

St John's Primary School, Middleton

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

Job Number: LKC 24 1098

Date: July 2024

Client: Cranmer Education Trust



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EXECUTIVE SUMMARY

Site Details

Location	North of Thornham Lane, Slattocks, Middleton, Manchester. Centred at National Grid Reference 389070E 408900N.
Area	8,100m ² .
Topography	150-154 metres above ordnance datum (AOD). Eastern part of site relatively level. Centre Western part of site slopes gently down to the south-west.
Current Site Use	Primary school with associated playground areas, soft landscaping, car parking spaces, an astroturf football pitch and a grass sports pitch.
Proposed Development	Two-storey extension to existing school, hardstood playground to the west of the extension and alternations to the existing grass sports pitch and infrastructure.

Site Setting

Main Historical Features	Onsite: St John's primary school, undeveloped and, field boundary. Surrounding Area: pond.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Glaciofluvial Ice Contact deposits (sand and gravel), Secondary A Aquifer. Bedrock: Pennine Lower Coal Measures (siltstone, sandstone and mudstone), Secondary A Aquifer.
Landfills / Infilled Ground	No recorded landfills. 1no. potentially infilled feature identified.
Site Reconnaissance	Site comprises a primary school building to the east with a grassed area to the west. Access to the site is through the car park to the south of site through a 3m wide gate.
Recommendations	Site Investigation was recommended to further assess geo-environmental risk.

Ground Investigation Work Undertaken

Date of Investigation:	28 th to 29 th May 2024.
Intrusive Investigation Work Undertaken:	5no. window sample boreholes. 3no. hand excavated foundation pits. 1no. cable percussion borehole. 2no. soakaway tests within hand excavated trial pits. 1no. falling head test undertaken within casing of window sample borehole. Contamination and geotechnical testing.

Ground Conditions

Made Ground / Topsoil	Sub-base (gravel with no anthropogenic material) present in all foundation pits. Present in WS104 to 0.40mbgl, comprising SILT with brick and ceramic. Topsoil present in all other locations to <0.50mbgl.
Superficial	Generally comprised medium dense SAND with varying constituents of gravel and silt to a maximum depth of 11.50mbgl (CP101). The depth of the granular was not proven in the window sample boreholes. <0.50m thick strata of SILT was noted in WS101 and WS103. The granular strata was underlain by firm becoming stiff sandy gravelly clay in CP101 to completion of the borehole (15.25mbgl).
Bedrock	Not encountered.

Groundwater	Groundwater strikes recorded in boreholes WS103, WS104 and WS105 at depths of 2.00mbgl, 1.90mbgl and 0.70mbgl respectively. Not encountered in the remainder of the site.
Obstructions	Concrete obstruction encountered in FP102.
Permeability	Soakaway test soil infiltration rate at 10^{-5} m/sec to 10^{-6} m/sec. Falling head test soil infiltration rate at 10^{-8} m/sec.

Geotechnical Assessment

Allowable Bearing Pressure	ABCs of between 93 and 422kN/m ² , averaging 199kN/m ² at 1.20-5.50mbgl in the granular, variable silty gravelly sand. Groundwater encountered between 0.70-1.90mbgl which has the potential to decrease bearing capacity of granular material by as much as 50%. sandy clay/silt. A conservative ABC of 100kN/m ² is considered for the sand.
Anticipated Foundation Type	Traditional shallow foundations comprising strip and pads recommended from a minimum of 450mm below the finished ground level. However, depending upon loads may have to consider a pile foundation.
Other Considerations	Temporary supports of excavations will be required. Detailed design should be carried out by structural engineer. Concrete Requirements DS1-AC-1 ^d . Soakaways will be suitable for the disposal of surface water runoff in the west of the site.

Contamination Risk Assessment

PL	Contaminant	Risk	Recommendations
1	ACM, heavy metals, PAHs (made ground, school)	Low	No remediation required.
2	Naphthalene (made ground, school)	Low	No remediation required.
3	Hazardous / ground gas: methane, carbon dioxide (no significant source identified)	Low	No remediation required.
4	Heavy metals, PAHs (made ground, school)	Low	No remediation required.
5	Naphthalene (made ground)	Low	Potable Water Pipe assessment required if new water pipes to be installed.

Recommendations

PL	Recommendation
1	No remediation required.
2	No remediation required.
3	No remediation required.
4	No remediation required.
5	Potable water pipe assessment required if new water pipes to be installed.

Other Considerations
Unexpected Contamination
Re-use of Site Generated Material
Stockpile Management
Disposal
Health and Safety Considerations
Piling in Contaminated Land

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Figure 3 – Site Investigation Location Plan

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Appendix B – Profile Logs

Appendix C – Certificates of Analysis (Soil)

Appendix D – Certificates of Analysis (Geotechnical)

Appendix E – Falling Head Tests / Soakaway Tests

Appendix F – Generic Assessment Criteria Values

Appendix G – HazWaste Online Classification Report

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 St John's Primary School, Middleton. The investigation was undertaken in support of a proposal to extend the school building and further develop the school grounds.

The following work has previously been undertaken:

- Preliminary Risk Assessment (PRA) report, undertaken by LKC (Ref: LKC 24 1098-A1-PRA-St John's Primary School, Middleton R0, dated 29th 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	North of Thornham Lane, Slattocks, Middleton, Manchester. Centred at National Grid Reference 389070E 408900N.
Area	8,100m ² .
Topography	150-154 metres above ordnance datum (AOD). Eastern part of site relatively level. Centre Western part of site slopes gently down to the south-west.
Current Site Use	Primary school with associated playground areas, soft landscaping, car parking spaces, an astroturf football pitch and a grass sports pitch.
Planning Application Ref.	24/00327/FUL
Proposed Development	Two-storey extension to existing school, hardstood playground to the west of the extension and alternations to the existing grass sports pitch and infrastructure.

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: St John's Primary School (east), undeveloped land (centre and west), field boundary (centre). Surrounding Area: pond.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Glaciofluvial Ice Contact deposits (sand and gravel), Secondary A Aquifer. Bedrock: Pennine Lower Coal Measures (siltstone, sandstone and mudstone), Secondary A Aquifer.
Landfills / Infilled Ground	No recorded landfills. 1no. potentially infilled feature identified.
Site Reconnaissance	Site comprises a primary school building to the east with a grassed area to the west. Access to the site is through the car park to the south of site through a 3m wide gate.

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	No recorded mining on site although Coal Authority note the site is in a development high risk area associated with an outcrop of the Arley coal seam. The Coal Mining Risk Assessment (by others) indicates Coal Authority's positioning of the Arley coal seam is incorrect and that with 80m of drift cover that "no remedial measures are required for the proposed development".
Made Ground	Unknown depth and constituent of made ground across the site. Initial information indicates relatively shallow made ground.
Superficial	Unknown strength of soils for foundation design.
Groundwater	Unknown depth and variability of groundwater.
Plasticity	Plasticity of clay deposits, if present, should be confirmed.
Sulphate	Unknown sulphate content of the made ground and natural.
Road / Pavement Design	Unknown CBR values for footpath and road design should be calculated.

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	ACM, heavy metals, PAHs (made ground, school).	West of site – school playing fields: Dermal contact. Inhalation of soil, fibres, and dust. Ingestion of soils, dust. Windblown dust.	Future site users. Offsite receptors.	Unlikely	Medium	Low
		No viable pathways in east of site for school extension (dermal contact, inhalation, ingestion).	-	-	-	-
2	Naphthalene (made ground, school).	Inhalation of vapours. Migration via permeable strata and preferential pathways.	Future site users. Offsite receptors.	Unlikely	Medium	Low
3	Hazardous / ground gas: methane, carbon dioxide (no significant source identified).	Migration via permeable strata and preferential pathways. Inhalation of gas. Explosion in confined spaces.	Future site users. Buildings.	Unlikely	Severe	Moderate / Low
4	Heavy metals, PAHs (made ground, school).	Surface run-off. Migration via permeable strata and preferential pathways. Perched waters migration.	Groundwater	Unlikely	Medium	Low
5	Naphthalene (made ground).	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 scope of the ground investigation was agreed with Booth King prior to undertaking the work. The investigation was carried out on 28th to 29th May 2024 and comprised the following:

- 5no. window sample boreholes drilled to 4.44-5.45 metres below ground level (mbgl) (ref. WS101 to WS105).
- 1no. cable percussion boreholes drilled to 15.25mbgl (ref. CP101).
- 1no. falling head test at 2.90mbgl within the casing of a window sample borehole (ref. WS103 / FHT103).
- 2no. soakaway tests at 0.30mbgl within hand excavated trial pits (ref. SA101 and SA102).
- 3no. hand excavated foundation pits were undertaken in the location of the existing exterior building wall (FP101 to FP103).

Locations of foundation pits had to be altered slightly due to the presence of a stairway on the exterior of the building.

Boreholes WS101, WS102 and WS105 encountered blowing sands, preventing the casing off of the borehole during drilling. As such, the borehole could not be cased off and there was collapse of the boreholes during drilling. Where window sampling could not be carried out to a depth below the borehole collapse, continuous SPT(C)s were undertaken to provide geotechnical information to a greater depth.

Due to access restrictions, the cable percussion borehole was carried out in the current car park onsite, near to the proposed extensions.

All site investigation locations are shown in Figure 3.

The investigation locations allow an adequate assessment of ground conditions across the site. The number of sampling points corresponds to one location per 40m square centres. This is considered appropriate given the size of the site, the historical land use and the relatively homogeneous ground conditions encountered.

Table 3-1 details the site investigation locations.

Site Investigation Locations	Rationale
WS104, WS105	Target proposed building footprint.
WS101-WS103, SA101-SA102	Positioned to allow infiltration testing to be undertaken.
CP101	Closest area to proposed building footprint accessible for the drilling rig.
FP101, FP102, FP103	Positioned to determine current building foundations.

Table 3-1: Summary of Sampling Locations.

All profile logs are provided in Appendix B and are in line with BS14688-1⁴ and BS5930⁵.

3.2. Sampling Protocol

3.2.1. Soil Sampling (Contamination)

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation⁶.

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 on-site monitoring was carried out in line CIRIA C665⁷ to aid in screening samples for volatile analysis.

Soil samples of approximately 500g 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, sulphate, speciated PAHs and hardness.	4	A basic suite with a broad selection of contaminants where no significant evidence of contamination was identified.
Metals / metalloids, pH, sulphate, cyanide suite, TPHCWG, BTEX, MTBE, speciated PAHs, phenol, and hardness.	2	Although no evidence of contamination identified, detailed suite undertaken on the only made ground encountered on site, to confirm the absence of contamination and to support waste classification.
Waste Acceptance Criteria (WAC)	1	Undertaken on sample of made ground 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; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene, and xylenes; MTBE=Methyl tert-butyl ether, VOC=Volatile organic Compounds, SVOC= Semi Volatile Organic Compounds, PCB=polychlorinated biphenyls, SOM=Soil Organic Matter.

3.2.2. Soil Sampling (Geotechnical)

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

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

Testing	No. Samples
Particle Size Distribution (PSD)	7

Table 3-3: Summary of Geotechnical Testing Undertaken.

3.2.3. Groundwater Sampling

Groundwater sampling 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.

3.3. In-situ Testing

3.3.1. 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.
- Continuous SPT(C)s were undertaken where blowing sands halted the progression of the casing of the drilling rig, and the borehole was unstable.

The results are provided within Appendix B.

3.3.2. Falling Head Tests

LKC undertook falling head tests in WS103 to assess the permeability of the ground. The tests were carried out in general accordance with guidance given in BS5930⁸ and BS22282⁹.

The tests were carried out in cased window sample borehole during drilling work.

The results are presented in Appendix E.

3.3.3. Soakaway Tests

Shallow soakaway tests were undertaken in SA101 and SA102 in accordance with BRE Digest 365¹⁰ in hand excavated trial pits. The arisings were logged in accordance with BS14688-1¹¹ and BS5930.

3.4. Gas Monitoring

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

A moderate / low 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 / Topsoil

Made ground was recorded within the foundation pits and in borehole WS104. The foundation pits made ground comprised a gravel sub-base with no anthropogenic material. Made ground in WS104 comprised a gravelly sandy SILT to 0.40mbgl with anthropogenic material including brick and ceramic.

Topsoil was present at all other locations to a maximum depth of 0.50mbgl.

4.1.2. Natural Strata

Superficial strata generally comprised stratas of medium dense variably gravelly and variably silty SAND from below the topsoil / made ground to the final depth of each window sample borehole.

A strata of sandy SILT was noted at depths of 2.10-2.30mbgl in WS101 and at 0.50-1.00mbgl in WS103.

The cable percussive borehole typically comprised granular strata of horizons of sand with varying constituents of gravel and silt to a depth of 11.50mbgl. The granular strata is underlain by firm becoming stiff, sandy gravelly CLAY to the completion depth of CP101 (15.25mbgl).

4.1.3. Contamination

Except for the anthropogenic material encountered in the made ground (as described above), no further contamination was identified.

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

An obstruction was noted in foundation pit FP102, where a layer of concrete continued out from the edge of the footing, therefore not allowing the bottom of the footing to be determined. It is thought this obstruction was a drainage pipe encased in concrete.

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). Groundwater strikes were recorded in boreholes WS103, WS104 and WS105 at depths of 2.00mbgl, 1.90mbgl and 0.70mbgl respectively. No groundwater strikes were recorded in the remainder of the boreholes.

4.2.2. Contamination

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

4.3. Permeability Tests

4.3.1. Falling Head Tests

The results of the falling head tests are presented in Appendix E.

BS5930¹² indicates that if 'Ho' is taken as the groundwater 'Head' above baseline conditions following the addition of water at the start of the permeability test and 'H' is the measured groundwater 'Head' above baseline conditions at any given time during the test then the time taken to reach a head ratio (H/Ho) of 0.37 is used to calculate the permeability of the soils.

Due to the slow draining FHT103, only one test was carried out, and its data was extrapolated from existing data collected on site to reach a 25% effective depth.

Groundwater was encountered at 2.00mbgl in WS103/FHT103, therefore baseline conditions were as this depth.

Based on the results of the falling head tests, the permeability at test depth has been calculated to an order of magnitude of 10^{-8} m/sec.

4.3.2. Soakaway Tests

The results of the soakaways are presented in Appendix E.

BRE365¹³ indicates that the calculation of the soil infiltration rate is made from the time taken for the water level to fall from 75% to 25% effective storage depth in each pit.

$$\text{Soil infiltration rate, } f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25} = the effective storage volume of water in the trial pit between 75% and 25% effective depth.

a_{p50} = the internal surface area of the trial pit up to 50% effective depth including the base area.

t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Due to the slow draining in SA101 only one test was carried out. SA101 was left overnight to soakaway and was noted as dry after 19 hours. This was taken as the worst possible case for the soakaway, and used in the calculation of the design soil infiltration rate.

Based on the results of the soakaway tests, the permeability at test depth has been calculated within an order of magnitude of 10^{-5} m/sec to 10^{-6} m/sec.

5. Geotechnical Assessment

5.1. Proposed Development

It is understood that the proposed development will comprise extensions to the existing St John's Primary School along with re-purposing of some of the existing structures. Details of the proposed loadings are not known and therefore a line loading of 75kN/m has been assumed for preliminary assessment purposes only.

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

The depths of any underground engineering works (sewers etc.) are unknown and therefore have not been considered in the following assessment. Any such works should be designed so as not to influence, or compromise, proposed or existing foundations or ground stability.

Given the nature of the proposed development the structure meets the criteria of Geotechnical Category 2 of Eurocode 7¹⁴.

5.2. Summary of Ground Conditions

Ground conditions identified at the site are detailed in Section 4.1, and typically comprises topsoil to 0.25-0.50mbgl or made ground of tarmac over granular sub-base to 0.40mbgl. Natural superficial deposits typically comprise granular strata of horizons of sand with varying constituents of gravel and silt to a depth of 11.50mbgl (CP101), the depth of the granular strata was not proven in any of the window sample boreholes. The granular strata is underlain by firm becoming stiff, sandy gravelly CLAY to the completion depth of CP101 (15.25mbgl).

