

Bury New Road, Ramsbottom

Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy

Job Number: LKC 23 1588

Date: December 2024

Client: Steven Mort



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EXECUTIVE SUMMARY

Site Details

Location	North of Bury New Road, west of Manchester Road, Ramsbottom. Centred at National Grid Reference 380042E 416535N.
Area	300m ² .
Topography	180 metres Above Ordnance Datum (AOD). Site gently slopes up to the north.
Current Site Use	Extended garden of 99 Bury New Road, Ramsbottom.
Proposed Development	1no. dwelling with private garden.

Site Setting

Main Historical Features	Onsite: Vacant land. Surrounding Area: Fletcher Bank Quarry, Shipper Bottom Farm, Residential Building works.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Devensian Till (diamicton). Secondary Undifferentiated Aquifer. Bedrock: Marsden Formation (Mudstone and Siltstone). Secondary A Aquifer.
Landfills / Infilled Ground	2no. recorded landfills present within 250m of the site. The gas risk was not considered to be significant due to age and distance to the site along with the intervening geology (clay and shallow bedrock).
Site Reconnaissance	Site reconnaissance identified garden waste and litter present on the open access site.
Recommendations	Site Investigation was recommended to further assess geo-environmental risk.

Ground Investigation Work Undertaken

Date of Investigation:	22 nd of November 2024.
Intrusive Investigation Work Undertaken:	5no. window sample boreholes. 1no. hand excavated trial pit. Groundwater monitoring.

Ground Conditions

Made Ground	Encountered to 0.20-1.00mbgl comprising reworked natural material with anthropogenic material including rare timber, brick and glass.
Superficial	Soft to stiff consistency silt and clay.
Bedrock	Possible weathered mudstone and sandstone bedrock was encountered from 2.90-3.70mbgl.
Groundwater	Perched water strikes were recorded at 0.80mbgl during the site investigation and 0.02mbgl and 0.91mbgl during the monitoring visit.
Obstructions	None encountered.

Geotechnical Assessment

Allowable Bearing Pressure	100-125kN/m ² at 3.0-2.5mbgl in the Glacial Deposits. Short bored piles can be taken into the Weathered bedrock at 3.0-5.0m depth begl.
Anticipated Foundation Type	Deep strip footings or mini piles
Shallow Groundwater	Shallow groundwater identified on the site which will present a constraint to the development. This may be perched groundwater and can be adequately controlled to allow deep strip footings. Trial excavation to confirm the groundwater regime should be completed during enabling works.

Concrete Requirements	Based on BRE Digest 2005 ¹ – DS-1 AC-1 recommended.
Plasticity this should be considered in foundation recommendations??	Consideration will need to be given to the shrink / swell of the clay strata if it is to be used as founding strata. A low to medium volume change potential has been calculated for the site.
Road / Pavement Design	A design CBR value of 2% should be adopted for the natural strata.

Contamination Risk Assessment

PL	Contaminant	Risk	Recommendations
1	Metals Asbestos PAHs	Low	No remediation required.
2	Naphthalene	Low	No remediation required.
3	Carbon dioxide, Methane	Moderate / Low	No remediation required.
3	Radon	Low	No remediation required.
4	Groundwater (mobile contaminants)	Low	No remediation required.
5	Organic contaminants.	Low	Potable water pipe assessment required.

Waste Assessment

The results show that all the samples tested are classified as **non-hazardous** for disposal.

Waste Acceptance Criteria (WAC) testing was also undertaken on 1no. sample The WAC limits cannot be used to assess whether a waste is non-hazardous or hazardous. It is recommended that the waste assessment and WAC data is forwarded to a licensed waste disposal operator.

Recommendations

PL	Recommendation
1	No remediation required. If required as a growing medium, 150mm imported topsoil (minimum of 3no. samples tested to ensure suitability) in garden / soft landscaped areas.
2	No remediation required.
3	No remediation required.
4	No remediation required
5	Potable water pipe assessment required. Likely standard PE pipework will be acceptable.

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FIGURES

Figure 1 – Site Location and Boundary Plan

Figure 2 – Proposed Development Plan

Figure 3 – Site Investigation Location Plan

APPENDICES

- Appendix A – Risk Matrix
- Appendix B – Profile Logs
- Appendix C – Certificates of Analysis (Soil)
- Appendix D – Certificates of Analysis (Geotechnical)
- Appendix E – Groundwater Level Monitoring Results
- Appendix F – Generic Assessment Criteria Values
- Appendix G – HazWasteOnline™ Certification
- Appendix H – References

1. Introduction

1.1. Background

LK Consult Ltd (LKC) has been commissioned to carry out a Phase 2 Geo-Environmental Investigation, Risk Assessment and Remediation Strategy for Land at 99 Bury New Road, Ramsbottom. The investigation was undertaken in support of a planning application to develop the site for residential use.

The following work has previously been undertaken:

- Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC 23 1588, dated 13th February 2024).

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.

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

Location	Land adjacent to the east of no. 99, end of Bury New Road, to the west of Manchester Road, Ramsbottom. Centred at National Grid Reference 380040E 416540N.
Area	300m ² .
Topography	180 metres Above Ordnance Datum (AOD). Site gently slopes up to the north.
Current Site Use	Extended garden of 99 Bury New Road, Ramsbottom.
Proposed Development	1no. dwelling with private garden.

Table 1-1: Summary of site details.

2. Summary of Preliminary Risk Assessment (PRA)

2.1. Phase 1 Preliminary Risk Assessment (PRA)

Pertinent information has been summarised from the PRA in Table 2-1.

Main Historical Features	Onsite: Vacant land. Surrounding Area: Fletcher Bank Quarry, Shipper Bottom Farm, Residential Building works.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Devensian Till (diamicton). Secondary Undifferentiated Aquifer. Bedrock: Marsden Formation (Mudstone and Siltstone). Secondary A Aquifer.
Landfills / Infilled Ground	2no. recorded landfills present within 250m of the site. The gas risk was not considered to be significant due to age and distance to the site along with the intervening geology (clay and shallow bedrock).
Site Reconnaissance	Site reconnaissance identified garden waste and litter present on the open access site.

Table 2-1: Summary of site details, historical review, environmental settings, and site reconnaissance.

Table 2-2 summarises the geotechnical constraints. This has been updated to consider the previous site investigation work.

Coal Mining	Site is not within a development high risk area. No further assessment required.
Slope Stability	Slope stability assessment recommended, retaining wall will be required.
Made Ground	Unknown depth and constituent of made ground across the site.
Superficial	Unknown strength of soils for foundation design.
Bedrock	Unknown depth to bedrock.
Groundwater	Unknown depth and variability of groundwater.
Plasticity	Plasticity of clay deposits should be confirmed.
Sulphate	Unknown sulphate content of the made ground and natural.

Table 2-2: Summary of geotechnical constraints.

2.2. Conceptual Model

The preliminary contamination conceptual model using contaminant-pathway-receptor linkages based on guidance in LCRM² has been summarised in Table 2-3.

Each pollutant linkage is described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552³. The risk matrix is provided in Appendix A.

PL	Contaminants of Concern (source)	Pathway	Receptor	Probability	Consequence	Risk
1	Asbestos, PAHs, metals TPHs (shallow made ground, quarry works)	Dermal contact. Inhalation of soil, fibres, and dust. Ingestion of soils, dust, home-grown produce, soil attached to home-grown produce. Windblown dust.	Future site users.	Low Likelihood	Medium	Moderate / Low
2	PAHs, light end TPHs (shallow made ground, quarry works)	Inhalation of vapours. Migration via permeable strata and preferential pathways.	Future site users.	Unlikely	Medium	Low
3	Hazardous / ground gas: methane, carbon dioxide (potentially infilled ground/landfills within 250m)	Migration via permeable strata and preferential pathways. Inhalation of gas. Explosion in confined spaces.	Future site users. Buildings.	Unlikely	Severe	Moderate / Low
4	TPHs, PAHs, metals (shallow made ground, quarry works)	Surface run-off. Migration via permeable strata and preferential pathways. Perched waters migration.	Groundwater Surface water	Unlikely	Medium	Low
5	TPHs, PAHs (shallow made ground, quarry works)	Permeation of pipes. Ingestion of tainted water supply.	Future site users. Water pipes.	Unlikely	Medium	Low

Table 2-3: Preliminary Contamination Conceptual Model.

3. Ground Investigation

3.1. Site Investigation Design and Methodology

The investigation was carried out on 22nd of November 2024 and comprised the following:

- 5no. window sample boreholes drilled to 3.35-4.45 metres below ground level (mbgl) (ref. WS101 to WS105).
- 1no. hand pit (using hand auger / spade) excavated to 1.0mbgl (ref. HD101).

All site investigation locations are shown in Figure 3.

The locations were chosen to allow adequate assessment of ground conditions across the site, . Table 3-1 details the site investigation locations.

Site Investigation Locations	Rationale
HD101 and WS104	Proposed Garden in North of site.
WS102-103	Beneath proposed house.
WS101 and WS105	Patio and parking / general site coverage.

Table 3-1: Summary of Sampling Locations.

Areas with more significant sloping or dense vegetation coverage could not be accessed by the window sample rig.

The number of site investigation points corresponds to approximately one location per 7m square centres. This is considered to be a conservative sampling density and is in line with BS10175⁴ for a 'detailed investigation'.

All profile logs are provided in Appendix B and are in line with BS14688-1⁵ and BS5930⁶.

3.2. Well Installations

3no. (WS102, WS103 and WS105) of the boreholes were installed with monitoring wells for 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.

Well installation details are provided in Profile Logs in Appendix B.

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 for total volatile organic compounds (TVOCs) using a photoionisation detector (PID) fitted with a 10.6eV lamp and moisture trap. 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. Results of the PID readings are presented on the profile logs (Appendix B). The onsite monitoring was carried out in line CIRIA C665⁹ to aid in screening samples for volatile analysis.

Soil samples of approximately 1kg were recovered in amber jars and plastic tubs. All the samples were sent to DETS laboratory for chemical testing.

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.

Testing	No. Samples	Justification
Metals / metalloids, pH, water soluble sulphate, speciated PAHs, SOM and asbestos screen.	4	A basic suite with a broad selection of contaminants where no significant evidence of contamination was identified (except for occasional brick fragments).
TPHCWG, BTEX, MTBE, speciated asbestos screen.	1	Detailed suite undertaken to support waste classification.
Waste Acceptance Criteria (WAC)	1	Samples of representative material which may be earmarked for disposal.

Table 3-2: Summary of Soil Testing.

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; BTEX=benzene, toluene, ethylbenzene, and xylenes; MTBE=Methyl tert-butyl ether, SOM=Soil Organic Matter.

3.3.2. Soil Sampling (Geotechnical)

Soil samples taken during the investigation were collected in tubs and bulk bags for testing and sent to Murray Rix Laboratories / DETS for geotechnical testing.

Further details are given in the laboratory report presented in Appendix D. Table 3-3 shows the geotechnical testing undertaken.

Testing	No. Samples
Atterberg Limits (plasticity testing)	3
BRE Suite Short	2

Table 3-3: Summary of Geotechnical Testing Undertaken.

3.3.3. Water Sampling / Leaching Testing

Groundwater sampling / leaching testing was not carried out as part of this investigation.

A low risk was identified in the preliminary contamination conceptual model for controlled waters (Pollutant Linkage 4) and further action was only recommended if significant soil contamination was identified on site. Based on the ground conditions encountered, LKC did not consider testing to be required. This is discussed further in Section 6.4.

3.4. In-situ Testing

3.4.1. Geotechnical Testing

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

- Standard Penetration Tests (SPTs) were performed in the window sample boreholes and cable percussion boreholes at approximately 1m intervals.

- Pocket penetrometer tests (giving undrained shear strength) were performed in the window sample boreholes and hand dug pits within cohesive strata.

The results are provided within Appendix B.

3.5. Gas Monitoring

A low / moderate risk was identified in the preliminary contamination conceptual model for gas (Pollutant Linkage 3) and further action was only recommended if significant organic / putrescible material was identified on site.

Based on the ground conditions encountered, LKC did not consider gas monitoring to be required. This is discussed further in Section 6.3.

4. Ground Conditions

4.1. Geology

The ground conditions beneath the site are summarised below. Logs are provided in Appendix B.

4.1.1. Made Ground

Made ground was recorded in all boreholes to depths of 0.20-1.00mbgl. The made ground comprised horizons of sand and silt with rare anthropogenic material including timber fragments, brick and glass.

4.1.2. Natural Strata

Superficial strata comprised horizons of soft to stiff silt and clay.

Weathered mudstone and sandstone bedrock was encountered from 2.90-3.70mbgl.

4.1.3. Contamination

There was no visual / olfactory evidence of hydrocarbons or volatile contaminants in any locations. The PID recorded a maximum of 0.1ppm TVOC in the samples.

4.1.4. Obstructions

No obstructions were identified within any investigation location.

4.1.5. Plasticity

Clay samples were subjected to Atterberg Limits (plasticity) and Moisture Content testing. Results are provided in Appendix D.

The clay is classified as low to medium plasticity.

The modified plasticity index as detailed in Chapter 4.2-D5 of the NHBC standards (modified plasticity index = plasticity index x % less than 425µm sieve / 100%) characterises the clay as having a low to medium volume change potential.

4.2. Groundwater

4.2.1. Groundwater Levels

Groundwater strikes were recorded during the investigation in trial pits and boreholes. This data is provided in the profile logs (Appendix B). Perched water strikes were recorded at 0.80mbgl in WS101 and WS105. No groundwater strikes were recorded in the remainder of the boreholes.

