Phase II Interpretative Ground Assessment

At

Former Apollo Public House
Miles Platting
Manchester
M40 8EE

Client: Jigsaw Homes

Reference: 33585-SUT-ZZ-00-RP-G-7201

Date: May 2025

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Phase II Interpretative Ground Assessment

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Foreword (Geotechnical and Environmental Assessment)

This report has been prepared for the sole internal use and reliance of the Client named on page 1. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Sutcliffe Investigation; such authorisation not to be unreasonably withheld. If any unauthorised third party comes into possession of this report, they rely on it at their risk and the authors owe them no duty of care and skill.

The report presents observations and factual data obtained during our site investigation and provides an assessment of Geotechnical and environmental issues with respect to information provided by the Client regarding the proposed development. Further advice should be sought from Sutcliffe Investigation prior to significant revision of the development proposals. Primary aims of this exploratory phase of investigation were to identify salient geotechnical and environmental issues affecting the site to enable the client to obtain budget costs for the necessary site preparatory and remedial works.

The report should be read in its entirety, including all associated drawings and appendices. Sutcliffe Investigation cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.

The findings and opinions conveyed in this report (including review of any third-party reports) are based on information obtained from a variety of sources as detailed within this report, and which Sutcliffe Investigation believes are reliable. All reasonable care and skill have been applied in examining the information obtained. Nevertheless, Sutcliffe Investigation cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

The report represents the findings and opinions of experienced Geotechnical and environmental consultants. Sutcliffe Investigations does not provide legal advice and the advice of lawyers may also be required.

Intrusive investigation can only investigate shallow ground beneath a small proportion of the total site area. It is possible therefore that the intrusive investigation undertaken by Sutcliffe Investigation, whilst fully appropriate, may not have encountered all significant subsurface conditions. Any opinions expressed as to the possible configuration of strata between, or below exploratory holes are for guidance only and no responsibility is accepted as to its accuracy.

It should be borne in mind that the timescale over which the investigation was undertaken might not allow the establishment of equilibrium groundwater levels. Particularly relevant in this context is that groundwater levels are susceptible to seasonal and other variations and may be higher during the wetter periods than those encountered during this commission.

Where the report refers to the potential presence of invasive weeds such as Japanese Knotweed, or the presence of asbestos containing materials, it should be noted that the observations are for information only and should be verified by a suitably qualified expert.

This report assumes that ground levels will not change significantly from those existing at present. If this is not to be the case, then some modification to this report may be required.

It should be noted that the banning of the co-disposal of hazardous and non-hazardous waste was introduced in 2011, as a result of the implementation within the UK of the Landfill Directive. This will considerably affect the current practices and procedures for the handling and disposal of wastes, in particular hazardous wastes. In addition, it will be a requirement for all wastes to be pre-treated and to comply with certain waste acceptance procedures prior to sending wastes to landfill. The full potential effects of these important changes are not known at this stage, but it is perceived that disposal costs will rise, particularly for hazardous wastes, and waste pre-treatment may, in some cases, become an ‘additional’ redevelopment cost with regard to the remediation of contaminated sites.

Should this report recommend materials could be excavated and removed off-site for landfill disposal, then it should be noted that the costs, timescales and implications of the pending changes to waste management legislation could not be predicted at this stage. Sutcliffe Investigation will not be responsible for changing practices, etc that may affect the viability of necessary remedial actions or of the implications of potential alternative treatment techniques.

Sutcliffe Investigation reserves the right to amend their conclusions and recommendations in the light of further information that may become available. General notes and limitations relevant to all Sutcliffe Investigations are described in the Foreword and should be read in conjunction with this report.

Executive Summary

INTRODUCTION	Sutcliffe Investigations was instructed by Jigsaw Homes (the "client") to undertake a Phase II ground assessment for the site known as the Former Apollo Public House, Miles Platting, Manchester, M40 8EE. The site is centred on National Grid Reference (NGR) 385800, 399610. This report assesses the ground based geotechnical and environmental risks, constraints and liabilities associated with the proposed development of the site. This is required in support of the discharge of contaminated land planning conditions assigned to the site and to allow the design of economic foundation solutions.
SITE DESCRIPTION	The site is irregular in shape, 0.22ha in area and can be accessed via the eastern, southern and western boundaries of the site. The site is relatively flat and comprises largely of grassed areas surrounding a derelict former public house along with a small area of hardstanding on the western portion of the site. A small grassed area is noted across Thornden Road in the southwest of the site.
DEVELOPMENT PROPOSAL	The proposed layout is shown in DK Architects *Drawing (Ref: 1349-1001.4)*. This report has been prepared in support of a planning application to develop the site for housing with associated garden areas and infrastructure. Based on information received from the architect, it is anticipated that site levels will be retained to facilitate the proposed development option.
PRELIMINARY CONCEPTUAL MODEL	Due to the scales of the earliest available historical maps dated (1848 and 1850) it is unclear if the markings on the site are land boundaries or building thought to be residential properties, despite this, residential properties were noted on site in 1891 and remained until 1949 when they were demolished, and the site appeared undeveloped. By 1952, a tank was noted on the western portion of the site, its purpose was unclear, and it was no longer noted by 1956. No further changes were noted on site until 1979 when the Apollo public house was noted and remained on site until the most up to date map dated 2024. A site visit has also confirmed the now disused public house remains on site. Historical maps have indicated that residential properties were noted on site from 1891 to 1949, a tank was noted from 1952 to 1956 and a public house with likely basements was noted from 1979 to present day With the exception of made ground potentially being present on site, together with potential basements associated with the public house, the potential for significant contamination to have arisen at the site as a result of the current and former usage on site is considered to be low. However, the possibility of contamination albeit likely to be localised cannot be discounted.
PREVIOUS WORKS	Sutcliffe have completed a Phase I Desk Study, a synopsis of which is provided in Section 2 of this report. No other previous studies are known to have been undertaken to Sutcliffe's knowledge.
SITE INVESTIGATION	Field works were undertaken from the 24th-28th of March 2025 by ZORD Geo and PM Sampling, specialist ground investigation contractors and comprised: - 4No. Window Sample Holes (WS101, WS101A, WS103 & WS105) - 2No. Cable Percussion Boreholes with Rotary follow on (BH101 & BH103) - 1No. Machine excavated Trial Pits (TP103) - 1No. BRE365 Soakaway Tests (TP102/SA) - Contamination samples from various depth in the Made Ground. - Leachate samples. - Gas monitoring wells. - Monitoring of ground gas / ground water with installed locations.
GROUND CONDITIONS	Made Ground: Made Ground was encountered in all the exploratory holes across the site and was noted to a maximum depth of 3.0m in WS101A. Final depth of Made Ground was not proven in WS101. Made Ground generally consisted of Grass over dark brown slightly gravelly slightly silty ashy SILT with frequent rootlets. Gravel is fine to medium rounded to angular of brick plastic and mixed lithologies. Sand is fine to coarse. (TOPSOIL). Some positions noted Macadam at the surface.

	Natural Ground: Natural ground was encountered in all exploratory holes except WS101. Ground conditions for superficial deposits generally consisted of Brown slightly gravelly slightly sandy CLAY. Gravel is fine subrounded to subangular of mudstone and sandstone. Sand is fine or Medium dense brown silty fine to coarse SAND. Bedrock conditions comprised of Grey highly weathered laminated MUDSTONE
GROUNDWATER	Groundwater was recorded in WS101A, WS103, WS105 and TP103 between 1.20-2.70m. No rise was noted during any of these water strikes.
SOIL INFILTRATION	A BRE365 Soakaway test was conducted. Due to the inefficiencies of the ground this test only comprised a single fill and was unable to provide an infiltration rate.
ENVIRONMENTAL RISK ASSESSMENT	Long Term Human Health Elevated levels of Lead, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene have been recorded on site and indicate the presence of site wide contamination that will require remediation to be safe for Human Health. This will require the removal of 600mm material from site and the importing of clean tested material to create a capping break layer in garden areas on site, with hardcover providing a break layer in other areas of the site. Controlled Waters Risk Assessment For controlled waters there are two assessment criteria, the Environmental Quality Standard (EQS) and the UK Drinking Water Standard (UKDWS). One sample of Lead was noted to exceed the UKDWS criteria. One sample of copper and two samples of Sulphide were noted to exceed the EQS criteria. Exceedances of DWS and EQS screening criteria are not considered significant given the likely depth to groundwater, effects of natural attenuation, lack of nearby groundwater abstractions and the absence of any surface water courses that could be in continuity with ground water beneath the site.
ASBESTOS	Asbestos containing materials (ACM) were not observed within samples screened.
GROUND GAS RISK ASSESSMENT	In accordance with CIRIA C665 the ground gas monitoring results indicate that the site has a HGFR of 0.0001l/hr for methane and 0.0020l/hr for carbon dioxide. This results in the site being classified as Characteristic Situation 1 – Very Low Risk and require no protective measures to be installed. Notwithstanding, this is a preliminary assessment based on 1No. monitoring visit(s) and will be reviewed on the completion of the monitoring program (6No. visits) within the final report.
RADON	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No radon protective measures are necessary
GEOTECHNICAL ASSESSMENT	General It is understood that consideration is being given to the development of houses with associated garden areas and infrastructure. Due to the ground conditions encountered it would be Sutcliffe's recommendation that a piled foundation solution is adopted due to the amount of Made Ground that has been identified on site. Final pile design will be undertaken by a specialist piling contractor. Limited groundwater ingress was recorded during site investigation works and subsequent monitoring. Sub-surface concrete that is only in contact with Made Ground can be Design Sulphate Class DS-1, with an ACEC Classification of AC-1s. Ground Floor Construction Based upon the amount of Made Ground noted on site it is not recommended that a ground-bearing slab is utilised on site. Sutcliffe Investigations therefore propose a suspended P.C Unit ground floor be adopted. Geotechnical Uncertainty The site has been subject to previous developments in the form of terraced housing and is currently developed and therefore, the potential for relic foundations and obstructions cannot be discounted.
WASTE CLASSIFICATION	As discussed above, the Waste Classification Report states that all soils analysed are as 'Non-Hazardous' waste

	WAC analysis indicates that soils cannot be downgraded to 'inert' due to an exceedance of loss on ignition and total organic carbon and the classification will remain as 'Non-Hazardous Waste'. Notwithstanding, the final decision on waste classification is determined by the accepting landfill, and consultation with landfill operators be carried out during the development of the SMMP.
RECOMMENDATIONS	The following actions are recommended: - Design a Phase III Remediation & Validation Proposal for submission to planning department. - Design SMMP – management of material on and off site. - Post demolition sampling - Good hygiene practices should be employed during construction work, in addition, the findings of this investigation should be included within the contractors H&S file and an assessment of risks associated with short term human health completed. No consumption of food or smoking should occur without prior hand washing. If dust is encountered, dust masks should be worn, and dust suppression employed.

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1 Introduction

1.1 Terms of Reference

Sutcliffe Investigations was instructed by Jigsaw Homes (*the "client"*) to undertake a Phase II ground assessment for the site known as the Former Apollo Public House, Miles Platting, Manchester, M40 8EE.

A plan detailing the sites existing site layout is presented as *Drawing Ref.LS5628-T.*

This report assesses the ground based geotechnical and environmental risks, constraints and liabilities associated with the proposed development of the site. This is required in support of the discharge of contaminated land planning conditions assigned to the site and to allow the design of economic foundation solutions.

1.2 Development Proposal & Legislative Context

Development Proposal

The proposed layout is shown in DK Architects *Drawing (Ref: 1349-1012)*. This report has been prepared in support of a planning application to develop the site for housing with associated garden areas and infrastructure. Based on information received from the architect, it is anticipated that site levels will be retained to facilitate the proposed development option.

Legislative Context

The presence of contaminants which may pose a risk to human health, or the environment is a material planning consideration. For planning it should be considered whether the site is suitable for its new use, and the responsibility for securing a safe development (including cumulative effects of pollution on health, and the potential sensitivity of the proposed development to adverse effects from pollution,) rests with the developer and/or landowner. Planning is concerned with the site's proposed use not its current use, where the amount of contamination is expected to be low relative to the level of risk. This is the opposite to Part 2A which considers high levels (significant harm) and the current use of the site.

Section 57 of the Environment Act 1995 adds Part 2A (ss.78A-18YC) to the Environmental Protection Act 1990 and contains the legislative framework for identifying and dealing with contaminated land. Where development is undertaken on land which may be affected by contamination, the National Planning Policy Framework, paragraph 120 to 122 considers pollution and remediation. This links the contaminated land regime within the development process.

For there to be an environmental liability associated with the site there must be a perceived source (a contaminant), a receptor (humans, living organisms or property) and a pathway between them. The potential presence of all of these aspects would result in a complete contaminant linkage.

In accordance with environmental legislation and the associated guidelines, assuming the site is to be redeveloped as housing, it should be noted that any redevelopment of the site could actually create new pathways that could increase the liabilities associated with the site. In addition, the basis of the intrusive ground assessment is to refine the preliminary conceptual model.

1.3 Site Location and Setting

The site is located at the former Apollo Public House, Miles Platting, Manchester, M40 8EE at National Grid Reference (NGR) 385800, 399610, within a predominantly residential area with local amenities also noted in the area.

A location plans and aerial photograph of the site are shown as *Figure 1 & 2*.

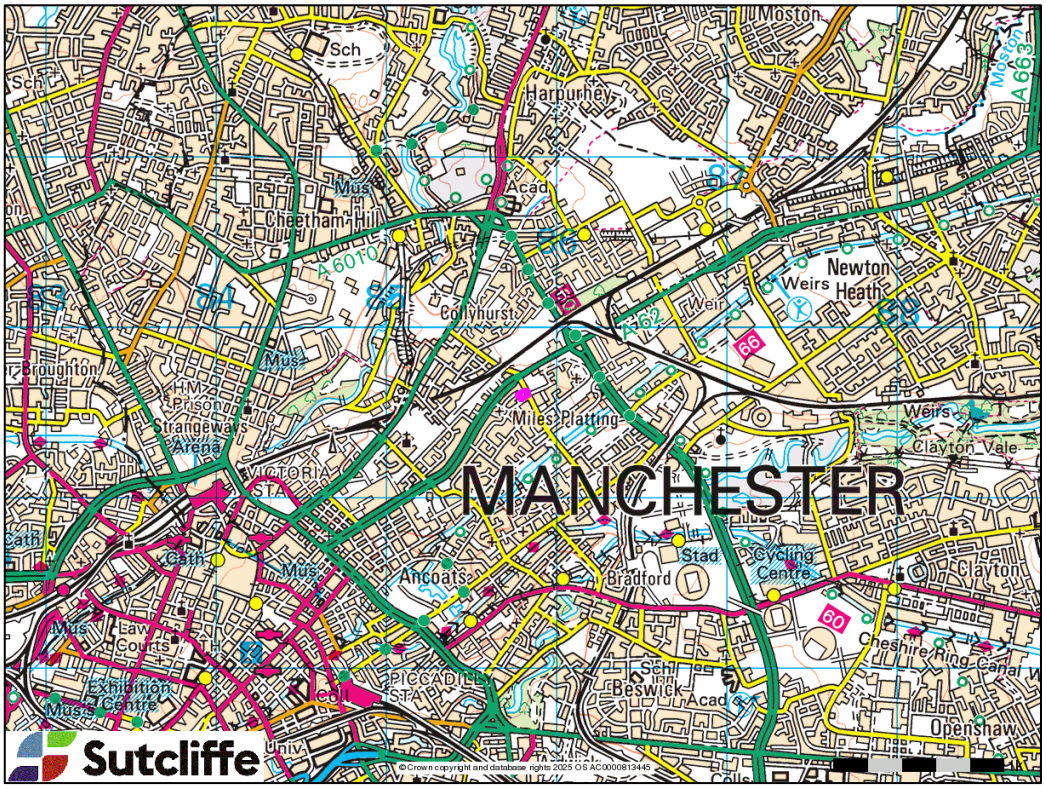

Figure 1: General Location of Site

1.4 Site Description and Layout

The site is irregular in shape, 0.22ha in area and can be accessed via the eastern, southern and western boundaries of the site. The site is relatively flat and comprises largely of grassed areas surrounding a derelict former public house along with a small area of hardstanding on the western portion of the site. A small grassed area is noted across Thornden Road in the southwest of the site with a small carpark in the northwest.

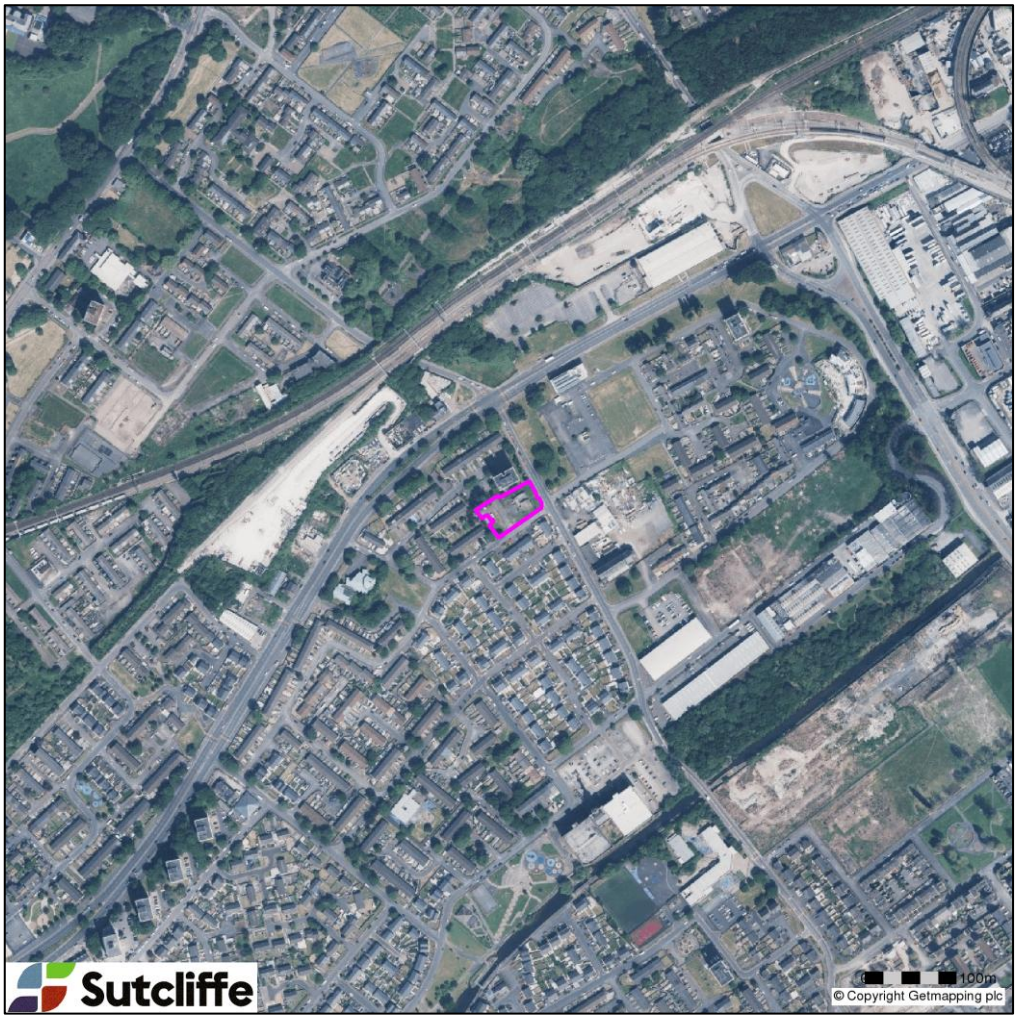

Figure 2: Aerial Photograph of the Site

1.5 Previous Studies

Sutcliffe have completed a Phase I Preliminary Risk Assessment (PRA). (*Report Reference: 33585-SUT-ZZ-00-RP-G-7101*), a synopsis of which is provided in *Section 2* of this report. No other previous studies are known to have been undertaken to Sutcliffe's knowledge.

1.6 Objectives & Scope of Assessment

The aim of the intrusive ground investigation is to identify potential geotechnical & environmental liabilities and constraints, associated with the development of the site area in support of the following:

- A planning application and the discharge of contaminated land conditions where reasonably practicable that may have been assigned to the site and to include the design of a remediation scheme, if required as part of the National Planning Policy Framework (NPPF).
- To assess the likelihood of reuse of materials that are site won or disposal options for surplus material.
- The preliminary design of detailed and economic foundations options inclusive of all information and specifications relating to foundation types, the location of underlying rock, (if encountered), preparation of ground, concrete grades, reuse of materials for both the proposed building, and the existing foundations.

2 Preliminary Conceptual Risk Assessment

2.1 Introduction

The Phase I PRA completed by Sutcliffe is summarised below. This report should be read in conjunction with Report Ref: *33585-SUT-ZZ-00-RP-G-7101.*

2.2 Site History

On-site

Due to the scales of the earliest available historical maps dated (1848 and 1850) it is unclear if the markings on the site are land boundaries or building thought to be residential properties, despite this, residential properties were noted on site in 1891 and remained until 1949 when they were demolished, and the site appeared undeveloped.

By 1952, a tank was noted on the western portion of the site, its purpose was unclear, and it was no longer noted by 1956.

No further changes were noted on site until 1979 when the Apollo public house was noted and remained on site until the most up to date map dated 2024. A site visit has also confirmed the now disused public house remains on site.

Off-site

The earliest historical maps dated 1848 and 1850 noted a skin yard approximately 70m east of the site, a coal pit approximately 200m east, ropewalks approximately 100m and 400m south of the site, Newton Brook approximately 105m south, a chemical works approximately 290m south east, Scooters Brook approximately 600m south, brickfields approximately 390m south and 285m west and residential properties between 500 to 1000m south and south west of the site.

By 1891 residential properties were noted in all immediate surroundings areas of the site, a wire works was noted approximately 15m north-west of the site, a chapel 10m north-east of the site beyond which a school was noted, a floor and cloth manufactory was noted approximately 10m south-east, Oldham Road Flint glass works was noted approximately 65m east and railway lines were noted approximately 170m west and 200m north of the site.

No further changes were noted in the surrounding areas of the site until 1908 when the industrial area approximately 270m south-east of the site had become more established and the Rochdale Canal was noted approximately 365m south-east of the site running through this industrial area.

Again, no further changes were noted until 1938 when two large derelict areas were identified 240m north-west and 415m south of the site. Between 1948 and 1949 the cloth manufacturer is now noted as a cotton and weaving mill and a bag factory.

No further changes were again noted until 1956 when the derelict areas noted to the north-west and south of the site have again become developed with residential properties.

Between 1960 to 1968 the configuration of properties immediately south-west of the site was noted to change and residential properties noted immediately east and approximately 65m north of the site were no longer evident.

Between 1977 to 1984 an electric substation was noted immediately west of the site and much of the industrial area to the south-east of the site had been demolished and replaced with local amenities including a library, swimming pool and schools.

Other than further demolition to the industrial area to the south-east of the site between 1990 and 1992 and the demolition of residential properties approximately 620m east of the site in 1999 no further changes were of note until the most recent historical map dated 2024.

Historical Contamination Potential

Historical maps have indicated that residential properties were noted on site from 1891 to 1949, a tank was noted from 1952 to 1956 and a public house with likely basements was noted from 1979 to present day

With the exception of made ground potentially being present on site, together with potential basements associated with the public house, the potential for significant contamination to have arisen at the site as a result of the current and former usage on site is considered to be low. However, the possibility of contamination albeit likely to be localised cannot be discounted.

2.3 Geotechnical Constraints

Coal Mining

The site is within a coal mining area and it was found in the Coal Mining Report that the site is at risk from possible shallow underground workings.

Geology

No records of artificial ground have been identified within the development site boundary. No action is required with respect to foundation design.

No faults have been identified within the development site boundary, however 4No. Rock segments and 1No. fault is noted within 500m of the site.

The closest rock segment is noted approximately 5m south of the site and the fault is noted approximately 460m west of the site.

Historical Land Use

The site was developed as residential housing from prior to 1891 and remained until 1949. The site became undeveloped until 1952 when a tank was noted. This tank was no longer noted by 1956. No changes occurred until 1979 when the Apollo Public House was noted and remains until the present day.

As the site has been subject to previous development, the potential for relic foundations and obstructions from the previous housing cannot be discounted.