5.3. 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 Works¹⁵. 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; and,
- Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.

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.

5.4. Existing Foundations

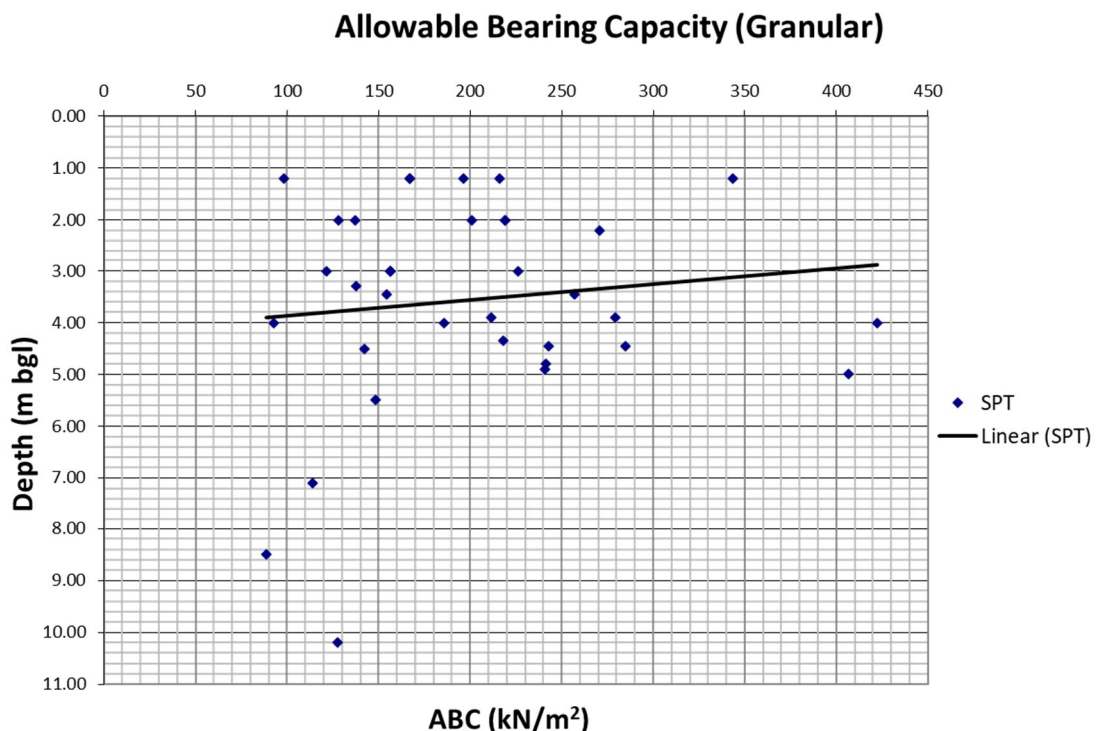
Three hand excavated foundation inspections pits were advanced along the western elevation of the existing building (shown on Figure 3) to assess the type and depth of the foundations. Foundations comprising concrete footings were encountered at a depth of between 0.15m and 0.30m, the foundations at locations FP101 and FP103

were 0.17m thick however the thickness of the foundation at FP102 was unable to be assessed due to the presence of a plastic pipe set in concrete, presumed part of a drainage system.

5.5. Foundation Conditions and Bearing Capacity

5.5.1. General

The natural granular material has been assessed using in-situ testing by SPT to obtain the density of the material. The results of the testing has been used to estimate Allowable Bearing Capacity (ABC), which is plotted against depth as shown in Graph 5-1.



Graph 5-1: Summary of S_u Vs. Depth from In-Situ SPT Testing.

Graph 5-1 demonstrates that the density of the granular strata is variable in the upper 5.50m, returning ABCs ranging from 93 to 422kN/m² and averaging 199kN/m².

Groundwater was recorded during the advancing of the exploratory holes at depths of between 0.70m and 1.90mbgl and the presence of groundwater within a granular material can reduce its bearing capacity by as much as 50%. Based upon this a conservative ABC of 100kN/m² is assigned to the natural granular strata, with a conservative angle of internal friction (ϕ') of 30°.

5.5.2. Foundations Options

Schools typically have large rooms (assembly, classrooms, dining etc.) and are likely to require large spans, it is therefore likely that the building will comprise a mix of foundation types, with strip footings supporting walls and pads supporting column loads.

As the strata is predominantly granular with shallow groundwater foundation options are:

- shallow strip foundations above the water table.
- ground improvement through vibro compaction.
- pad foundations; and,
- pile foundations.

These options are discussed in the following Sections.

5.5.3. Strip Foundations

Strip foundations supporting cladding walls can be constructed to bear upon the granular deposits recorded from a depth of 0.50mbgl. At this depth an Allowable Bearing Capacity of 100kN/m² has been calculated from results of in-situ SPT tests (Graph 5-1).

Although the proposed development is not a residential property, technical guidance provided by the by NHBC recommends that foundations should be 450mm below the finished ground level to avoid the risk of the bearing strata freezing and causing damaging movement. Where the finished ground level will be above the original ground level and the foundations are being cast when the ground is frozen, or is at risk of freezing before ground levels are raised to the finished level, the foundation depth should extend at least 450mm below the original ground level.

5.5.4. Pad Foundations

Based upon the calculated ABC and ϕ' from in-situ SPTs within the granular natural strata, an assessment has been made on a pad foundation supporting column loads. For preliminary assessment purposes, two size pads 1m² and 2m² (1.42m x 1.42m) have been considered at a depth of 1.00mbgl.

The Bearing Capacity values were calculated applying Design Approach 1 of Eurocode 7 with Combinations 1 and 2, where partial factors were applied to actions and ground parameters, respectively. For the partial factor R_v on bearing capacity, the value used is 1.5 instead of 1.0 for a more conservative value.

No additional loads (live or static or horizontal) have been added as surcharge into the analysis.

The following analysis are for assessment purposes only and foundation design should be undertaken by a specialist contractor.

Groundwater was taken to be present at 1.00mbgl. The assumed unit weight (γ) of 17kN/m³ and (γ_{sat}) 20kN/m³ for the SAND.

Pad Size	Pad Depth (mbgl)	Combination 1	Combination 2
		Allowable Load (kN)	Allowable Load (kN)
1m ² (1.00m x 1.00m)	1.00	324	176
2m ² (1.42m x 1.42m)		620	336

Table 5-1: Summary of Pad ABC.

Table 5-1 shows that a bearing resistance of approximately 176kN/m² is achieved with a pad size of 1m² and 336kN/m² with a pad size of 2m² at depth of 1.00mbgl using the more conservative Combination 2 of EC7 Design Approach1.

5.5.5. Ground Improvement

The use of ground improvement techniques such as vibro compaction will allow shallow foundations to be utilised within the shallow granular strata. Vibro compaction should provide an Allowable Bearing Capacity of around 150kN/m².

It should be noted that vibro compaction has a diminished effectiveness if sand has fines content between 10% and 15%, and definitely is not applicable if fines content in excess of 15%, unless combined with other ground improvement techniques.

Specialist advice should be sought from a suitably experienced contractor with regard to whether the ground conditions are suitable, the allowable bearing capacity that can be achieved and settlements.

5.5.6. Piled Foundations

As an alternative, consideration may be given to the use of piled foundations to transfer loadings deeper and bear within the granular material encountered up to 11.50mbgl.

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

Up to 0.50m of made ground has been recorded within the exploratory holes and the potential for negative skin friction to influence the piles is not considered to be required.

Casing is required while drilling the piles due to the presence of sands and groundwater. This will help minimise ground disturbance and prevent collapse into the borehole causing areas of weakness.

The working loads of end bearing piles have been calculated and are given in Table 5-2 below although different pile types and designs can be considered, such as screw piles.

Depth (mbgl)	Pile Carrying Capacity (kN)		
	300mm dia	450mm dia	600mm dia
5	42	94	167
10	95	177	296

Table 5-2: Preliminary Pile Carrying Capacity.

The above examples are not intended to constitute any form of recommendation regarding pile size or type, but merely to illustrate the use of above ground coefficients. Pile design should be undertaken by a specialist contractor to allow them to reduce the Factor or Safety based on their extensive pile testing data and for the design of appropriate piling scheme.

Should a pile foundation solution be the preferred option, then warranty providers may require further information on ground conditions to a minimum of 5m below the base of the pile.

5.5.7. Foundation Recommendations

Strip and pad foundations are likely to be the most economic however if the bearing capacities are too low and the water table too high for this solution then consideration can be given to a ground improvement or piled foundation.

5.6. Ground Floor Slabs

Following suitable preparation of the sub-grade, by a combination of excavation and re-compaction where required, a ground bearing floor slab should be suitable for the proposed structure. Floor slabs should be designed by a suitably experienced structural engineer.

5.7. Drainage

Three soil infiltration tests were undertaken. Two BRE 365 falling head tests undertaken in SA101 and SA102 in the west of the site show good soakage potential within the granular strata; however, the falling head test undertaken in WS103 in the north-east of the site returned a value of low permeability. Therefore the potential for soakaways to dispose of surface water runoff in the west of the site is good but the permeability of the ground at the north-east would be unsuitable for soakaways.

5.8. Concrete Durability

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

5.9. Excavations

Some of the exploratory holes were observed to be unstable during the excavation/drilling and the natural deposits included granular strata containing groundwater. The short- and long-term stability of near vertically sided excavations can therefore not be guaranteed and random and sudden instability within these soils should be anticipated.

All excavations should be supported or battered back in accordance with guidance contained in CIRIA R97¹⁶.

5.10. Construction Activity and Inspection

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

- It is recommended that sufficient allowance is made for the inspection of formation and sub formations to foundations and pavement construction.
- Excavations where access is required should be subject to a risk assessment from a competent person and where appropriate mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97¹⁷ utilised.
- De-watering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to provision of space for settling tanks or an attenuation pond.

- Where access to confined spaces is required appropriate mitigation measures should be addressed within the Construction Stage Health and Safety Plan. Particular account should be taken of the gas results.
- The presence of potential contamination and mitigation measures should be addressed as part of the Construction Stage Health and Safety Plan and should include measures to design out the risks, reduce their impact and finally the use of Personnel Protective Equipment (PPE).

6. Generic Risk Assessment

6.1. Introduction

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (LCRM¹⁸). 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) ^{19, 20}.
- LQM Suitable 4 Use Levels (S4ULs) ^{21, 22, 23, 24}.

The proposed development is for a school building extension with a hardstood playground and alternations to the existing grass sports pitch and infrastructure, therefore the assessment criteria for residential without plant uptake has been used as a conservative measure.

All criteria have been generated using the CLEA V1.06 model²⁵ 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^{26,27} and naphthalene the most volatile and soluble²⁸. 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 negligible²⁹. For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)³⁰ 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.*³¹, which was based on coal tar mixtures (>80,000mg/kg of total PAHs) fed in food to mice over a two-year carcinogenicity study.

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

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 elevated PAHs and metals have been identified on site, therefore the contaminants are not considered to pose a potential risk to future site users. The principal pathways are the ingestion pathways (soil, dust, and homegrown produce) and dermal contact.

The probability of PAH, metal and asbestos contamination affecting site users is unlikely. With a medium consequence, the risk is low and remediation is not required. However, as a precaution, construction workers should be and vigilant for any suspected ACM during groundworks (discussed further in Section 8.2).

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 detection limits.

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

Gas monitoring was not carried out as part of this assessment. The PRA identified a moderate / low risk and stated no further assessment was required.

No organic / putrescible material was encountered on site. Made ground was only noted in two locations and comprised 0.40-0.80m of reworked natural ground with rare / occasional brick and ceramic.

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 and no further action is required with respect to Pollutant Linkage 3.

6.4. Controlled Water Assessment

The PRA identified a low risk with respect to controlled waters as no significant source of mobile contamination was anticipated. Furthermore, a Secondary Aquifer is 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 contaminants have been identified on the site. Therefore, the probability of organic contaminants affecting potable water pipes is unlikely. Given the consequence is considered to be moderate, the risk (Pollutant Linkage 5) is anticipated to be low risk and no remediation is likely to be required.

If new in-ground water pipes are to be installed, 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.

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	ACM, heavy metals, PAHs (made ground, school).	West of site – school playing fields: Dermal contact. Inhalation of soil, fibres, and dust. Ingestion of soils, dust. Windblown dust.	Future site users. Offsite receptors.	Unlikely	Medium	Low	No remediation recommended.
		No viable pathways in east of site for school extension (dermal contact, inhalation, ingestion).	-	-	-	-	-
2	Naphthalene (made ground, school).	Inhalation of vapours. Migration via permeable strata and preferential pathways.	Future site users. Offsite receptors.	Unlikely	Medium	Low	No remediation recommended.
3	Hazardous / ground gas: methane, carbon dioxide (no significant source identified).	Migration via permeable strata and preferential pathways. Inhalation of gas. Explosion in confined spaces.	Future site users. Buildings.	Unlikely	Severe	Low (Due to known ground conditions)	No remediation recommended.
4	Heavy metals, PAHs (made ground, school).	Surface run-off. Migration via permeable strata and preferential pathways. Perched waters migration.	Groundwater	Unlikely	Medium	Low	No remediation recommended.
5	Naphthalene (made ground).	Ingestion of tainted water supply.	Future site users. Water pipes.	Unlikely	Medium	Low	Potable Water Pipe assessment required if new water pipes to be installed.

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.

The WAC limits cannot be used to assess whether a waste is non-hazardous or hazardous. 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 / Topsoil	Sub-base (gravel with no anthropogenic material) present in all foundation pits. Present in WS104 to 0.40mbgl, comprising SILT with brick and ceramic. Topsoil present in all other locations to <0.50mbgl.
Superficial	Generally comprised medium dense SAND with varying constituents of gravel and silt to a maximum depth of 11.50mbgl (CP101). The depth of the granular was not proven in the window sample boreholes. <0.50m thick strata of SILT was noted in WS101 and WS103. The granular strata was underlain by firm becoming stiff sandy gravelly clay in CP101 to completion of the borehole (15.25mbgl).
Bedrock	Not encountered.
Groundwater	Groundwater strikes recorded in boreholes WS103, WS104 and WS105 at depths of 2.00mbgl, 1.90mbgl and 0.70mbgl respectively. Not encountered in the remainder of the site.
Obstructions	Concrete obstruction encountered in FP102.
Permeability	Soakaway test soil infiltration rate at 10^{-5} m/sec to 10^{-6} m/sec. Falling head test soil infiltration rate at 10^{-8} m/sec.

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.

Exposed Existing Foundations	All foundations pits excavated along the western elevation of the existing school recorded strip footings at a depth of 0.15m in FP103 in the north, increasing to 0.30mbgl in FP101 to the south. The thickness of the concrete footings was recorded as 0.17m. At the location of FP102 central to the wall, a concrete footing was encountered at a depth of 0.24mbgl however due to the presence of a plastic services pipe, the extent of the footing could not be proven.
Allowable Bearing Capacity	ABCs of between 93 and 422kN/m ² , averaging 199kN/m ² at 1.20-5.50mbgl in the granular, variable silty gravelly sand. Groundwater encountered between 0.70-1.90mbgl which has the potential to decrease bearing capacity of granular material by as much as 50%. sandy clay/silt. A conservative ABC of 100kN/m ² is considered for the sand.
Anticipated Foundation Type	Traditional shallow foundations comprising strip and pads recommended from a minimum of 450mm below the finished ground level. However, depending upon loads may have to consider a pile foundation.
Shallow Groundwater	Shallow groundwater identified on the site which will present a constraint to the development. Suitable drainage should be considered in the proposed development layout. Lowering of the water table may be required to facilitate the construction work especially site level reductions. A discharge consent to release water to existing storm water or foul water drains may be required.
Concrete Requirements	Based on BRE Digest 2005 ³² – DS-1 AC-1 ^d recommended.
Services	Services – consideration to the presence of services running through the site. Services may need to be re-routed.
Temporary support of excavation	Will be required.

