BROWNFIELD SOLUTIONS LTD

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

FI CONSTRUCTION

The Oaks, Wrexham

Supplementary Phase II Geo-Environmental Assessment Report

CC/C6668/15518 Rev C

July 2026

EXECUTIVE SUMMARY	
Ground Conditions	Generalised ground conditions from the 2025 and 2026 investigations comprise (top down): • Made ground generally comprising clay with varying proportions of sand and gravel encountered from ground level to between 0.20m and 1.50m below ground level (bgl). • Natural superficial deposits mostly comprising firm to hard clay (Glacial Till) proven to depths of at least 4.45m bgl across the proposed development area. Natural deposits consisting of interbedded saturated very loose or very soft sand, silt, and clay (Alluvium) were proven to depths of between 2.40m and 2.70m bgl adjacent to Redwither Brook. • Solid geology was not encountered. • No groundwater was identified across the majority of the site. Groundwater levels ranging between 1.20m and 3.20m bgl were identified at lower elevation adjacent to Redwither Brook.
Foundations and Floor Slabs	Ground beam strip/trench fill and pad foundations are considered suitable. Safe bearing capacity of 110 kN/m^2 should be available at 1.00m begl in natural glacial Till, where present. 150 kN/m^2 should be available at a depth of 2.00m begl in glacial Till, keeping total and differential settlement within acceptable limits. Deepening is likely to be required where made ground or proposed fill is present. Deepening of foundations/heave protection is likely to be required to allow for the effects of trees. Ground bearing floor slab are considered suitable. If the above foundations are not considered to be economical due to significant volumes of infill concrete required, then installation of vibro-stone columns or piles may be used alternatively.
Concrete Classification	DS-1 and AC-1s conditions prevail.
Highways Design	Made Ground CBR – 2% Superficial Strata CBR – cohesive/fine soils– 2% The above should be confirmed by in-situ testing at formation level by a specialist geotechnical engineer during construction.
Site Drainage	Indicative soil infiltration rates are on the order of 10^{-9} m/s. Drainage to soakaways is considered to be unsuitable for this site. Alternative drainage methods may comprise either drainage to a nearby permanently flowing watercourse, or drainage to the council mains system.
Slope Stability & Retaining Walls	A moderately steep slope exists to the southwest of the proposed development that is considered to pose low instability risk in its current state. The Cut/Fill Plan shows >5m of proposed cut along the toe of this slope, which may cause instability. It is recommended that this slope maintains its current angle or alternatively, if the toe of the slope is to be excavated, then further assessment of slope stability and/or design and installation of a retaining wall may be required.
Human Health - Soils Contamination	Testing of the made ground at the site did not reveal any exceedances of heavy metals, explosives, PAHs, petroleum hydrocarbons, PCBs, BTEX or MTBE compounds; no further action is required.
Controlled Waters – Surface and Groundwater Contamination	Testing of groundwater from boreholes adjacent to Redwither Brook revealed a few exceedances of metals/ammonium which can be attributed to the natural geology and wider area farming/industrial input. Mobile contamination (TPH, PAHs) were below lab detection limits. The overall risk to controlled waters is considered to be low and no further action is required.
Ground Gas	Based on previous monitoring, the site is classified as CS1 with respect to carbon dioxide and methane. However, the BGS Radon Report indicates that basic radon protective measures are required for the site.
Outline Remedial Strategy	Aside from basic radon protection, no other specific remedial measures or long-term monitoring is considered necessary at the site.
Waste	Made ground and Natural – All locations classified as non-hazardous.
Further Work	The following further works will be required to progress to the construction phase: • Submission of this report for support of discharge of Condition 9 of planning permission reference P/2025/0430. • Tree survey by qualified arboriculturist. • Detailed foundation design by a structural engineer. • Production of a Remedial Strategy, including the production of short specification for radon protection within a Ground Gas Protection Measures Verification Plan. This relates to Condition 9 and 12 of planning permission P/2025/0430. • Production of Design Statement and Materials Management Plan (MMP) under the CL:AIRE DoWCoP, if required. • Production of a Verification Report following remediation (Conditions 10-12 of P/2025/0430).

This executive summary should be read in conjunction with the full report, reference CC/C6668/15518 Rev C and not as a standalone document. Report template version 4.12.

PROJECT QUALITY CONTROL DATA SHEET

Site Name:	The Oaks, Wrexham		
Document Name:	Ground Investigation Report		
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	A	20/05/2026	Final.
	B	21/05/2026	Update after client comment.
	C	30/07/2026	Update after groundwater sampling and contamination testing and NRW comment.

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DRAWINGS

Drawing Number	Rev	Title
1256-MCAU-T.02-00-001	T9	Proposed Site Plan
RCFP01	-	Regrade Cut/Fill Plan
C6668/01	-	Site Location Plan
C6668/02	-	Exploratory Hole Location Plan
C6668/03	-	Conceptual Site Model

APPENDICES

Appendix	Title
Photographs	Site Walkover Photographs
Appendix A	BSL Methodology and Guidance
Appendix B	Exploratory Hole Logs
Appendix C	Geotechnical Testing Results
Appendix D	Chemical Testing Results
Appendix E	Waste Assessment Report

1.0 INTRODUCTION

1.1 Context

This report describes a Supplementary Phase II Geo-Environmental Assessment carried out by Brownfield Solutions Limited (BSL) for FI Construction on a site off Oak Road, Wrexham, and has been completed in general accordance with the following guidance:

- Environment Agency guidance - Land Contamination: Risk Management (LCRM).
- BS 10175:2026 Investigation of Potentially Contaminated Sites.
- BS5930: 2015+A1:2020 Code of Practice for Ground Investigations.
- BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design. General rules plus UK National Annex.
- BS EN 1997-2:2007 Eurocode 7 Geotechnical design. Ground investigation and testing plus UK National Annex.

Definitions of terms and acronyms used within this report is presented in Section 11.0.

1.2 Proposed Development

The proposed development will comprise an approximately 80,000 sq.ft Hiab warehouse/office/distribution unit, with associated hardstanding car parking, infrastructure and soft landscaped areas as per MCAU drawing reference 1256-MCAU T.02-00-001-T7 dated September 2025. The wider area will be retained as managed woodland/soft landscaped areas.

1.3 Relevant Reports and Documents

Relevant reports and documents pertaining to the site are given below:

- Phase I Geo-Environmental Assessment Report was issued by SP Associates, reference S1916, dated March 2024.
- Phase II Geo-Environmental Assessment Report was issued by SP Associates, reference S1916-2, dated September 2025.
- Planning correspondence was issued by Natural Resources Wales (NRW), reference CAS-288516-J8L2, dated 9th January 2026.
- BGS Radon Report was purchased by BSL (reference BGS_348020/67330), dated 15th April 2026.
- Wrexham County Borough Council planning permission (reference P/2025/0430) granted on 8th May 2026.
- Planning correspondence was issued by Natural Resources Wales (NRW), reference CAS-311625-T4K1, dated 7th July 2026.

1.4 Objectives and Scope

The SP Associates Phase II Geo-Environmental Assessment, and following NRW correspondence, outlined the requirements for a supplementary ground investigation in the southern half of the site when vegetation clearance had been undertaken. Recent site clearance has since been undertaken, resulting in a supplementary ground investigation and associated reporting to be undertaken by BSL. A review of the previous investigations carried out at the site has also been undertaken and summarised within this report.

The objectives of this report are to determine the geo-environmental setting and ground conditions in the southern half of the site, highlighting potential risks and areas of concern that may govern the development under the current planning regime.

This supplementary Phase II report is intended to support discharge of Condition 9 of the granted planning permission reference P/2025/0430. Conditions 10-12 shall be fully addressed under separate cover via a Remediation Strategy and, following remediation on site during construction, and the production of a Verification Report.

The ground investigation was scoped and designed by FI Construction as the principal contractor, and the investigation was supervised by BSL.

The factual and interpretive sections of this report are produced in general accordance with the recommendations for a Tier 2 Generic Quantitative Risk Assessment as described in LCRM guidance. This assessment is also intended to fulfil the requirements of a Ground Investigation Report (GIR) as detailed in BS EN 1997-2:2007.

1.5 Limitations

This assessment has been prepared in accordance with the relevant current legislative framework, guidance and risk assessment methodology as outlined in Appendix A. BSL is not liable for any subsequent changes in the guidance and legislation.

The findings and opinions conveyed via this report are based on information obtained from a number of sources as detailed within this report, BSL have assumed this information is correct and reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

BSL have used reasonable skill, care and diligence for the investigation of the site and the production of this report. There may be other conditions prevailing on the site which are outside the scope of work and have not been highlighted by this assessment and therefore have not been considered by this report. Responsibility cannot be accepted for such site conditions not revealed by the assessment.

This report has been prepared for the sole use and reliance of the Client, FI Construction. No other third parties may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL). If any unauthorised third party comes into possession of this report, they rely on it at their own risk and BSL do not owe them any Duty of Care. This report may not be relied upon by the client or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance and regulatory approval, until all invoices have been settled in full.

The investigation carried out on the site has been conducted to provide the best information on the ground conditions within site access and budgetary constraints. The inherent variation of ground conditions allows only for definition of the actual conditions at the locations and depths of exploratory locations at the time of the investigation. Different ground conditions may exist that have not been identified within this investigation.

The recommendations in this report assume that ground levels will remain as existing, unless stated otherwise within the report. If there is to be any re-profiling (e.g. to create development platforms or flood defences) then the recommendations may not apply.

The groundwater results described are only representative of the dates on which they were recorded, and levels may vary seasonally (e.g. due to changes in weather).

This assessment has been based on the proposed planning layouts provided. Any subsequent change to the planning layout may have an impact on the validity of recommendations made within this report. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

Although every effort has been made to position exploratory holes in the least sensitive areas of the site, exploratory hole positions were located approximately as part of this investigation, and no guarantee can be given as to their accuracy. Consideration should be given to the possibility that exploratory holes excavated as part of this investigation and indeed any previous ground investigation work by others may be encountered beneath or within the influence of individual foundations. BSL cannot be held responsible for structural failures caused by the location of foundations of any form of structure within the influence of exploratory holes.

Where it has not been possible to reasonably use an EC7 compliant investigation technique, a practical alternative has been adopted to obtain indicative soil parameters and any interpretation is based upon engineering experience, local precedent where applicable and relevant published information.

The chemical testing carried out for this report was not scoped to comply with the requirements of the water supply company and further work may be required, unless otherwise stated.

Notwithstanding site observations concerning the presence or otherwise of archaeological issues, asbestos-containing materials (ACM) or invasive weeds (e.g. Japanese knotweed), this report does not constitute a formal survey of these potential issues.

Asbestos in structures was not covered in this report. It should be noted that an asbestos demolition survey will be required prior to any demolition of structures. If asbestos is present in soils, these will need to be dealt with in accordance with the Control of Asbestos Regulations (CAR) 2012.

The site plans enclosed in this report should not be scaled off. Any site boundary line depicted on plans does not imply legal ownership of land.

Any recommendations made in this report should be confirmed with the Regulatory Authorities prior to implementation to ensure compliance. Please note that whilst every effort has been made to pre-empt the likely requirements of the Local Authority, Environment Agency and warranty providers, they may have specific requirements that will need to be discussed and addressed at a later date.

Site specific limitations listed in section 4.2.

2.0 THE SITE

2.1 Location

The site is located off Oak Road, Wrexham, LL13 9RG, centred on National Grid Reference 338615, 349350, as shown on the Site Location Plan, Drawing No. C6668/01.

2.2 Site Description

A site walkover was carried out at the site on the 15th and 16th of April 2026. The main site features and potential issues identified are detailed below. A selection of photographs from the site walkover are presented to the rear of this report.

Feature	Description
Site Area	Approximately 4 hectares of proposed development area within the tenant boundary, however the site comprises 17 hectares overall within FI ownership. The site is defined based on the tenant boundary and proposed development area.
Site Access	Access is gained off Oak Road to the north of the site.
Current Land Use and Site Features	The site is mostly bare ground comprising recently deforested scrubland and woodland, however the southern extents of the site near Redwither Brook consist of woodland and grassed areas. A medium-sized brick building is present slightly beyond the northeast of the site and the proposed development area. Two sets of overhead powerlines cross the site, a 132 kV overhead service passing through the eastern boundary of the site and proposed development area, and a 33 kV overhead service passing through the western boundary of the site and proposed development area. A manhole cover was identified adjacent to Redwither Brook to the south of the site, denoting possible drainage/sewers. A concrete road provides access into the northern extent of the site, however most of the site is accessed using trackways.
Potential Sources of Gross Contamination	No obvious signs of potential contamination were identified during the site walkover.
Vegetation / Ecology	There are sporadic mature/semi-mature trees across the majority of the site. There is also woodland comprising abundant mature and semi-mature trees near Redwither Brook at the southern extents of the site.
Topography	The site generally comprised flat and undulating ground, varying in elevation but gradually increasing from 25.5m AOD in the south of the site to 28.5m AOD in the north of the site (approximately 3m difference). However, an embankment was present along the southwestern boundary of the site sloping down to an area of flat land adjacent to Redwither Brook at a substantially lower elevation of 22.50m AOD (approximately 3-6m below the majority of the site).
Site Boundaries	Oak Road borders the site to the north and Redwither Brook borders the site to the south. The remaining site boundaries are not defined by discernible features, except for an industrial warehouse that forms the western site boundary.
Surrounding Area	The site lies to the south of Wrexham Industrial Estate and Redwither Business Park. Industrial buildings are present to the north and west, and agricultural fields to the south and east. Immediately north of the site beyond Oak Road is an electricity substation.

3.0 SUMMARY OF RELEVANT REPORTS

A summary of the relevant points from the Phase I Geo-Environmental Assessment completed by SP Associates (reference S1916 issued March 2024) is presented below:

- The site was agricultural land until the early 1940s. During World War Two the site was developed as part of Royal Ordnance Factory (ROF) Wrexham, used primarily to manufacture cordite for explosives and subsequently as an ammunition dump. Post-war, bunkers and structures were removed and likely infilled with imported material. Since the early 1980s, the site has remained as undeveloped woodland and scrub.
- The surrounding area had a similar history, remaining undeveloped until establishment of ROF Wrexham in World War Two and post-war has included expansion of Wrexham Industrial Estate.
- Superficial geology comprised Glacial Diamicton (Till) deposits of Devensian age forming a Secondary Aquifer (undesignated) that consisted of clay, silt, sands and gravels (BSL also note the wider area includes alluvium) The underlying bedrock geology was the Kinnerton Sandstone (Principal Aquifer) of Triassic age comprising red-brown sandstone.
- The site was within Source Protection Zones 2 and 3. There were three licensed groundwater abstractions within 250m of the site (likely from the deep Principal Aquifer).
- No evidence of historic mining or quarrying affecting the site, and therefore mining-related instability risk was considered to be negligible.
- The nearest watercourse was Redwither Brook, approximately 50m south-west of the site.
- The site was not considered susceptible to flooding from rivers, groundwater at surface, or the sea. However, land approximately 30m south-west of the site showed flood susceptibility. A separate specialist flood risk assessment was recommended if required for planning.
- No registered landfills or waste transfer stations within 250m of the site. However, there were several licensed waste management and treatment facilities present within 250 m, reflecting the industrial nature of the area.
- On-site ground gas risk was moderate, due to potential Made Ground within infilled bunkers containing biodegradable material. Off-site ground gas risk was low to moderate due to possible Made Ground in surrounding former ROF areas.
- Site was in an Intermediate Radon Probability Area (5–10% of dwellings exceed action level), therefore basic radon protection measures were required for the proposed development.
- The site was part of ROF Wrexham explosives manufacturing and ammunition storage, resulting in a moderate to high UXO risk. A detailed UXO Risk Assessment was therefore recommended before intrusive ground works.
- The risk to human health was moderate to high, primarily due to possible explosive residues (e.g. cordite), and unknown made ground used to infill former bunkers across the site.
- The risk to controlled waters was low due to low-permeability glacial deposits that would restrict contaminant migration, and regulated upgradient industrial sources reducing the likelihood of uncontrolled releases.
- The Phase I report recommended a ground investigation comprising:
    - Windowless sampling boreholes with SPT testing.
    - Trial Pitting and bulk sampling.
    - Soakaway Testing to BRE 365 guidance.
    - In-situ CBR testing.
    - Searching for underground bunkers using ground penetrating radar (GPR).
    - Soil chemical laboratory testing.
    - Groundwater sampling and testing where boreholes encounter groundwater.
    - Installation of gas monitoring wells and completion of a gas monitoring regime.

A summary of the relevant points from the Phase II Geo-Environmental Assessment completed by SP Associates (reference S1916-2 issued September 2025) is presented below:

- Ground investigation comprised windowless sampling boreholes, trial pits, soakaway tests, soil laboratory testing, and ground gas monitoring.
- Investigations encountered made ground from the surface to 0.70-1.50m below ground level (bgl), comprising firm clay and loose sand with varying amounts of angular gravel of concrete, brick, and shale. The made ground was underlain by glacial Till consisting of firm to stiff clay. Groundwater and bedrock were not encountered during the investigations.
- Soakaway tests failed to drain successfully, therefore an alternative remedial strategy for surface water disposal was recommended either comprising connection to the mains drainage network, or drainage to a nearby permanently flowing surface water body.
- Geotechnical laboratory testing confirmed the natural glacial Till soils to be intermediate plasticity with a plasticity index ranging from 10-35%. The ratio between Natural Moisture Content (NMC) and Liquid Limit (LL) were used to estimate the natural glacial Till soils as displaying signs of desiccation.
- Chemical laboratory testing results were compared to screening criteria for industrial/commercial land use, finding all test results to be below acceptance criteria values. Therefore, the risk to human health from contaminants within onsite soils was considered to be low and no remedial measures were determined to be required.
- The risk to controlled waters was considered to be low. This was due to no contaminants being identified in onsite made ground, the underlying glacial Till comprising low permeability clay soils, and installed standpipes remaining dry throughout the groundwater monitoring regime. Therefore, there was no identified contaminant source and pathway.
- Ground gas monitoring and assessment identified a CS1 characterisation for the site and subsequently a very low risk with respect to methane and carbon dioxide. However, the site was within an area that required basic radon protection measures.
- Conventional strip or pad foundations were recommended for the proposed industrial warehouse, with embedment in the glacial Till deposits.
- The Phase II report recommended a supplementary ground investigation in the southern half of the site as dense vegetation had prevented the 2025 investigation from reaching these areas. The recommended supplementary investigation comprised:
    - Purchasing of a detailed UXO report.
    - Windowless sampling boreholes.
    - Trial Pitting and soil sampling.
    - Soil laboratory testing for an explosive's suite and PCBs.
    - GPR survey to investigate potential underground buried structures and obstructions, with follow up trial pitting.

Natural Resources Wales (NRW) issued planning correspondence on 9th January 2026 in response to previously supplied information and subsequently granted planning permission on 8th May 2026. The granted planning permission highlighted that further information was required including:

- A site investigation in the southern half of the proposed building area and attenuation basin with associated soil and groundwater chemical laboratory testing (Condition 9).
- Consideration of risk to controlled waters regarding the underlying Principal Aquifer and the nearby Redwither Brook (Condition 9).
- Based on the results of the investigation, a remedial options appraisal and verification plan and validation report, if required (Conditions 10 and 11).
- Based on the results of the investigation, a long-term monitoring plan for land contamination (Condition 12).

Due to the recommendations previously outlined in the SP Associates Phase I and Phase II reports, a BGS Radon Report for the site was subsequently obtained by BSL. A summary of the BGS Radon Report (reference BGS_348020/67330 issued 15 April 2026) is presented below:

- The property is in a radon affected area where 5-10% of properties are estimated to be at or above the action level.
- Basic radon protective measures are therefore required for the report area.

Natural Resources Wales (NRW) issued planning correspondence on 7th July 2026 in response to previously supplied information. The correspondence highlighted that further information was required including:

- Justification that potential contamination relating to the site history as a cordite manufacturer was adequately sampled and laboratory tested for the proposed development (Condition 9).
- Further consideration of risk to controlled waters regarding shallow groundwater encountered on site and the nearby Redwither Brook (Condition 9).

4.0 METHOD OF INVESTIGATION

4.1 Objectives

To confirm the risks to the identified receptors and confirm the ground conditions in respect to the identified geotechnical and geo-environmental risks, a supplementary intrusive investigation was undertaken as per the recommendations of the Phase II Geo-Environmental Assessment previously issued by SP Associates and subsequent Wrexham Borough Council planning permission conditions. This resulting supplementary Phase II report is intended to support discharge of Condition 9 of the granted planning permission.

The ground investigation was designed by FI Construction as the principal contractor and was supervised by BSL.

The aim of the fieldwork was to:

- Investigate ground conditions in the southern half of the site as recent vegetation clearance had made this portion of the site accessible.
- Install standpipes to allow for groundwater monitoring (if groundwater encountered).
- Assess the potential contamination on the site and obtain samples for contamination screening.
- Assess the potential impact of any contamination on controlled waters.
- Obtain geotechnical information on the ground conditions at the site for preliminary foundation design and preliminary pavement design purposes.
- Give an assessment of the geo-environmental risks associated with redevelopment of the site.

4.2 Site Works

The following site works have been undertaken as part of the supplementary intrusive investigation between the dates of 15th and 16th April 2026.

Method	No.	Range Depths (m bgl)	Purpose
Window sample boreholes – Tracked WS rig	8	2.45 – 4.45	Establish ground conditions across the southern section of the site that has recently undergone vegetation clearance. Allow Standard Penetration Tests (SPTs) to be carried out and obtain samples for contamination and geotechnical testing. Determine soil strengths/densities for preliminary foundation design. Installation of groundwater monitoring wells (if required).

Borehole WS103 was repositioned due to the survey located flag being hidden by tree branches and soil cover and undulating terrain making the initial test location inaccessible. Borehole WS105 was repositioned as the proposed location was directly beneath overhead services. Boreholes WS106, WS107, and WS108, were repositioned as the initially proposed location was on the moderately steep slope embankment and the location was inaccessible due to dense vegetation.

The surveyed locations of the exploratory holes are indicated on the Exploratory Hole Location Plan, Drawing No C6668/02. The exploratory hole logs are presented in Appendix B.

The exploratory holes were logged by an experienced geo-environmental engineer in general accordance with the following guidance:

- BS 5930:2015+A1:2020 Code of Practice for Site Investigations.

- BS EN 14688-1:2018 Geotechnical Investigation and Testing – Identification and classification of soil.

The client remained as Principal Contractor for the site and was therefore responsible for service clearance and UXO clearance. In accordance with BSL RAMS and in the absence of a specialist UXO study or specialist UXO surveyor, a safe standoff distance to each borehole was adhered to by the BSL Geo-environmental Consultant while drilling was undertaken. No evidence of UXO was identified during the investigation.

4.3 Sampling Strategy

Representative samples were taken from exploratory holes at regular intervals to assist in the identification of the soils and to allow subsequent laboratory testing. They were stored and transported in general accordance with BS 10175:2026.

The type of sample was dependent upon the stratum and the purpose of analysis in accordance with current environmental and geotechnical guidance. The distribution of samples taken across the site is recorded on the exploratory logs.

Investigatory hole locations were specified by the client, being spaced relatively evenly across the southern half of the site that had previously been covered in dense vegetation. Five of the boreholes (WS101-105) were located across the main development area, and three boreholes (WS106-108) were situated at lower elevation adjacent to Redwither Brook to the southwest of the proposed development area.

Groundwater samples were collected from boreholes WS106, WS107, and WS108 for groundwater contamination laboratory testing.

4.4 Laboratory Testing

Representative disturbed samples were obtained for all soil types encountered. Selected samples were scheduled for testing at an approved laboratory in accordance with BS 1377 'Method of Test for Soils for Civil Engineering Purposes' and BS EN ISO 17892- Parts 1-12:2018 'Geotechnical investigation and testing. Laboratory testing of soil'.

The following tests were scheduled for geotechnical purposes:

Description	No. of Samples
Atterberg Limits (i.e. Plasticity Index Analysis) including water content.	5
BRE SD1 Greenfield (Pyrite Absent) - Suite A.	3
BRE SD1 Full Suite.	2

The Geotechnical Laboratory Testing Results are presented in Appendix C.

As part of the further assessment for potential contamination of the site, selected samples were taken for the purpose of chemical contamination testing.

Based on the potential contaminative processes identified from historical site use, the following suite of determinands were analysed at a UKAS approved laboratory to screen for potential site impacts using soil samples:

Determinand	No of Samples
BSL Default Soil Suite: Arsenic, Cadmium, Chromium (III), Chromium (VI), Copper, Nickel, Mercury, Lead, Zinc, Selenium, speciated polycyclic hydrocarbons (PAH 16), water soluble sulphate (2:1 Extract), soil organic matter (SOM) and pH.	14
Petroleum Hydrocarbons (TPH CWG) inc BTEX and MTBE.	4

Determinand	No of Samples
Asbestos Screen and ID.	8
PCB Compounds (7 Congeners).	4
Explosives Screen.	3

Explosives suite and PCB laboratory testing was undertaken to assess whether the site was contaminated from its past land use as a cordite manufacturer. The explosives and PCB laboratory testing was taken from made ground samples at varying depths distributed across the entire site to ensure an adequate spread of potential source contamination. Four PCB and three explosives suite tests were considered sufficient for the development, with consideration given to the high cost of explosives suite testing.

Based on the potential contaminative processes identified from historical site use, the following suite of determinands were analysed at a UKAS approved laboratory to screen for potential site impacts using groundwater samples:

Determinand	No of Samples
BSL Default Water Suite: Arsenic, Boron, Cadmium, Chromium (III), Chromium (VI), Copper, Lead, Manganese, Mercury, Nickel, Selenium, Zinc, total and free cyanide, speciated polycyclic hydrocarbons (PAH 16), total phenol, sulphate as SO4, sulphide, chloride, Ammonium as NH4, Nitrate as N, Nitrate as NO3, Nitrate as NO2, pH, Hardness, electrical conductivity.	3
Speciated Total Petroleum Hydrocarbons (TPH CWG) inc BTEX and MTBE.	3

The Chemical Laboratory Testing Results are presented in Appendix D.

4.5 Groundwater Monitoring

Groundwater monitoring standpipes were installed in three boreholes drilled adjacent to Redwither Brook. The standpipes were installed in a precautionary manner to monitor groundwater if required, as discussed in Section 8.5 of this report. The standpipes were constructed in general accordance with the relevant guidance, and a summary of the installation construction is presented in the table below:

Location	Internal Diameter Pipe	Response Zone (m bgl)	Targeted Strata	Purpose
WS106	50mm HDPE	1.60 – 3.60	SAND, Sandy SILT, Sandy CLAY	Groundwater
WS107	50mm HDPE	0.80 – 2.80	SAND, Sandy SILT, Sandy CLAY	Groundwater
WS108	50mm HDPE	1.00 – 3.00	SAND, Sandy SILT, Sandy CLAY	Groundwater

4.6 Gas Monitoring

Ground gas monitoring was outside of the scope of work and therefore no ground gas monitoring wells were installed during this ground investigation. Gas monitoring and risk assessment is discussed further in Section 8.7 of this report.

5.0 GROUND CONDITIONS

5.1 Summary

A brief summary of the ground conditions encountered is presented in the table below (this includes the previous SP Associates 2025 ground investigation and the BSL 2026 investigation):

Stratum	Range Depths - Top (m bgl)	Range Depths - Base (m bgl)	Range Thickness' (m)	Brief Description
Made Ground	Surface	0.20 – 1.50	0.20 – 1.50	Variable but generally CLAY with varying proportions of gravel and sand. Less commonly SAND and GRAVEL. Gravel was comprised of brick, concrete, quartz, coal, mudstone, shale, and sandstone.
Natural Topsoil	Surface	0.20	0.20	CLAY or silty CLAY with frequent roots and rootlets.
Natural Superficial Strata (WS101-WS105)	0.20 – 1.50	2.45 - >4.45	0.95 - >3.75	CLAY with varying proportions of sand and gravel.
Natural Superficial Strata (WS106-WS108)	0.20 – 0.90	3.45 – >4.45	3.25 – >3.55	Interbedded Alluvial SAND, SILT, and CLAY with varying proportions of gravel. Underlying CLAY with varying proportions of gravel, silt, and sand.

Details are provided in the logs in Appendix B and the individual strata are described in the sections below, using the 2025 SP Associates and 2026 BSL ground investigations.

5.2 Made Ground

Made Ground – Topsoil
Made Ground Topsoil was encountered across the site (WS102, WS103, WS105, WS106, BH2 and BH5) from ground level to between 0.10m and 0.30m bgl, comprising either brown sand or dark brown clay with frequent tree roots, rootlets, and anthropogenic inclusions of fine to medium gravel-sized brick fragments.

Made Ground – General
Made ground was encountered within 6 locations across the site (WS101-106 and all 2025 investigation locations) and was observed from ground level to depths between 0.20m and 1.50m bgl.

The composition of the made ground was variable across the site, but comprised clay with varying proportions of gravel and cobbles, and less commonly gravel or sand with varying proportions of silt and clay. Gravel was subangular to angular fine to medium of brick, concrete, quartz, burnt shale, mudstone, sandstone, charcoal, and coal fragments. Cobbles were present in one borehole and were subangular 70-80mm of concrete.

5.3 Natural Topsoil

Natural Topsoil was encountered in two locations in the lower elevation southwestern area of the site adjacent to Redwither Brook (in WS107 and WS108).

Topsoil was encountered from ground level to 0.20m bgl, comprising either dark brown clay or dark brown slightly sandy silty clay with frequent small tree roots and rootlets.

For the purpose of this assessment, topsoil is defined as the upper darker and more fertile layer of the soil profile which is a product of natural chemical, physical, biological and environmental processes. This does not imply compliance with BS 3882:2015.

5.4 Natural Superficial Strata

The natural strata underlying the site can be subdivided into two main areas. The natural superficial deposits at higher elevation across the majority of the site (WS101-105), and the natural strata in the lower elevation southwestern area of the site adjacent to Redwither Brook (WS106-108).

The natural strata encountered at higher elevation across the majority of the site (WS101-105) were generally firm to stiff clay with varying amounts of gravel and sand as a minor constituent. This is interpreted to represent Glacial Till.

The natural strata in the lower elevation southwestern area of the site adjacent to Redwither Brook (WS106-108) comprised interbedded saturated sand, silt, and clay, with varying amounts of organic matter and gravel. This is interpreted to represent alluvial deposits. SPT values in the alluvial soils indicated the sand to be very loose and the silts and clays to be very soft.

5.5 Solid Geology

The western half of the site is mapped as the Salop Formation comprising mudstone, sandstone, and conglomerate. The eastern half of the site is mapped as the Kinnerton Sandstone Formation consisting of sandstone.

The bedrock geology was not encountered in the investigations. A BGS borehole located approximately in the north of the site encountered clay soils to 18m depth. A nearby BGS borehole situated approximately 100m north of the site encountered mostly clay soils to 45m depth with occasional sand lenses, while a BGS borehole 300m west of the site encountered interbedded mudstone and sandstone from 16.50m depth.

5.6 Groundwater

The depths to groundwater and locations present during site works are shown in the table below:

Location	Depth During Site Works (m)	Comments
WS106	1.30, 2.50, 3.20	-
WS107	1.50, 2.10	-
WS108	1.20, 2.00	-

5.7 Observations

Contamination
During the works undertaken by BSL, observations for both visual and olfactory evidence of contamination were undertaken.

With the exception of charcoal and burnt shale observed as a minor constituent in the made ground soils, no other evidence of contamination was observed at the site.

Stability of Excavations/Boreholes
The sides of the boreholes were generally stable, however minor collapse of the natural strata was observed in WS106, WS107, and WS108 due to groundwater inundation.

The firm to hard nature of the clay across the site resulted in relatively shallow SPT N value refusals in boreholes.

The borehole sidewalls were generally stable, and window sampling progressed without the need to install casing.

Obstructions
No obstructions were observed during the ground investigations on site.

UXO
No known possible UXO was encountered during the works.

6.0 TEST RESULTS

6.1 Geotechnical Laboratory Testing

Plasticity Index Analysis
Plasticity index results ranged between 23% and 26%. Associated water contents ranged between 18.7% and 32.6%.

After modification of particle size in accordance with BRE 240 the modified plasticity indices are in the range 22% to 25% indicating the cohesive soils to be of medium volume change potential.

6.2 Aggressive Ground Conditions – Geotechnical Chemical Testing

The test results for the assessment of aggressive ground conditions are presented in Appendix D. The results are summarised and assessed within Section 7.7 of this report.

6.3 In Situ Geotechnical Testing

In Situ Standard Penetration Tests
Standard Penetration Tests (SPTs) were carried out within the window sample boreholes at regular 1.0m to 1.2m intervals. The results of the individual blows and the N-values are recorded on the Exploratory Hole Logs in Appendix B.

All SPT N values are uncorrected. Density and strength descriptors are reported in accordance with the guidelines stated in BS 5930:2015+A1:2020, incorporating requirements of BS EN ISO 14688-1:2018, BS EN ISO 14688-2:2018 and BS EN ISO 14689-1:2018.

Soil Infiltration Test Results
In the 2025 SP Associates ground investigation, soil infiltration tests were undertaken within trial pits, and a summary of the results is presented in the table below. These were carried out in general accordance with BRE Digest 365 (BRE 2016) where infiltration rates allow three test runs during a working day (or where there is no infiltration), but where low infiltration rates were encountered the available time may not have been sufficient to fully comply with the BRE test method.

Where less than three tests were possible in a particular location the results provided should be considered as indicative only. Further discussion concerning the suitability of infiltration testing at the site is provided in Section 7.9.

Location	Stratum Type	Depth (m)	Infiltration Rate (m/sec) Test 1
TP1	CLAY	1.02 – 1.90	Test run for 4 hours then abandoned due to very slow rate of infiltration in stiff clay.
TP2	CLAY	0.98 – 1.80	Test run for 4 hours then abandoned due to very slow rate of infiltration in stiff clay.
TP3	Sandy CLAY	1.03 – 1.90	Test run for 4 hours then abandoned due to very slow rate of infiltration in stiff clay.

6.4 Geo-Environmental Testing

Chemical Laboratory Testing
The chemical test results for soils are presented in Appendix D. The results are summarised and assessed within Section 8.0 of this report.

Ground Gas Monitoring

SP Associates ground gas monitoring results are summarised and assessed within Section 8.7 of this report.

7.0 GEOTECHNICAL ASSESSMENT

7.1 Ground Model

The site is currently undulating and exposed ground with sparse mature trees due to recent vegetation clearance. An embankment is present to the southwest of the proposed development, and a brick building is present slightly beyond the northeast of the proposed development.