Groundwater level monitoring within the installed boreholes has been undertaken on one occasion. An oil-water interface probe was used to detect the presence of free phase hydrocarbons within each borehole. This data is provided in Appendix E.

Monitoring levels were recorded between 0.02mbgl and 0.91mbgl in the installed boreholes.

4.2.2. Contamination

No evidence of contamination was identified in the groundwater during investigation work or monitoring. No free phase hydrocarbons were detected.

5. Geotechnical Assessment

5.1. Proposed Development

It is understood that the proposed development will comprise a two storey residential property with associated landscaping and infrastructure.

To facilitate the development based on the current ground levels, it will be cut in to the slope, with a retaining wall along the northeast side of the house. The base of the retaining wall is currently proposed at approximately 175m AOD. Temporary sheet piling will be used to allow the wall construction.

Details of the proposed loadings are not known and therefore a line loading of 75kN/m has been assumed for preliminary assessment purposes only.

5.2. 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 Works¹⁰. This should include:

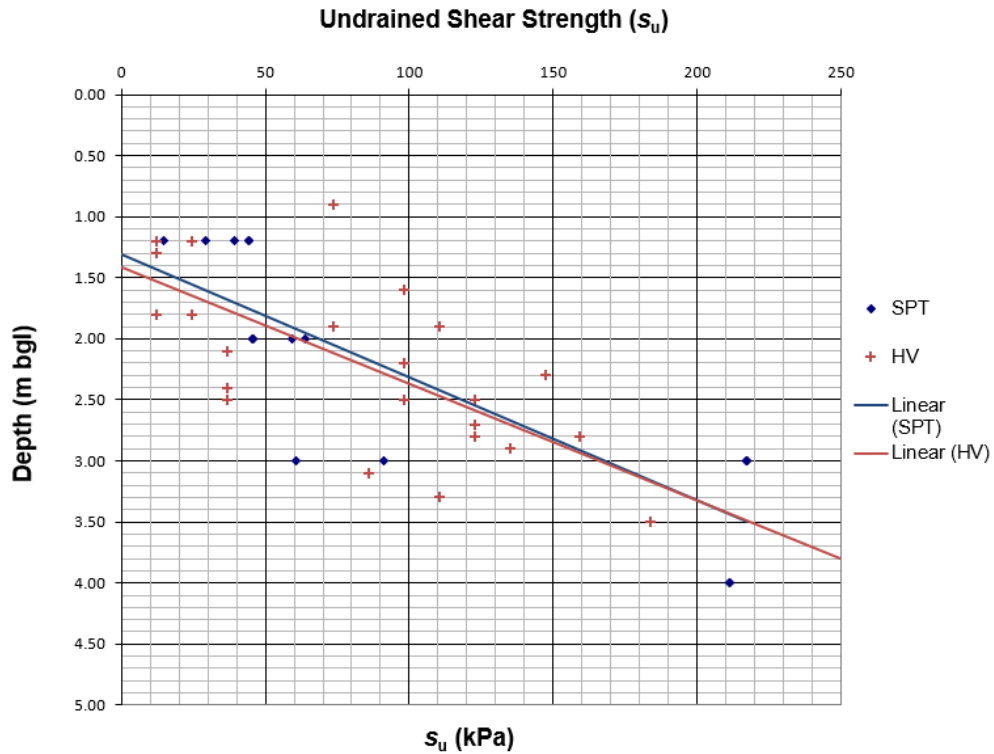
- Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill.
- Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill; and,
- Buried structures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

The near surface soils may potentially be disturbed by weathering and site traffic. Precautions should be taken to avoid this, as excessive disturbance may result in more onerous floor slab design, road cap thickness and increased amount of site disposal etc. Based on site observations the near surface soils may require at least some treatment or reinforcing to allow safe movement of construction plant and labour. A working platform will be required for piling plant.

5.3. Foundation Conditions and Bearing Capacity

5.3.1. General

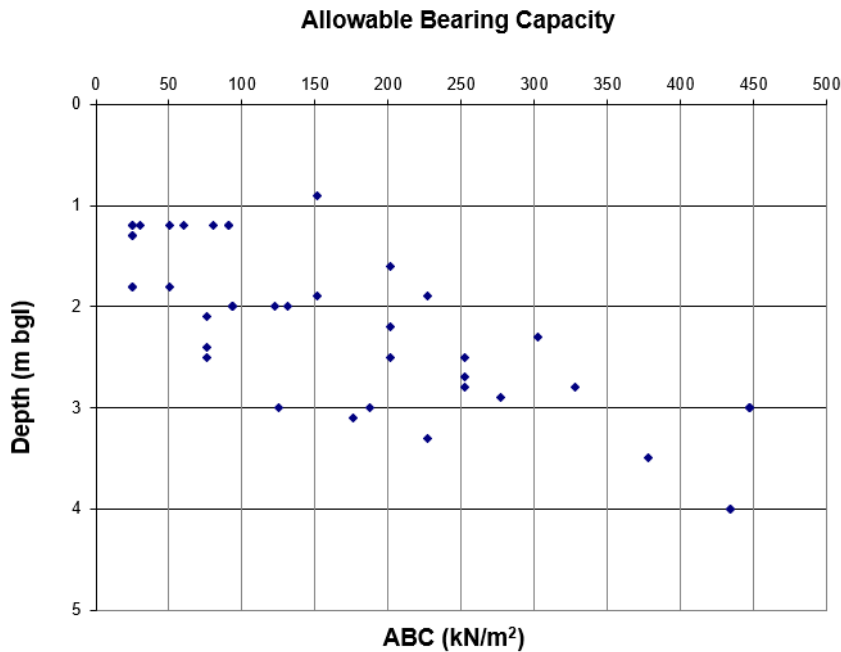
The natural cohesive material has been assessed using in-situ testing by SPT and pocket penetrometer (PP) to obtain the undrained shear strength (su) of the material. The results of the testing have been plotted against depth and is shown in Graph 5-1.



Graph 5-1: Summary of s_u Vs. Depth from In-Situ SPT and PP Testing.

Graph 5-1 demonstrates that the strength of the cohesive deposits is typically soft from 1.00-2.00m, then generally increases in strength with depth.

The results have then been used to provide guideline Allowable Bearing capacities (ABC) and is shown in Graph 5-2.



Graph 5-2: Summary of ABC Vs. Depth from In-Situ SPT and PP Testing.

5.3.2. Foundations Options

The investigation has proven a veneer of comprises made ground up to 1.00mbgl overlying natural cohesive superficial deposits of silt and clay. Weathered bedrock was encountered at depths between 2.90-3.70mbgl.

A single monitoring event has recorded shallow depth groundwater at 0.30-0.80mbgl. Given the ground conditions the groundwater levels are likely to be indicative or perched groundwater within the made ground / above the bedrock.

The made ground is not suitable for as founding material. The temporary sheet piling installed for the retaining walls and appropriate groundwater control can allow the underlying glacial deposits to be considered as a founding stratum for deep strip footing and the following design bearing pressures are given for guidance in Table 5.1:

Depth (m) BEGL	Design Bearing Pressure (kN/m ²)	
	1m*	2m*
2.00	100	50
2.50	125	75

Table 5-2: Design Bearing Pressures Spread Footings.

Notes:* Indicates width of foundation

At the intensities of loading given above, total settlements should not exceed 25mm, with angular rotation along a typical 10m long (mesh reinforced) strip footing of not worse than 1 in 650.

It is likely that there will be some variations in formation compressibility and consequently light gauge mesh reinforcement should be available on site should it be necessary to even out those variations in formation performance.

Deep strip footings may result in large quantities of excavation spoil and this may be a consideration.

As an alternative, consideration may be given to the use of mini-piled foundations to transfer loadings through the made ground and the Glacial deposits and bear upon the sandstone bedrock at depths encountered of between 3.00m and 5.00mbgl.

Use of mini piles will reduce the amount of spoil generated from foundation trenches requiring offsite disposal, along with the amount of concrete required for the development.

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.

Should a pile foundation solution be the preferred option, then warranty providers such as the NHBC or LABC, may require further information on ground conditions to a minimum of 5.00m below the base of the pile.

5.4. Ground Floor Slabs

In general, residential developments opt for block and beam ground floors due to ease of installation. The enabling works reducing the levels to ground floor level will remove the existing made ground. A ground bearing floor slab could prove suitable for the

proposed building. The Atterberg Limit determinations, show the clay within the natural ground to be of low to intermediate plasticity and low to medium shrinkage potential and should be design appropriately against the lower risk of potential heave.

If the pile substructure is adopted the ground floor would likely be suspended.

5.5. Earth Pressures and Retaining Walls

Foundations for retaining walls can be based on the allowable design bearing pressures given in Section 5.3.2. Earth pressures may be calculated assuming the following effective shear strength parameters provided in Table 5-2.

Stratum	Effective Cohesion C' (kN/m ²)	Effective Angle of Friction ϕ' (degrees)	Bulk Density (Mg/m ³)
Made Ground	0	28°	18.00
Glacial Deposits	0	30°	19.00

Table 5-2: Summary of Effective Shear Strength parameters.

5.6. Pavement Construction

An assessment of the likely California Bearing Ratio (CBR) for the made ground has been assessed from site observations and description of the materials encountered in the exploratory holes.

A design CBR of 2% should be adopted for pavement formations on the natural soils, however, recommended that this be re-assessed using on site plate tests of the formation. It is possible that a higher design CBR may be achievable.

Based on the plasticity index the soils are not considered frost susceptible.

5.7. Concrete Durability

Based upon the results of the chemical analyses (Appendix D), subsurface concrete can be designed in accordance with Design Sulphate Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with the recommendations provided in BRE Special Digest 1 (2005).

5.8. Excavations

Site observations indicated that excavations should be feasible in the near surface with normal plant.

Groundwater seepage was recorded in the window samples boreholes. It is likely that the groundwater is perched on the natural soils. Trial excavations during enabling works should be considered and the findings of this investigations reviewed based on the results.

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 (LCRM¹¹). 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) ^{12, 13}.
- LQM Suitable 4 Use Levels (S4ULs) ^{14, 15, 16, 17}.

The proposed development is for a residential house with garden areas, therefore the assessment criteria for 'residential with plant uptake' has been used.

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

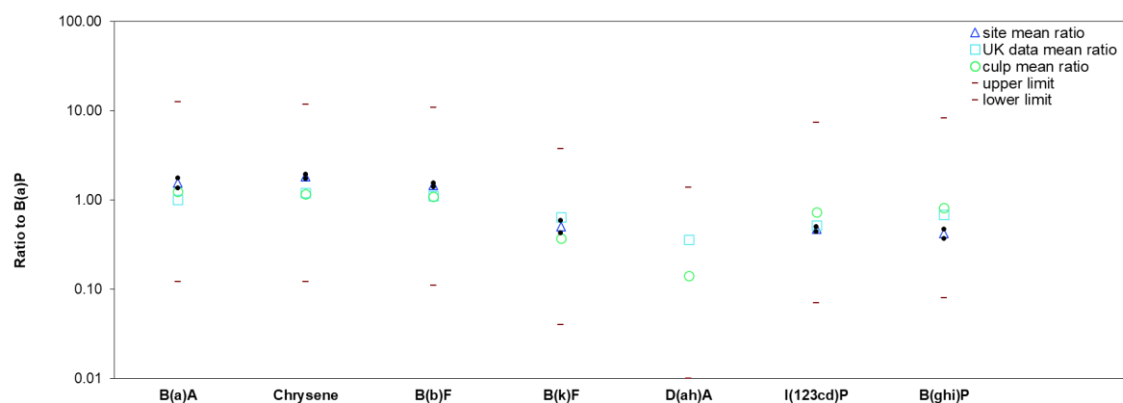
A summary of the generic assessment criteria used in this assessment is provided in Appendix F.

B(a)P as Surrogate Marker

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 PAHs^{19,20} and naphthalene the most volatile and soluble²¹. The 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 negligible²². For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)²³ and CL:AIRE (2013). Naphthalene will be treated separately using the LQM S4ULs.

LKC undertook an assessment of the PAH 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.*²⁴, 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.



Graph 6-1: The ratio of PAH to B(a)P in soil for all available data at the site based on 2 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.

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.

6.2.2. Soil Results Comparison against Assessment Criteria

All analysis sheets are presented in Appendix C. Results have been compared to the relevant assessment criteria and no elevated contaminants were identified. No asbestos was identified in any soil samples analysed.

6.2.3. Direct Contact Risk – Pollutant Linkage 1

No metals, asbestos or PAHs were identified, therefore the probability of these contaminants posing a risk to site users is considered unlikely. With a medium consequence, the risk is considered to be low, and no remediation is recommended.

6.2.4. Risk from Inhalation of Vapours – Pollutant Linkage 2

No visual / olfactory evidence of volatile contaminants was identified during the investigation. The PID did not detect any significant TVOCs. Confirmatory soil analysis did not detect any naphthalene above assessment criteria.

LKC therefore consider the probability of volatile contaminants affecting site users as unlikely. The consequence is expected to be medium, giving a low risk and no remediation is required.

6.3. Gas Risk Assessment (Pollutant Linkage 3)

Gas monitoring was not carried out as part of this assessment. The PRA identified a low / moderate risk and recommended gas monitoring if a significant depth of organic / putrescible material was identified onsite. The offsite risk was considered low due mainly to the geology (clay and shallow bedrock) limiting any migration of hazardous gas from licenced landfill within 250m of the site.

No significant organic / putrescible material was encountered on site. Made ground comprised approximately c.1m made ground comprising reworked natural ground with rare brick, timber and glass fragments. Clay was encountered across the site.

