BURO HAPPOLD

Manchester Metropolitan University, All Saints Library Transformation Project

Generic Quantitative Risk Assessment

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Executive Summary

Background	The purpose of this Study is to describe the environmental, geological, hydrological and hydrogeological conditions present at the Site and assesses the potential ground contamination risks associated with the proposed development. The proposed development comprises the demolition of the eastern portion of the existing All Saints Library (adjacent to footpath/Oxford Road) and build a new 12 No. storey building. The remainder of the building is to be retained and refurbished.
Site Setting	The Site covers approximately 0.70 ha, M16 6BH, National Grid Reference (NGR) SJ 84225 97158. The area in the immediate vicinity comprises existing MMU buildings, the Mancunian Way (elevated highway), Oxford Road, commercial buildings, All Saints' Park.
History	The site has a limited site history: Timber Yard / Terraced housing, Carriage & Tramway Depot then Manchester Polytechnic Building (All Saints Building).
Geological Setting	The natural geology beneath the Site comprises Glaciofluvial deposits and Glacial Till in turn underlain by bedrock of the Chester Formation / Manchester Marls Formation. These natural strata are overlain by Made Ground encountered to varying depths (0.90 – 3.30mbgl). Typically, Made Ground consisted of macadam/paving slabs over gravelly clay or gravelly sand, with gravel consisting of limestone, brick, concrete, clinker, sandstone and siltstone.
Site Investigation	An intrusive site investigation was carried out on site between 2023/2024 with a programme of post-field monitoring completed in October 2023. The investigation was completed in two phases and comprised four cable percussive with rotary follow-on boreholes to a maximum depth of 31.20mbgl, four windowless sample holes, two dynamic probe holes, nine external foundation inspection pits, two internal foundation inspections pits and two locations of slab investigation to determine slab thicknesses.
Contamination Risk Assessment	Seven soil samples were scheduled for chemical analysis. No concentrations above commercial / industrial thresholds were recorded for any inorganic and organic determinands. Asbestos was screened for all samples, one sample recorded chrysotile fibres at 0.005%. Groundwater was not sampled and tested during the ground investigation, however given no exceedances of commercial thresholds were observed within the soil samples, it is assumed that similar concentrations are likely within the groundwater. The ground gas regime has been assessed as Characteristic Situation 1 (Low Risk). Therefore, no mitigation is required to protect against potentially hazardous ground gas accumulation. Waste characterisation showed that the Made Ground was classified as Non-Hazardous Waste.
Conclusions and Recommendations	No significant geoenvironmental risks have been identified which would require further investigation prior to the enabling works / construction. The potential risks to the Contractors workforce engaged in earthworks, are capable of mitigation by the adoption of an appropriate good standard of health, safety and hygiene regime. However, there is a potential for contamination to be present and not to have been encountered by this investigation, in particular in areas not investigated. This potential for unforeseen contamination should be taken into account in the contractor's method statements etc. for any below ground works. Any suspect materials should be sampled and subject to chemical analysis and appropriate recommendations regarding the need for and scope of any remedial actions sought from an appropriate specialist. Based on the findings of the ground investigation, the proposed works being carried out can be completed under CDM regulations without the need for a formal Remediation Strategy. In order to demonstrate the works are completed in line with CDM regulations, a short report will be prepared that collates all the evidence to demonstrate standard good construction practice was implemented, spoil was appropriately disposed of, and no unexpected contamination was encountered. This will be the responsibility of the Principal Contractor undertaking the works and shall be documented within their Health and Safety File upon completion of the proposed works.

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1 Introduction

1.1 Background and commission

This report presents the results of a ground investigation (GI) and associated Generic Quantitative Risk Assessment (GQRA) for the Manchester Metropolitan University (MMU) All Saints Library (ASL) Transformation Project and is prepared by Buro Happold on behalf of MMU. The report establishes the environmental, geological, hydrological and hydrogeological conditions at the Site and assesses the potential ground contamination risks for the proposed works.

The Site boundary is indicated by the red line in Figure 1—1. Planning was granted for the proposed development (ref: Decision Notice 138424/FO/2023).

The Site covers approximately 0.70 ha, M16 6BH, National Grid Reference (NGR) SJ 84225 97158. The area in the immediate vicinity comprises existing MMU buildings, the Mancunian Way (elevated highway), Oxford Road, commercial buildings, All Saints' Park. The approximate location of the Site is shown below in Figure 1—1.

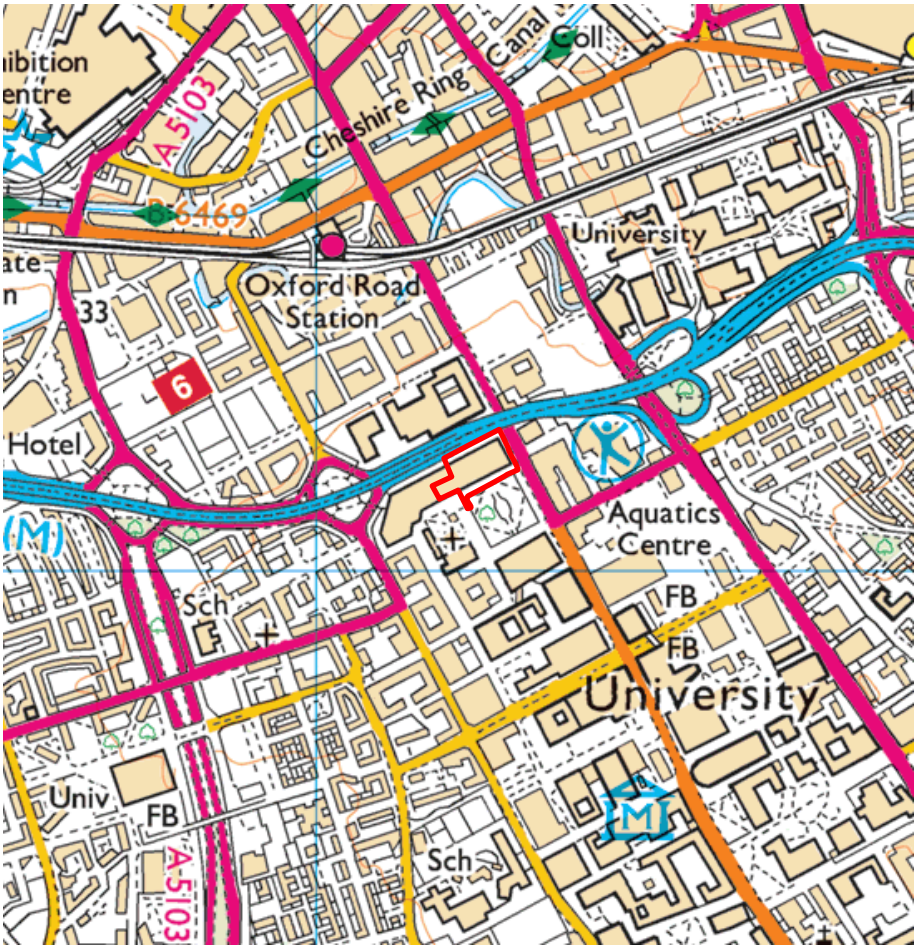


Figure 1—1 The MMU All Saints' Library site location plan. Image source www.streetmap.co.uk at 1:25,000 scale.

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1.2 Aims and objectives

The aim of the GI was to assess the geological, geotechnical and geoenvironmental conditions for the Site. This report considers the geoenvironmental aspects of the investigation, describes the Conceptual Site Model (CSM) and presents a generic quantitative assessment of contamination related risks associated with the proposed works using data obtained from both GIs.

1.3 Scope of works

To achieve the above aims, the objectives of the investigations at the Site were to provide information on the following:

- Ground model and groundwater regime;
- Location, nature and extent of contamination within the Made Ground and underlying natural strata;
- Ground gas and vapour regime to enable an outline assessment of the potential risks associated with hazardous gases and vapours.

The objectives of the report are:

- To identify any constraints associated with the ground and / or below ground infrastructure on the basis of available general information;
- To assess potential risks to people and the environment (natural and built) associated with ground contamination (solid, liquid or gas); and
- To provide recommendations and outline scope, if necessary for further works such as intrusive ground investigation and / or remedial action or design.

This report also provides information relevant for the proposed development in accordance with the requirements of the National Planning Policy Framework (NPPF) [1] and also with respect to potential liability under Part 2a of the Environmental Protection Act 1990 [2]. The work was carried out in general accordance with the Environment Agency (EA) Land Contamination Risk Management (LCRM) [3], the relevant British Standards (BS) [4] and [5], the EA Guiding Principles for Land Contamination (GPLC) [6], Groundwater Protection Policy [7] and other current good practice guidance.

1.4 Information sources

The principal source of historic information was taken from the MMU Desk Study [8]. This report is therefore based upon information obtained from these third-party sources, together with data obtained from the recent GI (undertaken between December 2023 and February 2024, Section 2.1 refers). The third-party data has been accepted at face value and has not been independently verified. Buro Happold can therefore give no warranty, representation or assurance as to the accuracy or completeness of such information.

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1.5 Competencies

Buro Happold is a consulting engineering company that manages its work under various Quality Management Systems that are certified to ISO 9001. The work itself was carried out by the staff with relevant qualifications, training and experience. Technical elements of this report have been reviewed by a Chartered Geologist.

1.6 Limitations

The scope and design of the ground investigation has reflected the site area, known history of Site use and the results of previous studies and investigations. The live site area, obstructions and presence of multiple utilities routes were significant constraints to the exploratory hole locations. On this basis the spacing and the sampling analysis for this investigation are considered to have provided a reasonable level certainty about the ground conditions. However, some parts of the Site have not been subject to recent intrusive GI due to the presence of existing operational buildings and infrastructure.

No investigation, however comprehensive, can be expected to determine absolutely the nature and variation of all the geology or contamination which could be present on any site. There will always be an element of uncertainty about the ground conditions including contamination. This potential for currently undetected contamination or variations in geology, together with the gaps in the investigation set out above, must therefore be taken into account not only in the risk assessment presented here but also in consideration of future development activities, for example, health and safety planning, financial planning and risk management and in the implementation of the below ground works during construction.

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2 Site Setting

2.1 Information sources

The Site setting has been informed from various sources of information listed below, it is recommended that the reader is fully cognisant with the original reports detailed below:

- Buro Happold (BH) Geoenvironmental Desk Study Report - Manchester Metropolitan University, All Saints Library Transformation Project. 2023 [9]
- Geotechnical Engineering Limited (GEL) Factual Ground Investigation Reports (Phase 1 / Phase 2) - MMU, All Saints Library. 2023. Ref: 37567/ 37757 [10] [11]

2.2 Site history

The following summary of the Site history has been derived from the BH Desk Study [9]. information.