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	ACM, heavy metals, PAHs (made ground, school)	Low	No remediation required.
2	Naphthalene (made ground, school)	Low	No remediation required.
3	Hazardous / ground gas: methane, carbon dioxide (no significant source identified)	Low	No remediation required.
4	Heavy metals, PAHs (made ground, school)	Low	No remediation required.
5	Naphthalene (made ground)	Low	Potable Water Pipe assessment required if new water pipes to be installed.

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. The WAC limits cannot be used to assess whether a waste is non-hazardous or hazardous. It is recommended that waste assessment and WAC data is forwarded to a licensed waste disposal operator.

9. Recommendations and Remediation Strategy

The recommendations/requirements 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 9-1.

PL	Recommendation
1	No remediation required.
2	No remediation required.
3	No remediation required.
4	No remediation required.
5	Potable water pipe assessment required if new water pipes to be installed.

Table 9-1: Remediation Summary.

9.1. Remediation and Validation Recommendations

9.1.1. Potable Water Pipe Remediation (PL5)

If new in-ground water pipes are required, it is recommended that a Water Pipeline Assessment³³ is undertaken once the location and depth of potable water pipes are known. It is likely that barrier pipe will not be required.

Validation of pipeline installation should include delivery notes of pipe materials, photographs of installed pipe and confirmation of connections.

9.2. Other Considerations

9.2.1. Unexpected Contamination

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

Impacted soils should be placed on an impermeable surface to await further assessment, treatment, or removal from site (this may be subject to chemical testing to confirm suitable waste facility). The work should be done under the supervision and instruction of an environmental consultant.

To determine that significantly impacted soils have been removed, verification samples will be collected from the base and sides of the excavation. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.

Validation requirements should include a log of work undertaken, including photographs and details of any sampling undertaken and validation of any potential additional remedial work.

9.2.2. Re-use of Site Generated Material

To ensure material is compliant with appropriate waste regulations, any site won material re-used onsite should be in recourse to appropriate exemptions. A U1 and T5 exemption should be registered. This will allow the following to be used onsite or brought in for use onsite (refer to guidance for types of waste that can be used³⁴):

- 5,000 tonnes (c. 2,500m³) treatment of crushed concrete / stone.
- 1,000 tonnes (c. 500m³) use of non-hazardous soil.
- 5,000 tonnes (c. 2,500m³) use of clays, sand, gravel, brick, concrete, stone etc.
- 50,000 tonnes (c. 25,000m³) use of bituminous material to be used in roadways.

A Materials Management Plan (MMP) with recourse to the CL:AIRE Code of Practice³⁵ may be required if volumes exceed exemption limits. This must be registered before material movement starts onsite.

If an MMP is required, this needs to be registered by a Qualified Person (QP) and there must be 'certainty of use' for any material re-used onsite or exported to site to ensure there is no 'sham recovery'.

For all the above material will need to be tested at the rate and analytical suites presented in Table 9-2.

9.2.3. Stockpile Management

Stockpiled material should be suitably managed. Material should be segregated by type and source. For example, construction / demolition arisings, site won subsoil. Stockpiles may also require covering to minimise the generation of vapours, fibres, dust, and possible nuisance to adjacent receptors, and to prevent rainwater ingress. The source of each stockpile should be recorded and appropriate validation testing for re-use or potential offsite disposal should be undertaken as required.

9.2.4. Disposal

Material required to be removed from site should be undertaken under an appropriate duty of care and the results of chemical analysis should be provided to a licensed landfill for confirmation of waste classification.

Waste records such as disposal tickets and waste carrier licences should be provided in the Site Completion Report. Photographic evidence of removal and waste removal tickets should be retained and included in the validation report.

9.2.5. Health and Safety Considerations

In working with, removing, or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance³⁶) should be adopted by all workers involved with site enabling and construction works.

9.2.6. Piling in Contaminated Land

If a piled foundation is being considered this may provide a preferential pathway for contaminants to the underlying aquifer. A piling risk assessment may be required. Good

practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency³⁷.

9.3. Validation of Imported / Site Won Soils

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

A summary of the required imported material sampling requirements is presented in Table 9-2 and is based on the YALPAG guidance (2021)³⁸. Ideally, the material should be sampled at source to prevent double handling if soil fails, with confirmatory sampling undertaken on importation to site. Where this is not possible then material imported should be segregated based on source and soil type. Validation samples should be taken prior to placement in gardens to ensure suitability for use.

If site won material is to be re-used onsite, confirmatory testing proving suitability will be required as detailed in Table 9-2 below.

Material Type	Source	Suite of Analysis	Sampling Rate
Topsoil / Subsoil	Greenfield / manufactured / site-won natural	Suite A*	1 sample per 50m³
	Brownfield / unknown	Suite B**	
Subsoil	Quarried sand	No testing required. Certification of material provenance is required.	
Gravel break layer	Quarried stone	No testing required. Certification of material provenance is required.	
	Recycled stone (6F2 / screened)	Suite B*	1 sample per 500m³

Table 9-2: Sampling Requirements for Imported and Site Won Soils.

Notes:

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

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

*Minimum sampling rate of 3 samples per source.

**Minimum sampling rate of 6 samples per source.

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

In addition, it should be ensured that the matrix of the topsoil is suitable as a growing medium and no undesirable material is present (in line with BS3882³⁹). LKC advise this information is provided by the supplier before material is imported onto site.

Imported material to be used in gardens will be compared against residential with plant uptake criteria (as used in the contamination risk assessment in Section 6).

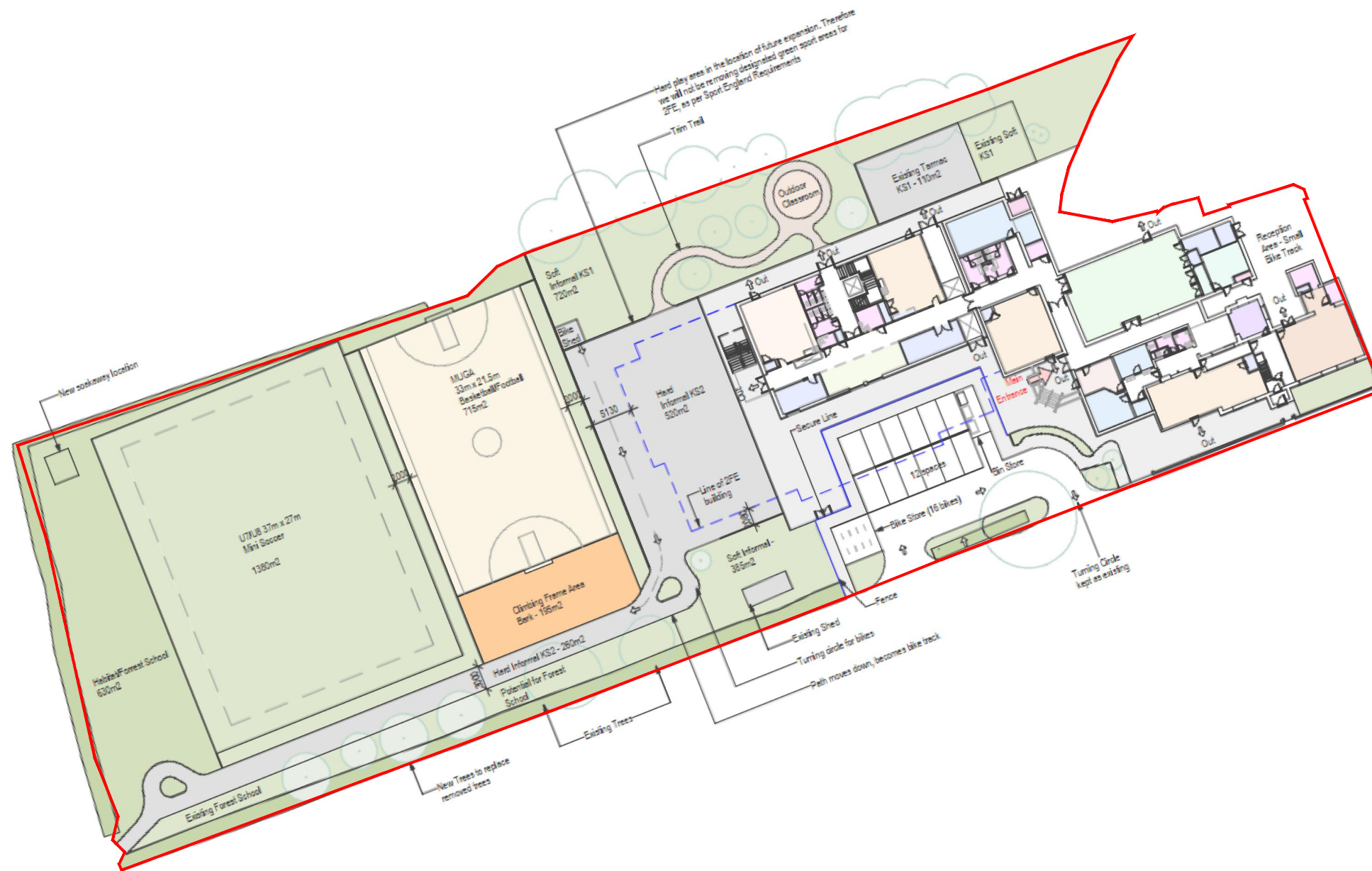
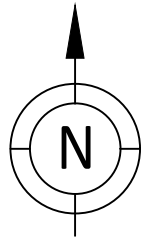
9.4. Site Completion Report

All remediation and validation work should be documented in a Site Completion Report. The Site Completion Report will allow discharge of relevant planning conditions.

Figures



Client: Cranmer Education Trust				Title: Site Location & Boundary Plan			
Site: St Johns Primary School, Middleton				Scale (see scale bar): 1:25,000 & 1:1,250 @ A4			
Job No.: LKC 24 1098	Drawn By: CK	Checked By: EM	Drawn: Feb 2024	Figure: 1			



KEY

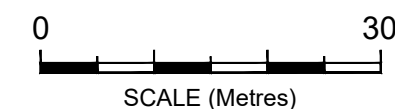
- Site Boundary
- Gross
- Habitat
- MUGA
- Bark
- Tarmac
- Pathways
- New Tree
- Existing Tree

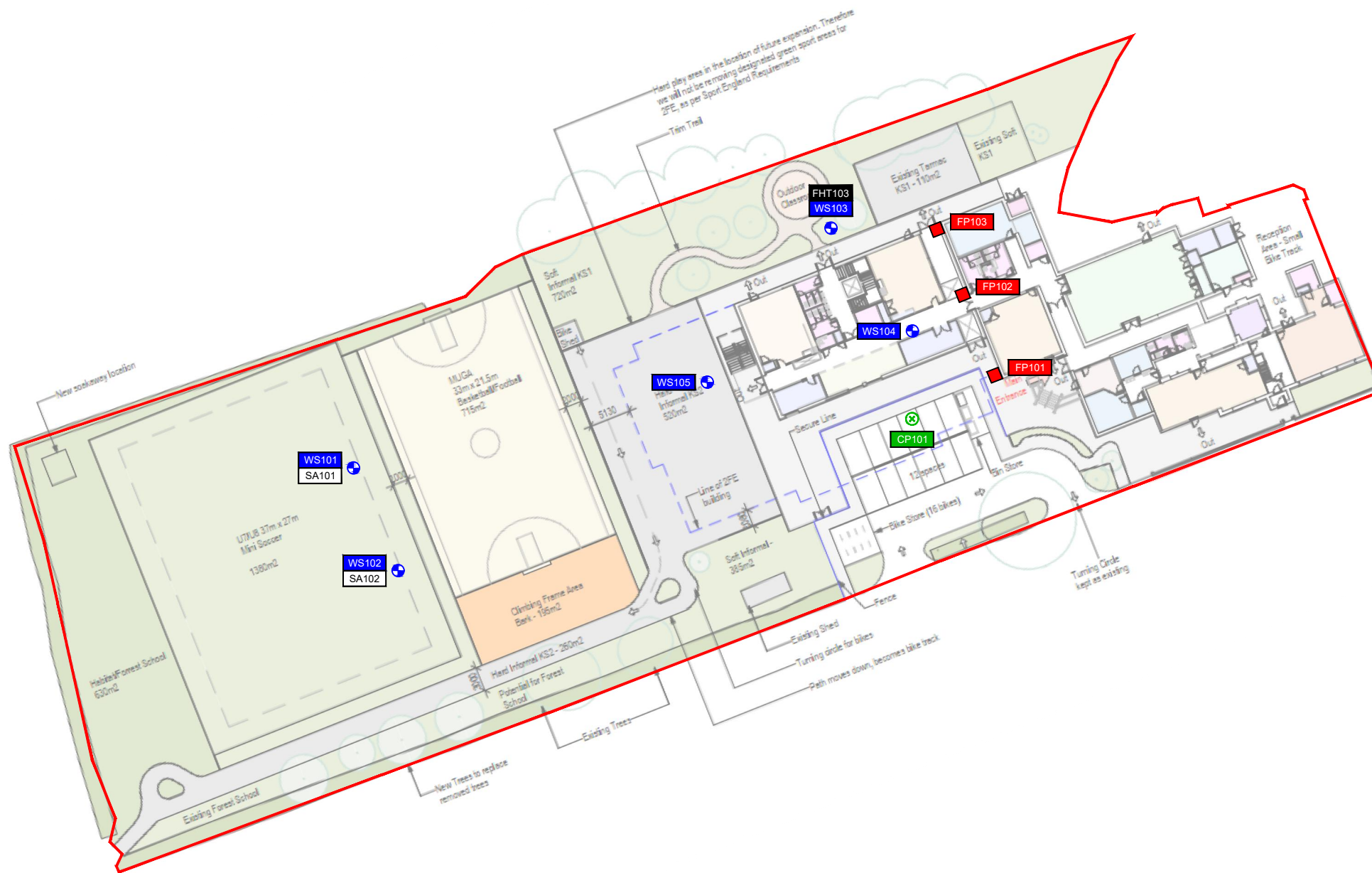
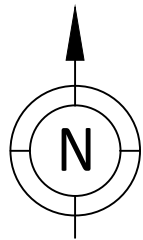
Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing 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: Cranmer Education Trust			
Site: St John's Primary School, Middleton			
Title: Proposed Development Plan			
Job No.: LKC 24 1098	Scale (See Scale Bar): See Scale Bar	Figure: 2	Revision:
Drawn By: AC	Checked By: CK	Date: Feb 2024	

Extract From: Booth King Partnership Limited
Drawing Ref: Option 3 - Proposed Site Plan Phase 1FE (07/02/2024)





KEY

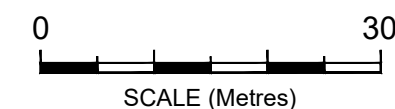
- Site Boundary
- Window Sample Borehole (WS)
- Cable Percussive Borehole (CP)
- Foundation Inspection Pit (FP)
- Soakaway Test (SA)
- Falling Head Test (FHT)

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: Cranmer Education Trust			
Site: St John's Primary School, Middleton			
Title: Site Investigation Location Plan			
Job No.: LKC 24 1098	Scale (See Scale Bar): See Scale Bar	Figure: 3	Revision:
Drawn By: AC	Checked By: JW	Drawn: May 2024	

Extract From: Booth King Partnership Limited
Drawing Ref: Option 3 - Proposed Site Plan Phase 1FE (07/02/2024)



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 552⁴⁰. 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

Date: 29/05/2024

Contractor: D & I Drilling Ltd

Page Number
Sheet 1 of 1

Remarks:
Borehole unstable below 2.00mbgl.
Strata within borehole are wet below 0.50mbgl.
Unable to case off borehole below 2.00mbgl due to blown sands.
Unable to obtain samples from drilling below 4.00mbgl due to repeated borehole collapse. Continuous SPT(C)s undertaken alternatively to provide geotechnical information (strata not determinable).