Given the ground conditions encountered, LKC considers the probability of gas posing a risk to site users as unlikely. The consequence is severe, which gives a moderate / low risk. No further action is required with respect to Pollutant Linkage 3.

6.4. Controlled Water Assessment (Pollutant Linkage 4)

The PRA identified a low risk with respect to controlled waters as no significant source of mobile contamination was anticipated. Secondary Undifferentiated and Secondary A Aquifers are present below the site, no abstractions have been identified within influencing distance and the site is not located in a Source Protection Zone.

The site investigation did not identify any significant sources of likely mobile contamination within the soils. This confirms an unlikely probability of onsite contamination affecting controlled waters. With a medium consequence the risk is anticipated to be low, and no remediation is required.

6.5. Potable Water Supply (Pollutant Linkage 5)

Soil results were compared to United Utilities (UU) guidelines for the selection of potable water pipes in land potentially affected by contamination. Only contaminants of concern, based on the preliminary conceptual model and ground conditions encountered, were analysed.

No elevated organic contamination was identified within the made ground or natural silt.

The probability of organic contaminants affecting potable water pipes is unlikely. Given the consequence is considered to be medium, the risk is anticipated to be low risk, and no remediation is likely to be required.

Once details of the pipeline location and depths are known a UU Water Pipe Risk Assessment in line with the utility provider should be undertaken to confirm the most appropriate pipework for potable water. Based on the soil data it is likely standard PE pipework will be suitable.

6.6. Revised Contamination Conceptual Model

The preliminary contamination conceptual model (Table 2-3) 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 6-1.

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

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

PL	Contaminants of Concern (source)	Pathway	Receptor	Probability	Consequence	Risk	Recommendations
1	Asbestos, PAHs, metals (shallow made ground)	Dermal contact. Inhalation of soil, fibres, and dust. Ingestion of soils, dust, home-grown produce, soil attached to home-grown produce. Windblown dust.	Future site users.	Unlikely	Medium	Low	No remediation required
2	Naphthalene (shallow made ground)	Inhalation of vapours. Migration via permeable strata and preferential pathways.	Future site users.	Unlikely	Medium	Low	No remediation required
3	Hazardous / ground gas: methane, carbon dioxide (potentially infilled ground/landfills within 250m)	Migration via permeable strata and preferential pathways. Inhalation of gas. Explosion in confined spaces.	Future site users. Buildings.	Unlikely	Severe	Moderate / Low	No remediation required
4	PAHs, metals (shallow made ground)	Surface run-off. Migration via permeable strata and preferential pathways. Perched waters migration.	Groundwater Surface water	Unlikely	Medium	Low	No remediation required
5	Naphthalene (shallow made ground)	Permeation of pipes. Ingestion of tainted water supply.	Future site users. Water pipes.	Unlikely	Medium	Low	Potable water pipe assessment recommended.

Table 6-1: Revised Contamination Conceptual Model.

7. Waste Disposal Assessment

7.1. HazWaste 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 HazWasteOnline™. This is a web-based facility that allows an assessment waste as either hazardous or non-hazardous waste based on relevant guidance and legislation.

HazWasteOnline™. has been designed to cover, amongst other waste types, the 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, contaminants were selected based on observations during sampling, site history, ground conditions and likely species present in soils (e.g., metal oxides relating to an ash-based source).

The results show that all the samples tested are classified as **non-hazardous for disposal**. The HazWasteOnline™ output sheets are provided in Appendix G.

7.2. Waste Acceptance Criteria (WAC) Testing

Waste Acceptance Criteria (WAC) testing was also undertaken on 1no. sample representative of material which may be earmarked for off-site disposal. WAC test results are included in Appendix C.

It is recommended that waste assessment and WAC data is forwarded to a licensed waste disposal operator.

8. Summary Conclusions

8.1. Ground Conditions

Ground conditions are summarised in Table 8-1 below.

Made Ground	Encountered to 0.20-1.00mbgl comprising reworked natural material with anthropogenic material including rare timber, brick and glass.
Superficial	Soft to stiff consistency silt and clay.
Bedrock	Possible weathered mudstone and sandstone bedrock was encountered from 2.90-3.70mbgl.
Groundwater	Perched water strikes were recorded at 0.80mbgl during the site investigation and 0.02mbgl and 0.91mbgl during the monitoring visit.
Obstructions	None encountered.

Table 8-1: Summary of Ground Conditions.

8.2. Geotechnical

Geotechnical observations and conclusions are contained in Table 8-2 below, more detailed discussions are contained within Section 5.

Allowable Bearing Pressure	100-125kN/m ² at 3.00-2.50mbgl in the Glacial Deposits. Short bored piles can be taken into the weathered bedrock at 3.00-5.00mbgl.
Anticipated Foundation Type	Deep strip footings or mini piles.
Shallow Groundwater	Shallow groundwater identified on the site which will present a constraint to the development. This may be perched groundwater and can be adequately controlled to allow deep strip footings. Trial excavation to confirm the groundwater regime should be completed during enabling works.
Concrete Requirements	Based on BRE Digest 2005 ²⁵ – DS-1 AC-1 recommended.
Plasticity	Consideration will need to be given to the shrink / swell of the clay strata if it is to be used as founding strata. A low to medium volume change potential has been calculated for the site.
Road / Pavement Design	A design CBR value of 2% should be adopted for the natural strata.

Table 8-2: Geotechnical Conclusions Table.

8.3. Contamination Assessment

A revised contamination conceptual model has been produced by LKC which is summarised in Table 8-3 below (more detailed model provided in Section 6).

PL	Contaminant	Risk	Recommendations
1	Metals Asbestos PAHs	Low	No remediation required.
2	Naphthalene	Low	No remediation required.
3	Carbon dioxide, Methane	Moderate / Low	No remediation required.
3	Radon	Low	No remediation required.
4	Groundwater (mobile contaminants)	Low	No remediation required.
5	Organic contaminants.	Low	Potable water pipe assessment required.

Table 8-3: Summary Risk Table. PL=Pollutant Linkage, see Table 6-1 for details.

8.4. Waste Assessment

The results show that all the samples tested are classified as **non-hazardous for disposal**.

Waste Acceptance Criteria (WAC) testing was also undertaken on 1no. sample. It is recommended that waste assessment and WAC data is forwarded to a licensed waste disposal operator.

8.5. Recommendations

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.

A summary of remediation requirements is included in Table 8-4.

PL	Recommendation
1	No remediation required. If required as a growing medium, 150mm imported topsoil (minimum of 3no. samples tested to ensure suitability) in garden / soft landscaped areas.
2	No remediation required.
3	No remediation required.
4	No remediation required
5	Potable water pipe assessment required. Likely standard PE pipework will be acceptable.

Table 8-4: Remediation Summary.

A watching brief for any unexpected contamination should be maintained during groundworks and if identified risks should and assessed.

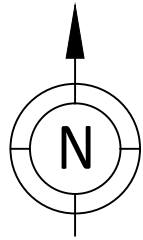
Although no remediation is required, if topsoil is to be imported onto site as a growing medium in gardens then any imported soils should be validated to ensure they are suitable for use against the criteria detailed in Section 6.2.1. Based on the site size, 3no. topsoil samples would be adequate tested for a comprehensive contamination suite.

All the remediation and validation work should be documented in a Site Completion Report. The Completion Report will be provided to satisfy the outstanding contaminated land planning condition.

Figures



Client: Steven Mort				Title: Site Location & Boundary Plan					
Site: 99 Bury New Road, Ramsbottom				Scale (see scale bar): 1:10,000 & 1:500 @ A4				Figure: 1	Revision:
Job No.: LKC 23 1588	Drawn By: AE	Checked By: EK	Drawn: Feb 2024						



KEY

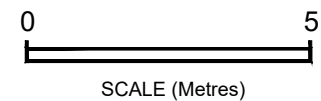
 Site Boundary

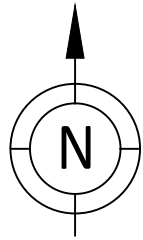
Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing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



Client:			
Steven Mort			
Site:			
99 Bury New Road, Ramsbottom			
Title:			
Proposed Development Plan			
Job No.:	LKC 23 1588	Scale (See Scale Bar):	See Scale Bar
Drawn By:	AC	Checked By:	AE
		Drawn:	Feb 2024
			2

Extract From: Peel Design Partnership Ltd
Drawing Ref: Proposed Ground Floor Plan, No.23-08-41-A, Rev:A (30/11/2023)





KEY

- Site Boundary
- Window Sample Borehole (WS)
- Hand Dug Trial Pit (HD)
- Elevation (mAOD)

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: Steven Mort			
Site: 99 Bury New Road, Ramsbottom			
Title: Site Investigation Location Plan			
Job No.: LKC231588	Scale (See Scale Bar): See Scale Bar	Figure: 3	Revision:
Drawn By: AC	Checked By: AE	Drawn: Dec 2024	

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 552²⁶. 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.

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.

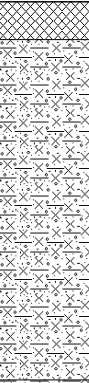
Appendix B – Profile Logs

		Window Sample Borehole Log				Location Number: WS102	
Project Name: Bury New Road, Ramsbottom			Client: Steven Mort		Date: 22/11/2024		
Project No. : LKC 23 1588			Contractor: D & I Drilling Ltd		Co-ords: E380041.71 N416537.04		
Equipment: Window Sample Rig: Competitor Dart			Level 176.24m AOD	Logged By AE	Scale 1:40	Page Number Sheet 1 of 1	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)	Well
0.00 - 0.20 0.00 - 0.20	ES PID=0.0ppm	0.20		MADE GROUND: Dark brown gravelly silty SAND with frequent rootlets and rare brick fragments. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.		176.04	
0.50 - 1.00 0.50 - 1.00	ES PID=0.0ppm			Very soft consistency very low strength light brown gravelly sandy clayey SILT. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	1		
1.20 - 1.65 1.20 1.20 - 1.65 1.50 - 2.00	D PP=12.3kPa N=3 (1,0/0,1,1,1) D						
1.80	PP=12.3kPa						
2.00 - 2.45 2.00 - 2.45	D N=14 (1,2/3,4,3,4)	2.00		Stiff consistency high strength grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	2	174.24	
2.30	PP=147.2kPa						
2.50 - 3.00	D	2.40		Stiff to very stiff consistency high to very high strength blackish grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.		173.84	
2.80	PP=159.4kPa			2.80m to 3.30mbgl - Strata is very stiff consistency very high strength.	3		
3.00 - 3.45 3.00 - 3.45	D N=14 (2,2/3,3,3,5)						
3.30	PP=110.4kPa						
		3.50		3.30m to 3.50mbgl - Strata is stiff consistency high strength.		172.74	
				Completely weathered MUDSTONE.			
4.00 - 4.45 4.00 - 4.45	D N=50 (5,9/12,12,13,13)				4		
		4.45		End of Borehole at 4.45m		171.79	
					5		
					6		
					7		
					8		

Remarks:
 Borehole dry and stable.
 SPT refusal on bedrock at 4.45mbgl.

		Window Sample Borehole Log				Location Number: WS103	
Project Name: Bury New Road, Ramsbottom			Client: Steven Mort		Date: 22/11/2024		
Project No. : LKC 23 1588			Contractor: D & I Drilling Ltd		Co-ords: E380041.75 N416533.12		
Equipment: Window Sample Rig: Competitor Dart			Level 176.01m AOD	Logged By AE / HW	Scale 1:40	Page Number Sheet 1 of 1	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)	Well
0.00 - 0.20 0.00 - 0.20	ES PID=0.0ppm	0.20		MADE GROUND: Dark brown gravelly silty SAND with frequent rootlets and rare brick fragments. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone. Very soft consistency very low strength light brown gravelly sandy SILT. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	1	175.81	
0.50 - 1.00 0.50 - 1.00	ES PID=0.0ppm						
1.20 - 1.65 1.20 1.20 - 1.65 1.30 1.50 - 2.00 1.80	D PP=12.3kPa N=9 (2,2/2,2,2,3) PP=12.3kPa D PP=12.3kPa						
2.00 - 2.45 2.00 - 2.45 2.20	D N=10 (2,2/2,2,3,3) PP=98.1kPa						
2.50 - 2.90 2.50	D PP=122.6kPa	2.40		Stiff consistency high strength grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	2	174.01	
2.50 - 2.90 2.50	D PP=122.6kPa	2.40		Stiff consistency high strength blackish grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.		173.61	
3.00 - 3.35 3.00 - 3.44	D N=50 (3,5/50 for 285mm)	2.90		Completely weathered MUDSTONE.	3	173.11	
		3.35		End of Borehole at 3.35m		172.66	
					4		
					5		
					6		
					7		
					8		

Remarks:
 Borehole dry and stable.
 SPT refusal at 3.35mbgl.