Table 2—1 Site history

Historical Land Use		
OS Map Edition	**Site**	**Surrounding Area (within 100 m)**
1851 (1:1,056)	Timber Yards and unnamed terraced buildings recorded. Devonshire Street in S of site.	Terraced buildings (N & W), Stone Yard & Smithy (35 m E), Grosvenor Square & All Saints Church (20m S), Scotchy Church (40 m S).
1893 (1:2,500)	Timber Yards no longer recorded. Carriage & Tramway Depot now identified	Hotel (40 m N), School (70 m E), Bank (92 m SE), Chorlton Union Offices (90 m S), Infant School (50 m SW).
1908 (1:2,500)	No major recorded changes.	No major recorded changes.
1922 (1:2,500)	Carriage & Tramway Depot no longer recorded. School now recorded on location of former depot.	Hospital recorded (21 m S).
1932(1:2,500)	No major recorded changes.	Bank (20 m NE), Textile Machinery Works (45 m ENE), Hall (65 m ENE), Post Office (74 m E), Bakery (56 m E), Ladies Garment Manufacturer (75 m ESE). Union Offices now recorded as Public Assistance Offices (90m S).
1950 (1:2,500)	Loxford Street (formerly Devonshire Street).	Buildings no longer recorded (65m NE), All Saints Church no longer recorded (S), Lavatories & Children's playground recorded on Grosvenor Square (S), warehouse (SW).
1970 (1:2,500)	No major recorded changes	Mancunian Way (immediately N), John Dalton College of technology (50 m N), National Computer Centre (80 m NE).
1985 (1:2,500)	School replaced by Manchester Polytechnic Building (All Saints Building).	Loxford Tower (WSW), Union Office recorded as Ormond Building (90m S), Mandela Building (20 m E). Playground no longer recorded.
1992 (1:1,250)	No major recorded changes.	Bellhouse Building (SW).
2003 (1:1,250)	No major recorded changes.	No major recorded changes.

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2.3 Proposed development

The proposed development comprises the demolition of the eastern portion of the existing All Saints Library (adjacent to footpath/Oxford Road) and build a new 12 No. storey building. The remainder of the building is to be retained and refurbished.



Figure 2—1 Architect's Impression of the All Saints Library Transformation

2.4 Anticipated ground model

The geological map indicates that superficial deposits that directly underlie the site comprise: Till in the northeast portion of the site and Glaciofluvial deposits the southwest. Bedrock underlying the superficial deposits comprises: the Permian Manchester Marls Formation (MM-MDST) in the northeast of the site, and the Triassic Chester Formation (CHES-SDST) in the southwest. The West Manchester Fault is recorded in the east of the site, trending from NNW-SSE. It is downthrown by an unknown magnitude to the northeast.

The GEL GI P1 records the geology as Made Ground (reworked natural material) locally underlain by glaciofluvial deposits (medium dense clayey gravelly SAND/medium dense sandy GRAVEL), underlain by glacial till (firm to stiff slightly gravelly, slightly sandy CLAY). The bedrock comprises reddish brown siltstone and sandstone with some mudstone (Chester Formation / Manchester Marl Formation).

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2.5 Unexploded ordnance

The Zetica UXO Risk Map classifies the site as “moderate” risk. A detailed UXO desk study was completed by a specialist UXO consultant [11] which identified the Site as high-risk. Further action is required during construction to reduce the risk from UXO to as low as reasonable possible (ALARP).

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3 Preliminary Risk Assessment

3.1 Preliminary Conceptual Site Model

The Preliminary Conceptual Site Model is described in the BH DS [9], summarised in Table 3—1 overleaf. The potential contamination sources are associated with the current and former uses of the Site.

The receptors relevant to the current project are human health (construction workers, site neighbours), controlled waters (Principal Aquifer) and the built environment (including soft landscaping).

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Table 3—1 Summary of preliminary risk assessment

Source		**Receptor**/ Pathway	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
On-site: Made Ground, electric substation, historic timber yard & carriage and tramway depot	Heavy metals, PAHs, asbestos, TPHs	**Description of the Source:** The site has a limited site history: Timber Yard / Terraced housing, Carriage & Tramway Depot then Manchester Polytechnic Building (All Saints Building). Limited Made Ground expected.				
		Future site users / visitors (employees, guests and maintenance) Direct / dermal contact. Inhalation of soils / dusts. Ingestion of contaminated water supplies. Migration and accumulation of hazardous gases.	Medium	Unlikely	**Low**	Proposed future use is for commercial (educational) use with soft and hard landscaping. Potential for dust generation, direct contact and ingestion. Exposure time is relatively limited. Mitigation of potential risks can be achieved by appropriate investigation / design and implementation of remediation / mitigation measures including encapsulation.
		Investigation and construction workers Direct / dermal contact. Ingestion / inhalation of contaminated soils, gases and vapours.	Medium	Low likelihood	**Moderate / Low**	Potential for exposure during investigations/ earthworks. Period of exposure dependent on construction timescales. Standard Health and Safety precautions likely to be used by workers. Mitigation of potential risks can be achieved by appropriate investigation and adoption of standard good construction practice.
		Off site occupiers / visitors of neighbouring land Inhalation of contaminated dusts.	Medium	Unlikely	**Low**	Large scale development, potential to impact surrounding visitors by dust generation. Increased potential during any earthworks. Mitigation of potential risks can be achieved by appropriate investigation and adoption of standard good construction practice.

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Source		**Receptor**/ Pathway	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
		Degradation of Water quality [Superficial Secondary A aquifer – Glacial Deposits] **Migration via permeable strata**	Medium	Low likelihood	**Moderate / Low**	Potential for increased infiltration and promotion of leaching during development earthworks. Mitigation of potential risks could be achieved by appropriate investigation, risk assessment and design.
		Degradation of Water quality [Bedrock Secondary B aquifer – Manchester Marl Formation]	Medium	Unlikely	**Low**	Potential for increased infiltration and promotion of leaching during development earthworks. Mitigation of potential risks could be achieved by appropriate investigation, risk assessment and design.
		Degradation of Water quality [Bedrock Principal aquifer – Chester Formation] Migration via permeable strata	Severe	Unlikely	**Moderate / Low**	Potential for increased infiltration and promotion of leaching during development earthworks. Mitigation of potential risks could be achieved by appropriate investigation, risk assessment and design.
		Buildings/services - permeation of water supply pipework, degradation of concrete Direct contact/, aggressive attack/ below ground structures	Medium	Unlikely	**Low**	Potential for direct contact on development site. Mitigation of potential risks can be achieved by appropriate investigation / design and implementation of appropriate design.

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4 Ground Investigation

4.1 Objectives

The scope of the GI was designed to meet the aims and objectives set out in Section 1. The investigation was designed and desk-based supervised by Buro Happold with contractor services provided by GEL. It should be noted the geotechnical aspects of the project will not be reported within this document.

4.2 Investigation scope

The scope of the Phase 2 and 2 GEL GI works is included below. Extracts of the exploratory hole location plans are provided in Figure 4—1 and Figure 4—2. The first phase of the GI comprised:

- 4 No. combined cable percussive boreholes with rotary core drilling (to maximum depth of 30 m BGL) to prove the geological succession, to allow assessment of the deeper ground conditions and to allow the installation of instrumentation (BH01-BH04, BH04A)
- 2 No. days of window sampling to allow an assessment of the near surface ground conditions across the entire site, to allow the installation of instrumentation and to determine any ground contamination in respect of end use, health and safety considerations in addition to waste disposal categorization (WS01-WS04).
- A series of hand excavated trial pits (ITP01, ITP04B, ITP05-ITP07) to:
    - Obtain foundation details/geometry of the foundations of structures onsite (e.g. retaining walls)
    - Determine the strength/composition of the bearing stratum at existing foundation formation
    - Sampling to allow an assessment of the near surface ground conditions across the entire site, and to determine any ground contamination in respect of end use, health and safety considerations in addition to waste disposal categorization
- Two Dynamic Probe Holes (DP01-DP02) to establish if the basement foundation at this location stepped out away from the building which could pose a risk to future piling works
- Permeability testing
    - Variable head permeability test (WS01)
    - Falling head test (small scale soakaway testing - WS03). Note this test did not work due to borehole collapse after adding water.
- Geotechnical laboratory testing to determine the physical properties and characteristics of the ground mass for foundation design purposes
- Chemical laboratory testing to allow an assessment of any ground contamination in respect of end use, health and safety considerations in addition to waste disposal categorization
- Installation of gas and groundwater monitoring wells in each exploratory hole to allow appropriate ground gas and groundwater monitoring to be undertaken

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- Programme of gas and groundwater monitoring to allow the ground gas and groundwater conditions beneath the site to be assessed.

Phase 2 comprised:

- 4 No. external hand excavated trial pits (ITP101 – ITP104) to:
    - Obtain foundation details/geometry of the foundations of structures onsite (e.g. retaining walls)
    - Determine the strength/composition of the bearing stratum at existing foundation formation
- 2 No. internal trial pits (ITP201-ITP202) to:
    - Obtain foundation details/geometry of the foundations of structures onsite (e.g. retaining walls)
    - Determine the strength/composition of the bearing stratum at existing foundation formation
- 2 No. locations of stitch drilling to prove slab thickness.

Please refer to DN01 Summary of foundation investigation works [12] and impact on foundation design for full details.

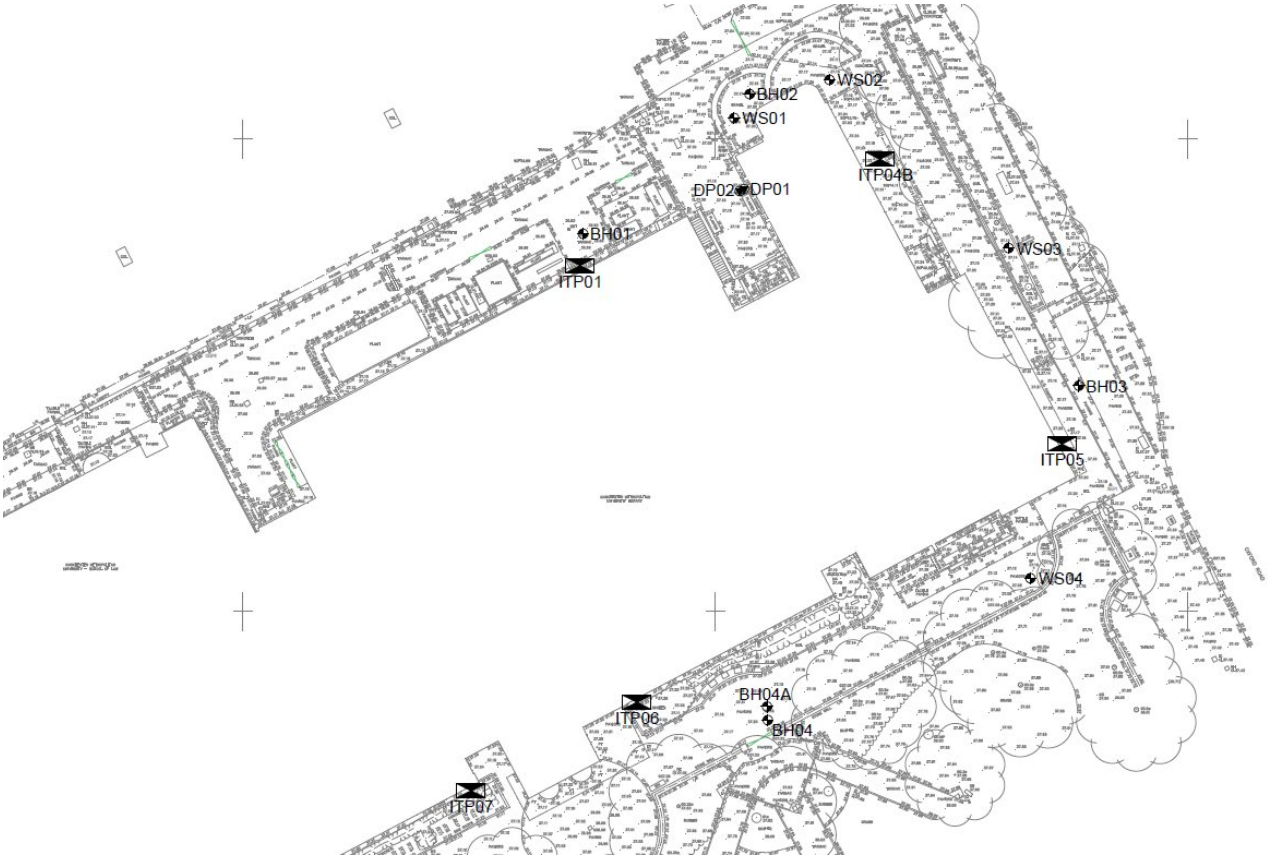


Figure 4—1 Extract of Exploratory Hole Location Plan (Phase 1)

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Figure 4—2 Extract of Exploratory Hole Location Plan (Phase 2)

4.3 Encountered ground conditions

The ground conditions comprise Made Ground, overlying Glaciofluvial deposits and Glacial Till in turn underlain by bedrock of the Chester Formation / Manchester Marls Formation.