2.4 Potential Contaminant Linkages

Sources

Based on the information from the desk study, historical maps, published information, and a site walkover a summary of potential contaminant sources is provided in *Table 2.1*.

Table 2.1: Potential Source(s) of Contamination

Ref.	Potential Sources	Potential Contaminants
S1 (On-site)	Made Ground associated with the demolition of former buildings / basements associated with the public house	All metals, fuel, hydrocarbons and oils and localised ground gas.
	Mine gas associated with historic mining activity	Carbon Monoxide, Carbon Dioxide, Methane, Oxygen, Nitrogen, Hydrogen and other Hydrocarbons
S2 (Off-Site)	Mine gas associated with historic mining activity	Carbon Monoxide, Carbon Dioxide, Methane, Oxygen, Nitrogen, Hydrogen and other Hydrocarbons

S1 (On-site)

Made Ground associated with the demolished buildings is anticipated below the site. By its nature, Made Ground may contain contaminative material, most commonly heavy metals, PAHs and asbestos.

Although the Coal Authority Report states that no mine gas emissions have been recorded within 500m of the site, due to shallow underground mine workings recorded beneath the site, the possibility of mine gas emissions cannot be discounted.

Additionally, carparking associated with the public house on site may be a source of hydrocarbon contamination which may pose a vapour ground gas risk.

S2 (Off-site)

As mentioned above, due to shallow underground mine workings recorded beneath the site, the possibility of mine gas emissions cannot be discounted.

Pathways

Exposure pathways are the potential routes and mechanisms by which potential on-site sources could be linked to the identified potential receptors and thereby expose them to potential harm.

The following potential exposure pathways have been identified at the site:

Table 2.2: Pathways

Ref.	Pathway	Description
P1	Direct contact with potential contaminants.	Dermal absorption, ingestion and inhalation of contaminants via direct contact. Construction workers may come into contact during the site works, however this will be for a short time and therefore limited exposure will occur. PPE can be used and worn as a precaution to reduce the risk.
P2	Ingestion of potential contaminants.	
P3	Inhalation of potential contaminants.	
P4	Leaching and migration of contaminants.	Leaching of possible contaminants could migrate into the underlying Secondary A Aquifers via shallow groundwater. On-site drainage is also at risk from shallow contamination, if present.
P5	Vertical and lateral migration of ground gases / vapours.	There is the potential for contaminants to be present on the site, which could generate ground gas & vapours on site.

P1-P3 (Direct Contact)

The site has been considered for a residential end-use with soft landscaping, and as such is considered a sensitive end-use.

If the identified contaminant sources are present or have migrated to the site, pathways to the receptors are considered possible.

P4 (Leaching & Migration)

Made Ground as previously discussed within section S1 may contain potentially leachable contaminants.

Historic hydrocarbon spills from car parking onsite are considered possible which could migrate, however, volumes anticipated would be unlikely to be significant to impact controlled waters.

Lateral migration off-site may be possible, dependent on the composition of the Glaciofluvial deposits, more specifically the granular / cohesive content of the lateral continuity of any granular horizons. Such migration is considered possible though unlikely.

Downward migration of contaminants to the Secondary A Aquifer is considered unlikely due to the cohesive Glacial Till and Glaciofluvial Deposits. Glaciofluvial Deposits are typically encountered as interbedded horizons of a wide range of materials, including cohesive Clay and Silt dominant layers. As such, while downward migration may be possible, it is considered ultimately unlikely due to the anticipated cohesive horizons likely to be encountered within the strata.

P5 (Migration of ground gas / vapours)

Made Ground thicknesses are expected to be relatively limited given the development present onsite. As such, it is considered unlikely that a thickness of Made Ground capable of generating significant thickness of permanent gases will be present.

Although mine gas emissions from past underground mining is considered possible, the probability that the gas migrates to the site is considered low due to the overlying impermeable Devensian Till.

Receptors

Based on the site's environmental setting and the proposed future end-use of the area following redevelopment, the following potential receptors have been identified:

Table 2.3: Receptors

Ref.	Receptor	Description
R1	Current & future site users	Site users; personnel, general workers and maintenance workers,
R2	Construction Workers	Contractors working on the development of the site. Construction workers, maintenance workers or other personnel who may be directly exposed to contaminated materials in the course of their activities).
R3	Controlled Waters	Secondary A Aquifers and on-site drainage
R4	Adjacent Site Users	Adjacent site users. Third-party land (*i.e.* the possibility of contamination migrating off-site onto third party land *via* contaminated groundwater, surface water run-off).
R5	Infrastructure / Buried services	Proposed buildings and buried services

R1

The site is proposed to have a residential end-use, considered to be a vulnerable end-user due to elevated potential exposure times.

R2

Construction works will be required for any redevelopment.

R3

Secondary A Aquifers have been identified below site, which are both considered to be relatively vulnerable receptors.

R4

The site is surrounded by residential houses, considered to be relatively vulnerable receptors.

R5

The proposed development will be founded below ground level and will be in contact with any soils below ground level.

2.5 Risk Evaluation

An evaluation of the risk that each contaminant linkage poses to the project (as identified in the *Section 2*) has been undertaken, in general accordance with CIRIA guidance document C552, 2001 (as detailed in *Appendix B*) and in *Tables 2.4*, *2.5* and *2.6* below.

The evaluation and resultant actions identified are based on available information presented within the Phase I PRA (*Report reference: 33585-SUT-ZZ-00-RP-G-7101*)

Table 2.4: Classification of consequence

Classification	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters.
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures.
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures.
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species.

Table 2.5: Classification of Probability

Classification	Definition
High Likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the long term.
Negligible	There is a pollution linkage, but circumstances and conditions are such that it is extremely unlikely an event would occur, even over an extended period.

Table 2.6: Risk Assessment Matrix

Consequence					
Severe	Medium	Mild	Minor		
Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk	High Likelihood	Probability
High Risk	Moderate Risk	Moderate / Low Risk	Low Risk	Likely	
Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk	Low Likelihood	
Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk	Unlikely	
Low Risk	Very Low Risk	Very Low Risk	Very Low Risk	Negligible Likelihood	

Each potential contaminant linkage is identified in *Table 2.7* below.

The evaluation and the resultant actions identified are based on the available information presented within this report. A visual representation of the Preliminary CSM is presented as *Figure 3.*

During the development there is a potential for short term human health risk to construction workers. These should be assessed and anticipated by the contractor under CDM Regulations 2015.

Table 2.7: Preliminary Risk Evaluation of Potential Contaminant Linkages

1. Hazard Identification		2. Hazard Assessment				3. Risk Estimation		4. Risk Evaluation	5. Managing the Risk
Contaminant Source		Pathway		Receptor		Consequence	Probability	Classification	Action required
S1	Potentially contaminated soil on-site	P1	Dermal contact	R1/2	Site users	Medium	Low	Moderate / Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard. Investigation is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
		P2	Ingestion of soil / soil dust	R1/2	Site users	Medium	Low	Moderate / Low Risk	
		P3	Inhalation of vapours / soil gas	R1/2	Site users	Severe	Unlikely	Moderate / Low Risk	
		P4	Leaching and migration of contaminants	R3/5	Secondary A aquifer	Medium	Low	Moderate / Low Risk	
		P5	Lateral migration of soil gas / vapours	R1	Site users	Severe	Unlikely	Moderate / Low Risk	
				R4	Property	Severe	Unlikely	Moderate / Low Risk	
S2	Mine gas associated with historic mining activity	P4	Leaching and migration of contaminants.	R3/5	Secondary A Aquifer	Medium	Unlikely	Low Risk	
		P5	Vertical and lateral migration of ground gases / vapours.	R1	Site users	Severe	Unlikely	Moderate / Low Risk	
				R4	Property	Severe	Unlikely	Moderate / Low Risk	

3 Ground Investigation

3.1 Design Rationale

The aim and design of the ground assessment is to satisfy planning conditions assigned to the site by reference to the National Planning Policy Framework (NPPF). This will identify elevated concentrations of determinands with the aim of assessing long term human health risks to site users and groundwater resources. In addition, the works have been designed to allow the design of economic foundation solutions for the proposed new builds.

3.2 Fieldwork

Field works were undertaken from the 24th-28th of March 2025 by ZORD Geo and PM Sampling, specialist ground investigation contractors and comprised:

- 4No. Window Sample Holes (WS101, WS101A, WS103 & WS105)
- 2No. Cable Percussion Boreholes with Rotary follow on (BH101 & BH103)
- 1No. Machine excavated Trial Pits (TP103)
- 1No. BRE365 Soakaway Tests (TP102/SA)
- Contamination samples from various depth in the Made Ground.
- Leachate samples.
- Gas monitoring wells.
- Monitoring of ground gas / ground water with installed locations.

All works were supervised by a suitably qualified Sutcliffe engineer. The investigation was carried out in general accordance with the following standards:

- BS10175:2011+A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice;
- R&D Technical Report P5-066/TR Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination, 2001 (Environment Agency).
- BS 5930:2015 Code of practice for site investigations; and,
- BS EN ISO 22475-1:2006 Geotechnical investigation and testing. Sampling methods and groundwater measurements. Technical principles for execution.

Site Investigation logs collated as part of the ground investigation completed by Sutcliffe are presented in *Appendix C.*

3.3 Health & Safety

Service plans for the development site have been obtained and are included as part of the Phase I PRA. Copies of these plans are maintained on site by the Sutcliffe engineer who is also responsible for clearing the areas to be investigated by use of a Cable Avoidance Tool (CAT) and signal generator (Genny).

3.4 Sampling Strategy

Due to the history of the site, with past development having occurred, a non-targeted sampling strategy was used to obtain a site wide representation of the site and the potential contamination issues.

The site area is 2,220m^2 ÷ 8 sample positions = 275m^2 ÷ 0.8 = 343.75

√343.75m^2 = a 18.54m grid.

Therefore this gives an 80% probability of finding a circular area of interest of 343.75m^2.

A summary of exploratory hole detailing rationale is shown in *Table 3.1* below.

Table 3.1: Summary of Site Activities

Ref. No.	Location Rationale	Method	Completed Depth (mbgl)	Installation Details	Testing & Sampling details
WS101	General Site Coverage (HH)	Window Sampler	1.20	No installation	Contamination Sample
WS101A	General Site Coverage (GG)	Window Sampler	6.45	Standpipe installed to 3.00m bgl	SPTs, Shear Vane, bulk samples
WS103	General Site Coverage (GG, HH)	Window Sampler	6.45	Standpipe installed to 2.00m bgl	SPTs, Contamination Sample
WS105	General Site Coverage (GG, HH)	Window Sampler	5.43	Standpipe installed to 4.00m bgl	SPTs, Shear Vane, bulk samples, Contamination Sample
BH101	General Site Coverage (HH)	Cable Percussion	16.56	No installation	SPTs, Shear Vane, small, bulk samples, Contamination Sample
BH103	General Site Coverage	Cable Percussion	17.30	No installation	SPTs, Shear Vane, bulk samples
TP102/SA	General Site Coverage (HH, CW)	BRE365 Soakaway Test	2.00	No installation	Contamination Sample
TP103	General Site Coverage (HH, CW)	Trial Pit	2.70	No installation	Contamination Sample

GG – Ground Gas / CW – Controlled Water / HH – Human Health

A plan detailing the position of sampling locations on an existing layout of the site is presented as *Drawing Ref. 33585-SUT-ZZ-XX-DR-G-7252.*

3.5 Chemical Laboratory Testing

Selected soil samples (Made Ground & natural) were collected at various depths and horizons and submitted for chemical analysis, details of which are presented in *Table 3.2.*

Table 3.2: Summary of Soils Analysis (Total & Leachate Concentrations)

Suite Reference	Analysis Suite
Soils Suite	Metals suite, speciated (16) polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons according to the Total Petroleum Hydrocarbon Working Group (TPHCWG), asbestos screen, total cyanide, phenols and soil organic matter.
Leachate	Metals suite, speciated (16) PAHs.
Pipeline RA Suite	EPH CWG, VOCs, SVOCs, VPH CWG, Ph, Electrical Conductivity and Redox Potential
Hazwaste Envriolab Minimal Requirements	Metals suite, speciated (16) polycyclic aromatic hydrocarbons (PAHs), TPH Total with ID + GC Trace (>C6-C40).
WAC E (Inert, SNRHW + Hazardous Landfills) 2 Stage	Antimony, Arsenic, Barium, Cadmium, Chloride, Chromium, Copper, DOC, Floride, Lead, Mercury, Molybdenum, Nickle, Phenol, Selenium, Sulphate, Total Dissolved Solids, Zinc.

All samples were analysed by MCERTS accredited soil analysis laboratory Envirolab under UKAS accredited methods. All samples have been taken in accordance with current British Standards.

Envirolab are appropriately accredited for the works required and are an approved supplier under the Sutcliffe's Quality Management System.

Analytical test certificates are presented in *Appendix D.*

TPH Speciated aromatic and aliphatic bands with BTEX analysis have been carried out in line with the TPHCWG. The toxicity and migration risk associated with a TPH is dependent on the specific aliphatic aromatic carbon banding.

Of particular concern are the low molecular weight compounds, which are highly mobile and show a greater level of toxicity that the higher molecular weight compounds. Therefore a low TPH consisting of low molecular weight aliphatic and aromatic carbon banding compounds may present more of a risk than a high TPH consisting of heavy weight aliphatic and aromatic carbon banding compounds.

Based on the TPHCWG the aromatic band C5 – C7 is considered to consist only of Benzene and the aromatic band C7 – C8 of Toluene. Therefore the more specific BTEX analysis has been used for risk assessment rather than the aromatic bands.

3.6 Drainage

It is recommended that the client / developer contact United Utilities with respect to capacity in existing foul and surface water sewers in the vicinity of the development area.

3.7 Water Supply

Suitable Pipeline risk assessment testing was carried out for this site and covers the contaminants required by United Utilities. This has indicated that barrier pipe is required. It is recommended that a full UU pipeline risk assessment is conducted.

3.8 Services

It is recommended that the client / developer contact the relevant service provided to ascertain the requirements for power reinforcement and / or relocation / diversion of existing services.

4 Ground Model

4.1 General

The following section describes the ground conditions encountered during the intrusive ground assessment completed by Sutcliffe.

4.2 Made Ground

A summary of the strata depths and thicknesses for Made Ground is detailed in Table 4.1 and Table 4.2 below.

Table 4.1: Ground Conditions Encountered (Made Ground)

Strata	Depths encountered (mbgl)		Thickness (m)		
	Min	Max	Min	Max	Average
MADE GROUND	0.00	3.00	0.03	2.80	0.51

Table 4.2: Ground Conditions Encountered (Made Ground – Detailed)

Strata	Depths encountered (mbgl)		Thickness (m)		
	Min	Max	Min	Max	Average
Macadam	0.00	0.10	0.05	0.10	0.07
Paving Slab[1]	0.05	0.08	0.03	0.03	0.03
Whole bricks and concrete fragments[2]	1.00	1.20**	0.20	0.20**	0.20**
Dark brown gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of brick and other mixed lithologies. Sand is fine to coarse.	0.35	1.30	0.20	0.95	0.58
Black ashy sandy fine to medium angular GRAVEL of mixed lithologies. Sand is fine to medium.	0.00	0.80	0.20	0.60	0.47
Dark brownish black ashy gravelly SAND. Gravel is fine to coarse subrounded of brick mudstone and sandstone. Sand is fine to coarse.	0.00	3.00	0.05	2.80	0.87
Grass over dark brown slightly gravelly slightly silty ashy SILT with frequent rootlets. Gravel is fine to medium rounded to angular of brick plastic and mixed lithologies. Sand is fine to coarse. (TOPSOIL)	0.00	1.30	0.20	1.00	0.48

[1] Only encountered at one location – TP103.
[2] Only encountered at one location – WS101.
*** Final Depth of Strata not proven, average thickness on identified ground.*

4.3 Natural Ground

A summary of the strata depths and thicknesses for natural ground is detailed in *Table 4.3* and *4.4* below.

Table 4.3: Ground Conditions Encountered (Natural – General)

Strata	Depths encountered (mbgl)		Thickness (m)		
	Min	Max	Min	Max	Average
CLAY	0.50	17.10	0.15	6.30	2.15
SAND	9.00	12.40	3.00	3.40	3.20
MUDSTONE	16.00	17.30**	0.20	0.56**	0.38**

*** Final Depth of Strata not proven, average thickness on identified ground.*

Table 4.4: Ground Conditions Encountered (Natural – Detailed)

Strata	Depths encountered (mbgl)		Thickness (m)		
	Min	Max	Min	Max	Average
Soft to very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.	0.50	17.10	0.15	6.30	2.65
Soft to Stiff greyish brown slightly silty CLAY.	3.00	6.45**	0.45	1.00**	0.86**
Brown slightly gravelly slightly sandy CLAY. Gravel is fine subrounded to subangular of mudstone and sandstone. Sand is fine.	0.80	2.70**	1.20	1.70**	1.45**
Medium dense brown silty fine to coarse SAND.	9.00	12.40	3.00	3.40	3.20
Grey highly weathered laminated MUDSTONE.	16.00	17.30**	0.20	0.56**	0.38**

*** Final Depth of Strata not proven, average thickness on identified ground.*

4.4 Standard Penetration Tests (SPT)

The standard penetration test (SPT) is used to provide geotechnical engineering properties for foundation design purposes. The results can be used to determine the relative density, bearing capacity, and settlement of granular soil. The results can also be used to correlate the approximate strength of cohesive soil.

The SPT results are detailed in *Table 4.5* and *Figure 4* hereunder.

Table 4.5: SPT Results

Strata	No. of Tests	Range	Average
CLAY	30	2-50	22.1
SAND	5	18-30	23.4
MUDSTONE	2	50	50.0

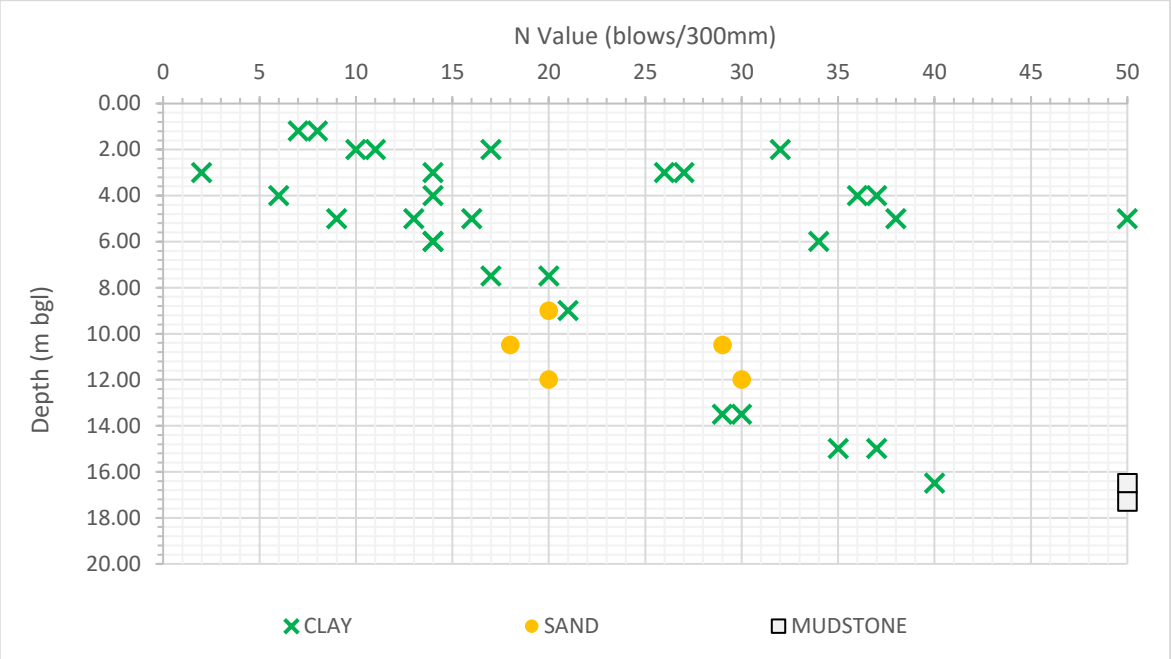

Figure 4: SPT Results

4.5 Field Evidence of Contaminated Soils

Made Ground was noted within every investigation location conducted. Within the Made Ground, addition contamination indicators were also noted:

Table 4.6: Field Evidence of Contaminated Soils

Ref. No.	Depth	Contamination Indicator
BH101	0.00-1.00	Plastic
BH102	0.05-0.50	Ashy
WS101	0.20 – 0.80	Ashy
WS101A	0.20-3.00	Slag
WS105	0.20-0.80	Ashy
TP103	0.00-0.05	Ashy
TP103	0.08-0.92	Slag

Apart from the above instances, no other visual or olfactory contamination indicators were noted during the Site Investigation

4.6 Groundwater

Multiple groundwater strikes were recorded during the investigation, as noted in *Table 4.7* below:

Table 4.7: Groundwater Observations

Ref. No.	Depth	Comment
WS101A	2.00	No Rise
WS103	2.00	No Rise
WS105	1.20	No Rise
TP103	2.70	Slight Seepage

5 Geotechnical Laboratory Testing and Assessment

5.1 General

In total 4No. samples were recovered from site for the purpose of geotechnical laboratory testing. A breakdown of the testing scheduled is set out in *Table 5.1* below.

Table 5.1: Geotechnical Testing

Ref. No.	Depth (m)	Plasticity Index	Triaxial	Moisture Content	Point Loads
WS101A	3.00-4.00	✓		✓	
WS105	2.00-3.00	✓		✓	
BH101	4.00-4.45	✓	✓	✓	✓
BH103	3.00-3.45	✓	✓	✓	✓

5.2 Plasticity Index

A total of 4No. samples were tested to determine the plasticity index of the underlying CLAY strata. The plasticity results and the modified plasticity index are outlined in *Table 5.2* below.