Window Sample Borehole Log

Location Number:

WS104

Project Name: Bury New Road, Ramsbottom

Client: Steven Mort

Date: 22/11/2024

Project No. : LKC 23 1588

Contractor: D & I Drilling Ltd

Co-ords: E380043.00 N416528.34

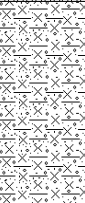
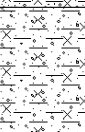
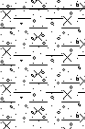
Equipment: Window Sample Rig: Competitor
Dart

Level
175.98m AOD

Logged By
AF / HW

Scale
1:40

Page Number
Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)
0.00 - 0.40	ES PID=0.0ppm	0.40		MADE GROUND: Dark brown gravelly silty SAND with frequent rootlets and rare brick fragments. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	175.58
0.50 - 1.00	ES PID=0.0ppm			Very soft consistency very low strength light brown gravelly sandy clayey SILT. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	
1.20 - 1.65	D N=8 (1,1/2,2,2,2,2)	1.50		Stiff consistency high strength blackish grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	174.48
1.50 - 2.00	D			Stiff consistency high strength grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	173.78
2.00 - 2.45	PP=110.4kPa D	2.20		Possible SANDSTONE recovered as sandy gravel.	173.08
2.00 - 2.45	N=10 (2,2/2,2,3,3)				
2.20 - 2.90	D	2.90			
2.50	PP=98.1kPa				
3.00 - 3.44	D	3.44			172.54
3.00 - 3.44	N=50 (5,8/50 for 295mm)				
				End of Borehole at 3.44m	

Remarks:

Borehole dry and stable.

SPT refusal on bedrock at 3.44mbgl.



Window Sample Borehole Log

Location Number:
WS105

Project Name: Bury New Road, Ramsbottom

Client: Steven Mort

Date: 22/11/2024

Project No. : LKC 23 1588

Contractor: D & I Drilling Ltd

Co-ords: E380038.55 N416529.69

Equipment: Window Sample Rig: Competitor Dart

Level
175.48m AOD

Logged By
AE / HW

Scale
1:40

Page Number
Sheet 1 of 1

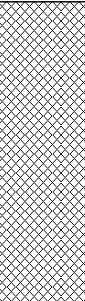
Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)	Water Strikes	Well
0.00 - 1.00 0.00 - 1.00	ES PID=0.1ppm			MADE GROUND: Soft consistency dark brown gravelly sandy clayey SILT with rare brick fragments and glass fragments. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.				
1.20 - 1.65 1.20 1.20 - 1.65 1.50 - 2.00 1.50 - 2.00 1.80	D PP=24.5kPa N=6 (1,1/1,2,1,2) ES PID=0.0ppm PP=24.5kPa	1.00		Soft consistency light brown gravelly sandy SILT. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	1	174.48		
2.00 - 2.45 2.00 - 2.45	D N=13 (3,3/3,3,4,3)	2.00		Soft consistency grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.	2	173.48		
2.50 - 2.90 2.50 2.80	D PP=36.8kPa PP=122.6kPa	2.90		Possible SANDSTONE recovered as sandy gravel.	3	172.58		
3.00 - 3.35 3.00 - 3.44	D N=50 (5,8/50 for 285mm)	3.35		End of Borehole at 3.35m		172.12		
					4			
					5			
					6			
					7			
					8			

Remarks:

Water strike at 0.80mbgl.

Borehole stable.

SPT refusal at 3.35mbgl.

		Trial Pit Log				Location Number: HD101				
Project: Bury New Road, Ramsbottom			Client: Steven Mort			Date: 22/11/2024				
Project No. : LKC 23 1588			Contractor: D & I Drilling Ltd			Co-ords: E380042.75 N416548.66				
Equipment: Window Sample Rig: Competitor Dart			Level 176.83m AOD		Logged By AE		Scale 1:10		Page Number Sheet 1 of 1	
Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description					Level (m)	
0.00 - 0.40	ES			MADE GROUND: Soft consistency dark brown gravelly sandy clayey SILT with rare brick fragments and glass fragments. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.					176.43	
0.40 - 1.00		0.40		Soft consistency light brown gravelly sandy SILT. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone.				0.5		
0.60	SV=30.00kPa									
		1.00		End of Trial Pit at 1.00m				1.0	175.83	
								1.5		
								2.0		
			Pit Dimensions					Pit Stability		
			Length (m)		Width (m)		Depth (m)		Stable	
			0.30		0.30		1.00			
			Remarks: Pit dry.							

Appendix C – Certificates of Analysis (Soil)



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Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 24-14268

Site Reference: 99 Bury New Road, Ramsbottom

Project / Job Ref: LKC 23 1588

Order No: PO C000618

Sample Receipt Date: 27/11/2024

Sample Scheduled Date: 27/11/2024

Report Issue Number: 1

Reporting Date: 04/12/2024

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.



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Soil Analysis Certificate						
DETS Report No: 24-14268	Date Sampled	22/11/24	22/11/24	22/11/24	22/11/24	
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: 99 Bury New Road, Ramsbottom	TP / BH No	HD101	WS104	WS104	WS105	
Project / Job Ref: LKC 23 1588	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: PO_C000618	Depth (m)	0.00 - 0.40	0.00 - 0.40	0.50 - 1.00	0.00 - 1.00	
Reporting Date: 04/12/2024	DETS Sample No	752805	752806	752807	752808	

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	6.3	6.7	7.0	7.2
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	13	< 10	< 10	15
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.01	< 0.01	< 0.01	0.02
Organic Matter (SOM)	%	< 0.1	MCERTS	9.6	10.4	1.3	8.5
Arsenic (As)	mg/kg	< 2	MCERTS	10	14	6	20
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3	0.4	< 0.2	0.7
Chromium (Cr)	mg/kg	< 2	MCERTS	13	15	15	21
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	34	45	14	57
Lead (Pb)	mg/kg	< 3	MCERTS	65	73	13	157
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	17	18	15	18
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	21	23	17	28
Zinc (Zn)	mg/kg	< 3	MCERTS	75	85	32	112
TPH (EPH EC10-EC40) : EH_1D_Total	mg/kg	< 6	MCERTS				48

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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4480

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-14268	Date Sampled	22/11/24	22/11/24	22/11/24	22/11/24	
LK Consult Limited	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: 99 Bury New Road, Ramsbottom	TP / BH No	HD101	WS104	WS104	WS105	
Project / Job Ref: LKC 23 1588	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: PO_C000618	Depth (m)	0.00 - 0.40	0.00 - 0.40	0.50 - 1.00	0.00 - 1.00	
Reporting Date: 04/12/2024	DETS Sample No	752805	752806	752807	752808	

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	0.16	
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	< 0.1	0.16	
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	0.42	1.27	< 0.1	1.64	
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.23	< 0.1	0.35	
Fluoranthene	mg/kg	< 0.1	MCERTS	0.25	1.83	< 0.1	3.39	
Pyrene	mg/kg	< 0.1	MCERTS	0.25	1.76	< 0.1	3.03	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.81	< 0.1	1.24	
Chrysene	mg/kg	< 0.1	MCERTS	0.19	0.88	< 0.1	1.58	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.64	< 0.1	1.41	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.27	< 0.1	0.39	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.46	< 0.1	0.92	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	< 0.1	0.46	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.17	< 0.1	0.43	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	8.8	< 1.6	15.2	



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Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3																																							
DETS Report No: 24-14268		Date Sampled	22/11/24		<table border="1"> <thead> <tr> <th colspan="3">Landfill Waste Acceptance Criteria Limits</th> </tr> <tr> <th>Inert Waste Landfill</th> <th>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th>Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td>5%</td> <td>6%</td> </tr> <tr> <td>--</td> <td>--</td> <td>10%</td> </tr> <tr> <td>6</td> <td>--</td> <td>--</td> </tr> <tr> <td>1</td> <td>--</td> <td>--</td> </tr> <tr> <td>500</td> <td>--</td> <td>--</td> </tr> <tr> <td>100</td> <td>--</td> <td>--</td> </tr> <tr> <td>--</td> <td>>6</td> <td>--</td> </tr> <tr> <td>--</td> <td>To be evaluated</td> <td>To be evaluated</td> </tr> </tbody> </table>					Landfill Waste Acceptance Criteria Limits			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	3%	5%	6%	--	--	10%	6	--	--	1	--	--	500	--	--	100	--	--	--	>6	--	--	To be evaluated	To be evaluated
Landfill Waste Acceptance Criteria Limits																																							
Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill																																					
3%	5%	6%																																					
--	--	10%																																					
6	--	--																																					
1	--	--																																					
500	--	--																																					
100	--	--																																					
--	>6	--																																					
--	To be evaluated	To be evaluated																																					
LK Consult Limited		Time Sampled	None Supplied																																				
Site Reference: 99 Bury New Road, Ramsbottom		TP / BH No	WS105																																				
Project / Job Ref: LKC 23 1588		Additional Refs	None Supplied																																				
Order No: PO_C000618		Depth (m)	0.00 - 1.00																																				
Reporting Date: 04/12/2024		DETS Sample No	752808																																				
Determinand	Unit	MDL																																					
TOC ^{MU}	%	< 0.1		4.9																																			
Loss on Ignition ^{MU}	%	< 0.01		9.40																																			
BTEX ^{MU}	mg/kg	< 0.05		< 0.05																																			
Sum of PCBs	mg/kg	< 0.1		< 0.1																																			
Mineral Oil ^{MU}	mg/kg	< 10		< 10																																			
Total PAH ^{MU}	mg/kg	< 1.7		15.2																																			
pH ^{MU}	pH Units	N/a		7.2																																			
Acid Neutralisation Capacity	mol/kg (+/-)	< 1		< 1																																			
Eluate Analysis		2:1 mg/l	8:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																																	
Arsenic ^U		0.0055	0.0012		0.026	0.5	2	25																															
Barium ^U		0.0187	0.0108		0.203	20	100	300																															
Cadmium ^U		< 0.0002	< 0.0002		< 0.002	0.04	1	5																															
Chromium ^U		0.0028	0.0008		0.017	0.5	10	70																															
Copper ^U		0.0180	0.0131		0.242	2	50	100																															
Mercury ^U		0.00010	< 0.00004		< 0.0004	0.01	0.2	2																															
Molybdenum ^U		0.0047	0.0022		0.042	0.5	10	30																															
Nickel ^U		0.0010	0.0007		0.0126	0.4	10	40																															
Lead ^U		0.0301	0.0040		0.097	0.5	10	50																															
Antimony ^U		0.0063	< 0.0002		0.006	0.06	0.7	5																															
Selenium ^U		0.0007	0.0003		0.0052	0.1	0.5	7																															
Zinc ^U		0.016	0.017		0.31	4	50	200																															
Chloride ^U		3	2		35	800	15000	25000																															
Fluoride ^U		< 0.5	< 0.5		< 1	10	150	500																															
Sulphate ^U		8	2		48	1000	20000	50000																															
TDS		59	28		537	4000	60000	100000																															
Phenol Index ^U		< 0.01	< 0.01		< 0.5	1	-	-																															
DOC ^U		18.9	12.2		228	500	800	1000																															
Leach Test Information																																							
Sample Mass (kg)		0.13																																					
Dry Matter (%)		69.2																																					
Moisture (%)		44.6																																					
Stage 1																																							
Volume Eluate L2 (litres)		0.14																																					
Filtered Eluate VE1 (litres)		0.08																																					

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation
 M Denotes MCERTS accredited test
 U Denotes ISO17025 accredited test



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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-14268	
LK Consult Limited	
Site Reference: 99 Bury New Road, Ramsbottom	
Project / Job Ref: LKC 23 1588	
Order No: PO_C000618	
Reporting Date: 04/12/2024	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
752805	HD101	None Supplied	0.00 - 0.40	19.9	Black loamy sand with vegetation
752806	WS104	None Supplied	0.00 - 0.40	21.4	Black loamy sand
752807	WS104	None Supplied	0.50 - 1.00	16.8	Light brown sandy clay
752808	WS105	None Supplied	0.00 - 1.00	30.4	Black loamy clay

Moisture content is part of procedure E003 & is not an accredited test



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-14268

LK Consult Limited

Site Reference: 99 Bury New Road, Ramsbottom

Project / Job Ref: LKC 23 1588

Order No: PO_C000618

Reporting Date: 04/12/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



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Water Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-14268

LK Consult Limited

Site Reference: 99 Bury New Road, Ramsbottom

Project / Job Ref: LKC 23 1588

Order No: PO_C000618

Reporting Date: 04/12/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



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Maidstone
Kent ME17 2JN
Tel : 01622 850410



List of HWOL Acronyms and Operators	
DETS Report No: 24-14268	
LK Consult Limited	
Site Reference: 99 Bury New Road, Ramsbottom	
Project / Job Ref: LKC 23 1588	
Order No: PO_C000618	
Reporting Date: 04/12/2024	

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym	
Mineral Oil (C10 - C40) (BS EN 12457-3) - EH_CU_1D_AL	
TPH (EPH EC10-EC40) - EH_1D_Total	
Total BTEX (BS EN 12457-3) - HS_1D_MS_Total	

Parameter	Matrix Type	Suite Reference	Expanded Uncertainty Measurement	Unit
TOC	Soil	BS EN 12457	12.2	%
Loss on Ignition	Soil	BS EN 12457	22.9	%
BTEX	Soil	BS EN 12457	11.2	%
Sum of PCBs	Soil	BS EN 12457	43.4	%
Mineral Oil	Soil	BS EN 12457	9.0	%
Total PAH	Soil	BS EN 12457	18.5	%
pH	Soil	BS EN 12457	0.335	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18.0	%
Clay Content	Soil	BS 3882: 2015	15.0	%
Silt Content	Soil	BS 3882: 2015	14.0	%
Sand Content	Soil	BS 3882: 2015	13.0	%
Loss on Ignition	Soil	BS 3882: 2015	22.9	%
pH	Soil	BS 3882: 2015	0.335	Units
Carbonate	Soil	BS 3882: 2015	12.0	%
Total Nitrogen	Soil	BS 3882: 2015	12.0	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24.0	%
Potassium (Extractable)	Soil	BS 3882: 2015	20.0	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26.0	%
Zinc	Soil	BS 3882: 2015	21.6	%
Copper	Soil	BS 3882: 2015	18.2	%
Nickel	Soil	BS 3882: 2015	24.3	%
Available Sodium	Soil	BS 3882: 2015	23.0	%
Available Calcium	Soil	BS 3882: 2015	23.0	%
Electrical Conductivity	Soil	BS 3882: 2015	10.0	%

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 23 1588 -
Land at 99 Bury New Road, Ramsbottom

Job Number MRN 24076/114
Date of Issue 13 December 2024
Page 1 of 4

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.
- 5 The results included within the report are representative of the samples submitted for analysis.
- 6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.