Table 4—1 Encountered ground conditions

Depth From (m BGL)		Thickness (M)		Strata Description
Min	Max	Min	Max	
0.00	0.00	0.90	3.30	Sandy GRAVEL of limestone (hardcore) / Soft to firm brown / grey slightly sandy gravelly CLAY with gravel of sandstone, mudstone, brick, concrete & clinker. Rare fragments of ceramic. / Medium dense dark grey slightly clayey gravelly SAND. Gravel of brick, mudstone, sandstone, concrete & limestone [MADE GROUND]
0.90	3.30	1.60	3.00	Medium dense brown / reddish brown clayey gravelly SAND / Medium dense brown / grey / reddish brown sandy GRAVEL of siltstone, sandstone & mudstone [GLACIOFLUVIAL]

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Depth From (m BGL)		Thickness (M)		Strata Description
3.30	4.60	0.59	10.40	Firm to stiff grey / brown slightly sandy gravelly CLAY with gravel of mudstone, siltstone, sandstone and coal [GLACIAL TILL]
10.50	16.55	>15		Very weak SILTSTONE / Very weak SANDSTONE / Extremely weak MUDSTONE [CHESTER FORMATION / MANCHESTER MARLS FORMATION]

4.3.1 Visual / olfactory evidence of contamination

No evidence of widespread and / or gross contamination was encountered during the GEL GI's.

4.4 Groundwater

Groundwater monitoring was carried out as part of the GEL P1 GI. Monitoring commenced following the completion of the fieldwork and comprised a six-week monitoring programme.

Groundwater strikes were recorded in the Made Ground and superficial deposits before drilling with water commenced between 2.30 – 2.90 m BGL (34.55 – 34.10 m AOD). Post field work monitoring was completed between May and August 2023. The data indicates groundwater within the:

- Made Ground / Glacial Till at ~36 m AOD
- Glaciofluvial deposits at ~35-36 m AOD – possibly hydraulically connected to the Made Ground
- Chester Formation / Manchester Marls Formation at ~24-26 m AOD

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5 Geoenvironmental Risk Assessment Criteria

5.1 Soil risk assessment criteria

In order to perform a Generic Quantitative Risk Assessment (GQRA), the soil and gas test results will be compared (see Sections 6 to 8 respectively) with available Soil Guideline Values (SGVs), Category 4 Screening Values (C4SLs), and Buro Happold and other industry Generic Assessment Criteria (GAC), the details of which are presented in Appendix A.

5.1.1 Risks to human health

Chronic: For human health risk assessment, soil results will be assessed using GACs, C4SLs and SGVs for the Contaminated Land Exposure Assessment (CLEA) residential without plant uptake and commercial land use scenarios. The residential and commercial land use scenarios are applied to give context to the data and to provide indicative upper and lower bounds for discussion purposes only. The commercial land use is considered to be the most appropriate scenario against which the data is to be compared to establish suitability for use, along with the acute exposure thresholds noted below.

Acute: For acute risks to human health, soil results will be assessed using the SoBRA Acute Generic Criteria (AGAC) [12]. These AGACs have been derived for seven determinands: arsenic, benzene, cadmium, free cyanide, phenol, trichloroethylene (TCE) and vinyl chloride (VC). Lead was also considered but due to the limited toxicological data available, no threshold was determined. The exposure scenarios modelled are:

- General public exposure (or trespasser) via a single large dose (or potentially sum of several smaller doses over a short duration) of a 1-2 year old female child (averaged across ages of 0 – 6 years).
- Occupational exposure of female adult commercial / industrial worker exposed to contaminated soil during their work, such as construction, utility, site investigation or remediation worker over the working day.

Acute exposure has been defined and modelled based on an irregular (i.e. not repeated) exposure of up to 24 hours duration based on the assumption lasting for 30 minutes or less.

For determinands other than the seven modelled by SoBRA, maximum concentrations (not the average concentration which is relevant to chronic / long term risk) were considered. Comparison of maximum concentrations are made with the other GACs and other screening values which provides a conservative benchmark for such short term risks (as the values are based on long term exposure).

5.1.2 Plant health (phytotoxicity)

It is not anticipated that direct planting will take place within the material currently on Site. However, as a conservative approach and in case of future planting, soil test results indicating phytotoxicity are assessed using the BS Specification for Topsoil (BS 3882) [13].

5.1.3 Risks to below ground structures

The water industry and several water utility companies have published guidance regarding the construction of new water supply pipework on Brownfield sites [14], but there is no universally accepted guidance (or contaminant thresholds). The most recent guidance published by Water UK [15] has been adopted as best practice but is not mandatory.

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5.2 Ground gas risk assessment criteria

Ground gas data obtained from the Site will be used to assess the risks to the Site with reference to CIRIA C665 [16], National House Building Council (NHBC) guidance [17] and BS 8485 [18]. Consideration to both methane (CH4) and carbon dioxide (CO2) concentrations as well as flow rates will be given. The borehole hazardous gas flow rate (Qhg) is calculated (as the product of gas concentration multiplied by flow rate) for each monitoring location at each monitoring event. If the data set is considered comprehensive and presentative and consistent with the CSM, the site characteristic Gas Screening Value (GSV) will be the maximum Qhg. If the data set is temporally or spatially limited, a plausible worst case condition should be determined (based upon maximum concentration and maximum flow rate from relevant monitoring wells) and this worst case Qhg will be adopted to determine the site characteristic GSV [Noe – BS8485 advises that this worst case scenario should be adopted only if it is prudent and reasonable to do so and that it would not result in unnecessarily conservative assessment and recommendations]. The site characteristic GSV for both methane and carbon dioxide is then used to determine the characteristic gas situation (CS). Further consideration of the appropriateness of the CS is given by reference to additional factors (e.g. recorded maximum concentrations and flow rates). Once this check is complete, the CS (and hazard potential) is confirmed, in turn enabling the identification of the need for the scope of gas protection measures.

5.2.1 Soil vapour

Soil vapour has not been assessed at the Site as the concentrations of volatile determinands in soil or groundwater (e.g. benzene and naphthalene) were not found to be present in concentrations that may pose a risk to human health at the Site.

5.3 Waste Classification

In order to determine the likely waste classification, soil test results have been assessed using the EA Technical Guidance WM3 [19].

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6 Analytical Results for Soil

6.1 Analytical scope for soil

Seven soil chemical tests were carried out as part of the GEL P1 GI within the Made Ground. No results are above the relevant commercial threshold.

Table 6—1 below presents the laboratory testing suites used for soil during the GI. The analytical test results for contaminants in soils are presented full in Appendix B.

Table 6—1 Laboratory testing suites for soil

Suite reference	Contaminant Analysis Suite
Made Ground Soil Analysis Suite	pH, CLEA metals suite, total cyanide, total mercury, speciated PAHs, phenol, TPH (total), Soil Organic Matter, asbestos screen, BTEX, hexavalent chromium, water soluble sulphate

6.2 Made Ground – Chronic Risks

6.2.1 Inorganic determinands

All seven samples of Made Ground were analysed for inorganic determinands. The full screening assessment and factual data is presented in Appendix B. All samples recorded inorganic contaminant concentrations below commercial thresholds. Lead was elevated above residential without plant uptake threshold in one sample (WS03 at 1.20mbgl, 740mg/kg) and above residential with plant update in one sample (WS02 at 1.1mbgl, 230mg/kg).

6.2.2 Organic determinands

Four samples of Made Ground were analysed for BTEX (benzene, toluene, ethyl benzene and xylene) which recorded BTEX contaminant concentrations below both residential and commercial thresholds.

All samples of Made Ground were analysed for PAHs. Concentrations were compared with relevant screening values for human health risk assessment; Table 6—2 presents a summary, with the full screening assessment and factual data in Appendix B. One PAH exceedance occurred when compared to the more conservative residential (without plant uptake) threshold, however, is well below the relevant threshold for commercial.

Table 6—2 Concentrations of PAHs (mg/kg)

Determinand	No. of samples	GAC (No. of samples exceeding GAC). SGV; C4SL		Value
		Residential without plant uptake	Commercial / Industrial	
Naphthalene	7	2.3 (0)	190 (0)	
Acenaphthylene	7	2900 (0)	83000 (0)	
Acenaphthene	7	3000 (0)	84000 (0)	
Fluorene	7	2800 (0)	63000 (0)	
Phenanthrene	7	1300 (0)	22000 (0)	
Anthracene	7	31000 (0)	520000 (0)	

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Determinand	No. of samples	GAC (No. of samples exceeding GAC). SGV; C4SL		Value
		Residential without plant uptake	Commercial / Industrial	
Fluoranthene	7	1500 (0)	23000 (0)	
Pyrene	7	3700 (0)	54000 (0)	
Chrysene	7	30 (0)	350 (0)	
Benzo[b]fluoranthene	7	3.9 (0)	44 (0)	
Benzo[k]fluoranthene	7	110 (0)	1200 (0)	
Benzo[a]pyrene	7	3.2 (0)	35 (0)	
Indeno[123-cd]pyrene	7	45 (0)	500 (0)	
Dibenzo[ah]anthracene	7	0.31 (1)	3.5 (0)	0.4
Benzo[ghi]perylene	7	360 (0)	3900 (0)	

6.2.3 pH in Made Ground

The measurement of soil pH was recorded between 7.8 – 9.4. The slightly alkaline results are potentially related to concrete fragments present within the Made Ground.

6.2.4 Asbestos

All samples were also screened for Asbestos Containing Material (ACM). ACM was recorded in 1 out of 7 No. soil samples - WS03 at 1.20 m BGL (chrysotile bundles in sample). Detailed gravimetric quantification has been carried out which records the percentage within the sample as 0.005%. This is well below the Hazardous Waste Threshold of 0.1%, and the risk is considered to be low assuming good construction methodologies to minimise dust during construction are undertaken.

6.3 Natural strata

No gross contamination was recorded on site and no soil chemical tests had any determinands above commercial thresholds. No samples of natural material were therefore tested.

6.4 Acute risk to human health

All samples were compared against the SoBRA Acute Generic Assessment Criteria [12] for both adult receptors and the more sensitive child receptor. Both samples returned no contamination concentrations exceeding the relevant thresholds.

6.5 Phytotoxicity risk

Analysis was carried out for copper, nickel and zinc on all samples. Table 6—3 provides a summary of the screening. No exceedances were recorded for phytotoxicity.

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Table 6—3 Concentrations of copper, nickel and zinc (mg/kg)

Determinand	No. of samples	Screening threshold (No. of samples exceeding)	Maximum	Minimum
Copper	2	200 (0)	49	11
Nickel	2	110 (0)	27	8.1
Zinc	2	300 (0)	200	34

6.6 Risk to below ground structures

The desk study identified potential risks to buried services (potable water supply pipework) and the potential for contamination to permeate any plastic water supply pipework laid directly in contaminated ground. The data for the shallow Made Ground has been discussed in some detail in Section 6.2 with respect to human health assessment criteria. Some of the determinands assessed in that section (particular organic compounds) have the potential to impact not only human health but also to affect below ground water supply. This is because there is potential for particular organic contaminants to permeate plastic pipes and taint water supply if those pipes are laid in contact with contaminated soils. Owing to the nature of the works, it is not known what depths any below ground water supply pipework may be placed therefore the Made Ground sample has been used within the assessment.