The ground conditions can be summarised as below (top down):

- Made ground generally comprising clay with varying proportions of sand and gravel from ground level to between 0.20m and 1.50m bgl.
- Natural superficial deposits mostly comprising firm to hard clay (Glacial Till) proven to depths of at least 4.45m bgl. Natural deposits consisting of interbedded saturated very loose or very soft sand, silt, and clay (Alluvium) were proven to depths of between 2.40m and 2.70m bgl to the southwest of the proposed development adjacent to Redwither Brook.
- Solid geology was not encountered in the 2025 or 2026 ground investigations. A BGS borehole conducted in the northern part of the site encountered clay soils to 18.00m depth. Other nearby BGS boreholes varied, with one having encountered clay soils to 45.00m depth, and another having encountered mudstone from 16.50m depth.
- No groundwater was identified across the majority of the site. Groundwater levels ranging between 1.20m and 3.20m bgl were identified during site works at lower elevation adjacent to Redwither Brook.

Infilled former bunkers and structures were historically removed and likely infilled with imported material, however the exact location(s) across the site are unknown. This will need to be taken into consideration for foundation design and earthworks; similar features may still be present.

The site is considered moderate to high UXO risk as it was formerly ROF Wrexham known for manufacturing explosives and storing ammunition. A detailed UXO Risk Assessment is therefore recommended before intrusive ground works.

The site is not considered to be susceptible to flooding from rivers, groundwater at surface, or the sea. However, land approximately 30m south-west of the site does show flood susceptibility. A separate specialist flood risk assessment is recommended if required for planning.

7.2 Design Soil Parameters

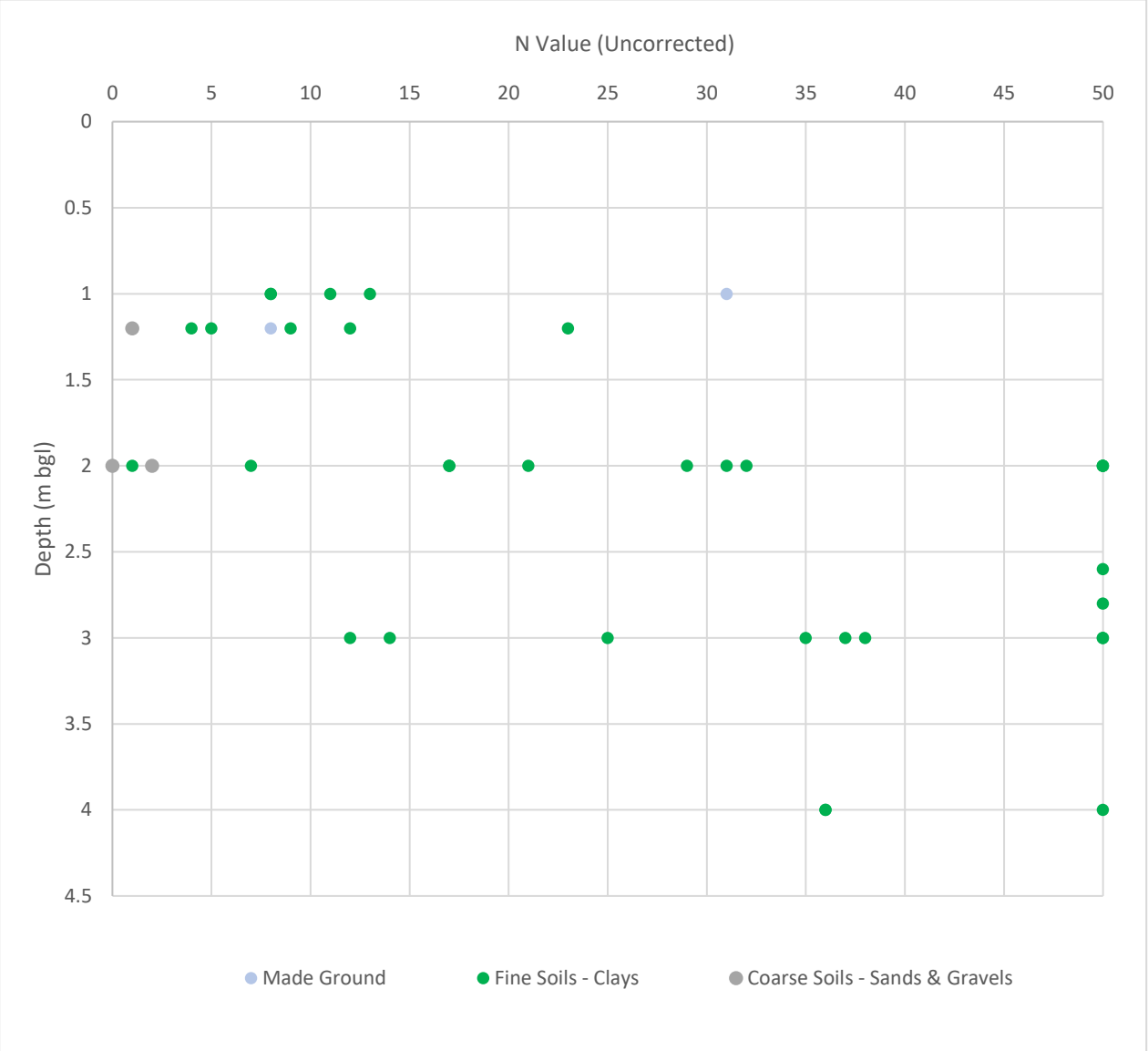
The relevant test results from the prior section have been evaluated to derive geotechnical soil parameters for the site.

For cohesive (fine) soils, the equivalent approximate undrained shear strengths (Cu) have been calculated from the recorded SPT N values, adopting f1 values based on the correlation of Stroud (1975) and the ‘average’ plasticity.

The equivalent approximate coefficients of volume compressibility (mv) have also been calculated from the recorded SPT N values, adopting f2 values based on the correlation of Stroud (1975) and the ‘average’ plasticity.

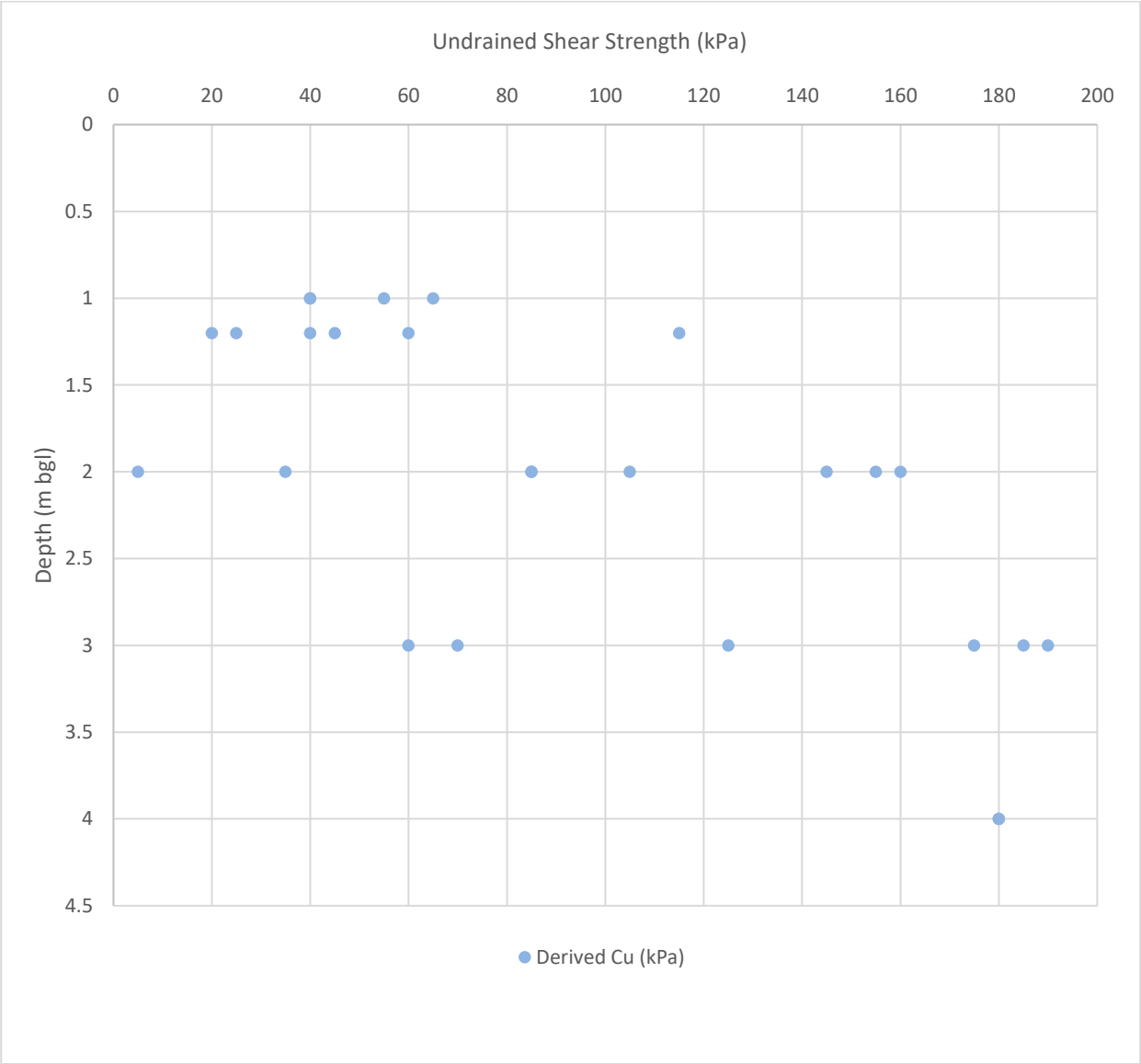
The angle of shearing resistance (ϕ') of the granular (coarse) soils has been derived from the uncorrected SPT N value data and the correlation of Peck (1967).

A depth (m bgl) vs SPT N value graph is also provided below to provide a profile of the materials underlying the site.



The above graph shows that the natural fine soils are variable but generally have higher N values with increasing depth, although it should be noted that the three lowest N values (N = 1, 4, 5) in the natural fine soils are all in interbedded alluvium beyond the proposed development area. The graph also shows the natural coarse soils to all be very loose in density, and that only two N values were recorded within the made ground which varied significantly in soil strength.

A depth (m bgl) vs derived shear strength (Cu) graph is provided below to provide a profile of the cohesive soils underlying the site.



The above graph shows a general increase in soils strengths as depth increases. It should be noted that the three lowest derived Cu values (5, 20, 25 kPa) in the natural fine soils are all in interbedded alluvium beyond the proposed development area.

Characteristic Values

Characterisation of the geotechnical parameters above has been undertaken to obtain characteristic values, which are a cautious estimate of the values affecting the occurrence of the limit state, taking into consideration typical minimum foundation depths for cohesive and granular soils.

Characteristic values for made ground are not presented due to the heterogeneity of the deposits and that they are not typically considered to be a suitable bearing stratum without some form of ground improvement.

Cohesive
Based on the medium volume change of the cohesive soils, foundations should be placed at a minimum depth of 0.90m bgl, therefore characteristic values are presented for this approximate depth, although may need to be deeper in areas due to made ground thickness.

The granular soils encountered in the investigation were all beyond the proposed development area, therefore founding depths in granular soils are not required to be assessed.

The characteristic value for undrained shear strength (Cu) in natural cohesive deposits below the proposed development at 1.00-1.20m begl is interpreted to be 55 kN/m^2, increasing to 150 kN/m^2 at 2.00m begl. These characteristic values are only for the proposed development area and are excluding the very soft or very loose soils encountered adjacent to Redwither Brook.

Approximate coefficients of volume compressibility (mv) derived from the in situ SPT testing within the cohesive materials range from 0.04 m^2/MN to 2.00 m^2/MN adopting an f2 value of 0.5 (based on the 'average' plasticity of 24).

Summary of derived geotechnical parameters
The table below summarises the characteristic geotechnical parameters for the site:

Stratum	Depth (m begl)	C_u (kN/m^2)	Mv (m^2/MN)
Superficial Deposits – Cohesive	1.00-1.20	55	0.195
	2.00	150	0.093

7.3 Foundations

The development will comprise an industrial warehouse building with a steel frame and is considered to be classed as Geotechnical Category 2 in accordance with Eurocode 7.

Preliminary design by calculation has been undertaken to determine the design resistance of the bearing strata in the following section. Note that the made ground, present to depths down to 1.50m bgl, is not considered to be a suitable bearing stratum.

Proposed structural loads of 150-200 kN/m were provided at the time of writing, therefore the following recommendations are provisional and should be reviewed at the detailed design stage.

The prior assessment recommended traditional shallow strip/pad foundations founded within the natural glacial Till deposits.

This foundation assessment utilises the provided Regrade Cut/Fill Plan (Drawing No. RCFP01) dated 20 March 2025. Any revisions to this Cut/Fill Plan would change the foundation recommendations, therefore the following recommendations are provisional and should be reviewed at the detailed design stage.

Shallow Foundations – Ground Beam Strip / Trench Fill and Pads
The most suitable foundations for the proposed warehouse building are considered to be ground beam strip / trench fill foundations for line loads/masonry in combination with pad foundations for steel portal frame elements.

Based on the medium volume change potential foundations should be placed at a minimum depth of 0.90m bgl into the natural cohesive deposits and deepened near trees and hedges in accordance with NHBC Chapter 4.2.

Over most of the proposed building area, there is minimal cut or fill shown on the provided Regrade Cut/Fill Plan. Therefore, building foundations will require embedment into natural cohesive deposits. Embedment can either be to:

- At least 0.90-1.00m below existing ground level (begl) into cohesive glacial Till deposits with estimated Cu of 55 kPa. Foundations are to be deepened where made ground is still present at 1.00m begl.
- 2.00m begl into cohesive glacial Till deposits with estimated Cu of 150 kPa. Foundations are to be deepened if made ground is still present at 2.0m begl.

The southern extent of the proposed building is shown to have >3.00m of engineered fill to be placed during earthworks. Made ground varies in thickness across the site, although it is thickest (1.50m bgl) at the southern extents of the proposed building platform. Therefore, embedment depth through the proposed engineered fill and into natural glacial Till may be approximately 4.50m deep in the south of the site, if taken to the top of the glacial Till.

If it is decided to embed the foundations deeper into the cohesive glacial Till deposits to obtain a higher bearing capacity, then an embedment depth of approximately 5.5m may be required in the south of the site.

The ground beam foundations may either be taken to approximately 1.00m begl to found on undisturbed natural firm clay or embedded approximately 2.00m begl into undisturbed natural stiff to very stiff clay. Foundations may either be placed at embedment depth or infilled with lean mix concrete to formation level.

At 1.00m bgl, an allowable bearing capacity not exceeding 110 kN/m^2 may be assumed. At 2.00m bgl, an allowable bearing capacity not exceeding 150 kN/m^2 may be assumed. This adopts a factor of safety of 3 which should limit settlements to within acceptable limits.

The surface water drain proposed to be constructed on site will need to be considered when designing the foundations. It is unadvisable for construction to be undertaken over the feature, foundations will either need to be taken to below the base of the feature or situated 3 to 4 times the breadth of the foundation away from it, this would ensure that the surface water drain is outside the pressure bulb of the foundation and that no load is being transferred to it.

Trees are noted within the area of the site proposed for development. Depending on their size, type and maturity, the required depth of founding based on the recommendations of BRE 298 may exceed 2.5m. Should this prove to be the case, then piled foundations should be considered as a potentially more economical solution, unless it can be proven that the soils are not desiccated.

Alternative Solutions
Alternatively, given the likely depth of fill across the southern part of the structure, foundations could be either placed in engineered fill if the end performance can be validated, or a deep solution such as the installation of vibro-stone columns or piles would need to be adopted. To minimise the effects of differential settlement, it is recommended that a single foundation option is designed and constructed across the entire building platform.

If a deep solution is opted for, then additional investigation may be required, subject to input from a vibro/piling contractor. In addition, prior to commencement of any penetrative works (piling/vibro), a working platform will be required for tracked plant. This should be designed and installed in accordance with BR470 (BRE 2004) based on the plant requirements, data and rig loadings.

General Advice for Shallow Foundations
The bearing stratum should be inspected for 'soft spots' within the natural clay strata, resulting for instance from localised groundwater perched within the overlying fill materials. If unsuitable soft soils are encountered, then foundations will need to be deepened to found on suitable strata or soft or loose zones should be excavated and replaced with well compacted suitable granular fill or lean mix concrete. The stratum should also be inspected for 'hard spots" which may require removal.

If the ground conditions encountered during the construction phase differ significantly to the conditions encountered during construction, work should cease and BSL be contacted for further advice.

During the construction phase, supervision should be on a continuous basis to check the design assumptions are correct and construction conforms to design. Supervision should include inspections, Control Ground Investigations and monitoring.

UXO
Based on the available information to date, specialist UXO advice and/or supervision will be required for all groundworks.

7.4 Building Near Trees

The clay soils on site are of medium volume change potential. Where foundation excavations (or piles if adopted) encounter cohesive strata in the vicinity of existing, proposed or recently removed trees, foundations should be adjusted in full accordance with BRE 298. All foundations should be deepened below roots of greater than 5mm diameter during excavations for footings.

A survey of all trees and hedges on the site and within influencing distance of the site boundary should be undertaken to identify tree species and heights by a qualified arboriculturist in accordance with BS 5837:2012. This information will be required in order to assess the effects of trees on the cohesive strata.

Where foundation depths due to trees already present or recently removed exceeds 1.50m, there is a possibility for heave to occur on removal of the tree and guidance states that compressible material or void former is required against the inside face of the foundation, unless it can be satisfied that the soil is not desiccated.

7.5 Floor Slabs

Ground bearing slabs may be adopted at the site providing the following criteria are satisfied:

- Any other compressible or unsuitable materials (topsoil containing vegetation and organic matter, including tree roots), are excavated and either removed and replaced with suitable materials or, if suitable (e.g. soft clays), improved by methods such as addition of lime/cement.
- The foundation depth (such as due to the influence of trees) is less than 1.5m.
- Any fill beneath the slab is suitable, well-compacted granular material placed in an appropriate thickness in accordance with a suitable specification (e.g. CC 601) designed and supervised by an appropriately qualified consultant, with the end performance validated.
- The slab is adequately reinforced.
- Regular construction joints and ties are provided to allow for differential settlement.

Given the thickness of made ground present (generally >600mm), suspended floor slabs may alternatively be adopted at the site.

The final floor slab design should be of sufficient thickness and sufficiently reinforced to accept the envisaged applied loads, without unacceptable total or differential movement.

Vertical elements within the structure, such as columns and walls will need to be isolated from the ground bearing slab in order to allow for the slab to expand against them without resulting in cracking.

Prior to the placement of the founding materials and the construction of a ground bearing floor slab, the sub-formation and formation will need to be inspected and checked by a geotechnical engineer to ensure the ground conditions are as expected. If soft spots or hard spots are identified at the formation level, they should be reported to the Geotechnical Engineer immediately and remedial actions agreed.

Incorporation of geogrid reinforcement at formation level, before granular material is placed and compacted, will likely minimise required excavation depths and help provide a suitable foundation for the ground bearing slab.

Ground floor slabs should also be designed to incorporate any ground gas protections measures; basic radon protection is required in this instance.

7.6 Site Preparation and Construction

If former underground relict structures (e.g. infilled bunkers) are encountered during construction, they will need to be grubbed out and fully removed. Topsoil and subsoil should be removed from beneath all proposed buildings and hardstanding areas.

There is a high voltage overhead powerline running through the western extents of the site, and another high voltage overhead powerline slightly to the east of the proposed development. There are also underground electricity services mapped slightly to the south of the proposed building area and underground water services mapped to the southwest of the site adjacent to Redwither Brook. To allow construction, all services will need to be disconnected, and any suspected dead services confirmed as dead by testing.

Instability of excavations through natural cohesive soils is not anticipated provided they are not exposed to adverse weather conditions for any substantial period of time. Instability of the made ground and alluvial deposits should be allowed for as they contain a combination of granular and cohesive material. All excavations should be carried out in accordance with CIRIA Report 97 'Trenching Practice'.

Excavation depths should generally be readily achieved using conventional plant (JCB or similar) although high specification plant (tracked 360^{o} or similar) is recommended to maintain the build programme. Breaking equipment may potentially be required locally to penetrate old, infilled bunkers or structures associated with former ROF Wrexham.

The presence of substantial depths of made ground and proposed fill across the site may result in settlement of newly installed drainage. This should be taken into consideration during the design of drainage, which may include flexible joints to allow for some differential settlement.

It should be noted that undertaking treatment locally or using deepened foundations (i.e. focussing only on the footprint of structures) means that the surrounding areas (roads and landscaping) may settle relative to the structures if disturbed. This risk can be mitigated by undertaking site wide earthworks to an appropriate specification.

To protect against the effects of heave, new drainage in cohesive soils should be designed to take account of potential ground movement, including where pipes and services which pass through substructure walls

or foundations. The volume change potential on this site is medium and the potential ground movements that need to be considered for design are 100mm.

7.7 Concrete Classification

The soluble sulphate and pH test results have been assessed in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005. The Design Sulphate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in the table below.

For the purposes of this assessment, the groundwater has been classified as static given that the site is predominantly underlain by low permeability clay soils.

Stratum	No. Samples	Characteristic SO_4 (g/l)	Characteristic pH	DS Class	ACEC Class
Topsoil	1	35.1	6.9	DS1	AC-1s
Made Ground	6	49.1	7.6	DS1	AC-1s
Natural Superficial Strata	9	144.2	7.2	DS1	AC-1s

Based on the above, the results of laboratory pH and sulphate content, alongside the BRE full suite tests, indicate that sulphate class DS-1 and ACEC Class AC-1s conditions prevail in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005.

The specific concrete mixes (the Design Concrete Class) to be used on site will be determined by the site-specific concrete requirements in terms of the durability and structural performance. These are assessed in terms of the Structural Performance Level (SPL) and any need for Additional Protective Measures (APM) detailed in Part D of BRE Special Digest 1 with further guidance in Pt E and F.

The 2025 SP Associates ground investigation included pH and soluble sulphate testing on 10 soil samples. The resulting concrete classification assessment identified a DS class of DS-1 and a corresponding ACEC class of AC-1.

7.8 Highways

Based on Table 5.1 from DMRB IAN 73/06 Rev 1 equilibrium CBR values of 5% are likely to be achieved in undisturbed natural granular soils and 2% for natural clay soils for pavement design purposes, unless proven otherwise by in-situ testing at formation level by a specialist geotechnical engineer. Equilibrium CBR values are likely to be 2% within the made ground.

Where the CBR is found to be less than 2%, the sub-grade is unlikely to be suitable for both the trafficking of site plant and as a permanent highway foundation without improvement of the soils.

To achieve the required design CBR value, improvement works should be carried out in accordance with DMRB IAN 73/06 Rev 1 Chapter 5 and may include proof rolling, excavation and re-engineering / replacement of weaker soils, the inclusion of a geogrid or use of stabilisation techniques such as the addition of hydraulic binders (e.g. cement/lime).

Based on the fines content of the soils, they are considered to be frost susceptible, therefore highway construction should be a minimum thickness of 450mm to mitigate against the risk.

Care should be taken to ensure the stratum at formation level is protected against inclement weather, as this is likely to lead to surface deterioration and a decrease in soils strengths.

7.9 Site Drainage

Based on the 2025 SP Associates ground investigation, the use of traditional soakaways within the natural ground was not considered to be feasible at the site due to the low infiltration rates obtained (on the order of 10^{-9} m/s) and the presence of low permeability cohesive strata underlying the site.

A soakaway test was initially proposed for the 2026 BSL ground investigation, however this was cancelled prior to the investigation as we understand NRW commented that the previous soakaway testing data would be sufficient for the site.

Due to the low infiltration rates obtained from natural superficial deposits on the site, an alternative drainage method will be required.

7.10 Slope Stability

A slope exists to the southwest of the proposed development, decreasing approximately 4m in elevation from the proposed development area to Redwither Brook below. The slope is moderately steep and vegetated with brambles and mature trees, with the walkover revealing the slope embankment to be clearly comprised of made ground (concrete and brick boulders) in one location.

This slope is situated beyond the proposed development area, displayed no obvious signs of slope instability during the site walkover, and was largely vegetated, therefore the slope is considered likely to pose minimal risk to the proposed development in its current state.

The provided Regrade Cut/Fill Plan shows significant depths (>5m) of proposed cut material along the bottom of this slope. It is not recommended that the toe of this slope be over-steepened as shown on the provided Cut/Fill plan, as this may result in the destabilisation of the slope and the ground failing towards Redwither Brook. If material is to be excavated from this slope for re-use elsewhere onsite, it is recommended that the current slope angle remains approximately the same or reduced is feasible. Alternatively, if the development will cut into the toe of the slope as shown on the Cut/Fill plan, then further assessment of slope stability may be required, or design and installation of a retaining wall may be required.

7.11 Earthworks

Given the variability of existing site levels and development layout requirements, earthworks will be required in order to achieve the desired development platform levels.

Design of the earthworks, particularly in the southwestern part of the site, should consider the stability of any cut or fill slopes. Any fill should be placed in accordance with an appropriate specification, as discussed further below. Designs should allow for incorporation of suitable drainage to prevent the build-up of pore water pressure which could lead to slope instability.

An initial assessment reveals spoil resulting from excavations within the made ground and superficial deposits should generally be suitable for re-use as general fill subject to further testing and specification or may be disposed off site.

The topsoil may only be used as landscaping fill subject to the necessary approvals or should be disposed of off site to a suitable facility.

Recorded water contents range from 18.7% to 32.6%, with an average of 24.8%.

The soils may be suitable for stabilisation and improvement by the inclusion of binders, subject to further detailed design and testing.

Where it is proposed to re-use site won materials as an engineered fill, it will be necessary to develop an appropriate Earthworks Specification. The basis for the Specification should be BS 6031:2009 and the latest version of the Standards for Highways, CC 601 Earthworks. Note that testing for earthworks was not within the scope of the investigation but is recommended.

If site-won material is to be re-used on site, it is recommended this is carried out under the CL:AIRE Development Industry Code of Practice (DoWCoP CL:AIRE March 2011).

8.0 GEO-ENVIRONMENTAL RISK ASSESSMENT

8.1 Introduction

The samples were tested for an assessment of the chemical contamination that may pose a risk to human health. The results were examined with reference to a selection of guidance documents as detailed in Appendix A. In this case the LQM/CIEH S4ULs and DEFRA C4SLs for a commercial end use have been adopted as Tier 1 generic screening values.

Where samples record determinand concentrations that exceed the relevant screening values then these will be considered further.

A summary assessment sheet is presented in Appendix D alongside the chemical test results. Results are discussed in detail in the sections below.

8.2 Previous Geo-Environmental Assessment

A geo-environmental assessment was previously undertaken by SP Associates following their 2025 ground investigation. The assessment utilised soil samples from window sample boreholes that were tested for asbestos, phenols, heavy metals, inorganic chemicals, speciated petroleum hydrocarbons, PAHs, and BTEX. The assessment compared the chemical data to Tier 1 chemical screening criteria for industrial/commercial end use.

The SP Associates geo-environmental assessment found that none of the above tested determinands were present at concentrations that exceeded their Tier 1 screening acceptance criteria values. Therefore, the risk to human health from contaminants within onsite shallow soils was considered to be low.

8.3 Soils Test Results and Risk Assessment – Human Health

Metals
No metals have been detected above the adopted screening criteria.

Asbestos
No asbestos has been detected in any of the eight samples screened.

Poly Aromatic Hydrocarbons (PAHs)
No PAHs have been detected above the adopted screening criteria.

Total Petroleum Hydrocarbons (TPH CWG)
No petroleum hydrocarbons have been detected above the adopted screening criteria.

BTEX and MTBE
No BTEX or MTBE compounds have been detected above the adopted screening criteria.

PCBs
No PCBs have been detected above the adopted Atkins AtRisk Soil SSVs screening criteria.

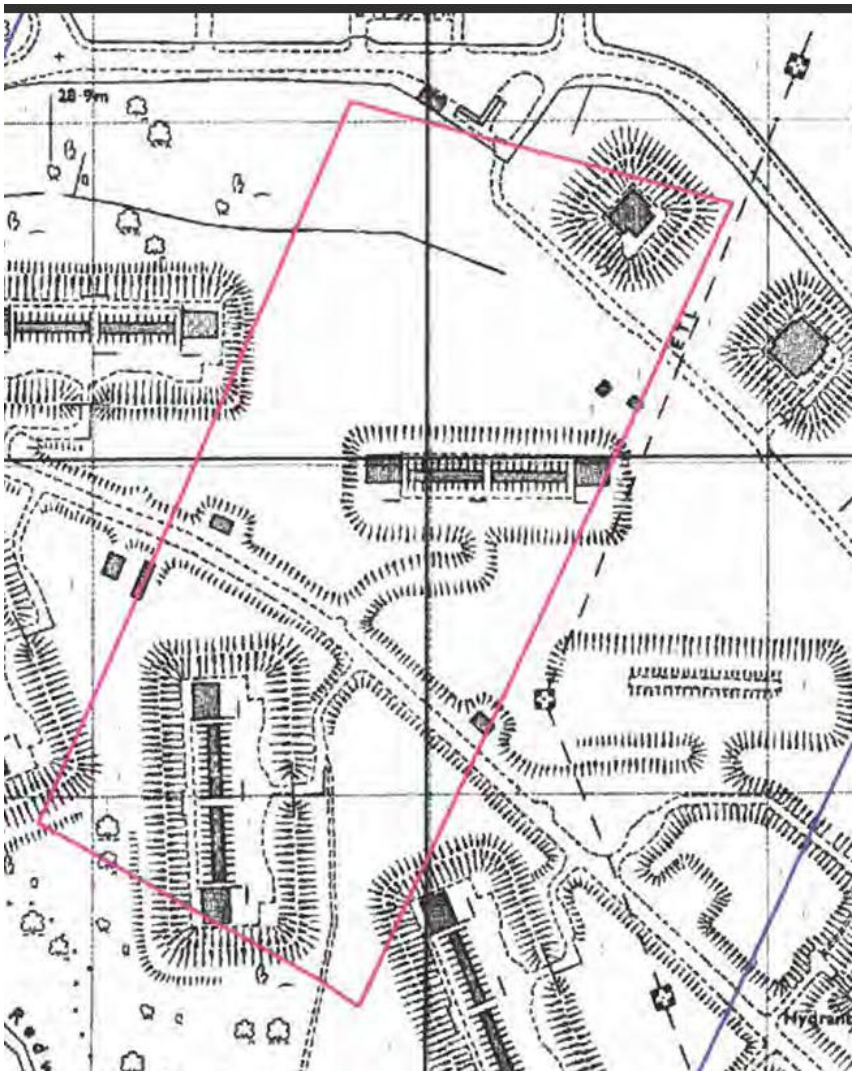
Explosives
No explosives suite chemicals have been detected above the adopted LQM/CIEH screening criteria; essentially all determinands were at or below laboratory detection limits.

8.4 Summary – Human Health Risk Assessment

Based on the testing and assessment undertaken, no further action is required in respect to human health risks from soils contamination, based on the intended end use. This is inclusive of the testing for explosives and PCBs related to the former site use as a cordite manufacturer and ammunition dump which were all below adopted screening criteria, therefore no further action is required.

The site history was further assessed regarding its previous use for cordite manufacturing. Further inspection of the Ordnance Survey Maps from the SP Associates Phase 1 assessment showed the following was present from approximately World War Two until 1980 (see site boundary in pink on attached snip):

- Small unnamed building in the northeast of the site.
- Group of buildings in the centre-east of the site.
- Group of buildings in the southwest of the site.
- Road traversing east-west across the southern portion of the site.



The mapping shows no obvious point sources for where cordite may be produced or disposed of within the site boundary. Explosives suite testing was undertaken in samples from WS101 (near no previous infrastructure), WS102 (near the centre-east group of buildings shown above), and WS105 (near the south-west group of buildings shown above). Therefore, the explosives suite testing was approximately located in areas of previous buildings which may have been used for cordite manufacturing. However, any cordite produced may have been dumped elsewhere on site or disposed off-site.

8.5 Soil, Water and Leachate Test Results – Controlled Waters

Soils

No significant concentrations of contaminants were identified in the soils tested. As soil contamination is a recognised indicator of potential groundwater impaction (i.e. with the soils as a potential source), the absence of any significant concentrations in the soils tested, the lack of visual and olfactory evidence of contamination and combined with the low permeability strata and the controlled waters risk assessment rationale in Section 8.6 below, indicates a low risk is posed to the identified and groundwater receptors.

8.6 Controlled Waters Risk Assessment

The site is not considered to pose a significant risk to controlled waters for the following reasons:

- Whilst the nearest groundwater abstraction is 160m southwest of the site, likely abstracting from the Principal Aquifer, no significant gross or mobile contamination has been identified on site in soils based on the results obtained as a potential indicator of groundwater contamination.
- Groundwater contamination testing from boreholes adjacent to Redwither Brook identified:
    - Mobile contamination (TPH, PAHs) was generally below lab detection limits.
    - There were a few exceedances of metals/ammonium, however it is likely these substances originate from the natural geology (especially in the case of manganese associated with Glacial Till and Alluvium) or in the case of ammonia/nitrate, are associated with a wider area issue from farming/industrial input as opposed to the subject site. Additionally, the inland waters EQS for copper, manganese, nickel and lead are based on the bioavailable fraction and because bioavailability has not been calculated for these metals the assessment is conservative as it is based on the assumption of 100% bioavailability.
    - Whilst there are exceedances of the EQS, at the concentrations identified it would likely be technically challenging and disproportionately costly to remove these contaminants from the discontinuous perched groundwater horizons, especially given the diffuse pollution from natural and wider area sources.
- Following development of the site, the condition of controlled waters may improve with increased hard cover and water retaining imported soft landscaping soils.
- There is unlikely to be any significant input of new contamination at the site in future, and the nature of the proposed development is considered to be low risk.
- The nearest watercourse is Redwither Brook approximately 10m southwest of the proposed development and 90m southwest of the proposed building platform, which provides some distance for attenuation and contaminant degradation from possible minor leachate generation from the made ground.
- The majority of the site is underlain by low permeability clays which will inhibit lateral and vertical contaminant migration.
- A BGS borehole situated in the north of the site indicates at least 18.00m thickness of low permeability cohesive deposits which as stated above will inhibit lateral and vertical contaminant migration.
- For the made ground, the preparation of samples for leachability analysis has not been undertaken as this is an aggressive methodology and provides theoretical values which are unlikely to be representative of existing site conditions, real site leaching concentrations will be reduced significantly from that indicated by the laboratory testing, furthermore this would not be representative of post construction conditions, which will significantly reduce infiltration.
- The concentrations of leachable substances that could emanate from the site will be subject to dilution and dispersal during transport and so the risks will reduce with distance from the site and into the identified surrounding water bodies.
- No significant groundwater body has been encountered with the glacial Till which underlies the majority of the site; boreholes were dry.
- There is no perceived risk to the underlying sensitive Principal Aquifer due to the geology; perched waters within the superficial aquifer are highly unlikely to be in hydraulic continuity with the underlying bedrock.