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

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

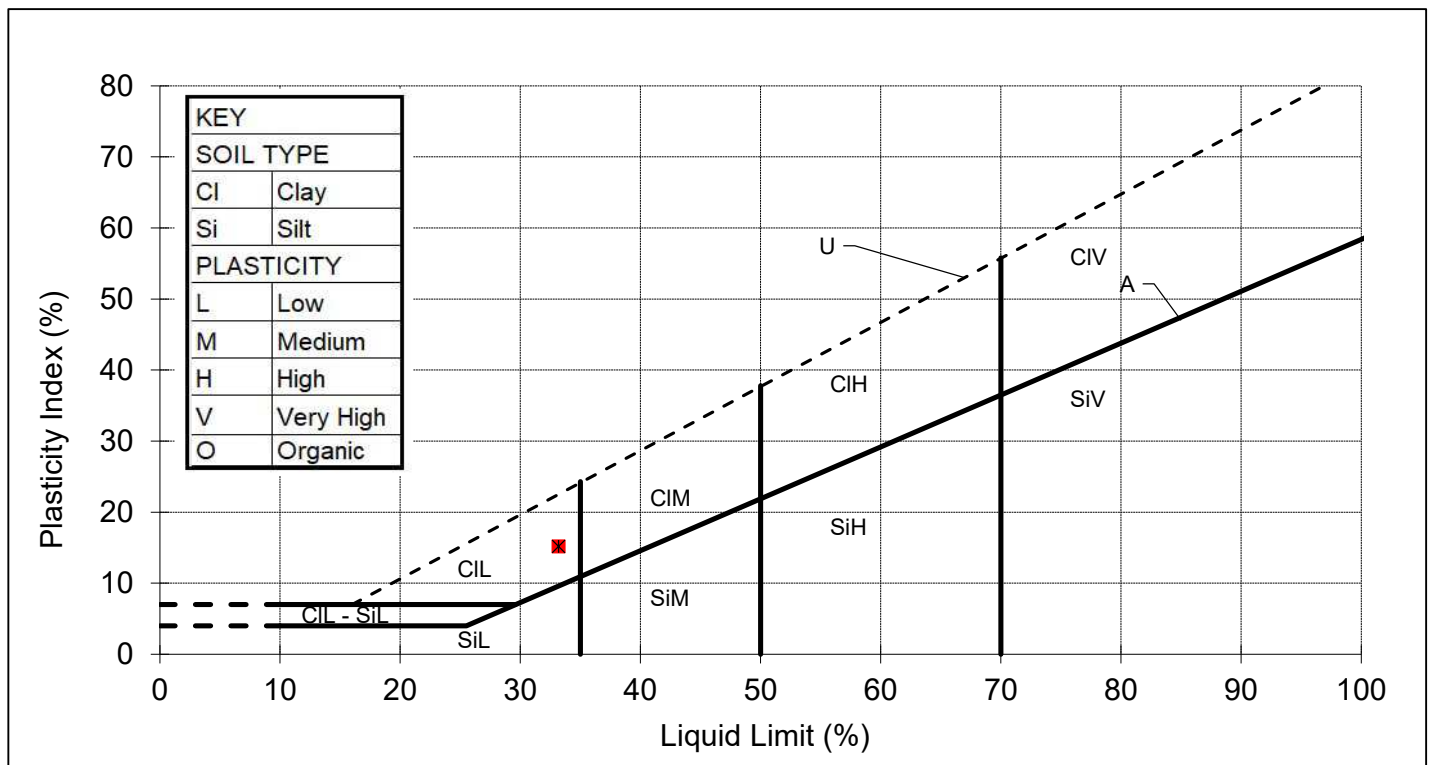
CLIENT	LK Consult Ltd
SITE	LKC 23 1588 - Land at 99 Bury New Road, Ramsbottom
JOB NUMBER	MRN 24076/114

SAMPLE LABEL	WS101 1.50-2.00	DATE SAMPLED	Not advised
SAMPLE No.	605001	DATE RECEIVED	27-Nov-24
DATE TESTED	02-Dec-24	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	23.8	34.6	0.955	
Determination 2 (avg)	24.2	34.9		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22.4	33	18	15	99



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

13-Dec-24

MURRAY RIX

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



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

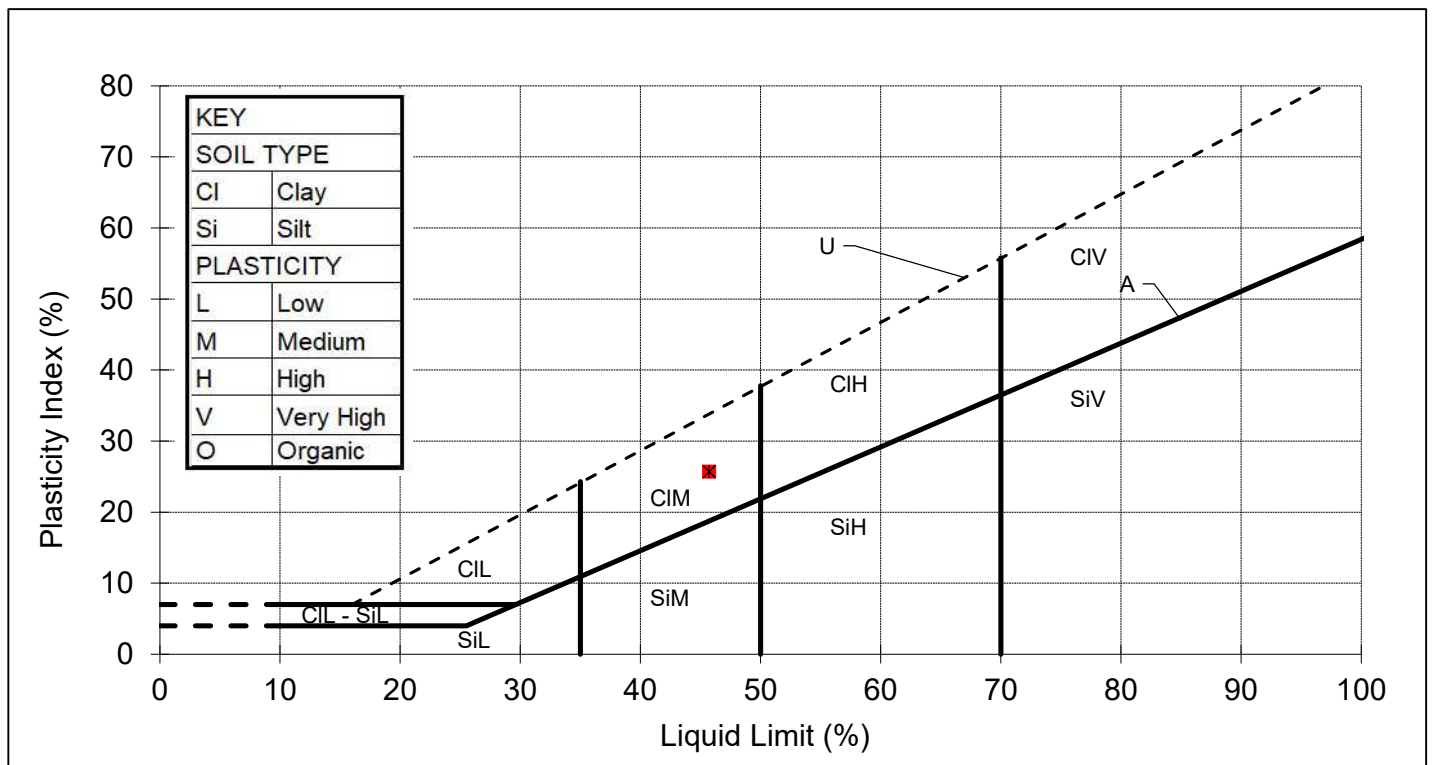
CLIENT	LK Consult Ltd
SITE	LKC 23 1588 - Land at 99 Bury New Road, Ramsbottom
JOB NUMBER	MRN 24076/114

SAMPLE LABEL	WS103 2.00-2.45	DATE SAMPLED	Not advised
SAMPLE No.	605002	DATE RECEIVED	27-Nov-24
DATE TESTED	02-Dec-24	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	16.9	43.7	1.044	
Determination 2 (avg)	17.0	43.9		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
24.6	46	20	26	100



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

13-Dec-24

MURRAY RIX

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



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

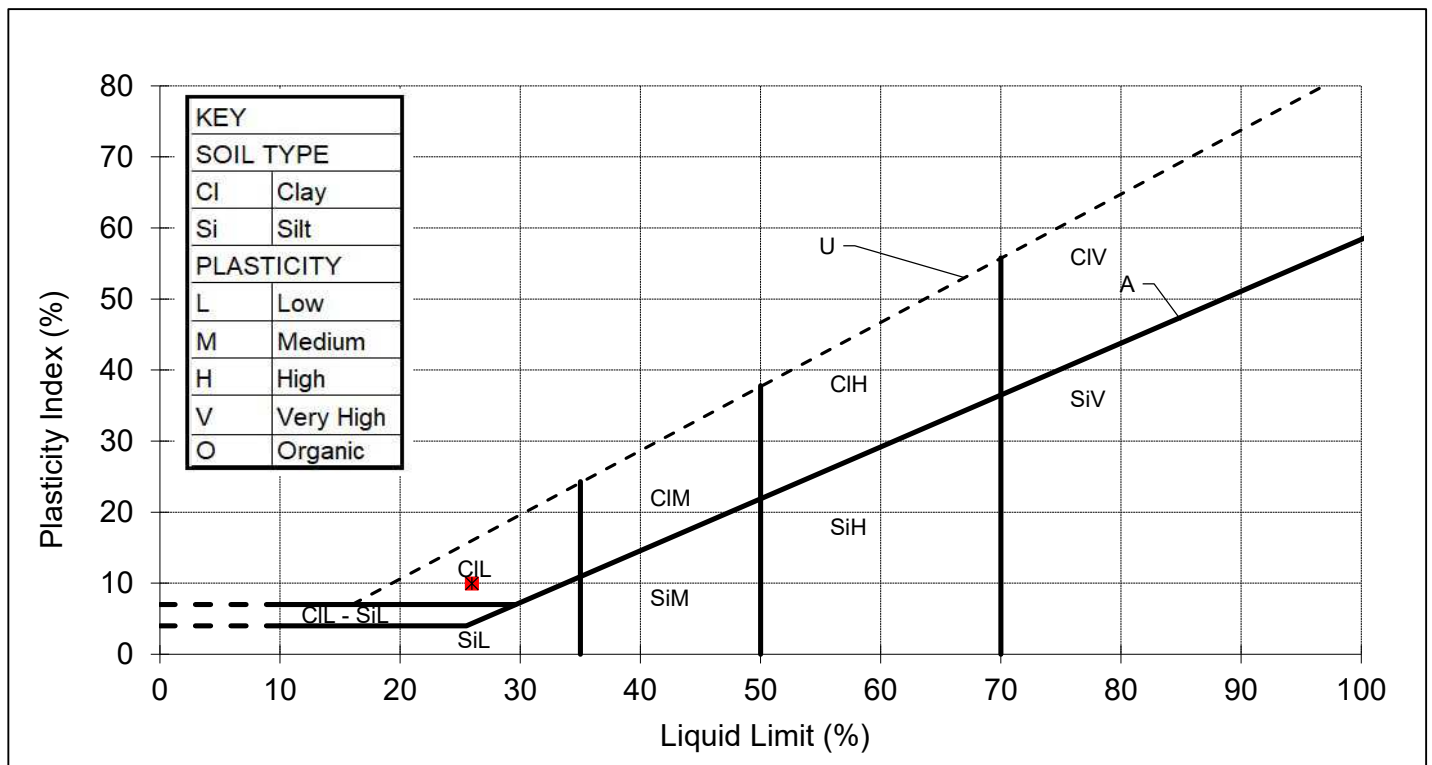
CLIENT	LK Consult Ltd
SITE	LKC 23 1588 - Land at 99 Bury New Road, Ramsbottom
JOB NUMBER	MRN 24076/114

SAMPLE LABEL	WS104 0.50-1.00	DATE SAMPLED	Not advised
SAMPLE No.	605003	DATE RECEIVED	27-Nov-24
DATE TESTED	02-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	21.7	26.5	0.974	
Determination 2 (avg)	21.8	26.8		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.8	26	16	10	74



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

13-Dec-24



Emma Khadun
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 24-14380

Site Reference: 99 Bury New Road, Ramsbottom

Project / Job Ref: LKC 23 1588

Order No: None Supplied

Sample Receipt Date: 29/11/2024

Sample Scheduled Date: 29/11/2024

Report Issue Number: 1

Reporting Date: 05/12/2024

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 24-14380	Date Sampled	22/11/24	22/11/24			
LK Consult Limited	Time Sampled	None Supplied	None Supplied			
Site Reference: 99 Bury New Road, Ramsbottom	TP / BH No	WS102	WS105			
Project / Job Ref: LKC 23 1588	Additional Refs	None Supplied	None Supplied			
Order No: None Supplied	Depth (m)	1.20 - 1.65	0.00 - 1.00			
Reporting Date: 05/12/2024	DETS Sample No	753297	753298			