6.6.1 Data assessment [Water UK]

Table 6—4 Summary of results using Water UK thresholds

Test Group	Determinand used	Total No. of samples	Polyethylene (PE) threshold (No. exceeding)	Metal Pipes / Barrier Pipes	Max.
EC5-EC10 aliphatic and aromatic hydrocarbons	Aliphatic and Aromatic C5-C10	7	2 (0)	Pass	Less than LOD
EC10-EC16 aliphatic and aromatic hydrocarbons	Aliphatic and Aromatic C10-C16	7	10 (0)	Pass	Less than LOD
EC16-EC40 aliphatic and aromatic hydrocarbons	Aliphatic and Aromatic C16-C35	7	500 (0)	Pass	Less than LOD
Total BTEX + MTBE		7	0.1 (0)	Pass	<0.01

Note 1 Threshold: For wrapped steel corrosive if pH<7 and conductivity >400uS/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity >400uS/cm. For copper, corrosive if pH<5 or >8 and Eh positive.

6.6.2 Summary

This assessment includes indicates that PE, PVC and copper pipes laid within the Made Ground may be appropriate for potable water supply at the Site. Further testing should be undertaken during the enabling works along pipe routes to confirm if barrier pipes are required, unless otherwise agreed with the utility company.

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7 Analytical Results for Groundwater

No groundwater testing has been undertaken as no exceedances above commercial thresholds were identified within the soil tested. No gross contamination was recorded in the GEL GI's.

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8 Analytical Results for Ground Gas and Characterisation

8.1 General

Five rounds of gas monitoring have been undertaken at the Site between 16th May and 25th October 2023. Monitoring was undertaken at two locations both within the Made Ground – WS02 and WS04.

8.2 Monitoring regime

Ground gas data obtained from the Site will be used to assess the potential risks associated with the proposed development with reference to CIRIA C665, NHBC and BS 8485. Accordingly, consideration is given to both methane (CH4) and carbon dioxide (CO2) concentrations as well as flow rates. The borehole hazardous gas flow rate (Qhg) is defined as the product of the gas concentration and the flow rate. This Qhg value is calculated for both gases from each monitoring location and for each monitoring event. A GSV is then designated after consideration of all of these data taking into account issues such as reliability, borehole construction, peak and steady flows, temporal and spatial shortages etc. The GSV is then considered (with other parameters) to define a CS which broadly identifies the level of hazard associated with the ground gas regime.

8.3 Monitoring Data

Please refer to Table 8—1 and Table 8—2 for the ground gas monitoring data.

8.3.1 Response zone

The response zones installed is reflective of the Made Ground.

WS02's response zone was between 1-2mbgl. No groundwater was encountered during drilling however, during monitoring groundwater was recorded in the installation making it 'mostly flooded'.

WS04's response zone was between 1-2mbgl. No groundwater was encountered during drilling however, during monitoring groundwater was recorded in the installation making it 'mostly flooded'.

8.3.2 Atmospheric conditions

Monitoring was carried out on a total of five different occasions post-fieldwork. Atmospheric pressures were recorded by the field instrument and weather data obtained from the meteorological office. The maximum atmospheric pressure recorded on the days of monitoring was 1018mb and the minimum was 994mb.

Table 8—1 Ground gas monitoring data (WS02)

No. of readings	Response Zone (mbgl)	Depth to water (mbgl)	Condition of response zone	Strata	Max flow rate (l/hr)	Peak methane (%)	Peak carbon dioxide (%)	Min oxygen (%)	Peak carbon monoxide (ppm)	Peak hydrogen sulphide (ppm)
5	1.00 – 2.00	1.06-1.07	Mostly flooded	MG	0	<0.1	1.5	18.9	Not recorded	<1

*Made Ground

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Table 8—2 Ground gas monitoring data (WS04)

No. of readings	Response Zone (mbgl)	Depth to water (mbgl)	Condition of response zone	Strata	Max flow rate (l/hr)	Peak methane (%)	Peak carbon dioxide (%)	Min oxygen (%)	Peak carbon monoxide (ppm)	Peak hydrogen sulphide (ppm)
5	1.00 – 2.00	1.05-1.95	Mostly flooded	MG*	0	<0.1	2	15.4	Not recorded	<1

*Made Ground

8.3.3 Data description

There were no elevated concentrations of methane above the guideline threshold of 1%. All boreholes on all occasions recorded concentrations of methane below the limit of detection (<0.1%).

No elevated concentrations of carbon dioxide above the guideline threshold of 5% were recorded throughout monitoring.

A slightly depleted concentration of oxygen, 15.4%, was recorded in WS04 recorded on one visit on 3rd August 2023. The next visit the recorded oxygen level was 19.7%.

Concentrations of carbon monoxide and hydrogen sulphide were recorded below the limit of detection (<1ppm) on all occasions.

8.4 Assessment of ground gas regime

The monitoring data described above has been assessed in accordance with CIRIA 665 [16] and BS 8485 [18]. In accordance with this guidance the reliability of this data and thus characterisation of the ground gas regime is influenced by several factors described below.

- There is a sufficient set of monitoring data from the recent GI to enable an assessment of the ground gas regime. A total of five return monitoring visits were carried out within both boreholes with a total of 10 readings obtained. Five readings are considered reliable for assessment.
- The monitoring data is generally consistent with the nature and extent of the source (Made Ground).
- The monitoring has been carried out during steady to rising and falling atmospheric pressure conditions.
- There were no elevated concentrations of methane above the guideline threshold of 1%. The monitoring data recorded concentrations of methane below the limit of detection on all occasions.
- No elevated concentrations of carbon dioxide above the guideline threshold of 5% were recorded throughout monitoring.
- The recorded gas flow rates were consistently low at 0l/hr.

The calculated worst gas screening value (GSV) for CO2 and CH4 (maximum concentrations x maximum flow rate) have been determined as both falling within Characteristic Situation 1.

On the basis of all of the above, the hazardous ground gas regime on Site is considered to fall within Characteristic Situation 1 (CS1).

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9 Waste management

9.1 Introduction

The proposed development will likely involve limited earthworks where some material will likely require removal from the Site. The following section provides a preliminary waste classification for costing purposes. The assessment rationale is presented in Appendix D.

9.2 Preliminary Waste Classification

9.2.1 Code of Waste

The most applicable codes for the material on Site (Made Ground) are 17 05 03 and 17 05 04. These are mirror codes that will require further assessment to classify. Uncontaminated natural soils would be classified as Inert (17 05 04).

9.2.2 Chemical composition of waste

Seven samples of Made Ground have been used in this analysis. All samples from the Made Ground are classified as Non Hazardous by Haz-Waste Online.

Based on the above, in the Made Ground, all samples were classified as 17 05 04 (soils and stones not mentioned in 17 05 03, e.g. non-hazardous). The above information provides a preliminary assessment for off-site disposal to non-hazardous landfill or treatment facilities. If the waste is to be disposed of to a hazardous or inert landfill, the waste will need to meet the relevant WAC criteria.

Visible fragments of suspect asbestos containing materials were not recorded during the ground investigation. A total of seven samples were screened (subject to microscopic examination) for asbestos. One sample in WS03 at 1.20mbgl detected chrysotile fibres which was quantified as 0.005%).

9.2.3 Disposal to landfill

A total of 5 samples were scheduled for Waste Acceptance Criteria (WAC). Four samples recorded concentrations of all determinands that met the Inert Waste Landfill criteria. One sample recorded a concentration of Total Organic Carbon marginally elevated above the Inert Waste Landfill criteria of 3% but is suitable for Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill.

Location ID	Depth (mbgl)	Waste Acceptance Criteria Results
BH01	0.6-0.7	Meets Inert Waste Landfill
WS02	1.1-1.2	Exceeds Inert Waste Landfill, meets Stable Non-Reactive: 3.1% Total Organic Carbon
ITP04B	1.1-1.2	Meets Inert Waste Landfill
BH03	1-1.2	Meets Inert Waste Landfill
BH04A	1.3-1.4	Meets Inert Waste Landfill

In addition to the above, Total Organic Carbon (TOC) testing was scheduled on all seven soil samples. All samples recorded concentrations of TOC below the Inert Waste Landfill criteria (i.e. below or at 3%).

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9.3 Concluding comments

Notwithstanding this preliminary assessment, it is the earthwork contractor's responsibility, in association with the operator and / or owner of the landfill to classify the materials for disposal in line with current guidance. Landfill waste acceptance criteria (WAC) leachate testing and classification prior to disposal to landfill should be undertaken to confirm the waste classification of the natural soils.

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10 Geoenvironmental risk assessment

10.1 General approach

In the UK, the assessment of risk from contamination follows the source-pathway-target approach. If one of these three elements is absent it is considered that there is no risk of harm. If, however, there is considered to be a linkage between any given source any given target / receptor then a risk-based approach is used to assess the significance or impact of any such linkage.

Source	The contaminants that have the potential to negatively affect human health and / or the health of the environment (ie the hazard).
Pathway	The potential route by which a receptor may come into contact with the source.
Receptor	The specific group of human beings or aspect of the environment (eg controlled waters) that could be affected by the source.

Risks are defined as the probability of an event occurring combined with the severity of the consequence of that event occurring. Particularly, to assess the risk to site end users posed by any given source, the sensitivity of each receptor is considered. For example, the concentration of contamination acceptable at a site to be developed as a residential property, with a garden used to grow vegetables and accessible to young children, is set lower than that for a commercial site where soil is exposed in minor areas of landscaping and the only long-term users of the site are adults. Similarly, a site overlying a major aquifer supplying potable water to a large population will be considered more stringently than a site overlying an impermeable geology with only minor seepages of groundwater.

10.2 Climate change

It is accepted that the climate is changing and that this will affect future weather patterns. The Environment Agency [6] requires factoring climate change into risk assessments and remedial solutions. The British Standard 'Adaption to Climate Change – Principles, Requirements and Guidelines' [20] states that 'climate change impacts shall be assessed comprehensively…including…contamination' and should focus 'upon understanding the implications of future climate change trends and climate events over the full lifespan of a decision'. The National Planning Policy Framework [1] requires new development to contribute to 'mitigating and adapting to climate change' and to 'minimise vulnerability and increase resilience' to the range of impacts arising from climate change.

The changes to weather patterns in the UK may include: an increase in warmer weather; an increase in the frequency and intensity of rainfall events; and an increase in the duration or frequency of dry spells in the summer. Such events are also likely to become more extreme. There is the potential for these scenarios to impact upon potential contaminant migration pathways in particular with respect to both hazardous ground gas and contaminated groundwater via permeable strata, during both construction and operation of the proposed development. As ground conditions at the proposed development may be vulnerable to extreme weather events due to climate change during the demolition, construction and operation phases, these potential impacts have been considered in the risk assessment.

10.3 Conceptual Site Model (CSM)

The potential risks posed to human health and the environment by ground contamination at this Site have been evaluated by a generic quantitative risk assessment which incorporates the 'source-pathway-receptor' identification and assessment methodology in accordance with the Land Contamination Risk Management [3]. The risk assessment

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process therefore involves the identification of each source based on the Site setting information and GI results and the identification of the relevant exposure pathway and each potential receptor. The potential risks to the receptors are then assessed by considering the potential effect of the source on the receptor as well as the likelihood of a pathway linking the two, i.e. a contaminant linkage as discussed above. The conceptual site model has been considered with respect to the proposed development.

