

Phase II Site Appraisal

11751 – St Chads Drive, Kirkby
Liverpool

for

McCarthy Stone
SCK-PPC-00-XX-RP-G-0002

November 2023

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Summary of Recommendations for St Chads Drive, Kirkby	
Risk to End-Users	No risk to end-users identified.
Risk to Controlled Waters	No risk to controlled waters identified.
Ground Gases	Site classified as CS1. Gas protection measures should be allowed for, subject to completion of the full gas monitoring programme.
Concrete Specification	GEN1 or RC25/30 concrete will be sufficient for buried concrete at the site.
Water Pipe Specification	Barrier or PVC pipes (not PE)will be required (to be confirmed by utility provider).
Engineering Ground Treatment	Vibro ground improvement
Likely Foundation Types	Vibro ground improvement should provide an appropriate solution for the proposed development. Piled foundation solution may be required where an increased bearing capacity is required.
Likely Foundation Depths	Reinforced strips or pads, or a raft foundation bearing on Vibro ground improved soils. Piled Foundations may be achieved bearing within the Chester Formation encountered below 4.00m begl.
Bearing Strata	TBC.
Allowable Bearing Pressure	TBC by vibro or piling contractor.
Volume Change Potential	Non-shrinkable soils predominantly present from surface to approximately 2.00m begl. The cohesive soils recorded at depth have been recorded as having a low volume change potential.
Tree Influence	N/A
Floor Slabs	Suspended floor slabs will likely be necessary due to the requirements for gas protection measures Unless a raft foundation is adopted and suitably designed.
Slope Stability Risk	Based on the current site gradients it is considered are unlikely that the site will present any slope stability issues.
Retaining Walls	No significant retaining structures are likely to be required.
SUDs	It is considered that soakaway drainage will likely be suitable for the proposed development subject to in situ infiltration testing to BRE365.
Roads	A design CBR value of 5% should be used for design (subject to in-situ testing).
Likely Waste Classification	Soils within samples at WS06 and WS10 have been classified as hazardous. All remaining areas of the site have been classified as non-hazardous and should allow to be removed as non-hazardous or inert waste subject to confirmation from the receiving facility.
Other Comments	None

The above summary should not be used in isolation and reference should be made the full report which provides a detailed assessment of the risks affecting the development.

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1.0 Introduction

1.1 Commission

Patrick Parsons (PP) have been appointed by McCarthy Stone (client) to produce a Phase II Site Appraisal for their site known as 'St Chad's Drive, Kirkby' near Liverpool herein referred to as 'the site'.

1.2 Proposed Development

It is understood that the site is to be developed to provide a four-storey retirement living complex comprising 53no. one and two-bedroom apartments, parking spaces and areas of soft landscaping. A proposed development plan is included in Appendix A.

1.3 Limitations

This report has been prepared for the client and their appointed agents only and should not be relied upon by any third party without the written permission of PP. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors do not owe them any Duty of Care or Skill. It is based on and limited to an assessment of the information and ground conditions identified here. PP is not responsible for ground conditions located between exploratory hole locations and not revealed during investigations.

1.4 Aim of Phase II Site Appraisal

The client's specific requirements were to undertake a Phase II Site Appraisal. The principal objectives are as follows:

- Obtain information about the soil and groundwater conditions within the area of the site;
- Determine the ground related geotechnical and contamination hazards within the site boundaries that may affect the proposed development;
- Define the Phase I Conceptual Site Model (CSM) and refine to form a Phase II CSM;
- Provide development recommendations and provide advice on further works if required.

1.5 Information Sources

This Phase II Site Appraisal is based on the findings of the investigation, chemical analysis and geotechnical testing undertaken during the assessment. The results have been used to refine the CSM and the initial recommendations outlined in the Phase I Site Appraisal report undertaken by PP (ref: SCK_PPC_00_XX_RP_G_0001, dated June 2023). The information included within this report helped to form the rationale for the design of this investigation.

2.0 Summary of Phase I Site Appraisal

The following is a summary of the findings of the Phase I Site Appraisal Report undertaken by PP in June 2023 and should not be read in isolation. For full details reference should be made to the report outlined in section 1.5.

- The site is developed parcel of land accessed off St Chad's Drive in the centre of the town of Kirkby, located approximately 10km north-east of the centre of Liverpool. The site is centred at OS grid reference 341441, 398766 and the nearest postcode is L32 8RE.
- The site is a roughly square shaped parcel of land comprising a car park covering approximately three quarters of the site with the remaining area covered by grass. The site area is 0.41ha and the topography is level and contiguous with the surrounding land.
- The site is bound to the north by Trentham Medical Centre, to the south by Kirkby Police Station, to the west by St Chad's Drive with access to the car park, and to the east by the A5208 dual carriageway named County Road. The wider area comprises primarily residential housing to the north, east and south with a large complex of commercial and retail buildings to the west.
- The site has comprised predominantly undeveloped land since at least the 1860s with a field boundary present across the north of the site. The 1961-1962 map records St Chads Drive to the west of the site and building is mapped at the centre of the site labelled 'Clinic' with areas of hardstanding surrounding it. By 1973-1977, a Magistrates Court is mapped in the north of the site adjoining the offsite Police Station. No significant changes are recorded until 2010, the Magistrates court is no longer recorded. The 2023 map no longer shows the clinic on site.
- In the wider area the surrounding land use has been predominantly rural with farms within 250m since the 1860s. Two ponds are located approximately 80m west of the site. Kirkby School is located approximately 200m north of the site on a crossroads. A large area of woodland is 300m northeast of the site with a former red sandstone quarry within it. In 1893 the larger of the two ponds is no longer recorded. A pond is recorded in the former quarry 300m north-east. By 1927, the smaller of the two ponds is no longer and is assumed to have been infilled. The 1955-1956 map records 500m north-east of the site adjacent to the red sandstone quarry a large complex of buildings is recorded as 'Industrial Hostel'. By 1961-1962 the surrounding area is now developed with a network of roads matching the current layout with a Police Station immediately south and Fire Station 75m south of the site. Kirkby Labour Club is mapped north of the site. A complex of market buildings is recorded 100m west of the site and the rest of the surrounding area is now residential housing. The quarry to the north-east is no longer recorded. By 1973-1977 an electrical substation is mapped 75m south and an ambulance station is recorded 80m south-east of the site. There are two large commercial buildings (shopping centre) 100m west of the site. No significant changes are recorded until 2010, the labour club is no longer recorded. The 2023 map shows the Trentham Medical Centre is recorded with a different building footprint to the north of the site.
- The site is not recorded to be underlain by Made Ground. However, given the history of development at the site there is likely to be Made Ground present across the site. The nearest recorded Made Ground deposit is 26m south-west associated with the large commercial and retail development. The site is recorded to be underlain by superficial deposits of the Shirdley Hill Sand Formation. The bedrock geology beneath the site is recorded to comprise Sandstone of the Chester Formation.

- The site is recorded to be in an area where radon levels are less than 1% of properties are above the action level.
- There are 2 no. (ceased) records of BritPits within 500m of the site, located 397m north-east associated with sandstone quarrying at Old Rough Delf and for sand and gravel extraction at Webster's Pits located 449m south-west. There are 2no. records of surface ground workings within 250m relating to unspecified pits located 245m south. There are 3no. records of underground workings within 1000m of the site, located 319 to 330m northeast of the site at Delf between 1890 and 1928
- The bedrock geology beneath the site is recorded to be a Principal Aquifer and the superficial deposits are a Secondary A aquifer. The site is within a Source Protection Zone III – Total Catchment.
- There are 26no. records of groundwater abstractions within 2000m of the site. The nearest record is located 893m north and is a historical record for a United Utilities potable water pumping station. There are 5 no. active records within 2000m of the site with the nearest at 970m east of the site for spray irrigation at Liverpool Football Club & Athletic Grounds.
- There are 2no. surface water abstraction records within 2000m of the site, both of which are historical. The nearest record is located 1157 m north-west. There is 1no. active record of potable abstractions within 2000m of the site located 1914 m east at Kirkby Industrial Estate used for drinking, cooking, washing, and commercial processes.
- There is 1no. record of surface water features within 1000 m of the site, Simmonswood Brook located 629m west which has an overall rating of moderate, an ecological rating of moderate and a fail for the chemical rating. The WFD groundwater body recorded on-site is the Lower Mersey Basin and North Merseyside Permo-Triassic Sandstone Aquifers, water body ID GB41201G101700, which has an overall rating of poor, a chemical rating of poor and a quantitative rating of poor when last assessed in 2019.
- The site is not recorded to be within an area at risk of flooding from surface water and has a moderate risk of flooding from groundwater.
- There are 13no. records of historical industrial land uses within 500m of the site. The closest record is located on-site and is a Police Station, however, historic mapping shows the police station to be located immediately offsite. The next nearest is a Fire Station 60m south-east of the site. Other historical records within 250m of the site comprise unspecified pits, delf (quarry), unspecified quarries and a sand pit.
- There are 3no. records of historical tanks within 500m of the site. The tanks are 234m north, 237m north, and 458m southeast and are all unspecified.
- There are 4no. records of historical garages all 306m west of the site.
- There are no records of any active, recent, or historic landfills within 500m of the site (BGS/EA/LA records). There are no records of historical waste sites within 500m.
- There are 8no. records of waste exemptions within 500m of the site all related to the sorting and denaturing of controlled drugs for disposal with the nearest at 140m south-west.
- There are 20no. records of recent or current industrial land use within 250m of the site. The nearest record is located 42m north relating to an electricity substation. The other pertinent records include an electricity substation 61m south, Kirkby Community Fire Station 71m south, Kirkby Ambulance Station 72m south-east and Morrisons petrol station 98m north.
- There are 2no. records of a current or recent petrol stations within 500m of the site. The nearest is located 129m north of the site, is currently active and operated by Morrisons.

- There are 3no. licensed pollutant releases (part A(2)/B) within 500m of the site. The nearest is located 87m south for dry cleaning. There is also a record of a licensed pollutant release from the Morrisons Petrol Station (127m north) during the unloading of petrol into storage.

No other significant potentially contaminative sources have been identified within influencing distance of the site.

3.0 Phase I Conceptual Model

3.1 Preliminary Conceptual Site Model

Based on the Phase I desk-based review including an environmental data report, a conceptual site model was produced in accordance with the Land Contamination Risk Management (LCRM) guidance document.

The specific contaminants of concern expected to be present on-site are Made Ground associated with the previous buildings on site. General contaminants which may be present on-site are likely to include heavy metals, polycyclic aromatic hydrocarbons (PAHs), pesticides and asbestos. Potential medical waste contamination from historic clinic.

Offsite sources of contamination include the active petrol station 129m north of the site as a source of Total Petroleum Hydrocarbons (TPH). A large area of artificial ground is mapped west of the site and is a potential source of ground gas.

The potential pathways for migration of contamination sources to potential receptors relevant to this site are as follows:

Human Health

- Direct contact with and/or incidental ingestion of contaminated soils;
- Dermal contact, inhalation and/or ingestion of dust derived from contaminated soils;
- Migration of hazardous soil-gases via permeable strata or ducts/drains into future buildings.

Controlled Waters

- Discharge of contamination within surface water run-off;
- Leaching of contamination with subsequent vertical and / or lateral migration of mobile contaminants into controlled water receptors;
- Migration of contamination via preferential pathways e.g. service runs.

Buried Services / Property

- Direct contact of contaminants with existing or future buried services;
- Migration of hazardous soil-gases via permeable strata or ducts/drains into enclosed spaces.

The following site-specific receptors are considered relevant:

Human Health

- Site users – end-users of the proposed high-rise residential development;
- Construction workers – personnel involved in the redevelopment works.
- Offsite residential properties – end users.

Controlled Waters

- Underlying superficial (Secondary A) and bedrock (Principal) aquifers.
- Source Protection Zone III – Total Catchment beneath the site.

Buried Services / Property

- Building fabric and foundations/piles.

A preliminary qualitative assessment of the identified PCLs and associated risk ratings was completed, and a summary is provided in the Table on the next page. The CSM provides the relationship between the following three criteria:

- The presence of substances that may cause harm (source);
- The presence of a plausible pollutant linkage between the source and receptor (pathway);
- The presence of a receptor which may be harmed (receptor).

If all three criteria are present, or considered likely to be present at a site, they are identified as Potential Contaminant Linkages (PCLs). EA R&D66 (2008) includes a risk classification system based on classification of consequence and probability, as shown in the table below, associated with the identified PCLs.

		Severity of Consequence			
		Severe	Medium	Mild	Minor
Probability of pollutant linkage	High Likelihood	Very High risk	High risk	Moderate risk	Moderate/ Low risk
	Likely	High risk	Moderate risk	Moderate / Low risk	Low risk
	Low Likelihood	Moderate risk	Moderate / Low risk	Low risk	Very Low risk
	Unlikely	Moderate / Low risk	Low risk	Very Low risk	Very Low risk

The definitions of the risk terminology are taken from CIRIA report C552.

A pollutant linkage must be established before tests for probability and consequence are applied. If there is no pollutant linkage, then there is no potential risk and there is no need to apply tests for probability and consequence. The risk assessment needs to include a logical and transparent system to define categories of severity of consequence and probability of occurrence.

3.2 Preliminary Conceptual Site Model

A preliminary qualitative assessment of the identified PCLs and associated risk ratings was completed, and a summary is provided in the Table on the next page.



Source	Pathway	Receptor	Consequence	Probability	Risk Assessment and Justification
On-site sources – Made Ground: general contaminants to include heavy metals, PAHs, pesticides and asbestos.	Dermal contact, inhalation and ingestion of contaminants in soil and soil derived dust	Future site user/worker	Medium	Likely	Moderate Risk – There is potential for Made Ground on-site, however, past site uses are not indicative of significant contamination. The proposed development of the site includes areas of soft landscaping, there will be a pathway between any potential contamination and end users.
	Inhalation of volatile soil vapours and ground gas	Site construction worker	Medium	Low Likelihood	Moderate / Low Risk - Construction workers have a shorter exposure period and risks shall be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015.
	Inhalation of asbestos free fibres	Future site user/worker Site construction worker	Medium	Low Likelihood	Moderate / Low Risk – There is potential for thicknesses of Made Ground on-site following demolition of historic buildings that could be a source of ground gases. Neighbouring sites with potential underground fuel storage tanks could be a source of hydrocarbon vapours and other gases such as CO ₂ .
Potential medical waste from historic clinic.	Inhalation of asbestos free fibres	Site user/worker	Severe	Likely	High Risk – Given the age of the previously demolished buildings, it is considered likely that they included asbestos containing materials within their fabric. Given that proposed development of the site includes areas of soft landscaping there will be a pathway between any potential contamination and end users.
Offsite sources – Active petrol station 129m north potential source of Total Petroleum Hydrocarbons (TPH).	Leaching of contaminants from soil and vertical migration into groundwater	Site construction worker	Low Likelihood	Low Likelihood	Moderate Risk - Construction workers have a shorter exposure period and risks shall be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015.
Large area of artificial ground recorded west of the site: Potential source of ground gasses.	Potential offsite sources such as underground fuel storage tanks	Groundwater within superficial deposits	Mild	Low likelihood	Low Risk: Moderate mobility contamination could impact the shallow groundwater within the underlying superficial deposits via percolation and lateral migration pathways. Risk assessed as Low given that the impact, if realised, would likely be mild given no likely significant sources of contamination and given that superficial deposits are unlikely to be utilised as a resource.
	Permeation through water pipes of shallow contamination.	Groundwater within bedrock	Medium	Unlikely	Low Risk – Any shallow contamination likely to be intercepted by shallow groundwater within the superficial deposits beneath the site.
		Groundwater within superficial deposits	Medium	Low Likelihood	Moderate / Low Risk – Neighbouring sites such as the police station and fire station could potentially have underground fuel storage tanks and are in close enough proximity to present a risk to the site from leaks causing impact to shallow groundwater beneath the site.
		Future site user/worker	Medium	Unlikely	Low Risk: No significant sources of contamination likely to be able to permeate into potable water supply pipes anticipated.