		Window Sample Borehole Log			Location Number: WS102	
Project Name: St Johns Primary School, Middleton		Client: Cranmer Education Trust		Date: 29/05/2024		
Project No. : LKC 24 1098		Contractor: D & I Drilling Ltd				
Equipment: Window Sample Rig: Competitor Dart		Level	Logged By JW	Scale 1:40	Page Number Sheet 1 of 1	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)
0.25 - 0.50	ES PID=0.1ppm D	0.25		TOPSOIL: Dark brown slightly gravelly slightly sandy SILT with frequent rootlets. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone.	1	
0.25 - 0.50						
0.50 - 1.40		0.50		Brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising quartzite. Strata is damp.		
				Brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising quartzite. Strata is wet.		
1.20 - 1.65	N=17 (4,3/3,4,5,5)					
1.40 - 2.20	D	1.40		Medium dense brown very silty SAND. Sand is fine to medium. Strata is wet.		
2.00 - 2.45	N=22 (3,4/5,6,5,6)					
2.20 - 3.00	D	2.20		Medium dense brown very gravelly SAND. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising sandstone and quartzite. Strata is very wet.		
3.00 - 3.45	N=18 (4,4/5,4,4,5)	3.00		STRATA NOT DETERMINED. SPT(C)s undertaken.	3	
3.45 - 3.90	N=18 (3,3/4,4,5,5)					
3.90 - 4.35	N=25 (4,5/6,6,7,6)					
4.35 - 4.80	N=26 (5,5/6,7,7,6)					
4.80	N=29 (6,7/8,6,8,7)					
		5.25		End of Borehole at 5.25m	5	
					6	
					7	
					8	

Remarks:
 Borehole unstable below 2.00mbgl.
 Strata within borehole are wet below 0.50mbgl.
 Unable to case off borehole below 2.00mbgl due to blown sands.
 Unable to obtain samples from drilling below 3.00mbgl due to repeated borehole collapse. Continuous SPT(C)s undertaken alternatively to provide geotechnical information (strata not determinable).

		Window Sample Borehole Log				Location Number: WS103	
Project Name: St Johns Primary School, Middleton			Client: Cranmer Education Trust		Date: 29/05/2024		
Project No. : LKC 24 1098			Contractor: D & I Drilling Ltd				
Equipment: Window Sample Rig: Competitor Dart			Level	Logged By JW	Scale 1:40	Page Number Sheet 1 of 1	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)	Water Strikes
0.00 - 0.50	D	0.50		TOPSOIL: Dark brown slightly gravelly slightly sandy SILT with frequent rootlets to 0.30mbgl. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite.			
0.00 - 0.50	ES						
0.50 - 1.00	D			Brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone.			
0.50 - 1.00	ES						
0.50 - 1.00	PID=0.1ppm						
1.00 - 1.40	D	1.00		Orangish brown slightly gravelly silty clayey SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone. Strata is wet.	1		
1.20 - 1.65	N=10 (0,0/0,3,4,3)						
1.40 - 2.00	D	1.40		Medium dense pinkish brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone. Strata is wet. Very dense at 5.00-5.45mbgl.			
2.00 - 2.45	N=15 (2,3/3,4,4,4)				2		▼
3.00 - 4.00	D				3		
3.00 - 3.45	N=14 (2,2/3,3,4,4)						
4.00 - 4.45	N=11 (3,3/4,3,2,2)				4		
5.00 - 5.45	N=49 (7,10/10,12,12,15)				5		
		5.45		End of Borehole at 5.45m			
					6		
					7		
					8		

Remarks:
 Borehole unstable below 3.00mbgl.
 Strata within borehole are wet below 1.00mbgl.
 Groundwater strike at 2.00mbgl.
 Unable to case off borehole below 3.00mbgl due to blown sands.

		Window Sample Borehole Log				Location Number: WS104	
Project Name: St Johns Primary School, Middleton			Client: Cranmer Education Trust		Date: 29/05/2024		
Project No. : LKC 24 1098			Contractor: D & I Drilling Ltd				
Equipment: Window Sample Rig: Competitor Dart			Level	Logged By JW	Scale 1:40	Page Number Sheet 1 of 1	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)	Water Strikes
0.00 - 0.40	D	0.40		MADE GROUND: Dark brown slightly gravelly slightly sandy SILT with frequent rootlets to 0.30mbgl, rare brick fragments and ceramic fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite.	1		
0.00 - 0.40	ES						
0.00 - 0.40	PID=0.1ppm						
0.40 - 1.00	D						
0.40 - 1.00	ES						
0.40 - 1.00	PID=0.0ppm			Medium dense orangish brown slightly gravelly slightly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite. Strata is wet.			
1.20 - 1.65	N=20 (3,4/5,5,5,5)	1.90		Medium dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to medium, subangular to subrounded comprising quartzite. Strata is wet.	2		
2.00 - 2.45	N=14 (2,2/3,3,3,5)						
2.50 - 3.50	D						
3.00 - 3.45	N=18 (3,3/3,5,5,5)				3		
4.00 - 4.44	N=50 (5,12/50 for 290mm)	4.00		STRATA NOT DETERMINED. SPT(C) undertaken.	4		
		4.44		End of Borehole at 4.44m			
					5		
					6		
					7		
					8		

Remarks:
 Strata within borehole are wet below 0.40mbgl.
 SPT refusal at 4.44mbgl.
 Borehole unstable below 2.00mbgl.
 Groundwater strike at 1.90mbgl.

Window Sample Borehole Log

Location Number:

WS105

Project Name: St Johns Primary School,
Middleton

Client: Cranmer Education Trust

Date: 29/05/2024

Project No. : LKC 24 1098

Contractor: D & I Drilling Ltd

Equipment: Window Sample Rig: Competitor
Dart

Level

Logged By
.JW

Scale
1:40

Page Number
Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
0.00 - 0.45	D	0.45		TOPSOIL: Dark brown slightly gravelly slightly sandy SILT with frequent rootlets. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone.		
0.00 - 0.45	ES PID=0.0ppm			Medium dense brown slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising quartzite.		
0.45 - 1.00	D	3.00		STRATA NOT DETERMINED. SPT(C)s undertaken.	1	
0.45 - 1.00	ES PID=0.0ppm				2	
1.20 - 1.65	N=22 (4,4/5,6,5,6)				3	
2.00 - 3.00	D				4	
2.00 - 2.45	N=24 (5,6/7,5,6,6)	4.90		End of Borehole at 4.90m	5	
3.00	N=26 (6,7/7,6,7,6)				6	
3.45	N=30 (7,7/8,7,8,7)				7	
3.90	N=33 (6,7/8,9,8,8)				8	
4.45	N=34 (7,8/9,8,9,8)					

Remarks:

Borehole unstable below 2.00mbgl.

Groundwater strike at 0.70mbql.

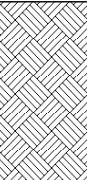
Strata within borehole are wet below 0.45mbgl.

Unable to case off borehole below 2.00mbgl due to blown sands.

Unable to obtain samples from drilling below 3.00mbgl due to repeated borehole collapse. Continuous SPT(C)s undertaken alternatively to provide geotechnical information (strata not determinable).

Groundwater strike at 1.50mbgl. Rose to 1.30mbgl after 5 minutes. No rise after 5 minutes.

		Cable Percussion Drilling Log				Location Number: CP101		
Project Name: St Johns Primary School, Middleton			Client: Cranmer Education Trust			Date: 28/05/2024 - 29/05/2024		
Project ID:LKC 24 1098			Contractor: D & I Drilling Ltd					
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig			Level	Logged By JW	Scale 1:50	Page Number Sheet 2 of 2		
Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description			Level (m)	Water Strikes
10.20 - 10.65 10.20	D N=16 (2,3/4,4,4,4)	10.20		Medium dense brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising quartzite.		11		
				Medium dense to dense brown slightly gravelly slightly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising quartzite.				
11.50 - 11.95 11.50	D N=19 (3,4/4,5,5,5)	11.50		Firm to stiff consistency brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite.		12		
12.00 - 12.30	B							
13.00 - 13.45	U	13.00		Stiff consistency brown slightly gravelly slightly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite.		13		
13.50 - 13.95 13.50	D N=28 (5,6/7,7,7,7)	13.60		Stiff consistency brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite.		14		
14.80 - 15.25 14.80	D N=31 (6,6/7,7,8,9)	15.25		End of Borehole at 15.25m		15		
						16		
						17		
						18		
						19		
						20		
Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
				5	1.30			
				10	1.30			
				15	1.30			
				20	1.30			
Remarks: Groundwater strike at 1.50mbgl. Rose to 1.30mbgl after 5 minutes. No rise after 5 minutes.								

		Trial Pit Log				Location Number: SA101	
Project: St Johns Primary School, Middleton		Client: Cranmer Education Trust			Date: 28/05/2024		
Project No. : LKC 24 1098		Contractor: D & I Drilling Ltd					
Equipment: Hand Excavation Tools		Level	Logged By JW		Scale 1:10	Page Number Sheet 1 of 1	
Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description			Level (m)
0.00 - 0.25 0.00 - 0.25 0.00 - 0.25	D ES PID=0.0ppm			TOPSOIL: Dark brown slightly gravelly slightly sandy SILT with frequent rootlets. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone.			
0.25 - 0.30	D	0.25 0.30		Brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite. Strata is damp.			
				End of Trial Pit at 0.30m			
						0.5	
						1.0	
						1.5	
						2.0	
		Pit Dimensions			Pit Stability		
		Length (m)	Width (m)	Depth (m)	Stable		
		0.50	0.50	0.30			
		Remarks: Hand excavated trial pit undertaken to allow for soakaway testing. Hand excavated trial pit damp at 0.25-0.30mbgl.					

		Trial Pit Log				Location Number: SA102	
Project: St Johns Primary School, Middleton		Client: Cranmer Education Trust			Date: 28/05/2024		
Project No. : LKC 24 1098		Contractor: D & I Drilling Ltd					
Equipment: Hand Excavation Tools		Level	Logged By JW	Scale 1:10	Page Number Sheet 1 of 1		
Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)	
0.00 - 0.25 0.00 - 0.25 0.00 - 0.25	D ES PID=0.0ppm			TOPSOIL: Dark brown slightly gravelly slightly sandy SILT with frequent rootlets. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone.			
0.25 - 0.30	D	0.25 0.30		Brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and quartzite. Strata is damp. End of Trial Pit at 0.30m			
						0.5	
						1.0	
						1.5	
						2.0	
			Pit Dimensions			Pit Stability	
			Length (m)	Width (m)	Depth (m)	Stable	
			0.50	0.50	0.30		
			Remarks: Hand excavated trial pit undertaken to allow for soakaway testing.				

Date: 28/05/2024

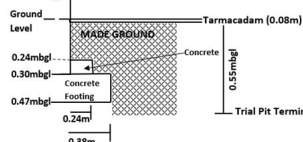
Contractor: D & I Drilling Ltd

Page Number
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2.0

Unstable below
tarmacadam

Hand excavated foundation pit undertaken to provide information on the foundations and ground conditions adjacent to the building wall.
Water inflow into hand excavated foundation pit from the sub-base underlying the tarmacadam.





Trial Pit Log

Location Number: **FP102**

Project: St Johns Primary School, Middleton

Client: Cranmer Education Trust

Date: 28/05/2024

Project No. : LKC 24 1098

Contractor: D & I Drilling Ltd

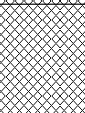
Equipment: Hand Excavation Tools

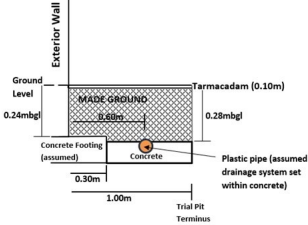
Level

Logged By
JW

Scale
1:10

Page Number
Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description		Level (m)
		0.08		TARMACADAM.		
				MADE GROUND: Grey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising limestone. (Probable sub-base).		
		0.24		CONCRETE. Likely building foundation.		
		0.28		Concrete present to 0.30m from exterior wall.		
		0.29		CONCRETE. Extends Concrete present at 0.30-1.00m from exterior wall.		
				End of Trial Pit at 0.29m		
					0.5	
					1.0	
					1.5	
					2.0	



Pit Dimensions

Length (m)	Width (m)	Depth (m)
1.00	0.50	0.29

Pit Stability

Unstable below tarmacadam

Remarks:

Hand excavated foundation pit undertaken to provide information on the foundations and ground conditions adjacent to the building wall. Water inflow into hand excavated foundation pit from the sub-base underlying the tarmacadam.

		Trial Pit Log				Location Number: FP103		
Project: St Johns Primary School, Middleton			Client: Cranmer Education Trust			Date: 28/05/2024		
Project No. : LKC 24 1098			Contractor: D & I Drilling Ltd					
Equipment: Hand Excavation Tools			Level	Logged By JW		Scale 1:10	Page Number Sheet 1 of 1	
Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description				Level (m)
				TARMACADAM.				
		0.10						
		0.15		MADE GROUND: Grey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising limestone. (Probable sub-base).				
				CONCRETE. Plastic membrane present at 0.19-0.32mbgl. Likely building foundation. Concrete present to 0.22m from exterior wall.				
		0.32						
		0.40		MADE GROUND: Grey sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising limestone. (Probable sub-base).				
				End of Trial Pit at 0.40m				
								0.5

FP101

Exterior Wall

Ground
Level

Tarmacadam (0.08m)

MADE GROUND

0.24mbgl

Concrete

0.30mbgl

Concrete
Footing

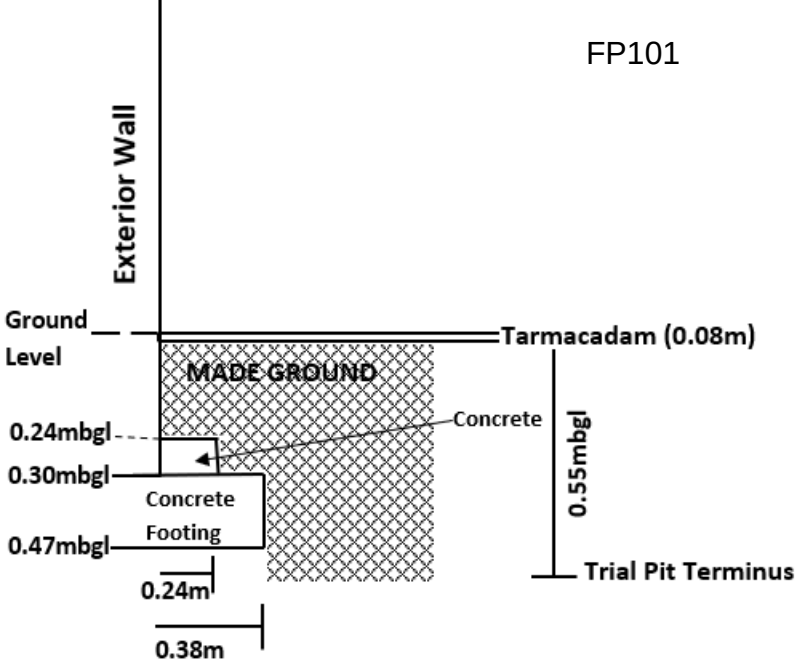
0.47mbgl

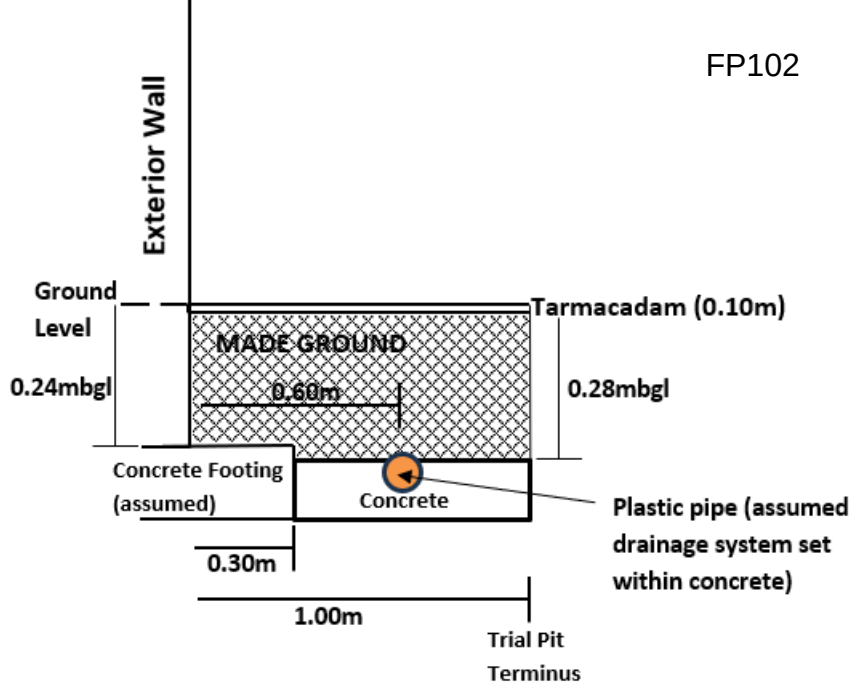
0.55mbgl

Trial Pit Terminus

0.24m

0.38m





FP103

Exterior Wall

Ground
Level

Tarmacadam (0.10m)