10.4 Contamination sources

Potential contamination sources from former uses of the Site have been identified following a review of Site setting and desk study information and from information gained during the GI. The potential sources of contamination and associated contaminants of concern are listed in Table 10—1.

The ground gas regime has been assessed as CS1, therefore it is not considered a source of contamination and has not been assessed further.

Table 10—1 Principal potential sources of contamination at the Site

Potential source	Location	Likely Age	Potential contaminants of concern
Made Ground (soil) from previous site uses.	On site	>100 years	Heavy metals, PAHs, asbestos, TPHs

10.5 Pollutant linkages

Site-specific pathway receptor linkages have been identified for the Site in Table 10—2 with respect to the sources outlined above the proposed development.

Table 10—2 Receptors and pathways

Receptor		Pathway
Human health	Earthwork contractors engaged with proposed development	Direct contact and dermal uptake, soil and dust ingestion and inhalation
	Users of neighbouring land (during enabling works and construction)	Soil and dust inhalation during enabling works and construction
	Future site users / visitors	Direct contact and dermal uptake, soil ingestion
Controlled Waters	Secondary A Aquifer (Superficial deposits)	Leaching and migration of potential contamination via preferential pathways
	Principal Aquifer (Chester Formation)	Leaching and migration of potential contamination via preferential pathways
Built environment	Water supply network	Direct contact with contaminated soils
Flora	Areas of soft landscaping located directly over Made Ground materials.	Root uptake from underlying contaminated materials

Based on the results of the intrusive GI and the preliminary conceptual site model, the geoenvironmental risk assessment is presented in Table 10—3 below.

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Table 10—3 Results of Geoenvironmental Risk Assessment

Source		**Receptor**/ Pathway	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
On-site: Made Ground, electric substation, historic timber yard & carriage and tramway depot	Heavy metals, PAHs, asbestos, TPHs	**Description of the Source:** The site has a limited site history: Timber Yard / Terraced housing, Carriage & Tramway Depot then Manchester Polytechnic Building (All Saints Building). Limited Made Ground expected. The recent ground investigation encountered: Made Ground to between 0.90-3.30mbgl, underlain by superficial deposits of Glaciofluvial and Glacial Till, in turn underlain by bedrock of the Chester Formation / Manchester Marls. No samples tested recorded elevated determinands above commercial thresholds with and the majority below residential without plant uptake thresholds. ACM fibres were recorded in one sample (WS03 at 1.20mbgl, quantified as 0.005%).				
		Human health impacts to future Site users / visitors Direct contact with contaminated materials within soft landscaped areas. Soil ingestion.	Minor	Unlikely	**Low**	The majority of the Site will be occupied by the proposed development or and/or hardstanding, preventing direct contact with contaminants. Potential for exposure in areas of soft landscaping directly onto Made Ground. In limited areas of soft landscaping it is anticipated that suitable soil materials (thickness and quality) will be imported.
		Investigation and construction workers Direct contact with contaminated materials during construction. Soil ingestion.	Medium	Low likelihood	**Moderate / Low**	Low levels of contamination recorded during GI. Potential for contractors to be exposed to minimally contaminated soils during earthworks. Exposure time will be relatively limited. Implementation of standard good practice and Health and Safety precautions including dust control and PPE will mitigate risks.
		Human health impacts to users of neighbouring land Soil and dust inhalation during earthworks	Medium	Unlikely	**Low**	Potential to impact surrounding visitors by dust generation. Increased potential during any earthworks. Exposure time will be relatively limited. Implementation of standard good practice and Health and Safety precautions including dust control will mitigate risks.
		Degradation of Water quality in Superficial Secondary A aquifer – Glacial Deposits	Medium	Low likelihood	**Low**	Low levels of contamination recorded during GI. Enhanced potential for infiltration during earthworks following hardstanding and drainage removal through preferential pathways. Leachability likely to be low.

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Source		**Receptor**/ Pathway	**Risk assessment** (following CIRIA C552)			Comment on hazard realisation
Origin	Contaminants of concern		Consequence	Probability	Risk	
		Degradation of Water quality in bedrock Secondary B aquifer – Manchester Marl Formation	Medium	Unlikely	**Low**	Low levels of contamination recorded during GI. Enhanced potential for infiltration during earthworks following hardstanding and drainage removal through preferential pathways. Leachability likely to be low.
		Degradation of Water quality in bedrock Principal aquifer – Chester Formation	Medium	Unlikely	**Low**	Low levels of contamination recorded during GI. Enhanced potential for infiltration during earthworks following hardstanding and drainage removal through preferential pathways. Leachability likely to be low.

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11 Conclusions

11.1 Risk assessment

The geology encountered during the 2023/2024 GI consists of a maximum thickness of 3.30m of Made Ground, underlain by ~7m of superficial deposits followed by the Chester Formation / Manchester Marls Formation (sandstone bedrock). The Made Ground has been considered as a potential source of contamination due to the Site history and recorded slightly elevated concentrations of some contaminants above the residential without plant uptake threshold. These have the potential to impact people and the environment. The following risk has been identified as below:

Table 11—1 Identified risks and proposed mitigation

Receptor (source and pathway)	Risk before mitigation	Proposed mitigation	Risk after mitigation
Human Health – contractors engaged in proposed development	Moderate / Low	Standard good practice and Health and safety precautions including dust control and PPE implemented to mitigate risks.	Low

11.2 Concluding remarks

Below the hardstanding across the majority of the Site, the Made Ground included approximately 3.30m of mixed constituents (cohesive and granular), with gravels comprising concrete, brick, clinker, sandstone and siltstone.

Seven soil samples were scheduled for chemical analysis. No concentrations of any inorganic and organic determinands were recorded above commercial / industrial thresholds. Lead was slightly elevated above the residential without plant uptake threshold in one sample (WS03 at 1.20mbgl, 740mg/kg) and above the residential with plant update threshold in one sample (WS02 at 1.1mbgl, 230mg/kg). One sample returned concentrations of Dibenzo[ah]anthracene above the residential without plant uptake threshold. All other samples were below the commercial thresholds.

Asbestos was screened as part of the chemical testing analysis, with chrysotile asbestos fibres detected in one sample in WS03 (quantification 0.005%).

The ground gas regime has been assessed as Characteristic Situation 1, therefore no mitigation is required to protect against potentially hazardous ground gas accumulation.

Limited waste characterisation has been carried out to inform the preliminary waste assessment. All samples are classified as non-hazardous waste. It is the earthwork contractor's responsibility, in association with the operator and / or owner of the landfill to classify the materials for disposal in line with current guidance.

The landscaping proposals at the Site generally comprise hardstanding with planters. If any areas of soft landscaping are proposed, they should incorporate suitable thicknesses of imported sub-soil and topsoil materials, which are also required for horticultural purposes.

A detailed UXO risk assessment concluded that the risks associated with UXO is high therefore further actions are required during any intrusive works for the proposed development. Please refer to the 6Alpha report for full details.

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11.3 Recommendations

No formal Remediation Strategy is required for the Site owing to the encountered ground conditions, proposed works and assessed risks, however the activities should be managed appropriately in line with standard good practice. These are outlined within Section 12.

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12 Remedial Approach

12.1 General

It is understood that a contractor (i.e. the Principal Contractor under Construction (Design and Management) Regulations 2015 (CDM 2015)) will be appointed to undertake the demolition aspects, complete minimal groundworks and install the substructure.

There are no significant risks identified at the Site. Slightly elevated concentrations of lead and Dibenzo[ah]anthracene were recorded in two samples, however these were all below the relevant commercial land use criteria. Asbestos fibres were detected at the Site in one sample from the GEL P1 GI. Upon quantification, this was 0.005% which is well below the Hazardous Waste threshold of 0.1%.

12.2 Remedial approach

12.2.1 Protection of earthwork contractors

The potential for direct contact and dust inhalation (including asbestos fibres) during the enabling works and any subsequent below ground work will be mitigated by a combination of the measures set out below. The measures comprise;

- Avoid below ground excavations / earthworks not required for proposed development.
- Ensuring awareness of the potential for contamination in the earthworks - workforce engaged in any below ground works by the provision of briefing and Site induction including description of the potential for and the nature of potential contaminants and setting out the provisions being implemented on Site.
- Soils excavated should be segregated during excavation based on visual and olfactory evidence of contamination, and stockpiled separately.
- Appropriate asbestos awareness training for all staff carrying out excavation works due to the asbestos containing material and fibres encountered in one sample from the GEL P1 GI (0.005%).
- A 'Watching Brief' to be undertaken during excavation of Made Ground materials.
- Providing an appropriate level of personal protective equipment (PPE) and ensuring that this is worn at all times;
- Ensuring that supplementary PPE that may become necessary (eg RPE) are immediately available to be used if required;
- Ensuring a good standard of hygiene with the consumption of food and drink permitted only in designated areas. Smoking will not be permitted on Site;
- Unforeseen contamination – addressed within the contractors Construction & Environmental Management Plan and the project earthworks specification;
- Suitable surface water control measures in place;

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- Ensuring good construction practice (including appropriate mitigation measures) is followed during excavation and any below ground works to prevent the generation and the migration of dusts created by below ground works and other construction activities; and
- In the unlikely event of a requirement for entry into below ground confined spaces, precautions will be adopted to accord with HSE guidance and regulations.

Once the proposed development is complete it is anticipated that the majority of the Made Ground will have been encapsulated by hardstanding. This significantly reduces the ongoing risk from direct contract or dust inhalation.

12.2.2 Protection of surrounding Site users / visitors

The potential for dust inhalation (including asbestos fibres) during earthworks will be mitigated by ensuring good construction practice to prevent the generation and the migration of dusts created by below ground work activities.

The Control of Asbestos Regulations (CAR) 2012 requires actions to ensure the protection of workers and general public from asbestos exposures resulting from work activities. The Contractor is required to put in place appropriate measures to deal with dust and the identified contamination during the works. This is particularly important when moving Made Ground soils which may contain asbestos.

Once the proposed development is complete it is anticipated that the majority of the Made Ground will have been encapsulated by hardstanding. This significantly reduces the ongoing risk from direct contact or dust inhalation.

12.2.3 Unforeseen contamination encountered

The GI data does not indicate the presence of widespread and / or gross contamination. However, there is potential that unforeseen contamination may be present in the Site which may be encountered during the enabling works and construction of the proposed development. The potential risks related to any such contamination will be mitigated by the following management regime;

1. The Contractor's toolbox talk will alert the construction workforce to the potential for such unforeseen contamination. Encountering any such unforeseen contamination will require immediate cessation of excavation and notification of the Contractor's Site Manager and the Engineer;

2. In the event of any such unforeseen contamination being encountered, an appropriately qualified environmental specialist will be contacted and will visit the Site as soon as practicable (but within a minimum of 48 hours) to determine the need for and scope of any remedial action. Proposals for any such action (investigation, analysis, monitoring or remedial action) will be discussed and agreed with the local authority (and EA if appropriate prior to implementation.

3. Adherence to the project earthworks specification.

12.2.4 Spoil disposal

To manage waste and off-site disposal routes and costs, soils should be segregated by the Contractor during excavation. It is important to segregate soils to maximise sustainability and disposal or re-use options and provide a cost benefit. The Contractor will need to be able to demonstrate this and provide a method statement for how it will approach the management of waste soil and other material.

