3-dichloropropene** (EC Number: 431-460-4, CAS Number: 10061-02-6)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Acute Tox. 3; H301 , Asp. Tox. 1; H304 , Acute Tox. 3; H311 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , Aquatic Chronic 1; H410

▪ **1,3-dichloropropane** (EC Number: 205-531-3, CAS Number: 142-28-9)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H332 , Flam. Liq. 2; H225 , Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335

▪ **dibromochloromethane** (EC Number: 204-704-0, CAS Number: 124-48-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT SE 3; H336 , Muta. 2; H341 , Aquatic Chronic 2; H411

▪ **1,1,1,2-tetrachloroethane** (EC Number: 211-135-1, CAS Number: 630-20-6)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Eye Dam. 1; H318 , Acute Tox. 4; H332 , Carc. 2; H351 , Acute Tox. 4; H312 , Aquatic Chronic 3; H412 , Skin Irrit. 2; H315

▪ **tert-butylbenzene** (EC Number: 202-632-4, CAS Number: 98-06-6)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , Acute Tox. 4; H332 , STOT SE 3; H335 , Asp. Tox. 1; H304 , Aquatic Chronic 2; H411

▪ **sec-butylbenzene** (EC Number: 205-227-0, CAS Number: 135-98-8)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Chronic 2; H411

▪ **4-isopropyltoluene** (EC Number: 202-796-7, CAS Number: 99-87-6)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Chronic 2; H411

▪ **n-butylbenzene** (EC Number: 203-209-7, CAS Number: 104-51-8)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Flam. Liq. 3; H226 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **hexachlorobutadiene** (EC Number: 201-765-5, CAS Number: 87-68-3)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 3;

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301 , Acute Tox. 2; H310 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Irrit. 2; H319 , Acute Tox. 2; H330 , Carc. 2; H351 , Repr. 2; H361 , STOT SE 2; H371 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **1,2,3-trichlorobenzene** (EC Number: 201-757-1, CAS Number: 87-61-6)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , STOT SE 3; H336 , Aquatic Acute 1; H400 , Aquatic Chronic 3; H410

■ **hexachloroethane** (EC Number: 200-666-4, CAS Number: 67-72-1)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

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

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , STOT RE 2; H373

■ **2-nitrophenol** (EC Number: 201-857-5, CAS Number: 88-75-5)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 4; H332 , STOT SE 3; H335 , STOT RE 2; H373 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **bis(2-chloroethoxy)methane** (EC Number: 203-920-2, CAS Number: 111-91-1)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 3; H301 , Acute Tox. 4; H312 , Acute Tox. 1; H330 , Acute Tox. 2; H330 , STOT SE 1; H370 , STOT RE 2; H373

■ **2-methyl naphthalene** (EC Number: 202-078-3, CAS Number: 91-57-6)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , STOT SE 3; H336 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **2-chloronaphthalene** (EC Number: 202-079-9, CAS Number: 91-58-7)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

■ **dimethyl phthalate** (EC Number: 205-011-6, CAS Number: 131-11-3)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , Acute Tox. 3; H331 , STOT SE 3; H335 , STOT SE 3; H336 , Repr. 2; H361 , Aquatic Chronic 3; H412

■ **dibenzofuran** (EC Number: 205-071-3, CAS Number: 132-64-9)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 4; H312 , Acute Tox. 4; H332 , Aquatic Chronic 2; H411

■ **4-chlorophenylphenylether** (EC Number: 230-281-7, CAS Number: 7005-72-3)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **diethyl phthalate** (EC Number: 201-550-6, CAS Number: 84-66-2)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Skin Irrit. 2; H315 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , STOT SE 3; H335 , STOT RE 2; H373 , Repr. 2; H361 , Acute Tox. 4; H302 , STOT SE 3; H336 , Skin Sens. 1; H317 , Aquatic Chronic 1; H410

• **4-bromophenylphenylether** (EC Number: 202-952-4, CAS Number: 101-55-3)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Eye Dam. 1; H318 , Eye Irrit. 2; H319 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **carbazole** (EC Number: 201-696-0, CAS Number: 86-74-8)

Description/Comments: VOC; Data from C&L Inventory Database; IARC considers substance Group 2B;

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

Data source date: 02 Mar 2017

Hazard Statements: Acute Tox. 4; H302 , Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Muta. 2; H341 , Carc. 2; H351 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301

• **di-n-octyl phthalate** (EC Number: 204-214-7, CAS Number: 117-84-0)

Description/Comments: VOC; Data from C&L Inventory Database

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

Data source date: 02 Mar 2017

Hazard Statements: Repr. 2; H361 , Skin Sens. 1; H317 , Resp. Sens. 1; H334 , Eye Irrit. 2; H319 , Aquatic Chronic 4; H413

• **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: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , 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) Worst 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 compounds with the exception of those specified elsewhere in this Annex}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

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 v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2022.25.4995.9469 (25 Jan 2022)

HazWasteOnline Database: 2022.25.4995.9469 (25 Jan 2022)

This classification utilises the following guidance and legislation:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

Appendix H

JIWG Output Sheets

Decision Support Tool for Receptor Risk Ranking

Stage 1		Score
Hazard Identification		
Select ACM type (run model for each type to generate 'Worst Case' output)	Free dispersed fibres/fibre bundles	2
Extent of degradation of ACMs	Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Distribution of Visible Asbestos Across Affected Area	Occasional/random occurrences of visible contamination by ACMs	1
Asbestos fibre type	Chrysotile alone	0
Sub-total		11
Hazard ranking		Medium

No warranty, expressed or implied, or reliance, is provided in relation to the use of this tool.
It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.