Table 5.2: Plasticity Test Results

Ref. No.	Depth (m)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Modified Plasticity Index (%)	Soil Classification
WS101A	3.00-4.00	46	21	25	91	22.75	CI
WS105	2.00-3.00	45	20	25	96	24	CI
BH101	4.00-4.45	49	22	27	95	25.65	CI
BH103	3.00-3.45	46	21	25	91	22.75	CI

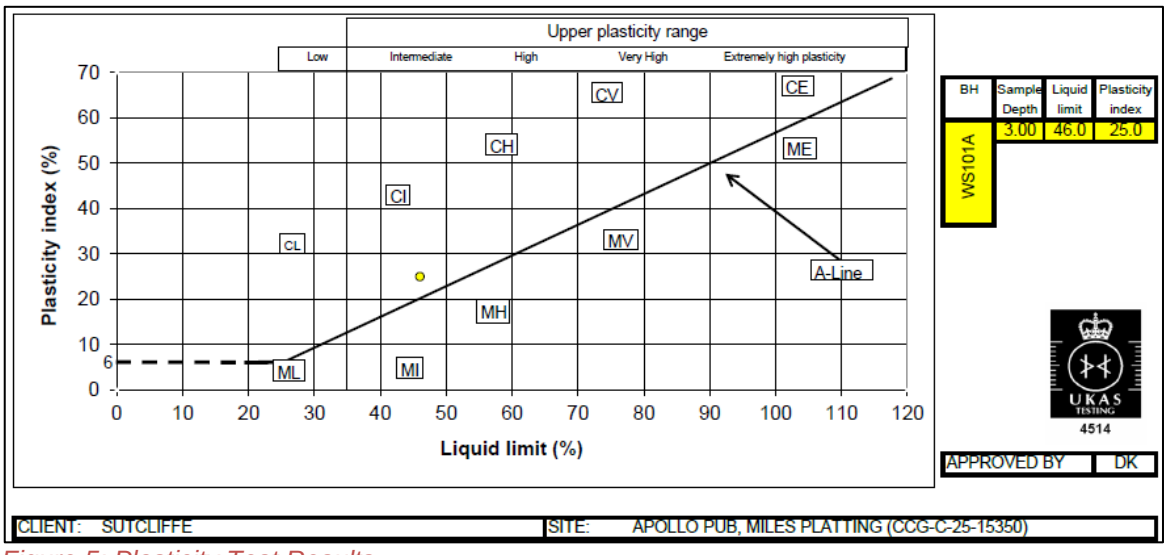

Figure 5: Plasticity Test Results

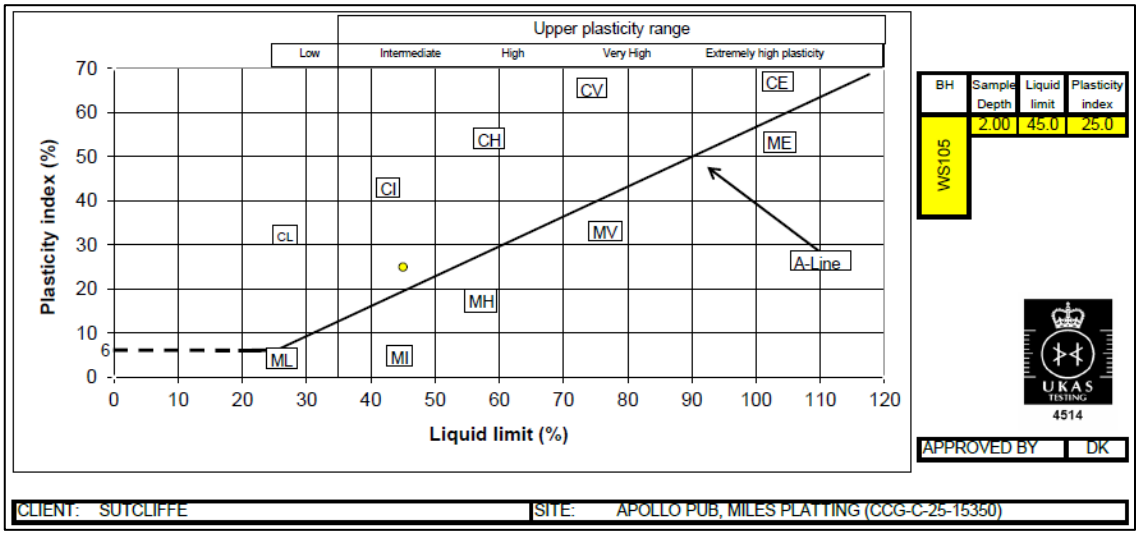

Figure 6: Plasticity Test Results

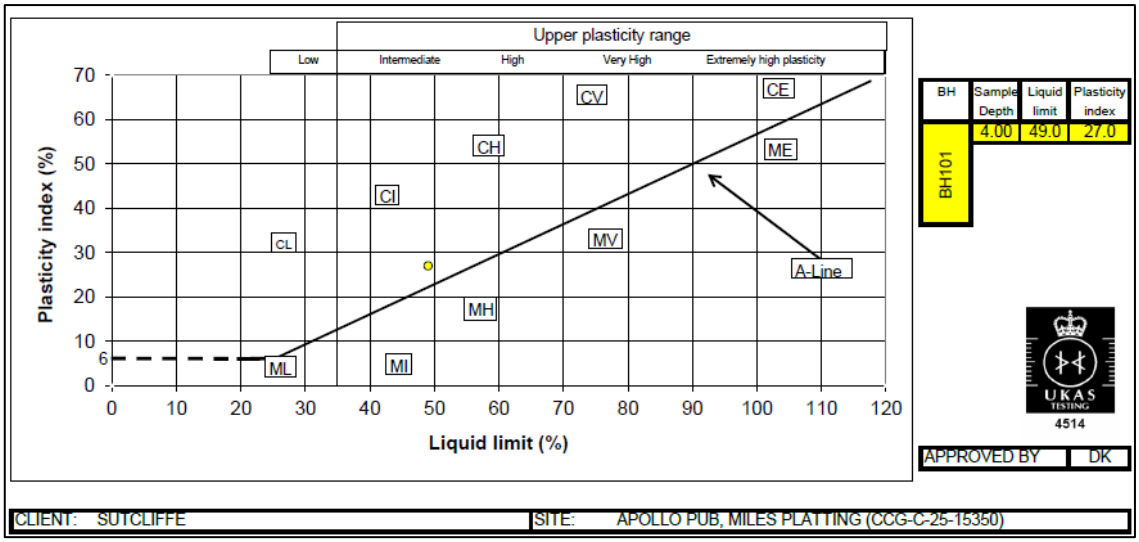

Figure 7: Plasticity Test Results

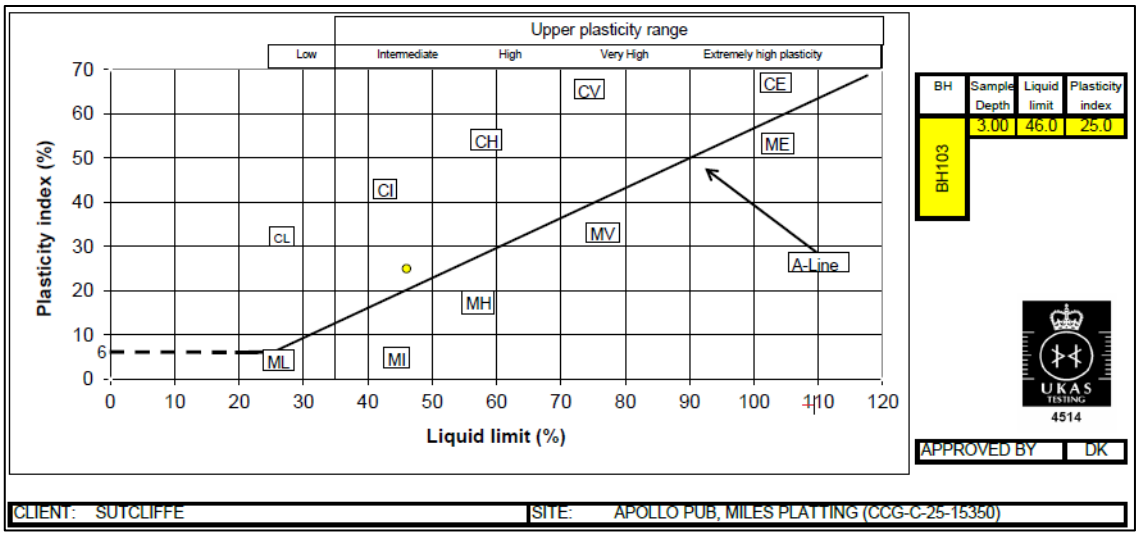

Figure 8: Plasticity Test Results

The results indicate that the underlying CLAY is Intermediate plasticity. Plasticity test results are included in *Appendix F*.

5.3 Shear Strength

Triaxial Testing

Triaxial testing was scheduled on 2No. samples recovered from site. The result of this testing is outlined below in *Table 5.3*.

Table 5.3: Triaxial Test Results

Ref. No.	Depth (m bgl)	Shear Strength (kPa)
BH101	4.00-4.45	131
BH103	3.00-3.45	156

Hand Shear Vane (HSV) Testing

2No. HSV Tests were carried out on samples recovered from site. The results are outlined below in *Table 5.4*.

Table 5.4: Laboratory HSV Test Results

Ref. No.	Depth (m bgl)	Shear Strength (kPa)
WS101A	3.00-4.00	50
WS105	2.00-3.00	>110

Shear Strength Testing Summary

A summary of the Shear Strength Testing including Triaxial and HSV Testing is presented in *Figure 6.*

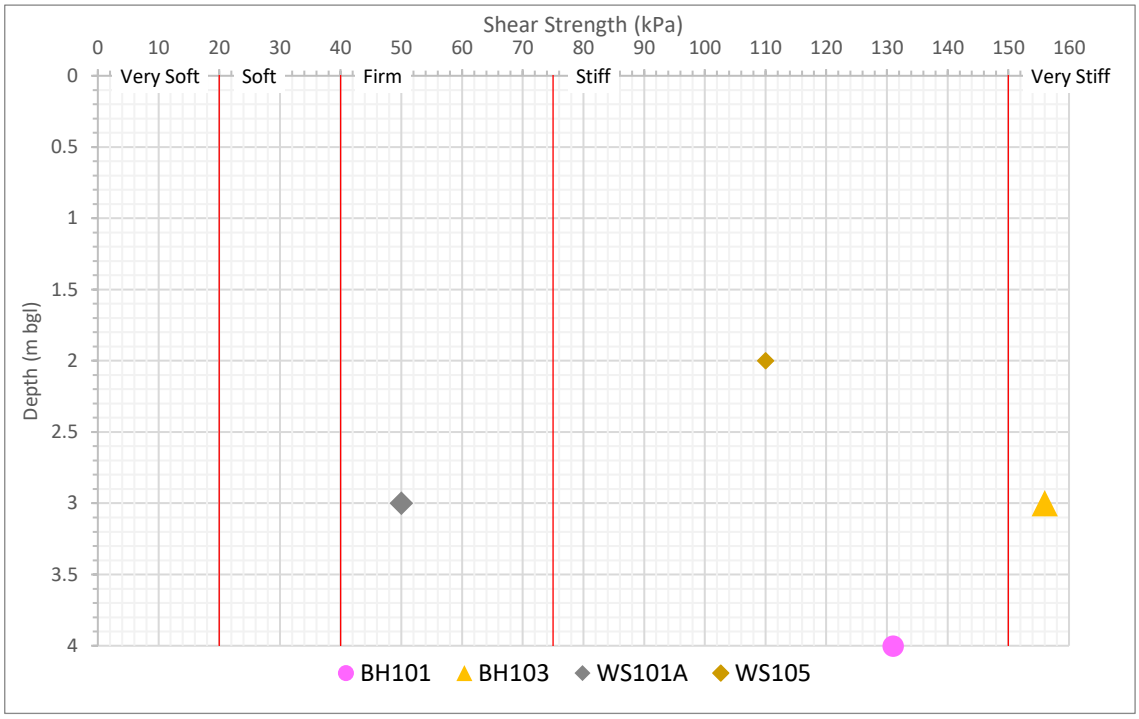

Figure 9: Shear Strength Test Results

The results of this testing indicate that the shear strength of the clay classifies as firm to very stiff.

5.4 Soil Infiltration

A BRE365 Soakaway test was conducted. Due to the inefficiencies of the ground this test only comprised a single fill and was unable to provide an infiltration rate.

Results of this testing are included in Appendix C.

5.5 Stability

No evidence of instability was noted in the exploratory holes that were undertaken on site; however, it is noted that these were only small diameter holes and that due to the amount of Made Ground noted on-site shoring would likely be required if any groundworks are to be left open during site works.

5.6 Soluble Sulphate and pH

It is envisaged foundations will extend through the Made Ground and into the natural strata and samples taken from the Made Ground have been submitted for pH and water-soluble sulphate (2:1 soil/water extract) analysis.

The highest water-soluble sulphate concentration and the lowest pH value for the Made Ground is shown in *Table 5.5.*

Table 5.5: Soluble sulphate and pH classification

Soil Type	Lowest pH Values	Highest Soluble Sulphate Concentration (g/l)
Made Ground	5.63	0.04

Therefore, in accordance with Table C2 of BRE: Special Digest 1 2005, sub-surface concrete that is in contact with Made Ground should be Design Sulphate Class **DS-1**, with the ACEC classification of **AC-1s**.

A complete set of geotechnical laboratory certificates are presented in *Appendix F*.

5.7 Foundation Recommendations

General

It is understood that consideration is being given to the development of houses with associated garden areas and infrastructure.

Due to the ground conditions encountered it would be Sutcliffe's recommendation that a piled foundation solution is adopted due to the amount of Made Ground that has been identified on site. Final pile design will be undertaken by a specialist piling contractor.

Limited groundwater ingress was recorded during site investigation works and subsequent monitoring.

Sub-surface concrete that is only in contact with Made Ground can be Design Sulphate Class DS-1, with an ACEC Classification of AC-1s.

Ground Floor Construction

Based upon the amount of Made Ground noted on site it is not recommended that a ground-bearing slab is utilised on site. Sutcliffe Investigations therefore propose a suspended P.C Unit ground floor be adopted.

Designated Concrete Mixes

The following designated mix in accordance with BRE Special Digest SD1 and BS 8500: Part1: 2015 will be suitable for use on this site.

Table 5.6: Designated Concrete Mixes

Application	DS-1 Conditions (Made Ground and Natural) ACEC Class AC-1s
Unreinforced strip / trench fill footings	GEN1
Reinforced strip / trench fill footing (mesh reinforcement)	RC30
Reinforced strip / trench fill footings (rebar etc)	RC30
Unreinforced concrete floor slabs	GEN2
In situ reinforced concrete floor slabs	RC30

**Note: Although RC 30 is in line with BS8500, Sutcliffe Investigation recommend the use of RC35 for concrete used in structurally sensitive works, to provide greater certainty of compliance with strength verification tests. Tolerable mixes dispatched by a batching plant are +/- 10%, and delays on site can also result in deterioration of the concrete.*

5.8 Geotechnical Uncertainty

The site has been subject to previous developments in the form of terraced housing and is currently developed and therefore, the potential for relic foundations and obstructions cannot be discounted.

6 Long Term Human Health Risk Assessment

6.1 Methodology

Based on the Preliminary Risk Assessment and Ground Model for this site, a Generic Quantitative Risk Assessment for human health has been undertaken in accordance with LCRM and SR (SC050021 series) (DEFRA) guidance as well as CL:AIRE Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration (2020) and comprises the following:

- Selection of appropriate generic screening values for human health assessment.
- Creation of relevant datasets from which to undertake the assessment.
- Assessment of contamination distribution and comparison of site data to screening values using relevant statistical tests (in accordance with CIEH guidance).
- Assessment of risks to receptors.
- Determination of requirements for further investigation or remediation.

6.2 Selection of Soil Screening Values

Soil screening values appropriate for a *Residential with Plant Uptake* were selected.

6.3 Creation of Relevant Datasets

As part of the desk study assessment and Preliminary Conceptual Model, Made Ground was identified as the principal potential source identified for contamination in the risk evaluation *(Section 2.0*). Consequently, the sampling strategy targeted Made Ground encountered on site.

6.4 Identification of Contaminants of Concern

The results of the soil analysis from the investigation are shown in *Appendix D.* These results were then compared against the relevant GACs for 6.0% soil organic matter (S.O.M.). The average percentage S.O.M. was 12.52% for 9No. samples.

Elevated levels of contamination were recorded in all samples taken from site when assessed against the *6%* S.O.M. *Residential with Plant Uptake* values.

Table 6.1: Chemical Analysis Results for Made Ground Stratum (0.00-1.00m bgl)

Contaminant	Threshold Value (mg/kg)	Location	Depth (m bgl)	Recorded Concentration (mg/kg)
Lead	200	WS105	0.20-0.50	245
		WS103	0.40-0.60	226
		TP103	0.08-1.00	443
Benzo(b)fluoranthene	3.7	WS101	0.20-0.40	4.52
Benzo(a)pyrene	3	WS101	0.20-0.40	4.16
Dibenzo(ah)anthracene	0.3	WS101	0.20-0.40	0.5

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6.5 Assessment

The soil analytical data has been assessed following CL:AIRE guidance, LCRM and NHBC R&D Publication 66 2008 *"Guidance for the Safe Development of Housing on Land Affected by Contamination".*

The purpose of human health risk assessment for planning is to decide whether the land is suitable for the proposed end use and does not pose a risk to human health.

Statistical analysis in accordance with CL:AIRE publication *Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration (2020)* was used to assist in answering the key question raised above.

Utilising the 2-way confidence interval method, the likelihood of whether the true mean is less than the critical concentration can be calculated and aid with decision making in terms of further investigation or remediation.

This assessment will be using an 85% confidence interval to state that:

*Sutcliffe are **85%** confident that the true mean concentration (μ) for the contaminant lies between **x** mg/kg and **y** mg/kg.*

A 99% confidence interval will be used to state that:

*Sutcliffe are **99%** confident that the true mean concentration (μ) for the contaminant does not lie outside of **x** mg/kg and **y** mg/kg.*

Results of the Statistical analysis is presented in *Appendix G.*

6.6 Statistical Analysis

Lead

There were 3No. exceedances of the Lead screening value from samples analysed at WS105, WS103 & TP103. The critical concentration of this contaminant is **200mg/kg.**

Statistical Analysis of samples screened for the contaminant indicate that:

- Sutcliffe are 85% confident that the true mean concentration (μ) for Lead (Total) lies between 146.59mg/kg and 309.07mg/kg.
- Sutcliffe are 99% confident that the true mean concentration (μ) for Lead (Total) does not lie outside of 35.07mg/kg and 420.59mg/kg.

Based on the results of the statistical analysis, Sutcliffe are not confident that the true mean concentration lies below the critical concentration.

Benzo(b)fluoranthene

There was 1No. exceedance of the Benzo(b)fluoranthene screening value from samples analysed at WS101. The critical concentration of this contaminant is **3.7mg/kg.**

Statistical Analysis of samples screened for the contaminant indicate that:

- Sutcliffe are 85% confident that the true mean concentration (μ) for benzo(b)fluoranthene lies between 0.28mg/kg and 2.62mg/kg.
- Sutcliffe are 99% confident that the true mean concentration (μ) for benzo(b)fluoranthene does not lie outside of 0.00mg/kg and 4.22mg/kg.

Based on the results of the statistical analysis, Sutcliffe are not confident that the true mean concentration lies below the critical concentration.

Benzo(a)pyrene

There was 1No. exceedance of the Benzo(a)pyrene screening value from samples analysed at WS101. The critical concentration of this contaminant is **3.0mg/kg.**

Statistical Analysis of samples screened for the contaminant indicate that:

- Sutcliffe are 85% confident that the true mean concentration (μ) for benzo(a)pyrene lies between 0.15mg/kg and 2.30mg/kg.
- Sutcliffe are 99% confident that the true mean concentration (μ) for benzo(a)pyrene does not lie outside of 0.00mg/kg and 3.78mg/kg.

Based on the results of the statistical analysis, Sutcliffe are not confident that the true mean concentration lies below the critical concentration.

Dibenzo(ah)anthracene

There was 1No. exceedance of the Dibenzo(ah)anthracene screening value from samples analysed at WS101. The critical concentration of this contaminant is **0.3mg/kg.**

Statistical Analysis of samples screened for the contaminant indicate that:

- Sutcliffe are 85% confident that the true mean concentration (μ) for dibenzo(ah)anthracene lies between 0.03mg/kg and 0.29mg/kg.
- Sutcliffe are 99% confident that the true mean concentration (μ) for dibenzo(ah)anthracene does not lie outside of 0.00mg/kg and 0.47mg/kg.

Based on the results of the statistical analysis, Sutcliffe are not confident that the true mean concentration lies below the critical concentration.

6.7 Discussion

The statistical analysis for all exceeded contaminants indicates that there is a very high probability that the true mean concentrations exceed the critical concentrations and Sutcliffe are not confident that these contaminants are unlikely to pose a site wide risk to human health.

6.8 Asbestos

Asbestos containing materials (ACM) were not observed within samples screened.

6.9 Conclusions

Based on the results of the statistical analysis, the site does pose a risk to human health, and remediation works will be required as part of the development to ensure that the site is suitable for occupation and no longer poses a risk to human health.

7 Controlled Waters Risk Assessment

7.1 Methodology

Based on the Preliminary Risk Assessment and Ground Model for this site, a Level 1 Screening Assessment has been undertaken in general accordance with Environment Agency guidance Environment Agency Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination, 2006.

The methodology comprises:

- Identification of potential contaminant linkages.
  - Selection of appropriate generic screening values for controlled waters.
  - Screening measured concentrations of leachate against the generic screening values available for UK Drinking Water Standards (UK DWS) and Environmental Quality Standards (EQS).
- Assessment of contaminant distribution and risk to receptors.
  - Identification of contaminants of concern and relevant contaminant linkages.
  - Identification of potential contaminants and contaminant linkages which are no longer of concern.

7.2 Identification of Potential Contaminant Linkages

Contaminant linkages have been identified in *Section 3.0* between the Made Ground and the underlying aquifer via infiltration and/or migration of dissolved phase contaminants.

7.3 Selection of Generic Screening Values

Screening values for Drinking Water Standards (DWS) have been used to assess leachability. DWS are relevant to potable receptors (Principal Aquifer).

Environmental Quality Standards (EQS) screening values have been used to assess risks to surface water resources.

7.4 Leachate Screening – UK DWS & EQS

Metals, TPHCWG and Speciated PAHs were assessed. Exceedances of relevant UK DWS and EQS screening criteria were encountered, details of which are identified in *Table 7.1 & 7.2.* It should be noted that several determinands have limits of detection greater than their respective screening values. Due to the level of uncertainty associated with such results, these exceedances are not considered significant and are excluded from the table below.

Table 7.1: Leachate Exceedances Summary - DWS

Determinant	DWS Threshold	Range of concentrations	Location	Depth (m bgl)	Recorded Concentration
Lead	10µg/l	2-11µg/l	TP103	0.08-1.0	11µg/l

Table 7.2: Leachate Exceedances Summary - EQS

Determinant	EQS Threshold	Range of concentrations	Location	Depth (m bgl)	Recorded Concentration
Copper	1 µg/l	<4-4 µg/l	TP103	0.08-1.0	4 µg/l
Sulphide	0.25 µg/l	0.3 µg/l	TP103	0.08-1.0	0.3 µg/l
			TP102	0.05-0.80	0.3 µg/l

Leachate screening tables are presented in *Appendix G.* Analytical certificates are presented in *Appendix D.*

7.5 Contaminant Distributions and Risk to Receptors

Several determinands exceeded the DWS and EQS screening values. However, the risk to controlled waters (groundwater & surface waters) is diminished as a result of the following:

- The site is underlain by a layer of Glacial Till which will act as an aquiclude impeding the flow of water to the underlying Principal Aquifer.
- The distance to the nearest surface water feature is too great for contaminants to spread and the effects of natural attenuation would reduce the concentration of contamination.

7.6 Conclusion

Exceedances of DWS and EQS screening criteria are not considered significant given the likely depth to groundwater, effects of natural attenuation, lack of nearby groundwater abstractions and the absence of any surface water courses that could be in continuity with ground water beneath the site.

8 Ground Gas & Groundwater Risk Assessment

8.1 CIRIA C665 Assessment

Gas monitoring wells were installed in 3No. exploratory hole locations (WS101A, WS103 & WS105) as part of the ground investigation completed by Sutcliffe.

A full copy of all gas monitoring readings and water levels can be found in *Appendix E.*

8.2 Methodology

A ground gas risk assessment has been undertaken in general accordance with the British Standard BS8485:2015+A1:2019, "*Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings".*

The guidance is written specifically for use by designers of gas protection measures relating to the development of a site. Reference has also been made to the CIRIA document C665:2007: "*Assessing Risks Posed by Hazardous Ground Gases to Buildings"* and to the Health and Safety Executive document EH40/2005 "Workplace Exposure Limits".

Our assessment comprises the following:

- Review of results.
- Calculation of Hazardous Gas Flow Rate for Methane (CH_4) and Carbon Dioxide (CO_2)
- Assessment of risks from ground gas.
- Development options.

8.3 Review of Field Data

One (1) round of gas and groundwater monitoring have been undertaken.

Gas monitoring was undertaken using a fully calibrated GFM gas monitor which measured concentrations of oxygen, carbon dioxide and methane as well as gas flow emission rates.

Monitoring of groundwater installations were undertaken using an electronic ATEX Dipmeter.

The findings are summarised below in *Table 8.1* and the results are presented in full in *Appendix E*.

Calibration certificates are also presented in *Appendix E.*

Table 8.1: Summarised Ground Gas and Groundwater Monitoring Data

Location	*MAX Flow Rate (l/hr)*	*MAX CH_4 (%)*	*MAX CO_2 (%)*	*MIN O_2 (%)*	*Atmospheric Pressure*	*Water Level (m bgl)*
01/09/2022						
WS101A	**0.00***	0.0	0.4	20.9	1009.0	1.84
WS103	**0.00**	0.0	0.8	20.0	1009.0	Dry
WS105	**0.00**	0.0	2.0	19.2	1009.0	2.25

** Peak flow recorded is likely to be due to a build-up of pressure caused by rising water trapping the gas within the solid section of pipe; the initial peak flow is not representative of the rate of gas generation within the ground and can be discounted from the dataset.*

8.4 Calculation of Hazardous Gas Flow Rate (HGFR)

A hazardous gas flow rate (HGFR) is derived, representative of the actual flow of gas from the borehole. This, combined with a consideration of other factors such as maximum concentration, is used to characterise the site.