The majority Made Ground at the Site is likely to be classified as Non-Hazardous Waste. Notwithstanding this preliminary assessment, it is the earthworks contractor's responsibility, in association with the operator and / or owner

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of the landfill to classify any such materials for disposal in line with current guidance. Landfill waste acceptance criteria (WAC) leachate testing and classification prior to disposal to landfill should be undertaken to confirm the waste classification. Where materials are retained for re-use on Site, these will require segregation and separate stockpiling away from any contaminated arisings. The material will need to meet the appropriate chemical and geotechnical requirements as set out in the Earthworks specification. Where soft landscaping is proposed, materials will need to meet the relevant horticultural requirements.

Natural uncontaminated soil arisings will be classified as Inert Waste.

Excavated materials may need to be temporarily stockpiled whilst awaiting disposal. The materials should be stockpiled in accordance with the following, in addition to any other good practice or legal requirements:

In order to minimise waste disposal costs, soils excavated should be segregated during excavation based on visual and olfactory evidence of contamination, and stockpiled separately.

All stockpiles will be placed in an impermeable area of the Site (e.g. concrete in good condition with no surface water drains), covered with impermeable sheeting and secured.

12.2.5 Obstructions

Due to the development history of the Site area and proposed Improvement Works, encountering sub-surface obstructions from former structures cannot be discounted. Photographs and logs with measurements will be required before removal to record such features and to delineate the extent, size and orientation of previous building foundations, other historic obstructions or redundant buried structures.

12.2.6 Soft landscaping

The landscaping proposals at the Site generally comprise hardstanding with some potential areas of soft landscaping (above ground planters). If any areas of soft landscaping are proposed, they should incorporate suitable thicknesses of imported subsoil and topsoil materials, which are also required for horticultural purposes.

12.2.7 Areas not investigated

It is broadly considered, that based on the Site history, the material in areas not investigated will be similar to those encountered within the surrounding area. However, it is recommended that a 'Watching Brief' is completed by suitably qualified environmental personnel during any excavations to confirm the nature of this material. Where materials present potential contamination, the remedial approach outlined above within Section 12.2.3 (unexpected contamination) is implemented.

12.3 Verification / Completion

Based on the findings of the GI, it is recommended that the proposed works to be carried can be completed under CDM regulations without the need for a formal Remediation Strategy. In order to demonstrate the works are completed in line with CDM regulations, a short report will be prepared that collates all the evidence to demonstrate standard good construction practice was implemented, spoil was appropriately disposed of, and no unexpected contamination was encountered. This will be the responsibility of the Principal Contractor undertaking the works and shall be documented within their Health and Safety File upon completion of the proposed works.

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Appendix A Contamination Risk Assessment Criteria

A.1 Introduction

A risk-based approach is used for the assessment of contamination, requiring identification of a contaminant source, a receptor and a realistic pathway via which the contaminant may reach the receptor. The key receptors considered in this assessment are site end-users, construction workers and controlled waters. In order to perform a generic quantitative risk assessment, the soil test results have been compared with available Soil Guideline Values (SGVs), Category 4 Screening Levels (C4SLs), BuroHappold and other industry Generic Assessment Criteria (GAC).

A.2 General Contaminants

Analytical data derived from the investigation has been put into context by comparison with published guidance or derived thresholds values. Current UK guidance published thresholds comprise SGVs and C4SLs, which are available for a limited number of determinands (Reference. 1 to Reference. 9) and land uses. For contaminants without published SGVs or C4SLs or where soil conditions are different to those assumed for the published guideline values (6% soil organic matter content and sandy loam soil), GACs have been derived. The derivation of GACs has been carried out based on published statutory guidance documents (Reference. 10, Reference. 11 and Reference. 12) and with consideration of the most sensitive receptors in the respective CLEA standard land- uses scenarios (the 0 to 6 year old child for the residential with plant uptake ($Resi_1$) and residential without plant uptake ($Resi_2$) scenarios and the adult for the commercial/ industrial land-use scenario) using the software model "CLEA 1.06" and "CLEA 1.071" and associated handbook (Reference. 13, Reference. 14 and Reference. 15). Contaminant specific model input values have been selected as prescribed by the Environment Agency SGV reports (Reference. 1 to Reference. 7). In the absence of SGV reports, contaminant specific input values have been selected as suggested by SC050021/SR7 (Reference. 16) and / or the LQM reports (Reference. 17 and Reference. 18) and/or the EIC/AGS report (Reference. 19).

A.3 Lead

Assessment criteria for Lead have been adopted as derived and detailed in the C4SL documents (Reference. 8).

A.4 Mercury

Assessment criteria for mercury is based on the published threshold SGV (Reference. 7) and the S4UL (Reference. 18), these have been produced for elemental, inorganic and methyl mercury. Inorganic mercury is the most common form of mercury in the environment. It is recommended by the Environment Agency that elemental and methyl mercury are used as thresholds where the Desk Study has identified a potential source otherwise inorganic mercury should be used. Concentrations of elemental mercury will also be considered where concentrations are notably higher than 'natural' background concentrations (e.g. 20mg/kg).

A.5 Nickel

Following the report by the European Food Safety Authority (EFSA) in February 2015 (Reference. 21) the Environment Agency withdrew the Soil Guideline Value (SGV) for nickel and its supporting reports. The Environment Agency have no plans to update the documents or produce any new SGV reports. Following the publication of the EFSA report, LQM advised that the TDI for oral pathways proposed by EFSA was more appropriate than the value previously used. Accordingly LQM issued a revised S4UL value for nickel which has been adopted here.

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A.6 Chromium

Assessment criteria for chromium is based on the published threshold LQM value (Reference. 17 and Reference. 18) and have been produced for chromium III (trivalent) and chromium VI (hexavalent). Chromium III is the most common form of chromium in the environment, chromium VI is produced by the oxidation of chromium III through industrial processes. Therefore chromium VI should only be assessed where the Desk Study has identified a potential source otherwise chromium III should be used.

A.7 Statistical Analysis

Where individual concentrations of contaminants have been found exceeding assessment criteria, the data of the specific contaminant was analysed statistically in line with the 'Guidance on Comparing Soil Contaminant Data with Critical Concentrations' (Reference. 20). Where the distribution of data for particular determinands showed evidence of non-normality, the 95% upper confidence limits (US95) were calculated using the Chebychev Theorem in accordance with this guidance (Reference. 20).

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Appendix B Soil Data

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BURO HAPPOLD

Project: MMU - Library
Project Number: 052621
Date: Jun-2024

Asbestos

Asbestos Screen	No. Samples	No. samples detected	No. samples ND	% of samples detect
	7	0	0	
Asbestos Quantification	No. Quants	No. samples <0.001%	No. samples >0.001% <0.01%	No. samples >0.01%
	1	0	1	0

Human Health

Soil Organic Matter 1%
N/A = no screening criteria available

No. samples exceeding

		Residential with Uptake	Residential without Uptake	Commercial	Residential with Uptake	Residential without Uptake	Commercial	No Tests	No <LOD	Min	Max	Location of Maximum
Cyanide	mg/kg	4.6	760	16000				6	2	0.10	1.00	WS03 1.2mbgl
Free Cyanide	mg/kg	4.6	760	16000				5	5			
Arsenic	mg/kg	37	40	640				7		3.60	11.00	WS02 1.1-1.2mbgl
Barium	mg/kg	N/A	1300	22000				7		43.00	690.00	WS03 1.2mbgl
Beryllium	mg/kg	1.7	1.7	12				4		0.30	0.80	BH03 1-1.2mbgl
Boron	mg/kg	290	11000	240000				7	3	0.40	0.80	WS02 1.1-1.2mbgl
Cadmium	mg/kg	26	149	410				7		0.10	0.70	WS02 1.1-1.2mbgl
Chromium	mg/kg	910	910	8600				7		8.30	25.00	BH03 1-1.2mbgl
Copper	mg/kg	2400	7100	68000				7		11.00	67.00	WS04 1.2mbgl
Lead	mg/kg	200	310	2330	2	1		7		9.90	740.00	WS03 1.2mbgl
Mercury (elemental)	mg/kg	1.2	1.2	58				7	1	0.09	0.96	WS02 1.1-1.2mbgl
Nickel	mg/kg	130	180	980				7		8.10	27.00	BH03 1-1.2mbgl
Selenium	mg/kg	250	430	12000				7	7			
Vanadium	mg/kg	410	1200	9000				7		14.00	33.00	BH03 1-1.2mbgl
Zinc	mg/kg	3700	40000	730000				7		26.00	200.00	WS03 1.2mbgl
TPH	mg/kg	N/A	N/A	N/A				7	4	34.00	140.00	WS03 1.2mbgl
Benzene	mg/kg	0.087	0.38	27				4	4			
Toluene	mg/kg	130	869	869				4	4			
Ethyl Benzene	mg/kg	47	83	518				4	4			
m/p Xylenes	mg/kg	56	79	576								
o Xylenes	mg/kg	60	88	478								
Xylenes	mg/kg	56	79	576				4	4			
MTBE	mg/kg	N/A	N/A	N/A				4	4			
Naphthalene	mg/kg	2.3	2.3	190				7	6	0.13	0.13	ITP04B 1.1-1.2mbgl
Acenaphthylene	mg/kg	170	2900	83000				7	6	0.05	0.05	ITP04B 1.1-1.2mbgl
Acenaphthene	mg/kg	210	3000	84000				7	5	0.05	0.31	ITP04B 1.1-1.2mbgl
Fluorene	mg/kg	170	2800	63000				7	5	0.04	0.24	ITP04B 1.1-1.2mbgl
Phenanthrene	mg/kg	95	1300	22000				7	3	0.30	2.30	ITP04B 1.1-1.2mbgl
Anthracene	mg/kg	2400	31000	520000				7	3	0.07	0.44	ITP04B 1.1-1.2mbgl
Fluoranthene	mg/kg	280	1500	23000				7	2	0.50	2.90	ITP04B 1.1-1.2mbgl
Pyrene	mg/kg	620	3700	54000				7	2	0.40	3.00	ITP04B 1.1-1.2mbgl
Benzo[a]anthracene	mg/kg	7.2	11	170				7	2	0.20	1.30	ITP04B 1.1-1.2mbgl
Chrysene	mg/kg	15	30	350				7	2	0.29	1.30	ITP04B 1.1-1.2mbgl
Benzo[b]fluoranthene	mg/kg	2.6	3.9	44				7	2	0.20	1.10	ITP04B 1.1-1.2mbgl
Benzo[k]fluoranthene	mg/kg	77	110	1200				7	2	0.08	0.39	ITP04B 1.1-1.2mbgl
Benzo[a]pyrene	mg/kg	2.2	3.2	35				7	2	0.20	0.97	ITP04B 1.1-1.2mbgl
Indeno[123-cd]pyrene	mg/kg	27	45	500				7	4	0.08	0.60	WS03 1.2mbgl
Dibenzo[ah]anthracene	mg/kg	0.24	0.31	3.5	1	1		7	5	0.12	0.40	WS03 1.2mbgl
Benzo[ghi]perylene	mg/kg	320	360	3900				7	4	0.09	0.40	WS03 1.2mbgl
Total USEPA 16 PAHs	mg/kg	N/A	N/A	N/A				7	2	2.00	15.00	ITP04B 1.1-1.2mbgl
Aliphatic C5 - C6	mg/kg	42	42	3200				7	7			
Aliphatic C6 - C8	mg/kg	100	100	7800				7	7			
Aliphatic C8 - C10	mg/kg	27	27	2000				7	7			
Aliphatic C10 - C12	mg/kg	130	130	9700				7	7			
Aliphatic C12 - C16	mg/kg	1100	1100	59000				7	7			
Aliphatic C16 - C21	mg/kg	65000	65000	1600000				7	7			
Aliphatic C21 - C35	mg/kg	65000	64000	1600000				7	7			
Total Aliphatic	mg/kg	N/A	N/A	N/A				7	7			
Aromatic C5 - C7	mg/kg	70	370	26000				7	7			
Aromatic C7 - 8	mg/kg	130	860	56000				7	7			
Aromatic C8 - C10	mg/kg	34	47	3500				7	7			
Aromatic C10 - 12	mg/kg	74	250	16000				7	7			
Aromatic C12 - C16	mg/kg	140	1800	36000				7	7			
Aromatic C16 - C21	mg/kg	260	1900	28000				7	7			
Aromatic C21 - C35	mg/kg	1100	1900	28000				7	7			
Total Aromatic	mg/kg	N/A	N/A	N/A				7	7			
Total Aliphatic and Aromatic	mg/kg	N/A	N/A	N/A				7	7			