MADE GROUND

0.15mbgl

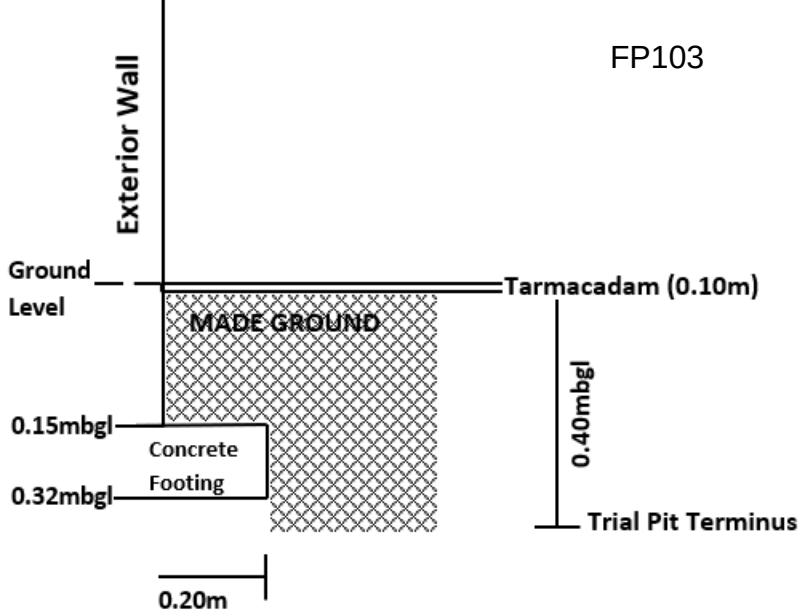
Concrete
Footing

0.32mbgl

0.40mbgl

Trial Pit Terminus

0.20m



Appendix C – Certificates of Analysis (Soil)



Rachel Peart
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 24-06046

Site Reference: St Johns Primary School, Middleton

Project / Job Ref: LKC 24 1098

Order No: LKC241098-RP

Sample Receipt Date: 31/05/2024

Sample Scheduled Date: 31/05/2024

Report Issue Number: 1

Reporting Date: 06/06/2024

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.



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



Soil Analysis Certificate						
DETS Report No: 24-06046	~Date Sampled	29/05/24	29/05/24	29/05/24	29/05/24	28/05/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: St Johns Primary School, Middleton	~TP / BH No	WS101	WS103	WS104	WS105	CP101
~Project / Job Ref: LKC 24 1098	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: LKC241098-RP	~Depth (m)	0.00 - 0.25	0.00 - 0.50	0.00 - 0.40	0.00 - 0.45	0.40 - 0.70
Reporting Date: 06/06/2024	DETS Sample No	718376	718377	718378	718379	718380

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	6.2	6.4	6.8	6.8	9.0
Total Cyanide	mg/kg	< 1	NONE			< 1		
Free Cyanide	mg/kg	< 1	NONE			< 1		
W/S Sulphate as SO ₄ (2:1)	mg/l	< 10	MCERTS	< 10	< 10	< 10	< 10	79
W/S Sulphate as SO ₄ (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	< 0.01	< 0.01	0.08
Organic Matter (SOM)	%	< 0.1	MCERTS	4.4	4.2	4.4	4.9	3.4
Arsenic (As)	mg/kg	< 2	MCERTS	6	10	15	16	4
W/S Boron	mg/kg	< 1	NONE			< 1		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	0.2	0.3	0.3	0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	10	15	21	28	11
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	17	21	32	32	24
Lead (Pb)	mg/kg	< 3	MCERTS	27	43	71	78	17
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	5	8	11	11	10
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	10	16	22	25	13
Zinc (Zn)	mg/kg	< 3	MCERTS	28	42	68	63	32
Total Phenols (monohydric)	mg/kg	< 2	NONE			< 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
Subcontracted analysis (S)

~Sample details provided by customer and can affect the validity of results



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



Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-06046	~Date Sampled	29/05/24	29/05/24	29/05/24	29/05/24	28/05/24
LK Consult Limited	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: St Johns Primary School, Middleton	~TP / BH No	WS101	WS103	WS104	WS105	CP101
~Project / Job Ref: LKC 24 1098	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: LKC241098-RP	~Depth (m)	0.00 - 0.25	0.00 - 0.50	0.00 - 0.40	0.00 - 0.45	0.40 - 0.70
Reporting Date: 06/06/2024	DETS Sample No	718376	718377	718378	718379	718380

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.14	0.22	0.19	0.25	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	0.14	0.20	0.20	0.26	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	0.14	0.18	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	0.17	0.20	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	0.19	0.20	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.17	0.19	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.12	0.13	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

~Sample details provided by customer and can affect the validity of results



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 24-06046	~Date Sampled	29/05/24				
LK Consult Limited	~Time Sampled	None Supplied				
~Site Reference: St Johns Primary School, Middleton	~TP / BH No	WS104				
~Project / Job Ref: LKC 24 1098	~Additional Refs	None Supplied				
~Order No: LKC241098-RP	~Depth (m)	0.00 - 0.40				
Reporting Date: 06/06/2024	DETS Sample No	718378				

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01			
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05			
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2			
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3			
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3			
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	< 10			
Aliphatic >C34 - C44 : EH_CU_1D_AL	mg/kg	< 10	NONE	< 10			
Aliphatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21			
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01			
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05			
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2			
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	< 3			
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	< 10			
Aromatic >C35 - C44 : EH_CU_1D_AR	mg/kg	< 10	NONE	< 10			
Aromatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21			
Total >C5 - C44 : HS_1D_MS+EH_CU_1D_Tot al	mg/kg	< 42	NONE	< 42			

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-06046	~Date Sampled	29/05/24				
LK Consult Limited	~Time Sampled	None Supplied				
~Site Reference: St Johns Primary School, Middleton	~TP / BH No	WS104				
~Project / Job Ref: LKC 24 1098	~Additional Refs	None Supplied				
~Order No: LKC241098-RP	~Depth (m)	0.00 - 0.40				
Reporting Date: 06/06/2024	DETS Sample No	718378				

Determinand	Unit	RL	Accreditation				
Benzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2			
Toluene : HS_1D_MS	ug/kg	< 5	MCERTS	< 5			
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2			
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2			
o-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2			
MTBE : HS_1D_MS	ug/kg	< 5	MCERTS	< 5			

~Sample details provided by customer and can affect the validity of results



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Waste Acceptance Criteria Analytical Certificate																																							
DETS Report No: 24-06046		~Date Sampled	29/05/24		<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: St Johns Primary School, Middleton		~TP / BH No	WS104																																				
~Project / Job Ref: LKC 24 1098		~Additional Refs	None Supplied																																				
~Order No: LKC241098-RP		~Depth (m)	0.00 - 0.40																																				
Reporting Date: 06/06/2024		DETS Sample No	718378																																				
Determinand	Unit	MDL																																					
TOC ^{MU}	%	< 0.1		2.6																																			
Loss on Ignition ^{MU}	%	< 0.01		5.30																																			
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		< 1.7																																			
pH ^{MU}	pH Units	N/a		6.8																																			
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		0.0027	0.0012		0.023	0.5	2	25																															
Barium ^U		0.0291	0.0175		0.325	20	100	300																															
Cadmium ^U		< 0.0002	< 0.0002		< 0.002	0.04	1	5																															
Chromium ^U		0.0022	0.0012		0.022	0.5	10	70																															
Copper ^U		0.0117	0.0041		0.079	2	50	100																															
Mercury ^U		< 0.00004	< 0.00004		< 0.0004	0.01	0.2	2																															
Molybdenum ^U		0.0022	0.0008		0.016	0.5	10	30																															
Nickel ^U		0.0016	0.0009		0.0171	0.4	10	40																															
Lead ^U		0.0139	0.0036		0.073	0.5	10	50																															
Antimony ^U		< 0.0002	< 0.0002		< 0.002	0.06	0.7	5																															
Selenium ^U		0.0005	< 0.0002		0.0035	0.1	0.5	7																															
Zinc ^U		0.008	0.010		0.17	4	50	200																															
Chloride ^U		2	2		38	800	15000	25000																															
Fluoride ^U		0.6	< 0.5		< 1	10	150	500																															
Sulphate ^U		1	2		28	1000	20000	50000																															
TDS		35	30		547	4000	60000	100000																															
Phenol Index ^U		< 0.01	< 0.01		< 0.5	1	-	-																															
DOC ^U		21.1	18.7		341	500	800	1000																															
Leach Test Information																																							
Sample Mass (kg)		0.11																																					
Dry Matter (%)		82.5																																					
Moisture (%)		21.2																																					
Stage 1																																							
Volume Eluate L2 (litres)		0.16																																					
Filtered Eluate VE1 (litres)		0.06																																					

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 Normec DETS Limited cannot be held responsible for any discrepancies with current legislation
 M Denotes MCERTS accredited test
 U Denotes ISO17025 accredited test
 ~Sample details provided by customer and can affect the validity of results
 * DETS are accredited for the testing of leachate and not the leachate preparation stage which is unaccredited



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 24-06046	
LK Consult Limited	
~Site Reference: St Johns Primary School, Middleton	
~Project / Job Ref: LKC 24 1098	
~Order No: LKC241098-RP	
Reporting Date: 06/06/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
718376	WS101	None Supplied	0.00 - 0.25	22.6	Brown sandy loam with vegetation
718377	WS103	None Supplied	0.00 - 0.50	16.9	Brown loamy sand with vegetation
718378	WS104	None Supplied	0.00 - 0.40	17	Brown loamy sand with vegetation
718379	WS105	None Supplied	0.00 - 0.45	20.1	Brown loamy sand with vegetation
718380	CP101	None Supplied	0.40 - 0.70	4.4	Brown sandy clay with stones

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

Insufficient Sample ^{1/5}

Unsuitable Sample ^{u/s}

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-06046

LK Consult Limited

~Site Reference: St Johns Primary School, Middleton

~Project / Job Ref: LKC 24 1098

~Order No: LKC241098-RP

Reporting Date: 06/06/2024

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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4480

Water Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-06046

LK Consult Limited

~Site Reference: St Johns Primary School, Middleton

~Project / Job Ref: LKC 24 1098

~Order No: LKC241098-RP

Reporting Date: 06/06/2024

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	U	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	UF	Biological Oxygen Demand (COD)	Determination using BOD sensors measuring the change of pressure	E133
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 detection	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

~Sample details provided by customer and can affect the validity of results



Normec DETS Limited
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: 24-06046	
LK Consult Limited	
~Site Reference: St Johns Primary School, Middleton	
~Project / Job Ref: LKC 24 1098	
~Order No: LKC241098-RP	
Reporting Date: 06/06/2024	

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
~	Sample details provided by customer and can affect the validity of results

Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
Mineral Oil (C10 - C40) (BS EN 12457-3) - EH_CU_1D_AL
TPH - Aliphatic >C34 - C44 - raw data - EH_CU_1D_AL
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C34 - C44 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C35 - C44 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C44 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
Total BTEX (BS EN 12457-3) - HS_1D_MS_Total
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Parameter	Matrix Type	Expanded Uncertainty Measurement	Unit
TOC	Soil	12.2	%
Loss on Ignition	Soil	22.9	%
BTEX	Soil	11.2	%
Sum of PCBs	Soil	43.4	%
Mineral Oil	Soil	9.0	%
Total PAH	Soil	18.5	%
pH	Soil	0.335	Units
Acid Neutralisation Capacity	Soil	18.0	%
Clay Content	Soil	15.0	%
Silt Content	Soil	14.0	%
Sand Content	Soil	13.0	%
Loss on Ignition	Soil	22.9	%
pH	Soil	0.335	Units
Carbonate	Soil	12.0	%
Total Nitrogen	Soil	12.0	%
Phosphorus (Extractable)	Soil	24.0	%
Potassium (Extractable)	Soil	20.0	%
Magnesium (Extractable)	Soil	26.0	%
Zinc	Soil	21.6	%
Copper	Soil	18.2	%
Nickel	Soil	24.3	%
Available Sodium	Soil	23.0	%
Available Calcium	Soil	23.0	%
Electrical Conductivity	Soil	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 24 1098 -
St Johns Primary School

Job Number MRN 24076/51
Date of Issue 21 June 2024
Page 1 of 8

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

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

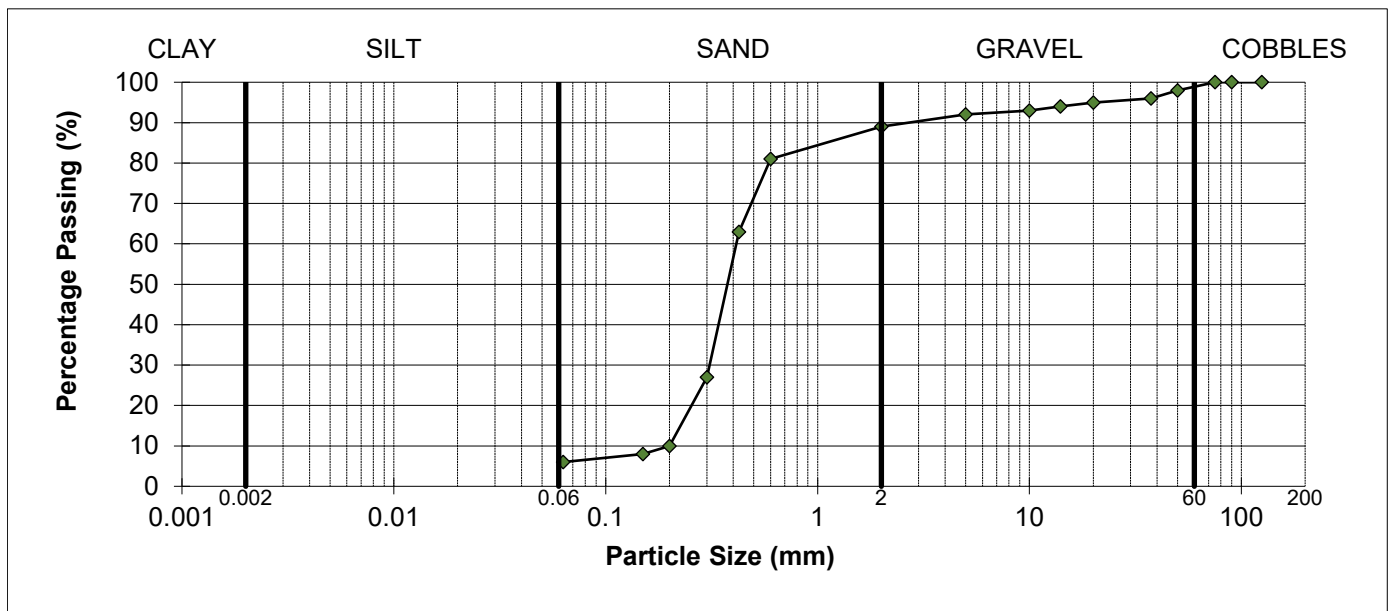
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1098 - St Johns Primary School
JOB NUMBER	MRN 24076/51