- Given the very low to negligible permeability nature of the superficial deposits as proven by infiltration testing, and interbedded nature of thin granular lenses in limited alluvium in the south, such bands are unlikely to provide any significant volume of groundwater to other features via baseflow.
- Based on the infiltration testing carried out, drainage to soakaways will not be feasible at the site, further reducing the risk of potential leachate generation, thus making any chemical testing of such strata of little worth.
- Whilst an attenuation basin is proposed in the south, construction will include low permeability membranes/low permeability natural site-won cohesive fill, minimising the potential for contaminant transport.
- The proposed foundation solution for structures will likely be mass trench fill concrete. This option will not create any new pathways, as these methods are unlikely to advance deeper than 2-3m into the very stiff clays; there would still be a significant thickness of very low to negligible permeability clay between the base of foundations and the Principal Aquifer. In addition, as stated above, there will be increased hard cover and improved drainage which would reduce the propensity for leachate generation in any case.
- Good site practice and modern construction techniques and equipment mean the risk of spillages from construction plant is unlikely and this temporary potential source is considered to have a low risk to controlled waters.
- The findings of this investigation concur with prior investigation and the assessment of a low risk to controlled waters by an independent consultant.
- The above wording clarifies the Conceptual Site Model with respect to controlled waters risk. No clear site-specific artificial contamination source exists, and contamination pathways are highly restricted, therefore no clear source-pathway-receptor linkage exists at the site with respect to controlled waters.

Based on the above, no further action is considered to be required with respect to controlled waters.

8.7 Ground Gas Risk Assessment

A summary of the SP Associates ground gas monitoring regime and assessment are discussed below.

The carbon dioxide measured within the boreholes had a maximum concentration of 1.6%, while methane was effectively absent. A resulting gas screening value (GSV) of 0.0016 l/hr was calculated for carbon dioxide. In accordance with Ciria C665 guidance, the GSV placed the site into a Characteristic Situation 1 (CS1) classification which classified the site as very low risk with respect to methane and carbon dioxide, therefore no further action is required.

The BGS Radon report indicated that property is in a radon affected area where 5-10% of properties are estimated to be at or above the action level, and that basic radon protective measures are required for the proposed development in accordance with BRE 211.

8.8 Qualitative Risk Assessment

The previous SP Associates CSM has been revised based on the findings of this site investigation and laboratory testing results and these are presented overpage and displayed on drawing C6668/03.

Human Health						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
On site Made Ground Metals, PAH's, PCBs, asbestos, explosives	Root uptake, ingestion, direct contact, inhalation of dusts	End-users	Unlikely	Severe	Low	The site was formerly used to manufacture explosives and store ammunition, with former bunkers that have likely been infilled with imported unknown material, therefore there was considered to be the potential for contaminated made ground to be present on site. However, the concentrations of heavy metals, PAHs, PCBs, explosives, and asbestos across the site are below the relevant screening values. Additionally, the presence of hardstanding across the commercial development will break the pathway to site end users. The risk is considered to be low.
On site Made Ground Metals and organic contamination	Migration into/chemical attack of water supply pipelines	Water Pipelines / End users	Unlikely	Mild	Low	Contaminants within the soil/groundwater could potentially attack the clean potable water supply pipe and should be assessed to determine the correct pipe material and level of precautions required, however, the risk is considered to be low at this stage.
On site and Off Site Made Ground, Small offsite Ponds Ground Gas (carbon dioxide and methane)	Migration into confined spaces, inhalation and asphyxiation/ explosion	End-users / property / structures	Unlikely	Medium	Low	No significant elevations of methane, carbon dioxide, VOCs, carbon monoxide or hydrogen sulphide were detected during the gas monitoring programme conducted by SP Associates. Underground structures immediately to the west, east, and south of the site were historically infilled with unknown material that possibly represents a ground gas source. However, ground gas monitoring identified a very low ground gas risk with respect to methane and carbon dioxide. Small ponds were also historically present within 100m of the site to the west, north, and east, that have since been backfilled, although as stated no significant concentrations have been recorded and lateral gas migration will be mitigated by the low permeability soils encountered on site. The ground gas risk assessment by SP characterised the site as Characteristic Situation 1 with respect to carbon dioxide and methane. Additionally, the 2026 BSL investigation identified the site to be mostly underlain by low permeability deposits and no credible significant ground gas sources were encountered; whilst alluvial deposits were recorded in the south these do not directly underly the proposed structure and in combination with the low permeability glacial Till alongside the inherent protection afforded by basic radon protection measures, the risk is considered to be low from permanent ground gas.

Human Health						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
Natural Geology Radon	Migration into confined spaces, inhalation	End-users	Likely	Medium	Moderate	Site-specific BGS Radon Report and BRE 211 radon advice indicates basic radon protection measures are required.
Off site Electricity Substation PCBs	Ingestion, direct contact, inhalation of dusts	End-users	Unlikely	Mild	Low	The mobility of PCBs is low, PCBs were measured to be below the adopted screening values, and the substation is situated off site. In addition, the proposed development will be covered in hardstanding which will break the pathway to site end users. The risk is considered to be low.
Off site Backfilled pond Metals, PAHs, petroleum hydrocarbons	Ingestion, direct contact, inhalation of vapours	End users	Unlikely	Medium	Low	Small ponds were historically present within 100m of the site to the west, north, and east, that have since been backfilled. However, lateral migration of contaminants will be mitigated by the low permeability soils and lack of groundwater encountered across most of the site. The risk is considered to be low.

Controlled Waters						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
Made Ground PAH's, Metals	Overland flow, / migration through saturated zone	Redwither Brook 10m away (Surface waters)	Unlikely	Medium	Low	Contamination testing by SP Associates and BSL has not identified any significant concentrations of contaminants within the soils analysis as a potential indicator of groundwater impaction. Groundwater contamination testing from boreholes adjacent to Redwither Brook identified: • Mobile contamination (TPH, PAHs) generally below lab detection limits. • There were a few exceedances of metals/ammonium, however it is likely these substances originate from the natural geology (especially in the case of manganese associated with Glacial Till and Alluvium) or in the case of ammonia/nitrate, are associated with a wider area issue from farming/industrial input as opposed to the subject site. Additionally, the inland waters EQS for copper, manganese, nickel and lead are based on the bioavailable fraction and because bioavailability has not been calculated for these metals the assessment is conservative as it is based on the assumption of 100% bioavailability. • Whilst there are exceedances of the EQS, at the concentrations identified it would likely be technically challenging and disproportionately costly to remove these contaminants from the discontinuous perched groundwater horizons, especially given the diffuse pollution from natural and wider area sources. In respect to surface waters, contaminants are also likely to attenuate and degrade over the distance to the Brook. Whilst there are three groundwater abstraction licences or Source Protection Zones within 250m of the site, all relating to a borehole 160m southwest of the site, likely abstracting from the Principal Aquifer, the low permeability of the underlying clay soils will inhibit lateral and vertical migration and further mitigate the risk. The site is also proposed to be surfaced in hardstanding, with a new surface water drainage system installed which will further reduce the risk to controlled waters.
	Leaching through unsaturated zone / Migration through saturated zone	Secondary A Aquifer – Undesignated (Groundwater)				
	Migration through saturated zone	Principal Aquifer (Groundwater)				

Controlled Waters						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
						By virtue of the development taking place, this should contribute to an overall "betterment" of groundwater quality. Therefore, a low risk to controlled waters is posed from the made ground.

8.9 Outline Remedial Measures

No sources of contamination have been identified on site, therefore no specific remedial measures are required for soils in respect to human health for the proposed end use.

Chemical analysis of the natural clay deposits have identified these soils to be acceptable for use as subsoil and general fill.

The previous Phase I Geo-Environmental Assessment identified historical infilled underground structures on site, however none were identified during the investigations undertaken on the site. If infilled structures are encountered with unexpected contamination, then works should cease in that area and BSL be consulted for advice.

Utilities
The level of protection for the clean potable water supply pipes should be determined using the local water company risk assessment criteria in accordance with UKWIR.

As the site is brownfield, there is the assumption that barrier pipe would be utilised, although requirements should be confirmed by risk assessment and with the water supply company.

Ground Gas Protection Systems
Basic radon protection measures in accordance with BRE 211(2023) are required for new buildings at this location.

As radon gas membranes are a passive protection system, after installation and verification they typically do not require associated long-term monitoring (as stipulated by Condition 12). The incorporation of basic radon protection measures would generally be considered an appropriate and proportionate mitigation measure for a commercial development. Therefore, long term monitoring of ground gas is not considered to be required for the site.

Once the above bodies have approved the above outline remedial proposals, a short Remediation Strategy including a Verification Plan for Ground Gas Protection Measures will need to be produced to meet planning requirements and submitted to the regulatory authorities for approval. This will address planning conditions 10-12 and will also give guidance to enable a suitably qualified contractor to carry out the works.

All installations should be subject to verification. The verifier should be independent, competent and suitably trained; BSL can provide this service. We recommend validation requirements should be discussed with the Local Authority prior to installation.

General
It is recommended that the approval of the Regulators (Local Authority / Environment Agency) is obtained in regard to the above prior to any irrevocable action is taken at the site.

In addition, the writing and approval of a Design Statement and Materials Management Plan (MMP) or suitable exemptions/permits will be required to allow re-use of suitable material at the site.

A watching brief is recommended during groundworks for any unidentified sources of contamination. If any gross contaminated material is encountered works should cease in that area and BSL be consulted.

Once remediation is complete, verification reports will need to be produced by a suitably qualified independent geo-environmental engineer, such as BSL, in order to achieve regulatory sign off.

8.10 Health and Safety Issues

During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. The risk to construction and ground workers is assessed in the table below:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
Made Ground (heavy metals, PAHs, petroleum hydrocarbons)	Ingestion, direct contact, inhalation of dusts.	Construction Workers	Low likelihood	Mild	Low
Asbestos	Ingestion, direct contact, inhalation of dusts.	Construction Workers	Low likelihood	Medium	Low
Ground gas	Inhalation in confined spaces/trenches	Construction Workers	Low likelihood	Severe	Low

The risk from made ground will be mitigated by standard PPE including gloves. Welfare facilities should be made available to wash before hand to mouth activities.

General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.
- Hand-washing and boot-washing facilities should be provided.
- Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

8.11 Asbestos

The investigation of asbestos issues within structures was beyond the scope of this report. However, guidance from UK Government indicates that asbestos should be assumed to be present in buildings unless proven otherwise.

Any asbestos within structures will require removal prior to re-development. This will need to be done by a suitably qualified experienced and licensed contractor, who ensures that adequate PPE is provided to operatives, and that all the relevant legislation is adhered to.

In addition, as asbestos may be present within the ground it will require a safe system of work to be set up on site to deal with the asbestos risk from the made ground. This may include but be not limited to:

- The use of qualified personnel where required.
- Careful segregation of stockpiles on site.
- Defining transport routes.
- Cleaning down of machinery in designated areas.
- Decontamination unit for ground workers.

- Damping down of soils to prevent dust migration.

Excavations in soils containing asbestos should comply with the CL:AIRE publication 'Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials' (CARSOIL) and CAR 2012. All such works will need to be agreed with the regulatory bodies (HSE and/or LA).

Additional guidance is provided within the BSL methodology Guidance Note in Appendix A.

9.0 WASTE SOIL CLASSIFICATION & ASSESSMENT

9.1 Summary

BSL have undertaken a preliminary assessment of potential excavation waste to arise from the site during redevelopment to:

- Classify the excavation waste to arise as either hazardous or non-hazardous.
- Identify the most sustainable options for the wastes to arise in accordance with the waste hierarchy.
- Provide a written description of the waste required as part of the Duty of Care.
- Provide details of "hazardous properties" to complete hazardous waste consignment note (where applicable).
- Be able to provide a basic classification report to a landfill operator (where waste is destined for landfill disposal).

It should be noted that testing requirements for contaminated land risk assessment differ to those for waste classification purposes. Unless otherwise stated, the assessment in this section has been carried out to provide initial indications in respect to disposal of waste soils, however this may not be fully compliant with waste testing requirements or frequencies, with further testing potentially required.

9.2 Soils Waste Classification Procedure

As described in the 'Waste Duty of Care Code of Practice (2016)' any substance or object that the holder discards, intends to discard or is required to discard is a waste. It is the responsibility of the waste producer to classify this waste. The classification process is described in the 'Guidance on the classification and assessment of waste' WM3 and aims to determine whether the waste is Hazardous or Non-Hazardous to human health and the environment.

Waste classification should be based on soils analyses that are representative of the actual waste load. At the stage of ground investigation, the materials that will become waste have generally not been defined yet, however test data can provide a useful guide to the likely waste classification before it is generated.

Further guidance is provided in Appendix A.

The Landfill Directive (Directive 1999/31/EC on the landfilling of waste, Decision 2003/33/EC and Landfill Regulations 2005) led to the establishment of a methodology for classifying wastes. Wastes first need to be classified based on their total concentrations and classified as either hazardous or non-hazardous waste. WAC testing is only required if the end disposal route is a landfill and WAC analysis must not be used for waste classification.

Wastes can only be accepted at a landfill if they meet the relevant Waste Acceptance Criteria (WAC) for that type of landfill. A waste must comply with the WAC limits for the relevant landfill, otherwise the soil will need to be pre-treated. There are three different WAC criteria, these are:

- Inert waste.
- Stable Non-Reactive Hazardous Waste (SNRHW).
- Hazardous waste.

Details of how material should be classified for waste disposal are presented in the BSL Methodology and Guidance in Appendix A and are summarised in the table below:

	PRIOR TO LEAVING SITE			
Classification based on Total Concentrations[1]	**Non-Hazardous Waste**		**Hazardous Waste**	
	IF SOILS CANNOT BE RE-USED ELSEWHERE AND MUST GO TO LANDFILL			
WAC testing	Below inert WAC limit values	Above inert WAC limit values	Below hazardous WAC limit values[4]	> WAC limit values
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill[2]	HAZARDOUS landfill	PRE-TREATMENT[3]

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).
2 Individual sites may have certain limit values pre-determined in their licence.
3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.
4 Possibility that wastes could be classified as stable Nonreactive HAZARDOUS waste in non-hazardous Landfill (e.g. soils containing low concentrations of asbestos, gypsum or sulphate bearing soils).

Inert Waste
The possibility of automatic inert classification of the naturally occurring "clean" soils should be explored in accordance with Section 4.3 of the EA guidance document. See Appendix A for further guidance.

9.3 Waste Classification and Waste Acceptance Criteria (WAC)

We have reviewed the testing results and assessed them through a waste classification database (HazwasteOnline™) which allows users to code and classify waste as defined in the EWC (European Waste Catalogue) based on EC Regulation 1272/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (CLP) and latest Environment Agency guidance (WM3 "Guidance on the classification and assessment of waste -Technical Guidance").

The samples tested were screened against assessment criteria within WM3 using the HazWasteOnline tool to assess whether they contained any contaminants in the hazardous range.

The Waste Classification Report is presented in Appendix E.

Based on the waste classification database assessment, all of the made ground and natural soils have been classified as **non-hazardous.**

Note that further testing of the soils (WAC testing) may be required on the actual arisings in order to satisfactorily categorise the soil for its suitability for disposal to landfill.

Waste Containing Asbestos
Should soils contain asbestos, the concentration and type of asbestos identified, in addition to the chemical composition (i.e. hazardous or non-hazardous detailed above), will determine which waste code is applicable to the soils and which landfill will accept it as summarised below:

Waste	Conc. by Weight (%)	EWC 2002 Catalogue Entry Code	Waste Disposal Route
Non-hazardous containing asbestos fibres	<0.001 - <0.1%	17 05 04 (soil and stones other than those mentioned in 17 05 03*)	Non-hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a stable non-reactive hazardous landfill site.
Hazardous containing asbestos fibres	<0.001 - <0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a hazardous landfill site.
Non-hazardous soils containing asbestos fibres	<0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill authorised to receive asbestos, or in a stable non-reactive hazardous waste cell at a non-hazardous landfill authorised to receive asbestos.

Waste	Conc. by Weight (%)	EWC 2002 Catalogue Entry Code	Waste Disposal Route
Non-hazardous Soils containing ACM (Mechanically separable)	>0.1%	17 06 05 (construction material containing asbestos) 17 05 04 (soil and stones other than those mentioned in 17 05 03*)	ACMs disposed of at a hazardous landfill authorised to receive asbestos, or in a stable non-reactive hazardous waste cell at a non-hazardous landfill authorised to receive asbestos. Soils should be disposed of at a non-hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a stable non-reactive hazardous landfill site.
Hazardous soils containing ACM	>0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a hazardous landfill site.

General
Following the classification of waste materials, the options available for the waste can be considered in the context of the waste hierarchy as below:

- Onsite re-use (with or without prior treatment) under suitable exceptions/permits.
- Offsite processing for recycling or recovery e.g. screening.
- Offsite disposal (with or without prior treatment) i.e. landfill.

Where feasible, efforts should be made to retain soils for onsite re-use to minimise costs and maximise the sustainability of projects.

If any gross hydrocarbon contaminated material is encountered during the construction phase, it is possible that this may be classified as hazardous and testing should be undertaken at that time.

Where it is necessary to dispose material off site it is recommended that materials are segregated and sufficient time is allowed to further classify the actual soil arisings that constitute the waste, including discussion with landfill sites and waste transfer stations to find the best disposal route. It is illegal to dilute and mix soils without a suitable permit.

Where possible, the option that the soils could be recycled at a suitable local waste treatment plant or transfer station rather than a landfill disposal route should be explored.

9.4 Re-use of Soils

By definition in law, any material excavated from the ground becomes waste at the moment of excavation. If that soil (now a “waste”) is then placed on another part of the development site (or used on another development site) without an appropriate materials management plan, permit or exemption being in place, by law this material is defined as “illegally deposited waste”.

In order to comply with UK legislation and avoid excessive costs, if the re-use of soils is proposed on site, this should be done in accordance with the relevant exemptions or permits in place.

Soils Re-use Under DoWCoP
One of the main industry mechanisms for allowing the re-use of soils in construction is the CL:AIRE “Development Industry Code of Practice for the Definition of Waste” (CL:AIRE DoWCoP) also known as a Materials Management Plan (MMP). Further guidance is provided in the BSL Methodology and Guidance in Appendix A.

In order to re-use soils under the DoWCoP, there are four key criteria that need to be met:

- The aims and objectives of the project meet the requirements of the Waste Framework Directive (does not harm human health or the environment).
- The soils can be demonstrated to be suitable for use (backed up by chemical/geotechnical testing and assessment).
- There is certainty of use (planning consents are in place alongside materials tracking, which should be in place as part of good site practice in any case).
- Quantity (the quantity of materials used should be known).

Information on existing site levels, proposed levels, volumes generated (e.g. foundation / drainage excavation arisings) would need to be known in order to complete the MMP.

If the DoWCoP is the chosen route, the MMP should be in place and declared by a Qualified Persons (QP) before works commence, otherwise excavated soils could constitute an illegal deposit of waste and enforcement action could be taken by the EA and HMRC.

Once the project is complete, a verification report detailing soils re-use/import will need to be produced and submitted to CL:AIRE, which may be subject to a random audit process. Sites found to be non-complaint with the CoP can be referred to the EA for further investigation.

Note that for re-use of landfilled materials or mining wastes, the DoWCoP may not apply and a Waste Recovery Permit (or others) may be required. Liaison with the Environment Agency would be needed on a case by case basis to determine the best option.

Re-use of soils containing asbestos should comply with the CL:AIRE publication 'Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials' (CAR-SOIL™) and CAR 2012.

In terms of the re-use of brick/concrete crush materials, the DoWCoP does cover aggregates, but only on the site of origin, and the EA WRAP aggregate Quality Protocol might best apply to ensure quality standards, which are discussed further below.

Soils Re-use under Exemptions and Permits

Other potentially suitable re-use mechanisms may include U1 Exemptions, WRAP quality protocols (for aggregates) or Waste Framework Directive (WFD) Exclusions, amongst other mechanisms. Further details are provided in Appendix A.

10.0 CONCLUSIONS

10.1 Geo-Environmental

This report is intended to support discharge of Condition 9 of planning permission reference P/2025/0430.

Geo-Environmental – Human Health – Soils
Testing of the made ground at the site did not reveal any exceedances of heavy metals, explosives, PAHs, petroleum hydrocarbons, PCBs, BTEX or MTBE compounds for a commercial end use, therefore no specific remedial action is required in respect to soils at this stage.

Geo-Environmental – Ground Gases and Vapours
Ground gas monitoring by SP Associates has revealed a maximum peak carbon dioxide concentration of 1.6%v/v and methane concentrations of <0.1%v/v. Based on the gas monitoring the site is classified as Characteristic Situation 1 (CS1) with respect to carbon dioxide and methane. However, basic radon protection measures are required for the site. This should be detailed within a short specification and verification plan in order to address the applied planning conditions. Based on the CS1 site characterisation with respect to carbon dioxide and methane and required installation and verification of a radon gas membrane, long term monitoring of ground gas is not considered to be required for the site.

Geo-Environmental – Controlled Waters
The findings of this assessment corroborate with the prior assessment by SP Associates; the overall risk to controlled waters is considered to be low and no further action is required.

Waste
Waste classification for the made ground and natural soils at the site has revealed all of the soils to be non-hazardous.

10.2 Geotechnical

Foundations and Floor Slabs
Foundations are to be embedded into natural cohesive deposits, either to 1.00m begl with an estimated Cu of 55 kPa (safe bearing capacity of 110kN/m^2), or to 2.00m begl with an estimated Cu of 150kPa (safe bearing capacity of 150kN/m^2). If made ground is present at these depths, foundations are to be deepened into natural strata.

The proposed foundation type is ground beam strip footings to support the building masonry walls, concrete pad footings to support the steel frame structure, and a ground bearing floor slab. Provided structural loads are 150-200 kN/m^2 across the building platform.

Due to significant filling to be placed across the southern part of the structure, foundations could be either placed in engineered fill if the end performance can be validated, or a deep solution such as the installation of vibro-stone columns or piles may be adopted. To minimise the effects of differential settlement, it is recommended that a single foundation option is designed and constructed across the entire building platform.

Concrete classification
The site has been assessed to be sulphate class DS-1 and ACEC Class AC-1s conditions in accordance with BRE Special Digest 1 “Concrete in aggressive ground” 2005.

Highways
CBR values of 5% are likely to be achieved in undisturbed natural granular soils and 2% for natural clay soils for pavement design purposes, unless proven otherwise by in-situ testing at formation level by a specialist geotechnical engineer. Equilibrium CBR values are likely to be 2% within the made ground.

Based on the fines content of the soils, they are considered to be frost susceptible, therefore highway construction should be a minimum thickness of 450mm to mitigate against the risk.

Drainage (SuDS)
Based on the 2025 SP Associates ground investigation, the use of traditional soakaways within the natural ground is not considered to be feasible at the site due to the low infiltration rates obtained (on the order of 10^{-9} m/s) and the presence of low permeability cohesive strata underlying the site. Therefore, an alternative drainage method will be required.

Slopes & Retaining Structures
A 4m high slope exists beyond the proposed development area to the southwest of the site. The slope displayed no obvious signs of slope instability in its current state. If the slope is to be altered during earthworks or construction, it will require further assessment for stability purposes.

Earthworks
Design of the earthworks, particularly in the southwestern part of the site near Redwither Brook, should consider the stability of any cut or fill slopes.

An initial assessment reveals spoil resulting from excavations within the made ground and superficial deposits should generally be suitable for re-use as general fill subject to further testing and specification or may be disposed off site.

10.3 Further Work

The following further work is considered necessary to progress the site to construction phase:

- Submission of this report for support of discharge of Condition 9 of planning permission reference P/2025/0430.
- Tree survey by qualified arboriculturist.
- Detailed foundation design by a structural engineer.
- Production of a Remedial Strategy, including the production of short specification for radon protection within a Ground Gas Protection Measures Verification Plan. This relates to Conditions 9 and 12 of planning permission P/2025/0430.
- Production of Design Statement and Materials Management Plan (MMP) under the CL:AIRE DoWCoP, if required.
- Production of a Verification Report following remediation to fully address Conditions 10-12 of P/2025/0430.

11.0 ABBREVIATIONS AND DEFINITIONS

GLOSSARY	
Term / Abbreviation	**Definition**
AST	Above Ground Storage Tank.
B(a)P	Benzo (a) Pyrene.
BGS	British Geological Survey.
BRE	Building Research Establishment.
BS	British Standard.
BSL	Brownfield Solutions Ltd.
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes.
CBR	California Bearing Ratio (used in pavement/highways design).
CAR 2012	Control of Asbestos Regulations (2012).
CBCB	Cheshire Brine Compensation Board.
CBCD	Cheshire Brine Compensation District.
CBR	California Bearing Ratio.
CIEH	Chartered Institute of Environmental Health.
CIRIA	Construction Industry Research Association.
CL:AIRE	Contaminated Land: Applications in Real Environments.
CLEA	Contaminated Land Exposure Assessment.
CLO	Contaminated Land Officer.
COMAH	Control of Major Accident Hazards.
Contamination	Presence of a substance which is in, on or under land, and which has the potential to cause significant harm or to cause significant pollution of controlled water. There is no assumption in this definition that harm results from the presence of the contamination. Naturally enhanced concentrations of harmful substances can fall within this definition of contamination. Contamination may relate to soils, surface water, groundwater or ground gas.
Controlled Waters	Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three-mile limit of territorial waters.
CPT	Cone Penetration Test.
CSM	Conceptual Site Model. A schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process. The conceptual site model is initially derived from the information obtained by the preliminary investigation (i.e. the Phase I Geo-Environmental Assessment). This conceptual model is used to focus subsequent investigations, where these are considered to be necessary, in order to meet the objectives of the investigations and the risk assessment. The results of intrusive investigations can provide additional data that can be used to further refine the conceptual site model.
DCP	Dynamic Cone Penetrometer.
DNAPL	Dense Non-Aqueous Phase Liquid.
DoWCoP	Definition of Waste Code of Practice.
DWS	Drinking Water Standard.
EA	Environment Agency.
EHO	Environmental Health Officer.
EQS	Environmental Quality Standard.

GLOSSARY	
Term / Abbreviation	**Definition**
GAC	Generic Assessment Criteria.
GDR	Geotechnical Design Report.
GFR	Geotechnical Feedback Report.
GIR	Ground Investigation Report.
GSV	Gas Screening Value.
Harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case of human health, including property/structures and water supply pipelines.
Hazard	Inherently dangerous quality of a substance, procedure or event.
HDPE	High Density Polyethylene.
HSV	Hand Shear Vane.
K	Modulus of Subgrade Reaction.
LCRM	Land Contamination: Risk Management (EA guidance).
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene).
LOD	Limit of Detection (for particular method adopted).
MMP	Materials Management Plan.
Mv	Modulus of Volume of Compressibility.
ND	Not Detected.
NHBC	National House Building Council.
NR	Not Recorded.
OS	Ordnance Survey.
PAH	Polycyclic Aromatic Hydrocarbon.
Pathway	Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.
PCB	Poly-Chlorinated Biphenyl.
PCSM	Preliminary Conceptual Site Model.
pH	Scale used to specify how acidic or basic a water-based solution is.
PHC	Petroleum Hydrocarbons.
PID	Photo Ionisation Detector.
PNEC	Predicted No-Effect Concentration.
Precision	Level of agreement within a series of measurements of a parameter.
PSD	Particle Size Distribution.
PVC	Polyvinyl Chloride.
Receptor	Human health, living organisms, ecological systems, controlled waters (surface waters and groundwater within aquifers), atmosphere, structures and utilities that could potentially be adversely affected by contaminant(s).
Risk	Probability of the occurrence, magnitude and consequences of an unwanted adverse effect on a receptor.
Risk Assessment	Process of establishing, to the extent possible, the existence, nature and significance of risk.
Sampling	Methods and techniques used to obtain a representative sample of the material under investigation.
SOM	Soil Organic Matter.
Source	Location from which contamination is, or was, derived. This could possibly be the location of the highest soil, groundwater or gas concentration of the contaminant(s).
SPT	Standard Penetration Test.
SVOCs	Semi Volatile Organic Compounds.
TOC	Total Organic Carbon.

GLOSSARY	
Term / Abbreviation	**Definition**
TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group).
TVOCs	Total volatile organic compounds.
UCS	Unconfined Compressive Strength.
Uncertainty	Parameter, associated with the result of a measurement that characterises the dispersion of the values that could reasonably be attributed to the measurement.
UST	Underground Storage Tank.
UXO	Unexploded Ordnance.
VCCs	Vibro Concrete Columns.
VSCs	Vibro Stone Columns
VOCs	Volatile Organic Compounds.
WAC	Waste Assessment Criteria.
WFD (in waste context)	Waste Framework Directive.
WFD (in water context)	Water Framework Directive.
Units	**Definition**
°	Degrees
Φ	Phi angle (in degrees)
g/l	Grams per Litre
Km	Kilometres
kPa	Kilo Pascal (Equivalent to kN/m^2)
$KN/m^2/mm$	Kilo Newton per metered squared per millimeter
kN/m^2	Kilo Newtons per metre squared
kPa	Kilo Pascal (Equivalent to kN/m^2)
l/hr	Litres per hour
MJ/kg	Mega joule per kilogram
MN	Mega Newton
M^2/MN	Mega Newton per metre squared
M	Metres
m bgl	Metres Below Ground Level
m OD	Metres Ordnance Datum (sea level)
µg/l	Micrograms per Litre (parts per billion)
µm	Micrometre
mb	Millibars (atmospheric pressure)
mg/kg	Milligrams per kilogram (parts per million)
mg/m^3	Milligram per metre cubed
mm	Millimetre
ppb	Parts Per Billion
Ppm	Parts Per Million

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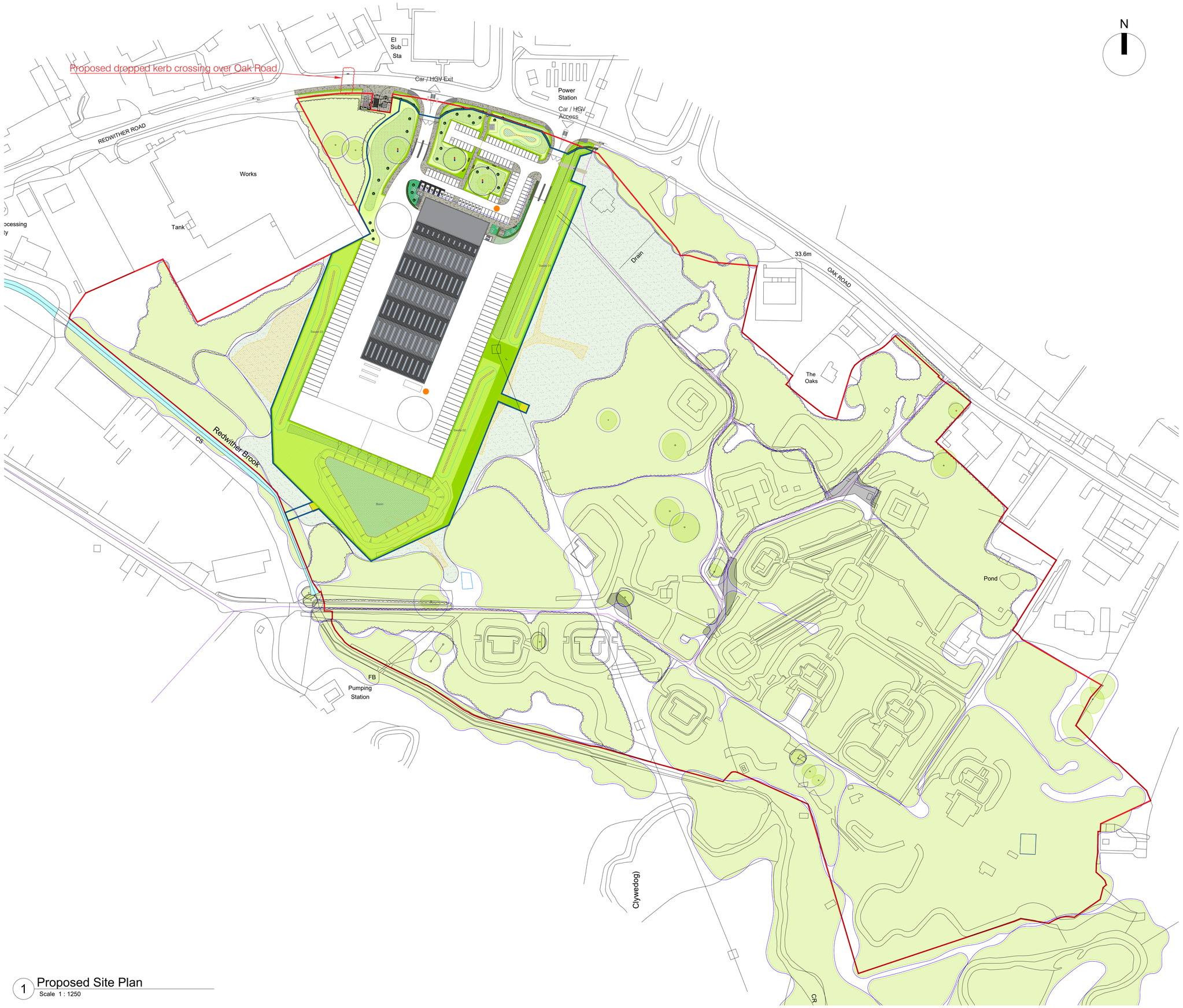
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DRAWINGS



N

	Description	By	Date
T1	Stage 4 Initial issue	LM	30.09.25
T2	Parking spaces added	LM	19.11.25
T3	Tenant boundary adjusted	LM	02.12.25
T4	Tenant boundary adjusted	LM	10.12.25
T5	Tender Issue	LM	12.12.25
T6	Building set out	LM	10.02.26
T7	Bin store relocated	LM	30.03.26
T8	Annotation update	LM	01.04.26
T9	Oak Road crossing	LM	17.04.26

FI Ownership

Tenant Boundary

Fire Hydrants

Welsh Water Combined Sewer Manhole

Parking Spaces - 96

Bin store to provide foul run off, water point connection and impervious floor. Tenant to consult with preferred waste collection authority.