Appendix C Ground Gas Data

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Gas Risk Assessment Spreadsheet

Data entered by: 03/07/2024

Site Name: MMU Library
Job Number: 53621

Methodology based on Wilson et al, 2006, Assessing Risks Posed by Hazardous Ground Gases to Buildings, CIRIA Report C665

Step 1: Summary of Monitoring Data

Table 1

Borehole	Maximum Flow rate (l/hr)	Minimum flow rate (inc Negative) (l/hr)	Peak Methane concentrations* (%)	Peak Carbon Dioxide concentrations* (%)	Minimum Oxygen concentrations (%)	Peak Carbon Monoxide concentrations (ppm)	Peak Hydrogen Sulphide concentrations (ppm)
WS02	0	0	0.0	1.5	18.9		0
WS04	0	0	0.0	2	15.4		0
Worst Case Example+	0	0	0	2	15.4	0	0

*Using 0.05% instead of 0% as this is half the minimum detection limit of the monitoring instrument used
+ Using highest concentration and highest flow rate

Situation A: All other development excluding low rise housing with gardens

Ref. 1 defines gas screening value (GSV) of gas = Chg/100 x q
Where: C_{hg} = hazardous gas concentrations (% v/v)
q = flow rate (litres/hour)

Table 2

Borehole	Peak CH4 GSV (l/hr)	CH4 GSV for peak gas concentration and flow rate (Table 8.5 - Ref. 1)	Peak CO2 GSV (l/hr)	CO2 GSV for peak gas concentration and flow rate (Table 8.5 - Ref. 1)
WS02	0.0000	1	0.0000	1
WS04	0.0000	1	0.0000	1
Worst Case Example+	0.0000	1	0.0000	1

Lower limit (l/hr)		Upper limit (l/hr)
0	1	0.07
0.07	2	0.7
0.7	3	3.5
3.5	4	15
15	5	70
70	6	

Based on Wilson *et al*, 1999, Reliability and Risk in Gas Protection Design

Situation B: Low rise housing with gardens

Ref. 1 defines gas screening value (GSV) of gas = Chg/100 x q
Where: C_{hg} = hazardous gas concentrations (% v/v)
q = flow rate (litres/hour)

Table 3

Borehole	CH4 Peak GSV (l/hr)	CH4 GSV for peak gas concentration and flow rate (Table 8.7 - Ref. 1)	CO2 Peak GSV (l/hr)	CO2 GSV for peak gas concentration and flow rate (Table 8.7 - Ref. 1)
WS02	0.00	Green	0	Green
WS04	0.00	Green	0	Green
Worst Case Example+	0.00	Green	0.00	Green

CH4

Lower limit (l/hr)	Upper limit (l/hr)		Typical Maximum
0	Green	0.16	1
0.16	Amber 1	0.63	5
0.63	Amber 2	1.56	20
1.56	Red		

CO2

Lower limit (l/hr)	Upper limit (l/hr)		Typical Maximum
0	Green	0.78	5
0.78	Amber 1	1.56	10
1.56	Amber 2	3.13	30
3.13	Red		

Based on Boyle and Witherington, 2006, Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present, Incorporating 'Traffic Lights'

Ref. 1: Wilson et al, 2007, Assessing Risks Posed by Hazardous Ground Gases to Buildings, CIRIA Report C665

Appendix D Preliminary Waste Classification (HazWaste Online)

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Buro Happold

HazWasteOnline™

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:

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

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

YOLWB-13W9W-BZHMP

Job name

MMU library

Description/Comments

Project

0052621

Site

MMU Library

Classified by

Name:
Geoffrey Perrett
Date:
03 Jul 2024 10:34 GMT
Telephone:
020 7927 9700

Company:
Buro Happold
71 Newman Street
London
W1T 1PD

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: -

Course	Date
Hazardous Waste Classification	-

Purpose of classification

2 - Material Characterisation

Address of the waste

MMU Library **Post Code** N/A

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Redevelopment of site leading to excess soils generation

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

Waste created during excavation of foundations and earthworks

Description of the waste

Made Ground

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH01	0.6-0.7	Non Hazardous		3
2	WS02	1.1-1.2	Non Hazardous		5
3	BH03	1-1.2	Non Hazardous		7
4	ITP04B	1.1-1.2	Non Hazardous		9
5	WS03	1.2	Non Hazardous		11
6	WS04	1.2	Non Hazardous		14
7	DCP01	0.6	Non Hazardous		16

Related documents

#	Name	Description
1	2022 Geoff	waste stream template used to create this Job

Report

Created by: Geoffrey Perrett

Created date: 03 Jul 2024 10:34 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	18
Appendix B: Rationale for selection of metal species	19
Appendix C: Version	20

Classification of sample: BH01

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

Sample details

Sample name:
BH01
Sample Depth:
0.6-0.7 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5 mg/kg	1.32	6.602 mg/kg	0.00066 %		
2	barium { barium oxide }		215-127-9	1304-28-5		43 mg/kg	1.117	48.01 mg/kg	0.0048 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.3 mg/kg	2.775	0.833 mg/kg	0.0000833 %		
4	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.4 mg/kg	3.22	1.288 mg/kg	0.000129 %		
5	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.1 mg/kg	1.142	0.114 mg/kg	0.0000114 %		
6	chromium { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				15 mg/kg	2.27	34.05 mg/kg	0.0034 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		11 mg/kg	1.126	12.385 mg/kg	0.00124 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	9.9 mg/kg	1.56	15.442 mg/kg	0.00099 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		8.1 mg/kg	2.976	24.108 mg/kg	0.00241 %		
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	1.405	<0.703 mg/kg	<0.0000703 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		21 mg/kg	1.785	37.489 mg/kg	0.00375 %		
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		26 mg/kg	2.774	72.128 mg/kg	0.00721 %		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<**LOD**
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**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									
15		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
19		TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
20		naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22		acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-469-6	83-32-9									
23		fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-695-5	86-73-7									
24		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
25		anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-371-1	120-12-7									
26		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
27		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35		benzo[ghi]perylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-883-8	191-24-2									
36		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
37		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0259 %		

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 Deteminand - 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: WS02

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

Sample details

Sample name:	LoW Code:	
WS02	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.1-1.2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	14.524	mg/kg	0.00145 %		
2	barium { barium oxide }		215-127-9	1304-28-5		280	mg/kg	1.117	312.622	mg/kg	0.0313 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.7	mg/kg	2.775	1.943	mg/kg	0.000194 %		
4	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.8	mg/kg	3.22	2.576	mg/kg	0.000258 %		
5	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7	mg/kg	1.142	0.8	mg/kg	0.00008 %		
6	chromium { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				14	mg/kg	2.27	31.78	mg/kg	0.00318 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		49	mg/kg	1.126	55.169	mg/kg	0.00552 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	230	mg/kg	1.56	358.757	mg/kg	0.023 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17	mg/kg	2.976	50.597	mg/kg	0.00506 %		
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		**<LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		26	mg/kg	1.785	46.415	mg/kg	0.00464 %		
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		100	mg/kg	2.774	277.415	mg/kg	0.0277 %		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		**<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									
15		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16	●	ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
19	●	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
20		naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21	●	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22	●	acenaphthene				0.05	mg/kg		0.05	mg/kg	0.000005 %		
			201-469-6	83-32-9									
23	●	fluorene				0.04	mg/kg		0.04	mg/kg	0.000004 %		
			201-695-5	86-73-7									
24	●	phenanthrene				0.47	mg/kg		0.47	mg/kg	0.000047 %		
			201-581-5	85-01-8									
25	●	anthracene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			204-371-1	120-12-7									
26	●	fluoranthene				0.77	mg/kg		0.77	mg/kg	0.000077 %		
			205-912-4	206-44-0									
27	●	pyrene				0.73	mg/kg		0.73	mg/kg	0.000073 %		
			204-927-3	129-00-0									
28		benzo[a]anthracene				0.25	mg/kg		0.25	mg/kg	0.000025 %		
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				0.29	mg/kg		0.29	mg/kg	0.000029 %		
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				0.24	mg/kg		0.24	mg/kg	0.000024 %		
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.2	mg/kg		0.2	mg/kg	0.00002 %		
		601-032-00-3	200-028-5	50-32-8									
33	●	indeno[123-cd]pyrene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35	●	benzo[ghi]perylene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-883-8	191-24-2									
36	●	pH				9.4	pH		9.4	pH	9.4 pH		
				PH									
37		phenol				5	mg/kg		5	mg/kg	0.0005 %		
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.104 %		

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 Deteminand - 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: BH03

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

Sample details

Sample name:		LoW Code:	
BH03		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1-1.2 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.9	mg/kg	1.32	11.751	mg/kg	0.00118 %		
2	barium { barium oxide }		215-127-9	1304-28-5		52	mg/kg	1.117	58.058	mg/kg	0.00581 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.8	mg/kg	2.775	2.22	mg/kg	0.000222 %		
4	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<**LOD**
5	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2	mg/kg	1.142	0.228	mg/kg	0.0000228 %		
6	chromium { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				25	mg/kg	2.27	56.75	mg/kg	0.00568 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24	mg/kg	1.126	27.021	mg/kg	0.0027 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	22	mg/kg	1.56	34.316	mg/kg	0.0022 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		27	mg/kg	2.976	80.359	mg/kg	0.00804 %		
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		33	mg/kg	1.785	58.911	mg/kg	0.00589 %		
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		45	mg/kg	2.774	124.837	mg/kg	0.0125 %		
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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									
16		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]											
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
17		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane											
		603-181-00-X	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
18	●	TPH (C6 to C40) petroleum group											
				TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
19		naphthalene											
		601-052-00-2	202-049-5	91-20-3		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
20	●	acenaphthylene											
			205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
21	●	acenaphthene											
			201-469-6	83-32-9		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
22	●	fluorene											
			201-695-5	86-73-7		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
23	●	phenanthrene											
			201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
24	●	anthracene											
			204-371-1	120-12-7		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
25	●	fluoranthene											
			205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
26	●	pyrene											
			204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
27		benzo[a]anthracene											
		601-033-00-9	200-280-6	56-55-3		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
28		chrysene											
		601-048-00-0	205-923-4	218-01-9		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
29		benzo[b]fluoranthene											
		601-034-00-4	205-911-9	205-99-2		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
30		benzo[k]fluoranthene											
		601-036-00-5	205-916-6	207-08-9		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
31		benzo[a]pyrene; benzo[def]chrysene											
		601-032-00-3	200-028-5	50-32-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
32	●	indeno[123-cd]pyrene											
			205-893-2	193-39-5		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
33		dibenz[a,h]anthracene											
		601-041-00-2	200-181-8	53-70-3		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
34	●	benzo[ghi]perylene											
			205-883-8	191-24-2		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
35	●	pH											
				PH		7.9	pH		7.9	pH	7.9 pH		
36		phenol											
		604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<**LOD**
										Total:	0.0454 %		