HGFRs for both methane and carbon dioxide based on steady state flow and concentration have been calculated as:

HGFR = maximum gas concentration on visit x measured borehole flow rate on visit.

Results of the calculation are presented in *Appendix E*.

Methane HGFR

The highest calculated HGFR per borehole for methane is presented below:

Table 8.2: Methane HGFR

Ref. No.	Flow (l/h)[1]	CH_4 (%)[2]	HGFR CH_4 (l/h)	Characteristic Situation
WS101A	0.10	0.10	0.0001	CS1
WS103	0.10	0.10	0.0001	CS1
WS105	0.10	0.10	0.0001	CS1

[1] Where maximum recorded flow is <0.1l/h, 0.1l/h has been used as recommended in CIRIA C665.
[2] Where maximum recorded concentration is <0.1%, 0.1% has been used as recommended in BS8485.

Carbon Dioxide HGFR

The highest calculated HGFR per borehole for carbon dioxide is presented below:

Table 8.3: Carbon Dioxide HGFR

Ref. No.	Flow (l/h)[1]	CO_2 (%)[2]	HGFR CO_2 (l/h)	Characteristic Situation
WS101A	0.10	0.40	0.0004	CS1
WS103	0.10	0.80	0.0008	CS1
WS105	0.10	2.00	0.0020	CS1

[1] Where maximum recorded flow is <0.1l/h, 0.1l/h has been used as recommended in CIRIA C665.
[2] Where maximum recorded concentration is <0.1%, 0.1% has been used as recommended in BS8485.

8.5 Ground Gas Risk Assessment

In accordance with CIRIA C665 the ground gas monitoring results indicate that the site has a HGFR of 0.0001l/hr for methane and 0.0020l/hr for carbon dioxide.

This results in the site being classified as Characteristic Situation 1 – Very Low Risk and require no protective measures to be installed.

Notwithstanding, this is a preliminary assessment based on 1No. monitoring visit(s) and will be reviewed on the completion of the monitoring program (6No. visits) within the final report.

8.6 Radon

According to the Envirocheck Report, the site is not within a radon affected area, as <1% of homes are above the action level hence no radon protection measures are necessary.

8.7 Groundwater Protection Measures

Groundwater was observed to be standing at 1.84-2.25m bgl during the monitoring investigation.

Based on the Resting Groundwater Levels (RWLs) no discernible groundwater flow has been recorded.

There is no evidence at this stage of significant perched water either in the Made Ground or in the natural stratum encountered on site that would suggest special groundwater protection measures to the building foundations are required.

In light of these observations, contractors should allow for pumping to develop and maintain dry working conditions, in foundation and service trench excavations.

9 Land Contamination Risks and Remediation Requirements

9.1 Revised Conceptual Model

Based on the findings of the human health, the preliminary conceptual model has been revised as shown in *Figure 7*. The drawing shows all contaminant linkages from the preliminary conceptual model, identifying those which remain relevant.

9.2 Discounted Contaminant Linkages

Controlled Waters – Groundwater Resources

The UK DWS Leachate screening identified concentrations of Lead that could pose a risk to the Principal aquifer. However, due to underlying glacial till this will likely impede migration into the principal aquifer.

Controlled Waters – Surface Water Resources

The EQS Leachate screening identified concentrations of Copper and Sulphide that could pose a risk to the local surface water features. However, due to the distance to the nearest surface water feature, any exceedances are unlikely to impact surface waters.

9.3 Remaining Potential Contaminant Linkages

Long Term Human Health

Elevated levels of Lead, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene all indicate the presence of site wide contamination that will require remediation to be safe for Human Health.

Construction workers may be exposed via dermal contact, ingestion and inhalation of soil / dust during the construction period. Adjacent site users may also be exposed to contaminated soils via inhalation of dust generated during the construction phase.

Ground Gas

Based on the results of the gas monitoring a characteristic situation 1 classification is recommended for the site and as such requires no protective measures to be installed.

Notwithstanding, this is a preliminary assessment based on 1No. monitoring visit(s) and will be reviewed on the completion of the monitoring program (6No. visits) within the final report.

Table 9.1: Summary of Remaining Contaminant Linkages

1. Hazard Identification		2. Hazard Assessment				3. Risk Estimation		4. Risk Evaluation	5. Managing the Risk
Contaminant Source		Pathway		Receptor		Consequence	Probability	Classification	Action required
S1	Potentially contaminated soil on-site	P1	Dermal contact	R1/2	Site users	Medium	Likely	Moderate Risk	Elevated levels of Arsenic, Lead, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene all indicate the presence of site wide contamination that will require remediation to be safe for Human Health. Construction workers may be exposed via dermal contact, ingestion and inhalation of soil / dust during the construction period. Adjacent site users may also be exposed to contaminated soils via inhalation of dust generated during the construction phase.
		P2	Ingestion of soil / soil dust	R1/2	Site users	Medium	Likely	Moderate Risk	
		P3	Inhalation of vapours / soil gas	R1/2	Site users	Severe	Low	Moderate Risk	
		P4	Leaching and migration of contaminants	R3/5	Principal aquifer	Medium	Low	Moderate / Low Risk	No Action Required
		P5	Lateral migration of soil gas / vapours	R1	Site users	Severe	Unlikely	Moderate / Low Risk	Based on the results of the gas monitoring a characteristic situation 1 classification is recommended for the site and as such requires no protective measures to be installed. Notwithstanding, this is a preliminary assessment based on 1No. monitoring visit(s) and will be reviewed on the completion of the monitoring program (6No. visits) within the final report.
				R4	Property	Severe	Unlikely	Moderate / Low Risk	

9.4 Additional Works Required to Assess Outstanding Contaminant Linkages

Based on the proposed development plan, a remediation strategy will be required and will include validation of imported material and site derived material scheduled for reuse would need to be designed to assess the risks to future site users.

On completion of the scheduled demolition works of the existing buildings, further investigation will be required in the area of the building to determine that the underlying material does not cause a human health risk and to determine the spread of any demolition waste and the potential risk it poses.

9.5 Remediation Requirements

Human Health – Soils

Elevated levels of Lead, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(ah)anthracene have been recorded on site and indicate the presence of site wide contamination that will require remediation to be safe for Human Health. This will require the removal of 600mm material from site and the importing of clean tested material to create a capping break layer in garden areas on site, with hardcover providing a break layer in other areas of the site.

Controlled Waters

Exceedances of DWS and EQS screening criteria are not considered significant given the effects of natural attenuation, protection afforded by the overlying Glacial Till and the distance to the nearest surface water features. The site concentrations detected within the Made Grounds are not considered to pose a significant risk to the Principal aquifer or surface water features in the surrounding area.

10 Waste Classification

10.1 Preliminary Waste Classification

A preliminary waste classification was carried out to determine the classification of soil contamination data using HazWasteOnline program, which creates the standard 'Hazardous / Non-Hazardous' classification of soils.

A summary of the preliminary waste classification is provided in *Table 10.1* below.

Table 10.1: Preliminary Waste Classification Summary

Ref. No.	Depth (m bgl)	Classification	Exceeded Contaminant	Value (mg/kg)
BH101	0.10-0.50	Non-Hazardous	-	-
WS105	0.20-0.50	Non-Hazardous	-	-
WS101	0.20-0.50	Non-Hazardous	-	-
WS103	0.40-0.60	Non-Hazardous	-	-
TP103	0.08-1.00	Non-Hazardous	-	-
TP102	0.05-0.80	Non-Hazardous	-	-

The full Waste Classification Report is provided in Appendix H.

Notwithstanding, the final decision on waste classification is determined by the accepting landfill, and consultation with landfill operators be carried out during the development of the SMMP.

10.2 Asbestos

Asbestos containing material was not observed in any samples screened.

10.3 Waste Acceptance Criteria (WAC)

WAC analysis was carried out to determine if the preliminary waste classification results can be downgraded. Results of the WAC analysis are presented in Appendix D and on worksheets in Appendix G.

10.4 Discussion

As discussed above, the Waste Classification Report states that all soils analysed are as 'Non-Hazardous' waste

WAC analysis indicates that soils cannot be downgraded to 'inert' due to an exceedance of loss on ignition and total organic carbon and the classification will remain as 'Non-Hazardous Waste'.

Notwithstanding, the final decision on waste classification is determined by the accepting landfill, and consultation with landfill operators be carried out during the development of the SMMP.

11 Recommendations

11.1 Further works

The following actions are recommended:

- Design a Phase III Remediation & Validation Proposal for submission to planning department.
- Post demolition sampling.
- Design SMMP – management of material on and off site.
- Good hygiene practices should be employed during construction work, in addition, the findings of this investigation should be included within the contractors H&S file and an assessment of risks associated with short term human health completed. No consumption of food or smoking should occur without prior hand washing. If dust is encountered, dust masks should be worn, and dust suppression employed.

12 References

- BRE Special Digest (1991) 'Sulphate and acidic resistance of concrete in the ground' 363
- BRE Special Digest (2001) 'Aggressive Chemical Environment for Concrete (ACEC) Site Classification.
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- CIRIA (2007) C665. 'Assessing risks posed by hazardous ground gases to buildings.' London
- DETR/Partners in Technology (1997) Passive venting of soil gases beneath buildings research report-guide for design.
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- Environment Agency (2000) 'Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination. Research and Development. Technical Report. P5-066/TR', Bristol.
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Appendix A – General Notes

General Notes

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1 Introduction

1.1 Current Guidance

In October 2020, the Environment Agency published the Land Contamination: Risk Management (LCRM) which replaces the now withdrawn Model Procedures for the Management of Contaminated Land (CLR 11).

The original CLR11 guidance was a technical framework for applying a risk management process in dealing with sites affected by contamination. In broad terms, it set out a model of identifying, making decisions on, and taking appropriate and measured action to deal the issue in a consistent way that is in line with current policies, standards and legislation.

Whilst the scope, purpose and framework of CLR11 remains largely the same, LCRM brings it up to date in a more accessible format.

The LCRM Stage 1 Risk Assessment is split into 3 Tiers:

- Tier 1: Preliminary Risk Assessment (PRA)
- Tier 2: General Quantitative Risk Assessment (GQRA)
- Tier 3: Detailed Quantitative Risk Assessment. (DQRA)

2 Tier 1: Preliminary Risk Assessment (PRA)

2.1 Introduction

Tier 1: Preliminary Risk Assessment (PRA) develops the initial conceptual site model to establish whether there are any potentially unacceptable risks and founded upon the use of the S-P-R (Source-Pathway-Receptor) principles in order to establish the presence or potential presence of a pollutant linkage. The PRA will:

- Interpret historical, archived and current information to establish the location of previous site activities.
- Understand the environmental setting of the site.
- Identify areas or zones that may contain distinct and different types of contamination.
- Identify potential contaminant linkages.
- Identify the types of contaminants likely to be present such as ground gases and vapours, solvents, metals.
- Identify any potential health and safety requirements such as immediate risks to human health from ground gases and vapours or unexploded ordnance that could cause asphyxiation or explosion.
- Develop an initial conceptual site model.
- Scope out the likelihood and requirements of a detailed investigation if you progress to the next tier.

This section outlines Sutcliffe Investigations process for the Tier 1 PRA.

2.2 Third Party Information

Third party information obtained from the British Geological Survey (BGS), the Coal Authority, the Local Authority, etc. is presented in the Appendix of the PRA.

2.3 Geology, Mining & Quarrying

In order to establish the geological setting of a site, Sutcliffe Investigations refer to BGS maps for the area and the relevant geological memoir.

A coal mining report is obtained from the Coal Authority. Further information is sourced from the Local Authority and by reference to current and historical OS plans.

2.4 Landfills

Sutcliffe Investigations obtain data from Envirocheck (Landmark Information Group), the Environment Agency and the Local Authority with respect to known areas of landfilling within 250m of the proposed development site. Reference is also made to historical OS plans, which are inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips, etc.

2.5 Radon

Radon is a colourless, odourless gas, which is radioactive. It is formed in strata that contain uranium and radium (most notably granite) and can move through fissures eventually

discharging to atmosphere, or the spaces under and within buildings. Where radon occurs in high concentrations, it can pose a risk to health.

In order to assess potential risks associated with radon gas, Sutcliffe Investigations refer to BRE Report BR211, 2015:

“Radon: guidance on protective measures for new dwellings.”

BR211 provides a preliminary indication of the measures required for a particular site, but it is also often necessary to request a Stage 2 Protective Measures Site Report from the BGS.

The level of protection needed is site-specific and is determined by reference to the radon potential map for the area followed by a geological assessment of the site. This information is contained in the Annexes of BR211.

Annex A – derived from statistical analysis of radon measurements in existing houses carried out by the NRPB and grouped on 5km grid.

Annex B – based on an assessment of the same radon measurements grouped by geological units. The maps show the 5km grid squares underlain completely or in part, by geological units which potentially exceed the action levels for radon protective measures. The grid squares are coded according to highest potential within the square. In many cases the actual geological radon potential varies considerably within a grid square.

Sutcliffe Investigations adopt the following procedure when assessing risk associated with radon.

Firstly, Annex A maps are reviewed to see whether the site requires full, basic or no measures. If the site is in a dark brown square, full radon protection measures are required. If the site is in a light brown square, reference should be made to Annex B.

Secondly, Annex B maps are reviewed to see whether a further geological assessment is required which may result in upgrading the result from Annex A. If a site lies within a shaded square, it may require radon protection and Sutcliffe Investigations request a Stage 2 Protective Measures Site Report from the BGS.

If the site is in a square that is not coloured or shaded in either set of maps, then no radon protection is needed and therefore a BGS Report is not normally necessary.

The BGS geological assessment involves checking whether the site is on or close to a geological unit that has statistically been found to have elevated radon potential. The geological assessment is based on either 1:50,000 or the 1:250,000 scale data. The search area specified as part of the request is increased by 50m in areas where 1:50,000 data is available and by 500m in areas with 1:250,000 scale data to allow for potential inaccuracies in the position of boundaries. The BGS report indicates the highest level of protection required within the search area and its buffer zone.

When requesting a BGS report, Sutcliffe Projects select the search radius carefully, since too large a search radius may result in the inclusion of areas underlain by geological units

of a higher radon potential, thereby giving rise to recommending too high a level of protection.

The report also includes (where available), a list of the geological units included in the assessment. Sutcliffe Investigations check that these actually underlie the site, rather than the buffer zone only.

On the basis of radon measurements in dwellings and on their geological interpretation, the BGS report stipulates the level of protective measures required for the proposed development site, and this could be:

- no measures.
- basic measures; or
- full measures.

Details of these measures are provided in the Hazardous Gas section of this Geo-environmental Report.

2.6 Hydrogeology

Sutcliffe Investigations obtain information from the Environment Agency (EA) and Envirocheck with respect to:

- groundwater quality.
- recorded pollution incidents.
- licensed groundwater abstractions.

Reference is also made to the EA Guidance “Protect groundwater and prevent groundwater pollution” (2024) and Defra Magic Map.

Groundwater protection policy uses aquifer designations that are consistent with the Water Framework Directive.

These designations reflect the importance of aquifers not only in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

Types of aquifer designations are presented hereunder:

Table 2.1: Aquifer Designations

Designation	Description
Principal Aquifer	Layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
Secondary Aquifer	Secondary aquifers are split into 2 groups: - Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers. - Secondary B aquifers are mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers.

Designation	Description
Secondary Undifferentiated Aquifer	Secondary undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.
Unproductive Aquifer	Unproductive strata are largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them.

Groundwater vulnerability is determined by 4 variables:

1. The presence and nature of overlying soil (the weathered zone affected by living organisms; soil in the UK can extend up to 2m in depth). Physical properties of the soil affect the downward passage of water and its ability to attenuate pollutants. The EA refer to a three-fold classification of soil types:

Table 2.2: Leaching Potential Types

Leaching Potential	Definition
Low	Soils in which the pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
Intermediate	Soils which have a moderate ability to attenuate diffuse source pollutants or in which it is possible that some non-absorbed diffuse source pollutants and liquid discharges could penetrate the soil layer.
High	Soils with little ability to attenuate diffuse source pollutants and in which non-absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater.

In urban areas and restored mineral workings the soil information is based on fewer observations than elsewhere. A worst-case vulnerability (H) is therefore assumed for these areas and for current mineral workings by the EA. All are given a designation of HU unless proved otherwise.

2. The presence and nature of Drift, which often overlies bedrock. Where Drift is of substantial thickness and low permeability, it can provide an effective barrier to surface pollutant migration. Permeability Drift is classified as an unproductive aquifer, except where it is in probable hydraulic continuity with a Principal Aquifer, where it is regarded as part of the Principal Aquifer unless proven otherwise by site investigation.

3. The nature of the geological strata (bedrock). Rocks that contain groundwater in exploitable quantities are called aquifers.

4. The depth of the unsaturated zone i.e., that part of the aquifer which lies above the water table.

The EA have also designated Source Protection Zones, which are based on proximity to a groundwater source (springs, wells and abstraction boreholes). The size of a Source Protection Zone may vary from tens to several thousand hectares.

2.7 Hydrology

Sutcliffe obtain information from the Environment Agency and Envirocheck with respect to:

- Surface water quality
- Recorded pollution incidents.
- Licensed abstractions (groundwater & surface waters)
- Licensed discharge consents
- Site susceptibility to flooding.

The EA have set water quality targets for all rivers. These targets are known as River Quality Objectives (RQOs). The water quality scheme used to set RQO planning targets is known as the River Ecosystem scheme. The scheme comprises five classes (RE1 to RE5) which reflect the chemical quality requirements of communities of plants and animals occurring in our rivers.

General Quality Assessment (GQA) grades reflect actual water quality. They are based on the most recent analytical testing undertaken by the EA. There are six GQA grades (denoted A to F) defined by the concentrations of biochemical oxygen demand, total ammonia and dissolved oxygen.

The susceptibility of a site to flooding is assessed by reference to a Flood Map on the Environment Agency's website. These maps provided show natural floodplains – areas potentially at risk of flooding it a river rises above its banks or high tides and stormy seas cause flooding in coastal areas.

There are different kinds of area shown on the Flood Map:

- Dark blue areas could be flooded by the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year, or by a river by a flood that has a 1% (1 in 200) or greater chance of happening each year.
- Light blue areas show the additional extend of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance or occurring each year.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manufactured structures and channel improvements.

The maps also show all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods. The Agency's assessment of the likelihood of flooding from rivers and the sea at any location is based on the presence and effect of all flood defences, predicted flood levels and ground levels.

It should also be noted that as the floodplain shown is the 1 in 100-year (or 1 in 200-year as appropriate) areas outside this may be flooded by more extreme floods (e.g., the 1 in 1000-year flood). Also, parts of the areas shown at risk of flooding will be flooded by lesser floods (e.g., the 1 in 5-year flood). In some places due to the shape of the river valley the smaller floods will flood a very similar extent to larger floods but to a lesser depth.

If a site falls within a floodplain, it is recommended that a flood survey be undertaken by a specialist consultant who can advise on appropriate mitigating measures i.e., raising slab levels, provision of storage, etc.

2.8 COMAH & Explosive Sites

Sutcliffe Investigations obtain information from Envirocheck with respect to COMAH or explosive sites within 1km of the proposed development site. Sutcliffe Investigations' report refers to any that are present and recommends that the Client seeks further advice from the HSE.

Areas around COMAH sites (chemical plants, etc.) are zoned with respect to the implementation of emergency plans. The HSE are a statutory consultee to the local planning authority for all COMAH sites. The COMAH site may have to revise its emergency action plan if development occurs. This might be quite straightforward or could entail significant expenditure. Consequently, the COMAH site may object to a proposed development (although, it is the Local Authority who have final say and they are likely to place more weight on advice from the HSE).

2.9 Preliminary Conceptual Ground Model

The site's environmental setting (and proposed end use) is used by Sutcliffe Investigations to assess the significance of any contamination encountered during the subsequent ground investigation.

A conceptual model is an essential element of any site-specific environmental risk assessment. In this context, they are often simple representations of the hypothesised relationships between sources, pathways and receptors.

A basic conceptual model is developed based on the principles of LCRM and interpretation of information gathered during the Tier 1 review. Thus, this allows the identification of potential contaminant linkages and whether these linkages have the potential to comprise significant harm and/or pollution of controlled waters in relation to the site.

Based on this interpretation, the implications for potential liability associated with soil or water contamination at the site can be evaluated.

- **SOURCES** – the identification of contaminants within the soils and groundwater that represent potential pollution sources.
- **PATHWAYS** – the identification of the potential exposure mechanisms and migration pathways from the potential sources; and
- **RECEPTORS** – the identification of the potential receptors that could be sensitive to harm if exposed to these pollution sources.

3 Tier 2: General Quantitative Risk Assessment (GQRA)

3.1 Introduction

Following the Tier 1 PRA, if one or more potential contaminant linkages have been identified and further assessment is necessary, a GQRA is required to assess the risks potentially impacting the site.

The GQRA will:

- define the objectives for this tier of risk assessment.
- establish if General assessment criteria and a standard set of General assumptions to assess the risks.
- do an intrusive site investigation.
- confirm which linkages are to be assess.
- decide if General assessment criteria are suitable to use.
- assess the risks and update the conceptual site model.
- decide what further action is needed.
- produce a report.

This section outlines the processes that Sutcliffe Investigations utilise during the GQRA.

3.2 Intrusive Site Investigation

General

Sutcliffe Ground Investigations are undertaken in accordance with current UK guidance including:

- BS10175:2011+A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice.
- R&D Technical Report P5-066/TR Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination, 2001 (Environment Agency).
- BS 5930:2015 (+A1:2020) Code of practice for site investigations; and,
- BS EN ISO 22475-1:2021 Geotechnical investigation and testing — Sampling methods and groundwater measurements — Part 1: Technical principles for the sampling of soil, rock and groundwater.

Exploratory hole logs are presented in the Appendices to this Ground Assessment Report. These logs include details of the:

- Investigation technique adopted.
- Samples taken.
- Descriptions of the solid strata and any groundwater encountered.
- Results of any in situ testing.
- Any gas/groundwater monitoring well installed.

Exploratory Hole Locations

Exploratory hole locations are selected by Sutcliffe Investigations, prior to commencement of fieldwork, to provide a representative view of the strata beneath the site and to target potential contaminant sources identified during the preliminary investigation (Phase I PRA).

Additional exploratory locations are often determined by the site engineer in light of the ground conditions actually encountered; this enables better delineation of the depth and lateral extent of organic contamination, poor ground, relict structures, etc.

Investigation Techniques

Ground conditions can be investigated by a number of techniques; the procedures used are in general accordance with BS5930:2015 (+A1:2020), BS1377: 2022 and BS EN ISO 22475-1:2021.

Techniques most commonly used by Sutcliffe Investigations include:

- Machine excavated trial pits, usually equipped with a backacter and a 0.6m wide bucket.
- Cable percussive (Shell & Auger) boreholes, typically using 150mm diameter tools and casing.
- Window or windowless sampling boreholes. Constraints associated with existing buildings, operations and underground service runs can render some sites partly or wholly inaccessible to a mechanical excavator. In such circumstances, window sampling is often the most appropriate technique. A window sampling drilling rig can be manoeuvred in areas of restricted access and results in minimal disturbance of the ground (a 150mm diameter bituminous/cementitious core can be lifted and put to one side). However, it should be noted that window sampling allows only a limited inspection of the ground (in particular, made ground with a significant proportion of coarse material).
- Rotary percussive open-hole probe holes are typically drilled using a tricone rock roller bit with air as the flushing medium. Probe holes are generally lined through made ground with temporary steel casing to prevent hole collapse.

Where installed, gas/groundwater monitoring wells typically comprise a lower slotted section, surrounded by a filter pack of 10mm non-calcareous gravel and an upper plain section surrounded in part by a bentonite seal and in part by gravel or arisings. The top of the plain pipe is cut off below ground level and the monitoring well protected by a square, stopcock type manhole cover set in concrete, or the plain pipe is cut off just above ground level and the well protected by 100mm diameter steel borehole helmet set in concrete.

Monitoring well details, including the location of the response zone and bentonite seal are presented on the relevant exploratory hole logs.

In situ Testing

Where relative densities of granular materials given on the trial pit and window sample logs are based on visual inspection only, they do not relate to any specific bearing capacities. However, wherever possible, Sutcliffe Investigations employ a mackintosh probe to assess relative density. Mackintosh probe results can be related to approximate allowable bearing capacities.