SAMPLE LABEL	CP101 B 1.70-2.00	DATE SAMPLED	Not advised
LAB SAMPLE No	488101	DATE RECEIVED	05-Jun-24
DATE TESTED	05-Jun-24	SAMPLED BY	Client

MATERIAL	Brown silty gravelly SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	92	
90	100		2	89	
75	100		0.6	81	
50	98		0.425	63	
37.5	96		0.3	27	
20	95		0.2	10	
14	94		0.15	8	
10	93		0.063	6	



REMARKS

As received water content = 19.5%

SIGNED



NAME

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

DATE

21-Jun-24

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

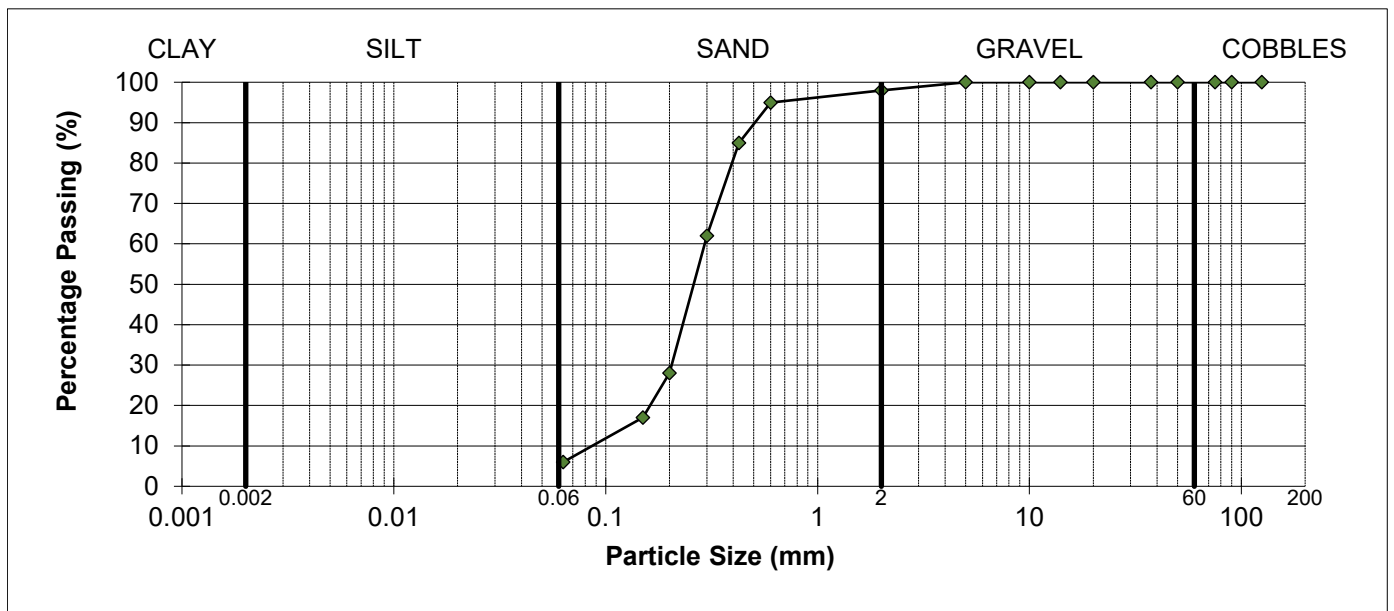
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1098 - St Johns Primary School
JOB NUMBER	MRN 24076/51

SAMPLE LABEL	CP101 B 6.00-6.30	DATE SAMPLED	Not advised
LAB SAMPLE No	488102	DATE RECEIVED	05-Jun-24
DATE TESTED	05-Jun-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly gravelly SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	100	
90	100		2	98	
75	100		0.6	95	
50	100		0.425	85	
37.5	100		0.3	62	
20	100		0.2	28	
14	100		0.15	17	
10	100		0.063	6	



REMARKS

As received water content = 18.9%

SIGNED



NAME

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

DATE

21-Jun-24

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

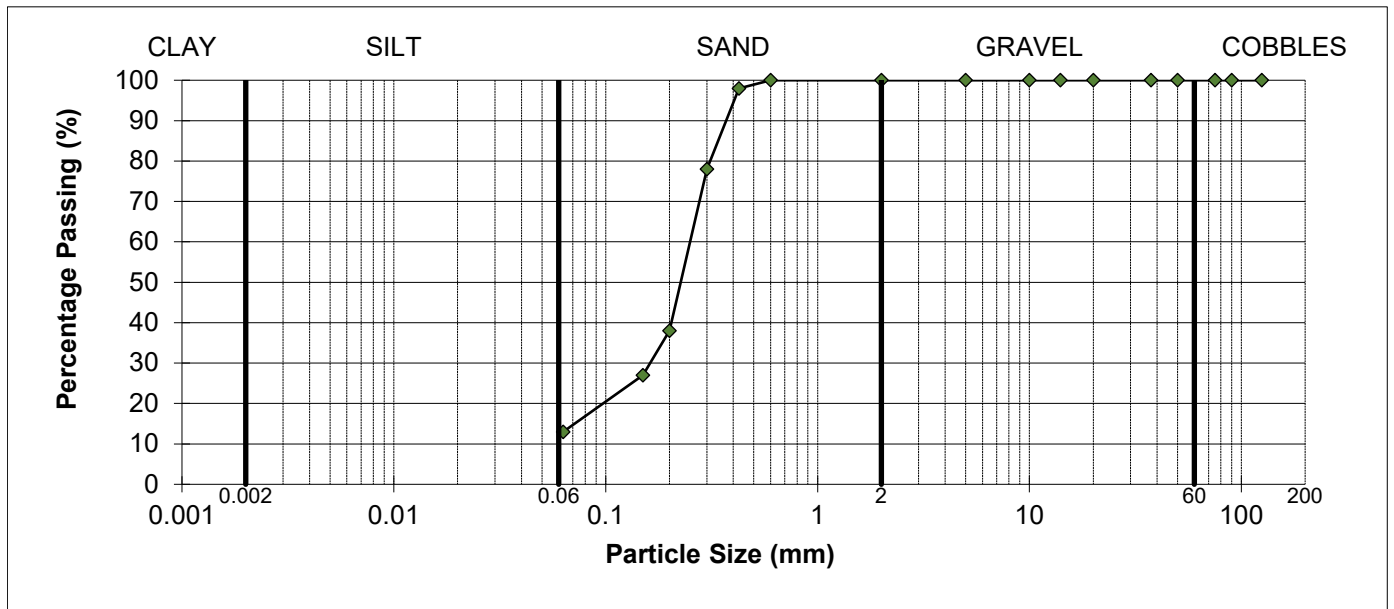
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1098 - St Johns Primary School
JOB NUMBER	MRN 24076/51

SAMPLE LABEL	WS103 D 3.00-4.00	DATE SAMPLED	Not advised
LAB SAMPLE No	488103	DATE RECEIVED	05-Jun-24
DATE TESTED	05-Jun-24	SAMPLED BY	Client

MATERIAL	Brown silty SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	100	
90	100		2	100	
75	100		0.6	100	
50	100		0.425	98	
37.5	100		0.3	78	
20	100		0.2	38	
14	100		0.15	27	
10	100		0.063	13	



REMARKS

As received water content = 21.6%

SIGNED



NAME

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

DATE

21-Jun-24

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

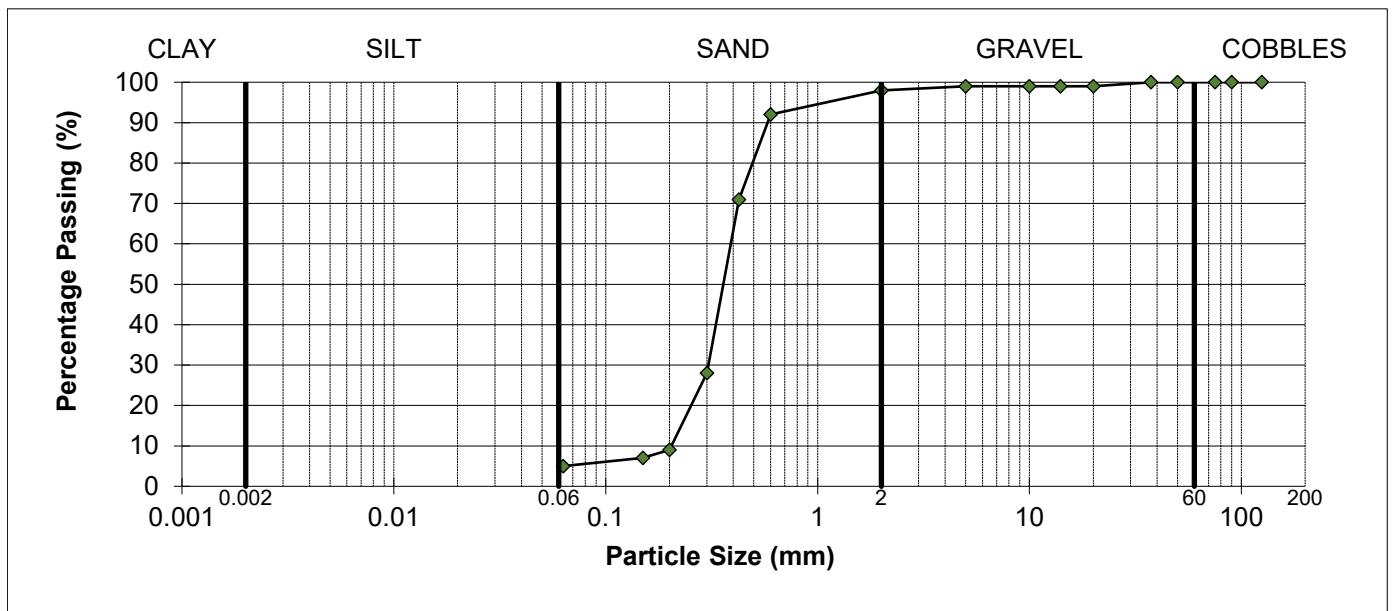
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1098 - St Johns Primary School
JOB NUMBER	MRN 24076/51

SAMPLE LABEL	WS104 D 0.40-1.00	DATE SAMPLED	Not advised
LAB SAMPLE No	488104	DATE RECEIVED	05-Jun-24
DATE TESTED	05-Jun-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly gravelly SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	99	
90	100		2	98	
75	100		0.6	92	
50	100		0.425	71	
37.5	100		0.3	28	
20	99		0.2	9	
14	99		0.15	7	
10	99		0.063	5	



REMARKS

As received water content = 9.8%

SIGNED



NAME

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

DATE

21-Jun-24

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

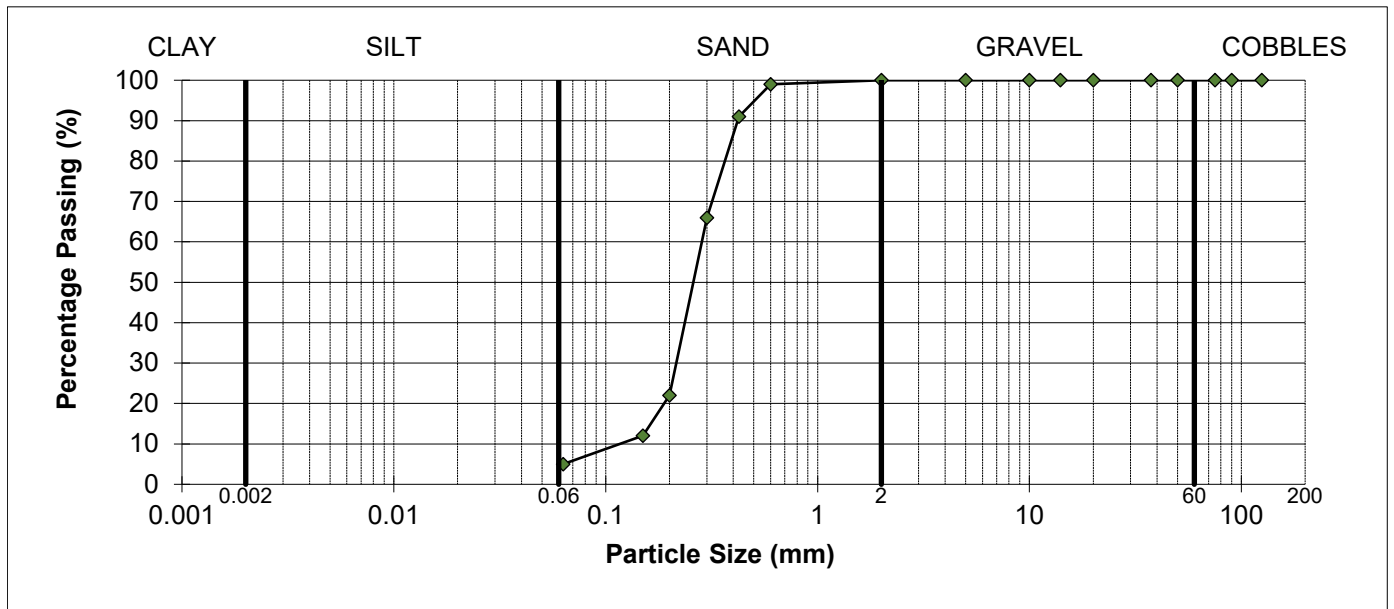
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1098 - St Johns Primary School
JOB NUMBER	MRN 24076/51

SAMPLE LABEL	WS105 D 2.00-3.00	DATE SAMPLED	Not advised
LAB SAMPLE No	488105	DATE RECEIVED	05-Jun-24
DATE TESTED	05-Jun-24	SAMPLED BY	Client

MATERIAL	Brown silty SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	100	
90	100		2	100	
75	100		0.6	99	
50	100		0.425	91	
37.5	100		0.3	66	
20	100		0.2	22	
14	100		0.15	12	
10	100		0.063	5	



REMARKS

As received water content = 20.0%

SIGNED



NAME

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

DATE

21-Jun-24

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

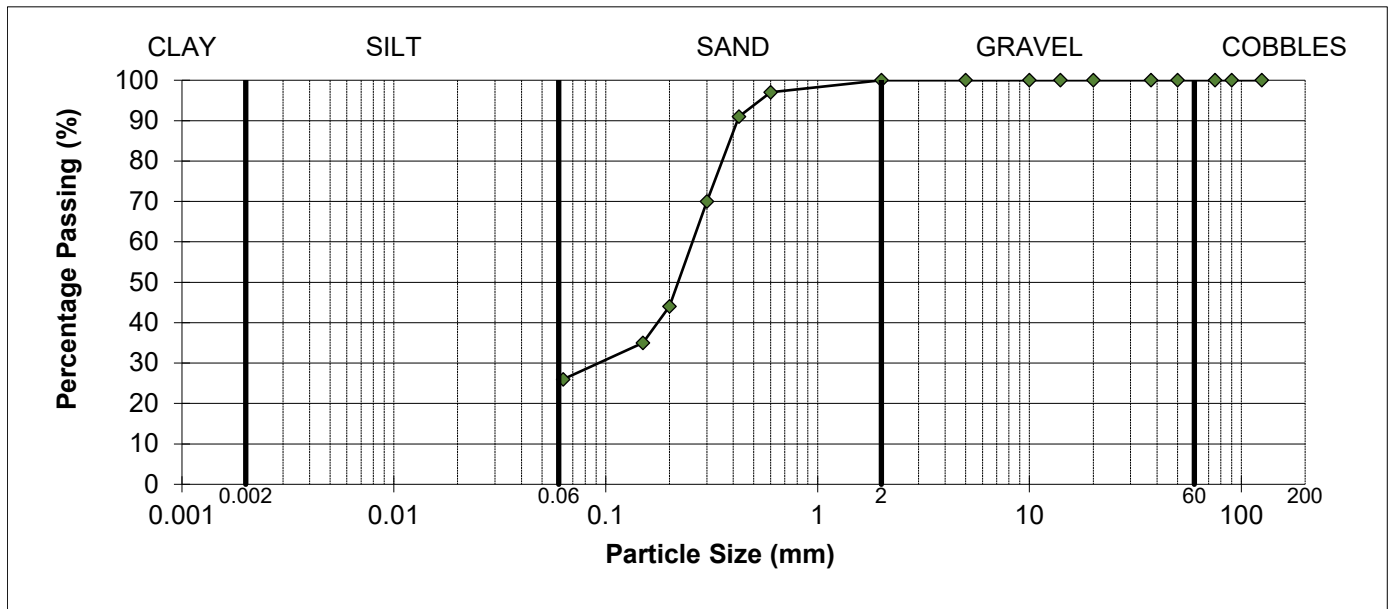
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1098 - St Johns Primary School
JOB NUMBER	MRN 24076/51