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	MCERTS	7.1	7.3		
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	44	25		
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	0.04	0.03		
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	36	13		
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	17.8	6.5		
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	< 3	MCERTS	10	23		
Water Soluble Nitrate (2:1) as NO ₃	mg/l	< 1.5	MCERTS	5	11.5		
W/S Magnesium	mg/l	< 0.1	NONE	1.6	1.2		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion



DETS Ltd
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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-14380	
LK Consult Limited	
Site Reference: 99 Bury New Road, Ramsbottom	
Project / Job Ref: LKC 23 1588	
Order No: None Supplied	
Reporting Date: 05/12/2024	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
753297	WS102	None Supplied	1.20 - 1.65	26	Light brown sandy clay
753298	WS105	None Supplied	0.00 - 1.00	27.5	Brown sandy loam

Moisture content is part of procedure E003 & is not an accredited test



DETS Ltd
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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-14380

LK Consult Limited

Site Reference: 99 Bury New Road, Ramsbottom

Project / Job Ref: LKC 23 1588

Order No: None Supplied

Reporting Date: 05/12/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



List of HWOL Acronyms and Operators	
DETS Report No: 24-14380	
LK Consult Limited	
Site Reference: 99 Bury New Road, Ramsbottom	
Project / Job Ref: LKC 23 1588	
Order No: None Supplied	
Reporting Date: 05/12/2024	

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

Appendix E – Groundwater Level Monitoring Results

Water Level Monitoring

5l = 1m water column

Date	19/12/2024	Weather	Overcast, raining
Site	99 Bury New Road, Ramsbottom		
Ref	LKC 23 1588	Other	No groundwater sampling. Water level monitoring only
Engineer	H. W.	Comments	

[illegible]

[illegible]

Appendix F – Generic Assessment Criteria Values

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{resi}	POS ^{park}	Source
Metals	Inorganic Arsenic	N/A	37	40	49	640	79	168	DEFRA C4SL
	Beryllium	N/A	1.7	1.7	35	12	2.2	63	LQM S4UL
	Boron	N/A	290	11,000	45	240,000	21,000	46,000	LQM S4UL
	Cadmium	N/A	26	149	4.9	410	220	880	DEFRA C4SL
	Chromium (III)	N/A	910	910	18,000	8,600	1,500	33,000	LQM S4UL
	Chromium (VI)	N/A	21.0	21.0	170.0	49	23.0	250	DEFRA C4SL
	Copper	N/A	2,400	7,100	520	68,000	12,000	44,000	LQM S4UL
	Lead	N/A	200	310	80	2,330	630	1,300	DEFRA C4SL
	Elemental Mercury	N/A	1.2	1.2	21	58 (25.8) ^{vap}	16	30 (25.8) ^{vap}	LQM S4UL
	Inorganic Mercury	N/A	40	56	19	1,100	120	240	LQM S4UL
	Methylmercury	N/A	11	15	6.0	320	40	68	LQM S4UL
	Nickel (2015 update)	N/A	130	180	53	980	230	800	LQM S4UL
	Selenium	N/A	250	430	88	12,000	1,100	1,800	LQM S4UL
	Vanadium	N/A	410	1,200	91	9,000	2,000	5,000	LQM S4UL
Zinc	N/A	3,700	40,000	620	730,000	81,000	170,000	LQM S4UL	
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	1%	210	3,000 (57.1) ^{sol}	34	84,000 (57.0) ^{sol}	15,000	29,000	LQM S4UL
		2.5%	510	4,700 (141) ^{sol}	85	97,000 (141) ^{sol}	15,000	30,000	LQM S4UL
		6%	1,100	6,000 (336) ^{sol}	200	100,000	15,000	30,000	LQM S4UL
	Acenaphthylene	1%	170	2,900 (86.1) ^{sol}	28	83,000 (86.1) ^{sol}	15,000	29,000	LQM S4UL
		2.5%	420	4,600 (212) ^{sol}	69	97,000 (212) ^{sol}	15,000	30,000	LQM S4UL
		6%	920	6,000 (506) ^{sol}	160	100,000	15,000	30,000	LQM S4UL
	Anthracene	1%	2,400	31,000 (1.17) ^{vap}	380	520,000	74,000	150,000	LQM S4UL
		2.5%	5,400	35,000	950	540,000	74,000	150,000	LQM S4UL
		6%	11,000	37,000	2,200	540,000	74,000	150,000	LQM S4UL
	Benz(a)anthracene	1%	7.2	11	2.9	170	29	49	LQM S4UL
		2.5%	11	14	6.5	170	29	56	LQM S4UL
		6%	13	15	13	180	29	62	LQM S4UL
	Benzo(a)pyrene (only)	1%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		2.5%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		6%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
	Benzo(a)pyrene (surrogate marker Coal Tar)	1%	0.8	1.2	0.32	15	2.2	4	LQM S4UL
		2.5%	1.0	1.2	0.67	15	2.2	5	LQM S4UL
		6%	1.1	1.2	1.20	15	2.2	5	LQM S4UL
	Benzo(b)fluoranthene	1%	2.6	3.9	0.99	44	7.1	13	LQM S4UL
		2.5%	3.3	4.0	2.1	44	7.2	15	LQM S4UL
		6%	3.7	4.0	3.9	45	7.2	16	LQM S4UL
	Benzo(ghi)perylene	1%	320	360	290	3,900	640	1,400	LQM S4UL
		2.5%	340	360	470	4,000	640	1,500	LQM S4UL
		6%	350	360	640	4,000	640	1,600	LQM S4UL
	Benzo(k)fluoranthene	1%	77	110	37	1,200	190	370	LQM S4UL
		2.5%	93	110	75	1,200	190	410	LQM S4UL
		6%	100	110	130	1,200	190	440	LQM S4UL
	Chrysene	1%	15	30	4.1	350	57	93	LQM S4UL
		2.5%	22	31	9.4	350	57	110	LQM S4UL
		6%	27	32	19	350	57	120	LQM S4UL
	Dibenzo(ah)anthracene	1%	0.24	0.31	0.14	3.5	0.57	1.1	LQM S4UL
		2.5%	0.28	0.32	0.27	3.6	0.58	1.3	LQM S4UL
		6%	0.3	0.32	0.43	3.6	0.58	1.4	LQM S4UL
	Fluoranthene	1%	280	1,500	52	23,000	3,100	6,300	LQM S4UL
		2.5%	560	1,600	130	23,000	3,100	6,300	LQM S4UL
		6%	890	1,600	290	23,000	3,100	6,400	LQM S4UL
	Fluorene	1%	170	2,800 (36.0) ^{sol}	27	63,000 (30.9) ^{sol}	9,900	20,000	LQM S4UL
		2.5%	400	3,800 (76.5) ^{sol}	67	68,000	9,900	20,000	LQM S4UL
		6%	860	4,500 (183) ^{sol}	160	71,000	9,900	20,000	LQM S4UL
	Indeno(123-cd)pyrene	1%	27	45	9.5	500	82	150	LQM S4UL
		2.5%	36	46	21	510	82	170	LQM S4UL
		6%	41	46	39	510	82	180	LQM S4UL
	Naphthalene	1%	15	15	65	1,600*	11,000*	8,400*	DEFRA C4SL
		2.5%	36	36	130	3,700*	15,000*	17,00*	DEFRA C4SL
		6%	85	85	200	8,400*	1,200*	1,900*	DEFRA C4SL
	Phenanthrene	1%	95	1,300 (36.0) ^{sol}	15	22,000	3,100	6,200	LQM S4UL
		2.5%	220	1,500	38	22,000	3,100	6,200	LQM S4UL
		6%	440	1,500	90	22,000	3,100	6,300	LQM S4UL
	Pyrene	1%	620	3,700	110	54,000	7,400	15,000	LQM S4UL
		2.5%	1,200	3,800	270	54,000	7,400	15,000	LQM S4UL
		6%	2,000	3,800	620	54,000	7,400	15,000	LQM S4UL
	Coal Tar (B(a)P as surrogate marker)	1%	0.79	1.2	0.32	15	2.2	4.4	LQM S4UL
		2.5%	0.98	1.2	0.67	15	2.2	4.7	LQM S4UL
		6%	1.1	1.2	1.2	15	2.2	4.8	LQM S4UL

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{res} i	POS ^{park}	Source
BTEX Compounds	Benzene	1%	0.87	0.38	0.017	27	72	90	LQM S4UL
		2.5%	0.17	0.70	0.034	47	72	100	LQM S4UL
		6%	0.37	1.4	0.075	90	73	110	LQM S4UL
	Toluene	1%	130	880 (869) vap	22	56,000 (869) vap	56,000	87,000 (869) vap	LQM S4UL
		2.5%	290	1,900	51	110,000 (1,920) vap	56,000	95,000 (1,920) vap	LQM S4UL
		6%	660	3,900	120	180,000 (4,360) vap	56,000	100,000 (4,360) vap	LQM S4UL
	Ethylbenzene	1%	47	83	16	5,700 (518) vap	24,000	17,000 (518) vap	LQM S4UL
		2.5%	110	190	39	13,000 (1,220) vap	24,000	22,000 (1,220) vap	LQM S4UL
		6%	260	440	91	27,000 (2,840) vap	25,000	27,000 (2,840) vap	LQM S4UL
	o-xylene	1%	60	88	28	6,600 (478) sol	41,000	17,000 (478) sol	LQM S4UL
		2.5%	140	210	67	15,000 (1,120) sol	42,000	24,000 (1,120) sol	LQM S4UL
		6%	330	480	160	33,000 (2,620) sol	43,000	33,000 (2,620) sol	LQM S4UL
	m-xylene	1%	59	82	31	6,200 (625) vap	41,000	17,000 (625) vap	LQM S4UL
		2.5%	140	190	74	14,000 (1,470) vap	42,000	24,000 (1,470) vap	LQM S4UL
		6%	320	450	170	31,000 (3,460) vap	43,000	32,000 (3,460) vap	LQM S4UL
	p-xylene	1%	56	79	29	5,900 (576) sol	41,000	17,000 (576) sol	LQM S4UL
		2.5%	130	180	69	14,000 (1,350) sol	42,000	23,000 (1,350) sol	LQM S4UL
		6%	310	430	160	30,000 (3,170) sol	43,000	31,000 (3,170) sol	LQM S4UL
Petroleum Hydroc	Aliphatic								
	EC 5-6	1%	42	42	730	3,200 (304) sol	570,000(304) ^{sol}	95,000 (304) sol	LQM S4UL
	EC>6-8	1%	100	100	2,300	7,800 (144) sol	600,000	150,000 (144) sol	LQM S4UL
	EC>8-10	1%	27	27	320	2,000 (78) sol	13,000	14,000 (78) vap	LQM S4UL
	EC>10-12	1%	130 (48) vap	130 (48) vap	2,200	9,700 (48) sol	13,000	21,000 (48) vap	LQM S4UL
	EC>12-16	1%	1,100 (24) sol	1,100 (24) sol	11,000	59,000 (24) sol	13,000	25,000 (24) sol	LQM S4UL
	EC>16-35	1%	65,000 (8.48)	65,000 (8.48) f, sol	260,000 f	160,000 f	250,000 f	450,000 f	LQM S4UL
	EC>35-44	1%	65,000 (8.48)	65,000 (8.48) f, sol	260,000 f	160,000 f	250,000 f	450,000 f	LQM S4UL
	Aliphatic								
	EC 5-6	2.5%	78	78	1,700	5,900 (558) sol	590,000	130,000 (558) sol	LQM S4UL
	EC>6-8	2.5%	230	230	5,600	17,000 (322) sol	610,000	220,000 (322) sol	LQM S4UL
	EC>8-10	2.5%	65	65	770	4,800 (190) vap	13,000	18,000 (190) vap	LQM S4UL
	EC>10-12	2.5%	330 (118) vap	330 (118) vap	4,400	23,000 (118) vap	13,000	23,000 (118) vap	LQM S4UL
	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	LQM S4UL
	EC>16-35	2.5%	92,000 (21)	92,000 (21) f, sol	270,000 f	1,700,000 f	250,000 f	480,000 f	LQM S4UL
	EC>35-44	2.5%	92,000 (21)	92,000 (21) f, sol	270,000 f	1,700,000 f	250,000 f	480,000 f	LQM S4UL
	Aliphatic								
	EC 5-6	6%	160	160	3,900	12,000 (1,150) sol	600,000	180,000 (1,150)	LQM S4UL
	EC>6-8	6%	530	530	13,000	40,000 (736) sol	620,000	320,000 (736) sol	LQM S4UL
	EC>8-10	6%	150	150	1,700	11,000 (451) vap	13,000	21,000 (451) vap	LQM S4UL
	EC>10-12	6%	760 (283) vap	760 (283) vap	7,300	47,000 (283) vap	13,000	24,000 (283) vap	LQM S4UL
	EC>12-16	6%	4,300 (142) sol	4,400 (142) sol	13,000	90,000 (142) sol	13,000	26,000 (142) sol	LQM S4UL
	EC>16-35	6%	110,000 f	110,000 f	270,000 f	1,800,000 f	250,000 f	490,000 f	LQM S4UL
	EC>35-44	6%	110,000 f	110,000 f	270,000 f	1,800,000 f	250,000 f	490,000 f	LQM S4UL
	Aromatic								
	EC5-7(benzene as non-	1%	70	370	13	26,000 (1,220) sol	56,000	76,000 (1,220) sol	LQM S4UL
	EC>7-8(toluene)	1%	130	860	22	56,000 (869) vap	56,000	87,000 (869) vap	LQM S4UL
	EC>8-10	1%	34	47	8.6	3,500 (613) vap	5,000	7,200 (613) vap	LQM S4UL
	EC>10-12	1%	74	250	13	16,000 (364) sol	5,000	9,200 (364) sol	LQM S4UL
	EC>12-16	1%	140	1,800	23	36,000 (169) sol	5,100	10,000	LQM S4UL
	EC>16-21	1%	260 f	1,900 f	46 f	28,000 f	3,800 f	7,600 f	LQM S4UL
	EC>21-35	1%	1,100 f	1,900 f	370 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	EC>35-44	1%	1,100 f	1,900 f	370 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	Aromatic								
	EC5-7(benzene as non-	2.5%	140	690	27	46,000 (2,260) sol	56,000	84,000 (2,260) sol	LQM S4UL
	EC>7-8(toluene)	2.5%	290	1,800	51	110,000 (1,920) sol	56,000	95,000 (1,920) sol	LQM S4UL
	EC>8-10	2.5%	83	110	21	8,100 (1,500) vap	5,000	8,500 (1,500) vap	LQM S4UL
	EC>10-12	2.5%	180	590	31	28,000 (899) sol	5,000	9,700 (899) sol	LQM S4UL
	EC>12-16	2.5%	330	2,300 (419) sol	57	37,000	5,100	10,000	LQM S4UL
	EC>16-21	2.5%	540 f	1,900 f	110 f	28,000 f	3,800 f	7,700 f	LQM S4UL
	EC>21-35	2.5%	1,500 f	1,900 f	820 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	EC>35-44	2.5%	1,500 f	1,900 f	820 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	Aromatic								
	EC5-7(benzene as non-	6%	300	1,400	57	86,000 (4,710) sol	56,000	92,000 (4,710) sol	LQM S4UL
	EC>7-8(toluene)	6%	660	3,900	120	180,000 (4,360) vap	56,000	100,000 (4,360)	LQM S4UL
	EC>8-10	6%	190	270	51	17,000 (3,580) vap	5,000	9,300 (3,580) vap	LQM S4UL
	EC>10-12	6%	380	1,200	4	34,000 (2,150) sol	5,000	10,000	LQM S4UL
	EC>12-16	6%	660	2,500	130	38,000	5,100	10,000	LQM S4UL
	EC>16-21	6%	930 f	1,900 f	260 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	EC>21-35	6%	1,700 f	1,900 f	1,600 f	28,000 f	3,800 f	7,900 f	LQM S4UL
	EC>35-44	6%	1,700 f	1,900 f	1,600 f	28,000 f	3,800 f	7,900 f	LQM S4UL
	Aliphatic +Aromatic >EC44	1%	1,600 f	1,900 f	1,200 f	28,000 f	3,800 f	7,800 f	LQM S4UL
		2.5%	1,800 f	1,900 f	2,100 f	28,000 f	3,800 f	7,800 f	LQM S4UL
		6%	1,900 f	1,900 f	3,000 f	28,000 f	3,800 f	7,900 f	LQM S4UL