The relative densities of granular materials encountered in cable percussive boreholes are based on Standard Penetration Test (SPT) results. SPTs are carried out boreholes, in accordance with BS 1377 2022.

Where full penetration (600mm) is not possible, “N” values are calculated by linear extrapolation and are shown on the logs as:

“N* = x.”

The strength of cohesive deposits is determined using a hand shear vane.

Shear strength test results reported on trial pit logs are considered to be more reliable than those reported on window sample logs. Significant sample disturbance occurs during window sampling and consequently shear strength results on disturbed window samples are generally lower than results obtained during trial pitting, in-situ or in large, excavated blocks.

Sampling

Representative soil/fill samples are taken at regular intervals from the exploratory holes to assist in description of the ground and to allow selected laboratory testing to be performed. The type of sample taken is dependent on the nature of the stratum and the purpose of the analysis.

Where the soils encountered contain a significant proportion of coarse-grained material, truly representative samples are not typically obtained – only the finer fraction is placed in sample containers. However, a visual estimate of the amount of coarse material is made on site.

NB: Coarse constituents not sampled are defined as: coarse gravel, cobble and boulder (i.e., any ‘particles’ with an average diameter greater than 20mm).

Occasionally, unrepresentative ‘spot’ samples are also taken from some exploratory locations for contaminant analysis, typically where unusual, localised pockets of materials are encountered.

Samples of soil for chemical testing are placed into 1 litre plastic tubs prior to delivery to the selected laboratory. Samples of water are taken in one litre brown glass bottles and stored in cool boxes, at a temperature of approximately 4°C, until delivery to the selected laboratory. Soil/fill samples for organic analysis are also stored in cool boxes.

Groundwater

Where encountered during fieldwork, groundwater is recorded on exploratory hole logs. If monitoring wells are installed, groundwater levels are also recorded on one or more occasions after completion of the fieldwork.

It should be borne in mind that the rapid excavation rates used during a ground investigation may not allow the establishment of equilibrium water levels. Water levels are likely to

fluctuate with season/rainfall and could be substantially higher at wetter times of the year than those found during this investigation.

Long term monitoring of standpipes of piezometers is always recommended if water levels are likely to have a significant effect on earthworks or foundation design.

3.3 Description of Strata

The soils encountered during a ground investigation are described (logged) in general accordance with BS5930:2015 (+A1:2020). The descriptions and depth of strata encountered are presented on the exploratory hole logs and summarised in the Ground Conditions section within the main body of text.

The materials encountered in the trial pits are logged, samples taken, and tests performed on the in-situ materials in the excavation faces, to depths of up to 1.2m; below this depth these operations are conducted at the surface on disturbed samples recovered from the excavation.

3.4 Health and Safety

All work was carried out in accordance with the procedures detailed in the Construction (Design and Management) Regulations 2015, Control of Asbestos Regulations 2012 and Manual Handling Operations Regulations 1992.

3.5 Geotechnical Laboratory Tests

General

Soil Samples are delivered to the laboratory for testing along with a schedule of testing drawn up by Sutcliffe Investigations. All tests are carried out in accordance with **BS 1377-2:2022.**

The test results are presented as received in an Appendix to this Geo-environmental Report. The following laboratory testing are routinely carried out on a selection of samples:

- Atterberg limits & moisture contents
- Particle Size Density (PSD)
- Soluble sulphate & pH

The additional tests are typically only scheduled where significant earthworks regrade is anticipated:

- Grading
- Compaction tests

Atterberg Limits & Moisture Content

The Liquid and Plastic Limits of samples of natural in-situ clay are determined using the cone penetrometer method and the rolling thread test. These tests enable determination of

an average Plasticity Index (PI) for each “type” of clay, although judgement is applied where variable results are reported.

PI can be related to shrinkability (low, medium or high) and then to minimum founding depth. Sutcliffe Investigations typically only consider a soil to be shrinkable if the proportion finer than 63µm is > 35%.

PI results are compared against guidance given in the NHBC Standards, Chapter 4.2 which advocates the use of modified Plasticity Index (I’p) defined as:

I’p = PI x (% <425µm/100)

i.e., if PI is 30%, but the soil contains 80% < 425µm, then I’p = 30 x 80/100 = 24%

It should be noted that in accordance with the requirements of BS 1377, the % passing the 425µm sieve is routinely reported by testing labs.

Sutcliffe Investigations apply engineering judgement where PI results are spread over a range of classifications. Consideration is given to:

- The average values for each particular soil type (i.e., differentiate between residual soil and alluvium)
- The number of results in each class and
- The actual values

Unless the judgement strongly indicates otherwise, Sutcliffe Investigations typically adopt a conservative approach and recommend assumption of the higher classification.

Soluble Sulphate and pH

Sulphates in soil and groundwater are the chemical agents most likely to attack sub-surface concrete, resulting in expansion and softening of the concrete to a mush. Another common cause of concrete deterioration is groundwater acidity.

The rate of chemical attack depends on the concentration of aggressive ions and their replenishment at the reaction surface. The rate of replenishment is related to the presence and mobility of groundwater.

Sutcliffe Investigations refer to **BRE Special Digest 1 (SD1) 3rd Edition (+A1:2017) “Concrete in aggressive ground”**.

SD1 provides definitions of:

- The nature of the site (Greenfield or Brownfield)
- The groundwater regime (static or mobile)
- The Design Sulphate Class (DC Class) and
- The Aggressive Chemical Environment for Concrete (ACEC Class)

Sutcliffe reports clearly state each of the above for the site being considered.

The concentrations of sulphate in aqueous soil/fill extracts are determined in the laboratory using the gravimetric method. The results are expressed in terms of SO_4 for direct comparison with BS 8500-1:2015+A2:2019. The pH value of each sample was determined by the electrometric method.

SD1 also discusses determination of "representative" sulphate concentration from a number of tests. Essentially if <10 samples of a given soil-type have been tested, the highest measured sulphate concentration should be taken. If >10 samples have been tested, the mean of the highest 20% of the sulphate test can be taken. With respect to groundwater, the highest sulphate concentration should always be taken.

With respect to pH (soil & groundwater) the value used is the lowest value if <10 samples have been tested and the mean of the lowest 20% if >10 samples have been tested.

3.6 Contamination Laboratory Analysis & Interpretation (including WAC)

General

An assessment of potential contaminants associated with the former usages of the site is undertaken with reference to:

- Environment Agency Guidance Land Contamination Risk Assessment (LCRM)(2020).
- SCI SC050021/SR3 (2009).
- DEFRA Contaminated Land Statutory Guidance (2012).
- CL:AIRE Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration (2020).
- DEPARTMENT OF THE ENVIRONMENT (DoE) Industry Profile(s).

Common Inorganic Contaminants

These include:

- Metals, most notably cadmium, copper, chromium, mercury, lead, nickel and zinc
- Semi-metals, most notably arsenic, selenium and (water soluble) boron
- Non-metals, most notably sulphur
- Inorganic anions, most notably cyanides (free & complex), sulphates, sulphides and nitrates

With respect to the terminology used by most analytical laboratories:

- Total cyanide = Free cyanide + Complex cyanide
- Total cyanide (CN) is determined by acid extraction, whereas free cyanide is the water-soluble fraction.
- Complex cyanide is "bound" in compounds and is hard to breakdown. Laboratory determination of complex CN involves subjecting the sample to UV digestion for determination of both free and total CN.
- Thiocyanate (SCN) is a different species combined with sulphur.
- Elemental sulphur (S) and free sulphur are the same. Total sulphur is all forms, including that present in sulphates (SO4) sulphates, etc.

- There are 2 forms of chromium (Cr), chromium VI and chromium III. Chromium VI is the more toxic of these. In soils, total chromium is determined by a strong aqua regia acid digestion. Chromium VI is an empirical method based on a water extract test.

Common Organic Contaminants

Petroleum hydrocarbons are a mixture of hydrocarbons produced from the distillation of crude oil. They include Aliphatics (alkanes, alkenes and cycloalkanes), aromatics (single or multi benzene ringed compounds) and hydrocarbon-like compounds containing minor amounts of oxygen, sulphur or nitrogen.

Petroleum hydrocarbons can be grouped based on the carbon number range:-

- **GRO** – Gasoline Range Organics (typically C6 to C10). Also referred to as PRO – Petroleum Range Organics
- **DRO** – Diesel Range Organics (typically C10 to C28)
- **LRO** – Lubricating Oil Range Organics (typically C28 to C40)
- **MRO** – Mineral Oil Range Organics (typically C18 to C44)

Total Petroleum Hydrocarbons (TPH) is also a poorly defined term; some testing laboratories regard TPH as hydrocarbons ranging from C5 – C40, whereas other define TPH as C10 – C30. The composition of a TPH plume migrating through the ground can vary significantly; this is primarily dictated by the nature of the source (e.g., petrol, diesel, engine oil, etc.). Furthermore, different hydrocarbons are affected differently by weathering processes, and this can result in further variation in the chemical composition of the TPH.

Gasoline contains light aliphatic hydrocarbons rapidly (especially within the C4 to C5 range) that will evaporate. The aromatic hydrocarbons in gasoline are primarily benzene, toluene, ethylbenzene and xylenes, referred to as BTEX. Small amounts of polyaromatic hydrocarbons (PAHs) such as benzo(a)pyrene may also be present.

Diesel and light fuel oils have higher molecular weights than gasoline. Consequently, they are less volatile and less water soluble. About 25 to 35% is composed of aromatic hydrocarbons. BTEX concentrations are generally low.

Heavy Fuel Oils are typically dark in colour and considerably more viscous than water. They contain 15 to 40% aromatic hydrocarbons. Polar NSO compounds are also present.

Lubricating Oils are relatively viscous and insoluble in groundwater. They may contain 10 to 30% aromatics, including the heavier PAHs. NSO compounds are also common.

Polycyclic Aromatic Hydrocarbons (PAHs) have more than two fused benzene rings as a structural characteristic. PAH compounds are present in both petrol and diesel, although insignificantly lower concentrations than in coal tars. Certain PAH compounds are carcinogenic (Benzo(a)pyrene) and/or mobile in the environment (naphthalene).

Polychlorinated Biphenyls (PCBs)

Volatile Organic Compounds (VOCs) The volatile organic compound (VOC) headspace concentration of all soil samples was made with a photoionization detector (PID) fitted with

a 10.2 eV lamp. This gives a semi-quantitative VOC concentration record as parts per million (ppm) (Vol/Vol). Prior to the VOC headspace reading, the background levels of VOCs were recorded. The PID was recalibrated with standard isobutylene in zero air after every 10 headspace readings.

Semi-Volatile Organic Compounds (sVOCs) Phenols

Solvents, pesticides, herbicides

Dioxins & furans

Methods of Analysis (Organic Compounds)

Toluene Extractable Matter (TEM) results provide a screening test for organic contamination. The sample is air dried a 30°C and ground prior to addition of the solvent (toluene). The solvent extraction is aggressive and most organic compounds (fuels, oils, tars, humic material, animal fats and vegetable oil) are dissolved, as are some other inorganic contaminants such as sulphur. However, the volatiles (lighter fuel fraction, etc.) are lost during evaporation of the solvent.

Total Petroleum Hydrocarbon (TPH) by IR (also known as mineral oil by some testing laboratories) is undertaken on “as received” samples. Tetrachloroethylene is the solvent, and fluoroscil is used to removed humic material, animal fats and vegetable oil. Consequently, this analysis detects a wide range of “mineral” organics from volatiles (BTEX and gasoline) through diesel and oils to tars (including the very heavy, stable tars such as asphalt and bitumen).

TPH by GC-FID is more refined analytical technique which only detects hydrocarbons (aliphatic and aromatic) in the range C10 to C40 (volatiles, heavy tars, humic material and sulphur are not detected). The laboratory can provide a breakdown of the TPH results into diesel range organics (DRO) and heavier lubricating oil range organics (LRO).

GRO (PRO) by GC-FID analysis detects the more volatile C6 – C9 hydrocarbons (aliphatic and aromatic) including those organic compounds present in petrol.

Speciated VOC (by GC-MS) analysis quantifies the concentrations of 30 USA-EPA priority compounds. These include chlorinated alkanes and alkenes (in the molecular weight range chloroethane to tetrachloroethane); trimethlybenzenes; and the 4 BTEX compounds (benzene, ethylbenzene, toluene & xylene).

Speciated sVOC by (GC-MS) analysis quantifies the concentration of a variety of organic compounds, including the 16 USA-EPA priority PAHs, phenols, 7 USA EPA priority PCB congeners, herbicides & pesticides.

Note: PAHs are hydrocarbons and consequently (where present) will be picked up when scheduling TPH by GC-FID. Naphthalene (the lightest PAH) is also one of the 58 US EPA VOCs.

Speciated TPH by GC-FID provides a “banded ”TPH”, initially split into aromatic and aliphatic fractions and then further divided into fraction specific carbon bandings based upon behavioural characteristics.

Note: Risk assessment models require physiochemical properties (solubilities, toxicitities, etc.) of compounds in order to model their behaviour in the environment. These physiochemical properties cannot be derived from a single "TPH", "GRO" or "DRO" value.

However, the carbon banded fractions can be used in risk assessment models. If the relative proportion of each carbon banding within the "TPH" impact at a site is known, the risks posed by each individual fraction can be assessed and a simple back calculation applied to calculate an overall

"TPH" screening value based upon the percentage weight fraction of each banding present in the "TPH". Specialised analytical techniques and data interpretation skills are required to identify each carbon banding.

Analysis Interpretation

General Quantitative Risk Assessment for human health is in accordance with LCRM and SR (SC050021 series) (DEFRA) guidance as well as CL:AIRE Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration (2020) and comprises the following:

- Selection of appropriate General screening values for human health assessment.
- Creation of relevant datasets from which to undertake the assessment.
- Assessment of contamination distribution and comparison of site data to screening values using relevant statistical tests (in accordance with CIEH guidance).
- Assessment of risks to receptors.
- Determination of requirements for further investigation or remediation.

The purpose of human health risk assessment for planning is to decide whether the land is suitable for the proposed end use and does not pose a risk to human health.

The LQM/CIEH 'Suitable 4 Use Levels' (S4ULs) follow on from the previous LQM/CIEH General Assessment Criteria. The assessment criteria have been updated in line with developments in UK human health risk assessment since 2009, in particular the additional land uses and exposure assumptions presented in Defra's recent C4SL guidance. However, the S4ULs are all based on Health Criteria that represent minimal or tolerable levels of risks to health as described in the Environment Agency's SR2 guidance, ensuring that the resulting assessment criteria are 'suitable for use' under planning.

For each substance, S4ULs have been derived for six General land uses (including the two Public Open Space land uses defined in C4SL guidance) and a range of Soil Organic Matter contents (organic contaminants only).

Note: There is no S4UL provided for Lead contaminant, hence Category 4 Screening Levels (C4SL) are used for the Long-Term Human Health assessment.

Statistical analysis is in accordance with CL:AIRE publication Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration (2020).

Utilising the 2-way confidence interval method, the likelihood of whether the true mean is less than the critical concentration can be calculated and aid with decision making in terms of further investigation or remediation.

This assessment will be using an 85% confidence interval to state that:

There is an 85% chance that the true mean concentration level of the contaminant in this sampling zone lies between x and y mg/kg.

A 99% confidence interval will be used to state that:

There is a 99% chance that the true mean concentration level of the contaminant in this sampling zone will not lie outside x and y mg/kg.

The potential risk to building materials is considered through reference to relevant BRE Digests, with particular emphasis on BRE Special Digest 1 (SD1) 3rd Edition (+A1:2017) “Concrete in aggressive ground (2005)”.

With respect to the interpretation of the calorific values, at present there are no accepted methods to assess whether a sample is combustible and under what circumstances it might smoulder.

Tier 1 Groundwater Risk Assessments are undertaken by comparing leachate concentrations with the appropriate water quality standard.

Based on the Preliminary Risk Assessment and Ground Model for this site, a Level 1 Screening Assessment has been undertaken in general accordance with Environment Agency guidance Environment Agency Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination, 2006.

The methodology comprises:

- Identification of potential contaminant linkages.
  - Selection of appropriate General screening values for controlled waters.
  - Screening measured concentrations of leachate against the General screening values available for UK Drinking Water Standards (UK DWS) and Environmental Quality Standards (EQS).
- Assessment of contaminant distribution and risk to receptors.
  - Identification of contaminants of concern and relevant contaminant linkages.
  - Identification of potential contaminants and contaminant linkages which are no longer of concern.

Depending upon the specific characteristics and environmental setting of the site the appropriate standard is likely to be one of the following:

- SI 2019/526 Environment, Food and Rural Affairs (Miscellaneous Amendments, etc.) Regulations 2019
- Environmental Quality Standards (for Freshwater)
- The Surface Waters (Abstraction for Drinking Water) Regulations

The Tier 1 risk assessment of landfill gas is undertaken through reference to the following documents:

- Approved Document C, Building Regulations 2010
- CIRIA Report 149, “Protecting Development from Methane”, 1995

Should any Tier 1 criteria be exceeded, then three potential courses of action are available. (The first is only applicable in terms of human health, but the second and third could also be applied to groundwater or landfill gas).

- Undertake further statistical following the approach set out in CL:AIRE publication Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration (2020)in order to determine whether contaminant concentrations of inorganic contaminants within soil/fill actually present a risk (only applicable to assessing the risk to human health).
- Based on a qualitative risk assessment, advocate an appropriate level of remediation to "break" the pollutant linkage – for example, the removal of the contaminated materials or the provision of a clean cover.
- Carry out a more detailed quantitative risk assessment in order to determine whether contamination risks actually exist.

3.7 Waste Classification & WAC

In accordance with the Landfill Regulations (2005) and Waste Framework Directive (WFD) (2008/98/EC), it is a statutory requirement that waste is characterised and also meets specific Waste Acceptance Criteria (WAC) prior to disposal at a landfill site. The waste producer has a Duty of Care to ensure that the waste is characterised, and the landfill operator must also be satisfied that a Preliminary Waste Classification, is properly completed before the waste is accepted.

If arisings from constructions works or other waste materials are intended for disposal then there is a requirement to determine prior to disposal whether these would classify as:

- Hazardous
- Non hazardous

The Environment Agency's technical guidance 'Waste Classification (WM3, 1st edition 2015)' which came into force on 1st July 2015, sets out the requirement for the classification. It also provides the basis for the methodology to employ in order to ensure compliance with the regulations.

The classification assesses the composition of the material and determines the concentrations of the hazardous substances in the material. The assessment of contaminated soil (excavated soil) to determine whether it is hazardous waste is dependent on the presence of "hazardous substances" exceeding particular thresholds.

The basic characterisation requires solids testing for potential contaminants, derived from the knowledge of the site history (in the case of contaminated soil) or product safety data sheet (in the case of other waste products).

The characterisation also determines the most appropriate List of Waste (LoW) code(s) for the waste. The List of Wastes (England) Regulations 2005 shows those wastes that are absolute entries (hazardous waste regardless of their concentration) and mirror entries (hazardous waste only if dangerous substances are present above threshold concentrations).

The Waste Acceptance Criteria (WAC) became mandatory in 2005 following the introduction of the Landfill Regulations.

Landfills are classified according to whether they can accept hazardous, non-hazardous or inert wastes. Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.

The WAC testing includes solids and leachate testing to assess which class of landfill the waste can be accepted at.

Currently there are only acceptance criteria for inert, stable-non-reactive hazardous and hazardous landfills. This means that WAC testing is only required for wastes destined for Inert, SNRH and Hazardous landfills.

If material is classified as non-hazardous, there is a choice of sending the material to a non-hazardous or an inert landfill (subject to meeting inert waste acceptance levels). Where the material is classified as hazardous, WAC analysis will be required to demonstrate that it meets the acceptance levels for hazardous landfill or stable non-reactive hazardous (SNRH) landfill.

3.8 Hazardous Gas

General

A ground gas risk assessment is undertaken in general accordance with the British Standard BS8485:2015+A1:2019, “Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings”.

The guidance is written specifically for use by designers of gas protection measures relating to the development of a site. Reference is also made to the CIRIA document C665:2007: “Assessing Risks Posed by Hazardous Ground Gases to Buildings” and to the Health and Safety Executive document EH40/2005 “Workplace Exposure Limits”.

Our assessment comprises the following:

- Review of results.
- Calculation of Hazardous Gas Flow Rate for Methane (CH_4) and Carbon Dioxide (CO_2)
- Assessment of risks from ground gas.
- Development options.

Hazardous gas is considered to be any mixture of potentially explosive, toxic or asphyxiating gases, most notably methane, carbon dioxide and oxygen (deficiency).

In addition, radon, a naturally occurring radioactive gas is also considered.

Assessment of potential risks associated with hazardous gas are based on a review of data obtained from Envirocheck, the Environment Agency and the Local Authority and the British Geological Survey.

Reference is also made to historical OS plans, which are inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips, etc.

Sources

Potential sources of hazardous gas are:

- Landfill sites.
- Made ground, especially where significant depths are present.
- Shallow mineworks associated with coal extraction.
- Geological strata, including peat, organic silts, coal-bearing strata and limestone (reaction with acidic waters), granite (radon)
- Groundwater can sometimes act as a “carrier” for hazardous gas.
- Leakages from pipelines or storage tanks
- Sewers, septic tanks and cess pits

Generation

Wherever biodegradable material is deposited, landfill gas (principally a mixture of methane and carbon dioxide) is likely to be generated by microbial activity. Carbon dioxide is an asphyxiant and toxic; methane is flammable and a mixture containing between 5% and 15%

methane by volume in air is explosive. Landfill gas in the ground is unlikely in itself to pose a significant risk, though it may damage vegetation. However, infiltration of landfill gas into confined spaces (e.g., cellars, services, etc.) may give rise to considerable risk.

There is no typical figure for the length of time that landfill gas will be evolved, but at many sites significant gas generation continues for at least 15 years after the last deposit of waste.

Migration

Gas migration from a landfill site may occur in several ways. It may migrate through adjacent strata; the distance of migration being dependent on the pressure gradients, volume of gas and permeability of the strata. Where there are faults, cavities and fissures within the strata, gas may move considerable distances. Other migration pathways for gas include manufactured features such as mine shafts, roadways and underground services.

Gas migration is influenced by a number of climatic factors, such as atmospheric pressure variations, water table level variations and the influence of a covering of snow or ice over the surface of the site and surrounding area.

Gas Monitoring Procedure

Sutcliffe Investigations adopt a standard gas monitoring procedure, in accordance with CIRIA guidance. This procedure involves the measurement, in the following order of:

- Atmospheric temperature, pressure and ambient oxygen concentration on site immediately prior to and on completion of monitoring.
- Gas emission rate.
- Methane, oxygen and carbon dioxide concentrations using and infra-red gas analyser.
- Standing water level using a Dipmeter.

In addition, ground conditions at each sampling location are recorded together with prevailing weather conditions and any other observations such as any vandalism.

Where samples of gas are required for laboratory analysis, Gresham Tubes are used. Gas concentrations in the well are typically recorded immediately before and after retrieval of a sample.

Appendix B – CIRIA Guidance Document C552 2001

Risk Assessment Methodology

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1 Risk Assessment Methodology

1.1 General

The purpose of this appendix is to describe in detail the concepts underlying the risk-based approach to assessing potentially contaminated land, introduce the roles of key legislation and describe the qualitative methodology adopted for evaluating and characterising risk.

Current best practice in the UK promotes a risk-based approach to dealing with both soil and groundwater contamination. The principal aim of the approach is to ensure protection of human health and the environment in a thorough, transparent and cost-effective manner.

Fundamental to the risk-based approach is the concept that for 'Contaminated Land' to be designated, as a consequence of historic activities, a pathway for contamination must be shown to exist between a source of contamination and a receptor. The combined presence of a source, pathway and a receptor is described as a 'pollutant linkage'.

The concepts associated with a contaminant source, pathway and receptor are defined in DETR Circular 02/2000 'Contaminated Land Environmental Protection Act 1990: Part II A'. A source of contamination may be considered as a 'substance, which is in, on or under land that has the potential to cause harm or to cause pollution of controlled waters'. A receptor can be considered as either 'a living organism, a group of living organisms, an ecological system or a piece of property which is being, or could be harmed, by a contaminant or controlled waters which are being, or could be, polluted by a contaminant'.