4.0 Phase II Ground Investigation

4.1 Fieldwork

The ground investigation (including fieldwork, sampling and laboratory analysis) has been designed to identify and assess potential ground related problems and to allow cost-effective solutions to be advised. It has been planned based on the desk study. All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

The exploratory holes have been positioned to determine the general ground/groundwater conditions below the site, with representative samples obtained for geotechnical and environmental laboratory analysis. The resultant exploratory hole density is considered to be appropriate with the complexity of the site conditions revealed in the desk study and detail of information required for this phase of the investigation.

The ground investigation was undertaken on 25 and 26 October 2023. The ground investigation comprised a total of 12no. window sample boreholes to a maximum depth of 4.00m below existing ground level (begl) (WS01 TO WS07 and WS09).

The exploratory hole location plan and exploratory hole logs are presented in Appendix B.

4.2 Ground Conditions

Topsoil was encountered across the east of the site in boreholes WS02 to WS07 to a maximum depth of 0.20m begl; comprising grass over dark brown gravelly silty fine to coarse sand with frequent rootlets. Gravel content is subangular to subrounded fine to medium brick, ceramic, mudstone and quartzite. Beneath the topsoil, Made Ground was encountered to a maximum depth of 1.10m begl (WS03 and WS05); comprising light brown to dark blackish brown silty gravelly fine to coarse sand with medium cobble content. Gravel content is subangular to subrounded fine to coarse sandstone, mudstone, brick, concrete, coal, quartzite, limestone, tarmac and clinker. Cobbles are subangular to subrounded concrete, mudstone, and bricks.

Made ground was encountered across the remainder of the site from surface comprising dark grey asphalt to a maximum depth of 0.20m begl (WS10). Beneath the asphalt, Made Ground was encountered to a maximum depth of 1.10m begl (WS01), comprising light brown occasionally slightly silty gravelly fine to coarse sand with a low to medium cobble content to dark grey sandy gravel or gravelly sand. Gravel content is subangular to subrounded fine to coarse sandstone, brick, mudstone, concrete clinker and dolomite and limestone. Cobbles are subrounded to subangular bricks and concrete. A geotextile was encountered beneath the tarmac at 0.20m.

Below the tarmac in WS12, Made Ground comprising weakly cemented light grey gravel and sand was encountered to 0.30m begl. The window sample location was terminated due to being unable to progress the hand dug service inspection pit.

Corrected SPT-N60 values within the Made ground were recorded to be between 21 and 28 at 1.00m begl.

Beneath the Made ground, the Shirdley Hill Sand Formation was encountered comprising loose to medium dense light brown to dark orangish brown fine to coarse sand with occasional pockets of dark brown sandy silt and black to dark brown silty fine to medium sand, to a maximum depth of 2.50m bgl (WS05).

Corrected SPT-N60 values within the Shirdley Hill Sand Formation were recorded to be between 9 and 15 at 1.00m-1.20m bgl, 13 and 18 at 2.00m bgl.

The Shirdley Hill Sand Formation is underlain by Till comprising firm becoming stiff dark reddish brown slightly sandy to sandy, slightly gravelly clay. Gravel is subangular to subrounded fine to medium sandstone and mudstone. This is in turn underlain by firm dark reddish brown sandy clay.

Hand shear vanes have been recorded within the Till deposits between 22 and 84 kPa at a depth of between 2.20m and 3.70m. However, it is considered that the shear vanes recorded have not failed through shear, due to the diameter of the test sample and therefore are unlikely to represent the shear strength of the unit. As such these values have been discounted.

Corrected SPT-N60 values within the Till were recorded to be between 9 at 1.20m bgl, 7 and 15 at 2.00m bgl, 10 and 29 at 3.00m bgl and 61 at 4.00m bgl (WS02 and WS04).

Below which the Chester Formation was encountered comprising very weak dark to light reddish-brown sandstone recovered as occasionally clayey gravelly sand to a maximum depth of 4.00m bgl. Corrected SPT-N60 values within the Chester Formation, 61 at 4.00m bgl (WS01, WS03, WS05, WS06, WS07, WS09).

4.3 Groundwater

Groundwater was encountered in WS05 TO WS07 during the site investigation to depths between 3.00m and 4.00m bgl. Groundwater was recorded within the monitoring installations at minimum depths of 1.93m bgl during the monitoring visits completed to date.

4.4 Contamination Observations

No visual or olfactory evidence of potential significant contamination was identified during the ground investigation.

4.5 Chemical Analysis

Chemical laboratory analyses were selected to provide the parameters necessary to assess the suitability for the re-use of soils on the site as well as to inform risk assessment for end users and controlled waters. The choice of contamination testing was based on the commonly occurring potential contaminants as identified within the Phase I Site Appraisal and on-site visual observations of contaminated soils. The chemical analysis results are presented in Appendix C. In summary the following testing has been completed:

- 8no. samples for a general suite of contaminants - metals, inorganics, speciated polyaromatic hydrocarbons, asbestos and total petroleum hydrocarbons;
- 3no. samples tested for soil leachates.

4.6 Geotechnical Testing

Geotechnical soils testing has been undertaken as part of the ground investigation to provide the parameters necessary for the budgetary design of the development. The geotechnical test results are presented in Appendix C. In summary the following testing has been completed:

- 3no. for Atterberg limit tests
- 3no. for pH and water-soluble sulphate;
- 2no. for remoulded laboratory CBRs.

5.0 Human Health Risk Assessment (Ground Gas)

Gas/groundwater monitoring standpipes have been installed within three boreholes (WS02, WS06 and WS09) and response zones targeted in the natural ground.

At the time this report was written, one round of gas and groundwater monitoring have been undertaken with further rounds to be undertaken every two weeks until six visits have been completed.

The results of the ground gas monitoring were assessed using the classification system contained within BS 8485:2015+A1:2019 and CIRIA C665. The classification system uses gas concentrations and recorded flow rates for CH₄ and CO₂ to determine a borehole hazardous gas flow rate (Q_{hg}). Q_{hg} is used to assign a Characteristic Situation (CS) for each borehole, based on Table 2 in BS 8485:2015+A1:2019 and the Q_{hg} has been calculated using the equation below:

$$Q_{hg} = q \left(\frac{C_{hg}}{100} \right)$$

where:

q is the measured flow rate of combined gases from the monitoring standpipe (l/hr)

Chg is the measured hazardous gas concentration (% v/v)

The recorded concentrations of ground gas and flow rate during the periodic monitoring undertaken to date are summarised in the table below:

Borehole	Max Steady Flow	Max. CH ₄ (% v/v)	Max. CO ₂ (% v/v)	CH ₄ Q _{hg} (l/hr)	CO ₂ Q _{hg} (l/hr)	CS
WS02	0.00	0.20	3.2	0	0	1
WS06	0.00	0.30	3.8	0	0	1
WS09	0.00	0.30	7.5	0	0	1

The initial round of monitoring undertaken to date has recorded a maximum carbon dioxide concentration of 7.5% v/v, a maximum methane concentration of 0.3% v/v and a minimum oxygen concentration of 9.1% v/v. Carbon monoxide and hydrogen sulphide were not recorded.

A plausible worst case Q_{hg} has been calculated for carbon dioxide (0.0075 l/hr) and methane (0.0003 l/hr) using the nominal maximum steady flow rate of 0.1 l/hr. The 'worst case' Q_{hg} for methane and carbon dioxide would classify the site as Characteristic Situation 1 (CS1) in accordance with BS 8485:2015+A1:2019.

Whilst hydrocarbons have been recorded within the Made Ground soils, a vapour risk is unlikely to be present due to the higher EC banding (typically EC16-35). The soils are also recorded below the relevant GAC for hydrocarbons which has the vapour risk factored into the calculated limits.

As such, at this stage it is assessed that gas precautions are unlikely to be required for the proposed development. However, an allowance for gas precaution measures should be

included subject to completion of the remaining monitoring programme and final gas risk assessment.

The gas monitoring results to date are presented in Appendix E.

6.0 Human Health Risk Assessment (Soil)

6.1 Introduction

It is understood that the site is to be developed to provide a four-storey retirement living complex comprising 53no. one and two-bedroom apartments, parking spaces and areas of soft landscaping.

The Phase II investigation works has revealed Made Ground across the entire site to a maximum depth of 1.10m begl although no visual or olfactory signs of contamination were recorded.

Representative samples of topsoil, Made Ground and natural strata encountered were collected for further examination and/or potential testing.

The Generic Assessment Criteria (GAC) used by Patrick Parsons are presented in Appendix F. For this site, the chemical analysis results are being compared against the GAC for residential end-use without home grown produce, this is considered the most appropriate GAC based on the most sensitive future end-use receptor.

6.2 Risk to End-Users

The chemical analyses of the topsoil, Made Ground and natural soils have recorded no exceedances of any contaminants of concern when compared to the GAC for residential end-use without home grown produce.

All 8no. samples were tested for the presence of asbestos; asbestos was not encountered in any of the samples.

Based on the results of the chemical analysis, the soils do not pose a risk to end-users and as such the topsoil, Made Ground and natural soils can be reused at the site.

It should be noted that the soil saturation limits have been exceeded for Aliphatic EC >16-35 in samples at the site which indicates the potential presence of free product within the soils in the vicinity of these locations. Soils saturated with hydrocarbons are likely to represent a source for the impaction of underlying groundwater and a risk to controlled water receptors which is discussed further in Section 7.

Full results of chemical analysis are presented in Appendix C.

6.3 Risk to Construction Workers

During any future construction works that take place on site, risks associated with contaminated soils must be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015. Potential acute risks resulting from short term exposure to contamination by construction / maintenance workers involved with the proposed development and future intrusive maintenance works (i.e. repairing services) cannot be assessed using the aforementioned GAC because they relate to the long-term (chronic) risk.

In accordance with CDM, potential risks to human health and the environment from construction activities shall be appropriately identified and all necessary steps taken to

eliminate/manage that risk with the use of appropriate risk assessments and safe systems of work. It has been assumed that any future construction works on-site will be undertaken in compliance with these requirements and therefore construction workers involved in any future development at the site and intrusive maintenance workers (e.g. for repair of underground services) have been discounted as a human receptor in this report.

However, it is recommended that the laboratory test results are included in the consideration of site-specific risk assessment for the ground workers that will be exposed to the soils beneath the site.

7.0 Controlled Waters Risk Assessment

7.1 Risk Assessment

The chemical testing and ground investigation has not identified any grossly contaminated soils.

The bedrock geology beneath the site is recorded to be a Principal Aquifer and the superficial deposits are a Secondary A aquifer. The site is within a Source Protection Zone III – Total Catchment.

There are 26no. records of groundwater abstractions within 2000m of the site. The nearest record is located 893m north and is a historical record for a United Utilities potable water pumping station. There are 5no. active records within 2000m of the site with the nearest at 970m east of the site for spray irrigation at Liverpool Football Club & Athletic Grounds.

There are 2no. surface water abstraction records within 2000m of the site, both of which are historical. The nearest record is located 1157 m north-west. There is 1no. active record of potable abstractions within 2000m of the site located 1914 m east at Kirkby Industrial Estate used for drinking, cooking, washing, and commercial processes.

There is 1no. record of surface water features within 1000 m of the site, Simmonswood Brook located 629m west. The surface water feature is considered unlikely to be close enough to be influenced directly by this site.

Groundwater has been recorded at the site in locations WS05 to WS07 with the water strike occurring between 3.00 and 4.00m begl and recorded to 1.93m begl during the monitoring to date.

Exceedances of the soil saturation limits for Aliphatic EC16-EC35 hydrocarbons were identified in soil samples during the ground investigation, and it was considered that they may represent a source for the impaction of underlying groundwater. However, it should be noted that in accordance with CL:AIRE, 2017. Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies, these contaminants are likely to be very immobile in the soil/groundwater environment due to their low aqueous solubilities and high Koc (organic carbon partitioning coefficient), meaning they are unlikely to enter the dissolved phase and have a strong affinity to adhere to sediments. Therefore, the identified exceedances of the soil saturation limits for these hydrocarbon splits are considered unlikely to represent a risk to controlled water receptors.

Whilst a sensitive receptor does exist groundwater is recorded to be below a significant thickness of cohesive natural soils and any vertical migration of contaminants is likely to be limited by this cohesive stratum.

Given the lack of identified contamination (source), no gross contamination has been identified at the site following chemical analysis and as such there is no source of contamination in the source-pathway-receptor model and it is therefore considered that there is a negligible risk to controlled waters.

8.0 Construction Materials Risk Assessment

8.1 Water Supply Pipes

The chemical analysis results have been compared against UK Water Industry Research (UKWIR) Contamination Thresholds for sub-surface water pipes.

Based on the site history and the chemical analysis completed which have identified elevated petroleum hydrocarbons above the UKWIR Contamination Thresholds, it considered that the site will require barrier or PVC water pipes (not PE pipes) subject to confirmation from the utility provider.

8.2 Buried Concrete

Based on the recorded water-soluble sulphate (<400mg/l) and pH (>6.5), the natural soils below the site (assuming mobile groundwater conditions) are characterised as DS-1 and the ACEC Class as AC-1 (in accordance with BRE Special Digest 1 (2005)). This equates to a DC-1 classification and as such in accordance with BS 8500 GEN1 or RC25/30 concrete would be suitable for unreinforced and reinforced concrete.

9.0 Phase II Conceptual Model

The preceding information has been used to revise the conceptual model.

9.1 Human Health Risks

The chemical analysis has identified no exceedances of any determinants when compared against the relevant Patrick Parsons GAC for a residential end-use without homegrown produce and as such, the soils beneath the site do not pose a risk to human health.

Based on the results of the ground gas monitoring to date, the site would classify as Characteristic Situation 1 (CS1) in accordance with BS 8485:2015+A1:2019. However, gas protection measures should be allowed for the future development, subject to the completion of the ground gas monitoring programme and the final gas risk assessment report.

9.2 Controlled Waters Risk

Whilst Made Ground was encountered across the site, no gross contamination has been identified at the site following chemical analysis and as such there is no source of contamination in the source-pathway-receptor model and it is therefore considered that there is a negligible risk to controlled waters.

9.3 Conceptual Site Model

An updated assessment of relevant PCLs and associated risk ratings has been completed and a summary is provided in the Table on the next page.