Generic Assessment Criteria Values

Contaminant		SOM	Res +	Res -	Allot.	Comm.	POS ^{res} i	POS ^{park}	Source
Chloroalkanes and Alkenes & Explosives	1,2 Dichloroethane (DCA)	1%	0.0071	0.0092	0.0046	0.67	29	21	LQM S4UL
		2.5%	0.0110	0.0130	0.0083	0.97	29	24	LQM S4UL
		6%	0.0190	0.0230	0.0160	1.7	29	28	LQM S4UL
	1,1,1 Trichloroethane (TCA)	1%	8.8	9.0	48	660	140,000	57,000 (1,425) ^{vap}	LQM S4UL
		2.5%	18	18	110	1,300	140,000	76,000 (2,915) ^{vap}	LQM S4UL
		6%	39	40	240	3,000	140,000	100,000 (6,392)	LQM S4UL
	1,1,2,2-Tetrachloroethanes (PCA)	1%	1.6	3.9	0.41	270	1,400	1,800	LQM S4UL
		2.5%	3.4	8.0	0.89	550	1,400	2,100	LQM S4UL
		6%	7.5	17	2.0	1,100	1,400	2,300	LQM S4UL
	1,1,1,2-Tetrachloroethanes (PCA)	1%	1.2	1.5	0.79	110	1,400	1,500	LQM S4UL
		2.5%	2.8	3.5	1.9	250	1,400	1,800	LQM S4UL
		6%	6.4	8.2	4.4	560	1,400	2,100	LQM S4UL
	Tetrachloroethene (PCE)	1%	0.31	0.32	2.00	24	3,200	1400	DEFRA C4SL
		2.5%	0.70	0.71	4.8	55	3,300	1900	DEFRA C4SL
		6%	1.60	1.60	11.0	130	3,400	2,500	DEFRA C4SL
	Tetrachloromethane (carbon tetrachloride)	1%	0.03	0.03	0.45	2.9	890	190	LQM S4UL
		2.5%	0.06	0.06	1.0	6.3	920	270	LQM S4UL
		6%	0.13	0.13	2.4	14	950	400	LQM S4UL
	Trichloroethene (TCE)	1%	0.009	0.010	0.032	0.7	76.0	41.0	DEFRA C4SL
		2.5%	0.020	0.020	0.072	1.5	78.0	51.0	DEFRA C4SL
		6%	0.043	0.045	0.160	3.4	79.0	69.0	DEFRA C4SL
	cis 1,2-dichloroethene	1%	0.46	0.50	0.890	38	3,800	2,000	DEFRA C4SL
		2.5%	0.78	0.84	1.70	64	3,800	2,400	DEFRA C4SL
		6%	1.50	1.60	3.60	120	3,900	3,100	DEFRA C4SL
	Trichloromethane (chloroform)	1%	0.91	1.2	0.42	99	2,500	2,600	LQM S4UL
		2.5%	1.7	2.1	0.83	170	2,500	2,800	LQM S4UL
		6%	3.4	4.2	1.7	350	2,500	3,100	LQM S4UL
	Trans-1,2 Dichloroethene	1%	0.9	0.9	3.7	69	13,000	5,600	DEFRA C4SL
		2.5%	1.6	1.7	7.5	120	13,000	7,000	DEFRA C4SL
		6%	3.3	3.4	16.0	260	13,000	9,100	DEFRA C4SL
	Chloroethene (vinyl chloride)	1%	0.006	0.015	0.0017	1.1E+00	7.8	18.0	DEFRA C4SL
		2.5%	0.010	0.019	0.0031	1.4E+00	7.8	19.0	DEFRA C4SL
		6%	0.017	0.029	0.0058	2.20	7.8	19.0	DEFRA C4SL
	2,4,6-Trinitrotoluene (TNT)	1%	1.6	65	0.24	1,000	130	260	LQM S4UL
		2.5%	3.7	66	0.58	1,000	130	270	LQM S4UL
		6%	8.1	66	1.4	1,000	130	270	LQM S4UL
	RDX	1%	120	13,000	17	210,000	26,000	49,000 (18.7) ^{sol}	LQM S4UL
		2.5%	250	13,000	38	210,000	26,000	51,000	LQM S4UL
		6%	540	13,000	85	210,000	27,000	53,000	LQM S4UL
	HMX	1%	5.7	6,700	0.86	110,000	13,000	23,000 (0.35) ^{vap}	LQM S4UL
		2.5%	13	6,700	1.9	110,000	13,000	23,000 (0.39) ^{vap}	LQM S4UL
		6%	26	6,700	3.9	110,000	13,000	24,000 (0.48) ^{vap}	LQM S4UL
Pesticides	Aldrin	1%	5.7	7.3	3.2	170	18	30	LQM S4UL
		2.5%	6.6	7.4	6.1	170	18	31	LQM S4UL
		6%	7.1	7.5	9.8	170	18	31	LQM S4UL
	Dieldrin	1%	0.97	7.0	0.17	170	18	30	LQM S4UL
		2.5%	2.0	7.3	0.41	170	18	30	LQM S4UL
		6%	3.5	7.4	0.96	170	18	31	LQM S4UL
	Atrazine	1%	3.3	610	0.5	9,300	1,200	2,300	LQM S4UL
		2.5%	7.8	620	1.2	9,400	1,200	2,400	LQM S4UL
		6%	17.4	620	2.7	9,400	1,200	2,400	LQM S4UL
	Dichlorvos	1%	3.2E-02	6.4	4.9E-03	140	16	26	LQM S4UL
		2.5%	6.6E-02	6.5	1.0E-02	140	16	26	LQM S4UL
		6%	0.14	6.6	2.2E-02	140	16	27	LQM S4UL
	Endosulfans (2 isomers)	1%	7.4	160 (3.0E-03) ^{vap}	1.2	5,600 (3.0E-03) ^{vap}	1,200	2,300	LQM S4UL
		2.5%	18	280 (7.0E-03) ^{vap}	2.9	7,400 (7.0E-03) ^{vap}	1,200	2,400	LQM S4UL
		6%	41	410 (1.6E-02) ^{vap}	6.8	8,400 (1.6E-02) ^{vap}	1,200	2,500	LQM S4UL
	Hexachlorocyclohexane (3 isomers), inc Lindane	1%	8.5E-02	3.7	1.3E-02	65	8.1	15	LQM S4UL
		2.5%	0.2	3.8	3.2E-02	65	8.1	15	LQM S4UL
		6%	0.46	3.8	7.7E-02	65	8.1	16	LQM S4UL
Chlorobenzenes	Chlorobenzene	1%	0.46	0.46	5.9	56	11,000	1,300 (675) ^{sol}	LQM S4UL
		2.5%	1.0	1.0	14	130	13,000	2,000 (1,520) ^{sol}	LQM S4UL
		6%	2.4	2.4	32	290	14,000	2,900	LQM S4UL
	Dichlorobenzenes (3 isomers)	1%	23	24	94	2,000 (571) ^{sol}	90,000	24,000 (571) ^{sol}	LQM S4UL
		2.5%	55	57	230	4,800 (1,370) ^{sol}	95,000	36,000 (1,370) ^{sol}	LQM S4UL
		6%	130	130	540	11,000 (3,240) ^{sol}	98,000	51,000 (3,270) ^{sol}	LQM S4UL
	Trichlorobenzenes (3 isomers)	1%	2.6	2.6	55	220	15,000	1,700 (318) ^{vap}	LQM S4UL
		2.5%	6.4	6.4	140	530	17,000	2,600 (786) ^{vap}	LQM S4UL
		6%	15	15	320	1,300	19,000	4,000 (1,880) ^{vap}	LQM S4UL
	Tetrachlorobenzenes (3 isomers)	1%	0.66	0.75	0.38	49 (39.4) ^{vap}	78	110 (39) ^{vap}	LQM S4UL
		2.5%	1.6	1.9	0.90	120 (98.1) ^{vap}	79	120	LQM S4UL
		6%	3.7	4.3	2.2	240 (235) ^{vap}	79	130	LQM S4UL
	Pentachlorobenzene	1%	5.8	19	1.2	640 (43.0) ^{sol}	100	190	LQM S4UL
		2.5%	12	30	3.1	770 (107) ^{sol}	100	190	LQM S4UL
		6%	22	38	7.0	830	100	190	LQM S4UL
	Hexachlorobenzene	1%	1.8 (0.20) ^{vap}	4.1 (0.20) ^{vap}	0.47	110 (0.20) ^{vap}	16	30	LQM S4UL
		2.5%	3.3 (0.50) ^{vap}	5.7 (0.50) ^{vap}	1.1	120	16	30	LQM S4UL
		6%	4.9	6.7 (1.2) ^{vap}	2.5	120	16	30	LQM S4UL

Generic Assessment Criteria Values

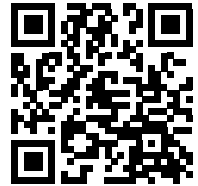
Contaminant		SOM	Res +	Res -	Allot.	Comm.	^{POS} resi	^{POS} park	Source
Chlorophenol	Chlorophenols (4 congeners)	1%	0.87 ^B	94	0.13 ^B	3,500	620	1,100	LQM S4UL
		2.5%	2.0	150	0.30	4,000	620	1,100	LQM S4UL
		6%	4.5	210	0.70	4,300	620	1,100	LQM S4UL
	Pentachlorophenol	1%	0.22	27 (16.4) ^{vap}	3.0E-02	400	60	110	LQM S4UL
		2.5%	0.52	29	8.0E-02	400	60	120	LQM S4UL
		6%	1.2	31	0.19	400	60	120	LQM S4UL
Others	Carbon Disulphide	1%	0.14	0.14	4.8	11	11,000	1,300	LQM S4UL
		2.5%	0.29	0.29	10	22	11,000	1,900	LQM S4UL
		6%	0.62	0.62	23	47	11,000	2,700	LQM S4UL
	Hexachlorobutadiene	1%	0.29	0.32	0.25	31	25	48	LQM S4UL
		2.5%	0.7	0.78	0.61	66	25	50	LQM S4UL
		6%	1.6	1.8	1.4	120	25	51	LQM S4UL
	Phenol	1%	120	440 (460)	23	440 ^{dir} (26,000)	440 ^{dir} (10,000)	440 ^{dir} (7,600)	LQM S4UL
		2.5%	200	690	42	690 ^{dir} (30,000)	690 ^{dir} (10,000)	690 ^{dir} (8,300)	LQM S4UL
		6%	380	1,200	83	1,300 ^{dir} (34,000)	1,300 ^{dir} (10,000)	1,300 ^{dir} (9,300)	LQM S4UL
sol/vap = solubility/vapour limit (potentially use if free product identified, although highly conservative)									
* = naphthalene C4SL exceeds the CLEA calculated soil saturation concentration (76 mg kg-1 for 1% SOM, 183 mg kg-1 for 2.5% SOM and 432 mg kg-1 for 6% SOM)									
f = oral, dermal and inhalation exposures compared to oral HCV									
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-tetrachlorophenol									

Appendix G – HazWasteOnline™ Assessment Certification

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)



WXUA2-IT536-Q4SRW

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

Report is invalid if pages are removed.