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 Deteminand - 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: ITP04B

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

Sample details

Sample name:	LoW Code:	
ITP04B	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.1-1.2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.6 mg/kg	1.32	12.675 mg/kg	0.00127 %		
2	barium { barium oxide }		215-127-9	1304-28-5		180 mg/kg	1.117	200.971 mg/kg	0.0201 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.6 mg/kg	2.775	1.665 mg/kg	0.000167 %		
4	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7 mg/kg	3.22	2.254 mg/kg	0.000225 %		
5	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3 mg/kg	1.142	0.343 mg/kg	0.0000343 %		
6	chromium { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				13 mg/kg	2.27	29.51 mg/kg	0.00295 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		49 mg/kg	1.126	55.169 mg/kg	0.00552 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	180 mg/kg	1.56	280.767 mg/kg	0.018 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15 mg/kg	2.976	44.644 mg/kg	0.00446 %		
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	1.405	<0.703 mg/kg	<0.0000703 %		**<LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		22 mg/kg	1.785	39.274 mg/kg	0.00393 %		
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		110 mg/kg	2.774	305.156 mg/kg	0.0305 %		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				0.2 mg/kg	1.884	0.377 mg/kg	0.0000377 %		
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		**<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									
15		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
16	●	ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
19	●	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
				TPH									
20		naphthalene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
		601-052-00-2	202-049-5	91-20-3									
21	●	acenaphthylene				0.05	mg/kg		0.05	mg/kg	0.000005 %		
			205-917-1	208-96-8									
22	●	acenaphthene				0.31	mg/kg		0.31	mg/kg	0.000031 %		
			201-469-6	83-32-9									
23	●	fluorene				0.24	mg/kg		0.24	mg/kg	0.000024 %		
			201-695-5	86-73-7									
24	●	phenanthrene				2.3	mg/kg		2.3	mg/kg	0.00023 %		
			201-581-5	85-01-8									
25	●	anthracene				0.44	mg/kg		0.44	mg/kg	0.000044 %		
			204-371-1	120-12-7									
26	●	fluoranthene				2.9	mg/kg		2.9	mg/kg	0.00029 %		
			205-912-4	206-44-0									
27	●	pyrene				3	mg/kg		3	mg/kg	0.0003 %		
			204-927-3	129-00-0									
28		benzo[a]anthracene				1.3	mg/kg		1.3	mg/kg	0.00013 %		
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				1.3	mg/kg		1.3	mg/kg	0.00013 %		
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				1.1	mg/kg		1.1	mg/kg	0.00011 %		
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				0.39	mg/kg		0.39	mg/kg	0.000039 %		
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				0.97	mg/kg		0.97	mg/kg	0.000097 %		
		601-032-00-3	200-028-5	50-32-8									
33	●	indeno[123-cd]pyrene				0.34	mg/kg		0.34	mg/kg	0.000034 %		
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				0.12	mg/kg		0.12	mg/kg	0.000012 %		
		601-041-00-2	200-181-8	53-70-3									
35	●	benzo[ghi]perylene				0.39	mg/kg		0.39	mg/kg	0.000039 %		
			205-883-8	191-24-2									
36	●	pH				9.3	pH		9.3	pH	9.3 pH		
				PH									
37		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0898 %		

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 Deteminand - 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: WS03

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

Sample details

Sample name:	LoW Code:	
WS03	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	asbestos	650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		0.005 mg/kg		0.005 mg/kg	0.0000005 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
3	barium { barium oxide }		215-127-9	1304-28-5		690 mg/kg	1.117	770.389 mg/kg	0.077 %		
4	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.6 mg/kg	3.22	1.932 mg/kg	0.000193 %		
5	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5 mg/kg	1.142	0.571 mg/kg	0.0000571 %		
6	chromium { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				18 mg/kg	2.27	40.86 mg/kg	0.00409 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		57 mg/kg	1.126	64.176 mg/kg	0.00642 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	740 mg/kg	1.56	1154.263 mg/kg	0.074 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		10 mg/kg	2.976	29.763 mg/kg	0.00298 %		
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	1.405	<0.703 mg/kg	<0.0000703 %		**<LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		23 mg/kg	1.785	41.059 mg/kg	0.00411 %		
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		200 mg/kg	2.774	554.829 mg/kg	0.0555 %		
13	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides,					1 mg/kg	1.884	1.884 mg/kg	0.000188 %		

#		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									
		ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }											
		006-007-00-5											
14		TPH (C6 to C40) petroleum group				140	mg/kg		140	mg/kg	0.014 %		
				TPH									
15		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
19		phenanthrene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
			201-581-5	85-01-8									
20		anthracene				0.2	mg/kg		0.2	mg/kg	0.00002 %		
			204-371-1	120-12-7									
21		fluoranthene				1.6	mg/kg		1.6	mg/kg	0.00016 %		
			205-912-4	206-44-0									
22		pyrene				1.5	mg/kg		1.5	mg/kg	0.00015 %		
			204-927-3	129-00-0									
23		benzo[a]anthracene				0.8	mg/kg		0.8	mg/kg	0.00008 %		
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				0.8	mg/kg		0.8	mg/kg	0.00008 %		
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				0.5	mg/kg		0.5	mg/kg	0.00005 %		
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				0.7	mg/kg		0.7	mg/kg	0.00007 %		
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				0.6	mg/kg		0.6	mg/kg	0.00006 %		
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				0.4	mg/kg		0.4	mg/kg	0.00004 %		
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				0.4	mg/kg		0.4	mg/kg	0.00004 %		
			205-883-8	191-24-2									
31		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
32		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.241 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No evidence of free product in soils. Soils present with natural moisture content. Unlikely to be flammable.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.014%)

Classification of sample: WS04

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

Sample details

Sample name:
WS04
Sample Depth:
1.2 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10 mg/kg	1.32	13.203 mg/kg	0.00132 %		
2	barium { barium oxide }		215-127-9	1304-28-5		55 mg/kg	1.117	61.408 mg/kg	0.00614 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
5	chromium { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				14 mg/kg	2.27	31.78 mg/kg	0.00318 %		
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		67 mg/kg	1.126	75.435 mg/kg	0.00754 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	77 mg/kg	1.56	120.106 mg/kg	0.0077 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		11 mg/kg	2.976	32.739 mg/kg	0.00327 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	1.405	<0.703 mg/kg	<0.0000703 %		<LOD
10	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		21 mg/kg	1.785	37.489 mg/kg	0.00375 %		
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		34 mg/kg	2.774	94.321 mg/kg	0.00943 %		
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				0.1 mg/kg	1.884	0.188 mg/kg	0.0000188 %		
13	TPH (C6 to C40) petroleum group			TPH		50 mg/kg		50 mg/kg	0.005 %		
14	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									
15		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
17		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
18		phenanthrene				1.1	mg/kg		1.1	mg/kg	0.00011 %		
			201-581-5	85-01-8									
19		anthracene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
			204-371-1	120-12-7									
20		fluoranthene				1.4	mg/kg		1.4	mg/kg	0.00014 %		
			205-912-4	206-44-0									
21		pyrene				1.5	mg/kg		1.5	mg/kg	0.00015 %		
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.8	mg/kg		0.8	mg/kg	0.00008 %		
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.7	mg/kg		0.7	mg/kg	0.00007 %		
		601-048-00-0	205-923-4	218-01-9									
24		benzo[b]fluoranthene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.2	mg/kg		0.2	mg/kg	0.00002 %		
		601-036-00-5	205-916-6	207-08-9									
26		benzo[a]pyrene; benzo[def]chrysene				0.7	mg/kg		0.7	mg/kg	0.00007 %		
		601-032-00-3	200-028-5	50-32-8									
27		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
28		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									
29		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
30		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
31		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0483 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No evidence of free product in soils. Soils present with natural moisture content. Unlikely to be flammable.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.005%)

Classification of sample: DCP01

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

Sample details

Sample name:
DCP01
Sample Depth:
0.6 m

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3.6 mg/kg	1.32	4.753 mg/kg	0.000475 %		
2	barium { barium oxide }		215-127-9	1304-28-5		290 mg/kg	1.117	323.787 mg/kg	0.0324 %		
3	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.2 mg/kg	3.22	<0.644 mg/kg	<0.0000644 %		<LOD
4	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2 mg/kg	1.142	0.228 mg/kg	0.0000228 %		
5	chromium { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				8.3 mg/kg	2.27	18.841 mg/kg	0.00188 %		
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16 mg/kg	1.126	18.014 mg/kg	0.0018 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	35 mg/kg	1.56	54.594 mg/kg	0.0035 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		9.3 mg/kg	2.976	27.679 mg/kg	0.00277 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5 mg/kg	1.405	<0.703 mg/kg	<0.0000703 %		<LOD
10	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		14 mg/kg	1.785	24.993 mg/kg	0.0025 %		
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		49 mg/kg	2.774	135.933 mg/kg	0.0136 %		
12	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
13	TPH (C6 to C40) petroleum group			TPH		34 mg/kg		34 mg/kg	0.0034 %		
14	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									
15		acenaphthylene											
			205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
16		acenaphthene											
			201-469-6	83-32-9		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
17		fluorene											
			201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
18		phenanthrene											
			201-581-5	85-01-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
19		anthracene											
			204-371-1	120-12-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
20		fluoranthene											
			205-912-4	206-44-0		0.5	mg/kg		0.5	mg/kg	0.00005 %		
21		pyrene											
			204-927-3	129-00-0		0.4	mg/kg		0.4	mg/kg	0.00004 %		
22		benzo[a]anthracene											
		601-033-00-9	200-280-6	56-55-3		0.2	mg/kg		0.2	mg/kg	0.00002 %		
23		chrysene											
		601-048-00-0	205-923-4	218-01-9		0.3	mg/kg		0.3	mg/kg	0.00003 %		
24		benzo[b]fluoranthene											
		601-034-00-4	205-911-9	205-99-2		0.2	mg/kg		0.2	mg/kg	0.00002 %		
25		benzo[k]fluoranthene											
		601-036-00-5	205-916-6	207-08-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		
26		benzo[a]pyrene; benzo[def]chrysene											
		601-032-00-3	200-028-5	50-32-8		0.3	mg/kg		0.3	mg/kg	0.00003 %		
27		indeno[123-cd]pyrene											
			205-893-2	193-39-5		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
28		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**
29		benzo[ghi]perylene											
			205-883-8	191-24-2		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**
30		pH											
				PH		8.7	pH		8.7	pH	8.7 pH		
31		phenol											
		604-001-00-2	203-632-7	108-95-2		<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		**<LOD**
										Total:	0.0628 %		

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 Deteminand - 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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No evidence of free product in soils. Soils present with natural moisture content. Unlikely to be flammable.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0034%)

Appendix A: Classifier defined and non GB MCL determinands

- **barium oxide** (EC Number: 215-127-9, CAS Number: 1304-28-5)

Description/Comments: Data from ECHA's C&L Inventory Database, Sigma Aldrich SDS dated 6/2/20
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/88825
Data source date: 02 Apr 2020
Hazard Statements: Acute Tox. 3; H301 , Skin Corr. 1B; H314 , Eye Dam. 1; H318 , Acute Tox. 1; H332

- **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

- **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

- **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

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

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

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

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

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

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

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

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

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

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

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

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

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

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

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

barium {barium oxide}

No evidence of sources of Barium or metal processing on site.

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

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 (edit as required)

cadmium {cadmium oxide}

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

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

Worst case scenario

copper {dicopper oxide; copper (I) oxide}

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

lead {lead chromate}

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

nickel {nickel chromate}

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

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

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide 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. (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worst Case Scenario

zinc {zinc chromate}

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

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

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

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

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