Source	Pathway	Receptor	Consequence	Probability	Risk Assessment and Justification
On-site sources – No sources of on-site contamination.	Dermal contact, inhalation and ingestion of contaminants in soil and soil derived dust	Future site user/worker	Mild	Unlikely	Very Low Risk – No sources of contamination encountered on-site. Topsoil, Made Ground and natural soils can be reused on-site.
		Site construction worker	Mild	Unlikely	Very Low Risk - Construction workers have a shorter exposure period and risks shall be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015.
	Inhalation of volatile soil vapours and ground gas	Future site user/worker	Medium	Low-Likelihood	Moderate / Low Risk – Characteristic Situation 1, may require increasing to CS2 due to the presence of Carbon Dioxide above 5% v/v during the initial visits of the monitoring programme. Confirmation of the mitigation measures will be outlined in the final gas risk assessment on completion of the monitoring programme.
		Site construction worker			
	Leaching of contaminants from soil and vertical migration into groundwater	Groundwater within superficial deposits	Mild	Unlikely	Very Low Risk: No contamination encountered on-site during site works.
		Groundwater within bedrock geology		Unlikely	Very Low Risk – No contamination encountered on-site during site works.
	Permeation through water pipes of shallow contamination.	Future site user/worker	Mild	Unlikely	Very Low Risk – No contamination encountered on-site during site works.

Asbestos has been removed from the Phase II conceptual site model as no asbestos was encountered in any of the samples analysed and there was no visual evidence of any suspected ACM containing fly tipped materials. However, a watching brief should be undertaken by the groundworkers during the enabling works and any site strip.

10.0 Remediation and Validation

10.1 Protection of End-Users

The chemical analysis has identified no exceedances within all soil samples tested when compared to the GACs for a residential end-use without homegrown produce. As such, it is considered that no remediation with respect to the risk from soil contamination to human-health is required.

10.1 Imported Material

Limited topsoil was encountered as part of the ground investigation. Should additional topsoil be required for any areas of proposed soft landscaping and communal garden areas, this will need to be imported. Imported topsoil will need to be chemically validated to ensure it is suitable for use on a residential development. All imported soils should be chemically validated at the rates shown in the table below:

Source and Validation Rate	Chemical Analysis Suite		
	General Soil Suite	Asbestos	Hydrocarbons (TPHCWG)
Greenfield Source 1 per 150m ³	✓		
Brownfield Source 1 per 100m ³	✓	✓	✓
Generated Soil 1 per 50m ³	✓	✓	✓

The results of the chemical validation should be compared to the GACs for a residential without plant uptake end-use as included in Appendix F and should comply with BS3882 specification for topsoil.

10.2 Human Health - Ground Gas

Based on the results of the preliminary ground gas monitoring the site has been classified as Characteristic Situation 1 (CS1) in accordance with BS8485:2015. Gas protection measures in line with Characteristic Situation 2 (CS2) may be required for the development subject to completion of the monitoring programme. There is no requirement for radon precautions.

A separate addendum gas risk assessment be undertaken to confirm these recommendations following completion of the recommended monitoring programme.

If gas precaution measures are required in line with CS2, in accordance with BS8485, a Retirement living complex residential end use classifies as a Type B Building. For Type B buildings in CS2 gas conditions, a gas protection point score of 3.5 must be achieved, this can be achieved by a range of measures as described in Section 7 of the standard. An example is provided below:

CS2 Conditions		
Gas Protection Element		Score
Table 5	Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations* * To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in	1.5
Table 6	Passive sub floor dispersal layer	2.5
Table 7	Gas resistant membrane	2

	Total	3.5
--	--------------	------------

The gas membrane selected should be resistant to carbon dioxide and methane. To achieve the 2 points assigned to the membrane in BS8485 the installed gas protection measures will need validated in accordance with CIRIA C735. As outlined in Annex 1 of C735 where membranes are installed by a groundworker they will need to be visually validated by an independent 3rd party to ensure it has been correctly installed to a high standard. The visual inspection will include, but not be limited to, the following checks:

- Visual inspection to check for presence of tears and holes in the membrane.
- Inspection of service entries to make sure a full seal has been achieved.
- Checking of joints to ensure correct tape and minimum overlap has been achieved.
- Checking of air bricks to ensure underfloor venting has been provided.

The local authority may require minimum qualifications of the installing personnel.

Photographic evidence should be collected during the validation process.

A validation letter report will be produced following the satisfactory installation of the gas protection membrane and will include a photographic record.

Radon precautions are not required.

The above recommendations are subject to completion of the gas monitoring and approval of the Local Authority.

10.3 Protection of Construction Workers

Specific remediation to protect construction workers is not required. However, during future construction works on site, risks associated with soils must be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations, 2015. In accordance with CDM, potential risks to human health and the environment from construction activities shall be appropriately identified and all necessary steps are taken to eliminate/manage that risk with the use of appropriate risk assessments and safe systems of work, including using suitable personal protective equipment (PPE) in line with the ground workers risk assessment.

10.4 Protection of Controlled Waters

The site is not considered to pose a risk to controlled waters and thus no remediation is required.

10.5 Protection of Construction Materials

Specific remediation to protect construction materials should not be required, PVC / Barrier pipe not PE water pipes will be required, subject to approval from the utility provider. In accordance with BS 8500:2016 GEN1 concrete would be suitable required or RC25/30 if reinforced.

10.6 Waste Disposal Classification

The results of the chemical analysis have been subject to an online Hazwaste Assessment. The online Hazwaste assessment has confirmed that out of a total of eight samples that underwent chemical analysis, six have been classified as non-hazardous.

The samples taken from WS06 at 0.40m begl and WS10 at 0.30m begl was classified as hazardous waste due to HP3 – Flammable, HP7 – Carcinogenic and HP11 - Mutagenic. As such, should any material in the vicinity of WS06 and WS10 require removal from site, it may require disposal as hazardous waste. Please refer to the exploratory hole location plan (Appendix B) for an approximate location of the soils which are classified as hazardous waste. All other locations may be suitable for disposal as non-hazardous or inert waste subject to confirmation by the receiving landfill site. Further testing / assessment of the soils in this location would be prudent to delineate the area to reduce volume requiring disposal as hazardous waste.

The full Hazwaste assessment can be found in Appendix D

10.7 Unrecorded or Unexpected Contamination

During future site redevelopment, groundworkers should remain vigilant for previously unrecorded or unexpected visual and/or olfactory evidence of contamination, or ground conditions which appear inconsistent with those identified during the ground investigation completed by PP.

Examples of contamination may include, but may not be limited to blue billy, oil-stained soils, free phase oily liquid within soils, buried waste materials, fibrous materials, strong odours or marked variation in soil colour and should any unexpected ground conditions be encountered during construction, the following procedures should be adopted:

- All works in the area should be ceased and cordoned off;
- Patrick Parsons or similar geo-environmental consultant should attend site to inspect the area and if necessary collect samples for chemical analysis;
- If the inspection and/or chemical testing confirm the presence of additional contamination, the results will be shared with the LA EHO and any changes to the remedial strategy agreed. No works in the area will be undertaken to agreement has been reached;
- If the inspection and/or chemical testing confirm that no additional contamination is present, then works can proceed with no alteration to the remedial strategy.

11.0 Geotechnical Appraisal

11.1 Introduction

It is understood that the site is to be developed to provide a four-storey retirement living complex comprising 53no. one and two-bedroom apartments, parking spaces and areas of soft landscaping.

11.2 Excavation Conditions

Shallow excavations in the soils encountered during the ground investigation should be easily achieved using conventional hydraulic equipment. Trench support may be required due to the presence of granular strata encountered at the site, however, inspection pits remained stable during excavation, and battering back of temporary excavations should be undertaken, if required, in accordance with CIRIA Report 97 Trenching Practice (2nd Edition, 2001). Person entry into unsupported excavations should be prohibited.

Groundwater was encountered during the site investigation, sump pumping techniques should be adequate to control any ingress. Foundations should be constructed as soon as possible after excavation to reduce loosening of the formation horizon.

11.3 Foundations

Based on development proposals it is considered that a traditional foundation solution will unlikely be feasible due to the presence of significant thicknesses of Made Ground soils and variable low density natural granular soils requiring deepening of excavation, and the potential for excavation overbreak beyond what is considered to be economically viable.

The ground conditions are considered potentially suitable for a scheme of vibro ground improvement techniques through the Made Ground and low-density superficial sand deposits. Following vibro ground improvement then a reinforced stirp / pad foundation or raft foundation may be adopted subject to confirmation of the achievable bearing capacity by a specialist ground improvement contractor.

Should an increased bearing capacity be required for the proposed build in excess of that which can be achieved with vibro ground improvement techniques then a piled foundation solution bearing within the Sandstone of the Chester Formation encountered below 4.00m begl will likely provide higher allowable bearing pressures subject to confirmation following detailed pile design.

The near surface soils are recorded to be non-plastic, however cohesive soils are recorded at depth. The volume change potential of the cohesive natural soils has been recorded as low. Cohesive soils are recorded to be at a depth where tree influence is unlikely to effect any proposed structures.

11.4 New Access Roads and Car Parking

The proposed development includes parking areas and access roads. Laboratory CBR testing has been carried out from a bulk sample collected from WS01 and WS11 in locations of proposed access roads and car parking. The results are tabulated on the table below.

Location	Depth (m)	Result (%)
WS01	0.30-0.70	40
WS11	0.20-0.60	66

The CBR values of 40% and 66% are unlikely to be achievable across the site, therefore it is recommended that a CBR design value of 5% should be used, subject to in-situ testing.

11.5 Falling Head Test.

Falling head tests were undertaken at two locations across the site within the window sample boreholes. The falling head tests returned the following indicative infiltration rates shown in the table below:

Falling Head Test Location	Test 1
WS08	1.19×10^{-4}
WS11	8.74×10^{-6}

Based on the above results, it is considered that soakaway drainage may be viable for the proposed development. Should soakaway drainage be included within the detailed drainage design then in situ infiltration testing in full accordance with BRE365 should be undertaken at the proposed soakaway locations.

11.6 Slope Stability

Based on the current site gradients it is considered are unlikely that the site will present any slope stability issues.

11.7 Retaining Structures

Given the existing topography in the areas of proposed development it is considered that no significant retaining structures are likely to be required. Should retaining structures be required they should be designed by a suitably qualified structural engineer.

12.0 Further Investigation

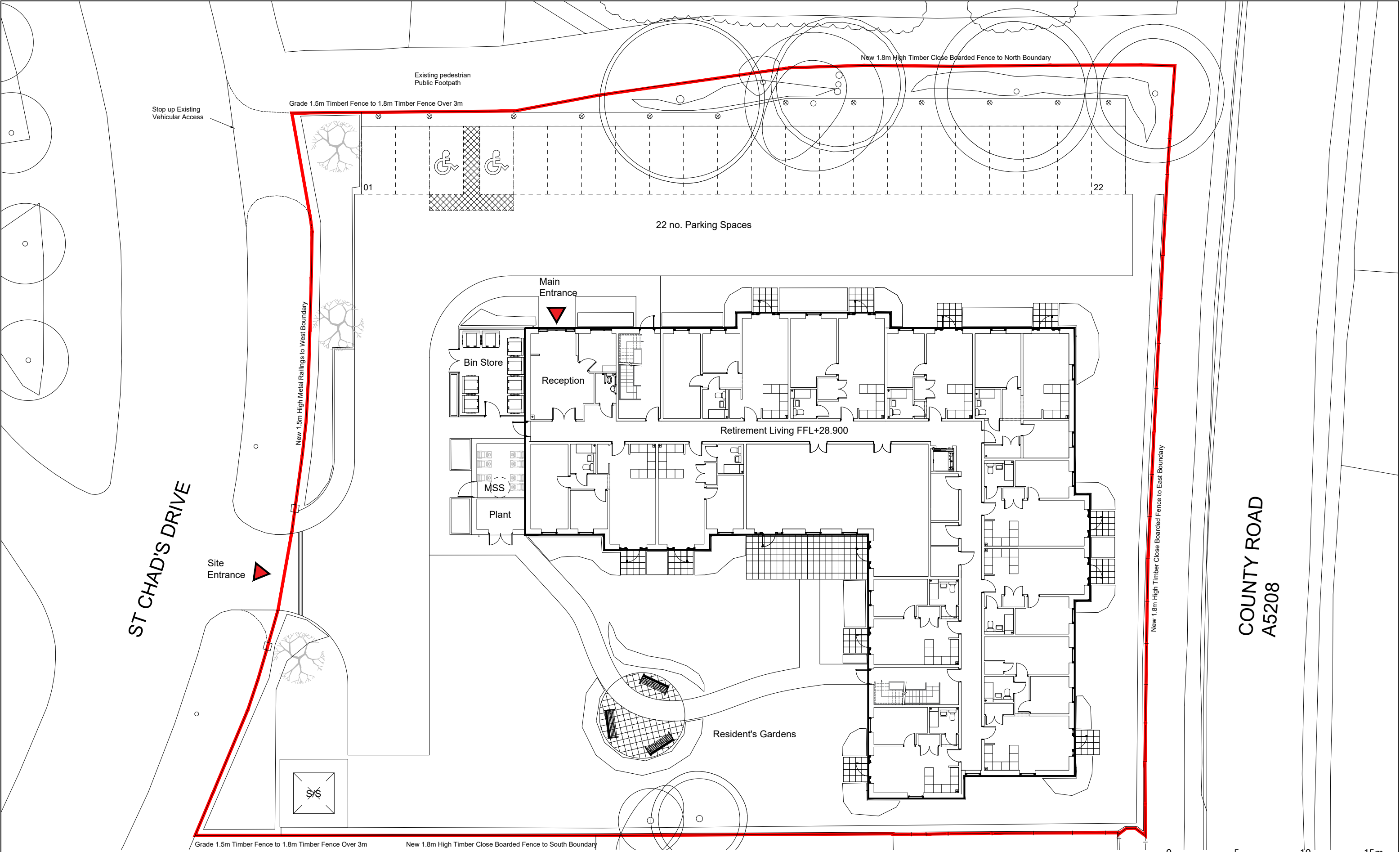
Based on the ground conditions encountered in the site investigation it is considered that following further works are required:

- The ground gas monitoring programme should be completed, and a final gas risk assessment undertaken.
- In situ infiltration testing should be undertaken in accordance with BRE365 to confirm infiltration rates for detailed design should soakaways be included in the drainage strategy.
- Additional works may be requested by the vibro ground improvement contractor to check the viability of the site for this methodology, which may include trial pits to view the soils in exposure.
- Additional deeper borehole information may be required by the warranty provider if a piled foundation solution is adopted.
- Delineation of the extent of the identified hazardous soils would be prudent to minimise volume required to be disposed of as hazardous waste.

Following review of this report a copy of it should be submitted to the Local Authority planning department prior to any development works as this is often a condition of planning.