Job name

LKC231588

Description/Comments

Project

LKC231588

Site

99 Bury New Road

Classified by

Name: **Peter Dunn**
Date: **20 Dec 2024 17:36 GMT**
Telephone: **0161 763 7200**
Company: **LK Group**

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

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification
Most recent 3 year Refresher

Date

26 Mar 2015 *
02 Aug 2022

Next 3 year Refresher due by Aug 2025
* training course booked

Purpose of classification

2 - Material Characterisation

Address of the waste

99 Bury New Road, Ramsbottom

Post Code **BL0 0BZ**

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Development of brownfield land

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

Construction

Description of the waste

Made ground

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	HD101-0.00 - 0.40-22/11/2024	0.00 - 0.40	Non Hazardous		3
2	WS104-0.00 - 0.40-22/11/2024	0.00 - 0.40	Non Hazardous		5
3	WS104-0.50 - 1.00-22/11/2024	0.50 - 1.00	Non Hazardous		7
4	WS105-0.00 - 1.00-22/11/2024	0.00 - 1.00	Non Hazardous		9

Related documents

#	Name	Description
1	24-14268.1.hwol	DETS South .hwol file used to populate the Job
2	LK SUITE 1 - 5	waste stream template used to create this Job

Report

Created by: Peter Dunn

Created date: 20 Dec 2024 17:36 GMT

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

Classification of sample: HD101-0.00 - 0.40-22/11/2024

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

Sample details

Sample name:	LoW Code:
HD101-0.00 - 0.40-22/11/2024	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00 - 0.40 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
19.9%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 19.9% 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 }			10	mg/kg	1.32	10.576	mg/kg	0.00106 %	✓		
	033-003-00-0	215-481-4	1327-53-3										
2		cadmium { cadmium oxide }			0.3	mg/kg	1.142	0.275	mg/kg	0.0000275 %	✓		
	048-002-00-0	215-146-2	1306-19-0										
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }			13	mg/kg	1.462	15.219	mg/kg	0.00152 %	✓		
		215-160-9	1308-38-9										
4		copper { dicopper oxide; copper (I) oxide }			34	mg/kg	1.126	30.662	mg/kg	0.00307 %	✓		
	029-002-00-X	215-270-7	1317-39-1										
5		mercury { mercury dichloride }			<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD	
	080-010-00-X	231-299-8	7487-94-7										
6		nickel { nickel(II) oxide (nickel monoxide) }			17	mg/kg	1.273	17.329	mg/kg	0.00173 %	✓		
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]										
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	65	mg/kg		52.065	mg/kg	0.00521 %	✓	
	082-001-00-6												
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }			<2	mg/kg	1.405	<2.81	mg/kg	<0.000281 %		<LOD	
	034-002-00-8												
9		vanadium { divanadium pentaoxide; vanadium pentoxide }			21	mg/kg	1.785	30.029	mg/kg	0.003 %	✓		
	023-001-00-8	215-239-8	1314-62-1										
10		zinc { zinc oxide }			75	mg/kg	1.245	74.776	mg/kg	0.00748 %	✓		
	030-013-00-7	215-222-5	1314-13-2										
11		chromium in chromium(VI) compounds { chromium(VI) oxide }			<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %		<LOD	
	024-001-00-0	215-607-8	1333-82-0										
12		pH			6.3	pH		6.3	pH	6.3 pH			
			PH										
13		naphthalene			<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD	
	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							
14	acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
16	fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	phenanthrene	201-581-5	85-01-8		0.42 mg/kg		0.336 mg/kg	0.0000336 %	✓	
18	anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
19	fluoranthene	205-912-4	206-44-0		0.25 mg/kg		0.2 mg/kg	0.00002 %	✓	
20	pyrene	204-927-3	129-00-0		0.25 mg/kg		0.2 mg/kg	0.00002 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
22	chrysene	601-048-00-0	205-923-4		0.19 mg/kg		0.152 mg/kg	0.0000152 %	✓	
23	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0241 %		

Key

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

Classification of sample: WS104-0.00 - 0.40-22/11/2024

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

Sample details

Sample name:	LoW Code:
WS104-0.00 - 0.40-22/11/2024	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00 - 0.40 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
21.4%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 21.4% 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 }				14 mg/kg	1.32	14.529 mg/kg	0.00145 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.4 mg/kg	1.142	0.359 mg/kg	0.0000359 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	17.232 mg/kg	0.00172 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				45 mg/kg	1.126	39.823 mg/kg	0.00398 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
5	mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
6	nickel { nickel(II) oxide (nickel monoxide) }				18 mg/kg	1.273	18.005 mg/kg	0.0018 %	✓	
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	73 mg/kg		57.378 mg/kg	0.00574 %	✓	
	082-001-00-6									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
	034-002-00-8									
9	vanadium { divanadium pentaoxide; vanadium pentoxide }				23 mg/kg	1.785	32.273 mg/kg	0.00323 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
10	zinc { zinc oxide }				85 mg/kg	1.245	83.159 mg/kg	0.00832 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
12	pH				6.7 pH		6.7 pH	6.7 pH		
13	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	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							
14	● acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	● acenaphthene	201-469-6	83-32-9		0.14 mg/kg		0.11 mg/kg	0.000011 %	✓	
16	● fluorene	201-695-5	86-73-7		0.14 mg/kg		0.11 mg/kg	0.000011 %	✓	
17	● phenanthrene	201-581-5	85-01-8		1.27 mg/kg		0.998 mg/kg	0.0000998 %	✓	
18	● anthracene	204-371-1	120-12-7		0.23 mg/kg		0.181 mg/kg	0.0000181 %	✓	
19	● fluoranthene	205-912-4	206-44-0		1.83 mg/kg		1.438 mg/kg	0.000144 %	✓	
20	● pyrene	204-927-3	129-00-0		1.76 mg/kg		1.383 mg/kg	0.000138 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6		0.81 mg/kg		0.637 mg/kg	0.0000637 %	✓	
22	chrysene	601-048-00-0	205-923-4		0.88 mg/kg		0.692 mg/kg	0.0000692 %	✓	
23	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.64 mg/kg		0.503 mg/kg	0.0000503 %	✓	
24	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.27 mg/kg		0.212 mg/kg	0.0000212 %	✓	
25	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.46 mg/kg		0.362 mg/kg	0.0000362 %	✓	
26	● indeno[123-cd]pyrene	205-893-2	193-39-5		0.2 mg/kg		0.157 mg/kg	0.0000157 %	✓	
27	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	● benzo[ghi]perylene	205-883-8	191-24-2		0.17 mg/kg		0.134 mg/kg	0.0000134 %	✓	
Total:								0.0278 %		

Key

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

Classification of sample: WS104-0.50 - 1.00-22/11/2024

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

Sample details

Sample name:	LoW Code:
WS104-0.50 - 1.00-22/11/2024	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 - 1.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16.8%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 16.8% 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 mg/kg	1.32	6.591 mg/kg		0.000659 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2		cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg		<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15 mg/kg	1.462	18.24 mg/kg		0.00182 %	✓	
		215-160-9	1308-38-9									
4		copper { dicopper oxide; copper (I) oxide }				14 mg/kg	1.126	13.114 mg/kg		0.00131 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
5		mercury { mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg		<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
6		nickel { nickel(II) oxide (nickel monoxide) }				15 mg/kg	1.273	15.882 mg/kg		0.00159 %	✓	
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]									
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	13 mg/kg		10.816 mg/kg		0.00108 %	✓	
	082-001-00-6											
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2 mg/kg	1.405	<2.81 mg/kg		<0.000281 %		<LOD
	034-002-00-8											
9		vanadium { divanadium pentaoxide; vanadium pentoxide }				17 mg/kg	1.785	25.25 mg/kg		0.00252 %	✓	
	023-001-00-8	215-239-8	1314-62-1									
10		zinc { zinc oxide }				32 mg/kg	1.245	33.139 mg/kg		0.00331 %	✓	
	030-013-00-7	215-222-5	1314-13-2									
11		chromium in chromium(VI) compounds { chromium(VI) oxide }				<2 mg/kg	1.923	<3.846 mg/kg		<0.000385 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
12		pH				7 pH		7 pH		7pH		
			PH									
13		naphthalene				<0.1 mg/kg		<0.1 mg/kg		<0.00001 %		<LOD
	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							
14	● acenaphthylene	205-917-1	208-96-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	● acenaphthene	201-469-6	83-32-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
16	● fluorene	201-695-5	86-73-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	● phenanthrene	201-581-5	85-01-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
18	● anthracene	204-371-1	120-12-7		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
19	● fluoranthene	205-912-4	206-44-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
20	● pyrene	204-927-3	129-00-0		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
21	benzo[a]anthracene	601-033-00-9	200-280-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
22	chrysene	601-048-00-0	205-923-4		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
25	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
26	● indeno[123-cd]pyrene	205-893-2	193-39-5		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
27	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	● benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0133 %		

Key

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

Classification of sample: WS105-0.00 - 1.00-22/11/2024

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

Sample details

Sample name:	LoW Code:
WS105-0.00 - 1.00-22/11/2024	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00 - 1.00 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
30.4%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 30.4% 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	18.379	mg/kg	0.00184 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		cadmium { cadmium oxide }				0.7	mg/kg	1.142	0.557	mg/kg	0.0000557 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
3		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				21	mg/kg	1.462	21.362	mg/kg	0.00214 %	✓	
			215-160-9	1308-38-9									
4		copper { dicopper oxide; copper (I) oxide }				57	mg/kg	1.126	44.666	mg/kg	0.00447 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
5		mercury { mercury dichloride }				<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
6		nickel { nickel(II) oxide (nickel monoxide) }				18	mg/kg	1.273	15.943	mg/kg	0.00159 %	✓	
		028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]									
7		lead {  lead compounds with the exception of those specified elsewhere in this Annex }			1	157	mg/kg		109.272	mg/kg	0.0109 %	✓	
		082-001-00-6											
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<2	mg/kg	1.405	<2.81	mg/kg	<0.000281 %		<LOD
		034-002-00-8											
9		vanadium { divanadium pentaoxide; vanadium pentoxide }				28	mg/kg	1.785	34.79	mg/kg	0.00348 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
10		zinc { zinc oxide }				112	mg/kg	1.245	97.028	mg/kg	0.0097 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
11		chromium in chromium(VI) compounds { chromium(VI) oxide }				<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
12		pH				7.2	pH		7.2	pH	7.2 pH		
				PH									
13		naphthalene				0.16	mg/kg		0.111	mg/kg	0.0000111 %	✓	
		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							
14	acenaphthylene 205-917-1 208-96-8				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
15	acenaphthene 201-469-6 83-32-9				0.16 mg/kg		0.111 mg/kg	0.0000111 %	✓	
16	fluorene 201-695-5 86-73-7				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
17	phenanthrene 201-581-5 85-01-8				1.64 mg/kg		1.141 mg/kg	0.000114 %	✓	
18	anthracene 204-371-1 120-12-7				0.35 mg/kg		0.244 mg/kg	0.0000244 %	✓	
19	fluoranthene 205-912-4 206-44-0				3.39 mg/kg		2.359 mg/kg	0.000236 %	✓	
20	pyrene 204-927-3 129-00-0				3.03 mg/kg		2.109 mg/kg	0.000211 %	✓	
21	benzo[a]anthracene 601-033-00-9 200-280-6 56-55-3				1.24 mg/kg		0.863 mg/kg	0.0000863 %	✓	
22	chrysene 601-048-00-0 205-923-4 218-01-9				1.58 mg/kg		1.1 mg/kg	0.00011 %	✓	
23	benzo[b]fluoranthene 601-034-00-4 205-911-9 205-99-2				1.41 mg/kg		0.981 mg/kg	0.0000981 %	✓	
24	benzo[k]fluoranthene 601-036-00-5 205-916-6 207-08-9				0.39 mg/kg		0.271 mg/kg	0.0000271 %	✓	
25	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 200-028-5 50-32-8				0.92 mg/kg		0.64 mg/kg	0.000064 %	✓	
26	indeno[123-cd]pyrene 205-893-2 193-39-5				0.46 mg/kg		0.32 mg/kg	0.000032 %	✓	
27	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
28	benzo[ghi]perylene 205-883-8 191-24-2				0.43 mg/kg		0.299 mg/kg	0.0000299 %	✓	
29	polychlorobiphenyls; PCB 602-039-00-4 215-648-1 1336-36-3				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0361 %		

Key

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

• 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

■ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

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

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.

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

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. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

nickel {nickel(II) oxide (nickel monoxide)}

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

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.

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

Harmonised group entry used as most reasonable case. Pigment cadmium selenosulfide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

vanadium {divanadium pentaoxide; vanadium pentoxide}

Most conservative species.

zinc {zinc oxide}

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

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

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2024.354.6407.11702 (19 Dec 2024)
HazWasteOnline Database: 2024.353.6406.11701 (18 Dec 2024)

This classification utilises the following guidance and legislation:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

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

GB MCL List v3.0 - version 3.0 of 11th January 2024

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

GB MCL List v5.0 - version 5.0 of 26th June 2024

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