0 10 20 40 60m

Scale 1:1250

1 Proposed Site Plan

Scale 1 : 1250

Modern City Architecture & Urbanism

Avenue HQ
17 Mann Island
Liverpool
L3 1BP

t: 0161 974 7203
e: info@mcau.co.uk
www.mcau.co.uk

Client
F.I Real Estate Management

Project
The Oaks
Wrexham

Description
Proposed Site Plan

Status
Stage 4 Technical Design

Drawn By
LM

Job Number
1256-MCAU

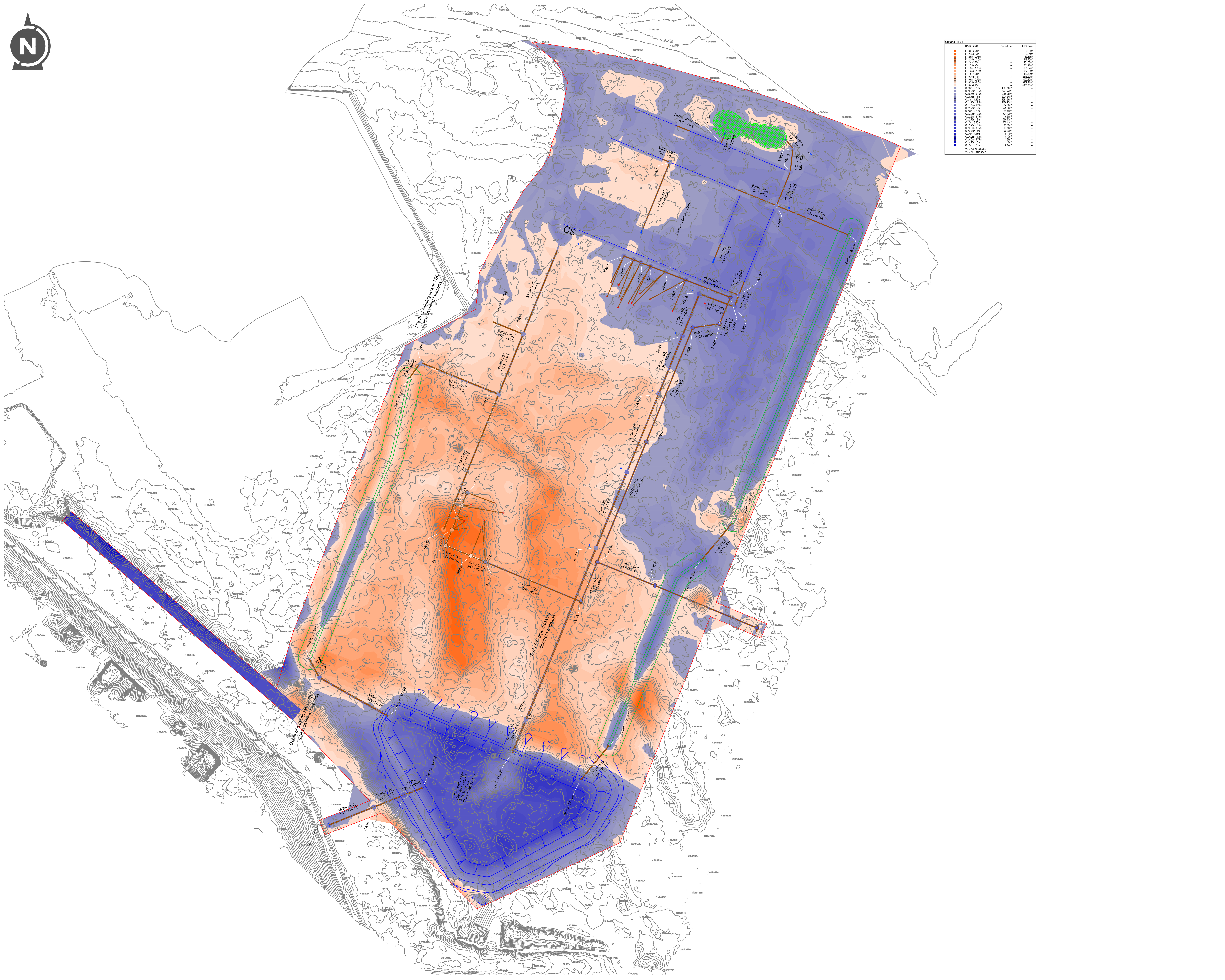
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Date
Sep 25

Drawing Number
T.02-00-001

Revision
T9

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Cut and Fill v1		
Height Bands	Cut Volume	Fill Volume
Fill 3m - 3.25m	--	0.90m³
Fill 2.75m - 3m	--	33.04m³
Fill 2.5m - 2.75m	--	83.37m³
Fill 2.25m - 2.5m	--	148.75m³
Fill 2m - 2.25m	--	251.03m³
Fill 1.75m - 2m	--	381.91m³
Fill 1.5m - 1.75m	--	605.37m³
Fill 1.25m - 1.5m	--	957.28m³
Fill 1m - 1.25m	--	1483.80m³
Fill 0.75m - 1m	--	2246.20m³
Fill 0.5m - 0.75m	--	3090.49m³
Fill 0.25m - 0.5m	--	3939.41m³
Fill 0m - 0.25m	--	4903.70m³
Cut 0m - 0.25m	4807.50m³	--
Cut 0.25m - 0.5m	3774.73m³	--
Cut 0.5m - 0.75m	2956.28m³	--
Cut 0.75m - 1m	2224.34m³	--
Cut 1m - 1.25m	1583.99m³	--
Cut 1.25m - 1.5m	1106.92m³	--
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Cut 2.75m - 3m	269.73m³	--
Cut 3m - 3.25m	159.41m³	--
Cut 3.25m - 3.5m	82.39m³	--
Cut 3.5m - 3.75m	37.50m³	--
Cut 3.75m - 4m	23.63m³	--
Cut 4m - 4.25m	15.11m³	--
Cut 4.25m - 4.5m	8.42m³	--
Cut 4.5m - 4.75m	3.96m³	--
Cut 4.75m - 5m	1.40m³	--
Cut 5m - 5.25m	0.14m³	--

Total Cut: 20381.08m³
Total Fill: 18125.25m³

Notes:

DESIGN PARAMETERS USED

TOPSOIL - NO TOPSOIL ANTICPATED TO BE STRIPPED

BUILDING FOOTPRINT - FFL PROJECTED DOWN 450mm TO ALLOW FOR 300mm THICK GRANULAR BUILD UP LEFT 150mm BELOW FFL

REMAINDER OF SITE - FINISHED GROUND LEVELS PROJECTED DOWN 400mm TO ROAD AND YARD LEVELS AND 700mm WHERE PERMEABLE PAVING IS PROPOSED.

REV:	DESCRIPTION:	BY:	DATE:

STATUS: FOR APPROVAL

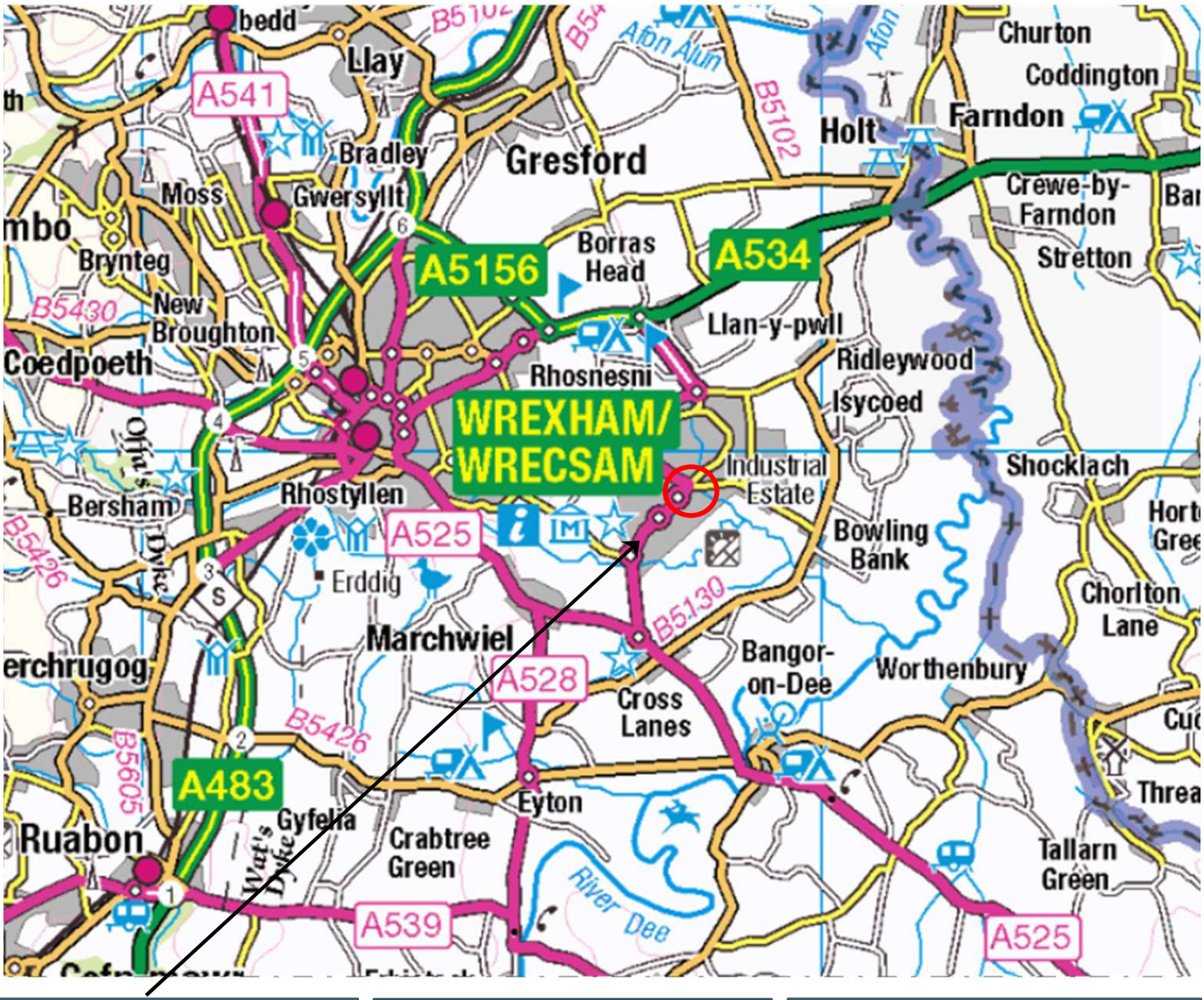
FI Construction
Canal Mill, Botany Brow
Chorley, Lancashire
PR6 9AF

CLIENT: FI Real Estate Management Ltd
Canal Mill, Botany Brow,
Chorley, Lancashire
PR6 9AF

SITE: The Oaks
Oak road, Wrexham

TITLE: Regrade Cut/Fill Plan

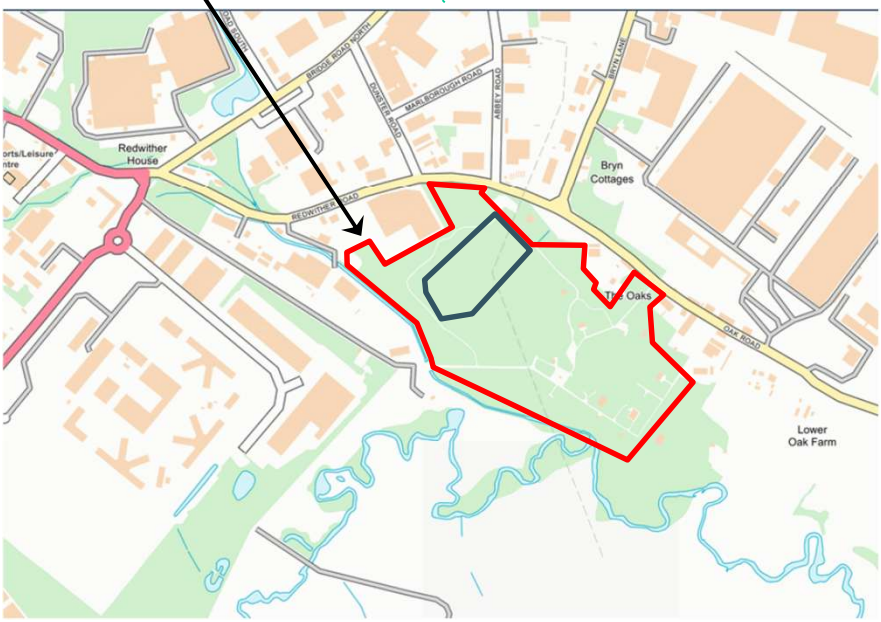
SCALE AT A1:	DATE:	DRAWN:	CHECKED:
1:1000	20/03/2025	DTT	
PROJECT NO:	DRAWING NO:		REVISION:
	RCFP01		-



SITE LOCATION

NEAREST POSTCODE: LL13 9RD

SITE ENTRANCE. WHAT THREE WORDS ///ASKED.MARSH.THUMB



REV	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS

CLIENT
FI CONSTRUCTION

PROJECT TITLE
THE OAKS, WREXHAM

DRAWING TITLE
SITE LOCATION PLAN

DRAWING No.	REVISION	SCALE	DATE
C6668/02	-	NTS	15/04/26

DRAWN BY	CHECKED BY
MO	AJS



KEY	
	FI CONSTRUCTION OWNERSHIP BOUNDARY
	APPROXIMATE SITE BOUNDARY
WSXX	WINDOW SAMPLE BOREHOLE (2026)
TPXX	TRIAL PIT (2025)
WSXX	WINDOW SAMPLE BOREHOLE (2025)
	BOREHOLE INSTALLATION

NOTES

1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS REPORTS. THIS DRAWING IS COPYRIGHT OF BSL.
3. DRAWING NOT FOR CONSTRUCTION PURPOSES.
4. LOCATIONS OF 2025 SP ASSOCIATES INVESTIGATION TESTS (BH1-5 AND TP1-3) ARE APPROXIMATELY LOCATED BASED ON THEIR HOLE PLAN.

REV	DATE	DESCRIPTION	BY	CKD
-	20/04/26	DRAFT ISSUED AFTER INVESTIGATIONS	CC	AJS
A	14/05/26	REVISED USING NEW DRAWING FILE	CC	AJS

BROWNFIELD SOLUTIONS LTD

CLIENT

FI CONSTRUCTION

PROJECT TITLE

THE OAKS, WREXHAM

DRAWING TITLE

EXPLORATORY HOLE PLAN

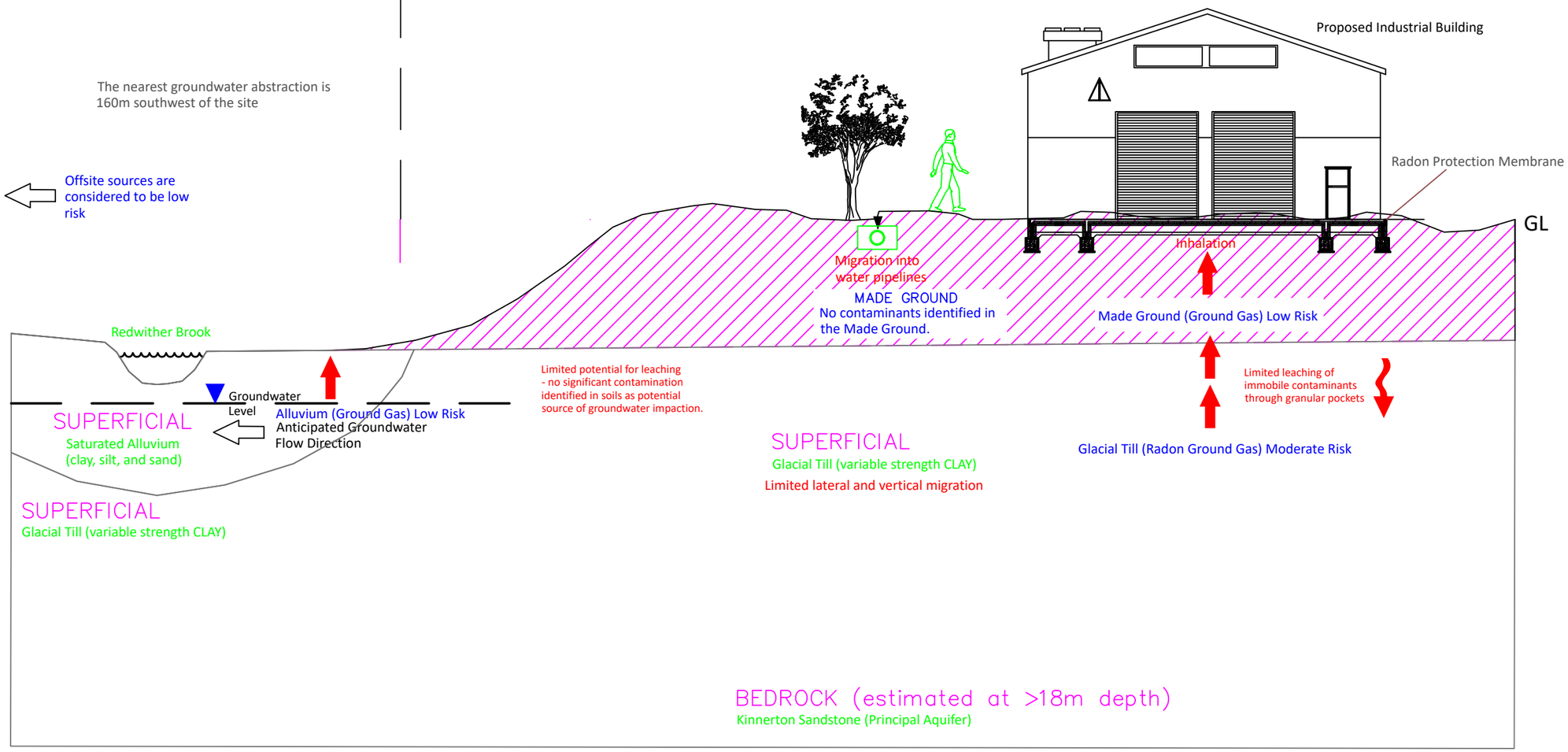
DRAWING No.	REVISION	SCALE	DATE
C6668/02	A	NTS	14/05/26

DRAWN BY	CHECKED BY
CC	AJS

OFF-SITE

ON-SITE

The nearest groundwater abstraction is 160m southwest of the site



Key

- Made ground
- Blue For Source
- Red For Pathway
- Green For Receptor
- Strip and Pad Foundations
- Tree

NOTES

1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
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REV	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS LTD

CLIENT

FI CONSTRUCTION

PROJECT TITLE

THE OAKS, WREXHAM

DRAWING TITLE

CONCEPTUAL SITE MODEL

DRAWING No.	REVISION	SCALE	DATE
C6668/03	-	NTS	14/05/26

DRAWN BY	CHECKED BY
CC	AJS

PHOTOGRAPHS



Photograph 1: Site entrance looking to the west.



Photograph 2: North of the site looking east towards an existing building northeast of the site.



Photograph 3: Overview of the site.



Photograph 4: Approximate centre of the site looking north towards industrial building.



Photograph 5: Access track excavated into the slope near WS108.



Photograph 6: Grassed area adjacent to Redwither Brook.



Photograph 7: Access track through woodland adjacent to Redwither Brook.



Photograph 8: Borehole WS107 location in woodland.



Photograph 9: Made ground forming the slope near WS106.



Photograph 10: Borehole WS105 location on undulating terrain.



Photograph 11: Eastern extents of the site from the northeast corner looking to the south.



Photograph 12: Centre of the site from near Oak Road looking south.

APPENDIX A

BSL Methodology and Guidance

BSL Phase I & II Geo-Environmental Assessment Reports - Methodology and Guidance

Background

This Appendix provides information on the approaches, methods and guidance used by Brownfield Solutions Ltd in the preparation of this report.

The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential soils and groundwater contamination). The term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). It should be noted that this is an integrated investigation and these two main aspects are related, unless otherwise specified within the report.

Phase I reports are written in general accordance with the description of a Preliminary Investigation as defined in BS10175:2011+A2:2017 and are also produced in general accordance with the recommendations for a Tier 1 Preliminary Risk Assessment as described in LCRM guidance.

The first stage of the investigation and assessment of a site is the Preliminary Investigation/Tier 1 Preliminary Risk Assessment, often referred to as a Phase 1 Desk Study, comprising a desk study and walk-over survey and collation of desk-based searches, which culminates in the Preliminary Risk Assessment and the development of a preliminary/initial **Conceptual Site Model (CSM)**. From this are identified any potential geotechnical and geo-environmental hazards and the qualitative degree of risk associated with them. In the case of the geotechnical hazard identification, this is referred to as the **Ground Model.**

From the geo-environmental perspective, the hazard Identification process uses professional judgement to evaluate all the hazards in terms of possible contaminant linkages (of source-pathway-receptor). Possible contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and generic risk assessment as part of Phase II investigations and reports.

The second stage is the Ground Investigation, Generic Risk Assessment and Geotechnical Interpretation. This represents the further assessment mentioned above. The Ground Investigation comprises field work and laboratory testing based on the findings of the Preliminary Risk Assessment, to reduce uncertainty in the geotechnical and geo-environmental hazard identification. This may include an exploratory, a detailed or/and supplementary Investigations as described in BS 10175:2011+A2:2017. Phase II Assessments are produced in general accordance with the recommendations for a Tier 2 Generic Quantitative Risk Assessment as described in LCRM guidance and are also intended to fulfil the requirements of a Ground Investigation Report (GIR) as detailed in BS EN 1997-2:2007.

Contaminated Land - Legislative Background

Land contamination can be addressed in several ways, e.g. during planning, under Part 2A, following an incident, during an investigation into environmental damages, or during the application of an environmental permit, or its surrender.

For the planning process the key test is **as a minimum the site cannot be determined as contaminated land**, e.g. there is not significant harm, significant possibility of significant harm to human health or that there is not significant harm to, or the significant possibility that the pollution of controlled waters will occur.

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

- The 1995 Environment Act.
- The Contaminated Land Statutory Guidance, DEFRA – April 2012.
- The Contaminated Land (England) Regulations 2006.
- The Contaminated Land (England) Amendment Regulations 2012.
- Water Resources Act.
- Water Framework Directive.
- Environmental Damage Regulations.
- Environment Agency (EA) - Land Contamination Risk Management (LCRM) 2019.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

1) Significant harm is being caused or there is a significant possibility of such harm being caused.
2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

Source - substances that are potential contaminants or pollutants that may cause harm.
Pathway - a potential route by which contaminants can move from the source to the receptor, and the impact of that migration on the source e.g. attenuation.
Receptor - a receptor that may be harmed, for example the water environment, humans and water, considering the sensitivity of the receptor.

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused.



Where any one of the “pollution linkages” between the above is absent there is deemed to be no risk.

The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the S-P-R approach is ‘suitable for use’ criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents
This report has been prepared in accordance with the list of guidance below, however the list is not exhaustive:

- DETR: Circular 02/2000: Environmental Protection Act 1990: Part IIA: Contaminated land. 2012.
- Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002.
- BS 10175:2011+A2:2017.
- Environment Agency (EA) - Land Contamination Risk Management (LCRM). 2019.
- Groundwater Protection https://www.gov.uk/government/collections/groundwater-protection
- UK Technical Advisory Group (UKTAG) - Water Framework Directive
- Incidents and their classification: the Common Incident Classification Scheme (CICS) – Used by the Environment Agency to classify pollution incidents.

Relevant Legislative Documents
The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012).
- The Environment Protection Act (1990).
- The Water Resources Act (1991).
- The Environment Act (1995).
- The Contaminated Land (England) Act (2000).
- The Pollution Prevention and Control (England and Wales) Regulations (2000).
- The Landfill Regulations (England and Wales) Regulations (2002).
- The Landfill (England and Wales) (Amendment) Regulations (2004).
- Contaminated Land (England) Regulations (2012).
- The Environmental Damage (Prevention and Remediation) Regulations (2009).
- Environmental Permitting Regulations (England and Wales) Regulations (2010).
- The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017).
- Health and Safety at Work Act.
- National Planning Policy Framework (NPPF) – latest version.

Contaminated Land Risk Assessment Approach

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:



LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process. Under LCRM, three tiers of risk assessment exist – Stage/Tier Preliminary Risk Assessment, Stage 2 Generic Quantitative and Stage 3 Detailed Quantitative.

Further information can be found at the below site:
https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552, with reference to Incidents and their classification: the Common Incident Classification Scheme (CICS), Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance 2012 and other guidance as appropriate which will be detailed within the main body of the report if applied.

The likelihood of a given receptor being impacted is related to a number of factors, e.g. the geology which could inhibit contaminant migration. For example, a site with a significant thickness of clay between it and a receptor may reduce migration of contamination via the subsurface, which will reduce the likelihood of a given receptor being impacted. The geology or drainage for example could offer a preferential pathway e.g. mines shafts/faults increasing the likelihood and potential magnitude of an impact. The depth of contamination will also affect the exposure pathway, for example petroleum hydrocarbons at depth are unlikely to reach a receptor via dermal contact but could via vapour pathways which will influence the likelihood of an impact being felt e.g. if there are no buildings on site.

The terms and definitions used for the assessment of the likelihood are provided below:

High likelihood: There is a pollution linkage and an event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Examples - Extensive areas with concentrations above saturation limits for mobile contamination e.g. petroleum hydrocarbons within the water table.

Likely: There is a pollution linkage and all the elements are present and in the right place, which means it is probable that an event will occur. Circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term.
Examples – Localised areas of contaminants with concentrations above saturation limits for mobile contamination e.g. localised petroleum hydrocarbons within the water table; shallow contamination above relevant human health generic assessment criteria is present with little or no hardstanding,

Low likelihood: There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain even over a longer period such event would take place, and is less likely in the short term.
Examples - A thickness/distance of low permeability deposits preventing contaminant migration to a receptor is present; a site is mostly covered hard standing preventing exposure to soil contamination.

Unlikely: There is a pollution linkage but circumstances are such that it is improbable the event would occur even in the long term.
Examples – A site is underlain by a substantial thickness of low permeability clays, between the source and potential receptors which will inhibit significantly, but not completely rule out migration to sensitive receptors.

The severity is also classified using a system based on CIRIA C552, with reference to Incidents and their classification: the Common Incident Classification Scheme (CICS), Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance 2012 and other guidance as appropriate which will be detailed within the main body of the report, if applied. The terms and definitions are:

Severe: Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);

Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse.

Medium: Chronic damage to human health ('significant harm' as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve.

Mild: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment.
Examples – Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

Minor: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.
Examples – Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very Low	Very low
	Negligible	Negligible Risk / No Linkage			

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

Very high: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required.

High: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term.

Moderate: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term.

Low: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Very Low: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Some linkages may be identified which constitutes a theoretical connection between a source and a receptor, but professional judgement shows them not to be possible for some reason. These are labelled 'negligible risk' and 'no linkage' in the summary table, which give rise to an overall **negligible** risk category and no further action is required.

Contaminated Land Screening Values

In assessing the potential for contamination Brownfield Solutions Limited (BSL) follows UK guidance and current best practice.

General
The purpose of using generic Tier 1 screening levels is to have a simple means of assessing the potential contamination of a site and to inform decisions on whether further investigation is warranted or whether an option to undertake remedial action based on the data to hand is cost effective.

Human Health
Current UK guidance on risks to human health is provided by DEFRA and the Environment Agency (EA). Under the land use planning system where the aim is to demonstrate 'suitability for use' the key will usually be to confidently determine that the level of contamination of the land is low relative to some appropriate measure of risk at a particular critical connection.

Publications forming part of the guidance include the CLEA Model and toxicological reports collectively referred to as the CLEA Guidance. The CLEA Guidance has included a number of publications which have provided initial screening values or Generic Assessment Criteria (GACs) for soils contamination based on standard land uses and soil assumptions. The critical concentrations referred to above can be the relevant GAC.

CLEA guidance has gone through a number of revisions over time. Tier 1 generic S4UL values (or GACs) have been published using the CLEA 1.06 Model by CIEH/LQM. These are the third set of generic assessment criteria generated by CIEH and replace the previous two sets of GACs. The revised S4UL values are based on greater knowledge of relevant toxicology and further consideration of exposure frequencies.

C4SL values for six determinands including lead were published by DEFRA/CL:AIRE in December 2014. Additional determinands were added in 2021. They represent a low risk as opposed to minimal risk, however they are still strongly precautionary. These screening values were published by DEFRA for Part 2A use, although DEFRA have also confirmed acceptability for use under planning. However, S4ULs remain the first reference point for BSL due to the broader range of end uses scenarios and the availability of a wide array of determinands with various soil organic contents.

As part of Tier 1 assessments, the following data sources are used in the order of preference given below, unless further justification is provided to adopt less conservative criteria:

- CIEH S4UL values (derived by CIEH/LQM).
- DEFRA/CL:AIRE C4SL's https://www.claire.co.uk/projects-and-initiatives/category-4-screening-levels
- CL:AIRE GAC values.
- Guidance from other European countries.
- Guidance from the outside Europe.

Dependent on requirements, test results may be divided into representative data sets for assessment against the above referenced screening criteria, based on the conceptual model and taking into account such characteristics as variation in soil properties, historical, existing or proposed land uses. The soils in these areas are considered likely to form the ground cover in critical receptor areas (e.g. gardens, soft landscaping etc)

where pathways may exist. The critical part of the soil column is typically taken as the upper metre in terms of contact with end users of a development site for the purposes of initial assessment.

The screening criteria adopted by BSL are presented overleaf.

Further Assessment
When screening values are exceeded then further consideration is required. This could include further additional detailed investigation and assessment to further define the risk or to design appropriate remedial measures to either remove the source or break the pathway. In some cases, dependant on the Conceptual Site Model (CSM), no action may be required.

PAHs and B(a)P as a Surrogate Marker for Adoption of C4SLs
As stated above, S4ULs remain the first reference point as screening levels unless further justification is provided. In order to determine if the C4SL can be adopted, benzo(a)pyrene (B(a)P), the following guidance within SP1010 Appendix E for B(a)P and Public Heath England (PHE) may be adopted with our assessments where appropriate.

Guidance states that benzo(a)pyrene is considered to be one of the most potent PAHs, and it would be appropriate to assume the cancer risk in a mixture is proportional to the concentration of a surrogate marker PAH (benzo(a)pyrene) in the mixture. The ratio of PAHs within the mixture can be assessed to ensure that the profile is similar to that seen for the test material (coal tar mixtures) in the toxicological study by Culp et al. The International Programme on Chemical Safety (IPCS) considered that the PAH profile of the soil sample may deviate from the average profile by about an order of magnitude (up or down).

A more recent study by Bull et al (2013) which analysed PAH concentrations in soil samples from 274 sites, showed that the levels of PAH relative to B(a)P showed little variability and were similar to that recorded for the coal tar mix used in the Culp et al study. Given this, it was concluded that benzo(a)pyrene is a suitable surrogate marker to represent mixtures of PAH in soil.

In order to risk assess the PAH mixture for site specific soil samples using human health guideline values, notably the C4SLs, as detailed in SP10101 the ratio of the seven genotoxic PAHs as shown below, relative to B(a)P, should be calculated to ensure it is similar to the test material used in the Culp study (PHE 2010). To be considered sufficiently similar, the ratio relative to B(a)P should fit within the upper and lower limits (representing an order of magnitude above and below the mean ratio to B(a)P of test material used in the Culp et al study). In such cases B(a)P is considered an adequate surrogate marker and the Low Level of Toxicological concern (LLTC) for B(a)P (i.e., the C4SL) may be used in the risk assessment.

Statistical Analysis on Soils
Guidance on the use of statistics is taken from the CL:AIRE publication "Comparing Soil Contamination Data with a Critical Concentration" 2020, the basis of which in statistics is termed Central Limit Theorem (CLT), which says "*The distribution of sample means converges to a normal distribution as the sample size increases*".

If the critical concentrations have been exceeded, as part of a further assessment, statistical analysis may be undertaken on a dataset to demonstrate that the mean concentration on the site (or a particular area) is actually below the critical concentration. The true mean concentration of a contaminant is never known because all the site soil has not been tested. An estimation of the true mean can be obtained from the samples tested during the investigation. The greater the number of samples tested, the closer the mean of these values is to the true mean.

As discussed above, test results are typically divided into representative data sets for assessment and may be referred to as 'averaging areas' to which statistics can be applied, although several statements need to be satisfied before applying the guidance:

- Averaging areas have been defined based on the CSM.
- Sample locations – random/grid sampling adopted as opposed to targeted investigation.
- Samples are evenly spread and not clustered.

- Analysis do not suggest a hotspot/outlier or cluster established by histogram or other means.
- Samples are of same/similar depth and taken from one population (e.g. just topsoil).
- Analyses do not show a spatial trend or other spatial pattern across that zone.
- The number of samples has been shown to be sufficient for statistical analysis.

Once the above have been satisfied, when undertaking statistical analysis, the question "*are mean soil concentrations within the averaging area equal to, or greater than, the GAC*?" is being asked. Typically, outliers or "hotspots" are treated as separate zones or averaging areas. The sampling strategy and assessment should also take into account uncertainty (for example, spatial heterogeneity) in contaminant concentrations. There is the assumption that sampling was random or stratified and systematic (e.g. on a grid) and not targeted at specific sources; data from such targeted areas should be omitted from the statistical analysis. Data should be from one population (i.e. the same materials).

The statistical test that is carried out is used to demonstrate that there is a certain probability that the true mean falls below the critical concentration (typically the GAC in a screening exercise). The main tool used to draw conclusions based on the 2020 guidance is a comparison of a 2-way confidence interval with the critical concentration. A confidence interval consists of two sets of numbers; an interval i.e. a range of values plus a pre-determined level of confidence e.g. 80%. A common interpretation of a confidence interval of say 80% is that "*there is an 80% chance that the true mean concentration level of the contaminant in a sampling zone lies between X concentration and Y concentration*".

The current guidance for planning says that the site has to be "safe" which suggests we should use a large confidence interval such as 95% or higher to make a decision. This means that there is a 95% chance of the true mean concentration lying in this interval, there is also a 5% chance it lies outside this interval. One could then conclude that the requirements of planning have been met if the 95% confidence interval lies below the critical concentration.

The guidance recommends that at least two confidence levels are used such as 90% and 99% or 80% and 95%. By using two differing confidence intervals, we can use the smaller confidence interval (e.g. 80% confidence interval) to say "*we think the mean is most likely to be inside this range*" and the larger confidence interval (e.g. 95% confidence interval) to say "*we think the mean is most unlikely to be outside this range*".

If the confidence interval extends to above the critical concentration, then further action may be required.

Controlled Waters

The European Water Framework Directive (WFD) became UK law in December 2003. It was created to ensure that European countries manage their rivers, groundwater and lakes so that they stay healthy for people and for wildlife.

This is achieved by the use of chemical standards (Water Quality Targets – WQTs) for surface waters and groundwater. These values describe concentrations of chemicals that are not expected to cause harm to environmental organisms or human health, provided they are not exceeded. The same chemical may have several standards for different environmental regimes, and for different protection objectives.

Statutory Standards are set in legislation and if exceeded, this constitutes non-compliance with statutory obligations. European Directives are implemented in England and Wales by corresponding statutory instruments (i.e. regulations- The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 and The Private Water Supplies (England) Regulations 2016. SI 2016 / 618). In Scotland, the Public Water Supplies (Scotland) Regulations 2014 apply. The statutory instruments can be the exact same standards as they appear in the Directive or be more stringent.