SAMPLE LABEL	SA101 D 0.25-0.30	DATE SAMPLED	Not advised
LAB SAMPLE No	488106	DATE RECEIVED	05-Jun-24
DATE TESTED	05-Jun-24	SAMPLED BY	Client

MATERIAL	Brown silty SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	100	
90	100		2	100	
75	100		0.6	97	
50	100		0.425	91	
37.5	100		0.3	70	
20	100		0.2	44	
14	100		0.15	35	
10	100		0.063	26	



REMARKS

As received water content = 21.5%

SIGNED



NAME

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

DATE

21-Jun-24

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

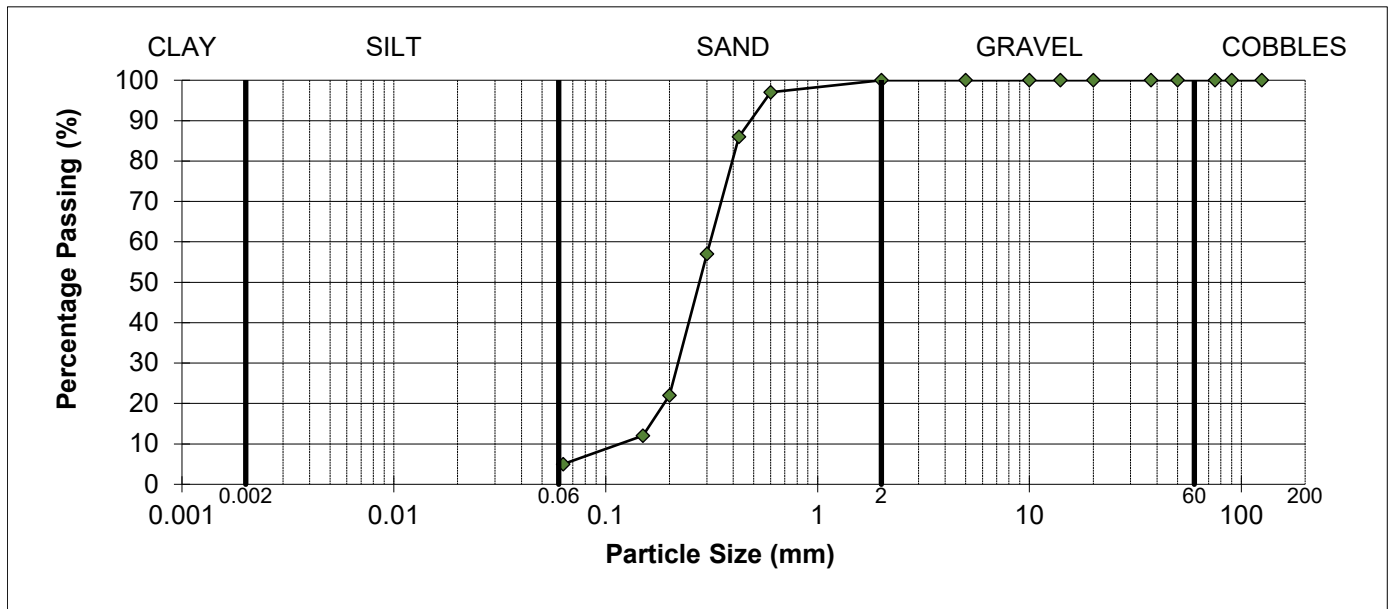
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1098 - St Johns Primary School
JOB NUMBER	MRN 24076/51

SAMPLE LABEL	SA102 D 0.25-0.30	DATE SAMPLED	Not advised
LAB SAMPLE No	488107	DATE RECEIVED	05-Jun-24
DATE TESTED	05-Jun-24	SAMPLED BY	Client

MATERIAL	Brown silty SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	100	
90	100		2	100	
75	100		0.6	97	
50	100		0.425	86	
37.5	100		0.3	57	
20	100		0.2	22	
14	100		0.15	12	
10	100		0.063	5	



REMARKS

As received water content = 11.6%

SIGNED



NAME

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

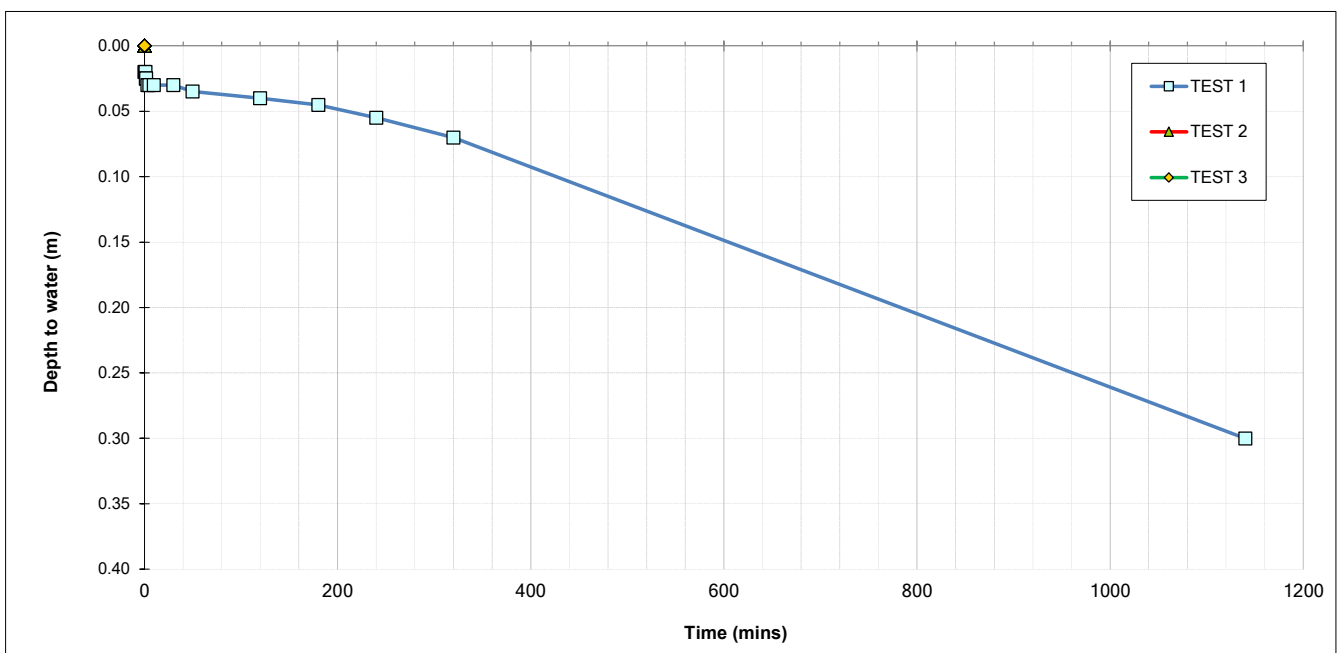
DATE

21-Jun-24

Appendix E – Falling Head Tests / Soakaway Tests

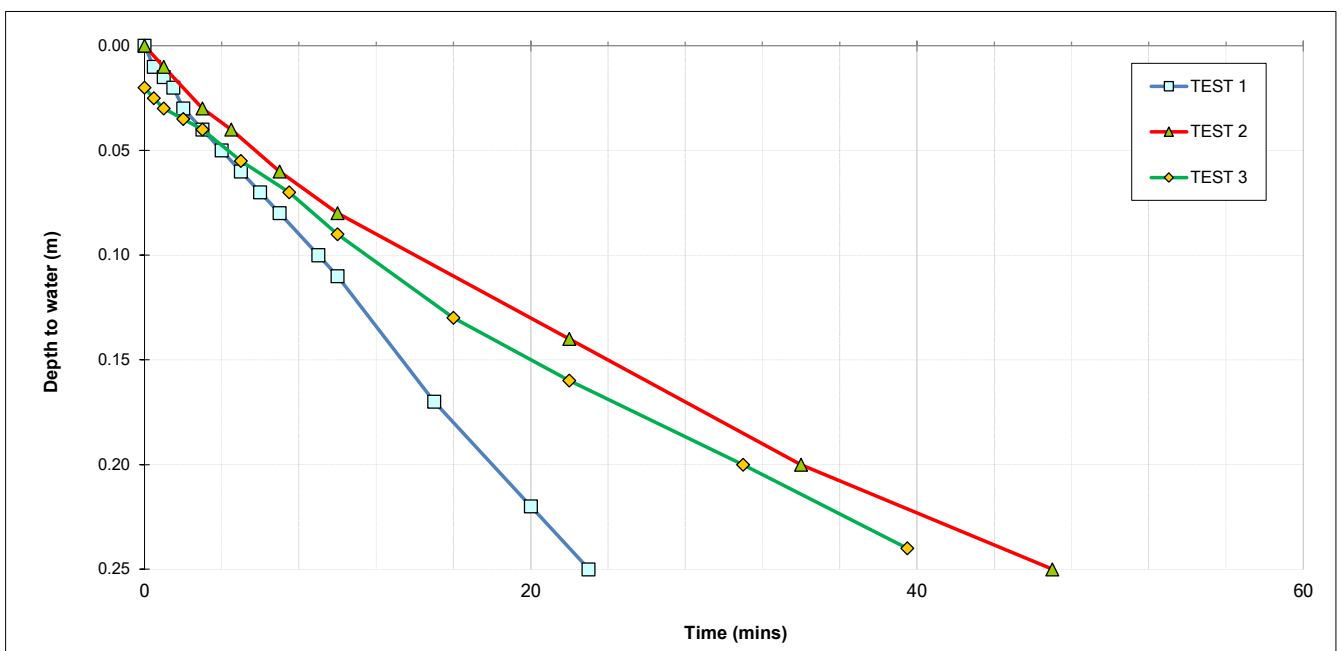
LK CONSULT		Site St Johns Primary School, Middleton Job Number LKC 24 1098 Date of Test 28/05/2024		Trial Pit Number.....SA101 Length.....0.50m Width.....0.50m Depth.....0.30m Groundwater Level.....Not encounteredm																																																																	
Remarks - Test 1 left overnight and checked the following day. Pit was dry after 19 hours. Ground description 0.00-0.25TOPSOIL: Brown slightly gravelly slightly sandy SILT. 0.25-0.30Brown slightly gravelly silty SAND.		TEST 1 <table><thead><tr><th>Time(min)</th><th>Depth to Water (m)</th><th></th><th></th></tr></thead><tbody><tr><td>0</td><td>0.02</td><td></td><td></td></tr><tr><td>0.5</td><td>0.02</td><td></td><td></td></tr><tr><td>1</td><td>0.02</td><td></td><td></td></tr><tr><td>1.5</td><td>0.03</td><td></td><td></td></tr><tr><td>2</td><td>0.03</td><td></td><td></td></tr><tr><td>3</td><td>0.03</td><td></td><td></td></tr><tr><td>5</td><td>0.03</td><td></td><td></td></tr><tr><td>10</td><td>0.03</td><td></td><td></td></tr><tr><td>30</td><td>0.03</td><td></td><td></td></tr><tr><td>50</td><td>0.04</td><td></td><td></td></tr><tr><td>120</td><td>0.04</td><td></td><td></td></tr><tr><td>180</td><td>0.05</td><td></td><td></td></tr><tr><td>240</td><td>0.06</td><td></td><td></td></tr><tr><td>320</td><td>0.07</td><td></td><td></td></tr><tr><td>1140</td><td>0.30</td><td></td><td></td></tr></tbody></table>				Time(min)	Depth to Water (m)			0	0.02			0.5	0.02			1	0.02			1.5	0.03			2	0.03			3	0.03			5	0.03			10	0.03			30	0.03			50	0.04			120	0.04			180	0.05			240	0.06			320	0.07			1140	0.30		
Time(min)	Depth to Water (m)																																																																				
0	0.02																																																																				
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2	0.03																																																																				
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50	0.04																																																																				
120	0.04																																																																				
180	0.05																																																																				
240	0.06																																																																				
320	0.07																																																																				
1140	0.30																																																																				
Effective Storage Depthm0.28 75% Effective Storage Depthm0.21 (i.e. depth below GL)m0.09 25% Effective Storage Depthm0.07 (i.e. depth below GL)m0.23 Effective Storage Depth 75%-25%m0.14 Time to fall to 75% effective depthmins320.00 Time to fall to 25% effective depthmins800.00 V (75%-25%)m30.04 a (50%)m20.53 t (75%-25%)mins480.00																																																																					
SOIL INFILTRATION RATEm/s		2.29E-06																																																																			

DESIGN SOIL INFILTRATION RATE, f	2.29E-06
---	-----------------



Remarks -	TEST 1		TEST 2		TEST 3	
	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
Ground description	0	0.00	0	0.00	0	0.02
0.00-0.25 TOPSOIL: Brown slightly gravelly slightly sandy SILT.	0.5	0.01	1	0.01	0.5	0.03
	1	0.02	3	0.03	1	0.03
0.25-0.30 Brown slightly gravelly silty SAND.	1.5	0.02	4.5	0.04	2	0.04
	2	0.03	7	0.06	3	0.04
	3	0.04	10	0.08	5	0.06
	4	0.05	22	0.14	7.5	0.07
	5	0.06	34	0.20	10	0.09
	6	0.07	47	0.25	16	0.13
	7	0.08			22	0.16
	9	0.10			31	0.20
	10	0.11			39.5	0.24
	15	0.17				
	20	0.22				
	23	0.25				
Effective Storage Depth m		0.30		0.30		0.28
75% Effective Storage Depth m		0.23		0.23		0.21
(i.e. depth below GL) m		0.08		0.08		0.09
25% Effective Storage Depth m		0.08		0.08		0.07
(i.e. depth below GL) m		0.23		0.23		0.23
Effective Storage Depth 75%-25% m		0.15		0.15		0.14
Time to fall to 75% effective depth mins		6.50		9.00		8.00
Time to fall to 25% effective depth mins		20.50		32.00		29.00
V (75%-25%) m3		0.04		0.04		0.04
a (50%) m2		0.55		0.55		0.53
t (75%-25%) mins		14.00		23.00		21.00
SOIL INFILTRATION RATE m/s		8.12E-05		4.94E-05		5.24E-05