Stage 2		Score
Emission Factors		
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Very Low quantities - 0.001 to 0.01 %wt/wt	1
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Low	2
Activity type and effect on deterioration of ACMs	Minimal disturbance, no deterioration expected	1
Best description of primary host material matrix	Made Ground - Recycled Aggregate, Track Ballast	4
Sub-total		8
Exposure ranking		Low

Stage 3		Score
Pathway and Receptor Sensitivity		
Receptor category	Residential	No score required
Age of Receptor	School age (>5 and <16)	3
Duration of exposure/site occupancy	< 1 hour in any single day (e.g. frequent but short exposure event)	1
Receptor ranking		4 Low
Combined hazard, exposure and receptor ranking		Low
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4
Pathway: Depth to impacted material	Material present near the surface, potential to be disturbed during non-construction/routine use of land	D
Pathway ranking		4D Medium
Overall ranking		Low

Project Reference	LKC 20 1913
Site Name	Osborne's Yard, Manchester
Client	MPH Ancoats Ltd
Run by	RP
Date	02.03.2022
Reviewed by	EK
Characterisation of scenario being evaluated	ACM disturbance by site residents
Interpretation of scenario ranking by DST	



Joint Industry **Working Group**

Asbestos in Soil and Construction & Demolition Materials

Project Reference	LKC 20 1913
Site Name	Osborne's Yard, Manchester
Client	MPH Ancoats Ltd
Run by	RP
Date	02.03.2022
Scenario details	Residential apartments with soft landscaping

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

Score

Select ACM type (run model for each type to generate 'Worst Case' output)
Extent of degradation of ACMs at outset of work
Friability and degree of bonding by matrix (ACM matrix, not ground materials)
Distribution of Visible Asbestos Across Affected Area
Amount of asbestos fibre in selected ACM/fibre type as % of host material

Free dispersed fibres/fibre bundles	2
Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles)	4
Friable ACM or ACM with fibres not linked in any matrix (free dispersed fibres/fibre bundles)	4
Occasional/random occurrences of visible contamination by ACMs	1
Very Low quantities - <0.001 to 0.01 %wt/wt	1

Sub-total

12

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking

Medium

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It is contingent on users to satisfy themselves that the output from the tool is relevant and appropriate to the assessment being made.

Stage 2

Exposure Factors

Score

Anticipated airborne fibre concentration - Control Limit or SALI?
 Anticipated duration of exposure to asbestos
 Activity type and effect on deterioration of ACMs during work
 Best description of primary host material matrix (soil/made ground)
 Respirable fibre index for ACM - RIVM report 711701034 (2003)

<0.01 fibres/ml	1
> 2 hours in a 7 day period and Up to 10 hours in a day (e.g. full time occupational exposure)	4
Sampling, manual or mechanical (significant deterioration expected)	2
Made Ground - Recycled Aggregate, Track Ballast	4
Low	2

Sub-total

13

Exposure ranking

Medium

Combined hazard and exposure ranking

25

Medium

Stage 3

Risk Assessment Outputs

Probable Licensing Status	Non-Licensed Work
RPE*	EN140 with P3 filter half mask
Dust Suppression**	Localised mechanical dust suppression
Hygiene/Decontamination***	Localised and enhanced personal decontamination facilities

*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.

**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)

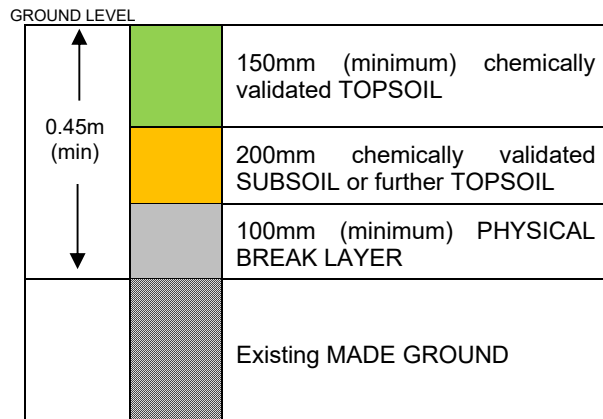
***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

Appendix I

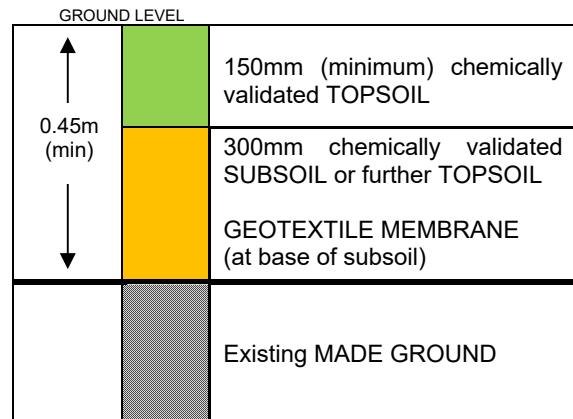
Environmental Cover System Construction

SHARED LANDSCAPING:

Either (physical break layer)



Or (geotextile membrane)



Hardstood Areas – No Remediation Required.

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