A number of non-statutory standards also exist, these are set by various organisations (including the EA) for chemicals that are considered to be of concern, but are not covered by any specific legislation.

The chemical standards used in the UK to control impaction of contamination on controlled waters are Environmental Quality Standards (EQS). These cover a large number of compounds. EQS are available for inland surface waters (freshwater) and other surface waters (transitional and marine).

Several EQS are based on bioavailable metal proportions (i.e. copper, lead, manganese, nickel and zinc). A software tool (M-BAT) is available from the Water Framework Directive - UK TAG website for calculating the bioavailable fraction. Where this tool has been used, the bioavailability has been taken into account by calculating site-specific $PNEC_{dissolved}$ (Predicted No Effect Concentration) values. These enable the dissolved concentration data to be compared with the PNEC as if it were an EQS.

UK Drinking Water Standards (DWS) apply to waters abstracted for human consumption. Where no UK or EU drinking water standard exists, reference is made to the World Health Organisation criteria (2011).

The DWS apply to groundwater or to surface water used for abstraction and the EQS apply to surface water where the aquatic ecosystem is the receptor. Where the most appropriate water quality target cannot be determined with certainty, the lowest one is adopted in line with the precautionary principle.

In some instances, the laboratory detection limits (LODs) may be greater than the water quality target it is being screened against, but it should be noted that these comparisons are an initial screening assessment. It may be the case that lower LODs could be obtained using a more specialised technique, but it would be disproportionately expensive to adopt the more costly specialist technique for initial screening exercises.

The preference of BSL is to have testing carried out on actual samples of ground/surface water rather than theoretical values obtained from leachate testing, which is considered to often be highly conservative. Data from water samples obtained or from leachate analysis is then compared against the screening criteria adopted by BSL, which are presented overleaf.

When screening values are exceeded then further consideration is required. This could include further additional detailed investigation and detailed quantitative risk assessment (DQRA) to further define the risk or to design appropriate remedial measures to either remove the source or break the pathway.

Ground Gas Risk Assessment

BS8485:2015+A1:2019, BS 8576:2013, CL:AIRE RB17, and NHBC 'Hazardous Ground Gas - An essential guide for housebuilders' 2023, are the current guidance which gives up-to-date advice on all aspects of permanent ground gas risk. BS8576 alongside CIRIA C682 also provides guidance on assessment of hydrocarbon vapour intrusion.

The CL:AIRE publication 'Good Practice for Coal Mine Gas Emissions" 2021 provides guidance on the assessment of risks from mine gas sources.

The above all outline good practice in investigation, the collection of relevant data and monitoring programmes in a risk-based approach to ground gas contamination. The aim of the guidance is for a consistent approach to decision making, particularly relating to the scope of protective design measures on a site-specific basis.

Legislative Framework
BS8485:2015+A1:2019, BS 8576:2013 and CIRIA C665 provides technical guidance, however they also recognise the context into which the guidance has to be employed. Government policy is based upon a "suitable for use approach", which is relevant to both the current and proposed future use of land. When considering the current use of land, Part IIA of the Environment Protection Act 1990 provides the regulatory regime. The presence of hazardous ground gases could provide the "source" in a "pollutant linkage" which could lead the regulator to determine that considerable harm or there is a significant possibility of such harm being caused. Under such circumstances, the regulator would determine the land to be "contaminated land" under the provisions of the Act, setting out the process of remediation as described in the DETR Circular 02/2000 *Statutory guidance on contaminated land.*

Generation Potential of Sources

BS 8576:2013 Figure 6 provides a basis for assessing the generation potential from sources identified as part of the Phase I Assessment. These are summarised below:

Generation Potential	Typical Sources
Very Low	• Natural carbonate soil and strata, e.g. chalk and limestone. • Natural soil strata with a low degradable organic content, e.g. alluvium, peat. • In-filled pond less than 15 m diameter, in-filled before 1930s to 1940s. • Made ground with low degradable organic content (e.g. up to 5% organic material such as pieces of wood, pieces of paper, rags, etc. with a high proportion of ash and no food or other easily degradable waste). • Mine workings shallow or shaft (where there is clear evidence that they are flooded). • Inert landfill sites (and pre -1945 landfills).
Low	• Natural soil strata with a high degradable organic content (DOC). • Made ground with total organic carbon (TOC) up to 6% (e.g. dock silt, no food or other easily degradable waste). • Foundry sand (includes phenolic binders, rags and wood that decay, albeit at low rates). • Landfill 1945 to mid 1960s (see also Moderate below).
Moderate	• Sewage sludge. • Mine workings – unflooded, more than 50 years since last worked (gas is liberated from coal when mine workings are excavated; this continues for up to about 50 years). • Landfill 1945 to mid 1960s (this could also be “low” or, if disturbed, “high”).
High	• Landfill mid 1960s to early 1990s. • Mine workings – unflooded – less than 50 years since last worked.
Very High	• Municipal landfill sites. • Landfill early 1990s onward.

Frequency and Duration of Monitoring

BS8576 notes to determine where and how to monitor ground gases requires consideration of credible pathways of possible exposure of the receptors, taking into account what is known about the geology and hydrogeology, building construction and services layout, foreseeable events such as flooding, changes in groundwater level, climate change, extreme weather conditions, the closure of mines, and possible changes to the gas regime caused by future development.

The monitoring period for a specific site should cover the “worst case” scenario. A “worst case” scenario will typically occur during falling atmospheric pressure and, in particular, weather conditions such as rainfall, frost and dry weather.

The benefits of additional information and whether it is likely to change the scope of gas protection should be considered, as are the consequences of failing to characterise adequately pollutant linkages. Investigations concerned with ground gas are required to provide monitoring data sufficient to allow prediction of worst case conditions enabling the confident assessment of risk and subsequent design of appropriate gas protection schemes. Monitoring programmes should not be an academic exercise in data collection. CL:AIRE publication TB17 “Ground Gas Monitoring and ‘Worst-Case’ Conditions” provides further guidance.

Below are matrices that will aid in determining an appropriate number of gas monitoring visits and the length of monitoring period.

Typical/idealised periods of monitoring

		Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	1 month	2 months	3 months	6 months	12 months
	Moderate (Apartments)	2 months	3 months	6 months	12 months	24 months
	High (Low rise Residential)	3 months	6 months	6 months	12 months	24 months

Typical/idealised frequency of monitoring/Number of Visits Required

		Gas Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4	6	6	12	12
	Moderate (Apartments)	6	6	9	12	24
	High (Low rise Residential)	6	9	12	24	24

Notes

1 Generation potential of sources based on descriptions within BS 8576:2013.

2 At least two sets of readings should be at low and falling atmospheric pressure (but not restricted to periods below <1000 mb) known as worst case conditions. Historical data can be used as part of the data set (Table 5.5b).

It is recommended that newly installed monitoring wells are left for 24 hours to allow the soil gas to reach equilibrium. It should be recognised, however, that some soil gas regimes could take considerably longer (up to seven days). Interpretation of any initial readings should take this equilibrium process into account.

Gas Risk Assessment

Within BS8485:2015+A1:2019 a semi-quantitative method is set out for the assessment of risk.

This method (Modified Wilson and Card) uses the concept of Gas Screening Values (GSVs) and typical threshold concentrations of carbon dioxide and methane to identify levels of risk. Sites are then classified into a 'Characteristic Situation' or 'CS' from CS1 where no mitigation is required and CS2 increasing up to CS6 where protection measures are required.

The NHBC guide 'Hazardous Ground Gas - An essential guide for housebuilders' 2023 provides further assessment tools for ground gas monitoring data, including the use of ternary plots to determine ground gas sources.

A separate approach to assessment without monitoring data is discussed under the RB17 header further below.

CIRIA C682 and BS 8576:2013 provide guidance on assessment of VOC intrusion risk.

Ground Gas Mitigation

Where a risk is determined to be present by assessment, BS8485:2015+A1:2019 provides guidance for the design of protection systems based on a points scoring system depending on the characteristic situation, structure type, structural barrier types, ventilation and a gas resistant membrane. Source removal can also be considered.

The design requires the structures to be categorised into one of four building types: Type A, Type B, Type C or Type D, related to the construction and end use of the building, together with the control of future structural changes and maintenance.

CIRIA C748 provides advice on the use of membranes as VOC vapour barriers.

CIRIA C735 sets out the approach for verification of installed mitigation measures. Note that if a membrane is installed it must be verified in accordance with CIRIA C735 or it will score zero points and assumed to not afford any protection.

RB17 Approach
CL:AIRE RB17 (Card et al 2012) is a pragmatic approach to ground gas risk assessment and was developed because gas concentration, pressure and flow rate measured in a well headspace may not be representative of the conditions in the surrounding formation.

In these low-risk situations, the approach is to use the conceptual site model and the estimation of the likely gas generation from a source to identify where or if gas monitoring is required to better define the risks.

Under this approach, for sites with natural soils only with no credible methane source, then no action is required (no monitoring or gas protection measures) as this represents Characteristic Situation 1 (CS1).

Radon
Advice on radon protection in England is provided by the UK Health Security Agency, https://www.ukradon.org/information/ukmaps and by the BRE (BR 211 (Scivyer 2023).

Areas of the country can be categorised according to the percentage of existing homes where radon is present above the Action Level:

- 0-1% lower probability.
- 1-3% and 3-10% intermediate probability.
- >10% higher probability.

Basic radon protection measures are required in new buildings and extensions in areas of England and Wales where 3-10% of properties exceed the Action Level and full radon protection measures where >10% exceed the Action Level.

Unexploded Ordnance (UXO) Guidance

Clients have a legal duty under the CDM 2015 Regulations to provide designers and contractors with project-specific health and safety information needed to identify hazards and risks. This includes the possibility of unexploded ordnance (UXO) being encountered on the site. Further details are given in CIRIA report C681.

BSL carry out non-specialist UXO screening exercises by considering any evidence of UK defence activities on or near the site evident from gathered desk study information and the unexploded aerial delivered bomb (UXB) online risk maps produced by Zetica. Other data sources are available, but as a first stage screening exercise the freely available online Zetica maps have been used. The level of risk stated is that determined by Zetica, a company experienced and considered competent in the assessment of UXO.

Geotechnical Guidance

A preliminary risk assessment of geotechnical hazards is carried out at the desk study stage and confirmed (or amended) at the ground investigation stage.

The CD 622 'Managing Geotechnical Risk' guidance document defines the technical approval and certification procedures to be used to ensure that the risk associated with the geotechnical activities are appropriately managed.

The desk-based stage may also include the requirements for a Coal Mining Risk Assessment (CMRA) which specifically assesses the risks from mining induced instability and related issues in high risk development areas: https://www.gov.uk/guidance/planning-applications-coal-mining-risk-assessments.

In order to establish the requirements of a project, the Geotechnical Category which is based on a consideration of project complexity, proposed geotechnical activities, presence of geo-hazards and severity of geotechnical risks, shall also be considered. These range from Category 1 (small/simple structures) to Category 3 (very large, unusual or complex activities/structures, such as tunnels). It is envisaged most projects typically fall into Category 2, including conventional types of geotechnical structures, earthworks and activities.

In the case of the geotechnical hazard identification at the intrusive investigation stage, this is referred to as the **ground model**.

The geotechnical sections of the report contain the factual information on the geology and relevant site data, including both in situ and laboratory testing, with a geotechnical evaluation of the information stating the assumptions made in the interpretation of the data.

Derived values of geotechnical parameters are obtained from test results by theory (book values), correlation or empiricism in general accordance with BS EN 1997-2:2007 (EC7).

Where derived geotechnical parameters are to be used in designs in accordance with EC7, the selection of characteristic values for geotechnical parameters using the derived values is carried out by well-established experience.

The characteristic value is a cautious estimate of the value affecting the occurrence of the limit state. For any particular material type there may be more than one characteristic value for each parameter because there may be more than one limit state.

The second stage is the selection of design values. The design values are either derived from the characteristic value by applying the relevant partial factors or assessed directly. Similarly, there can be several design values for the same material type.

In the event that geotechnical designs are included in this report, selection of the characteristic and design values is included. Otherwise, it is the duty of the geotechnical designer to determine these within a separate design report (a GDR).

Where it has not been possible to reasonably use an EC7 compliant technique, a practical alternative has been adopted to obtain indicative soil parameters and any interpretation is based upon engineering experience, local precedent where applicable and relevant published information.

In addition to the above:

- Assessments for highways designs are based on CD 622 Managing Geotechnical Risk.
- The assessment of sustainable drainage is based on BRE365 and CIRIA C753 'The SuDS Manual'.
- Earthworks Assessments are based on SHW Series 600 and BS6031.
- Risks from mining (both at the desk based and intrusive stages) are assessed adopting guidance from CIRIA C758.

Re-Use of Waste Soils Guidance

Definition of Waste
The Environment Agency considers waste to be "*...any material that is discarded, or intended to be discarded...*" this includes any soil from drainage trenches, foundation arisings, site strips etc. It is no longer required in its original location, therefore it is considered to be waste. Without an appropriate materials management plan, permit or exemption in place, by law this material is defined as "illegally deposited waste".

Landfill tax rules allow HM Revenue & Customs (HMRC) to recover landfill tax on illegally deposited waste on construction sites. This could lead to excessive costs without the correct documentation in place. In addition, a

person who makes, knowingly causes or knowingly facilitates a disposal to be made at an unauthorised site is also liable to pay Landfill Tax.

CL:AIRE: Code of Practice
Where materials are excavated for construction purposes, wherever possible these should be retained on site for engineering purposes if they are suitable for use. This can be implemented under the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE DoWCoP), also commonly referred to as a "Materials Management Plan".

https://www.claire.co.uk/projects-and-initiatives/dow-cop

Developers and contractors are advised to complete all works under the DoWCoP where applicable.

To implement the DoWCoP (for Route A), there is a requirement to notify the Environment Agency and Local Authority of the intention to use the code of practice in principle, after which there is a 21-day notice period for their response.

In order to re-use soils under the DoWCoP, there are four key criteria that need to be met:

- The aims and objectives of the project meet the requirements of the Waste Framework Directive (does not harm human health or the environment).
- The soils can be demonstrated to be suitable for use (backed up by chemical/geotechnical testing and assessment).
- There is certainty of use (planning consents are in place alongside materials tracking, which should be in place as part of good site practice in any case).
- Quantity (the quantity of materials used should be known).

Potential scenarios where soils may be able to be re-used:

- Material capable of being used in another place on the same site without treatment.
- Material capable of being used in another place on the same site following ex-situ treatment on site.
- Material capable of being used in another development site without treatment (Direct Transfer).
- Material capable of being used in another development site following ex-situ treatment on another site e.g. Hub site.

In order to satisfy these requirements, the following are required:

i) Consultation/approval with Local Authority & Environment Agency to confirm they have no objections to the proposed re-use of waste soils, or the risk assessments for the site.
ii) Risk Assessments to demonstrate that the site does not present an Environmental Hazard.
iii) Remediation Strategy for contaminated sites (or Design Statement for non-contaminated sites).
iv) Materials Management Plan (MMP) which details material generated stockpiles and the end use.
v) Volume calculations.
vi) Planning permission for the development.
vii) Contractual details to be clear, regarding who steps in is a contractor goes into administration/liquidation.

The use of the CoP is effectively industry regulated, there is a requirement to appoint an independent Qualified Person (QP) who checks all the requirements have been met and registers the documentation with the Environment Agency. This person must not have had any involvement with the preparing of the risk assessments or remedial strategy on the site.

Soils which require treatment on site (e.g. bioremediation, stabilisation etc) may require an Environmental Permit for treatment, together with justification and validation to prove, once treated, this material is suitable for use.

Construction activities carried out on uncontaminated soils solely for the purpose of improving geotechnical properties are not generally regarded as waste treatment operations and do not require a permit.

Site management procedures need to be in place to ensure that material is tracked through from excavation stockpiling, treatment and remediation processes. Should the process of material tracking be considered non-robust, or not adhered to, this may fail the test whether excavated materials may be considered non-waste.

Any declared MMP should be amended as new import sources are added.

Regardless of implementing re-use under the code of practice or not, all sites should have some form of materials tracking in place in compliance with current legislation. Any re-use scheme should also be designed to minimise disposal costs. Note that for re-use of landfilled materials or mining wastes, the DoWCoP may not apply and a Waste Recovery Permit (or others) may be required. Liaison with the Environment Agency would be needed on a case by case basis to determine the best option.

Once the project is complete, a verification report detailing soils re-use/import will need to be produced and submitted to CL:AIRE, which may be subject to a random audit process. Sites found to be non-complaint with the CoP can be referred to the EA for further investigation.

Soils Re-use under Exemptions and Permits
Other potential options to allow the re-use and/or import of soils and aggregates on site are provided in the table below. Applies to England/Wales only – Scotland differs.

Re-use Mechanism	Description
U1 Exemption	Can be applied to re-use/import of soils and stones, but only up to 1000 tonnes or for brick and concrete up to 5000 tonnes. This is usually an efficient way to re-use small volumes of waste materials. However, only one U1 can be filled in per site in any 3-year period. Quick and free via online registration.
WRAP Quality Protocols	Describes how processed demolition arisings can be removed from regulatory waste regime. Requires a demonstration of appropriateness by: • Factory Production Control Manual. • Facility Permit (or Exemption). • Grading Analysis.
Waste Framework Directive (WFD) exclusion	In regard to "clean" naturally occurring soils only that are to be re-used on their site of origin, these are covered by a Waste Framework Directive (WFD) exclusion which is an EA regulatory position statement. So long as the project can prove the four criteria listed above for the DoWCoP, then permits or the DoWCoP are not required. However, many projects still use the CoP to ensure compliance.
T5 Screening and blending of waste	The T5 exemption allows you to temporarily treat waste on a small scale to produce aggregate or soil at a particular location, such as a construction or demolition site. The limit is 5,000 tonnes. This applies to: • Screening soil on a demolition site to remove wood and rubble. • Blending soil and compost that has been produced under an exemption on a construction site to produce better soil for landscaping on that site (e.g. peaty deposits). • Crushing waste (except bricks, tiles and concrete) before screening or blending • Grading waste concrete after it has been crushed to produce a certain type of aggregate.
T7 Exemption	The T7 allows treatment of waste bricks, tiles and concrete by crushing, grinding or reducing in size. This needs to be registered with the Local Authority.
Other Permitting Routes	Other options include use under an Environmental Permit (Standard or Bespoke Rules), however these may be a time consuming and costly route, where use of the other above options (if applicable) are likely to be more feasible in construction.

There are also potential non-enforcement positions for re-use e.g. a site has a large volume waste illegally deposited on it (not by landowner). The new owner is keen to re-use waste where possible to reprofile the site (planning condition granted). The DoWCoP could not be used as materials already excavated and deposited as a waste (illegally). The EA may agree that although the DoWCoP not applicable, they would take a non-enforcement position if the works were completed in accordance with the DoWCoP – this would need to be agreed in advance.

Waste Classification and Disposal Guidance for Soils

Introduction
As described in the 'Waste Duty of Care Code of Practice (2016)' any substance or object that the holder discards, intends to discard or is required to discard is a waste. Waste producers have a duty of care to classify the waste they are producing:

- Before it is collected, disposed of or recovered.
- To identify the controls that apply to the movement of the waste.
- To complete waste documents and records.
- To identify suitably authorised waste management options.
- To prevent harm to people and the environment.

The most sustainable and economic method of dealing with waste soil is usually the retention and re-use on site. Where this is not possible there are three main options for the disposal of soils:

1. Disposal to a permitted waste recycling facility.
2. Re-use on another site (subject to the suitability).
3. Disposal to a landfill site.

The disposal to a permitted facility will be subject to the **specific conditions of the permits for each individual facility** and will vary dependent on location and environmental sensitivity of the receiving site. Re-use on another site will also be subject to the acceptability criteria of that site.

The guidance below relates to disposal to **landfill sites only**.

Background for Landfill Disposal
The Landfill Directive places controls on waste disposal. These controls include requirements to follow the waste acceptance procedures and criteria that have been agreed by the Council of the European Union and are laid out in Council Decision 2003/33/EC.

Before a waste can be accepted at a landfill site, the landfill **operator** must be satisfied that the waste meets permit conditions, the waste acceptance procedures (WAP) and waste acceptance criteria (WAC).

If disposal to landfill is the best management option for the waste soils, these procedures **must** be followed or the operator may refuse to accept the waste.

Key Points:

- Not all waste can be landfilled.
- Landfills are classified according to whether they can accept hazardous, non-hazardous or inert wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes that must be followed before wastes can be accepted at a landfill site.

Classification

Wastes are listed in the European Waste Catalogue and grouped according to generic industry, process or waste types. Wastes within the EWC are either hazardous or non-hazardous. Some of these wastes are hazardous without further assessment (absolute entries) or are 'mirror' entries that require further assessment of their hazardous properties in order to determine whether they are hazardous waste.

Waste soil has mirror entries on the EWC and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not i.e. the hazard assessment. The most common EWC waste codes related to soil are:

17 05	Soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03

Soils may contain certain contaminants (e.g. asbestos, oil,) which have prescribed concentration thresholds, that if breached will render the material hazardous waste. These are based on specific "hazardous properties" which include hazards such as carcinogenicity, flammability and toxicity.

In the first instance the concentrations of plausible contaminants within the soil should be identified and wastes should be **classified based on their total concentrations** and classified as either hazardous or non-hazardous waste. WAC analysis must not be used for waste classification.

Waste Definitions

Inert	• Will not undergo any significant physical, chemical or biological transformations. • Will not dissolve. • Will not burn. • Will not physically or chemically react. • Will not biodegrade. • Will not adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health. • Has insignificant total leachability and pollutant content. • Produces a leachate with an ecotoxicity that is insignificant (if it produces leachate).
Non-Hazardous	Is not inert (see above). Is not hazardous (see below).
Hazardous	Soil has hazardous properties as defined in WM3 (Guidance on the classification and assessment of waste (1st edition 2015)- Technical Guidance).
Stable Non-reactive hazardous waste#	Hazardous waste, the leaching behaviour of which will not change adversely in the long-term, under landfill design conditions or foreseeable accidents either: in the waste alone (for example, by biodegradation), under the impact of long-term ambient conditions (for example, water, air, temperature or mechanical constraints) or by the impact of other wastes (including waste products such as leachate and gas).

This option allows hazardous waste that is stable and thus has a low leaching potential to be deposited in cells with a standard of containment consistent with non-hazardous wastes.

WAC Testing

The purpose of WAC analysis is to confirm that the waste complies with the relevant WAC for the receiving landfill. If the waste has any disposal route other than a landfill site (e.g. recycling facility, incineration etc) then WAC is not relevant. Furthermore, the WAC limits **cannot** be used to make an assessment of whether a waste is hazardous. WAC testing does however define if a non-hazardous waste is suitable for an inert landfill.

Classification based on Total Concentrations[1]	Non-Hazardous Waste		Hazardous Waste	
WAC testing	Below inert WAC limit values:	Above inert WAC limit values:	Below hazardous WAC limit values	> WAC limit values

Landfill requirements	INERT landfill	NON-HAZARDOUS landfill[2]	HAZARDOUS landfill	PRE-TREATMENT[3]

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).
2 Individual sites may have certain limit values pre-determined in their licence.
3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.
4 Possibility that wastes could be classified as stable Nonreactive HAZARDOUS waste in non-hazardous Landfill (e.g. soils containing low concentrations of asbestos, gypsum or sulphate bearing soils).

Waste classified as non-hazardous can be accepted into a non-hazardous landfill without having to pass any numerical WAC.

Soils above hazardous WAC limit values require pre-treatment prior to disposal. The effective pre-treatment, typically involving separation, sorting and screening, can offer cost savings through reducing the hazardous nature and volumes of soil. Costs for disposal of non-hazardous/hazardous soils are significant compared to the disposal of inert material.

Greenfield Sites and Inert Waste
The possibility of automatic inert classification naturally occurring "clean" soils should be explored in accordance with the requirements of paragraph 10 (wastes acceptable without testing at landfills for inert waste) of the Landfill (England and Wales) (Amendment) Regulations (2005). This is the case if:

- They are single stream waste of a single waste type (although different waste types from the list may be accepted together if they are from a single source); and
- There is no suspicion of material or substances such as metals, asbestos, plastics, chemicals, etc to an extent which increases the risk associated with the waste sufficiently to justify contamination and they do not contain other classes of landfill (e.g. the waste producer can characterise the waste based on visual assessment and written description with supporting evidence such as a desk study, subject to agreement by the landfill operator).

Hydrocarbons in Soils
WM3 uses the term Oil or Waste Oil to cover hydrocarbons products such as fuel oil, petrol or diesel. These are defined by WM3 as hazardous under an absolute entry in the List of Wastes. However, hydrocarbons in soils are a mixture rather than a pure product and are therefore not absolute entries.

Known Oils
The simplest scenario is where the identity of the contaminating oil is known or can be identified. If the oil is known the manufacturer's or supplier's REACH compliant safety data sheet for the specific oil can be obtained and the hazard statement codes on that Safety Data Sheet can be used for the hazardous waste assessment.

Where the identity of the oil can only be identified down to a petroleum group level (i.e. the contaminating oil is known to be diesel, but the specific type/brand is unknown), then the classification of that petroleum group should be used in the assessment. The marker compounds associated with that petroleum group may be used to confirm carcinogenicity.

Oils may contain a range of hydrocarbons, so the presence of for instance Diesel Range Organics (DRO) does not enable the assessor to conclude that diesel is present. These hydrocarbons may have arisen from other oils, the laboratory needs to provide an interpretation of the chromatograph to determine if it is consistent with diesel or weathered diesel as a whole.

The concentration of known oils should be determined using a method that as a minimum spans the range in which the carbon numbers for that known oil fall.

Unknown Oils
Where hydrocarbons are contaminating soils, it is likely that the oil will be unknown or cannot be determined.

WM3 states that:

> For contaminated land specific consideration must be given to the following before proceeding:
>
> - The presence of other organic contaminants, for example solvents or coal tar that could be detected as hydrocarbons. Coal Tar is not an oil and is considered separately in WM3 example 2. Where the site history or investigation indicates the presence of hydrocarbons from oil and other sources (e.g. coal tar), and the origin of the hydrocarbons cannot reliably be assigned to either, then a worst case approach of considering the hydrocarbons both as waste oil (in accordance with this example) and from other sources, for example coal tar should be taken.
> - The presence of diesel, or weathered diesel, should be specifically considered by the laboratory and where this is confirmed by the hydrocarbon profile the oil should be assessed as a known or identified oil (diesel).

The use of marker compounds is optional; however, it is recommended that where possible the marker compounds should be used. WM3 states:

> If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic/mutagenic due to the presence of oil if all three of the following criteria are met:
>
> - The waste contains benzo[a]pyrene (BaP) at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.1 of the CLP for BaP)
> - This has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D of WM3, and
> - The analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel.

For example:

TPH Concentration (mg/kg)	Petrol or Diesel	BaP (mg/kg)	Classification
10,000	No	0.9	Non- Hazardous
1,000	No	Not available	Hazardous
1,000	Yes	Not relevant	Hazardous

References

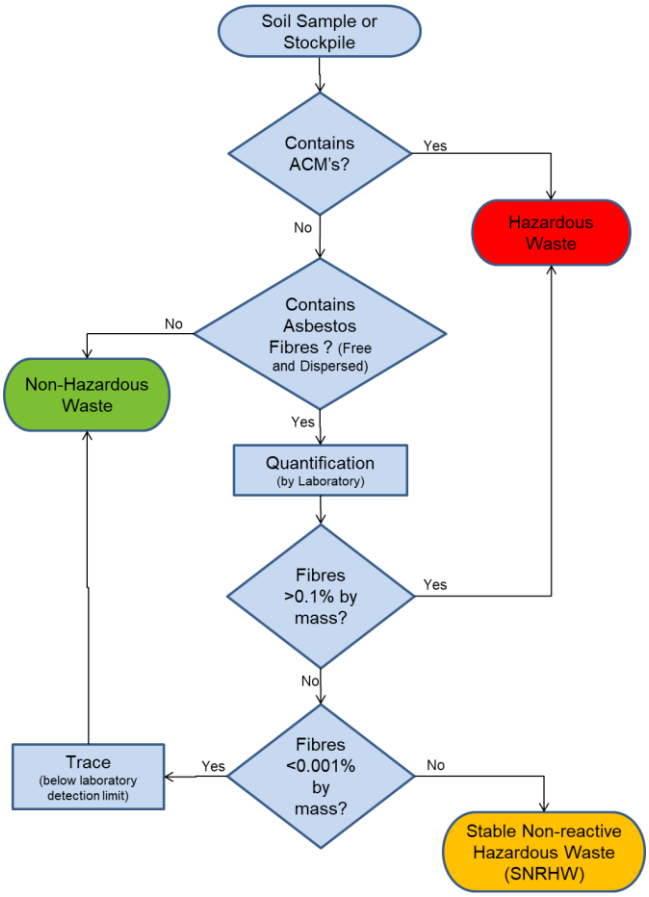
1. Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EP Regulations), the Landfill Directive (1999/31/EC) and the subsequent Council Decisions.
2. Environment Agency Environmental Permitting Regulations: "Inert Waste Guidance- Standards and Measures for the Deposit of Inert Waste on Land" 2009.
3. Environment Agency "Waste acceptance at landfills - Guidance on waste acceptance procedures and criteria" Nov 2010.
4. Environment Agency "Guidance on the classification and assessment of waste (Technical Guidance WM3)".
5. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).
6. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.
7. 2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament.
8. Environmental Permitting Guidance The Landfill Directive For the Environmental Permitting (England and Wales) Regulations 2010 Updated March 2010 Version 3.1.
9. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).

Waste Containing Asbestos

The assessment of asbestos containing waste is dependent on whether the asbestos is present as:

- Fibres that are free and dispersed, or
- Identifiable pieces of asbestos containing materials (ACM's).

Identifiable pieces of asbestos are any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye. The result is that commonly soils with visible ACM's are sorted and the ACM's removed by hand picking and separate disposal.



Should soils contain asbestos, the concentration and type of asbestos identified, in addition to the chemical composition (i.e. hazardous or non-hazardous detailed above), will determine which waste code is applicable to the soils and which landfill will accept it as summarised below:

Waste	Conc. by Weight (%)	EWC 2002 Catalogue Entry Code	Waste Disposal Route
Non-hazardous containing asbestos fibres	<0.001 - <0.1%	17 05 04 (soil and stones other than those mentioned in 17 05 03*)	Non-hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a stable non-reactive hazardous landfill site.
Hazardous containing asbestos fibres	<0.001 - <0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a hazardous landfill site.
Non-hazardous soils containing asbestos fibres	>0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill authorised to receive asbestos, or in a stable non-reactive hazardous waste cell at a non-hazardous landfill authorised to receive asbestos.

Waste	Conc. by Weight (%)	EWC 2002 Catalogue Entry Code	Waste Disposal Route
Non-hazardous Soils containing ACM (Mechanically separable)	>0.1%	17 06 05 (construction material containing asbestos) 17 05 04 (soil and stones other than those mentioned in 17 05 03*)	ACMs disposed of at a hazardous landfill authorised to receive asbestos, or in a stable non-reactive hazardous waste cell at a non-hazardous landfill authorised to receive asbestos. Soils should be disposed of at a non-hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a stable non-reactive hazardous landfill site.
Hazardous soils containing ACM	>0.1%	17 05 03* (soil and stones containing dangerous substances)	Hazardous landfill subject to achieving Waste Acceptance Criteria (WAC) for a hazardous landfill site.

Asbestos concentrations below 0.001% by mass are below standard laboratory detection limits and are not currently regarded as containing asbestos for the purposes of disposal and may be disposed of to an inert landfill site[1]. These levels are often termed "trace" by laboratories.

Asbestos concentrations between 0.001% and 0.1% are stable non-reactive hazardous waste (SNRHW)[1]. Waste transfer stations where soil recycling takes place may be able to take SNRHW, but are unlikely to take soils containing asbestos above trace concentrations.

The following codes should be assigned to the asbestos waste as appropriate:

17 06	Insulation materials and asbestos-containing construction materials
17 06 01	Insulation materials containing asbestos
17 06 03	Other insulation materials consisting of or containing hazardous substances
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05	Construction material containing asbestos

WM3 indicates that 17 06 05 would normally be used in preference to 17 06 01 for the asbestos in asbestos contaminated soil and stones.

Construction materials containing asbestos and "*other suitable materials*" may be landfilled at landfills for non-hazardous waste in accordance with the Landfill Directive without testing.

This means that wastes that are only hazardous because of their asbestos content can be disposed of at landfills for non-hazardous waste in separate landfill cells that only accept asbestos wastes and other suitable materials. The Landfill Directive requires that stable non-reactive hazardous waste shall not be deposited with biodegradable waste (for example organic material, household waste, paper etc..) and must meet the waste acceptance criteria set out in accordance with Annex II.

Construction

Health and Safety Executive (HSE) guidance on asbestos is not directly related to soil and much of the guidance focuses on the removal of asbestos from buildings. The overarching legislation is the Control of Asbestos Regulation (CAR 2012). However, where work involves (or is likely to involve) contact with asbestos then CAR 2012 requires a risk assessment including whether the work is licensed or notifiable non-licensed work and may require an Asbestos Management Plan. Work becomes notifiable if it is considered that the control limit could be exceeded.

Brownfield sites frequently have soils that contain asbestos and the presence of asbestos needs to be considered within the context of construction, particularly in relation to groundworks. The exposure of soils and the use of excavators and plant to move soil around increases the possibility of fibres becoming airborne. However, it is good site practice to not generate dusts and to employ dust suppression on all sites regardless of the presence of asbestos.

The legal control limit for asbestos is 0.1f/ml over a continuous four-hour period. The control limit is not a '*safe*' level and exposure from work activities involving asbestos must be reduced to as far below the control limit as possible.

Clearly the higher the concentrations in the soil the greater potential there is for fibres to be released, however IOM publication TM/88/14 "the release of dispersed asbestos fibres from soil" 1988 concludes that:

- Mixtures of asbestos in dry soils with asbestos content as low as 0.001% can produce airborne respirable asbestos concentrations greater than 0.1f/ml in dust clouds where the respirable dust concentrations are less than 5mg/m3.
- An action limit is recommended of no higher than 0.001% asbestos in soils above which steps should be taken to minimise exposure to airborne fibres (e.g. by wetting).
- The addition of relatively small quantities (10%) of water can reduce the airborne fibre concentrations by an order of magnitude.

Where asbestos has been identified at concentrations above 0.001% as free and dispersed fibres in the soil precautions need to be adopted. Concentrations below this are considered to be normal background, although good site practice dictates that the generation of dusts should be avoided and therefore any fugitive fibre release from minor concentrations should be kept to a practical minimum.

End Use
The use of materials containing asbestos and material containing asbestos is prohibited under EU legislation.

Asbestos containing materials can remain in situ under a suitable cover system which may be hard surfacing or soft landscaping (with or without hard dig layers and markers).