DESIGN SOIL INFILTRATION RATE, f 4.94E-05



VARIABLE HEAD PERMEABILITY TEST



SITE	St Johns Primary School
REF	LKC 24 1098
BH REF	FHT103 / WS103

TYPE OF TEST	FALLING HEAD
STRATA	0.00-0.50m Topsoil, 0.50-1.00m SILT, 1.0-5.45m SAND.
DATE OF TEST	29/05/2024
STAFF	JW

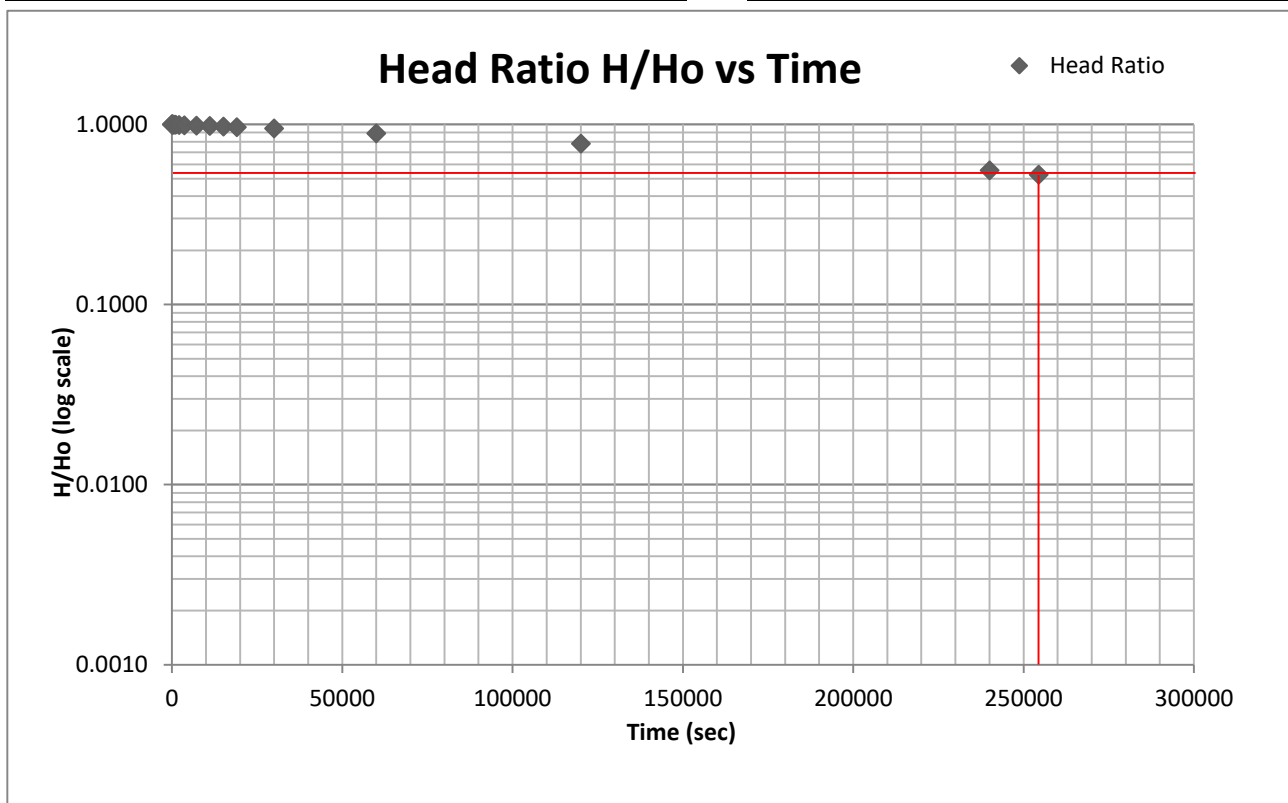
CONDITIONS OF TEST ZONE (BS5930:1999 Figure 6)	
Select 'Case' from Figure 6	r
Diameter of Borehole (D)	101 mm
L (see BS5930:1999 Figure 6)	2.55 mm
Intake Factor (F)	0.6347

Initial GW Depth	2 mbgl
Base of Installation	2.9 mbgl
Standpipe Diameter	101 mm
Standpipe X sec Area (A)	8.04E-03 m ²
Depth to response zone	2 m
BASIC TIME LAG (T) (from Plot)	255000 seconds

CALCULATED VALUES	
Permeability $k = A/F \times T$	
k =	5.0E-08 m/sec

FIELD MEASUREMENTS			
Time	Depth	Head H	Head Ratio
seconds	mbgl	m	H/Ho
0	0.4	2.500	1.0000
30	0.4	2.500	1.0000
120	0.4	2.500	1.0000
225	0.405	2.495	0.9980
300	0.41	2.490	0.9960
660	0.41	2.490	0.9960
1035	0.415	2.485	0.9940
2040	0.42	2.480	0.9920
3600	0.43	2.470	0.9880
7200	0.44	2.460	0.9840
11100	0.45	2.450	0.9800
15120	0.47	2.430	0.9720
19080	0.49	2.410	0.9659
30000	0.54	2.360	0.9478
60000	0.68	2.220	0.8916
120000	0.96	1.940	0.7807
240000	1.52	1.380	0.5565
254400	1.6	1.300	0.5263

NOTE: Values in bold are extrapolated from existing data.



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%	2.3 ^f	2.3 ^f	4.1 ^f	190 ^f (76.4) ^{sol}	4,900 ^f	1,200 ^f (76.4) ^{sol}	LQM S4UL
		2.5%	5.6 ^f	5.6 ^f	10 ^f	460 ^f (183) ^{sol}	4,900 ^f	1,900 ^f (183) ^{sol}	LQM S4UL
		6%	13 ^f	13 ^f	24 ^f	1,100 ^f (432) ^{sol}	4,900 ^f	3,000	LQM S4UL
	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%	0.087	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

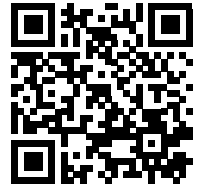
sol/vap = solubility/vapour limit (potentially use if free product identified, although highly conservative)
f=naphthalene is based on comparison of inhalation exposure with TDI(inhal) for localised effect
f = oral, dermal and inhalation exposures compared to oral HCV
dir = S4ULs based on threshold protective of direct skin contact with phenol)brackets long term exposure for illustration purposes)
g = derived based on 2,3,4-tetrachlorophenol

Appendix G – HazWaste Online Classification Report

Waste Classification Report

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

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



5R7C3-P579X-LGBQX

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

Job name

LKC 24 1098

Description/Comments

Project

LKC 24 1098

Site

St Johns Primary School

Classified by

Name: **Peter Dunn**
Date: **16 Jul 2024 13:53 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

St Johns CE Primary School, Thornham Lane, Middleton, Manchester

Post Code **M24 2SB**

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 and soil

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS101-0.00 - 0.25-29/05/2024	0.00 - 0.25	Non Hazardous		3
2	WS103-0.00 - 0.50-29/05/2024	0.00 - 0.50	Non Hazardous		5
3	WS104-0.00 - 0.40-29/05/2024	0.00 - 0.40	Non Hazardous		7
4	WS105-0.00 - 0.45-29/05/2024	0.00 - 0.45	Non Hazardous		10
5	CP101-0.40 - 0.70-28/05/2024	0.40 - 0.70	Non Hazardous		12

Related documents

#	Name	Description
1	24-06046.1.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: 16 Jul 2024 13:53 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	14
Appendix B: Rationale for selection of metal species	15
Appendix C: Version	16

Classification of sample: WS101-0.00 - 0.25-29/05/2024

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

Sample details

Sample name:	LoW Code:
WS101-0.00 - 0.25-29/05/2024	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00 - 0.25 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
22.6%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 22.6% 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	6.132 mg/kg	0.000613 %	✓	
	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) }				10 mg/kg	1.462	11.312 mg/kg	0.00113 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	14.814 mg/kg	0.00148 %	✓	
	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) }				5 mg/kg	1.273	4.925 mg/kg	0.000492 %	✓	
	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	27 mg/kg		20.898 mg/kg	0.00209 %	✓	
	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 }				10 mg/kg	1.785	13.817 mg/kg	0.00138 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
10	zinc { zinc oxide }				28 mg/kg	1.245	26.975 mg/kg	0.0027 %	✓	
	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				6.2 pH		6.2 pH	6.2 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		<0.1 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		0.14 mg/kg		0.108 mg/kg	0.0000108 %	✓	
20	• pyrene	204-927-3	129-00-0		0.14 mg/kg		0.108 mg/kg	0.0000108 %	✓	
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:								0.0109 %		

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: WS103-0.00 - 0.50-29/05/2024

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

Sample details

Sample name:	LoW Code:
WS103-0.00 - 0.50-29/05/2024	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.00 - 0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
16.9%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 16.9% 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	10.972 mg/kg	0.0011 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.2 mg/kg	1.142	0.19 mg/kg	0.000019 %	✓	
	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	18.218 mg/kg	0.00182 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				21 mg/kg	1.126	19.648 mg/kg	0.00196 %	✓	
	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) }				8 mg/kg	1.273	8.46 mg/kg	0.000846 %	✓	
	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	43 mg/kg		35.733 mg/kg	0.00357 %	✓	
	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 }				16 mg/kg	1.785	23.736 mg/kg	0.00237 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
10	zinc { zinc oxide }				42 mg/kg	1.245	43.443 mg/kg	0.00434 %	✓	
	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				6.4 pH		6.4 pH	6.4 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		<0.1 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		0.22 mg/kg		0.183 mg/kg	0.0000183 %	✓	
20	• pyrene	204-927-3	129-00-0		0.2 mg/kg		0.166 mg/kg	0.0000166 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.13 mg/kg		0.108 mg/kg	0.0000108 %	✓	
22	chrysene	601-048-00-0	205-923-4	218-01-9	0.13 mg/kg		0.108 mg/kg	0.0000108 %	✓	
23	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.13 mg/kg		0.108 mg/kg	0.0000108 %	✓	
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<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	50-32-8	<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	53-70-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	• benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.017 %		

Key

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

Classification of sample: WS104-0.00 - 0.40-29/05/2024

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

Sample details

Sample name:	LoW Code:
WS104-0.00 - 0.40-29/05/2024	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)
17%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 17% 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 }				15 mg/kg	1.32	16.438 mg/kg	0.00164 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	cadmium { cadmium oxide }				0.3 mg/kg	1.142	0.284 mg/kg	0.0000284 %	✓	
	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	25.475 mg/kg	0.00255 %	✓	
		215-160-9	1308-38-9							
4	copper { dicopper oxide; copper (I) oxide }				32 mg/kg	1.126	29.904 mg/kg	0.00299 %	✓	
	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) }				11 mg/kg	1.273	11.619 mg/kg	0.00116 %	✓	
	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	71 mg/kg		58.93 mg/kg	0.00589 %	✓	
	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 }				22 mg/kg	1.785	32.597 mg/kg	0.00326 %	✓	
	023-001-00-8	215-239-8	1314-62-1							
10	zinc { zinc oxide }				68 mg/kg	1.245	70.252 mg/kg	0.00703 %	✓	
	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	boron { diboron trioxide }				<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
13	TPH (C6 to C40) petroleum group				<42 mg/kg		<42 mg/kg	<0.0042 %		<LOD
			TPH							

#	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	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
15	benzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
16	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
17	ethylbenzene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
18	xylene				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
19	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
20	pH				6.8 pH		6.8 pH	6.8 pH			
			PH								
21	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
22	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
23	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
24	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
25	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-581-5	85-01-8								
26	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-371-1	120-12-7								
27	fluoranthene				0.19 mg/kg		0.158 mg/kg	0.0000158 %	✓		
		205-912-4	206-44-0								
28	pyrene				0.2 mg/kg		0.166 mg/kg	0.0000166 %	✓		
		204-927-3	129-00-0								
29	benzo[a]anthracene				0.14 mg/kg		0.116 mg/kg	0.0000116 %	✓		
	601-033-00-9	200-280-6	56-55-3								
30	chrysene				0.17 mg/kg		0.141 mg/kg	0.0000141 %	✓		
	601-048-00-0	205-923-4	218-01-9								
31	benzo[b]fluoranthene				0.19 mg/kg		0.158 mg/kg	0.0000158 %	✓		
	601-034-00-4	205-911-9	205-99-2								
32	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
33	benzo[a]pyrene; benzo[def]chrysene				0.17 mg/kg		0.141 mg/kg	0.0000141 %	✓		
	601-032-00-3	200-028-5	50-32-8								
34	indeno[123-cd]pyrene				0.12 mg/kg		0.0996 mg/kg	0.00000996 %	✓		
		205-893-2	193-39-5								
35	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
36	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
37	polychlorobiphenyls; PCB				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
38	monohydric phenols				<2 mg/kg		<2 mg/kg	<0.0002 %			<LOD
			P1186								
Total:									0.0305 %		

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 - 0.45-29/05/2024

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

Sample details

Sample name:	LoW Code:
WS105-0.00 - 0.45-29/05/2024	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.00 - 0.45 m	
Moisture content:	
20.1%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 20.1% 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 }	033-003-00-0	215-481-4	1327-53-3	16 mg/kg	1.32	16.879 mg/kg	0.00169 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	0.3 mg/kg	1.142	0.274 mg/kg	0.0000274 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		28 mg/kg	1.462	32.698 mg/kg	0.00327 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	32 mg/kg	1.126	28.787 mg/kg	0.00288 %	✓	
5	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
6	nickel { nickel(II) oxide (nickel monoxide) }	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]	11 mg/kg	1.273	11.185 mg/kg	0.00112 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			78 mg/kg		62.322 mg/kg	0.00623 %	✓	
8	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }	034-002-00-8			<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
9	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	25 mg/kg	1.785	35.659 mg/kg	0.00357 %	✓	
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	63 mg/kg	1.245	62.655 mg/kg	0.00627 %	✓	
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
12	pH		PH		6.8 pH		6.8 pH	6.8 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
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		0.25 mg/kg		0.2 mg/kg	0.00002 %	✓	
20	pyrene	204-927-3	129-00-0		0.26 mg/kg		0.208 mg/kg	0.0000208 %	✓	
21	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.18 mg/kg		0.144 mg/kg	0.0000144 %	✓	
22	chrysene	601-048-00-0	205-923-4	218-01-9	0.2 mg/kg		0.16 mg/kg	0.000016 %	✓	
23	benzo[k]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.2 mg/kg		0.16 mg/kg	0.000016 %	✓	
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<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	50-32-8	0.19 mg/kg		0.152 mg/kg	0.0000152 %	✓	
26	indeno[123-cd]pyrene	205-893-2	193-39-5		0.13 mg/kg		0.104 mg/kg	0.0000104 %	✓	
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		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.026 %		

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: CP101-0.40 - 0.70-28/05/2024

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

Sample details

Sample name:	LoW Code:
CP101-0.40 - 0.70-28/05/2024	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.40 - 0.70 m	
Moisture content:	
4.4%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 4.4% 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 }	033-003-00-0	215-481-4	1327-53-3	4 mg/kg	1.32	5.049 mg/kg	0.000505 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0	0.5 mg/kg	1.142	0.546 mg/kg	0.0000546 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		11 mg/kg	1.462	15.37 mg/kg	0.00154 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1	24 mg/kg	1.126	25.832 mg/kg	0.00258 %	✓	
5	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7	<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
6	nickel { nickel(II) oxide (nickel monoxide) }	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]	10 mg/kg	1.273	12.166 mg/kg	0.00122 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			17 mg/kg		16.252 mg/kg	0.00163 %	✓	
8	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }	034-002-00-8			<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
9	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1	13 mg/kg	1.785	22.186 mg/kg	0.00222 %	✓	
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2	32 mg/kg	1.245	38.078 mg/kg	0.00381 %	✓	
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
12	pH		PH		9 pH		9 pH	9pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
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	56-55-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
22	chrysene	601-048-00-0	205-923-4	218-01-9	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
23	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
24	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<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	50-32-8	<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	53-70-3	<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
28	• benzo[ghi]perylene	205-883-8	191-24-2		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
Total:								0.0145 %		

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

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

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

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

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

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

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

▪ **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

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

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 <= conc. < 3 % , Eye Irrit. 2; H319 1 <= conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

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 selenoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium selenoselenide 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

boron {diboron trioxide}

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

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

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

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2024.158.6092.11254 (06 Jun 2024)
HazWasteOnline Database: 2024.158.6092.11254 (06 Jun 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

Appendix H – References

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