Appendix A

Figures



1002
01

Proposed Site Plan
Scale 1:250

- Notes:
- All drawings are subject to Planning and Building Control consent.
 - The details shown are for design intent purposes only and are subject to further design development with suppliers and sub-contractors
 - Proposals subject to consultation and approval from Local Authority Building Control or an Approved Inspector
 - All setting out dimensions should be checked on-site prior to construction and any discrepancies and/or omissions should be reported to the Architect immediately



Rev. Date Details

Drawn Chkd

Rev. Date Details

Drawn Chkd

Drawn By: MP
Date: 17.11.23
Checked By: MA
Date: 17.11.23
Project No: 23046
Scale: 1:250 @A3
Dwg No: 1002
Rev: P1

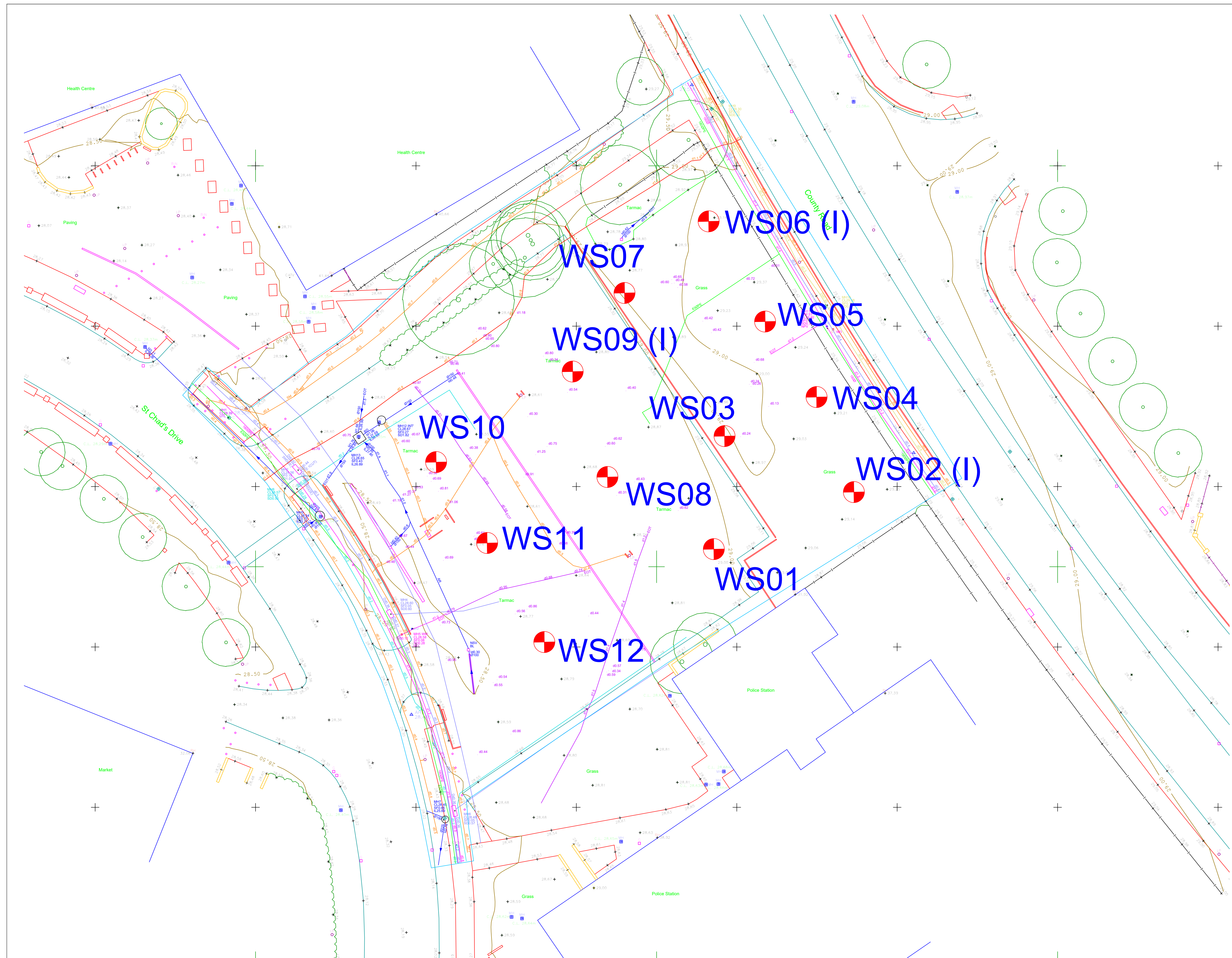
Issued for: **PLANNING ISSUE**
Project/Client: Project Evolve RL Scheme, St Chad's Drive
Drawing: Proposed Site Plan
Kirkby, McCarthy Stone

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Appendix B

Exploratory Hole Location Plan and Logs



GENERAL NOTES

1.1. THIS DRAWING IS COPYRIGHT AND SHOULD NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN CONSENT OF PATRICK PARSONS LTD.

1.2. DO NOT SCALE FROM THIS DRAWING.

Rev.	Amendments	Date	Drg	Chk
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Revisions



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Client
McCarthy Stone

Project
11751 - St Chad's Drive, Kirkby

Drawing

Exploratory Hole Location Plan

Scales	NTS	At original size	A1
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Date	01/11/2023	Drawn by PGS	Checked by NAM
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Status **Draft**

Drawing No. SCK-PPC-00-XX-DR-G-704 Rev. 0

Borehole Log

Borehole No.

WS01

Sheet 1 of 1

Project Name: St Chads Drive, Kirkby

Project No.
11751

Co-ords: 341459E - 398756N

Hole Type
WS

Location: Liverpool

Level:

Scale
1:25

Client: McCarthy and Stone

Dates: 25/10/2023

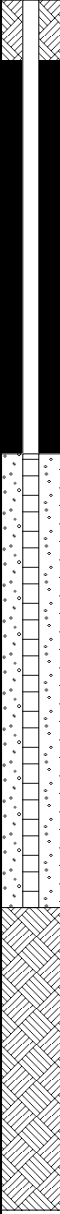
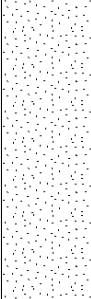
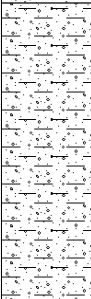
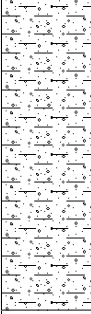
Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			MADE GROUND: Dark grey tarmac.	
		0.30 - 0.70	B					MADE GROUND: Light brown slightly silty gravelly fine to coarse sand with a low cobble content. Gravel is subangular to subrounded fine to coarse sandstone, brick, mudstone, concrete and limestone. Cobbles are subrounded concrete.	
		0.50	ES					At 0.20m, geotextile.	
					1.10				1
		1.20	SPT	N=7 (1,1/1,2,2,2)				Loose light brown fine to coarse SAND with occasional pockets of dark brown sandy silt.	
		1.50	ES						
		2.00	SPT	N=11 (1,1/2,2,3,4)				At 2.00m, medium dense.	2
					2.10			Firm dark reddish brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sandstone and mudstone.	
		2.50		HVP=52				Below 2.60m, slightly sandy, gravelly.	
		3.00	SPT	N=8 (4,3/2,2,2,2)				Below 2.90m, stiff.	3
					3.20			Firm dark reddish brown sandy CLAY.	
					3.80			Very weak light reddish brown SANDSTONE recovered as gravelly sand.	
		4.00	SPT	50 (6,10/50 for 75mm)	4.00			End of Borehole at 4.00m	4
									5

Remarks

1) Location CAT scanned prior to breaking out and hand dug pit to 1.20m. 2) Groundwater was not encountered. 3) Borehole backfilled with arisings between 0.20m-4.00m and cold lay tarmac between ground level and 0.20m.

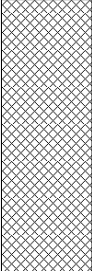
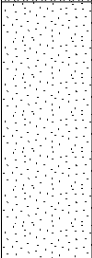
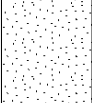
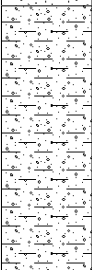
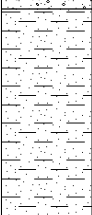
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Project Name: St Chads Drive, Kirkby				Project No. 11751		Co-ords: 341474E - 398762N		Hole Type WS	
Location: Liverpool				Level:		Scale 1:25		Logged By	
Client: McCarthy and Stone				Dates: 25/10/2023					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.20		GRASS OVER TOPSOIL: Dark brown gravelly silty fine to coarse sand with frequent rootlets. Gravel is subangular to subrounded fine to medium brick, mudstone and quartzite.		
		0.40	ES				MADE GROUND: Light brown slightly clayey gravelly fine to coarse sand with medium cobble content. Gravel is subangular to subrounded fine to coarse sandstone, mudstone, brick, concrete. Cobbles are subangular to subrounded concrete and bricks.		
		0.90	ES		1.00		Medium dense dark orangish brown fine to coarse SAND.		
		1.00	SPT	N=12 (3,4/3,3,3,3)			At 1.00m, concrete cobble obstruction.		
		1.20	D						
		1.20	ES			Below 1.50m, light brown.			
		1.90	ES		2.00		Stiff dark brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse mudstone and sandstone.		
		2.00	SPT	N=11 (1,1/2,2,3,4)			Below 2.80m, slightly sandy.		
		2.20		HVP=38					
		2.80		HVP=58	3.00		Below 3.00m, very stiff, occasional bands of reddish brown fine to coarse sand.		
	3.00	SPT	N=17 (3,4/3,4,5,5)						
	4.00	SPT	50 (4,4/50 for 225mm)	4.00	End of Borehole at 4.00m				

Remarks
 1) Location CAT scanned prior to hand dug pit to 1.20m. 2) Groundwater was not encountered. 3) Borehole installed with a monitoring well.



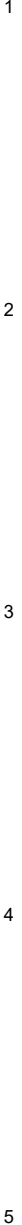
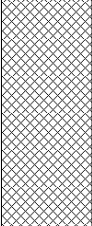
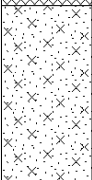
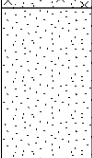
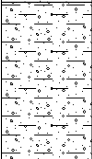
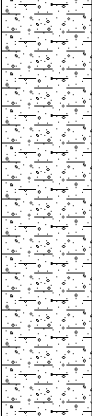
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Project Name: St Chads Drive, Kirkby				Project No. 11751		Co-ords: 341462E - 398765N		Hole Type WS	
Location: Liverpool				Level:		Scale 1:25		Logged By	
Client: McCarthy and Stone				Dates: 25/10/2023					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.20			GRASS OVER TOPSOIL: Dark brown gravelly silty fine to coarse sand with frequent rootlets. Gravel is subangular to subrounded fine to medium brick, ceramic, mudstone and quartzite.		
		0.60	ES					MADE GROUND: Dark blackish brown silty gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse coal, mudstone, quartzite and tarmac.		
		1.20	D ES SPT	N=10 (2,2/2,3,3,2)	1.10			Light brown mottled dark brown fine to coarse SAND. <i>Below 1.20m medium dense.</i>		
		1.20								
		1.20								
				2.00	SPT	N=6 (2,2/1,1,2,2)				At 2.00m, loose.
				2.30						
				2.50		HVP=25				Soft dark brown sandy slightly gravelly CLAY. Gravel subrounded to rounded fine mudstone.
										Between 2.60m - 2.70m, band of orangish brown fine to coarse sand.
				3.00	SPT	N=10 (1,1/2,2,3,3)				Below 3.00m, stiff
					3.20			Firm dark brown sandy CLAY.		
					3.90			Light reddish brown SANDSTONE recovered as fine to coarse sand		
		4.00	SPT	50 (10,15/50 for 75mm)	4.00			End of Borehole at 4.00m		

Remarks
 1) Location CAT scanned prior to hand dug pit to 1.20m. 2) Groundwater was not encountered. 3) Borehole backfilled with arisings.



				Borehole Log				Borehole No. WS04 Sheet 1 of 1	
Project Name: St Chads Drive, Kirkby				Project No. 11751		Co-ords: 341471E - 398768N		Hole Type WS	
Location: Liverpool				Level:		Scale 1:25		Logged By	
Client: McCarthy and Stone				Dates: 25/10/2023					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.20		 GRASS OVER TOPSOIL: Dark brown gravelly silty fine to coarse sand with frequent rootlets. Gravel is subangular to subrounded fine to medium brick, ceramic, mudstone and quartzite.		
		1.00	SPT	N=7 (1,2/2,1,2,2)	1.00				 MADE GROUND: Dark brown mottled light grey silty gravelly fine to coarse sand with a medium cobble content. Gravel is subangular to subrounded fine to coarse sandstone, mudstone, brick, clinker and ceramic. Cobbles are subrounded bricks and concrete.
		1.30	D				 Loose black silty fine to medium SAND. At 1.00m, concrete cobble obstruction.		
		1.30	ES						
					1.60		 Light brown fine to medium SAND. At 2.00m, medium dense.		
		2.00	SPT	N=14 (1,2/3,3,4,4)	2.10				
		2.30		HVP=59			 Firm dark brown sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium mudstone and sandstone. Below 2.20m, slightly sandy.		
		2.60		HVP=82					
		3.00	SPT	N=24 (5,5/5,6,6,7)			 At 3.00m, very stiff. Between 3.00m-4.00m, no recovery.		
		4.00	SPT	50 (25 for 75mm/50 for 75mm)	4.00				
					End of Borehole at 4.00m		4		
							5		

Remarks
 1) Location CAT scanned prior to hand dug pit to 1.20m. 2) Groundwater was not encountered. 3) Borehole backfilled with arisings.





Borehole Log

Borehole No.

WS06

Sheet 1 of 1

Project Name: St Chads Drive, Kirkby

Project No.
11751

Co-ords: 341453E - 398795N

Hole Type
WS

Location: Liverpool

Level:

Scale
1:25

Client: McCarthy and Stone

Dates: 25/10/2023

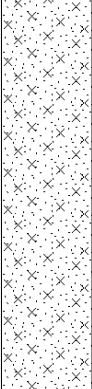
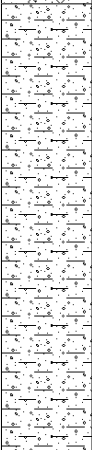
Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20			GRASS OVER TOPSOIL: Dark brown gravelly silty fine to coarse sand with frequent rootlets. Gravel is subangular to subrounded fine to medium brick, ceramic, mudstone and quartzite.	
		0.40 0.40	D ES		0.60			MADE GROUND: Dark grey slightly silty gravelly fine to coarse sand with a low cobble content. Gravel is subangular to subrounded fine to coarse concrete, brick, ceramic, tarmac and limestone. Cobbles are subrounded concrete.	
		0.90 0.90	D ES					Dark orangish brown fine to coarse SAND.	1
		1.20	SPT	N=11 (2,2/2,3,3,3)				<i>Below 1.20m, medium dense.</i> <i>Below 1.30m, light brown.</i>	
		2.00	SPT	N=15 (2,2/3,3,4,5)					2
		2.50 2.50	D	HVP=52	2.40			Firm dark brown slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse sandstone and mudstone.	
		2.90 3.00	SPT	HVP=84 N=20 (4,4/5,5,5,5)				<i>Below 2.80m, stiff.</i> <i>Between 3.00m-3.20m, dark brown fine to coarse sand.</i>	3
		4.00	SPT	50 (25 for 110mm/50 for 75mm)	3.90 4.00			Very weak dark reddish brown SANDSTONE recovered as clayey gravelly fine to coarse sand. End of Borehole at 4.00m	4
									5

Remarks

1) Location CAT scanned prior to hand dug pit to 1.20m. 2) Groundwater was encountered at 4.00m, slow rise to 3.84m. 3) Borehole installed with monitoring well.