There is a risk that future maintenance may compromise such systems and details of the presence of asbestos should be kept in the Health and Safety File.

Publications from the JIWG provide guides for decision making in relation to construction.

The re-use of waste soils should be undertaken in accordance with the CL:AIRE Code of Practice and is subject to suitable risk assessments demonstrating low risk. There is nothing that specifically excludes the re-use of soils containing asbestos as fill to raise levels. However, the movement of materials increases the risk of fibres becoming airborne and suitable precautions will be required. Re-use of soils containing asbestos should be as per CARSOILS.

The re-use of soils containing asbestos at concentrations above hazardous waste levels may be met with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be feasible where there is a long program for implementation.

Asbestos in Soil as Free Fibres

Concentration (by weight)	Waste Disposal				Construction Issues	End Use	
	Recycle	Inert	SNR	Haz		Suitable for re-use on site	Precautions
Not detected	√	√			No precautions necessary, however on a brownfield site asbestos not previously identified may be found during works and a statement within the contractor's method statement for how they will deal with this unforeseen asbestos would be good practice to ensure compliance with CAR2012.	Yes.	None.
Trace (<0.001%)		√ [2]			Precautions are unlikely to be required, however a detailed method statement may be required to ensure compliance with CAR2012. Basic asbestos management good practice will be required. Typically precautions would include: • Ensuring soils do not dry out to become dusty. • Site personnel have the risk communicated at induction stage.	Yes Soils can be re-used under CL:AIRE CoP with the correct precautions in place.	Generally clean cover or hardstanding cover required.
0.001% – 0.099%			√		Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: • Site personnel have the risk communicated at induction stage. • Ensuring personnel have suitable training. • Task monitoring to inform PPE requirements. • Ensuring soils do not dry out to become dusty and that misting is available during groundworks. • Separate stockpiling. • Clean haulage routes.	Possibly. Soils may be able to be re-used under CL:AIRE CoP, subject to a satisfactory Risk Assessment and regulatory agreement with the correct precautions in place.	Clean cover with hard dig/demarcation layer or hardstanding cover required.
0.1+%				√	Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: • Site personnel have the risk communicated at induction stage. • Ensuring personnel have suitable training. • Task monitoring to inform PPE requirements. • Site wide and or perimeter monitoring. • Ensuring soils do not dry out to become dusty and that misting is available during groundworks. • Separate stockpiling.	Unlikely [3] Re-use of soils containing asbestos within an earthworks scheme will involve significant engineering and the risk for generating dusts will be significantly	Clean cover and a hard dig / demarcation layer. A plan should be in place for future excavations as part of the Health and Safety File.

Concentration (by weight)	Waste Disposal				Construction Issues	End Use	
	Recycle	Inert	SNR	Haz		Suitable for re-use on site	Precautions
					• Clean haulage routes. • Decontamination unit	increased with repeated handling and compaction.	

1. The standard laboratory detection limit is normally 0.001%. Below 0.001% is trace and currently regarded as not containing asbestos for the purposes of disposal off site. However the waste producer has a duty to fully classify the waste and the presence of trace asbestos should be declared. Consequently it is unlikely that a waste treatment site will take this soil and an inert landfill may make a commercial decision to only take it under some circumstances.

2 The re-use of soils containing asbestos at concentrations above hazardous waste is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be warranted where there a long program for implementation.

APPENDIX B

Exploratory Hole Logs

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS101
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338590E, 349419N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	28.20m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	15/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00-0.30	ES					MADE GROUND: Brownish orange sandy gravel. Sand is fine to coarse. Gravel is angular fine to coarse of brick and mudstone.
					0.30	27.90		
		0.40-0.60	ES					MADE GROUND: Brown slightly gravelly clay. Gravel is subangular fine to medium of brick and charcoal.
					0.80	27.40		
		1.20-1.65 1.20	D SPT	N=23 (3,3/4,6,6,7)				Stiff brown slightly gravelly CLAY with grey mottling. Gravel is subangular fine to coarse of grey weathered mudstone.
		1.70-1.90	ES					
		2.00-2.45 2.00	D SPT	N≥50 (5,7/11,12,12,15)				*2.00m bgl: becoming hard.*
					2.45	25.75		End of Borehole at 2.45m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Principal Contractor responsible for service clearance.
2. No groundwater encountered.
3. Refused early at 2.45m bgl including SPT on hard clay.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS102
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338573E, 349363N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	27.40m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	15/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.20	ES		0.20	27.20		MADE GROUND: Dark brown slightly gravelly clay with frequent rootlets. Gravel is subangular fine of brick.
		0.40-0.60	ES		1.00	26.40		Brown slightly gravelly CLAY with occasional small tree roots. Gravel is angular fine of mudstone.
		1.20-1.65 1.20	D SPT	N=12 (2,2/2,3,3,4)				Firm dark brown slightly gravelly CLAY with grey mottling. Gravel is mostly subrounded fine to medium of mudstone with rare fine to medium gravel of coal fragments.
		1.90-2.45 2.00	D SPT	N≥50 (4,7/10,12,12,16)				*2.00m bgl: becoming hard.*
					2.45	24.95		End of Borehole at 2.45m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Principal Contractor responsible for service clearance.
2. No groundwater encountered.
3. Refused early at 2.45m bgl including SPT on hard clay.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS103
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338544E, 349289N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	25.60m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	15/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	25.50		MADE GROUND: Dark brown clay with frequent tree roots and leaves.
		0.30-0.60	ES					MADE GROUND: Brown gravelly clay with high cobble content. Gravel is angular fine to coarse of brick, concrete, and mudstone. Cobbles are subangular 70-80mm of concrete.
					1.10	24.50		
		1.20-1.65 1.20	D SPT	N=8 (2,2/2,2,2,2)				Soft dark brown slightly gravelly CLAY. Gravel is subangular fine to coarse of sandstone, mudstone, and charcoal fragments.
		1.30-1.50	ES					
					1.80	23.80		Brown CLAY with minor orange mottling.
		2.00-2.45 2.00	D SPT	N=17 (2,2/3,4,4,6)	2.10	23.50		Stiff brown slightly gravelly CLAY with grey mottling. Gravel is angular fine of mudstone.
		2.50-3.05 2.60	D SPT	N≥50 (5,8/11,13,13,14)				*2.60m bgl: becoming hard.*
					3.05	22.55		End of Borehole at 3.05m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Principal Contractor responsible for service clearance.
2. No groundwater encountered.
3. Refused early at 3.05m bgl including SPT on hard clay.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS104
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338525E, 349277N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	27.20m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	15/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20-0.40	ES					MADE GROUND: Brown clay with grey mottling.
					0.50	26.70		MADE GROUND: Brown slightly gravelly clay. Gravel is angular fine to coarse of brick and burnt shale.
		1.20-1.40 1.20	ES SPT	N=8 (2,2/2,2,2,2)	1.10	26.10		MADE GROUND: Soft brown gravelly clay. Gravel is angular fine to coarse of brick, burnt shale, and coal fragments.
		1.70-1.90	ES		1.50	25.70		Soft brown CLAY with minor grey mottling. *2.00m bgl: becoming hard.*
		2.00-2.45 2.00	D SPT	N≥50 (2,3/9,13,13,15)				
					2.45	24.75		End of Borehole at 2.45m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Principal Contractor responsible for service clearance.
2. No groundwater encountered.
3. Refused early at 2.45m bgl including SPT on hard clay.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS105
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338564E, 349258N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	27.20m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	16/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20-0.40	ES					MADE GROUND: Brown slightly gravelly clay with frequent small tree roots and rootlets. Gravel is angular fine to medium of brick.
								0.20m bgl: no tree roots or rootlets.
					0.60	26.60		MADE GROUND: Brown slightly gravelly clay. Gravel is angular fine to coarse of brick and mudstone.
		1.00-1.20	ES					
		1.20	SPT	N=9 (2,3/2,2,2,3)				
					1.30	25.90		Firm brown slightly gravelly CLAY with grey mottling. Gravel is subrounded fine of sandstone.
								1.70 - 2.40m bgl: orange mottling and rare small tree roots present.
		1.80-2.00	ES					
		2.00	SPT	N=17 (2,3/3,4,4,6)				*2.00m bgl: becoming stiff.*
					2.40	24.80		Stiff orangish brown CLAY with grey mottling.
		2.70-3.25	D					
		2.80	SPT	N≥50 (7,9/13,13,13,11)				*2.80m bgl: becoming hard.*
					3.25	23.95		End of Borehole at 3.25m

Remarks

1. Principal Contractor responsible for service clearance.
2. No groundwater encountered.
3. Refused early at 3.25m bgl including SPT on hard clay.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS106
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338408E, 349304N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	22.80m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	16/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30-0.50	ES		0.20	22.60		MADE GROUND: Grass over dark brown slightly gravelly clay with frequent tree roots and rootlets. Gravel is angular fine of brick.
								MADE GROUND: Brown gravelly clay. Gravel is angular fine to coarse of brick, charcoal, and sandstone.
		1.00-1.20	ES		0.90	21.90		Greyish brown slightly silty fine to coarse SAND with orange mottling.
	▽	1.20	SPT	N=5 (1,1/1,1,1,2)	1.20	21.60		Very soft greyish brown sandy CLAY. Sand is fine to coarse.
		1.50-1.70	D		1.40	21.40		Soft orangish brown slightly sandy slightly gravelly CLAY with orange and black mottling. Sand is fine to coarse. Gravel is subangular fine of weathered sandstone.
		2.00	SPT	N=1 (0,0/0,0,0,1)	1.90	20.90		Very loose orangish brown sandy SILT. Sand is fine to coarse.
					2.10	20.70		Very soft grey CLAY.
	▽				2.30	20.50		Very loose grey sandy SILT with rare fibrous woody organics. Sand is fine to coarse.
		2.90-3.45	D		2.70	20.10		Firm brown CLAY with grey mottling.
	▽	3.00	SPT	N=12 (2,3/3,3,3,3)				
		3.90-4.45	D		3.60	19.20		Hard brown slightly gravelly CLAY. Gravel is subrounded fine to medium of weathered mudstone.
		4.00	SPT	N≥50 (4,6/11,13,13,13)				
					4.45	18.35		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Principal Contractor responsible for service clearance.
2. Groundwater encountered at 1.30m, 2.50m, and 3.20m bgl as perched.
3. Refused early at 4.45m bgl including SPT on hard clay.
4. Installed with 1.60m plain pipe and 2.00m slotted pipe.
5. Backfilled with bentonite to 1.60m bgl, gravel from 1.60m to 3.60m bgl, and hole collapsed to 3.60m bgl. The well was installed raised above ground level.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS107
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338430E, 349294N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	23.00m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	16/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	22.80		Dark brown CLAY with frequent small tree roots and rootlets. (TOPSOIL)
		0.40-0.60	ES					Brown slightly sandy slighty gravelly CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded fine to medium of sandstone.
					0.70	22.30		Brown sandy CLAY with orange mottling. Sand is fine to coarse.
		1.20-1.40	D		1.20	21.80		Very soft brown slightly sandy silty CLAY with orange and black mottling. Sand is fine to coarse.
		1.20	SPT	N=4 (1,1/1,1,1,1)				
	▽				1.40	21.60		Very loose greyish brown silty fine to coarse SAND with occasional black fibrous woody organics.
					1.70	21.30		Light brown slightly silty slightly clayey fine to coarse SAND with frequent tree branches.
		2.00	SPT	N=0 (0,0/0,0,0,0)	2.00	21.00		Very loose blackish grey fine to coarse SAND with frequent black fibrous woody organics.
	▽	2.10-2.40	D		2.10	20.90		Very loose orangish grey silty fine to coarse SAND with occasional black fibrous woody organic material.
					2.40	20.60		Greyish brown silty fine to coarse SAND.
					2.50	20.50		Brown slightly gravelly CLAY. Gravel is subrounded fine of weathered mudstone.
					2.70	20.30		Hard brown slightly sandy slightly gravelly CLAY with grey mottling. Sand is fine to coarse. Gravel is subrounded fine to coarse of mudstone.
		2.80-3.00	D					
		3.00	SPT	N≥50 (3,6/11,13,13,13)				
					3.45	19.55		End of Borehole at 3.45m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Principal Contractor responsible for service clearance.
2. Groundwater encountered at 1.50m and 2.10m bgl as perched.
3. Refused early at 3.45m bgl including SPT on hard clay.
4. Installed with 0.80m plain pipe and 2.00m slotted pipe.
5. Backfilled with bentonite to 0.80m bgl, gravel from 0.80m to 2.80m bgl, and hole collapsed to 2.80m bgl. The well was installed raised above ground level.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS108
Sheet 1 of 1

PROJECT NO:	C6668	**CO-ORDS:**	338473E, 349259N
PROJECT NAME:	THE OAKS, WREXHAM	**LEVEL:**	22.50m OD
CLIENT:	FI CONSTRUCTION	**DATES:**	16/04/26

Hole Type	Scale	Logged	Checked
WS	1:25	CC	AJS

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.20	ES					Moss over dark brown slightly sandy silty CLAY with frequent small roots and rootlets. Sand is fine to coarse. (TOPSOIL)
					0.20	22.30		Brown slightly sandy silty CLAY with rare black mottling. Sand is fine to coarse.
		0.40-0.60	ES					
		1.00-1.20	D		1.00	21.50		Brown sandy clayey SILT with occasional orange and black mottling. Sand is fine to coarse.
	▽	1.20	SPT	N=1 (0,0/0,1,0,0)	1.20	21.30		Very loose orangish brown slightly silty fine to coarse SAND.
					1.40	21.10		Very soft brown slightly clayey sandy SILT with black mottling. Sand is fine to coarse.
					1.70	20.80		Brown sandy silty CLAY. Sand is fine.
	▽	2.00-2.30	D		2.00	20.50		Very loose grey sandy SILT. Sand is fine.
		2.00	SPT	N=2 (0,0/1,0,0,1)				
					2.30	20.20		Very soft grey sandy silty CLAY. Sand is fine.
					2.40	20.10		Brown CLAY with grey mottling.
		2.60-2.80	D					
		3.00-3.45	D					*3.00m bgl: becoming hard.*
		3.00	SPT	N≥50 (5,9/12,12,13,13)				
					3.45	19.05		End of Borehole at 3.45m

1.0 2.0 3.0 4.0 5.0

Remarks

1. Principal Contractor responsible for service clearance.
2. Groundwater encountered at 1.20m and 2.00m bgl as perched.
3. Refused early at 3.45m bgl including SPT on hard clay.
4. Installed with 1.00m plain pipe and 2.00m slotted pipe.
5. Backfilled with bentonite to 1.00m bgl, gravel from 1.00m to 3.00m bgl. The well was installed at approximately ground level.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

APPENDIX C

Geotechnical Testing Results

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client Brownfield Solutions Ltd

Address William Smith House
173-183 Witton Street
Northwich
Cheshire
CW9 5LP

Contract C6668 - The Oaks, Wrexham

Job Number MRN 26012/18
Date of Issue 08 May 2026

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

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

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

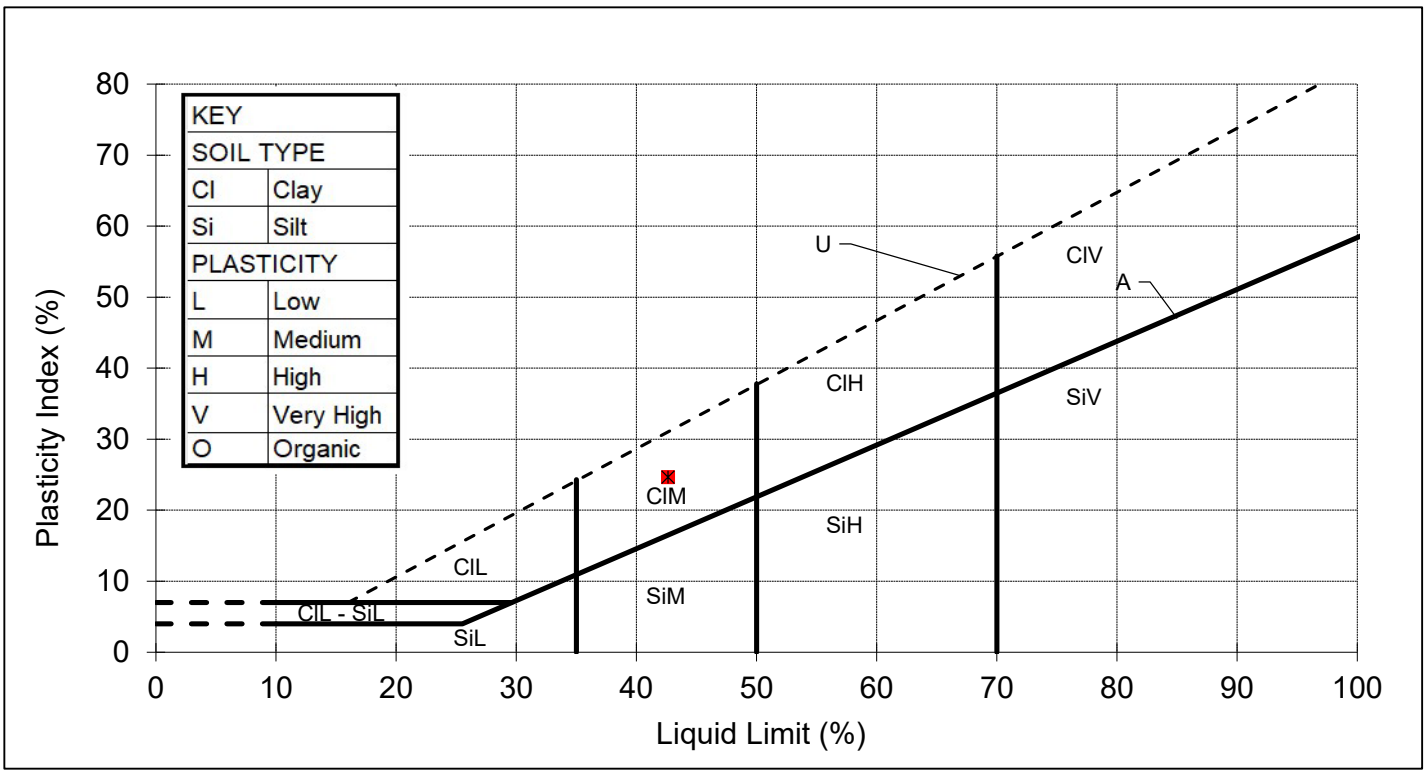
CLIENT	Brownfield Solutions Ltd
SITE	C6668 - The Oaks, Wrexham
JOB NUMBER	MRN 26012/18

SAMPLE LABEL	WS101 1.2-1.65m	DATE SAMPLED	15-Apr-26
SAMPLE No.	6088401	DATE RECEIVED	24-Apr-26
DATE TESTED	29-Apr-26	SAMPLED BY	Client

MATERIAL	Orangey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	As received	% RET. 425um BY	Hand picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.9	42.6	1.002	
Determination 2 (avg)	19.9	42.5		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18.7	43	18	25	96



REMARKS

SIGNED

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

DATE 08-May-26

MURRAY RIX

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

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

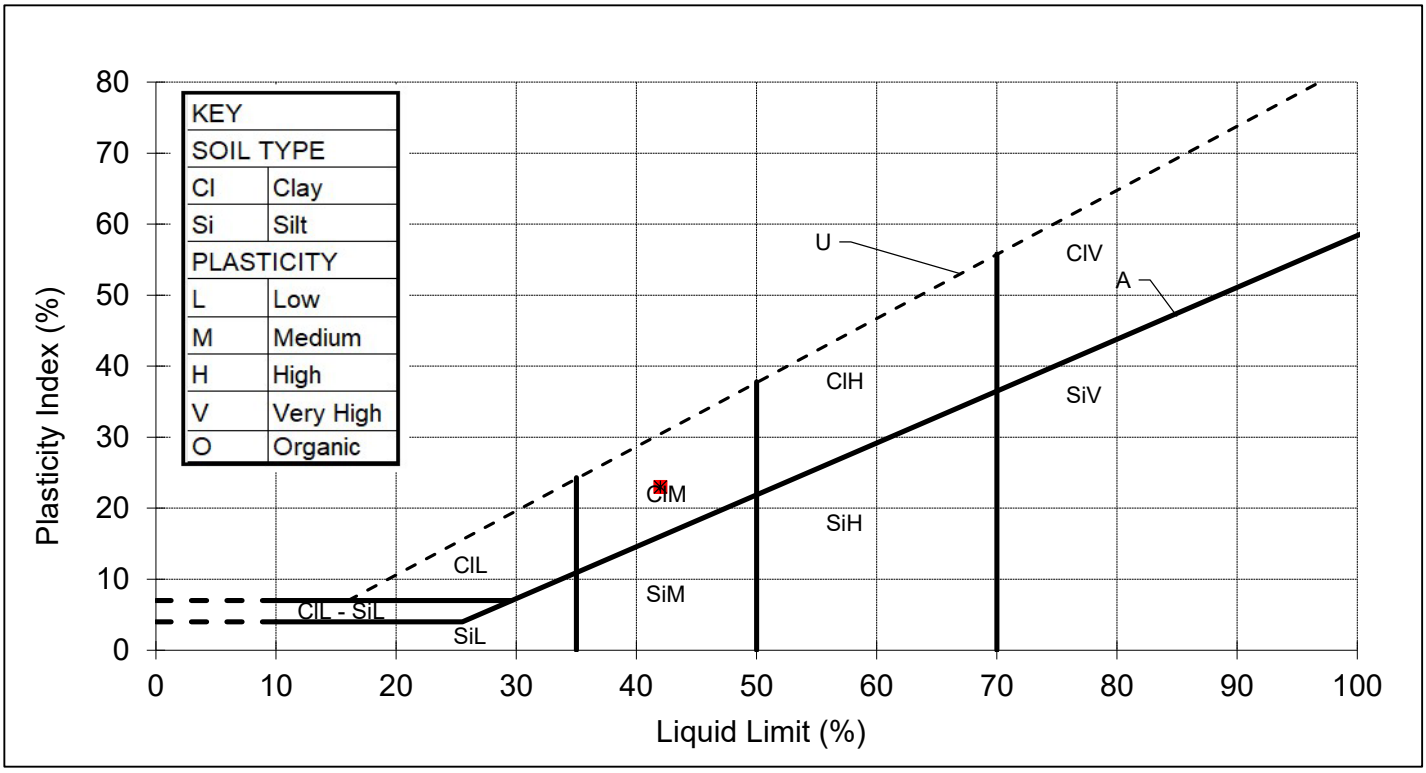
CLIENT	Brownfield Solutions Ltd
SITE	C6668 - The Oaks, Wrexham
JOB NUMBER	MRN 26012/18

SAMPLE LABEL	WS103 1.2-1.65m	DATE SAMPLED	15-Apr-26
SAMPLE No.	6088402	DATE RECEIVED	24-Apr-26
DATE TESTED	29-Apr-26	SAMPLED BY	Client

MATERIAL	Orangey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	As received	% RET. 425um BY	Hand picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	17.3	39.9	1.052	
Determination 2 (avg)	17.1	39.9		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
23.3	42	19	23	96



REMARKS

SIGNED

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

DATE 08-May-26

MURRAY RIX

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

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

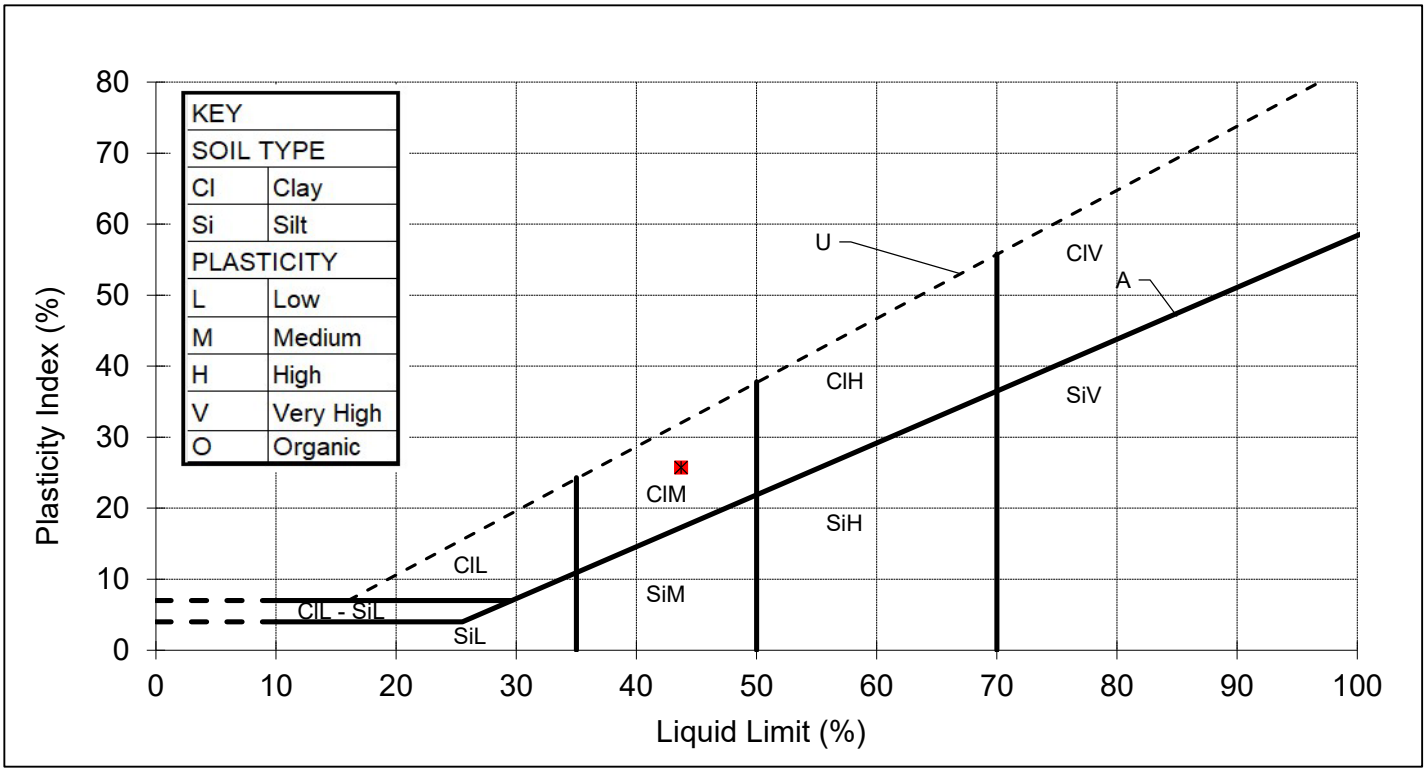
CLIENT	Brownfield Solutions Ltd
SITE	C6668 - The Oaks, Wrexham
JOB NUMBER	MRN 26012/18

SAMPLE LABEL	WS103 2.0-2.45m	DATE SAMPLED	15-Apr-26
SAMPLE No.	6088403	DATE RECEIVED	24-Apr-26
DATE TESTED	29-Apr-26	SAMPLED BY	Client

MATERIAL	Orangey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	As received	% RET. 425um BY	Hand picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.5	43.3	1.011	
Determination 2 (avg)	19.4	43.2		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22.9	44	18	26	97



REMARKS

SIGNED

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

DATE 08-May-26

MURRAY RIX

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

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

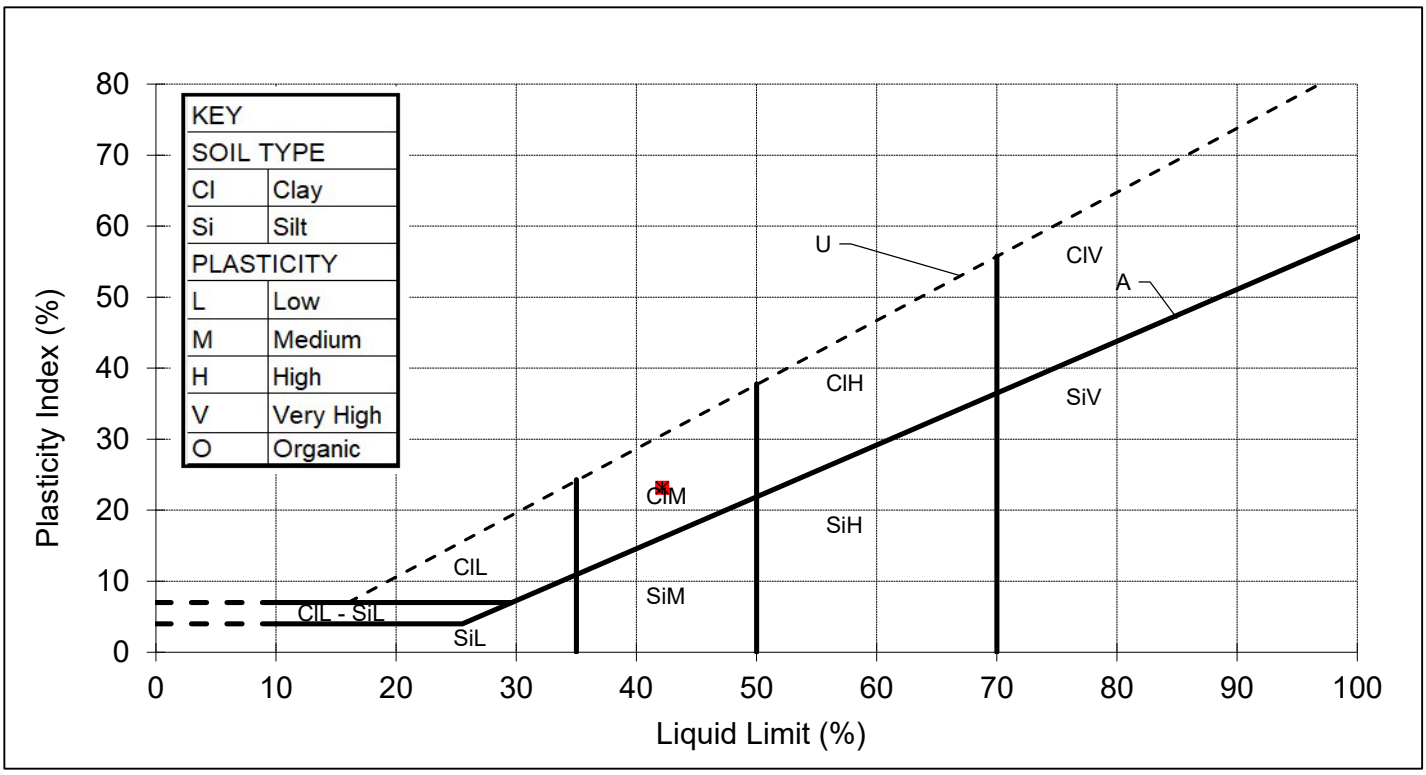
CLIENT	Brownfield Solutions Ltd
SITE	C6668 - The Oaks, Wrexham
JOB NUMBER	MRN 26012/18

SAMPLE LABEL	WS106 1.5-1.7m	DATE SAMPLED	15-Apr-26
SAMPLE No.	6088404	DATE RECEIVED	24-Apr-26
DATE TESTED	29-Apr-26	SAMPLED BY	Client

MATERIAL	Orangey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	As received	% RET. 425um BY	Hand picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.0	42.1	1.000	
Determination 2 (avg)	20.0	42.2		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
26.6	42	19	23	95



REMARKS

SIGNED

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

DATE 08-May-26

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

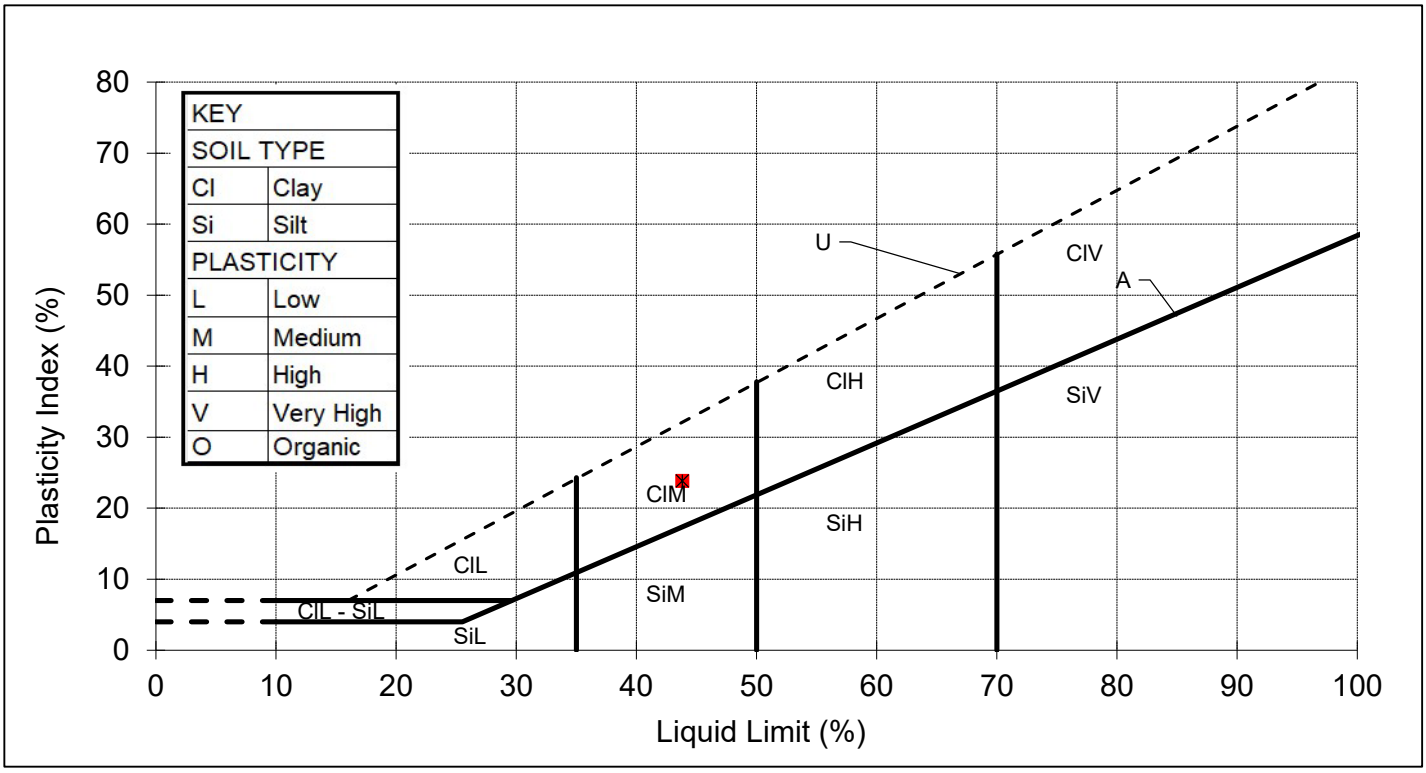
CLIENT	Brownfield Solutions Ltd
SITE	C6668 - The Oaks, Wrexham
JOB NUMBER	MRN 26012/18