A pathway may be considered as one or more routes by, or through, which a receptor is being, or could be, exposed to or affected, by a contaminant. Typical pathways may include migration in groundwater, surface water run-off or infiltration, inhalation, dermal contact and ingestion.

The risks posed by an identified pollutant linkage can often be mitigated by removing the source of contamination, treating the source of contamination, blocking the relevant pathway(s) or by protecting the receptor.

1.2 Principles of Risk Evaluation

The risk evaluation methodology presented below is qualitative in nature and is therefore a subjective method. It is based upon guidance presented in CIRIA publication referenced C552, 'Contaminated land risk assessment - A guide to good practice', 2001 and involves the classification of the following.

- The magnitude of the potential consequence (severity) of risks occurring (Table 1.1).
- The magnitude of the probability (likelihood) of the risk occurring (Table 1.2).
- These are then considered in conjunction to give a risk matrix (Table 1.3).

Table 1.1: Classification of Consequence

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environmental Protection Act 1990, Part IIA. Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem. (Note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentrations of a contaminant from site exceed the generic or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/ services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

Table 1.2: Classification of Probability

Classification	Definition
High Likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term
Low Likelihood	There is a pollution linkage, and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	There is a pollution linkage, but circumstances are such that it is unlikely that an event would occur even in the very long term.
Negligible	There is a pollution linkage, but circumstances and conditions are such that it is extremely unlikely an event would occur, even over an extended period.

Table 1.3: Risk Assessment Matrix

Consequence					
Severe	Medium	Mild	Minor		
Very High Risk	High Risk	Moderate Risk	Moderate / Low Risk	High Likelihood	Probability
High Risk	Moderate Risk	Moderate / Low Risk	Low Risk	Likely	
Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk	Low Likelihood	
Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk	Unlikely	
Low Risk	Very Low Risk	Very Low Risk	Very Low Risk	Negligible Likelihood	

1.3 Risk Classification and Action Requirements

This table categorises the risk of pollution events based on the presence and conditions of pollution linkages. It outlines five levels, ranging from imminent or almost inevitable events with evidence of harm, to scenarios where an event is extremely unlikely even over an extended period. This structured assessment aids in evaluating environmental risks and prioritising mitigation measures accordingly.

Table 1.4: Description of the classified risks and likely action required

Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.

	Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

2 Risk Assessment for the Water Environment

2.1 General

The risk assessment has been developed to provide a greater level of standardisation. It includes relevant elements from TAG (Transport Analysis Guidance) Table 1 relating to the features described as river, floodplain, groundwater and stillwaters, including their attributes/services and selected/modified indicators of quality and possible measures. Two additional columns have been added for 'grading' and 'importance level'.

These columns expand on the limited number of examples provided in TAG Table 2.

2.2 Principles of Risk Evaluation

Table 2.1 has been developed with reference to TAG, Highways Agency's 'New Approach to Appraisal' (NATA), the Water Framework Directive and other sources as referenced in the table.

Table 2.1 here relies on easily available data to avoid unnecessary data collection. Should inadequate data be available a 'worst case' should be assumed. The table is designed to act as a guide to determining importance and to raise the level of compatibility in predicting the significance of impacts on the water environment.

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Table 2.1: Water features, their attributes, indicators of quality, grading and importance

Feature	Attribute / Service	Indicator of Quality	Measure	Grading	Importance Level
River	Water Supply	Chemical water quality	Environment Agency's Chemical General Quality Assessment (GQA)	A	Very High
				B	High
				C-D	Medium
				E-F	Low
		Industrial / agricultural abstractions	Location and volume of abstraction	All abstractions within 2km downstream:	
				>1000m^3/day	Very High
				500-1000m^3/day	High
				50-499m^3/day	Medium
				<50m^3/day	Low
		Drinking water supply	Classification defined within The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996. No 3001[2]	Classification:	
				DW1 or DW2 within critical travel time for pollution downstream	Very High
				DW3 within critical time downstream	High
				Not designated	Medium - Low
	Biodiversity[3]	Biological Water Quality	Environment Agency's Biological GQA[1]	A	Very High
				B	High
				C-D	Medium
				E-F	Low
		Fisheries Quality	Fisheries status as defined within the Freshwater Fish Directive 78/659/EEC	Designated salmonid fishery	Very High
				Designated cyprinid fishery	High
				Undesignated fishery	Medium
				Not a fishery	Low
	Transport and dilution of waste product	Surface Water / effluent discharges	Type of discharges with reference to the EC Dangerous Substances Directive (76/464/EEC and Daughter Directives)	All discharges within 2km up or downstream:	
				List I	Very High - High
				List II	Medium
				Other discharge / no discharge	Medium - Low
	Recreation	Riverside access	Presence / absence of route and importance	National trail / cycleway	Very High
				Regional trail	High
				Definitive footpath / bridleway	Medium
				No route	Low
		Presence of clubs / recreation use	Presence / absence	Club recreation use present	Very High - High - Medium
				No club / recreation use	Low
	Conveyance of flow and material	Presence of water courses	Size of watercourses[5]	Main River > 10m wide	Very High
				Main River < 10m wide	High
				Ordinary watercourse >5m wide	Medium
				Other	Low
Floodplain	Flood defence	Importance in relation to flood defence	Status of flood plain area	Designated washland	Very High
				Active floodplain	High
				Existing defended area	Medium
				Does not flood	Low
			Return period	> (i.e. more frequent then) 1 in 25 years	Very High
				< 1 in 25 years	High
				<1 in 100 years (urban)	Medium
				<1 in 50 years	Medium
				<1 in 200 years	Low

Feature	Attribute / Service	Indicator of Quality	Measure	Grading	Importance Level
Groundwater	Water supply	Industrial / agricultural abstractions	Location and volume of abstraction	All abstraction points within zone of influence of development:	
				>1000m^3/day	Very High
				>500-1000m^3/day	High
				>50-499m^3/day	Medium
				<50m^3/day	Low
		Drinking water supply	Presence of potable public supply or private water supply within zone of influence of development	Public supply	Very High
				Private water supply >10m3/day or serves >50 people6	High
				Other private water supply	Medium
				No supply	Low
		Groundwater vulnerability	Source protection status	Within zone 1,2 or 3 of a source protection zone	Very High-High-Medium
				Not within a source protection zone	Low
			Classification of aquifer vulnerability	Major aquifer with H soils or I soils or U soils.	Very High
				Minor aquifer with H soils or U soils	High
				Major aquifer with L soils.	Medium
				Minor aquifer with L soils or non aquifer.	Low
	Conveyance of flood flows	Acceptance potential of flood flows	Soil type / groundwater table levels8	Gravels with low water table (>1m below infiltration point)	Very High
				Sands with low water table	High
				All soil types with high water table	Medium
				Clay	Low
Stillwaters (lakes and ponds)	Biodiversity[3]	Biological water quality	Classification system to be developed under the Water Framework Directive for ecological status / potential		
		Fisheries quality	Fisheries status as defined within the Freshwater Fish Directive 78/659/EEC	Designated salmonid fishery	Very High-High
				Designated cyprinid fishery	High - Medium
				Undesignated fishery	Medium - Low
				Not a fishery	Low
	Water supply	Use for abstraction	Presence / absence	Abstraction	Very High - High – Medium[9]
				No abstraction	Low
	Recreation	Presence of clubs / recreation use	Presence / absence	Club recreation use present	Very High - High - Medium[4]
				No club / recreation use	Low

1. *If the river is unclassified and hence has no GQA grade, the quality can be measured, or assumptions can be made based on the grade of the nearest classified stretch.*
2. *An importance level of high or very high must also be awarded if the water feature provides more than 10m^3/day of drinking water, or serves more than 50 people, which is the definition used in the Water Framework Directive to define drinking water protected areas.*
3. *Conservation value is not included, as this should be included within an ecology/nature conservation assessment.*
4. *This required judgement on a case-by-case basis because the importance of use by people is being assessed, and they are sensitive to being categorised as unimportant. Careful assessment is thus required, using as much data as possible e.g. on the facilities, their scale and frequency of use, membership levels and economic value.*
5. *An importance level of 'Medium' or greater must also be awarded if a river has a catchment greater than 10km^2, as this means that it will be classified as a water body under the Water Framework Directive. Other measures are available for describing the ability of watercourses to convey flow and material (such as the carrying capacity of the channel for flood flows) and could if necessary be substituted.*
6. *Based on criteria given within the Water Framework Directive for features to be designated as drinking water protected areas.*
7. *Adapted from NRA Policy and Practice for the Protection of Groundwater, Groundwater Vulnerability Sheets, NRA 1994. Because soil information in urban areas is less reliable and based on fewer observations than in rural areas, the worst case is assumed, and such land is classified as being high of leaching potential. H = high, I = Intermediate, L = Low and U = Unclassified leaching potential.*
8. *This uses a coarse basis of permeability together with the ability of the existing ground conditions to accept additional flows. For example, gravels in a river floodplain are unlikely to have a high acceptance potential because of raised water table due to river flows. Sands above a relatively dry substrata would have a high potential; however, caution is required in areas such as chalk with highly fluctuating groundwater levels.*
9. *Depends on use of water, volume abstracted etc. An importance level of 'High' or 'Very high' must be awarded if the water feature provides more than 10m3/day of drinking water, or serves more than 50 people, which is the definition used in the Water Framework Directive to define drinking water protected areas.*

2.3 Risk Classification and Action Requirements

Once Table 2.1 has been used to determine the importance of the environmental attributes that may be affected by a particular development project, Tables 3 and 4 of TAG Unit 3.3.11 can be used to estimate the significance of potential impacts. These tables are reproduced here as Tables 2.2 and 2.3 respectively. Table 2.2 provides a methodology for determining impact magnitude. Table 2.3 is a matrix that allows the significance of the impact to be calculated based on the impact magnitude and the importance of the attribute. The significance of impacts can range from 'insignificant' to 'very significant'

Table 2.2: Criteria for determining impact magnitude

Magnitude	Criteria	Example
Major	Results in loss of attribute	• Loss of EC designated Salmonid fishery • Compromise employment source • Pollution of potable source of abstraction • Change in GQA grade of river reach • Loss of flood storage / increased flood risk
Moderate	Results in impact on integrity of attribute or loss of art of attribute	• Loss in productivity of a fishery • Contribution of a significant proportion of the effluent in the receiving river, but insufficient to change its GQA grade • Reduction in the economic value of the feature
Minor	Results in minor impact on attribute	• Measurable change in attribute, but of limited • size and/or proportion
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use / integrity	• Discharges to watercourse but no significant loss in quality, fishery productivity or biodiversity • No significant impact on the economic value of the feature • No increase in flood risk

Table 2.3: Significance Criteria of Potential Impacts

Magnitude of Potential impact	Importance of Attribute			
	Very High	High	Medium	Low
Major	Very Significant	Very Significant	Significant	Low Significant
Moderate	Very Significant	Significant	Low Significant	Insignificant
Minor	Significant	Low Significant	Insignificant	Insignificant
Negligible	Low Significant	Insignificant	Insignificant	Insignificant

Table 2.4: Significance Criteria of Potential Impacts

Feature	Attribute / Service	Importance Level	Magnitude of Impact	Significance of Impact
River	Water Supply	Very High	Minor	Significant

References

1-The Highways Agency et al, Design Manual for Roads and Bridges, Vol 11. Environmental Assessment, 1993.
2-DETR 'Guidance on the New Approach to Appraisal, 1998.
3-Department for Transport, Transport Analysis Guidance (TAG) 2003

Appendix C – Site Investigation Logs

Sutcliffe

Site	Borehole Number
Apollo Pub, Miles Platting, Manchester	BH101

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			Jigsaw Homes	33585LG
	Location	**Dates** 25/03/2025	**Engineer** Michael Wiggins	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00 0.10-0.50	B1 ES1					(1.00)	MADE GROUND: Grass over dark brown slightly gravelly slightly sandy ashy SILT with frequent rootlets. Gravel is fine to medium rounded to angular of brick plastic and other mixed lithologies. Sand is fine to coarse. (TOPSOIL).		
						1.00			
1.20-1.65 1.20-1.65	SPT N=8 B2			1,2/2,2,2,2		(0.65)	Firm brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.		
						1.65			
2.00-2.45	SPT N=10			1,2/2,3,2,3			Firm to stiff brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.		
3.00-3.45	SPT N=14			2,3/3,3,4,4					
4.00-4.45	U1								
						(6.30)			
5.00-5.45	SPT N=13			3,3/3,3,4,3					
6.00-6.45	SPT N=14			3,3/4,3,3,4					
7.50-7.95	SPT N=17			3,4/4,4,4,5					
						7.95			
						(1.05)	Very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.		
9.00-9.45 9.00-9.45	SPT N=20 B3			4,4/5,5,5,5		9.00	Medium dense brown silty fine to coarse SAND.		

Remarks
Borehole DRY.

Scale (approx)	Logged By
1:50	MW

Figure No. 33585LG.BH101

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Sutcliffe

Site	Borehole Number
Apollo Pub, Miles Platting, Manchester	BH101

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			Jigsaw Homes	33585LG
	Location	**Dates** 25/03/2025	**Engineer** Michael Wiggins	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50-10.95	SPT N=18			4,4/4,5,4,5		(3.40)			
12.00-12.45	SPT N=20			3,4/5,5,5,5		12.40	Very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.		
13.50-13.95	SPT N=29			5,7/7,8,7,7		(3.60)			
15.00-15.45	SPT N=37			7,8/9,9,9,10		16.00	Grey highly weathered laminated MUDSTONE.		
						(0.56)			
16.50-16.56	SPT 21*/39 50/21			21/50		16.56	Terminated at 16.56m		

Remarks
Refused at 16.56m - borehole terminated.

Scale (approx)	Logged By
1:50	MW

Figure No. 33585LG.BH101

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Sutcliffe

Site	Borehole Number
Apollo Pub, Miles Platting, Manchester	BH103

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			Jigsaw Homes	33585LG
	Location	**Dates**	**Engineer**	**Sheet**
		26/03/2025-27/03/2025	Michael Wiggins	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.05	MADE GROUND: Macadam.		
						(0.45)	MADE GROUND: Dark brownish black ashy gravelly SAND. Gravel is fine to coarse subrounded of brick mudstone and sandstone. Sand is fine to coarse.		
						0.50	Firm brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.		
1.20-1.65	SPT N=7			1,2/2,2,2,1		(1.15)			
1.20-1.65	B1								
						1.65	Stiff brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.		
2.00-2.45	SPT N=11			2,3/3,2,3,3					
3.00-3.45	B2								
						(3.80)			
4.00-4.45	SPT N=14			3,3/3,4,3,4					
5.00-5.45	SPT N=16			3,4/4,4,4,4					
						5.45	Very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine rounded of mudstone.		
6.00-6.45	B3								
						(3.95)			
7.50-7.95	SPT N=20			4,5/5,5,5,5					
9.00-9.45	SPT N=21			4,5/6,5,5,5					
						9.40	Dense brown silty fine to coarse SAND.		

Remarks
Borehole DRY.

Scale (approx)	Logged By
1:50	

Figure No.
33585LG.BH103

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Sutcliffe

Site	Borehole Number
Apollo Pub, Miles Platting, Manchester	BH103

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion			Jigsaw Homes	33585LG
	Location	**Dates** 26/03/2025-27/03/2025	**Engineer** Michael Wiggins	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.50-10.95	SPT N=29			5,6/6,7,8,8		(3.00)			
12.00-12.45	SPT N=30			6,7/7,8,8,7		12.40	Very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine rounded to subrounded fine of mudstone.		
13.50-13.95	SPT N=30			5,7/7,7,8,8		(4.70)			
15.00-15.45	SPT N=35			6,7/9,9,8,9					
16.50-16.95	SPT N=40			8,9/10,10,10,10					
17.30-17.34	SPT 25*/4 50/32			25/50		17.10 (0.20) 17.30	Grey highly weathered laminated MUDSTONE. Terminated at 17.30m		

Remarks
Refused at 17.30m - borehole terminated.

Scale (approx)	Logged By
1:50	

Figure No. 33585LG.BH103

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Sutcliffe

Site	Trial Pit Number
Apollo Pub, Miles Platting, Manchester	TP102/SA

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	L - 1.50m W - 0.70m D - 2.00m		Jigsaw Homes	33585LG
	Location	**Dates** 26/03/2025	**Engineer** Michael Wiggins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.05-0.80	ES1				0.05	MADE GROUND: Macadam.		
					(0.75)	MADE GROUND: Dark brownish black gravelly ashy fine to coarse SAND. Gravel is fine to coarse subrounded of brick mudstone and sandstone.		
0.80-1.20	ES2				0.80	Greyish yellow slightly gravelly slightly sandy CLAY. Gravel is fine subrounded to subangular of mudstone and sandstone. Sand is fine.		
					(1.20)			
					2.00	Complete at 2.00m		

Remarks

Trial pit DRY before test water added.

Scale (approx)	Logged By	Figure No.
1:50	AW	33585LG.TP102/SA

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Sutcliffe

Site	Trial Pit Number
Apollo Pub, Miles Platting, Manchester	TP103

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	L - 1.50m W - 0.70m D - 2.70m		Jigsaw Homes	33585LG
	Location	**Dates** 26/03/2025	**Engineer** Michael Wiggins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.08-1.00	ES1				0.05 0.08	MADE GROUND: Grass over black ashy medium to coarse SAND with frequent roots (TOPSOIL).		
					(0.92)	MADE GROUND: Paving slab.		
0.75-1.20	ES2				1.00	MADE GROUND: Brown reddish gravelly medium to coarse SAND. Gravel is medium to coarse angular of brick fragments slag tiles glass coal fragments mudstone.		
					(1.70)	Brown slightly gravelly slightly sandy CLAY. Gravel is fine subrounded of mudstone and coal fragments. Sand is fine to medium.		
					2.70	Complete at 2.70m		

Remarks

Slight groundwater seepage at base of trial pit.

Scale (approx)	Logged By	Figure No.
1:50	MW	33585LG.TP103

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Sutcliffe

Site	Number
Apollo Pub, Miles Platting, Manchester	WS101

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Jigsaw Homes	33585LG
	Location	**Dates** 26/03/2025	**Engineer** Michael Wiggins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.40 0.40-0.60	ES1 ES2				(0.20) 0.20 (0.60) 0.80 (0.20) 1.00 (0.20) 1.20	MADE GROUND: Grass over dark brown slightly gravelly slightly sandy SILT. Gravel is fine to medium angular to subangular of plastic glass and other mixed lithologies. Sand is fine to coarse (TOPSOIL). MADE GROUND: Black ashy sandy fine to medium angular GRAVEL of mixed lithologies. Sand is fine to medium. MADE GROUND: Brown slightly gravelly CLAY. Gravel is fine subrounded of mixed lithologies. MADE GROUND: Whole bricks and concrete fragments. Terminated at 1.20m		

Remarks
Casing sinking in hole - borehole terminated.
Borehole DRY.

Scale (approx)	Logged By
1:50	MW

Figure No. 33585LG.WS101

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Sutcliffe

Site	Number
Apollo Pub, Miles Platting, Manchester	WS101A

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Jigsaw Homes	33585LG
	Location	**Dates** 26/03/2025	**Engineer** Michael Wiggins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.20) 0.20	MADE GROUND: Grass over black sandy ashy medium angular GRAVEL of mixed lithologies. Sand is fine to medium (TOPSOIL).			
					(2.80)	MADE GROUND: Dark brown gravelly clayey ashy fine to coarse SAND. Gravel is fine to coarse angular to subangular of brick sandstone slate slag glass and concrete.			
1.00-1.45	SPT N=9		0,0/2,3,2,2						
2.00-2.45	SPT N=8		Water strike(1) at 2.00m. 2,2/3,2,2,1					▽1	
3.00-3.45	SPT N=2		2,1/1,0,0,1		3.00				
3.00-4.00	U1				(0.45)	Soft greyish brown slightly silty CLAY.			
					3.45				
4.00-4.45	SPT N=6		0,0/0,2,2,2		(1.00)	Firm greyish brown slightly silty CLAY.			
					4.45				
5.00-5.45	SPT N=9		1,2/2,2,2,3		(1.00)	Firm to stiff greyish brown slightly silty CLAY.			
					5.45				
6.00-6.45	SPT N=14		2,2/3,2,4,5		(1.00)	Stiff greyish brown slightly silty CLAY.			
					6.45				
						Complete at 6.45m			

Remarks
Groundwater encountered at 2.00m

Scale (approx)	Logged By
1:50	MW

Figure No.
33585LG.WS101A

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Sutcliffe

Site	Number
Apollo Pub, Miles Platting, Manchester	WS103

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Jigsaw Homes	33585LG
	Location	**Dates** 26/03/2025	**Engineer** Michael Wiggins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					0.10 (0.25)	MADE GROUND: Macadam.			
0.40-0.60	ES1				0.35	MADE GROUND: Light brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.			
1.00-1.45	SPT N=3		0,0/0,1,1,1		(0.95)	MADE GROUND: Dark brown gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of brick and other mixed lithologies. Sand is fine to coarse.			
					1.30 (0.15) 1.45	Soft brown slightly gravelly slightly silty CLAY. Gravel is fine angular of mudstone.			
2.00-3.00	U1		Water strike(1) at 2.00m.			Very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine angular of mudstone.		▽1	
2.00-2.45	SPT N=32		3,3/4,7,10,11						
3.00-3.45	SPT N=27		2,3/4,5,7,11						
4.00-4.45	SPT N=37		3,6/6,6,12,13		(5.00)				
5.00-5.45	SPT N=38		3,6/6,8,11,13						
6.00-6.45	SPT N=34		3,5/6,8,9,11						
					6.45	Complete at 6.45m			

Remarks
Groundwater encountered at 2.00m.

Scale (approx)	Logged By
1:50	MW

Figure No. 33585LG.WS103

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Sutcliffe

Site	Number
Apollo Pub, Miles Platting, Manchester	WS105

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Jigsaw Homes	33585LG
	Location	**Dates** 26/03/2025	**Engineer** Michael Wiggins	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.20) 0.20	MADE GROUND: Grass over dark brown slightly gravelly slightly sandy SILT. Gravel is fine to medium angular to subangular of glass plastic and other mixed lithologies. Sand is fine (TOPSOIL).			
0.20-0.50	ES1				(0.60) 0.80	MADE GROUND: Black sandy ashy fine to medium angular GRAVEL of mixed lithologies. Sand is fine to medium.			
1.00-1.45	SPT N=4		0,0/0,1,1,2		(0.50) 1.30	MADE GROUND: Dark brownish black slightly gravelly SILT. Gravel is medium angular of brick.		▽1	
			Water strike(1) at 1.20m.		(0.15) 1.45	Soft brown slightly gravelly slightly silty CLAY. Gravel is fine to coarse angular to subrounded of mudstone.			
2.00-2.45	SPT N=17		2,2/3,3,5,6		(1.00)	Stiff to very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine to coarse angular to subrounded of mudstone.			
2.00-3.00	U1				2.45	Very stiff brown slightly gravelly slightly silty CLAY. Gravel is fine to coarse angular to subrounded of mudstone.			
3.00-3.45	SPT N=26		2,3/5,5,7,9						
4.00-4.45	SPT N=36		3,6/6,7,10,13		(2.98)				
5.00-5.43	SPT 50/280		6,10/12,13,13,12		5.43	Terminated at 5.43m			

Remarks
Groundwater encountered at 1.20m.
Refused at 5.43m - borehole terminated.