				Borehole Log				Borehole No. WS07 Sheet 1 of 1	
Project Name: St Chads Drive, Kirkby				Project No. 11751		Co-ords: 341445E - 398788N		Hole Type WS	
Location: Liverpool				Level:		Scale 1:25		Logged By	
Client: McCarthy and Stone				Dates: 25/10/2023					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	D ES		0.20		 GRASS OVER TOPSOIL: Dark brown gravelly silty fine to coarse sand with frequent rootlets. Gravel is subangular to subrounded fine to medium brick, ceramic, mudstone and quartzite.		
		0.30							
		0.90	ES		1.00		 Dark greyish black silty fine to medium SAND. <i>Below 1.20m, medium dense.</i>	1	
		1.20	SPT	N=12 (3,3/3,3,3,3)					
		1.60	ES		2.30	 Firm dark reddish brown slightly sandy slightly gravelly CLAY. Gravel subangular to subrounded fine to coarse mudstone.			
		1.70	D						
		2.00	SPT	N=12 (1,2/2,3,3,4)			2		
		2.50	D	HVP=34	2.60				
		3.00							
		3.00	D SPT	N=16 (3,4/4,4,4,4)		 <i>Below 3.00m, very stiff.</i>	3		
3.70		HVP=40							
4.00	SPT	50 (25 for 75mm/50 for 150mm)	4.00	 Very weak light reddish brown SANDSTONE recovered as gravelly sand.	4				
End of Borehole at 4.00m								5	

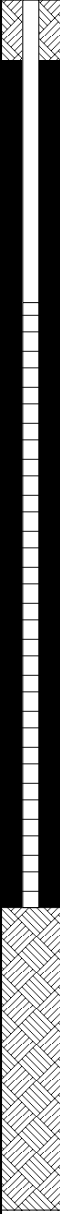
Remarks

1) Location CAT scanned prior to hand dug pit to 1.20m. 2) Groundwater was encountered at 3.00m, no rise. 3) Borehole backfilled with arisings between 0.20m and 4.00m and cold lay tarmac between ground level and 0.20m.



					Borehole Log			Borehole No. WS08 Sheet 1 of 1		
Project Name: St Chads Drive, Kirkby					Project No. 11751		Co-ords: 341441E - 398768N		Hole Type WS	
Location: Liverpool					Level:			Scale 1:25		
Client: McCarthy and Stone					Dates: 26/10/2023			Logged By		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.15	D	N=7 (1,2/2,2,1,2)	0.10			MADE GROUND: Dark grey tarmac.	1	
		0.15	ES		0.20			MADE GROUND: Dark grey sandy gravel. Gravel is subangular to subrounded fine to coarse limestone, sandstone, clinker and dolomite.		
								Dark orangish brown slightly silty fine to medium SAND.		
								At 0.20m, geotextile.		
		0.60	D							
		0.60	ES		0.70					
		0.80	D							
		0.80	ES		0.90					
		1.10	D							
		1.10	ES							
1.20	SPT						Firm dark reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse mudstone.	2		
2.00	SPT	N=12 (1,2/3,3,3,3)					Below 2.00m, stiff.			
2.30	D									
					3.00			End of Borehole at 3.00m	3	
									4	
									5	
Remarks										
1) Location CAT scanned prior to breaking out and hand dug pit to 1.20m. 2) Groundwater was not encountered. 3) Borehole backfilled with arisings between 0.20m and 4.00m and cold lay tarmac between ground level and 0.20m. 4) Falling head test carried at the base of the borehole.										

				Borehole Log				Borehole No. WS09 Sheet 1 of 1	
Project Name: St Chads Drive, Kirkby				Project No. 11751		Co-ords: 341442E - 398781N		Hole Type WS	
Location: Liverpool				Level:		Scale 1:25		Logged By	
Client: McCarthy and Stone				Dates: 26/10/2023					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15 0.15	D ES		0.10 0.20		MADE GROUND: Dark grey tarmac. MADE GROUND: Light grey sandy gravel. Gravel is subangular to subrounded fine to coarse dolomite, clinker, concrete and brick. MADE GROUND: Dark grey gravelly sand. Gravel is subangular to subrounded fine to coarse sandstone, clinker and limestone. At 0.20m, geotextile.		
		0.60 0.60	D ES		0.80		Dark orangish brown slightly silty fine to medium SAND.	1	
		1.00	D						
		1.20	SPT	N=8 (1,2/2,2,2,2)	1.20		Loose light yellowish brown fine to medium SAND.		
		1.40	D						
		2.00	SPT	N=15 (2,2/3,3,4,5)			Below 2.00m, medium dense.	2	
		2.60		HVP=46	2.40		Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse mudstone.		
		3.00	SPT	N=11 (2,2/2,3,3,3)			Below 3.00m, stiff.	3	
							Between 3.30m-3.70m, soft, very sandy.		
					3.70		Very weak dark reddish brown SANDSTONE recovered as gravelly sand.		
		4.00	SPT	50 (25 for 75mm/50 for 75mm)	4.00		End of Borehole at 4.00m	4	
								5	

Remarks

1) Location CAT scanned prior to breaking out and hand dug pit to 1.20m. 2) Groundwater was not encountered. 3) Borehole installed with monitoring well.





				Borehole Log				Borehole No. WS11 Sheet 1 of 1	
Project Name: St Chads Drive, Kirkby				Project No. 11751		Co-ords: 341430E - 398759N		Hole Type WS	
Location: Liverpool				Level:		Scale 1:25		Logged By	
Client: McCarthy and Stone				Dates: 26/10/2023					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.60	B		0.10		MADE GROUND: Dark grey tarmac		
		0.40 0.40	D ES				MADE GROUND: Dark grey slightly silty sandy gravel with a medium cobble content. Gravel is subangular to subrounded fine to coarse limestone, sandstone, quartzite, concrete and brick. Cobbles are subangular to subrounded bricks and concrete. <i>At 0.20m, geotextile.</i>		
							<i>At 0.75m, concrete obstruction.</i>		
		1.00	SPT	N=23 (5,5/6,6,6,5)			<i>At 1.00m, medium dense.</i>	1	
					1.20		Light brown fine to medium SAND.		
					1.70		Stiff dark reddish brown slightly sandy CLAY.		
					2.00		End of Borehole at 2.00m	2	
								3	
								4	
								5	

Remarks

1) Location CAT scanned prior to hand dug pit to 1.20m. 2) Groundwater was not encountered. 3) Borehole backfilled with arisings between 0.20m and 4.00m and cold lay tarmac between ground level and 0.20m. 4) Falling head test carried at the base of the borehole.





Appendix C

Laboratory Test Results

**Zara Chand**

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e: reception@i2analytical.com

e: Patrick Parsons

Analytical Report Number : 23-65803

Project / Site name:	St Chads Drive	Samples received on:	27/10/2023
Your job number:	11751	Samples instructed on/ Analysis started on:	31/10/2023
Your order number:	2519	Analysis completed by:	08/11/2023
Report Issue Number:	1	Report issued on:	08/11/2023
Samples Analysed:	3 leachate samples - 8 soil 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

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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.

Analytical Report Number: 23-65803
Project / Site name: St Chads Drive
Your Order No: 2519

Lab Sample Number				2863042	2863044	2863045	2863046	2863047
Sample Reference				WS01	WS04	WS06	WS07	WS08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.30	0.40	0.30	1.10
Date Sampled				25/10/2023	25/10/2023	25/10/2023	25/10/2023	26/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.2	11	8.6	8.5	5.1
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.9	0.6	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	IZJ	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.7	9.7	8.5	8.1	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	%	0.005	MCERTS	0.115	0.154	0.102	0.027	< 0.005
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	180	300	56	52	17
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.091	0.15	0.0278	0.0262	0.0084
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	91	150	27.8	26.2	8.4
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.1	0.9	3	1.4	< 0.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.78	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.06	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.85	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.54	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.27	4	0.29	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.08	0.81	0.06	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.09	0.5	3.5	0.25	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.11	0.62	3.6	0.26	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.07	0.34	1.7	0.11	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.06	0.39	2.1	0.15	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.1	0.61	2	0.14	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.06	0.25	0.78	0.07	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.13	0.56	1.8	0.12	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.08	0.32	0.87	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.1	0.32	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.12	0.37	1.1	0.09	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	0.82	4.41	24.8	1.54	< 0.80
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Analytical Report Number: 23-65803
Project / Site name: St Chads Drive
Your Order No: 2519

Lab Sample Number				2863042	2863044	2863045	2863046	2863047
Sample Reference				WS01	WS04	WS06	WS07	WS08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.30	0.40	0.30	1.10
Date Sampled				25/10/2023	25/10/2023	25/10/2023	25/10/2023	26/10/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.9	7.6	25	5.1	< 1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.9	17	16	8.4	2.9
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	25	160	24	2.8
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	31	170	32	2
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.4	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.1	17	23	9.5	2.5
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	36	69	140	49	4.7

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	2.5	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	5.1	29	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	9.7	46	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	32	78	220	71	< 8.0
TPH-CWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	< 10	21	180	34	< 10
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	40	86	230	150	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	2.8	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10	15	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	14	28	220	19	< 10
TPH-CWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	< 10	14	230	21	< 10
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	15	31	240	27	< 10
TPH Total C5 - C40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	70	150	880	230	< 10

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

Analytical Report Number: 23-65803
Project / Site name: St Chads Drive
Your Order No: 2519

Lab Sample Number				2863048	2863049
Sample Reference				WS10	WS11
Sample Number				None Supplied	None Supplied
Depth (m)				0.30	0.40
Date Sampled				26/10/2023	26/10/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	40	19
Moisture Content	%	0.01	NONE	7.6	7.3
Total mass of sample received	kg	0.001	NONE	1	1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.3	9.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.028	0.061
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	95	170
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0473	0.0867
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	47.3	86.7
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.3	0.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.28	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.08	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.16	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.11	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.29	0.17
Anthracene	mg/kg	0.05	MCERTS	0.13	0.09
Fluoranthene	mg/kg	0.05	MCERTS	0.33	0.3
Pyrene	mg/kg	0.05	MCERTS	0.35	0.26
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.15	0.11
Chrysene	mg/kg	0.05	MCERTS	0.28	0.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.23	0.11
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.16	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.2	0.09
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.2	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.29	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3.24	1.23
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Analytical Report Number: 23-65803
Project / Site name: St Chads Drive
Your Order No: 2519

Lab Sample Number				2863048	2863049
Sample Reference				WS10	WS11
Sample Number				None Supplied	None Supplied
Depth (m)				0.30	0.40
Date Sampled				26/10/2023	26/10/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.8	2.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	9.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	6.5
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	98
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	8.6
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	42

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.05	NONE	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	1.4	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	4.7	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	20	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	670	43
TPH-CWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	210	38
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	700	46

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.05	NONE	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	3.7	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	18	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	660	46
TPH-CWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	350	54
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	680	48
TPH Total C5 - C40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	1900	190

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



4041



Analytical Report Number: 23-65803

Project / Site name: St Chads Drive

Your Order No: 2519

Lab Sample Number				2863050	2863051	2863052
Sample Reference				WS01	WS07	WS10
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.30	0.30
Date Sampled				25/10/2023	25/10/2023	26/10/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	8.8	7.9	7.7
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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	NONE	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	3.4	3.2	2.3
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	2	2.5	1.7
Copper (dissolved)	µg/l	0.7	ISO 17025	11	18	12
Lead (dissolved)	µg/l	1	ISO 17025	1.4	3.7	1.3
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.5	1.9	2
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	12	16	12

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

Analytical Report Number : 23-65803

Project / Site name: St Chads Drive

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2863042	WS01	None Supplied	0.5	Brown sand with gravel and clinker
2863044	WS04	None Supplied	0.3	Brown sandy clay with gravel.
2863045	WS06	None Supplied	0.4	Brown sand with gravel.
2863046	WS07	None Supplied	0.3	Brown sand with gravel.
2863047	WS08	None Supplied	1.1	Brown sand.
2863048	WS10	None Supplied	0.3	Brown sand with gravel and stones.
2863049	WS11	None Supplied	0.4	Brown clay and sand with gravel and stones.

Analytical Report Number : 23-65803

Project / Site name: St Chads Drive

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

Analytical Report Number : 23-65803

Project / Site name: St Chads Drive

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser.	L080-PL	W	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

**Zara Chand**

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e: Patrick Parsons

Analytical Report Number : 23-65968

Project / Site name:	St Chads Drive	Samples received on:	27/10/2023
Your job number:	11751	Samples instructed on/ Analysis started on:	01/11/2023
Your order number:	2519	Analysis completed by:	08/11/2023
Report Issue Number:	1	Report issued on:	08/11/2023
Samples Analysed:	1 soil sample		

Izabela Wójcik
Signed:

Izabela Wójcik
Senior 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

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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.

Analytical Report Number: 23-65968
Project / Site name: St Chads Drive
Your Order No: 2519

Lab Sample Number				2863720
Sample Reference				WS02
Sample Number				None Supplied
Depth (m)				0.10
Date Sampled				25/10/2023
Time Taken				0900
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	15
Total mass of sample received	kg	0.001	NONE	0.7

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	WEM

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.162
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	200
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.1
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	100
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.07
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.16
Fluorene	mg/kg	0.05	MCERTS	0.12
Phenanthrene	mg/kg	0.05	MCERTS	1.5
Anthracene	mg/kg	0.05	MCERTS	0.34
Fluoranthene	mg/kg	0.05	MCERTS	2.6
Pyrene	mg/kg	0.05	MCERTS	2.6
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.4
Chrysene	mg/kg	0.05	MCERTS	1.5
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.9
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.78
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.86
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.2
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	16.8
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Analytical Report Number: 23-65968
Project / Site name: St Chads Drive
Your Order No: 2519

Lab Sample Number	2863720			
Sample Reference	WS02			
Sample Number	None Supplied			
Depth (m)	0.10			
Date Sampled	25/10/2023			
Time Taken	0900			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	43
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.05	NONE	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	60
TPH-CWG - Aliphatic >EC35 - EC40 _{EH_CU_1D_AL}	mg/kg	10	NONE	23
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	61

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.05	NONE	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	3.1
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	11
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	73
TPH-CWG - Aromatic >EC35 - EC40 _{EH_CU_1D_AR}	mg/kg	10	NONE	31
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	87
TPH Total C5 - C40 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	200

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

Analytical Report Number : 23-65968

Project / Site name: St Chads Drive

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2863720	WS02	None Supplied	0.1	Brown loam with gravel and vegetation.

Analytical Report Number : 23-65968

Project / Site name: St Chads Drive

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (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 soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser.	L080-PL	W	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 23-65968

Project / Site name: St Chads Drive

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

GEOLABS Limited
Unit D3 HRS Business Park
Granby Avenue
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B33 0SJ

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web: www.geolabs.co.uk

Patrick Parsons
40 St Pauls Square
Birmingham
B3 1FQ

17 November 2023

Report No : GEO/39196/01

Page 1 of 1

For the attention of Ms Z Chand

Our ref **GEO / 39196**
Your Ref **11751**

Date samples received 26/10/2023
Date written instructions received 31/10/2023
Date testing commenced 01/11/2023
Date of sample disposal 15/12/2023

Project **ST CHADS DRIVE, KIRKBY**

Further to your instructions we have pleasure in enclosing the results of the tests you requested in the attached figures.

LABORATORY TEST REPORT

Item No	Test Quantity	Description
1	~	Liquid & Plastic Limits Summary
~	2	Water Content
2	2	Liquid & Plastic Limits
3	~	Geochemical Test Summary
~	2	BRE SD1 Suite A - Natural ground
4	2	California Bearing Ratio

Any opinions or interpretations expressed herein are outside the scope of UKAS accreditation. All results contained in this report are provisional unless signed by an approved signatory. The results contained in this report relate only to samples received in the laboratory and are tested 'as received' unless otherwise stated. This report should not be reproduced, except in full, without the written approval of the laboratory. The results reported are applicable only to the test items received by the laboratory.