SAMPLE LABEL	WS107 1.2-1.4m	DATE SAMPLED	15-Apr-26
SAMPLE No.	6088405	DATE RECEIVED	24-Apr-26
DATE TESTED	29-Apr-26	SAMPLED BY	Client

MATERIAL	Orangey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
PRE TREATMENT	As received	% RET. 425um BY	Hand picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.5	44.1	0.991	
Determination 2 (avg)	20.6	44.3		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
32.6	44	20	24	96



REMARKS

SIGNED

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

DATE 08-May-26

APPENDIX D

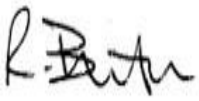
Chemical Testing Results

ANALYTICAL TEST REPORT

Report Number	26-04895, issue number 1
Contract name:	The Oaks, Wrexham
Client reference:	C6668
Clients name:	Brownfield Solutions Ltd
Clients address:	Brownfield Solutions Ltd 173-183 Witton Street Northwich Cheshire CW9 5LP
Samples received:	27/04/2026
Analysis started:	27/04/2026
Analysis completed:	30/04/2026
Report issued:	30/04/2026

Key

U UKAS accredited test
M MCERTS & UKAS accredited test
(B) Analysis performed at Southampton Site
I/S Insufficient sample to carry out test
U/S Sample not suitable for testing
NAD No Asbestos Detected
Full key available on Information page



Approved by: Rachael Burton
Technical Support Manager

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
% Moisture reported as MCERTS drying at 30°C

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
102804	WS101	0.00 - 0.30	Red Sand with Gravel and Vegetation.	-	-	8.3
102805	WS101	1.70 - 1.90	Brown Sandy Clay with Gravel and Vegetation.	-	-	14.3
102806	WS102	0.40 - 0.60	Brown Sandy Clay with Gravel and Vegetation.	-	-	17.5
102807	WS102	1.20 - 1.65	Brown Sandy Clay with Gravel and Vegetation.	-	-	14.3
102808	WS102	1.90 - 2.45	Brown Sandy Clay with Gravel and Vegetation.	-	-	16.0
102809	WS103	0.30 - 0.60	Brown Sandy Clay with Gravel and Vegetation.	-	-	16.4
102810	WS103	1.30 - 1.50	Brown Sandy Clay with Gravel and Vegetation.	-	-	14.8
102811	WS104	0.20 - 0.40	Brown Sandy Clay with Gravel and Vegetation.	-	-	16.3
102812	WS104	1.20 - 1.40	Brown Sandy Clay with Gravel and Vegetation.	-	-	16.8
102813	WS104	1.70 - 1.90	Brown Sandy Clay with Gravel and Vegetation.	-	-	18.8
102814	WS105	1.00 - 1.20	Brown Sandy Clay with Gravel and Vegetation.	-	-	16.0
102815	WS105	1.80 - 2.00	Brown Sandy Clay with Gravel and Vegetation.	-	-	19.0
102816	WS106	0.30 - 0.50	Brown Sandy Clay with Gravel and Vegetation.	-	-	6.7
102817	WS106	1.00 - 1.20	Brown Sand with Gravel and Vegetation.	-	-	17.5
102818	WS107	0.40 - 0.60	Brown Sand with Gravel and Vegetation.	-	-	37.6
102819	WS108	0.00 - 0.20	Brown Sandy Clay with Gravel and Vegetation.	-	-	24.3

SOILS

Lab Number					102804	102805	102806	102807	102808
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS101	WS101	WS102	WS102	WS102
Depth (m)					0.00 - 0.30	1.70 - 1.90	0.40 - 0.60	1.20 - 1.65	1.90 - 2.45
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
Asbestos									
Asbestos Identification	SUBCON	SU	0	-	NAD	n/t	NAD	n/t	n/t
Asbestos sample description	SUBCON	SN	0	-	-	n/t	-	n/t	n/t
Soil sample preparation parameters									
Stones Content	CE001	N	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Metals									
Water Soluble Magnesium	CE061	N	1	mg/l	n/t	n/t	8.88	18.6	n/t
Water Soluble Sulphate	CE061	M	10	mg/l	54.4	33.5	< 10.0	40.4	208
Acid Soluble Sulphate (SO4)	CE062	M	0.01	%	n/t	n/t	0.02	0.03	n/t
Arsenic	CE264	M	2.3	mg/kg	15.3	11.8	13.5	n/t	n/t
Cadmium	CE264	M	1.1	mg/kg	< 1.1	< 1.1	< 1.1	n/t	n/t
Chromium	CE264	U	1.3	mg/kg	27.8	35.1	50.0	n/t	n/t
Copper	CE264	M	1.2	mg/kg	30.8	18.3	20.5	n/t	n/t
Lead	CE264	U	2.4	mg/kg	21.0	13.9	16.0	n/t	n/t
Mercury	CE264	M	0.6	mg/kg	< 0.6	< 0.6	< 0.6	n/t	n/t
Nickel	CE264	M	1.6	mg/kg	32.8	36.9	47.7	n/t	n/t
Selenium	CE264	M	3	mg/kg	< 3.0	< 3.0	< 3.0	n/t	n/t
Sulphur %	CE264	N	0.0026	%	n/t	n/t	0.0192	0.0218	n/t
Zinc	CE264	M	2.4	mg/kg	49.6	53.7	62.7	n/t	n/t
PCB (ICES 7 congeners)									
Total PCBs (7 congeners)	CE137	M	0.035	mg/kg	< 0.035	n/t	n/t	n/t	n/t
PCB 101	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 118	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 138	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 153	CE137	M	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
PCB 180	CE137	M	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
PCB 28	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 52	CE137	M	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
Colourimetric									
Water Soluble Chloride	CE261	U	1.5	mg/l	n/t	n/t	< 1.50	2.76	n/t

SOILS

Lab Number					102804	102805	102806	102807	102808
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS101	WS101	WS102	WS102	WS102
Depth (m)					0.00 - 0.30	1.70 - 1.90	0.40 - 0.60	1.20 - 1.65	1.90 - 2.45
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
Nitrate as NO3	CE261	N	3.8	mg/l	n/t	n/t	< 3.80	< 3.80	n/t
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040	< 0.040	< 0.040	n/t	n/t
Ammoniacal Nitrogen as NH4	CE262	N	0.14	mg/l	n/t	n/t	1.39	1.31	n/t
Chromium III	CE208	N	2	mg/kg	27.8	35.1	50.0	n/t	n/t
Combustion									
Moisture Content	CE001	N	0.1	%	8.3	14.3	17.5	14.3	16.0
Soil Organic Matter	CE192	N	0.1	%	1.57	0.76	0.98	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	< 0.016	n/t	n/t
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	< 0.015	< 0.015	n/t	n/t
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	< 0.013	< 0.013	n/t	n/t
Fluorene	CE087	U	0.013	mg/kg	< 0.013	< 0.013	< 0.013	n/t	n/t
Phenanthrene	CE087	M	0.014	mg/kg	0.097	< 0.014	< 0.014	n/t	n/t
Anthracene	CE087	U	0.017	mg/kg	0.175	< 0.017	< 0.017	n/t	n/t
Fluoranthene	CE087	M	0.017	mg/kg	< 0.017	< 0.017	< 0.017	n/t	n/t
Pyrene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	< 0.016	n/t	n/t
Benzo(a)anthracene	CE087	U	0.012	mg/kg	0.036	< 0.012	< 0.012	n/t	n/t
Chrysene	CE087	M	0.028	mg/kg	< 0.028	< 0.028	< 0.028	n/t	n/t
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	0.021	< 0.020	< 0.020	n/t	n/t
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025	< 0.025	< 0.025	n/t	n/t
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019	< 0.019	< 0.019	n/t	n/t
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	< 0.019	n/t	n/t
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	< 0.017	< 0.017	n/t	n/t
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	< 0.019	n/t	n/t
Total PAH(16)	CE087	N	0.28	mg/kg	0.329	< 0.280	< 0.280	n/t	n/t
BTEX									
Benzene	CE267	U	0.001	mg/kg	g < 0.001	n/t	n/t	n/t	n/t
Toluene	CE267	U	0.001	mg/kg	g < 0.001	n/t	n/t	n/t	n/t
Ethylbenzene	CE267	U	0.001	mg/kg	g < 0.001	n/t	n/t	n/t	n/t
MTBE	CE267	N	0.002	mg/kg	g < 0.002	n/t	n/t	n/t	n/t

SOILS

Lab Number					102804	102805	102806	102807	102808
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS101	WS101	WS102	WS102	WS102
Depth (m)					0.00 - 0.30	1.70 - 1.90	0.40 - 0.60	1.20 - 1.65	1.90 - 2.45
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
m,p-Xylene	CE267	U	0.002	mg/kg	g < 0.002	n/t	n/t	n/t	n/t
oXylenes	CE267	U	0.002	mg/kg	g < 0.002	n/t	n/t	n/t	n/t
Total Petroleum Hydrocarbons									
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	g < 0.10	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	g < 0.10	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	g < 0.10	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	< 1.0	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	2.4	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	10.5	n/t	n/t	n/t	n/t
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	2.6	n/t	n/t	n/t	n/t
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	g < 0.010	n/t	n/t	n/t	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	g < 0.010	n/t	n/t	n/t	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	g < 0.010	n/t	n/t	n/t	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	1.6	n/t	n/t	n/t	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	6.1	n/t	n/t	n/t	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	6.4	n/t	n/t	n/t	n/t
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	48.2	n/t	n/t	n/t	n/t
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	23.9	n/t	n/t	n/t	n/t
Wet Chem									
pH	CE004	M	0.1	pH units	7.9	8.4	8.3	8.4	8.4

SOILS

Lab Number					102809	102810	102811	102812	102813
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS103	WS103	WS104	WS104	WS104
Depth (m)					0.30 - 0.60	1.30 - 1.50	0.20 - 0.40	1.20 - 1.40	1.70 - 1.90
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
Asbestos									
Asbestos Identification	SUBCON	SU	0	-	NAD	n/t	NAD	NAD	n/t
Asbestos sample description	SUBCON	SN	0	-	-	n/t	-	-	n/t
Soil sample preparation parameters									
Stones Content	CE001	N	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Metals									
Water Soluble Magnesium	CE061	N	1	mg/l	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	CE061	M	10	mg/l	36.9	74.3	11.2	43.8	80.3
Acid Soluble Sulphate (SO4)	CE062	M	0.01	%	n/t	n/t	n/t	n/t	n/t
Arsenic	CE264	M	2.3	mg/kg	12.6	11.8	9.9	11.1	11.8
Cadmium	CE264	M	1.1	mg/kg	< 1.1	< 1.1	< 1.1	1.3	< 1.1
Chromium	CE264	U	1.3	mg/kg	38.8	37.6	37.2	34.1	37.5
Copper	CE264	M	1.2	mg/kg	21.4	15.6	17.2	19.3	15.6
Lead	CE264	U	2.4	mg/kg	958	104	23.1	20.1	17.1
Mercury	CE264	M	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Nickel	CE264	M	1.6	mg/kg	33.8	34.5	38.4	37.5	36.2
Selenium	CE264	M	3	mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Sulphur %	CE264	N	0.0026	%	n/t	n/t	n/t	n/t	n/t
Zinc	CE264	M	2.4	mg/kg	281	72.7	61.9	129	59.3
PCB (ICES 7 congeners)									
Total PCBs (7 congeners)	CE137	M	0.035	mg/kg	< 0.035	n/t	n/t	n/t	n/t
PCB 101	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 118	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 138	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 153	CE137	M	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
PCB 180	CE137	M	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
PCB 28	CE137	M	0.015	mg/kg	< 0.015	n/t	n/t	n/t	n/t
PCB 52	CE137	M	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
Colourimetric									
Water Soluble Chloride	CE261	U	1.5	mg/l	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					102809	102810	102811	102812	102813
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS103	WS103	WS104	WS104	WS104
Depth (m)					0.30 - 0.60	1.30 - 1.50	0.20 - 0.40	1.20 - 1.40	1.70 - 1.90
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
Nitrate as NO3	CE261	N	3.8	mg/l	n/t	n/t	n/t	n/t	n/t
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Ammoniacal Nitrogen as NH4	CE262	N	0.14	mg/l	n/t	n/t	n/t	n/t	n/t
Chromium III	CE208	N	2	mg/kg	38.8	37.6	37.2	34.1	37.5
Combustion									
Moisture Content	CE001	N	0.1	%	16.4	14.8	16.3	16.8	18.8
Soil Organic Matter	CE192	N	0.1	%	1.55	0.71	0.78	0.74	1.31
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	< 0.014	< 0.014	< 0.014	0.042	< 0.014
Anthracene	CE087	U	0.017	mg/kg	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
Fluoranthene	CE087	M	0.017	mg/kg	0.052	< 0.017	< 0.017	< 0.017	< 0.017
Pyrene	CE087	M	0.016	mg/kg	0.065	< 0.016	< 0.016	< 0.016	< 0.016
Benzo(a)anthracene	CE087	U	0.012	mg/kg	0.062	< 0.012	< 0.012	< 0.012	< 0.012
Chrysene	CE087	M	0.028	mg/kg	0.049	< 0.028	< 0.028	< 0.028	< 0.028
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	0.105	< 0.020	< 0.020	< 0.020	< 0.020
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	0.039	< 0.025	< 0.025	< 0.025	< 0.025
Benzo(a)pyrene	CE087	U	0.019	mg/kg	0.081	< 0.019	< 0.019	< 0.019	< 0.019
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	0.096	< 0.019	< 0.019	< 0.019	< 0.019
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	0.098	< 0.019	< 0.019	< 0.019	< 0.019
Total PAH(16)	CE087	N	0.28	mg/kg	0.647	< 0.280	< 0.280	< 0.280	< 0.280
BTEX									
Benzene	CE267	U	0.001	mg/kg	< 0.001	n/t	n/t	n/t	n/t
Toluene	CE267	U	0.001	mg/kg	< 0.001	n/t	n/t	n/t	n/t
Ethylbenzene	CE267	U	0.001	mg/kg	< 0.001	n/t	n/t	n/t	n/t
MTBE	CE267	N	0.002	mg/kg	< 0.002	n/t	n/t	n/t	n/t

SOILS

Lab Number					102809	102810	102811	102812	102813
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS103	WS103	WS104	WS104	WS104
Depth (m)					0.30 - 0.60	1.30 - 1.50	0.20 - 0.40	1.20 - 1.40	1.70 - 1.90
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
m,p-Xylene	CE267	U	0.002	mg/kg	< 0.002	n/t	n/t	n/t	n/t
oXylenes	CE267	U	0.002	mg/kg	< 0.002	n/t	n/t	n/t	n/t
Total Petroleum Hydrocarbons									
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	n/t	n/t	n/t	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	n/t	n/t	n/t	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	< 0.10	n/t	n/t	n/t	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	< 1.0	n/t	n/t	n/t	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5	n/t	n/t	n/t	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	< 0.7	n/t	n/t	n/t	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	8.2	n/t	n/t	n/t	n/t
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	1.9	n/t	n/t	n/t	n/t
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	< 0.010	n/t	n/t	n/t	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	1.5	n/t	n/t	n/t	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	5.0	n/t	n/t	n/t	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	2.8	n/t	n/t	n/t	n/t
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	35.2	n/t	n/t	n/t	n/t
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	11.7	n/t	n/t	n/t	n/t
Wet Chem									
pH	CE004	M	0.1	pH units	8.4	8.3	8.5	8.5	8.4

SOILS

Lab Number					102814	102815	102816	102817	102818
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS105	WS105	WS106	WS106	WS107
Depth (m)					1.00 - 1.20	1.80 - 2.00	0.30 - 0.50	1.00 - 1.20	0.40 - 0.60
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
Asbestos									
Asbestos Identification	SUBCON	SU	0	-	NAD	n/t	NAD	n/t	n/t
Asbestos sample description	SUBCON	SN	0	-	-	n/t	-	n/t	n/t
Soil sample preparation parameters									
Stones Content	CE001	N	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Metals									
Water Soluble Magnesium	CE061	N	1	mg/l	n/t	n/t	n/t	n/t	n/t
Water Soluble Sulphate	CE061	M	10	mg/l	32.8	75.0	27.8	28.1	36.0
Acid Soluble Sulphate (SO4)	CE062	M	0.01	%	n/t	n/t	n/t	n/t	n/t
Arsenic	CE264	M	2.3	mg/kg	9.7	11.0	11.6	12.0	11.3
Cadmium	CE264	M	1.1	mg/kg	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Chromium	CE264	U	1.3	mg/kg	36.6	46.0	34.3	15.0	17.2
Copper	CE264	M	1.2	mg/kg	12.8	14.6	16.4	11.3	16.8
Lead	CE264	U	2.4	mg/kg	24.5	18.8	37.5	71.2	315
Mercury	CE264	M	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Nickel	CE264	M	1.6	mg/kg	31.4	41.6	34.2	15.5	14.8
Selenium	CE264	M	3	mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Sulphur %	CE264	N	0.0026	%	n/t	n/t	n/t	n/t	n/t
Zinc	CE264	M	2.4	mg/kg	53.7	61.6	64.6	89.0	115
PCB (ICES 7 congeners)									
Total PCBs (7 congeners)	CE137	M	0.035	mg/kg	< 0.035	n/t	0.140	n/t	n/t
PCB 101	CE137	M	0.015	mg/kg	< 0.015	n/t	0.020	n/t	n/t
PCB 118	CE137	M	0.015	mg/kg	< 0.015	n/t	0.045	n/t	n/t
PCB 138	CE137	M	0.015	mg/kg	< 0.015	n/t	0.046	n/t	n/t
PCB 153	CE137	M	0.01	mg/kg	< 0.010	n/t	0.029	n/t	n/t
PCB 180	CE137	M	0.01	mg/kg	< 0.010	n/t	< 0.010	n/t	n/t
PCB 28	CE137	M	0.015	mg/kg	< 0.015	n/t	< 0.015	n/t	n/t
PCB 52	CE137	M	0.01	mg/kg	< 0.010	n/t	< 0.010	n/t	n/t
Colourimetric									
Water Soluble Chloride	CE261	U	1.5	mg/l	n/t	n/t	n/t	n/t	n/t

SOILS

Lab Number					102814	102815	102816	102817	102818
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS105	WS105	WS106	WS106	WS107
Depth (m)					1.00 - 1.20	1.80 - 2.00	0.30 - 0.50	1.00 - 1.20	0.40 - 0.60
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
Nitrate as NO3	CE261	N	3.8	mg/l	n/t	n/t	n/t	n/t	n/t
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Ammoniacal Nitrogen as NH4	CE262	N	0.14	mg/l	n/t	n/t	n/t	n/t	n/t
Chromium III	CE208	N	2	mg/kg	36.7	46.0	34.4	15.0	17.2
Combustion									
Moisture Content	CE001	N	0.1	%	16.0	19.0	6.7	17.5	37.6
Soil Organic Matter	CE192	N	0.1	%	1.60	1.00	1.62	1.93	14.0
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	< 0.016	< 0.016	< 0.016
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013	< 0.013	< 0.013	< 0.013	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	0.075	< 0.014	0.017	0.033	0.018
Anthracene	CE087	U	0.017	mg/kg	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
Fluoranthene	CE087	M	0.017	mg/kg	0.020	< 0.017	0.025	0.140	0.043
Pyrene	CE087	M	0.016	mg/kg	< 0.016	< 0.016	0.025	0.149	0.049
Benzo(a)anthracene	CE087	U	0.012	mg/kg	< 0.012	< 0.012	0.033	0.090	0.044
Chrysene	CE087	M	0.028	mg/kg	< 0.028	< 0.028	< 0.028	0.078	< 0.028
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	< 0.020	< 0.020	0.029	0.116	0.042
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025	< 0.025	< 0.025	0.040	< 0.025
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019	< 0.019	0.021	0.072	0.027
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	0.030	0.102	0.040
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	< 0.017	< 0.017	< 0.017	< 0.017
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019	< 0.019	0.020	0.071	0.026
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280	< 0.280	< 0.280	0.890	0.289
BTEX									
Benzene	CE267	U	0.001	mg/kg	g < 0.001	n/t	< 0.001	n/t	n/t
Toluene	CE267	U	0.001	mg/kg	g < 0.001	n/t	< 0.001	n/t	n/t
Ethylbenzene	CE267	U	0.001	mg/kg	g < 0.001	n/t	< 0.001	n/t	n/t
MTBE	CE267	N	0.002	mg/kg	g < 0.002	n/t	< 0.002	n/t	n/t

SOILS

Lab Number					102814	102815	102816	102817	102818
Client Reference					ES	ES	ES	ES	ES
Sample ID					WS105	WS105	WS106	WS106	WS107
Depth (m)					1.00 - 1.20	1.80 - 2.00	0.30 - 0.50	1.00 - 1.20	0.40 - 0.60
Sampling Date					15/04/2026	15/04/2026	15/04/2026	15/04/2026	15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**					
m,p-Xylene	CE267	U	0.002	mg/kg	g < 0.002	n/t	< 0.002	n/t	n/t
oXylenes	CE267	U	0.002	mg/kg	g < 0.002	n/t	< 0.002	n/t	n/t
Total Petroleum Hydrocarbons									
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	g < 0.10	n/t	< 0.10	n/t	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	g < 0.10	n/t	< 0.10	n/t	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	g < 0.10	n/t	< 0.10	n/t	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	< 1.0	n/t	< 1.0	n/t	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5	n/t	< 0.5	n/t	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	< 0.7	n/t	< 0.7	n/t	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	< 4.0	n/t	< 4.0	n/t	n/t
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	< 0.5	n/t	< 0.5	n/t	n/t
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	g < 0.010	n/t	< 0.010	n/t	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	g < 0.010	n/t	< 0.010	n/t	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	g < 0.010	n/t	< 0.010	n/t	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	0.7	n/t	0.6	n/t	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	2.8	n/t	2.4	n/t	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	< 2.0	n/t	< 2.0	n/t	n/t
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	12.7	n/t	10.0	n/t	n/t
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	4.1	n/t	2.4	n/t	n/t
Wet Chem									
pH	CE004	M	0.1	pH units	8.3	8.5	7.3	7.3	7.0

SOILS

Lab Number					102819
Client Reference					ES
Sample ID					WS108
Depth (m)					0.00 - 0.20
Sampling Date					15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**	
Asbestos					
Asbestos Identification	SUBCON	SU	0	-	NAD
Asbestos sample description	SUBCON	SN	0	-	-
Soil sample preparation parameters					
Stones Content	CE001	N	0.1	%	< 0.1
Metals					
Water Soluble Magnesium	CE061	N	1	mg/l	n/t
Water Soluble Sulphate	CE061	M	10	mg/l	35.1
Acid Soluble Sulphate (SO4)	CE062	M	0.01	%	n/t
Arsenic	CE264	M	2.3	mg/kg	15.6
Cadmium	CE264	M	1.1	mg/kg	< 1.1
Chromium	CE264	U	1.3	mg/kg	25.1
Copper	CE264	M	1.2	mg/kg	12.5
Lead	CE264	U	2.4	mg/kg	174
Mercury	CE264	M	0.6	mg/kg	< 0.6
Nickel	CE264	M	1.6	mg/kg	22.4
Selenium	CE264	M	3	mg/kg	< 3.0
Sulphur %	CE264	N	0.0026	%	n/t
Zinc	CE264	M	2.4	mg/kg	81.0
PCB (ICES 7 congeners)					
Total PCBs (7 congeners)	CE137	M	0.035	mg/kg	n/t
PCB 101	CE137	M	0.015	mg/kg	n/t
PCB 118	CE137	M	0.015	mg/kg	n/t
PCB 138	CE137	M	0.015	mg/kg	n/t
PCB 153	CE137	M	0.01	mg/kg	n/t
PCB 180	CE137	M	0.01	mg/kg	n/t
PCB 28	CE137	M	0.015	mg/kg	n/t
PCB 52	CE137	M	0.01	mg/kg	n/t
Colourimetric					
Water Soluble Chloride	CE261	U	1.5	mg/l	n/t

SOILS

Lab Number					102819
Client Reference					ES
Sample ID					WS108
Depth (m)					0.00 - 0.20
Sampling Date					15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**	
Nitrate as NO3	CE261	N	3.8	mg/l	n/t
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	< 0.040
Ammoniacal Nitrogen as NH4	CE262	N	0.14	mg/l	n/t
Chromium III	CE208	N	2	mg/kg	25.1
Combustion					
Moisture Content	CE001	N	0.1	%	24.3
Soil Organic Matter	CE192	N	0.1	%	4.33
Polyaromatic hydrocarbons					
Naphthalene	CE087	M	0.016	mg/kg	< 0.016
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	0.015
Anthracene	CE087	U	0.017	mg/kg	< 0.017
Fluoranthene	CE087	M	0.017	mg/kg	0.035
Pyrene	CE087	M	0.016	mg/kg	0.035
Benzo(a)anthracene	CE087	U	0.012	mg/kg	0.039
Chrysene	CE087	M	0.028	mg/kg	< 0.028
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	0.024
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	0.021
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280
BTEX					
Benzene	CE267	U	0.001	mg/kg	n/t
Toluene	CE267	U	0.001	mg/kg	n/t
Ethylbenzene	CE267	U	0.001	mg/kg	n/t
MTBE	CE267	N	0.002	mg/kg	n/t

SOILS

Lab Number					102819
Client Reference					ES
Sample ID					WS108
Depth (m)					0.00 - 0.20
Sampling Date					15/04/2026
Test	**Method**	**Accred**	**LoD**	**Units**	
m,p-Xylene	CE267	U	0.002	mg/kg	n/t
oXylenes	CE267	U	0.002	mg/kg	n/t
Total Petroleum Hydrocarbons					
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t
Wet Chem					
pH	CE004	M	0.1	pH units	6.9

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE267	VPH in Soil	HS-GCFID	As submitted sample
CE250	GCXGC in Soil	DCM Extraction and GCxGC-FID	As submitted sample
SUBCON	Asbestos Soil	HSG248	Air Dried Sample
CE061	W. Sol Metals	ICPOES	Air dried sample
CE062	Acid Soluble Sulphate in Soils	HCl Extract and ICPOES	Air dried sample
CE137	PCB's in Soil	DCM Extraction and GCMS	As submitted sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample
CE267	BTEX in Soils	Analysis by HSGCFID	As submitted sample
CE261	Anions by Discrete Analyser in Soils	Gallery	Air dried sample
CE263	ChromiumVI by Discrete Analyser in Soil	Gallery	Air dried sample
CE087	PAH in Soil	DCM Extraction and GCMS	As submitted sample
CE208	Chromium Hexavalent in Soil	Colorimetry	Air dried sample

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

a	Sampling date not provided
b	Sampling time not provided (waters only)
c	Sample not received in appropriate containers
d	Storage Temperature
e	Headspace present in sample container
f	Sample exceeded sampling to receipt
g	Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
102804	WS101	0.00 - 0.30	Y	BTEX in Soils(g), VPH in Soil(g)
102805	WS101	1.70 - 1.90	N	
102806	WS102	0.40 - 0.60	N	
102807	WS102	1.20 - 1.65	N	
102808	WS102	1.90 - 2.45	N	
102809	WS103	0.30 - 0.60	N	
102810	WS103	1.30 - 1.50	N	
102811	WS104	0.20 - 0.40	N	
102812	WS104	1.20 - 1.40	N	
102813	WS104	1.70 - 1.90	N	
102814	WS105	1.00 - 1.20	Y	BTEX in Soils(g), VPH in Soil(g)
102815	WS105	1.80 - 2.00	N	
102816	WS106	0.30 - 0.50	N	
102817	WS106	1.00 - 1.20	N	
102818	WS107	0.40 - 0.60	N	
102819	WS108	0.00 - 0.20	N	

REPORT INFORMATION

Report No.:26-04895, issue number 1

Key

U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix
*	ISO17025 accreditation not applicable for sample matrix
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

The results relate only to the sample received.

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Moisture Content Calculated on a Wet Weight basis (at 30°C)

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

Where sampling was undertaken by Chemtech Environmental Limited it is outside the UKAS accreditation scope.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

For soils and solids, all results are reported on a dry basis (30°C). Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones and 'inert' material, where applicable.

'Client Reference', 'Sample ID', 'Sample Location', 'Sample Type', 'Depth', 'Sample Date' and 'Sample Time' information is provided by the customer

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt

All water samples will be retained for a period of 2 weeks from the point of Reporting

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

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

Unless specifically identified (noted as "(B)" in analyte name) all internal analysis performed at Durham site

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Brownfield Solutions Limited
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Northwich
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United Kingdom
CW9 5LP

Attention :	Aaron Stokoe
Date :	18th May, 2026
Your reference :	C6668
Our reference :	Test Report 26/6280 Batch 1
Location :	The Oaks, Wrexham
Date samples received :	23rd April, 2026
Status :	Final Report
Issue :	202605181131

Three samples were received for analysis on 23rd April, 2026 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 0.434 kg of CO2

Scope 1&2&3 emissions - 1.027 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: Brownfield Solutions Limited
Reference: C6668
Location: The Oaks, Wrexham
Contact: Aaron Stokoe
EMT Job No: 26/6280

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9									
Sample ID	WS101	WS102	WS105									
Depth	0.40-0.60	0.00-0.20	0.20-0.40									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	15/04/2026	15/04/2026	16/04/2026									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	23/04/2026	23/04/2026	23/04/2026									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Nitrocellulose Colour*	-ve	-ve	-ve									None	Subcontracted
Nitrocellulose*	<5000	<5000	<5000									mg/kg	Subcontracted
Cyclotetramethylene Tetranitramine (HMX)*	<2	<2	<2									mg/kg	Subcontracted
Cyclo-1,3,5-Trimethylene-2,4,6-Trinitramine (RDX)*	<2	<2	<2									mg/kg	Subcontracted
Ethylene Glycol Dinitrate (EGDN)*	<1	<1	<1									mg/kg	Subcontracted
2,4,6-Trinitro-Phenylmethyl Nitramine (Tetryl)*	<1	<1	<1									mg/kg	Subcontracted
Glycerol Trinitrate (NG)*	<1	<1	,1									mg/kg	Subcontracted
2,4,6-Trinitrotoluene (TNT)*	<0.1	<0.1	<1									mg/kg	Subcontracted
2,6-Dinitrotoluene*	<1	<1	<3									mg/kg	Subcontracted
2,4-Dinitrotoluene*	<1	<1	<1									mg/kg	Subcontracted
Hexanitro-Stilbene (HNS)*	<0.5	<0.5	<0.5									mg/kg	Subcontracted
Pentaeryhritol Tetranitrate (PETN)*	<5	<5	<5									mg/kg	Subcontracted
Nitroguanidine (Picrite)*	<0.25	<0.25	<0.25									mg/kg	Subcontracted
2,4,6-Trinitro Phenol (Picric Acid)*	<0.1	<0.1	<0.1									mg/kg	Subcontracted

Client Name: Brownfield Solutions Limited
Reference: C6668
Location: The Oaks, Wrexham
Contact: Aaron Stokoe

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 26/6280						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 26/6280

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 26/6280

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
Subcontracted	See attached subcontractor report for accreditation status and provider.					AD	Yes

4041

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Analytical Report Number : 26-029923

Project / Site name:	The Oaks, Wrexham	**Samples received on:**	04/06/2026
Your job number:	C6668	**Samples instructed on/ Analysis started on:**	04/06/2026
Your order number:	C6668-7717-PH	**Analysis completed by:**	12/06/2026
Report Issue Number:	1	**Report issued on:**	12/06/2026
Samples Analysed:	3 water samples		

Signed:

Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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

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Analytical Report Number: 26-029923
Project / Site name: The Oaks, Wrexham

Your Order No: C6668-7717-PH

Lab Sample Number				940852	940853	940854
Sample Reference				WS106	WS107	WS108
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				Ground water	Ground water	Ground water
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				29/05/2026	29/05/2026	29/05/2026
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status			
General Inorganics						
pH (L099)	pH Units	N/A	ISO 17025	7	6.9	7.3
Electrical Conductivity at 20°C	µS/cm	10	ISO 17025	1100	1400	830
Sulphate as SO_4	mg/l	0.045	ISO 17025	134	72.7	61
Sulphide	µg/l	5	NONE	< 5.0	17	< 5.0
Chloride	mg/l	0.15	ISO 17025	100	51	49
Ammoniacal Nitrogen as NH_4^+	µg/l	15	ISO 17025	32	1400	19
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	6.92	31.5	3.98
Nitrate as N	mg/l	0.01	ISO 17025	1.4	< 0.01	0.02
Nitrate as NO_3	mg/l	0.05	ISO 17025	6.18	< 0.05	0.1
Nitrite as NO_2	µg/l	5	ISO 17025	18	< 5.0	40
Hardness - Total	mgCaCO3/l	1	ISO 17025	639	897	473
Speciated PAHs						
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Total PAH						
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16

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The results included within the report are representative of the samples submitted for analysis.