Scale (approx)	Logged By
1:50	MW

Figure No. 33585LG.WS105

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SUTCLIFFE INVESTIGATIONS

TEL: 0151 227 3155
FAX: 0151 227 3156

BRE 365
Soil Infiltration Test

Job No.:	33585LG	**Job Name:**	Former Apollo Public House		
Position Ref.:	TP102/SA	**Date:**	26/03/2025	**Site Team:**	MW/AW

Pit Dimensions

Depth (m)	2.00	**Width (m)**	0.70	**Length (m)**	1.50
Depth to Water (m bgl)		0.90	**Effective Depth (m)**		1.10

Soil Infiltration Test Data

Time (mins)	Depth (m bgl)
0	0.90
1	0.90
10	0.90
20	0.90
180	0.90

Volume Outflowing between 75% and 25% of effective depth

V_{p75-25} = **L** x **B** x D_{75-25}

= 1.50 x 0.70 x 0.55

= 0.17 m^3 (30% Void Allowance Made)

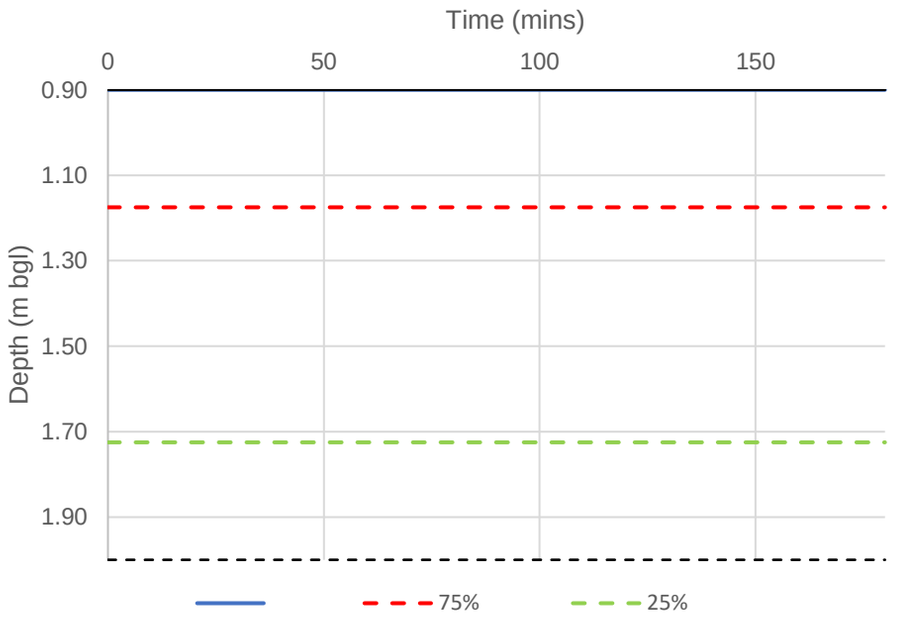
Mean surface area through which outflow occurs, taken to be pit sides to 50% effective depth and including the base of the pit

a_{p50} = L_{side} **Area** + B_{side} **Area** + **Base Area**

= 1.65 + 0.77 + 1.05

= 3.47 m^2

Soil Infiltration Test Graph



Depth at 75% (m bgl)	1.18	**Depth at 25% (m bgl)**	1.73

Infiltration Rate Calculation

t_{p75-25} = **Time at 25%** - **Time at 75%**

= - 60 = -

Soil Infiltration Rate = V_{p75-25} / (a_{p50}*t_{p75-25}*60)

= - m/s = - mm/hr

Comments

Test Failed - The test results did not provide an infiltration rate due to the inefficiencies of the ground to infiltrate. Infiltration testing has been undertaken and failed, therefore alternative drainage solutions will be required.

Appendix D – Analytical Certificates

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Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

Final Test Report

Envirolab Job Number:	25/03345
Issue Number:	1
Date:	16-Apr-25
Client:	Sutcliffe 18-20 Harrington Street Liverpool L2 9QA Cheshire UK, WA6 0AR
Project Manager:	(use) D Evans; D Bowen; A Tosh; W Baldwin/(use)Sar
Project Name:	Apollo Pub Miles Platting
Project Ref:	33585LG
Order No:	10801
Date Samples Received:	31-Mar-25
Date Instructions Received:	1-Apr-25
Date Analysis Completed:	16-Apr-25

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

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

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:

Gemma Berrisford
Deputy Client Services Supervisor

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Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	25/03345/2						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				WS105						
Depth to Top				0.2						
Depth to Bottom				0.50						
Date Sampled				26/03/2025						
Sample Type				Soil						
Sample Matrix Code				5AE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**6.93**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.11**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.03**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**10.5**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**10.9**				3	5	6
PAH Sum of 17 (mg/kg) $_A$	A-T-019	N	N	**9.22**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH_CU_1D_AL}$	A-T-007	N	N	**223**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	0.009	0.010	0.020	**0.100**	0.5	2	25
Barium	A-T-025	N	N	0.048	0.027	0.105	**0.300**	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	0.019	0.013	0.042	**0.140**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.049	0.013	0.108	**0.170**	0.5	10	30
Nickel	A-T-025	N	N	<0.002	<0.002	<0.004	**<0.02**	0.4	10	40
Lead	A-T-025	N	N	0.012	0.027	0.026	**0.260**	0.5	10	50
Antimony	A-T-025	N	N	0.011	0.005	0.024	**0.060**	0.06	0.7	5
Selenium	A-T-025	N	N	0.001	<0.001	0.002	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.024	0.016	0.053	**0.170**	4	50	200
Chloride	A-T-026	N	N	2	<1.00	3	**<10**	800	15000	25000
Fluoride	A-T-026	N	N	0.8	0.7	1.8	**7.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	25	4	55	**65**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	136	47	299	**581**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<20.0	<20.0	<40	**<200**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.6	7.3					
Conductivity (µS/cm)	A-T-037	N	N	273	94					
Mass Sample (kg)				0.209						
Dry Matter (%)	A-T-044	N	N	83.6						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation

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Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details								Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	25/03345/3						
Client Sample Number								Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				WS101						
Depth to Top				0.2						
Depth to Bottom				0.40						
Date Sampled				26/03/2025						
Sample Type				Soil						
Sample Matrix Code				4ABE						
Solid Waste Analysis										
pH (pH Units)$_D$	A-T-031	N	N	**8.23**				-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.15**				-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.04**				-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**8.6**				-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**9.15**				3	5	6
PAH Sum of 17 (mg/kg) $_A$	A-T-019	N	N	**48.6**				100	-	-
Mineral Oil (mg/kg)$_{A\ EH_CU_1D_AL}$	A-T-007	N	N	**118**				500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N	**<0.007**				1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N	**<0.01**				6	-	-
Eluate Analysis				**2:1**	**8:1**	**2:1**	**Cumulative 10:1**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
				mg/l		**mg/kg**				
Arsenic	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	2	25
Barium	A-T-025	N	N	0.008	0.005	0.017	**0.050**	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	<0.004	<0.004	<0.008	**<0.04**	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.0005	<0.001	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	<0.002	<0.002	<0.004	**<0.02**	0.4	10	40
Lead	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.001	<0.002	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.008	0.009	0.017	**0.090**	4	50	200
Chloride	A-T-026	N	N	<1.00	<1.00	<2	**<10**	800	15000	25000
Fluoride	A-T-026	N	N	0.4	0.1	0.9	**1.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	<1.00	<1.00	<2	**<10**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	<20	<20	<40	**<200**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.01	<0.02	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<20.0	<20.0	<40	**<200**	500	800	1000
Leach Test Information										
pH (pH Units)	A-T-031	N	N	7.0	6.9					
Conductivity (µS/cm)	A-T-037	N	N	35	13					
Mass Sample (kg)				0.200						
Dry Matter (%)	A-T-044	N	N	87.7						
Stage 1										
Volume Leachant, L_2 (l)	A-T-046			0.350						
Filtered Eluate Volume, VE_1 (l)	A-T-046			0.200						
Stage 2										
Volume Leachant, L_8 (l)	A-T-046			1.400						

Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation

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Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 25/03345
Issue Number: 1 **Date:** 16 April, 2025

Client: Sutcliffe
18-20 Harrington Street
Liverpool
L2 9QA

Project Manager: (use) D Evans; D Bowen; A Tosh; W Baldwin/(use)Sar
Project Name: Apollo Pub Miles Platting
Project Ref: 33585LG
Order No: 10801
Date Samples Received: 31/03/25
Date Instructions Received: 01/04/25
Date Analysis Completed: 16/04/25

Approved by:

Gemma Berrisford
Deputy Client Services Supervisor

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
% Moisture at <40C$_A$	29.0	20.9	14.4	-	19.9	18.7	-	% w/w	0.1	A-T-044
% Stones >10mm$_A$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH$_D^{M\#}$	5.63	6.93	8.23	-	7.78	8.37	8.07	pH	0.01	A-T-031s
Electrical conductivity @ 20degC$_D$	-	-	-	-	-	-	168	µs/cm	10	A-T-037s
Sulphate (water sol 2:1)$_D^{M\#}$	0.02	0.03	0.04	-	0.02	0.01	-	g/l	0.01	A-T-026s
Sulphate (acid soluble)$_D^{M\#}$	860	550	580	-	470	1200	-	mg/kg	200	A-T-028s
Cyanide (total)$_A^{M\#}$	<1	5	1	-	<1	2	-	mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC$_A$	<0.2	<0.2	<0.2	-	<0.2	<0.2	-	mg/kg	0.2	A-T-050s
Sulphide$_A$	<50	<25	<25	-	<25	<5	-	mg/kg	5	A-T-043-s
Sulphur (elemental)$_D^{M\#}$	7	29	180	-	90	15	-	mg/kg	5	A-T-029s
Organic Matter$_D^{M\#}$	12.2	18.8	15.8	-	7.44	8.67	-	% w/w	0.14	A-T-032s
Arsenic$_D^{M\#}$	17	25	20	-	10	18	-	mg/kg	1	A-T-024s
Boron (water soluble)$_D^{M\#}$	<1.0	2.2	<1.0	-	1.5	<1.0	-	mg/kg	1	A-T-027s
Cadmium$_D^{M\#}$	0.6	0.6	0.7	-	0.5	0.6	-	mg/kg	0.5	A-T-024s
Copper$_D^{M\#}$	46	132	113	-	54	79	-	mg/kg	1	A-T-024s
Chromium$_D^{M\#}$	14	18	29	-	21	21	-	mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	<1	<1	-	<1	<1	-	mg/kg	1	A-T-040s
Chromium (trivalent)	14	18	29	-	21	21	-	mg/kg	1	Calc
Lead$_D^{M\#}$	155	245	195	-	226	443	-	mg/kg	1	A-T-024s
Mercury$_D$	<0.17	0.58	0.30	-	0.37	0.38	-	mg/kg	0.17	A-T-024s
Nickel$_D^{M\#}$	11	24	18	-	24	17	-	mg/kg	1	A-T-024s
Selenium$_D^{M\#}$	1	<1	<1	-	<1	<1	-	mg/kg	1	A-T-024s
Zinc$_D^{M\#}$	72	116	121	-	74	132	-	mg/kg	1	A-T-024s
Redox Potential (water soluble)$_D$	-	-	-	-	-	-	272	mV		Redox

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	NAD	NAD	NAD	-	NAD	NAD	-			A-T-045
Asbestos Matrix (visual)$_{D}$	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope)$_{D}$	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A	N/A	N/A	-	N/A	N/A	-			A-T-045

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
PAH-16MS										
Acenaphthene$_A^{M\#}$	0.03	0.15	0.44	-	0.04	0.20	-	mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01^U	0.05^U	0.05^U	-	0.02^U	0.02^U	-	mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	0.06	0.30	1.31	-	0.11	0.33	-	mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.23	0.75	3.91	-	0.26	1.70	-	mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.21	0.64	4.16	-	0.26	1.77	-	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.31	0.83	4.52	-	0.30	2.29	-	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.14	0.37	2.28	-	0.14	1.40	-	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	0.29	1.66	-	<0.07	0.70	-	mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.30	0.88	4.09	-	0.35	1.94	-	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	0.09	0.50	-	<0.04	0.27	-	mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.44	1.15	8.57	-	0.60	2.78	-	mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	0.01	0.21	0.34	-	0.05	0.10	-	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.14	0.34	2.13	-	0.11	1.19	-	mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	0.25	0.27	-	<0.03	<0.03	-	mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.27	1.77	5.48	-	0.56	1.60	-	mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.45	1.05	8.13	-	0.64	2.46	-	mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	2.59	9.12	47.8	-	3.44	18.8	-	mg/kg	0.01	A-T-019s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
SVOC										
4-Bromophenyl phenyl ether$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachlorobenzene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Diethyl phthalate$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dimethyl phthalate$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dibenzofuran$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Carbazole$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Butylbenzyl phthalate$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-ethylhexyl)phthalate$_A$	-	-	-	-	-	-	<5000	µg/kg	500	A-T-052s
Bis(2-chloroethoxy)methane$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-chloroethyl)ether$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
4-Nitrophenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
3+4-Methylphenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
4-Chloro-3-methylphenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Nitrophenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Methylphenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,2,4-Trichlorobenzene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Chlorophenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,6-Dinitrotoluene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dinitrotoluene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dimethylphenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4-Dichlorophenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4,6-Trichlorophenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2,4,5-Trichlorophenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,4-Dichlorobenzene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,3-Dichlorobenzene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
1,2-Dichlorobenzene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Chloronaphthalene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
2-Methylnaphthalene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Acenaphthylene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Acenaphthene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Anthracene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Benzo(a)anthracene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
Benzo(b)fluoranthene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Benzo(k)fluoranthene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Benzo(a)pyrene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Benzo(ghi)perylene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Chrysene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Fluoranthene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Fluorene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Indeno(1,2,3-cd)pyrene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Phenanthrene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Pyrene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Naphthalene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Dibenzo(ah)anthracene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Bis(2-chloroisopropyl)ether$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Phenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Pentachlorophenol$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
n-Nitroso-n-dipropylamine$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
n-Dioctylphthalate$_A$	-	-	-	-	-	-	<5000	µg/kg	500	A-T-052s
n-Dibutylphthalate$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Nitrobenzene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Isophorone$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachloroethane$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Hexachlorobutadiene$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
SVOC Total (excl. PAH/Phenols/Cresols)$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Phenol Total$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s
Cresol & Chlorinated Phenol Total$_A$	-	-	-	-	-	-	<1000	µg/kg	100	A-T-052s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
VOC										
Dichlorodifluoromethane$_{A}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Chloromethane$_{A}$	-	-	-	-	-	-	<250	µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene)$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Bromomethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Chloroethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Trichlorofluoromethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,1-Dichloroethene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Carbon Disulphide$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Dichloromethane$_{A}$	-	-	-	-	-	-	<125	µg/kg	5	A-T-006s
trans 1,2-Dichloroethene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,1-Dichloroethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
cis 1,2-Dichloroethene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
2,2-Dichloropropane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Bromochloromethane$_{A}^{\#}$	-	-	-	-	-	-	<125	µg/kg	5	A-T-006s
Chloroform$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,1,1-Trichloroethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,1-Dichloropropene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Carbon Tetrachloride$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dichloroethane$_{A}^{\#}$	-	-	-	-	-	-	<50	µg/kg	2	A-T-006s
Benzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Trichloroethene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dichloropropane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Dibromomethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Bromodichloromethane$_{A}^{\#}$	-	-	-	-	-	-	<250	µg/kg	10	A-T-006s
cis 1,3-Dichloropropene$_{A}^{\#}$	-	-	-	-	-	-	<25^{U}	µg/kg	1	A-T-006s
Toluene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
trans 1,3-Dichloropropene$_{A}^{\#}$	-	-	-	-	-	-	<25^{U}	µg/kg	1	A-T-006s
1,1,2-Trichloroethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,3-Dichloropropane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Tetrachloroethene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Dibromochloromethane$_{A}^{\#}$	-	-	-	-	-	-	<75	µg/kg	3	A-T-006s
1,2-Dibromoethane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
Chlorobenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane$_{A}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Ethylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
m & p Xylene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
o-Xylene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Styrene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Bromoform$_{A}^{\#}$	-	-	-	-	-	-	<75	µg/kg	3	A-T-006s
Isopropylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane$_{A}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,2,3-Trichloropropane$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
Bromobenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
n-Propylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
2-Chlorotoluene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
4-Chlorotoluene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
tert-Butylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<50	µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
sec-Butylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
4-Isopropyltoluene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,3-Dichlorobenzene$_{A}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,4-Dichlorobenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
n-Butylbenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dichlorobenzene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP)$_{A}$	-	-	-	-	-	-	<50	µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene$_{A}$	-	-	-	-	-	-	<75	µg/kg	3	A-T-006s
Hexachlorobutadiene$_{A}^{\#}$	-	-	-	-	-	-	<25	µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene$_{A}$	-	-	-	-	-	-	<75	µg/kg	3	A-T-006s
VOC Total$_{A}$	-	-	-	-	-	-	<250	µg/kg	10	A-T-006s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
TPH CWG with Clean Up										
Ali >C5-C6$_A$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8$_A$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1	<1	<1	-	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1	<1	1	-	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<1	1	4	-	<1	2	4	mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	<1	3	5	-	<1	4	6	mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	11	18	41	-	4	27	34	mg/kg	1	A-T-055s
Total Aliphatics$_A$	-	-	-	-	-	-	43	mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<1	1	<1	-	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1	1	1	-	<1	1	1	mg/kg	1	A-T-055s
Aro >C12-C16$_A$	3	5	7	-	1	7	11	mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	7	11	50	-	2	47	80	mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	28	38	236	-	11	257	386	mg/kg	1	A-T-055s
EPH Total Ali & Aro (>C10-C16)$_A^{\#}$	-	-	-	-	-	-	16	mg/kg	1	A-T-055s
EPH Total Ali & Aro (>C16-C35)$_A^{M\#}$	-	-	-	-	-	-	504	mg/kg	1	A-T-055s
Total Aromatics$_A$	-	-	-	-	-	-	478	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	-	-	-	-	-	-	521	mg/kg	1	Calc-As Recd
BTEX and MTBE Total$_A$	-	-	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s
BTEX - Benzene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
VPH total (>C5-C10)$_A$	-	-	-	-	-	-	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
TPH UKCWG with Clean Up										
Ali >C35-C44$_A$	3	5	26	-	<1	20	-	mg/kg	1	A-T-055s
Total Aliphatics$_A$	14	27	76	-	4	53	-	mg/kg	1	Calc-As Recd
Aro >C35-C44$_A$	1	3	25	-	<1	18	-	mg/kg	1	A-T-055s
Total Aromatics$_A$	39	59	319	-	15	331	-	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44)$_A$	54	86	395	-	19	384	-	mg/kg	1	Calc-As Recd

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
Leachate Prep NRA (10:1)$_A$	-	-	-	-	-	*	-			A-T-001
pH (leachable)$_A$	-	-	-	-	-	8.00	-	pH	0.01	A-T-031w
Sulphate (leachable)$_A$	-	-	-	-	-	1.84	-	mg/l	1	A-T-026w
Cyanide (total) (leachable)$_A$	-	-	-	-	-	0.006	-	mg/l	0.005	A-T-042wTCN
Phenols (total by HPLC) (leachable)$_A$	-	-	-	-	-	<0.01	-	mg/l	0.01	A-T-050w
Sulphide (leachable)$_A$	-	-	-	-	-	0.3	-	mg/l	0.1	A-T-043-w
DOC (leachable)$_A$	-	-	-	-	-	<2.0	-	mg/l	2	A-T-032w
Arsenic (leachable)$_A$	-	-	-	-	-	5	-	µg/l	1	A-T-025w
Boron (leachable)$_A$	-	-	-	-	-	<10	-	µg/l	10	A-T-025w
Cadmium (leachable)$_A$	-	-	-	-	-	<1	-	µg/l	1	A-T-025w
Copper (leachable)$_A$	-	-	-	-	-	4	-	µg/l	4	A-T-025w
Chromium (leachable)$_A$	-	-	-	-	-	5	-	µg/l	1	A-T-025w
Chromium (hexavalent) (leachable)$_A$	-	-	-	-	-	<0.05	-	mg/l	0.05	A-T-040w
Chromium (trivalent) (leachable)	-	-	-	-	-	<0.05	-	mg/l	0.05	Calc
Lead (leachable)$_A$	-	-	-	-	-	11	-	µg/l	1	A-T-025w
Mercury (leachable)$_A$	-	-	-	-	-	<0.1	-	µg/l	0.1	A-T-025w
Nickel (leachable)$_A$	-	-	-	-	-	<2	-	µg/l	2	A-T-025w
Selenium (leachable)$_A$	-	-	-	-	-	<1	-	µg/l	1	A-T-025w
Sulphur (elemental/free) (leachable)$_A$	-	-	-	-	-	<0.1	-	mg/l	0.1	A-T-029w
Zinc (leachable)$_A$	-	-	-	-	-	7	-	µg/l	2	A-T-025w
TPH total (>C6-C40) (leachable)$_A$	-	-	-	-	-	<80	-	µg/l	80	A-T-007w

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH101	WS105	WS101	WS101	WS103	TP103	TP103			
Depth to Top	0.1	0.2	0.2	0.4	0.4	0.08	0.75			
Depth To Bottom	0.5	0.5	0.4	0.6	0.6	1.0	1.2			
Date Sampled	25-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25	26-Mar-25			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	5AE	5AE	4ABE	4ABE	6A	4ABE	4ABED			
PAH-16MS (leachable)										
Acenaphthene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Acenaphthylene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Anthracene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Benzo(a)anthracene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Benzo(a)pyrene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Benzo(b)fluoranthene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Benzo(ghi)perylene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Benzo(k)fluoranthene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Chrysene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Dibenzo(ah)anthracene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Fluoranthene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Fluorene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Indeno(123-cd)pyrene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Naphthalene (leachable)$_A$	-	-	-	-	-	<0.03	-	µg/l	0.01	A-T-019w
Phenanthrene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Pyrene (leachable)$_A$	-	-	-	-	-	<0.01	-	µg/l	0.01	A-T-019w
Total PAH-16MS (leachable)$_A$	-	-	-	-	-	<0.03	-	µg/l	0.01	A-T-019w

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
% Moisture at <40C$_A$	10.7	-						% w/w	0.1	A-T-044
% Stones >10mm$_A$	<0.1	<0.1						% w/w	0.1	A-T-044
pH$_D^{M\#}$	8.30	7.89						pH	0.01	A-T-031s
Electrical conductivity @ 20degC$_D$	-	141						µs/cm	10	A-T-037s
Sulphate (water sol 2:1)$_D^{M\#}$	0.04	-						g/l	0.01	A-T-026s
Sulphate (acid soluble)$_D^{M\#}$	330	-						mg/kg	200	A-T-028s
Cyanide (total)$_A^{M\#}$	<1	-						mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC$_A$	<0.2	-						mg/kg	0.2	A-T-050s
Sulphide$_A$	<25	-						mg/kg	5	A-T-043-s
Sulphur (elemental)$_D^{M\#}$	16	-						mg/kg	5	A-T-029s
Organic Matter$_D^{M\#}$	12.2	-						% w/w	0.14	A-T-032s
Arsenic$_D^{M\#}$	11	-						mg/kg	1	A-T-024s
Boron (water soluble)$_D^{M\#}$	<1.0	-						mg/kg	1	A-T-027s
Cadmium$_D^{M\#}$	0.7	-						mg/kg	0.5	A-T-024s
Copper$_D^{M\#}$	49	-						mg/kg	1	A-T-024s
Chromium$_D^{M\#}$	18	-						mg/kg	1	A-T-024s
Chromium (hexavalent)$_D$	<1	-						mg/kg	1	A-T-040s
Chromium (trivalent)	18	-						mg/kg	1	Calc
Lead$_D^{M\#}$	103	-						mg/kg	1	A-T-024s
Mercury$_D$	0.86	-						mg/kg	0.17	A-T-024s
Nickel$_D^{M\#}$	15	-						mg/kg	1	A-T-024s
Selenium$_D^{M\#}$	<1	-						mg/kg	1	A-T-024s
Zinc$_D^{M\#}$	94	-						mg/kg	1	A-T-024s
Redox Potential (water soluble)$_D$	-	192						mV		Redox

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_{D}^{\#}$	NAD	-								A-T-045
Asbestos Matrix (visual)$_{D}$	-	-								A-T-045
Asbestos Matrix (microscope)$_{D}$	-	-								A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A	-								A-T-045