All the necessary data required by the documented test procedures has been recorded and will be stored for a period of not less than 6 years. This data will be issued to yourselves at your request. All samples will be disposed of after the date shown above. Written confirmation will be required to retain the samples beyond this period and a storage charge may be applied.

We trust that the above meets your requirements and should you require any further information or assistance, please do not hesitate to contact us.

Yours faithfully
on behalf of **GEOLABS Limited**



J A Reynolds
Director

Test Type:	1 - 1 point 80g / 30° fall cone method.	Sample condition:	1 - As Received 2 - Air Dried 3 - Washed & Air Dried
-------------------	---	--------------------------	--

J A Reynolds - Director ☐

**ST CHADS DRIVE, KIRKBY
11751**



LIQUID AND PLASTIC LIMITS

Location WS06
Depth (m) 2.50
Sample Type D

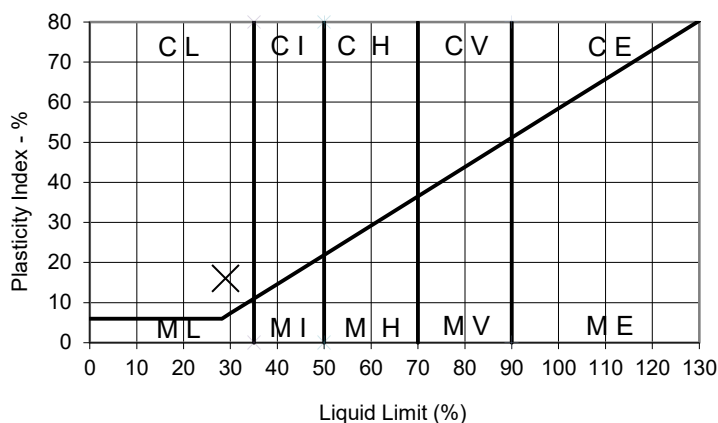
Description:

Brown very sandy CLAY with rare fine to medium gravel.

Preparation : Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014+A1:2022) 14.9 %
 Estimated percentage passing 425µm sieve : 95 %
 *Liquid Limit - Fall Cone 1 point Method (cone angle 30°) : 29 %
 Plastic Limit : 13 %
 Plasticity Index : 16 %

Equivalent Water Content of material passing 425µm sieve : 15.6 %
 Liquidity Index : 0.16

***One point liquid limit test readings**

Cone penetration 19.7 mm
 Water content 28.6 %
 One point method correlation factor : BS 1377-2 : 2022 : 5.3.2 1.004

Tested by AD
 Checked and Approved by

J A Reynolds

J A Reynolds - Director
 17/11/2023

Project Number:

GEO / 39196

Project Name:

**ST CHADS DRIVE, KIRKBY
 11751**

GEOLABS

LIQUID AND PLASTIC LIMITS

Location WS07
Depth (m) 3.00
Sample Type D

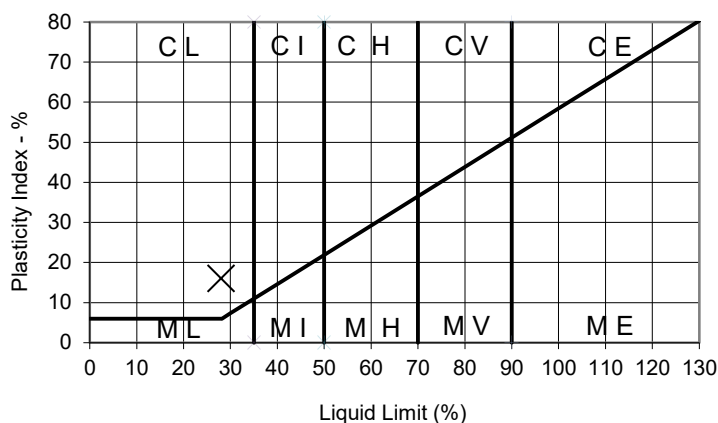
Description:

Brown sandy CLAY with rare fine to medium gravel.

Preparation : Sample as received with discrete coarse particles removed by hand.

Water Content : (BS EN ISO 17892-1:2014+A1:2022) 144 %
Estimated percentage passing 425µm sieve : 90 %
*Liquid Limit - Fall Cone 1 point Method (cone angle 30°) : 28 %
Plastic Limit : 12 %
Plasticity Index : 16 %

Equivalent Water Content of material passing 425µm sieve : 160 %
Liquidity Index : 9.25

***One point liquid limit test readings**

Cone penetration 19.7 mm
Water content 27.5 %
One point method correlation factor : BS 1377-2 : 2022 : 5.3.2 1.004

Tested by AD
Checked and Approved by

J A Reynolds

J A Reynolds - Director
17/11/2023

Project Number:

GEO / 39196

Project Name:

**ST CHADS DRIVE, KIRKBY
11751**

GEOLABS

Tested by Eurofins Chemtest Ltd : MCERTS / UKAS No 2183

GEOLABSPage 1 of 1
(Ref 1700237069)

CALIFORNIA BEARING RATIO

Location WS01
Depth (m) 0.30-0.70
Sample Type B

Description:

Brown SAND with much fine to coarse gravel.

Original sample contained >25% +20mm material.

PREPARATION DETAILS

The specimen was tested in an unsoaked condition.

The specimen was tested at the as received water content

The specimen was prepared by dynamic compaction using a 2.5 kg rammer

Prepared bulk density 2.17 Mg/m³

Prepared dry density 1.98 Mg/m³

44.7 % of the sample was retained on a 20mm sieve

Test Details

Surcharge
Seating load
Water content

Top

8.0 kg
50 N
10 %

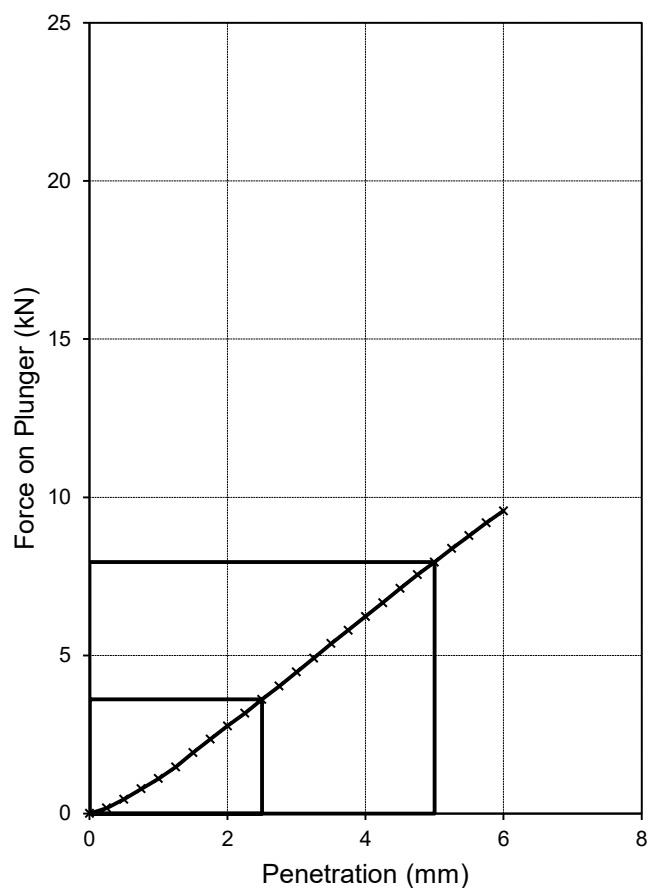
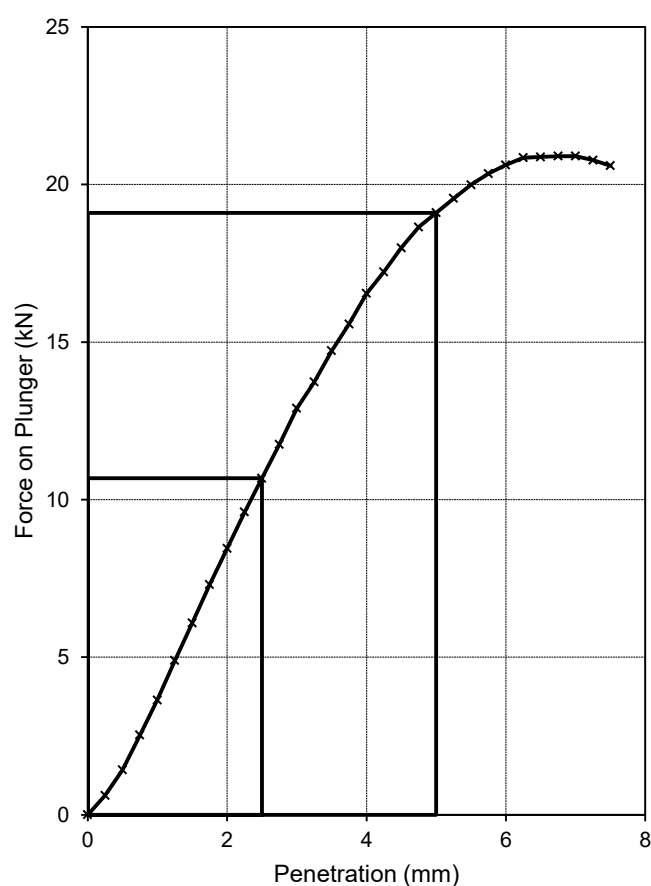
Base

8.0 kg
50 N
9.3 %

CBR Value

40 %

96 %

Top of Specimen**Base of Specimen**

Tested by DF
Checked and Approved by

J A Reynolds

J A Reynolds - Director
17/11/2023

Project Number:

GEO / 39196

Project Name:

**ST CHADS DRIVE, KIRKBY
11751**



CALIFORNIA BEARING RATIO

Location WS11
Depth (m) 0.20-0.60
Sample Type B

Description:

Brown SAND with much fine to coarse gravel.

PREPARATION DETAILS

The specimen was tested in an unsoaked condition.

The specimen was tested at the as received water content

The specimen was prepared by dynamic compaction using a 2.5 kg rammer

Prepared bulk density 2.44 Mg/m³

Prepared dry density 2.21 Mg/m³

21.7 % of the sample was retained on a 20mm sieve

Test Details

Surcharge
Seating load
Water content

Top

8.0 kg
50 N
10 %

Base

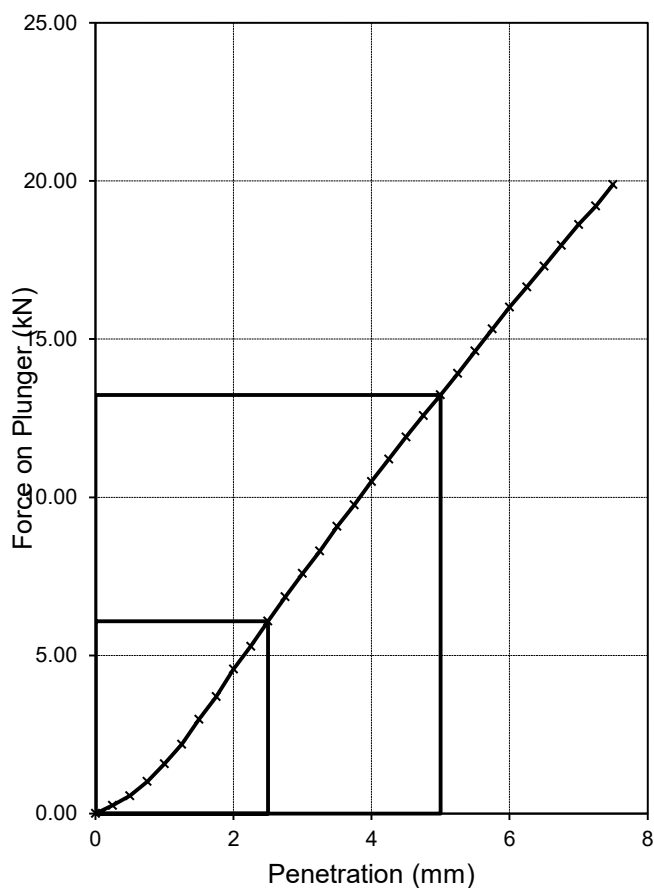
8.0 kg
50 N
10 %

CBR Value

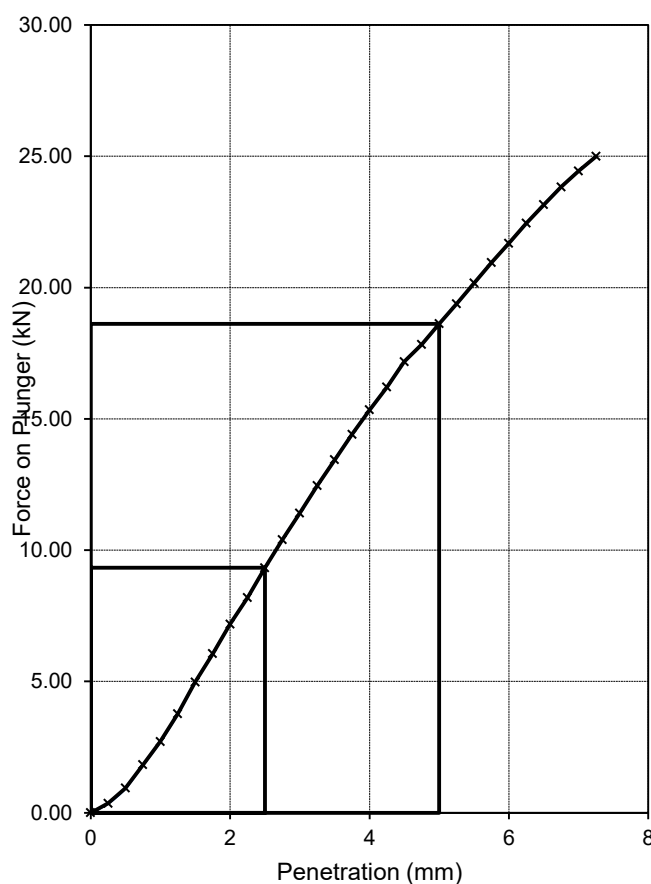
66 %

93 %

Top of Specimen



Base of Specimen



Tested by DF ☐
Checked and Approved by

J A Reynolds

J A Reynolds - Director ☐
17/11/2023

Project Number:

GEO / 39196

Project Name:

**ST CHADS DRIVE, KIRKBY
11751**

GEOLABS®



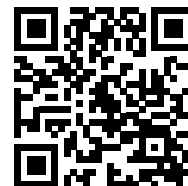
Appendix D

Online Hazwaste Results

Waste Classification Report

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

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



HL7EG-F1O8M-479F2

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

Job name

11751 - St Chads Drive, Kirkby

Description/Comments

Project

11751 - St Chads Drive, Kirkby

Site

11751 - St Chads Drive, Kirkby

Classified by

Name: **Hugh Adler**
 Date: **17 Nov 2023 16:40 GMT**
 Telephone: **0121 592 0000**
 Company: **PPCP Ltd t/a Patrick Parsons**
40 St Pauls Square
Birmingham
B3 1FQ

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

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

10 Feb 2022

Next 3 year Refresher due by Feb 2025

Purpose of classification

4 - Classification of Waste Products

Address of the waste

6 St Chad's Dr, Liverpool L32 8RH

Post Code L32 8RH

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Redevelopment of brownfield site to construct residential dwellings.