4041

Analytical Report Number: 26-029923
Project / Site name: The Oaks, Wrexham

Your Order No: C6668-7717-PH

Lab Sample Number				940852	940853	940854
Sample Reference				WS106	WS107	WS108
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				Ground water	Ground water	Ground water
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				29/05/2026	29/05/2026	29/05/2026
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status			
Heavy Metals / Metalloids						
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.42	9.25	2.86
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.05	0.02	0.04
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	2.9	3.2
Copper (dissolved)	µg/l	0.5	ISO 17025	2.3	1	1.4
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	2	2.9
Manganese (dissolved)	µg/l	0.05	ISO 17025	2900	15000	5900
Mercury (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.7	5	3.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	1.2	0.8
Zinc (dissolved)	µg/l	0.5	ISO 17025	8.9	5.4	7.4
Boron (dissolved)	µg/l	10	ISO 17025	93	83	140
Calcium (dissolved)	mg/l	0.012	ISO 17025	160	230	130
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0
Petroleum Hydrocarbons						
TPH - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH - Aliphatic >EC10 - EC12 $_{EH_1D_AL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC12 - EC16 $_{EH_1D_AL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC16 - EC21 $_{EH_1D_AL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC21 - EC35 $_{EH_1D_AL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC5 - EC35 $_{HS+EH_1D_AL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC35 - EC40 $_{EH_1D_AL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aliphatic >EC5 - EC40 $_{HS+EH_1D_AL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH - Aromatic >EC10 - EC12 $_{EH_1D_AR_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC12 - EC16 $_{EH_1D_AR_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC16 - EC21 $_{EH_1D_AR_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC21 - EC35 $_{EH_1D_AR_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC5 - EC35 $_{HS+EH_1D_AR_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC35 - EC40 $_{EH_1D_AR_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH - Aromatic >EC5 - EC40 $_{HS+EH_1D_AR_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH (>EC5 - EC10) $_{HS_1D_TOTAL}$	µg/l	10	NONE	< 10	< 10	< 10
TPH (>EC6 - EC8) $_{HS_1D_TOTAL}$	µg/l	10	ISO 17025	< 10	< 10	< 10
TPH (>EC8 - EC10) $_{HS_1D_TOTAL}$	µg/l	10	ISO 17025	< 10	< 10	< 10
TPH (>EC10 - EC16) $_{EH_1D_TOTAL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
TPH (>EC16 - EC40) $_{EH_1D_TOTAL_MS}$	µg/l	10	NONE	< 10	< 10	< 10
Petroleum Range Organics (EC6 - EC10) $_{HS_1D_TOTAL}$	µg/l	10	ISO 17025	< 10	< 10	< 10

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Analytical Report Number: 26-029923
Project / Site name: The Oaks, Wrexham

Your Order No: C6668-7717-PH

Lab Sample Number				940852	940853	940854
Sample Reference				WS106	WS107	WS108
Sample Number				None Supplied	None Supplied	None Supplied
Water Matrix				Ground water	Ground water	Ground water
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				29/05/2026	29/05/2026	29/05/2026
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status			
TPH Total (>EC5 - EC40) HS+EH_1D_TOTAL_MS	µg/l	10	NONE	< 10	< 10	< 10

VOCs

MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

MTBE (Methyl Tertiary Butyl Ether)	mg/l	0.003	ISO 17025	< 0.003	< 0.003	< 0.003
Benzene	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001
Toluene	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001
Ethylbenzene	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001
p & m-xylene	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001
o-xylene	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 26-029923
Project / Site name: The Oaks, Wrexham

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited matrices: SW, PW, GW, except B - SW,GW, Hg - SW,PW, Al - SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode	In-house method	L029-PL	W	NONE
Electrical Conductivity at 20°C in water	Determination of electrical conductivity in water by electrochemical measurement. Accredited matrices: SW, PW, GW, FSE	In-house method	L031B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, FSE, LL; PrW, DI PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of total hardness of water by calculation from calcium and magnesium. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Total Petroleum Hydrocarbons with carbon banding in water by GC-MS	Determination of total petroleum hydrocarbons in water by GC-MS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
Total Petroleum Hydrocarbons with carbon banding in water by GC-MS/HS-GC-MS	Determination of total petroleum hydrocarbons in water by GC-MS/HS-GC-MS with carbon banding aliphatic and aromatic (Summed Bands)	Calculation	L070B/L088-PL	W	NONE
Total Petroleum Hydrocarbons in water by GC-MS	Determination of total petroleum hydrocarbons in water by GC-MS. Accredited matrices (TPH C12-C35): SW, PW, GW	In-house method	L070B	W	NONE
BTEX and/or Volatile Organic Compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW, PW, GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08	L078-PL	W	ISO 17025
Chromium(III) in water	In-house method by calculation from total Cr and Cr(VI)	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5-diphenylcarbazide, followed by colorimetry. Accredited matrices: SW, PW, GW, FSE, LL	In-house method by continuous flow analyser	L080-PL	W	ISO 17025
Chloride in water	Determination of chloride in water by colorimetry using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of ammonium/ammonia/ammoniacal nitrogen by the colorimetric salicylate/nitroprusside method using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by colorimetry using discrete analyser. Accredited matrices: SW, PW, GW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025

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Analytical Report Number : 26-029923
Project / Site name: The Oaks, Wrexham

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)
Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Petroleum Hydrocarbons in water by HS-GC/MS	Determination of total petroleum hydrocarbons in water by headspace HS-GC/MS . Accredited matrices: SW, PW, GW	In-house method	L088-PL	W	ISO 17025
pH of water at 20°C (automated)	Determination of pH of water by electrochemical measurement. Accredited matrices: SW, PW, GW, FSE, LL	In-house method	L099-PL	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAHs) in water by extraction in dichloromethane followed by GC-MS. Accredited matrices (PAHs): SW, PW, GW	In-house method based on USEPA 8270	L102B	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW, DI PrW, FSE, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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Sample Deviation Report

Analytical Report Number : 26-029923
Project / Site name: The Oaks, Wrexham

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS106	None Supplied	W	940852	c	Ammoniacal Nitrogen as N in water	L082B	c
WS106	None Supplied	W	940852	c	Ammonium as NH4 in water	L082B	c
WS106	None Supplied	W	940852	c	BTEX and/or Volatile Organic Compounds in water	L073B	c
WS106	None Supplied	W	940852	c	Chromium(III) in water	L080-PL	c
WS106	None Supplied	W	940852	c	Electrical Conductivity at 20°C in water	L031B	c
WS106	None Supplied	W	940852	c	Hexavalent chromium in water	L080-PL	c
WS106	None Supplied	W	940852	c	Nitrite as N in water	L082B	c
WS106	None Supplied	W	940852	c	Nitrite in water	L082B	c
WS106	None Supplied	W	940852	c	Total Petroleum Hydrocarbons in water by HS-GC/MS	L088-PL	c
WS106	None Supplied	W	940852	c	pH of water at 20°C (automated)	L099-PL	c
WS107	None Supplied	W	940853	c	Ammoniacal Nitrogen as N in water	L082B	c
WS107	None Supplied	W	940853	c	Ammonium as NH4 in water	L082B	c
WS107	None Supplied	W	940853	c	BTEX and/or Volatile Organic Compounds in water	L073B	c
WS107	None Supplied	W	940853	c	Chromium(III) in water	L080-PL	c
WS107	None Supplied	W	940853	c	Electrical Conductivity at 20°C in water	L031B	c
WS107	None Supplied	W	940853	c	Hexavalent chromium in water	L080-PL	c
WS107	None Supplied	W	940853	c	Nitrite as N in water	L082B	c
WS107	None Supplied	W	940853	c	Nitrite in water	L082B	c
WS107	None Supplied	W	940853	c	Total Petroleum Hydrocarbons in water by HS-GC/MS	L088-PL	c
WS107	None Supplied	W	940853	c	pH of water at 20°C (automated)	L099-PL	c
WS108	None Supplied	W	940854	c	Ammoniacal Nitrogen as N in water	L082B	c
WS108	None Supplied	W	940854	c	Ammonium as NH4 in water	L082B	c
WS108	None Supplied	W	940854	c	BTEX and/or Volatile Organic Compounds in water	L073B	c
WS108	None Supplied	W	940854	c	Chromium(III) in water	L080-PL	c
WS108	None Supplied	W	940854	c	Electrical Conductivity at 20°C in water	L031B	c
WS108	None Supplied	W	940854	c	Hexavalent chromium in water	L080-PL	c
WS108	None Supplied	W	940854	c	Nitrite as N in water	L082B	c
WS108	None Supplied	W	940854	c	Nitrite in water	L082B	c
WS108	None Supplied	W	940854	c	Total Petroleum Hydrocarbons in water by HS-GC/MS	L088-PL	c
WS108	None Supplied	W	940854	c	pH of water at 20°C (automated)	L099-PL	c

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APPENDIX E

Waste Assessment Report

Waste Classification Report

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

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.

FTNEX-WNVB5-3XAQE

Report is invalid if pages are removed.

Job name

The Oaks, Wrexham

Description/Comments

Project

C6668

Site

The Oaks, Wrexham

Classified by

Name:
Tom Lipscomb
Date:
12 May 2026 12:36 GMT
Telephone:
01606 334844

Company:
Brownfield Solutions Limited
5 Alfred Court
Saxon Business Park
Bromsgrove
B60 4AD

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

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	05 Feb 2026

Next 3 year Refresher due by Feb 2029

Purpose of classification

2 - Material Characterisation

Address of the waste

The Oaks, Wrexham **Post Code** LL13 9RD

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Redevelopment of former Royal Ordnance Factory Wrexham used in WW2. All buildings have since been removed from site and bunkers have been infilled since WW2. The proposed development area is currently bare ground with sparse trees.

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

Waste created during the excavation of soils for construction of the building foundations.

Description of the waste

Mixture of made ground and natural strata. The made ground generally comprised gravelly clay with gravels of brick, mudstone, burnt shale, and charcoal. The natural strata generally comprised clay and slightly gravelly clay with gravel of mudstone.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS101	0.00 - 0.30	Non Hazardous		3
2	WS101[2]	1.70 - 1.90	Non Hazardous		6
3	WS102	0.40 - 0.60	Non Hazardous		8
4	WS102[2]	1.20 - 1.65	Non Hazardous		10
5	WS102[3]	1.90 - 2.45	Non Hazardous		11
6	WS103	0.30 - 0.60	Non Hazardous		12
7	WS103[2]	1.30 - 1.50	Non Hazardous		15
8	WS104	0.20 - 0.40	Non Hazardous		17
9	WS104[2]	1.20 - 1.40	Non Hazardous		19
10	WS104[3]	1.70 - 1.90	Non Hazardous		21
11	WS105	1.00 - 1.20	Non Hazardous		23
12	WS105[2]	1.80 - 2.00	Non Hazardous		26
13	WS106	0.30 - 0.50	Non Hazardous		28
14	WS106[2]	1.00 - 1.20	Non Hazardous		31
15	WS107	0.40 - 0.60	Non Hazardous		33
16	WS108	0.00 - 0.20	Non Hazardous		35

Related documents

#	Name	Description
1	Example worst case waste stream template: 17 05 04 or 17 05 03 *	waste stream template used to create this Job

Report

Created by: Tom Lipscomb

Created date: 12 May 2026 12:36 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	37
Appendix B: Rationale for selection of metal species	38
Appendix C: Version	38

Classification of sample: WS101

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

Sample details

Sample name:
WS101
Sample Depth:
0.00 - 0.30 m
Moisture content:
8.3%
(no correction)

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: 8.3% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				15.3 mg/kg	1.895	28.986 mg/kg	0.0029 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<**LOD**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27.8 mg/kg	1.462	40.631 mg/kg	0.00406 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<**LOD**
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		30.8 mg/kg	3.929	121.015 mg/kg	0.0121 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	21 mg/kg	1.56	32.756 mg/kg	0.0021 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<**LOD**
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		32.8 mg/kg	5.358	175.753 mg/kg	0.0176 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		49.6 mg/kg	2.774	137.598 mg/kg	0.0138 %		
12	TPH (C6 to C40) petroleum group			TPH		101.7 mg/kg		101.7 mg/kg	0.0102 %		
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		pH				7.9	pH		7.9	pH	7.9 pH		
				PH									
19		naphthalene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
			205-917-1	208-96-8									
21		acenaphthene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<LOD
			201-469-6	83-32-9									
22		fluorene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<LOD
			201-695-5	86-73-7									
23		phenanthrene				0.097	mg/kg		0.097	mg/kg	0.0000097 %		
			201-581-5	85-01-8									
24		anthracene				0.175	mg/kg		0.175	mg/kg	0.0000175 %		
			204-371-1	120-12-7									
25		fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			205-912-4	206-44-0									
26		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
			204-927-3	129-00-0									
27		benzo[a]anthracene				0.036	mg/kg		0.036	mg/kg	0.0000036 %		
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				0.021	mg/kg		0.021	mg/kg	0.0000021 %		
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0627 %		

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 for cumulative determinand results below the concentration of: 1000 mg/kg (0.1%) because: TPH concentrations too low to be flammable

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0102%)

Classification of sample: WS101[2]

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

Sample details

Sample name:
WS101[2]
Sample Depth:
1.70 - 1.90 m
Moisture content:
14.3%
(no correction)

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: 14.3% 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 acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				11.8 mg/kg	1.895	22.355 mg/kg	0.00224 %		
2	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<**LOD**
3	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		35.1 mg/kg	1.462	51.301 mg/kg	0.00513 %		
4	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<**LOD**
5	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		18.3 mg/kg	3.929	71.902 mg/kg	0.00719 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	13.9 mg/kg	1.56	21.681 mg/kg	0.00139 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<**LOD**
8	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		36.9 mg/kg	5.358	197.722 mg/kg	0.0198 %		
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		53.7 mg/kg	2.774	148.972 mg/kg	0.0149 %		
11	pH			PH		8.4 pH		8.4 pH	8.4 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<**LOD**
14	acenaphthene		201-469-6	83-32-9		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<**LOD**
15	fluorene		201-695-5	86-73-7		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<**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		phenanthrene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
			201-581-5	85-01-8									
17		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			204-371-1	120-12-7									
18		fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			205-912-4	206-44-0									
19		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
			204-927-3	129-00-0									
20		benzo[a]anthracene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0506 %		

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: WS102

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

Sample details

Sample name:
WS102
Sample Depth:
0.40 - 0.60 m
Moisture content:
17.5%
(no correction)

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: 17.5% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				13.5 mg/kg	1.895	25.576 mg/kg	0.00256 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<LOD
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		50 mg/kg	1.462	73.078 mg/kg	0.00731 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<LOD
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		20.5 mg/kg	3.929	80.546 mg/kg	0.00805 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	16 mg/kg	1.56	24.957 mg/kg	0.0016 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<LOD
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		47.7 mg/kg	5.358	255.592 mg/kg	0.0256 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		62.7 mg/kg	2.774	173.939 mg/kg	0.0174 %		
12	pH			PH		8.3 pH		8.3 pH	8.3 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
15	acenaphthene		201-469-6	83-32-9		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<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		fluorene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
			201-695-5	86-73-7									
17		phenanthrene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<**LOD**
			201-581-5	85-01-8									
18		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			204-371-1	120-12-7									
19		fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			205-912-4	206-44-0									
20		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
			205-883-8	191-24-2									
										Total:	0.0625 %		

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: WS102[2]

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

Sample details

Sample name:
WS102[2]
Sample Depth:
1.20 - 1.65 m
Moisture content:
14.3%
(no correction)

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: 14.3% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		8.4 pH		8.4 pH	8.4 pH		
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS102[3]

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

Sample details

Sample name:
WS102[3]
Sample Depth:
1.90 - 2.45 m
Moisture content:
16%
(no correction)

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: 16% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		8.4 pH		8.4 pH	8.4 pH		
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS103

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

Sample details

Sample name:
WS103
Sample Depth:
0.30 - 0.60 m
Moisture content:
16.4%
(no correction)

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: 16.4% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				12.6 mg/kg	1.895	23.871 mg/kg	0.00239 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<LOD
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		38.8 mg/kg	1.462	56.708 mg/kg	0.00567 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<LOD
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		21.4 mg/kg	3.929	84.082 mg/kg	0.00841 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	958 mg/kg	1.56	1494.303 mg/kg	0.0958 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<LOD
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		33.8 mg/kg	5.358	181.111 mg/kg	0.0181 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		281 mg/kg	2.774	779.535 mg/kg	0.078 %		
12	TPH (C6 to C40) petroleum group			TPH		67 mg/kg		67 mg/kg	0.0067 %		
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		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
16		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
17		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
18		pH			PH		8.4	pH		8.4	pH	8.4 pH		
19		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
20		acenaphthylene		205-917-1	208-96-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<**LOD**
21		acenaphthene		201-469-6	83-32-9		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
22		fluorene		201-695-5	86-73-7		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
23		phenanthrene		201-581-5	85-01-8		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<**LOD**
24		anthracene		204-371-1	120-12-7		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
25		fluoranthene		205-912-4	206-44-0		0.052	mg/kg		0.052	mg/kg	0.0000052 %		
26		pyrene		204-927-3	129-00-0		0.065	mg/kg		0.065	mg/kg	0.0000065 %		
27		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.062	mg/kg		0.062	mg/kg	0.0000062 %		
28		chrysene	601-048-00-0	205-923-4	218-01-9		0.049	mg/kg		0.049	mg/kg	0.0000049 %		
29		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.105	mg/kg		0.105	mg/kg	0.0000105 %		
30		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.039	mg/kg		0.039	mg/kg	0.0000039 %		
31		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.081	mg/kg		0.081	mg/kg	0.0000081 %		
32		indeno[123-cd]pyrene		205-893-2	193-39-5		0.096	mg/kg		0.096	mg/kg	0.0000096 %		
33		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
34		benzo[ghi]perylene		205-883-8	191-24-2		0.098	mg/kg		0.098	mg/kg	0.0000098 %		
											Total:	0.215 %		

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 for cumulative determinand results below the concentration of: 1000 mg/kg (0.1%) because: TPH concentrations too low to be flammable

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0067%)

Classification of sample: WS103[2]

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

Sample details

Sample name:
WS103[2]
Sample Depth:
1.30 - 1.50 m
Moisture content:
14.8%
(no correction)

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: 14.8% 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 acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				11.8	mg/kg	1.895	22.355	mg/kg	0.00224 %		
2		cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1	mg/kg	1.855	<2.04	mg/kg	<0.000204 %		<**LOD**
3		chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		37.6	mg/kg	1.462	54.954	mg/kg	0.0055 %		
4		chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04	mg/kg	2.27	<0.0908	mg/kg	<0.00000908 %		<**LOD**
5		copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		15.6	mg/kg	3.929	61.293	mg/kg	0.00613 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	104	mg/kg	1.56	162.221	mg/kg	0.0104 %		
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6	mg/kg	1.353	<0.812	mg/kg	<0.0000812 %		<**LOD**
8		nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		34.5	mg/kg	5.358	184.862	mg/kg	0.0185 %		
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		72.7	mg/kg	2.774	201.68	mg/kg	0.0202 %		
11		pH			PH		8.3	pH		8.3	pH	8.3 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
13		acenaphthylene		205-917-1	208-96-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<**LOD**
14		acenaphthene		201-469-6	83-32-9		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
15		fluorene		201-695-5	86-73-7		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**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		phenanthrene	201-581-5	85-01-8		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<**LOD**
17		anthracene	204-371-1	120-12-7		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
18		fluoranthene	205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
19		pyrene	204-927-3	129-00-0		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<**LOD**
21		chrysene	601-048-00-0	205-923-4	218-01-9	<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<**LOD**
22		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
23		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<**LOD**
24		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
25		indeno[123-cd]pyrene	205-893-2	193-39-5		<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
26		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
27		benzo[ghi]perylene	205-883-8	191-24-2		<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
										Total:	0.0629 %		

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: WS104

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

Sample details

Sample name:
WS104
Sample Depth:
0.20 - 0.40 m
Moisture content:
16.3%
(no correction)

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: 16.3% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				9.9 mg/kg	1.895	18.756 mg/kg	0.00188 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<LOD
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		37.2 mg/kg	1.462	54.37 mg/kg	0.00544 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<LOD
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		17.2 mg/kg	3.929	67.58 mg/kg	0.00676 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	23.1 mg/kg	1.56	36.032 mg/kg	0.00231 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<LOD
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		38.4 mg/kg	5.358	205.759 mg/kg	0.0206 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		61.9 mg/kg	2.774	171.72 mg/kg	0.0172 %		
12	pH			PH		8.5 pH		8.5 pH	8.5 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
15	acenaphthene		201-469-6	83-32-9		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<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		fluorene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
			201-695-5	86-73-7									
17		phenanthrene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<**LOD**
			201-581-5	85-01-8									
18		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			204-371-1	120-12-7									
19		fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			205-912-4	206-44-0									
20		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
			205-883-8	191-24-2									
										Total:	0.0541 %		

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: WS104[2]

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

Sample details

Sample name:
WS104[2]
Sample Depth:
1.20 - 1.40 m
Moisture content:
16.8%
(no correction)

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: 16.8% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				11.1 mg/kg	1.895	21.029 mg/kg	0.0021 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		1.3 mg/kg	1.855	2.411 mg/kg	0.000241 %		
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		34.1 mg/kg	1.462	49.839 mg/kg	0.00498 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<LOD
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		19.3 mg/kg	3.929	75.831 mg/kg	0.00758 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	20.1 mg/kg	1.56	31.352 mg/kg	0.00201 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<LOD
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		37.5 mg/kg	5.358	200.937 mg/kg	0.0201 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<LOD
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		129 mg/kg	2.774	357.865 mg/kg	0.0358 %		
12	pH			PH		8.5 pH		8.5 pH	8.5 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
14	acenaphthylene		205-917-1	208-96-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
15	acenaphthene		201-469-6	83-32-9		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<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		fluorene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				0.042	mg/kg		0.042	mg/kg	0.0000042 %		
			201-581-5	85-01-8									
18		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0728 %		

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: WS104[3]

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

Sample details

Sample name:
WS104[3]
Sample Depth:
1.70 - 1.90 m
Moisture content:
18.8%
(no correction)

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: 18.8% 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 acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				11.8	mg/kg	1.895	22.355	mg/kg	0.00224 %		
2		cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1	mg/kg	1.855	<2.04	mg/kg	<0.000204 %		<**LOD**
3		chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		37.5	mg/kg	1.462	54.808	mg/kg	0.00548 %		
4		chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04	mg/kg	2.27	<0.0908	mg/kg	<0.00000908 %		<**LOD**
5		copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		15.6	mg/kg	3.929	61.293	mg/kg	0.00613 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17.1	mg/kg	1.56	26.673	mg/kg	0.00171 %		
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6	mg/kg	1.353	<0.812	mg/kg	<0.0000812 %		<**LOD**
8		nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		36.2	mg/kg	5.358	193.971	mg/kg	0.0194 %		
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		59.3	mg/kg	2.774	164.507	mg/kg	0.0165 %		
11		pH			PH		8.4	pH		8.4	pH	8.4 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
13		acenaphthylene		205-917-1	208-96-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<**LOD**
14		acenaphthene		201-469-6	83-32-9		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
15		fluorene		201-695-5	86-73-7		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**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		phenanthrene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<**LOD**
			201-581-5	85-01-8									
17		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			204-371-1	120-12-7									
18		fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			205-912-4	206-44-0									
19		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
			204-927-3	129-00-0									
20		benzo[a]anthracene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<**LOD**
			205-883-8	191-24-2									
										Total:	0.0514 %		

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: WS105

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

Sample details

Sample name:
WS105
Sample Depth:
1.00 - 1.20 m
Moisture content:
16%
(no correction)

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: 16% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				9.7 mg/kg	1.895	18.377 mg/kg	0.00184 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<**LOD**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		36.7 mg/kg	1.462	53.639 mg/kg	0.00536 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<**LOD**
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		12.8 mg/kg	3.929	50.292 mg/kg	0.00503 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	24.5 mg/kg	1.56	38.215 mg/kg	0.00245 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<**LOD**
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		31.4 mg/kg	5.358	168.251 mg/kg	0.0168 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		53.7 mg/kg	2.774	148.972 mg/kg	0.0149 %		
12	TPH (C6 to C40) petroleum group			TPH		20.3 mg/kg		20.3 mg/kg	0.00203 %		
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		pH				8.3	pH		8.3	pH	8.3 pH		
				PH									
19		naphthalene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
			205-917-1	208-96-8									
21		acenaphthene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<LOD
			201-469-6	83-32-9									
22		fluorene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<LOD
			201-695-5	86-73-7									
23		phenanthrene				0.075	mg/kg		0.075	mg/kg	0.0000075 %		
			201-581-5	85-01-8									
24		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			204-371-1	120-12-7									
25		fluoranthene				0.02	mg/kg		0.02	mg/kg	0.000002 %		
			205-912-4	206-44-0									
26		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
			204-927-3	129-00-0									
27		benzo[a]anthracene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0484 %		

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 for cumulative determinand results below the concentration of: 1000 mg/kg (0.1%) because: TPH concentrations too low to be flammable

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00203%)

Classification of sample: WS105[2]

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

Sample details

Sample name:
WS105[2]
Sample Depth:
1.80 - 2.00 m
Moisture content:
19%
(no correction)

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: 19% 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 acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				11	mg/kg	1.895	20.84	mg/kg	0.00208 %		
2	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1	mg/kg	1.855	<2.04	mg/kg	<0.000204 %		<**LOD**
3	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		46	mg/kg	1.462	67.232	mg/kg	0.00672 %		
4	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04	mg/kg	2.27	<0.0908	mg/kg	<0.00000908 %		<**LOD**
5	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		14.6	mg/kg	3.929	57.364	mg/kg	0.00574 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	18.8	mg/kg	1.56	29.325	mg/kg	0.00188 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6	mg/kg	1.353	<0.812	mg/kg	<0.0000812 %		<**LOD**
8	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		41.6	mg/kg	5.358	222.906	mg/kg	0.0223 %		
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		61.6	mg/kg	2.774	170.887	mg/kg	0.0171 %		
11	pH			PH		8.5	pH		8.5	pH	8.5 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<**LOD**
14	acenaphthene		201-469-6	83-32-9		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
15	fluorene		201-695-5	86-73-7		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**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		phenanthrene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
			201-581-5	85-01-8									
17		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			204-371-1	120-12-7									
18		fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			205-912-4	206-44-0									
19		pyrene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
			204-927-3	129-00-0									
20		benzo[a]anthracene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0558 %		

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: WS106

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

Sample details

Sample name:
WS106
Sample Depth:
0.30 - 0.50 m
Moisture content:
6.7%
(no correction)

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: 6.7% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				11.6 mg/kg	1.895	21.976 mg/kg	0.0022 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<**LOD**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		34.4 mg/kg	1.462	50.278 mg/kg	0.00503 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<**LOD**
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		16.4 mg/kg	3.929	64.436 mg/kg	0.00644 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	37.5 mg/kg	1.56	58.493 mg/kg	0.00375 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<**LOD**
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		34.2 mg/kg	5.358	183.254 mg/kg	0.0183 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		64.6 mg/kg	2.774	179.21 mg/kg	0.0179 %		
12	TPH (C6 to C40) petroleum group			TPH		15.4 mg/kg		15.4 mg/kg	0.00154 %		
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<**LOD**
14	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**
15	toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
17		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
18		pH				7.3	pH		7.3	pH	7.3 pH		
				PH									
19		naphthalene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<**LOD**
			205-917-1	208-96-8									
21		acenaphthene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
			201-469-6	83-32-9									
22		fluorene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
			201-695-5	86-73-7									
23		phenanthrene				0.017	mg/kg		0.017	mg/kg	0.0000017 %		
			201-581-5	85-01-8									
24		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			204-371-1	120-12-7									
25		fluoranthene				0.025	mg/kg		0.025	mg/kg	0.0000025 %		
			205-912-4	206-44-0									
26		pyrene				0.025	mg/kg		0.025	mg/kg	0.0000025 %		
			204-927-3	129-00-0									
27		benzo[a]anthracene				0.033	mg/kg		0.033	mg/kg	0.0000033 %		
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				0.029	mg/kg		0.029	mg/kg	0.0000029 %		
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				0.021	mg/kg		0.021	mg/kg	0.0000021 %		
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				0.03	mg/kg		0.03	mg/kg	0.000003 %		
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				0.02	mg/kg		0.02	mg/kg	0.000002 %		
			205-883-8	191-24-2									
										Total:	0.0552 %		

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 for cumulative determinand results below the concentration of: 1000 mg/kg (0.1%) because: TPH concentrations too low to be flammable

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00154%)

Classification of sample: WS106[2]

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

Sample details

Sample name:
WS106[2]
Sample Depth:
1.00 - 1.20 m
Moisture content:
17.5%
(no correction)

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: 17.5% 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 acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				12	mg/kg	1.895	22.734	mg/kg	0.00227 %		
2		cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1	mg/kg	1.855	<2.04	mg/kg	<0.000204 %		<**LOD**
3		chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
4		chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04	mg/kg	2.27	<0.0908	mg/kg	<0.00000908 %		<**LOD**
5		copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		11.3	mg/kg	3.929	44.398	mg/kg	0.00444 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	71.2	mg/kg	1.56	111.059	mg/kg	0.00712 %		
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6	mg/kg	1.353	<0.812	mg/kg	<0.0000812 %		<**LOD**
8		nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		15.5	mg/kg	5.358	83.054	mg/kg	0.00831 %		
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		89	mg/kg	2.774	246.899	mg/kg	0.0247 %		
11		pH			PH		7.3	pH		7.3	pH	7.3 pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
13		acenaphthylene		205-917-1	208-96-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<**LOD**
14		acenaphthene		201-469-6	83-32-9		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
15		fluorene		201-695-5	86-73-7		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**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		phenanthrene				0.033	mg/kg		0.033	mg/kg	0.0000033 %		
			201-581-5	85-01-8									
17		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			204-371-1	120-12-7									
18		fluoranthene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			205-912-4	206-44-0									
19		pyrene				0.149	mg/kg		0.149	mg/kg	0.0000149 %		
			204-927-3	129-00-0									
20		benzo[a]anthracene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				0.078	mg/kg		0.078	mg/kg	0.0000078 %		
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				0.116	mg/kg		0.116	mg/kg	0.0000116 %		
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.04	mg/kg		0.04	mg/kg	0.000004 %		
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.072	mg/kg		0.072	mg/kg	0.0000072 %		
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.102	mg/kg		0.102	mg/kg	0.0000102 %		
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.071	mg/kg		0.071	mg/kg	0.0000071 %		
			205-883-8	191-24-2									
										Total:	0.0491 %		

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: WS107

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

Sample details

Sample name:
WS107
Sample Depth:
0.40 - 0.60 m
Moisture content:
37.6%
(no correction)

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: 37.6% 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 acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				11.3	mg/kg	1.895	21.408	mg/kg	0.00214 %		
2		cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1	mg/kg	1.855	<2.04	mg/kg	<0.000204 %		<**LOD**
3		chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17.2	mg/kg	1.462	25.139	mg/kg	0.00251 %		
4		chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04	mg/kg	2.27	<0.0908	mg/kg	<0.00000908 %		<**LOD**
5		copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		16.8	mg/kg	3.929	66.008	mg/kg	0.0066 %		
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	315	mg/kg	1.56	491.342	mg/kg	0.0315 %		
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6	mg/kg	1.353	<0.812	mg/kg	<0.0000812 %		<**LOD**
8		nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		14.8	mg/kg	5.358	79.303	mg/kg	0.00793 %		
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3	mg/kg	2.554	<7.662	mg/kg	<0.000766 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		115	mg/kg	2.774	319.027	mg/kg	0.0319 %		
11		pH			PH		7	pH		7	pH	7pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<**LOD**
13		acenaphthylene		205-917-1	208-96-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<**LOD**
14		acenaphthene		201-469-6	83-32-9		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**LOD**
15		fluorene		201-695-5	86-73-7		<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<**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		phenanthrene				0.018	mg/kg		0.018	mg/kg	0.0000018 %		
			201-581-5	85-01-8									
17		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
			204-371-1	120-12-7									
18		fluoranthene				0.043	mg/kg		0.043	mg/kg	0.0000043 %		
			205-912-4	206-44-0									
19		pyrene				0.049	mg/kg		0.049	mg/kg	0.0000049 %		
			204-927-3	129-00-0									
20		benzo[a]anthracene				0.044	mg/kg		0.044	mg/kg	0.0000044 %		
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				0.042	mg/kg		0.042	mg/kg	0.0000042 %		
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.027	mg/kg		0.027	mg/kg	0.0000027 %		
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.04	mg/kg		0.04	mg/kg	0.000004 %		
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.026	mg/kg		0.026	mg/kg	0.0000026 %		
			205-883-8	191-24-2									
										Total:	0.0826 %		

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: WS108

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

Sample details

Sample name:
WS108
Sample Depth:
0.00 - 0.20 m
Moisture content:
24.3%
(no correction)

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: 24.3% 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 fibres detected (Yes/No)			ACM_FIBRES		No					
2	arsenic { arsenic acid and its salts with the exception of those specified elsewhere in this Annex }	033-005-00-1				15.6 mg/kg	1.895	29.555 mg/kg	0.00296 %		
3	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<1.1 mg/kg	1.855	<2.04 mg/kg	<0.000204 %		<**LOD**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25.1 mg/kg	1.462	36.685 mg/kg	0.00367 %		
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<0.04 mg/kg	2.27	<0.0908 mg/kg	<0.00000908 %		<**LOD**
6	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		12.5 mg/kg	3.929	49.113 mg/kg	0.00491 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	174 mg/kg	1.56	271.408 mg/kg	0.0174 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.6 mg/kg	1.353	<0.812 mg/kg	<0.0000812 %		<**LOD**
9	nickel { nickel dibromate }	028-053-00-5	238-596-1	14550-87-9		22.4 mg/kg	5.358	120.026 mg/kg	0.012 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<3 mg/kg	2.554	<7.662 mg/kg	<0.000766 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		81 mg/kg	2.774	224.706 mg/kg	0.0225 %		
12	pH			PH		6.9 pH		6.9 pH	6.9 pH		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<**LOD**
14	acenaphthylene		205-917-1	208-96-8		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<**LOD**
15	acenaphthene		201-469-6	83-32-9		<0.013 mg/kg		<0.013 mg/kg	<0.0000013 %		<**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		fluorene				<0.013	mg/kg		<0.013	mg/kg	<0.0000013 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				0.015	mg/kg		0.015	mg/kg	0.0000015 %		
			201-581-5	85-01-8									
18		anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				0.035	mg/kg		0.035	mg/kg	0.0000035 %		
			205-912-4	206-44-0									
20		pyrene				0.035	mg/kg		0.035	mg/kg	0.0000035 %		
			204-927-3	129-00-0									
21		benzo[a]anthracene				0.039	mg/kg		0.039	mg/kg	0.0000039 %		
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.028	mg/kg		<0.028	mg/kg	<0.0000028 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				0.024	mg/kg		0.024	mg/kg	0.0000024 %		
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.025	mg/kg		<0.025	mg/kg	<0.0000025 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				0.021	mg/kg		0.021	mg/kg	0.0000021 %		
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.019	mg/kg		<0.019	mg/kg	<0.0000019 %		<LOD
			205-883-8	191-24-2									
										Total:	0.0634 %		

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

Appendix A: Classifier defined and non GB MCL determinands

asbestos fibres detected (Yes/No) (CAS Number: ACM_FIBRES)

Description/Comments: not classified, information only
Data source: N/A
Data source date: 15 Jan 2020
Hazard Statements: None.

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

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

Description/Comments: Unknown Oil

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

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

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

pH (CAS Number: PH)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic acid and its salts with the exception of those specified elsewhere in this Annex}

Worst case CLP species based on hazard statements/molecular weight and conversion factor for arsenic acid H3AsO4. (edit as required)

cadmium {cadmium sulfate}

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

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

There isn't enough Metal and Cr(VI) to make the Metal chromate

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

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

copper {copper sulphate pentahydrate}

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

lead {lead chromate}

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

mercury {mercury dichloride}

Reasonable worst case CLP species based on hazard statements/molecular weight and assuming no evidence for the use of explosives. (edit as required)

nickel {nickel dibromate}

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

selenium {nickel selenate}

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

zinc {zinc chromate}

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

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2026.83.7020.12656 (25 Mar 2026)
HazWasteOnline Database: 2026.83.7020.12656 (25 Mar 2026)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021
GB MCL List v2.0 - version 2.0 of 20th October 2023
GB MCL List v3.0 - version 3.0 of 11th January 2024
GB MCL List v4.0 - version 4.0 of 2nd March 2024
GB MCL List v5.0 - version 5.0 of 26th June 2024
GB MCL List v6.0 - version 6.0 of 15th February 2025
GB MCL List v7.0 - version 7.0 of 23rd September 2025

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