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

Waste created during the excavation of foundation runs and utility runs.

Description of the waste

Made ground and natural soils of silty gravelly sand with concrete, sandstone, red brick, mudstone and limestone or orangish brown fine to coarse sand.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01	0.50	Non Hazardous		3
2	WS04	0.30	Non Hazardous		5
3	WS06	0.40	Hazardous	HP 3(i), HP 7, HP 11	7
4	WS07	0.30	Non Hazardous		10
5	WS08	1.10	Non Hazardous		12
6	WS10	0.30	Hazardous	HP 3(i), HP 7, HP 11	14
7	WS11	0.40	Non Hazardous		17
8	WS02	0.10	Non Hazardous		19

Related documents

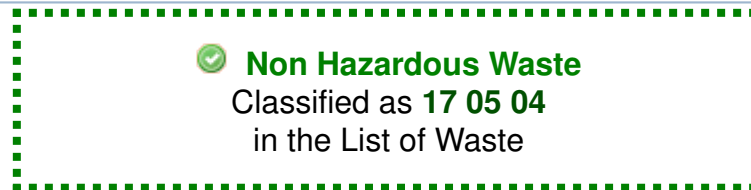
#	Name	Description
1	PP Standard Suite	waste stream template used to create this Job

Report

Created by: Hugh Adler

Created date: 17 Nov 2023 16:40 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	21
Appendix B: Rationale for selection of metal species	22
Appendix C: Version	22

Classification of sample: WS01

Sample details

Sample name:	LoW Code:
WS01	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
7.2%	
(no correction)	

Hazard properties

None identified

Determinands

Moisture content: 7.2% 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				9.7 pH		9.7 pH		9.7 pH		
2	arsenic { arsenic trioxide }				3.9 mg/kg	1.32	5.149 mg/kg		0.000515 %		
	033-003-00-0	215-481-4	1327-53-3								
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg		<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6								
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				8.9 mg/kg	1.462	13.008 mg/kg		0.0013 %		
		215-160-9	1308-38-9								
5	copper { copper sulphate pentahydrate }				13 mg/kg	3.929	51.078 mg/kg		0.00511 %		
	029-023-00-4	231-847-6	7758-99-8								
6	lead { lead chromate }			1	11 mg/kg	1.56	17.158 mg/kg		0.0011 %		
	082-004-00-2	231-846-0	7758-97-6								
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg		<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				7.1 mg/kg	2.976	21.131 mg/kg		0.00211 %		
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg		<0.000141 %		<LOD
	034-002-00-8										
10	zinc { zinc chromate }				36 mg/kg	2.774	99.869 mg/kg		0.00999 %		
	024-007-00-3	236-878-9	13530-65-9								
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg		<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	TPH (C6 to C40) petroleum group				110 mg/kg		110 mg/kg		0.011 %		
			TPH								
13	acenaphthene				<0.05 mg/kg		<0.05 mg/kg		<0.000005 %		<LOD
		201-469-6	83-32-9								
14	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg		<0.000005 %		<LOD
		205-917-1	208-96-8								
15	anthracene				<0.05 mg/kg		<0.05 mg/kg		<0.000005 %		<LOD
		204-371-1	120-12-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.07 mg/kg		0.07 mg/kg	0.000007 %		
17	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.13 mg/kg		0.13 mg/kg	0.000013 %		
18	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.1 mg/kg		0.1 mg/kg	0.00001 %		
19	benzo[ghi]perylene 205-883-8		191-24-2		0.12 mg/kg		0.12 mg/kg	0.000012 %		
20	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.06 mg/kg		0.06 mg/kg	0.000006 %		
21	chrysene 601-048-00-0	205-923-4	218-01-9		0.06 mg/kg		0.06 mg/kg	0.000006 %		
22	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluoranthene 205-912-4		206-44-0		0.09 mg/kg		0.09 mg/kg	0.000009 %		
24	fluorene 201-695-5		86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
25	indeno[123-cd]pyrene 205-893-2		193-39-5		0.08 mg/kg		0.08 mg/kg	0.000008 %		
26	phenanthrene 201-581-5		85-01-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
27	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
28	pyrene 204-927-3		129-00-0		0.11 mg/kg		0.11 mg/kg	0.000011 %		
Total:								0.0317 %		

Key

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

Supplementary Hazardous Property Information

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

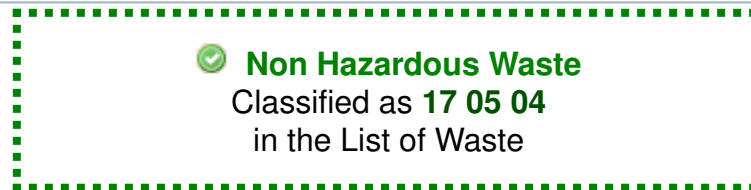
Force this Hazardous property to non hazardous because No free product hydrocarbons recorded.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.011%)

Classification of sample: WS04

Sample details

Sample name:	WS04	LoW Code:	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	0.30 m	Entry:		17 05 04 (Soil and stones other than those mentioned in 17 05 03)
Moisture content:	11% (no correction)			

Hazard properties

None identified

Determinands

Moisture content: 11% 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				9.7	pH		9.7	pH	9.7 pH		
2	arsenic { arsenic trioxide }				7.6	mg/kg	1.32	10.034	mg/kg	0.001 %		
	033-003-00-0	215-481-4	1327-53-3									
3	cadmium { cadmium sulfide }			1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
		215-160-9	1308-38-9									
5	copper { copper sulphate pentahydrate }				25	mg/kg	3.929	98.226	mg/kg	0.00982 %		
	029-023-00-4	231-847-6	7758-99-8									
6	lead { lead chromate }			1	31	mg/kg	1.56	48.354	mg/kg	0.0031 %		
	082-004-00-2	231-846-0	7758-97-6									
7	mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
8	nickel { nickel chromate }				17	mg/kg	2.976	50.597	mg/kg	0.00506 %		
	028-035-00-7	238-766-5	14721-18-7									
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
10	zinc { zinc chromate }				69	mg/kg	2.774	191.416	mg/kg	0.0191 %		
	024-007-00-3	236-878-9	13530-65-9									
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
12	TPH (C6 to C40) petroleum group				236	mg/kg		236	mg/kg	0.0236 %		
			TPH									
13	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9									
14	acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8									
15	anthracene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		204-371-1	120-12-7									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.34 mg/kg		0.34 mg/kg	0.000034 %		
17	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.56 mg/kg		0.56 mg/kg	0.000056 %		
18	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.61 mg/kg		0.61 mg/kg	0.000061 %		
19	benzo[ghi]perylene 205-883-8		191-24-2		0.37 mg/kg		0.37 mg/kg	0.000037 %		
20	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.25 mg/kg		0.25 mg/kg	0.000025 %		
21	chrysene 601-048-00-0	205-923-4	218-01-9		0.39 mg/kg		0.39 mg/kg	0.000039 %		
22	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		0.1 mg/kg		0.1 mg/kg	0.00001 %		
23	fluoranthene 205-912-4		206-44-0		0.5 mg/kg		0.5 mg/kg	0.00005 %		
24	fluorene 201-695-5		86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
25	indeno[123-cd]pyrene 205-893-2		193-39-5		0.32 mg/kg		0.32 mg/kg	0.000032 %		
26	phenanthrene 201-581-5		85-01-8		0.27 mg/kg		0.27 mg/kg	0.000027 %		
27	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
28	pyrene 204-927-3		129-00-0		0.62 mg/kg		0.62 mg/kg	0.000062 %		
Total:								0.0651 %		

Key

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

Supplementary Hazardous Property Information

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

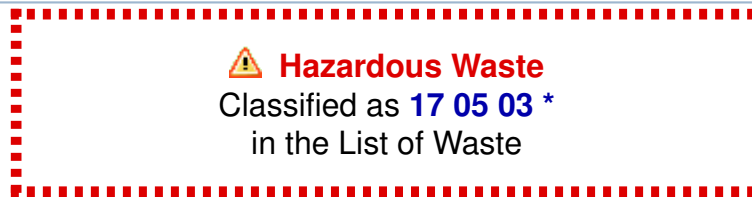
Force this Hazardous property to non hazardous because No free product hydrocarbons recorded.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0236%)

Classification of sample: WS06

Sample details

Sample name:	LoW Code:
WS06	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
0.40 m	
Moisture content:	
8.6%	
(no correction)	

Hazard properties

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 hazardous because No free product hydrocarbons recorded.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.111%)

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.111%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.111%)

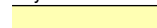
Determinands

Moisture content: 8.6% 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				8.5	pH		8.5	pH	8.5 pH		
2	arsenic { arsenic trioxide }				25	mg/kg	1.32	33.008	mg/kg	0.0033 %		
	033-003-00-0	215-481-4	1327-53-3									
3	cadmium { cadmium sulfide }			1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
5	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6		160 mg/kg	3.929	628.648 mg/kg	0.0629 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	1	170 mg/kg	1.56	265.169 mg/kg	0.017 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8		0.4 mg/kg	1.353	0.541 mg/kg	0.0000541 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5		23 mg/kg	2.976	68.454 mg/kg	0.00685 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9		140 mg/kg	2.774	388.381 mg/kg	0.0388 %		
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
12	TPH (C6 to C40) petroleum group		TPH		1110 mg/kg		1110 mg/kg	0.111 %		
13	acenaphthene	201-469-6	83-32-9		0.85 mg/kg		0.85 mg/kg	0.000085 %		
14	acenaphthylene	205-917-1	208-96-8		0.06 mg/kg		0.06 mg/kg	0.000006 %		
15	anthracene	204-371-1	120-12-7		0.81 mg/kg		0.81 mg/kg	0.000081 %		
16	benzo[a]anthracene	601-033-00-9	200-280-6		1.7 mg/kg		1.7 mg/kg	0.00017 %		
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.8 mg/kg		1.8 mg/kg	0.00018 %		
18	benzo[b]fluoranthene	601-034-00-4	205-911-9		2 mg/kg		2 mg/kg	0.0002 %		
19	benzo[ghi]perylene	205-883-8	191-24-2		1.1 mg/kg		1.1 mg/kg	0.00011 %		
20	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.78 mg/kg		0.78 mg/kg	0.000078 %		
21	chrysene	601-048-00-0	205-923-4		2.1 mg/kg		2.1 mg/kg	0.00021 %		
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.32 mg/kg		0.32 mg/kg	0.000032 %		
23	fluoranthene	205-912-4	206-44-0		3.5 mg/kg		3.5 mg/kg	0.00035 %		
24	fluorene	201-695-5	86-73-7		0.54 mg/kg		0.54 mg/kg	0.000054 %		
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.87 mg/kg		0.87 mg/kg	0.000087 %		
26	phenanthrene	201-581-5	85-01-8		4 mg/kg		4 mg/kg	0.0004 %		
27	naphthalene	601-052-00-2	202-049-5		0.78 mg/kg		0.78 mg/kg	0.000078 %		
28	pyrene	204-927-3	129-00-0		3.6 mg/kg		3.6 mg/kg	0.00036 %		
Total:								0.245 %		

Key

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

Classification of sample: WS07

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

Sample details

Sample name:	LoW Code:
WS07	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.30 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.5%	
(no correction)	

Hazard properties

None identified

Determinands

 Moisture content: **8.5% 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		8.1 pH		8.1 pH	8.1 pH		
2	arsenic { arsenic trioxide }				5.1 mg/kg	1.32	6.734 mg/kg	0.000673 %		
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				8.4 mg/kg	1.462	12.277 mg/kg	0.00123 %		
		215-160-9	1308-38-9							
5	copper { copper sulphate pentahydrate }				24 mg/kg	3.929	94.297 mg/kg	0.00943 %		
	029-023-00-4	231-847-6	7758-99-8							
6	lead { lead chromate }			1	32 mg/kg	1.56	49.914 mg/kg	0.0032 %		
	082-004-00-2	231-846-0	7758-97-6							
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				9.5 mg/kg	2.976	28.275 mg/kg	0.00283 %		
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
10	zinc { zinc chromate }				49 mg/kg	2.774	135.933 mg/kg	0.0136 %		
	024-007-00-3	236-878-9	13530-65-9							
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
12	TPH (C6 to C40) petroleum group		TPH		380 mg/kg		380 mg/kg	0.038 %		
13	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
14	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
15	anthracene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
		204-371-1	120-12-7							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.11 mg/kg		0.11 mg/kg	0.000011 %		
17	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.12 mg/kg		0.12 mg/kg	0.000012 %		
18	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.14 mg/kg		0.14 mg/kg	0.000014 %		
19	benzo[ghi]perylene 205-883-8	191-24-2			0.09 mg/kg		0.09 mg/kg	0.000009 %		
20	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.07 mg/kg		0.07 mg/kg	0.000007 %		
21	chrysene 601-048-00-0	205-923-4	218-01-9		0.15 mg/kg		0.15 mg/kg	0.000015 %		
22	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluoranthene 205-912-4	206-44-0			0.25 mg/kg		0.25 mg/kg	0.000025 %		
24	fluorene 201-695-5	86-73-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
25	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
26	phenanthrene 201-581-5	85-01-8			0.29 mg/kg		0.29 mg/kg	0.000029 %		
27	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
28	pyrene 204-927-3	129-00-0			0.26 mg/kg		0.26 mg/kg	0.000026 %		
Total:								0.0696 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No free product hydrocarbons recorded.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.038%)

Classification of sample: WS08

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

Sample details

Sample name:	LoW Code:
WS08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.10 m	
Moisture content:	
5.1%	
(no correction)	

Hazard properties

None identified

Determinands

Moisture content: 5.1% 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		8.5 pH		8.5 pH	8.5 pH		
2	arsenic { arsenic trioxide }				<1 mg/kg	1.32	<1.32 mg/kg	<0.000132 %		<LOD
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				2.9 mg/kg	1.462	4.239 mg/kg	0.000424 %		
		215-160-9	1308-38-9							
5	copper { copper sulphate pentahydrate }				2.8 mg/kg	3.929	11.001 mg/kg	0.0011 %		
	029-023-00-4	231-847-6	7758-99-8							
6	lead { lead chromate }			1	2 mg/kg	1.56	3.12 mg/kg	0.0002 %		
	082-004-00-2	231-846-0	7758-97-6							
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
8	nickel { nickel chromate }				2.5 mg/kg	2.976	7.441 mg/kg	0.000744 %		
	028-035-00-7	238-766-5	14721-18-7							
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
	034-002-00-8									
10	zinc { zinc chromate }				4.7 mg/kg	2.774	13.038 mg/kg	0.0013 %		
	024-007-00-3	236-878-9	13530-65-9							
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
12	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
13	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
14	anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-371-1	120-12-7							
15	benzo[a]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-033-00-9	200-280-6	56-55-3							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	benzo[a]pyrene; benzo[def]chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
17	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
18	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
20	chrysene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
21	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
22	fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-912-4	206-44-0							
23	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
24	indeno[123-cd]pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-893-2	193-39-5							
25	phenanthrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-581-5	85-01-8							
26	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
27	pyrene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		204-927-3	129-00-0							
Total:								0.00442 %		

Key

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

Classification of sample: WS10

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

Sample details

Sample name:	LoW Code:
WS10	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
0.30 m	
Moisture content:	
7.6%	
(no correction)	

Hazard properties

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 hazardous because No free product hydrocarbons recorded.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.26%)

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.26%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.26%)

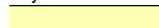
Determinands

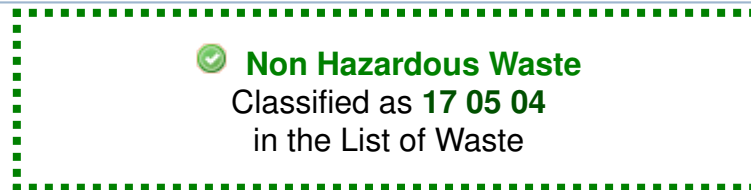
Moisture content: 7.6% No Moisture Correction applied (MC)

#	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		9.3 pH		9.3	pH	9.3 pH		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	2.8 mg/kg	1.32	3.697	mg/kg	0.00037 %		
3	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	<0.2 mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<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							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }	215-160-9	1308-38-9		12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
5	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6		16 mg/kg	3.929	62.865 mg/kg	0.00629 %		
6	lead { lead chromate }	082-004-00-2	231-846-0		19 mg/kg	1.56	29.636 mg/kg	0.0019 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5		25 mg/kg	2.976	74.407 mg/kg	0.00744 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8			<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9		54 mg/kg	2.774	149.804 mg/kg	0.015 %		
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
12	TPH (C6 to C40) petroleum group		TPH		2600 mg/kg		2600 mg/kg	0.26 %		
13	acenaphthene	201-469-6	83-32-9		0.16 mg/kg		0.16 mg/kg	0.000016 %		
14	acenaphthylene	205-917-1	208-96-8		0.08 mg/kg		0.08 mg/kg	0.000008 %		
15	anthracene	204-371-1	120-12-7		0.13 mg/kg		0.13 mg/kg	0.000013 %		
16	benzo[a]anthracene	601-033-00-9	200-280-6		0.15 mg/kg		0.15 mg/kg	0.000015 %		
17	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.2 mg/kg		0.2 mg/kg	0.00002 %		
18	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.23 mg/kg		0.23 mg/kg	0.000023 %		
19	benzo[ghi]perylene	205-883-8	191-24-2		0.29 mg/kg		0.29 mg/kg	0.000029 %		
20	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.16 mg/kg		0.16 mg/kg	0.000016 %		
21	chrysene	601-048-00-0	205-923-4		0.28 mg/kg		0.28 mg/kg	0.000028 %		
22	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluoranthene	205-912-4	206-44-0		0.33 mg/kg		0.33 mg/kg	0.000033 %		
24	fluorene	201-695-5	86-73-7		0.11 mg/kg		0.11 mg/kg	0.000011 %		
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.2 mg/kg		0.2 mg/kg	0.00002 %		
26	phenanthrene	201-581-5	85-01-8		0.29 mg/kg		0.29 mg/kg	0.000029 %		
27	naphthalene	601-052-00-2	202-049-5		0.28 mg/kg		0.28 mg/kg	0.000028 %		
28	pyrene	204-927-3	129-00-0		0.35 mg/kg		0.35 mg/kg	0.000035 %		
Total:								0.293 %		

Key

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

Classification of sample: WS11

Sample details

Sample name:	LoW Code:
WS11	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.40 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
7.3%	
(no correction)	

Hazard properties

None identified

Determinands

Moisture content: 7.3% 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				9.8 pH		9.8	pH	9.8 pH		
2	arsenic { arsenic trioxide }				2.2 mg/kg	1.32	2.905	mg/kg	0.00029 %		
	033-003-00-0	215-481-4	1327-53-3								
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6								
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.6 mg/kg	1.462	14.031	mg/kg	0.0014 %		
		215-160-9	1308-38-9								
5	copper { copper sulphate pentahydrate }				6.5 mg/kg	3.929	25.539	mg/kg	0.00255 %		
	029-023-00-4	231-847-6	7758-99-8								
6	lead { lead chromate }			1	98 mg/kg	1.56	152.862	mg/kg	0.0098 %		
	082-004-00-2	231-846-0	7758-97-6								
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				8.6 mg/kg	2.976	25.596	mg/kg	0.00256 %		
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
10	zinc { zinc chromate }				42 mg/kg	2.774	116.514	mg/kg	0.0117 %		
	024-007-00-3	236-878-9	13530-65-9								
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	TPH (C6 to C40) petroleum group				236 mg/kg		236	mg/kg	0.0236 %		
			TPH								
13	acenaphthene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9								
14	acenaphthylene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8								
15	anthracene				0.09 mg/kg		0.09	mg/kg	0.000009 %		
		204-371-1	120-12-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.11 mg/kg		0.11 mg/kg	0.000011 %		
17	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.09 mg/kg		0.09 mg/kg	0.000009 %		
18	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		0.11 mg/kg		0.11 mg/kg	0.000011 %		
19	benzo[ghi]perylene 205-883-8	191-24-2			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
20	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
21	chrysene 601-048-00-0	205-923-4	218-01-9		0.1 mg/kg		0.1 mg/kg	0.00001 %		
22	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluoranthene 205-912-4	206-44-0			0.3 mg/kg		0.3 mg/kg	0.00003 %		
24	fluorene 201-695-5	86-73-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
25	indeno[123-cd]pyrene 205-893-2	193-39-5			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
26	phenanthrene 201-581-5	85-01-8			0.17 mg/kg		0.17 mg/kg	0.000017 %		
27	naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
28	pyrene 204-927-3	129-00-0			0.26 mg/kg		0.26 mg/kg	0.000026 %		
Total:								0.0525 %		

Key

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

Supplementary Hazardous Property Information

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

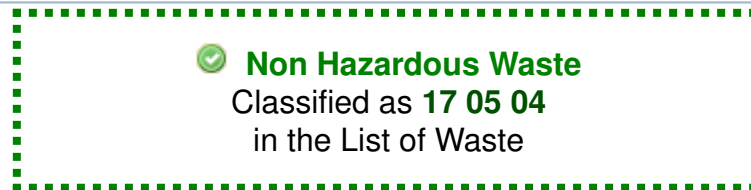
Force this Hazardous property to non hazardous because No free product hydrocarbons recorded.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0236%)

Classification of sample: WS02

Sample details

Sample name:	LoW Code:
WS02	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.10 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
15%	
(no correction)	

Hazard properties

None identified

Determinands

Moisture content: 15% 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				8.6 pH		8.6	pH	8.6 pH		
2	arsenic { arsenic trioxide }				12 mg/kg	1.32	15.844	mg/kg	0.00158 %		
	033-003-00-0	215-481-4	1327-53-3								
3	cadmium { cadmium sulfide }			1	0.7 mg/kg	1.285	0.9	mg/kg	0.00007 %		
	048-010-00-4	215-147-8	1306-23-6								
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				21 mg/kg	1.462	30.693	mg/kg	0.00307 %		
		215-160-9	1308-38-9								
5	copper { copper sulphate pentahydrate }				43 mg/kg	3.929	168.949	mg/kg	0.0169 %		
	029-023-00-4	231-847-6	7758-99-8								
6	lead { lead chromate }			1	130 mg/kg	1.56	202.776	mg/kg	0.013 %		
	082-004-00-2	231-846-0	7758-97-6								
7	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
8	nickel { nickel chromate }				17 mg/kg	2.976	50.597	mg/kg	0.00506 %		
	028-035-00-7	238-766-5	14721-18-7								
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
10	zinc { zinc chromate }				170 mg/kg	2.774	471.605	mg/kg	0.0472 %		
	024-007-00-3	236-878-9	13530-65-9								
11	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
12	TPH (C6 to C40) petroleum group				261 mg/kg		261	mg/kg	0.0261 %		
			TPH								
13	acenaphthene				0.16 mg/kg		0.16	mg/kg	0.000016 %		
		201-469-6	83-32-9								
14	acenaphthylene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8								
15	anthracene				0.34 mg/kg		0.34	mg/kg	0.000034 %		
		204-371-1	120-12-7								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
16	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		1.4 mg/kg		1.4 mg/kg	0.00014 %		
17	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		1.7 mg/kg		1.7 mg/kg	0.00017 %		
18	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		1.9 mg/kg		1.9 mg/kg	0.00019 %		
19	benzo[ghi]perylene 205-883-8		191-24-2		1.1 mg/kg		1.1 mg/kg	0.00011 %		
20	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.78 mg/kg		0.78 mg/kg	0.000078 %		
21	chrysene 601-048-00-0	205-923-4	218-01-9		1.5 mg/kg		1.5 mg/kg	0.00015 %		
22	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		0.2 mg/kg		0.2 mg/kg	0.00002 %		
23	fluoranthene 205-912-4		206-44-0		2.6 mg/kg		2.6 mg/kg	0.00026 %		
24	fluorene 201-695-5		86-73-7		0.12 mg/kg		0.12 mg/kg	0.000012 %		
25	indeno[123-cd]pyrene 205-893-2		193-39-5		0.86 mg/kg		0.86 mg/kg	0.000086 %		
26	phenanthrene 201-581-5		85-01-8		1.5 mg/kg		1.5 mg/kg	0.00015 %		
27	naphthalene 601-052-00-2	202-049-5	91-20-3		0.07 mg/kg		0.07 mg/kg	0.000007 %		
28	pyrene 204-927-3		129-00-0		2.6 mg/kg		2.6 mg/kg	0.00026 %		
Total:								0.115 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because No free product hydrocarbons recorded.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0261%)

Appendix A: Classifier defined and non GB MCL determinands

• pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
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: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

• 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

• 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

• 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

• 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

• 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

• 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

• 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

■ **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

■ **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

(enter justification for selecting this species)

cadmium {cadmium sulfide}

(enter justification for selecting this species)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

(enter justification for selecting this species)

copper {copper sulphate pentahydrate}

(enter justification for selecting this species)

lead {lead chromate}

(enter justification for selecting this species)

mercury {mercury dichloride}

(enter justification for selecting this species)

nickel {nickel chromate}

(enter justification for selecting this species)

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

(enter justification for selecting this species)

zinc {zinc chromate}

(enter justification for selecting this species)

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

(enter justification for selecting this species)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021

HazWasteOnline Classification Engine Version: 2023.320.5812.10769 (16 Nov 2023)

HazWasteOnline Database: 2023.320.5812.10769 (16 Nov 2023)

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

Appendix E

Gas & Groundwater Monitoring

Appendix F

Patrick Parsons Generic Assessment Criteria (GAC)

Generic Assessment Criteria

		Residential with Homegrown Produce			Residential without Homegrown Produce			Allotments			Commercial			Public Open Space Near Residential Housing			Public Open Space Park		
SOM %		1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6
Metals and Inorganics (non SOM dependent)	Arsenic		37			40			43			640			79			170	
	Beryllium		1.7			1.7			35			12			2.2			63	
	Boron		290			11000			45			240000			21000			46000	
	Cadmium		11			85			1.9			190			120			555	
	Chromium (III)		910			910			18000			8600			1500			33000	
	Chromium (VI) (Hexavalent)		6			6			1.8			33			7.7			220	
	Copper		2400			7100			520			68000			12000			44000	
	Elemental Mercury		1.2			1.2			21			58			16			30	
	Inorganic Mercury		40			56			19			1100			120			240	
	Methylmercury		11			15			6			320			40			68	
	Lead		200			310			80			2300			630			1300	
	Nickel		130			180			53			980			230			800	
	Selenium		250			430			88			12000			1100			1800	
	Vanadium		410			1200			91			9000			2000			5000	
	Zinc		3700			40000			620			730000			81000			170000	
Polyaromatic Hydrocarbons	Acenaphthene	210	510	1100	3000	4700	6000	34	85	200	84000	97000	100000	15000	15000	15000	29000	30000	30000
	Acenaphthylene	170	420	920	2900	4600	6000	28	69	160	83000	97000	100000	15000	15000	15000	29000	30000	30000
	Anthracene	2400	5400	11000	31000	35000	37000	380	950	2200	520000	540000	540000	74000	74000	74000	150000	150000	150000
	Benzo[a]anthracene	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62
	Benzo[a]pyrene	2.2	2.7	3	3.2	3.2	3.2	0.97	2.0	3.5	35	35	36	5.7	5.7	5.7	11	12	13
	Benzo[b]fluoranthene	2.6	3.3	3.7	3.9	4.0	4.0	0.99	2.1	3.9	44	44	45	7.1	7.2	7.2	13	15	16
	Benzo[ghi]perylene	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600
	Benzo[k]fluoranthene	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440
	Chrysene	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120
	Dibenz[ah]anthracene	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.43	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4
	Fluoranthene	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	6300	6300	6400
	Fluorene	170	400	860	2800	3800	4500	27	67	160	63000	68000	71000	9900	9900	9900	20000	20000	20000
	Indeno[123-cd]pyrene	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180
	Naphthalene	2.3	5.6	13	2.3	5.6	13	4.1	10	24	190	460	1100	4900	4900	4900	1200	1900	3000
	Phenanthrene	95	220	440	1300	1500	1500	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300
	Pyrene	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000
	Coal Tar (B[a]P as surrogate marker)	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8
Petroleum Hydrocarbons	Benzene	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110
	Toluene	130	290	660	880	1900	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000
	Ethylbenzene	47	110	260	83	190	440	16	39	91	5700	13000	27000	24000	24000	25000	17000	22000	27000
	m-Xylene	59	140	320	82	190	450	31	74	170	6200	14000	31000	41000	42000	43000	17000	24000	32000
	o-Xylene	60	140	330	88	210	480	28	67	160	6600	15000	33000	41000	42000	43000	17000	24000	33000
	p-Xylene	56	130	310	79	180	430	29	69	160	5900	14000	30000	41000	42000	43000	17000	23000	31000
	Aliphatic EC 5-6	42	78	160	42	78	160	730	1700	3900	3200	5900	12000	570000	590000	600000	95000	130000	180000
	Aliphatic EC >6-8	100	230	530	100	230	530	2300	5600	13000	7800	17000	40000	600000	610000	620000	150000	220000	320000
	Aliphatic EC >8-10	27	65	150	27	65	150	320	770	1700	2000	4800	11000	13000	13000	13000	14000	18000	21000
	Aliphatic EC >10-12	130	330	760	130	330	770	2200	4400	7300	9700	23000	47000	13000	13000	13000	21000	23000	24000
	Aliphatic EC >12-16	1100	2400	4300	1100	2400	4400	11000	13000	13000	59000	82000	90000	13000	13000	13000	25000	25000	26000
	Aliphatic EC >16-35	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000
	Aliphatic EC >35-44	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000
	Aromatic EC 5-7 (benzene)	70	140	300	370	690	1400	13	27	57	26000	46000	86000	56000	56000	56000	76000	84000	92000
	Aromatic EC >7-8 (toluene)	130	290	660	860	1800	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000
	Aromatic EC >8-10	34	83	190	47	110	270	8.6	21	51	3500	8100	17000	5000	5000	5000	7200	8500	9300
	Aromatic EC >10-12	74	180	380	250	590	1200	13	31	74	16000	28000	34000	5000	5000	5000	9200	9700	10000
	Aromatic EC >12-16	140	330	660	1800	2300	2500	23	57	130	36000	37000	38000	5100	5100	5000	10000	10000	10000
	Aromatic EC >16-21	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800
	Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900
	Aromatic EC >35-44	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900
	Petroleum Hydrocarbons EC >44-70	1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	3800	3800	7800	7800	7900

UK Locations

Ash Vale
Birmingham
London
Wakefield