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
PAH-16MS										
Acenaphthene$_A^{M\#}$	0.04	-						mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01^U	-						mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	0.06	-						mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.28	-						mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.30	-						mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.44	-						mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.18	-						mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	0.13	-						mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.44	-						mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	-						mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.50	-						mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	0.02	-						mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.16	-						mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	-						mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.26	-						mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.58	-						mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	3.39	-						mg/kg	0.01	A-T-019s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
SVOC										
4-Bromophenyl phenyl ether$_A$	-	<100						µg/kg	100	A-T-052s
Hexachlorobenzene$_A$	-	<100						µg/kg	100	A-T-052s
Diethyl phthalate$_A$	-	<100						µg/kg	100	A-T-052s
Dimethyl phthalate$_A$	-	<100						µg/kg	100	A-T-052s
Dibenzofuran$_A$	-	<100						µg/kg	100	A-T-052s
Carbazole$_A$	-	<100						µg/kg	100	A-T-052s
Butylbenzyl phthalate$_A$	-	<100						µg/kg	100	A-T-052s
Bis(2-ethylhexyl)phthalate$_A$	-	<500						µg/kg	500	A-T-052s
Bis(2-chloroethoxy)methane$_A$	-	<100						µg/kg	100	A-T-052s
Bis(2-chloroethyl)ether$_A$	-	<100						µg/kg	100	A-T-052s
4-Nitrophenol$_A$	-	<100						µg/kg	100	A-T-052s
3+4-Methylphenol$_A$	-	<100						µg/kg	100	A-T-052s
4-Chloro-3-methylphenol$_A$	-	<100						µg/kg	100	A-T-052s
2-Nitrophenol$_A$	-	<100						µg/kg	100	A-T-052s
2-Methylphenol$_A$	-	<100						µg/kg	100	A-T-052s
1,2,4-Trichlorobenzene$_A$	-	<100						µg/kg	100	A-T-052s
2-Chlorophenol$_A$	-	<100						µg/kg	100	A-T-052s
2,6-Dinitrotoluene$_A$	-	<100						µg/kg	100	A-T-052s
2,4-Dinitrotoluene$_A$	-	<100						µg/kg	100	A-T-052s
2,4-Dimethylphenol$_A$	-	<100						µg/kg	100	A-T-052s
2,4-Dichlorophenol$_A$	-	<100						µg/kg	100	A-T-052s
2,4,6-Trichlorophenol$_A$	-	<100						µg/kg	100	A-T-052s
2,4,5-Trichlorophenol$_A$	-	<100						µg/kg	100	A-T-052s
1,4-Dichlorobenzene$_A$	-	<100						µg/kg	100	A-T-052s
1,3-Dichlorobenzene$_A$	-	<100						µg/kg	100	A-T-052s
1,2-Dichlorobenzene$_A$	-	<100						µg/kg	100	A-T-052s
2-Chloronaphthalene$_A$	-	<100						µg/kg	100	A-T-052s
2-Methylnaphthalene$_A$	-	<100						µg/kg	100	A-T-052s
Acenaphthylene$_A$	-	<100						µg/kg	100	A-T-052s
Acenaphthene$_A$	-	<100						µg/kg	100	A-T-052s
Anthracene$_A$	-	<100						µg/kg	100	A-T-052s
Benzo(a)anthracene$_A$	-	<100						µg/kg	100	A-T-052s

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
Benzo(b)fluoranthene$_A$	-	<100						µg/kg	100	A-T-052s
Benzo(k)fluoranthene$_A$	-	<100						µg/kg	100	A-T-052s
Benzo(a)pyrene$_A$	-	<100						µg/kg	100	A-T-052s
Benzo(ghi)perylene$_A$	-	<100						µg/kg	100	A-T-052s
Chrysene$_A$	-	<100						µg/kg	100	A-T-052s
Fluoranthene$_A$	-	<100						µg/kg	100	A-T-052s
Fluorene$_A$	-	<100						µg/kg	100	A-T-052s
Indeno(1,2,3-cd)pyrene$_A$	-	<100						µg/kg	100	A-T-052s
Phenanthrene$_A$	-	<100						µg/kg	100	A-T-052s
Pyrene$_A$	-	<100						µg/kg	100	A-T-052s
Naphthalene$_A$	-	<100						µg/kg	100	A-T-052s
Dibenzo(ah)anthracene$_A$	-	<100						µg/kg	100	A-T-052s
Bis(2-chloroisopropyl)ether$_A$	-	<100						µg/kg	100	A-T-052s
Phenol$_A$	-	<100						µg/kg	100	A-T-052s
Pentachlorophenol$_A$	-	<100						µg/kg	100	A-T-052s
n-Nitroso-n-dipropylamine$_A$	-	<100						µg/kg	100	A-T-052s
n-Dioctylphthalate$_A$	-	<500						µg/kg	500	A-T-052s
n-Dibutylphthalate$_A$	-	<100						µg/kg	100	A-T-052s
Nitrobenzene$_A$	-	<100						µg/kg	100	A-T-052s
Isophorone$_A$	-	<100						µg/kg	100	A-T-052s
Hexachloroethane$_A$	-	<100						µg/kg	100	A-T-052s
Hexachlorobutadiene$_A$	-	<100						µg/kg	100	A-T-052s
SVOC Total (excl. PAH/Phenols/Cresols)$_A$	-	<100						µg/kg	100	A-T-052s
Phenol Total$_A$	-	<100						µg/kg	100	A-T-052s
Cresol & Chlorinated Phenol Total$_A$	-	<100						µg/kg	100	A-T-052s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
VOC										
Dichlorodifluoromethane$_{A}$	-	<1						µg/kg	1	A-T-006s
Chloromethane$_{A}$	-	<10						µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene)$_{A}^{\#}$	-	<5						µg/kg	1	A-T-006s
Bromomethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Chloroethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Trichlorofluoromethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,1-Dichloroethene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Carbon Disulphide$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Dichloromethane$_{A}$	-	<5						µg/kg	5	A-T-006s
trans 1,2-Dichloroethene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,1-Dichloroethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
cis 1,2-Dichloroethene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
2,2-Dichloropropane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Bromochloromethane$_{A}^{\#}$	-	<5						µg/kg	5	A-T-006s
Chloroform$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,1,1-Trichloroethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,1-Dichloropropene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Carbon Tetrachloride$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,2-Dichloroethane$_{A}^{\#}$	-	<2						µg/kg	2	A-T-006s
Benzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Trichloroethene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,2-Dichloropropane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Dibromomethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Bromodichloromethane$_{A}^{\#}$	-	<10						µg/kg	10	A-T-006s
cis 1,3-Dichloropropene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Toluene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
trans 1,3-Dichloropropene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,1,2-Trichloroethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,3-Dichloropropane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Tetrachloroethene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Dibromochloromethane$_{A}^{\#}$	-	<3						µg/kg	3	A-T-006s
1,2-Dibromoethane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
Chlorobenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane$_{A}$	-	<1						µg/kg	1	A-T-006s
Ethylbenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
m & p Xylene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
o-Xylene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Styrene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Bromoform$_{A}^{\#}$	-	<3						µg/kg	3	A-T-006s
Isopropylbenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane$_{A}$	-	<1						µg/kg	1	A-T-006s
1,2,3-Trichloropropane$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
Bromobenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
n-Propylbenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
2-Chlorotoluene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
4-Chlorotoluene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
tert-Butylbenzene$_{A}^{\#}$	-	<2						µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
sec-Butylbenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
4-Isopropyltoluene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,3-Dichlorobenzene$_{A}$	-	<1						µg/kg	1	A-T-006s
1,4-Dichlorobenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
n-Butylbenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,2-Dichlorobenzene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP)$_{A}$	-	<2						µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene$_{A}$	-	<3						µg/kg	3	A-T-006s
Hexachlorobutadiene$_{A}^{\#}$	-	<1						µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene$_{A}$	-	<3						µg/kg	3	A-T-006s
VOC Total$_{A}$	-	<10						µg/kg	10	A-T-006s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
TPH CWG with Clean Up										
Ali >C5-C6$_A$	<0.01	<0.01						mg/kg	0.01	A-T-022s
Ali >C6-C8$_A$	<0.01	<0.01						mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	<1	<1						mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	<1	<1						mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	<1	<1						mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	2	<1						mg/kg	1	A-T-055s
Ali >C21-C35$_A^{M\#}$	28	2						mg/kg	1	A-T-055s
Total Aliphatics$_A$	-	2						mg/kg	1	Calc-As Recd
Aro >C5-C7$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	<1	<1						mg/kg	1	A-T-055s
Aro >C10-C12$_A$	<1	<1						mg/kg	1	A-T-055s
Aro >C12-C16$_A$	2	2						mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	4	6						mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	20	17						mg/kg	1	A-T-055s
EPH Total Ali & Aro (>C10-C16)$_A^{\#}$	-	2						mg/kg	1	A-T-055s
EPH Total Ali & Aro (>C16-C35)$_A^{M\#}$	-	24						mg/kg	1	A-T-055s
Total Aromatics$_A$	-	25						mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_A$	-	28						mg/kg	1	Calc-As Recd
BTEX and MTBE Total$_A$	-	<0.01						mg/kg	0.01	A-T-022s
BTEX - Benzene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
VPH total (>C5-C10)$_A$	-	<0.01						mg/kg	0.01	A-T-022s

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
TPH UKCWG with Clean Up										
Ali >C35-C44$_A$	10	-						mg/kg	1	A-T-055s
Total Aliphatics$_A$	40	-						mg/kg	1	Calc-As Recd
Aro >C35-C44$_A$	7	-						mg/kg	1	A-T-055s
Total Aromatics$_A$	34	-						mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C44)$_A$	74	-						mg/kg	1	Calc-As Recd

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
Leachate Prep NRA (10:1)$_A$	*	-								A-T-001
pH (leachable)$_A$	7.90	-						pH	0.01	A-T-031w
Sulphate (leachable)$_A$	4.44	-						mg/l	1	A-T-026w
Cyanide (total) (leachable)$_A$	<0.005	-						mg/l	0.005	A-T-042wTCN
Phenols (total by HPLC) (leachable)$_A$	<0.01	-						mg/l	0.01	A-T-050w
Sulphide (leachable)$_A$	0.3	-						mg/l	0.1	A-T-043-w
DOC (leachable)$_A$	<2.0	-						mg/l	2	A-T-032w
Arsenic (leachable)$_A$	5	-						µg/l	1	A-T-025w
Boron (leachable)$_A$	<10	-						µg/l	10	A-T-025w
Cadmium (leachable)$_A$	<1	-						µg/l	1	A-T-025w
Copper (leachable)$_A$	<4	-						µg/l	4	A-T-025w
Chromium (leachable)$_A$	<1	-						µg/l	1	A-T-025w
Chromium (hexavalent) (leachable)$_A$	<0.05	-						mg/l	0.05	A-T-040w
Chromium (trivalent) (leachable)	<0.05	-						mg/l	0.05	Calc
Lead (leachable)$_A$	2	-						µg/l	1	A-T-025w
Mercury (leachable)$_A$	<0.1	-						µg/l	0.1	A-T-025w
Nickel (leachable)$_A$	<2	-						µg/l	2	A-T-025w
Selenium (leachable)$_A$	<1	-						µg/l	1	A-T-025w
Sulphur (elemental/free) (leachable)$_A$	<0.1	-						mg/l	0.1	A-T-029w
Zinc (leachable)$_A$	5	-						µg/l	2	A-T-025w
TPH total (>C6-C40) (leachable)$_A$	<80	-						µg/l	80	A-T-007w

Envirolab Job Number: 25/03345

Client Project Name: Apollo Pub Miles Platting

Client Project Ref: 33585LG

Lab Sample ID	25/03345/8	25/03345/9						Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP102	TP102								
Depth to Top	0.05	0.8								
Depth To Bottom	0.8	1.2								
Date Sampled	26-Mar-25	26-Mar-25								
Sample Type	SOIL	SOIL								
Sample Matrix Code	4ABE	5AE								
PAH-16MS (leachable)										
Acenaphthene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Acenaphthylene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Anthracene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Benzo(a)anthracene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Benzo(a)pyrene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Benzo(b)fluoranthene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Benzo(ghi)perylene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Benzo(k)fluoranthene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Chrysene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Dibenzo(ah)anthracene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Fluoranthene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Fluorene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Indeno(123-cd)pyrene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Naphthalene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Phenanthrene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Pyrene (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w
Total PAH-16MS (leachable)$_A$	<0.01	-						µg/l	0.01	A-T-019w

Report Notes

General

•This report shall not be reproduced, except in full, without written approval from Envirolab.
•The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
•The results reported herein relate only to the material supplied to the laboratory.
•The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
•Analytical results reflect the quality of the sample at the time of analysis only.
•Opinions and Interpretations expressed are outside our scope of accreditation.
•A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
•If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
•Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
Superscript "U"	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript "A"	Analysis performed on as-received Sample
Subscript "D"	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript "D" on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript "^"	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.
Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). "TRACE" will be reported as a quantification result.
PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25^0C / 11550µS/cm @ 20^0C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Sutcliffe, 18-20 Harrington Street, Liverpool, L2 9QA

Project No: 25/03345

Date Received: 01/04/2025 (am)

Project: Apollo Pub Miles Platting

Cool Box Temperatures (°C): 9.7

Clients Project No: 33585LG

Lab Sample ID	25/03345/1
Client Sample No	
Client Sample ID/Depth	BH101 0.1-0.5m
Date Sampled	25/03/25
Deviation Code	
F	✓

Key
F *Maximum holding time exceeded between sampling date and analysis for analytes listed below*

HOLDING TIME EXCEEDANCES

Lab Sample ID	25/03345/1
Client Sample No	
Client Sample ID/Depth	BH101 0.1-0.5m
Date Sampled	25/03/25
Cyanide (total)	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	25/03345/8	25/03345/9
Client Sample No									
Client Sample ID/Depth	BH101 0.1-0.5m	WS105 0.2-0.5m	WS101 0.2-0.4m	WS101 0.4-0.6m	WS103 0.4-0.6m	TP103 0.08-1.0m	TP103 0.75-1.2m	TP102 0.05-0.8m	TP102 0.8-1.2m
Date Sampled	25/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25
A-T-004s		11/04/2025	11/04/2025						
A-T-006s							08/04/2025		04/04/2025
A-T-007s		11/04/2025	11/04/2025						
A-T-007w						10/04/2025		10/04/2025	
A-T-019s	08/04/2025	08/04/2025	08/04/2025		08/04/2025	08/04/2025		08/04/2025	
A-T-019w						08/04/2025		08/04/2025	
A-T-022s	07/04/2025	07/04/2025	07/04/2025		07/04/2025	07/04/2025	07/04/2025	07/04/2025	07/04/2025
A-T-024s	15/04/2025	15/04/2025	15/04/2025		15/04/2025	15/04/2025		15/04/2025	
A-T-025w		14/04/2025	14/04/2025			08/04/2025		08/04/2025	
A-T-026s	09/04/2025	09/04/2025	09/04/2025		09/04/2025	09/04/2025		09/04/2025	
A-T-026w		14/04/2025	14/04/2025			08/04/2025		08/04/2025	
A-T-026w (F)		14/04/2025	14/04/2025						
A-T-027s	09/04/2025	09/04/2025	09/04/2025		09/04/2025	09/04/2025		09/04/2025	
A-T-028s	14/04/2025	14/04/2025	14/04/2025		14/04/2025	14/04/2025		14/04/2025	
A-T-029s	09/04/2025	09/04/2025	09/04/2025		09/04/2025	09/04/2025		09/04/2025	
A-T-029w						09/04/2025		09/04/2025	
A-T-030s		15/04/2025	16/04/2025						
A-T-031s	09/04/2025	09/04/2025	09/04/2025		09/04/2025	14/04/2025	14/04/2025	14/04/2025	14/04/2025
A-T-031w		14/04/2025	14/04/2025			08/04/2025		08/04/2025	
A-T-032s	10/04/2025	10/04/2025	16/04/2025		10/04/2025	10/04/2025		10/04/2025	
A-T-032w		14/04/2025	14/04/2025			10/04/2025		10/04/2025	
A-T-037s							09/04/2025		09/04/2025
A-T-037w		14/04/2025	14/04/2025						
A-T-040s	09/04/2025	09/04/2025	09/04/2025		09/04/2025	09/04/2025		09/04/2025	
A-T-040w						08/04/2025		08/04/2025	
A-T-042sTCN	10/04/2025	10/04/2025	10/04/2025		10/04/2025	10/04/2025		10/04/2025	
A-T-042wTCN						09/04/2025		09/04/2025	
A-T-043-s	09/04/2025	09/04/2025	09/04/2025		09/04/2025	09/04/2025		09/04/2025	
A-T-043-w						08/04/2025		08/04/2025	
A-T-044	09/04/2025	09/04/2025	09/04/2025	09/04/2025	09/04/2025	09/04/2025	09/04/2025	09/04/2025	09/04/2025
A-T-045	04/04/2025	04/04/2025	04/04/2025		04/04/2025	04/04/2025		04/04/2025	
A-T-050s	07/04/2025	07/04/2025	04/04/2025		04/04/2025	04/04/2025		07/04/2025	

Lab Sample ID	25/03345/1	25/03345/2	25/03345/3	25/03345/4	25/03345/5	25/03345/6	25/03345/7	25/03345/8	25/03345/9
Client Sample No									
Client Sample ID/Depth	BH101 0.1-0.5m	WS105 0.2-0.5m	WS101 0.2-0.4m	WS101 0.4-0.6m	WS103 0.4-0.6m	TP103 0.08-1.0m	TP103 0.75-1.2m	TP102 0.05-0.8m	TP102 0.8-1.2m
Date Sampled	25/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25	26/03/25
A-T-050w		14/04/2025	14/04/2025			08/04/2025		08/04/2025	
A-T-052s							10/04/2025		10/04/2025
A-T-055s	09/04/2025	09/04/2025	09/04/2025		09/04/2025	09/04/2025	09/04/2025	09/04/2025	09/04/2025
A-T-ANCs		15/04/2025	15/04/2025						
Calc	15/04/2025	15/04/2025	15/04/2025		15/04/2025	15/04/2025		15/04/2025	
Calc-As Recd	09/04/2025	09/04/2025	09/04/2025		09/04/2025	09/04/2025	09/04/2025	09/04/2025	09/04/2025
Calc-no stones		14/04/2025	14/04/2025						
Probe (w)		14/04/2025	14/04/2025						
Redox							09/04/2025		09/04/2025

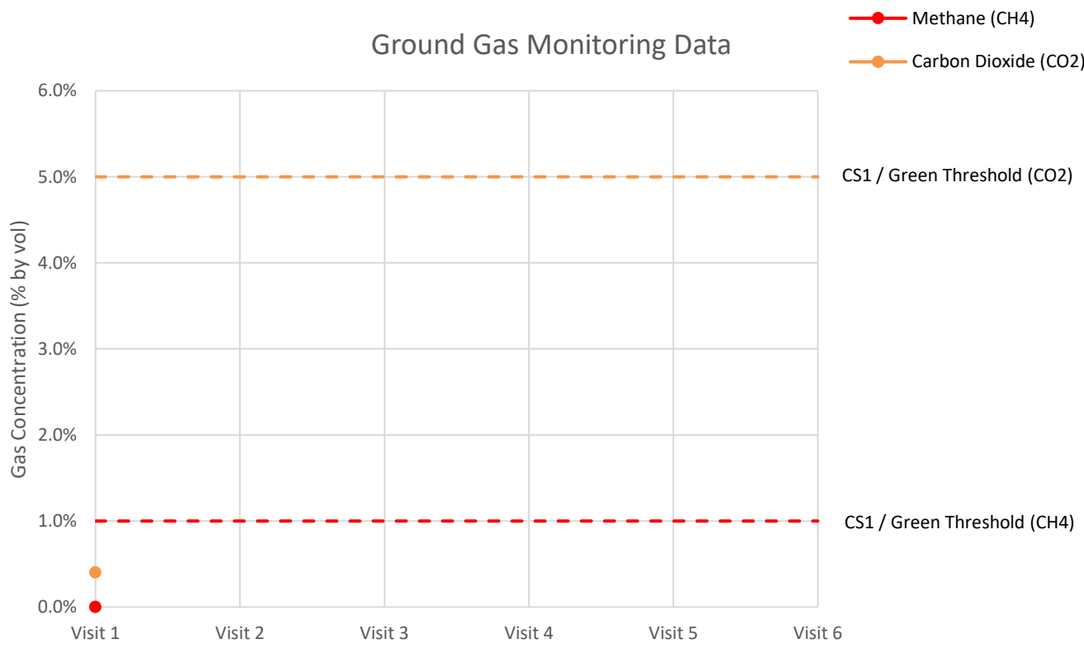
The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

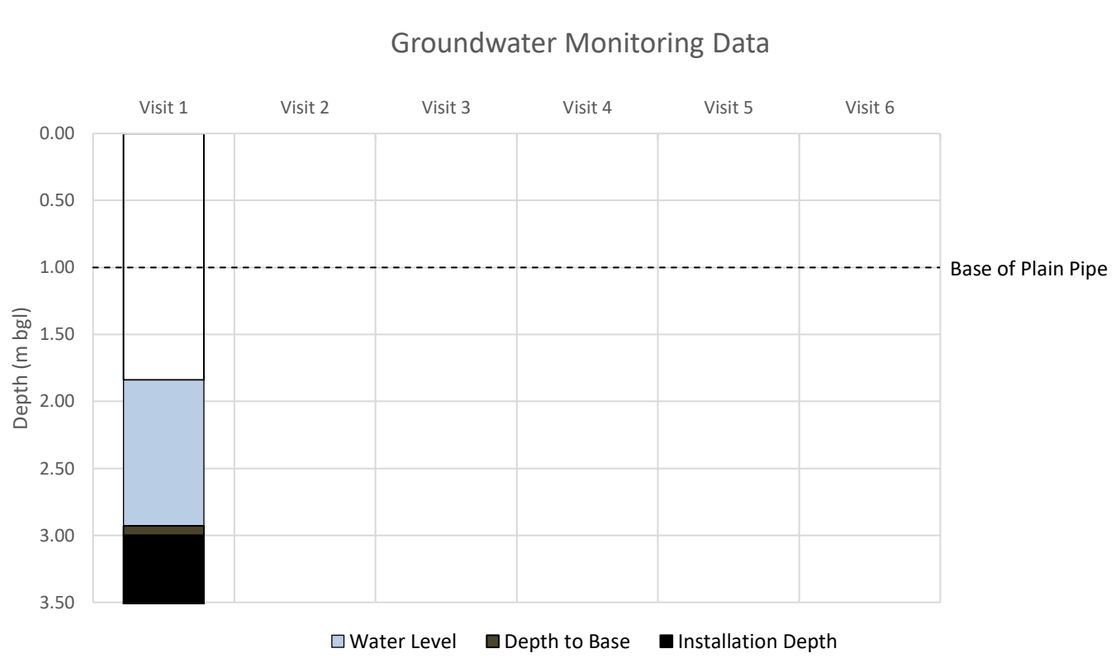
End of Report

Appendix E – Ground Gas & Groundwater Monitoring Data

SUTCLIFFE INVESTIGATIONS	Site Details		Installation Details		Position Ref.:
	Job No.:	33585LG	Installation Date:	26/03/2025	WS101A
TEL: 0151 227 3155	Site Name:	Apollo Pub, Miles Platting	Installation Depth (m bgl):	3.00	
FAX: 0151 227 3156	Client:	Jigsaw	Base of Plain Pipe (m bgl):	1.00	

Site Monitoring Visit Details							Gas and Groundwater Monitoring Data							Ground Gas Risk Assessment				
Visit No.	Visit Date	Logged By	Weather	Atmospheric Pressure	Pressure Trend	Relative Pressure (mb)	Flow Rate (l/h)	Max CH_4 (% LEL)	Max CH_4 (% by vol)	Max CO_2 (% by vol)	Min O_2 (% by vol)	Water Level (m bgl)	Depth to Base (m bgl)	Gas Type	Max Flow Rate[2] (l/h)	Max Gas Conc.[3] (% by vol)	HGFR[1] (l/h)	Characteristic Situation (CS)
Visit 1	01/05/2025	AW	Sunny, warm	1009	rising	-	0.00	0.0%	0.0%	0.4%	20.9%	1.84	2.93	CH_4	0.10	0.10	0.0001	CS1
Visit 2	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 3	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 4	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-	CO_2	0.10	0.40	0.0004	CS1
Visit 5	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 6	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					





Instrument Used:	Accuracy of Instrument (% by volume)	CH_4	CO_2	O_2	Comments:
GFM		± 0.5% @ 5%	± 0.5% @ 5%	± 1.0%	
		± 1.0% @15%	± 1.0% @15%		
		±3.0% @>15%	±3.0% @>15%		

[1] Hazardous Gas Flow Rate Assessment Methodology (HGFR) is the calculation of the maximum gas concentration for the location x maximum flow rate for the location.

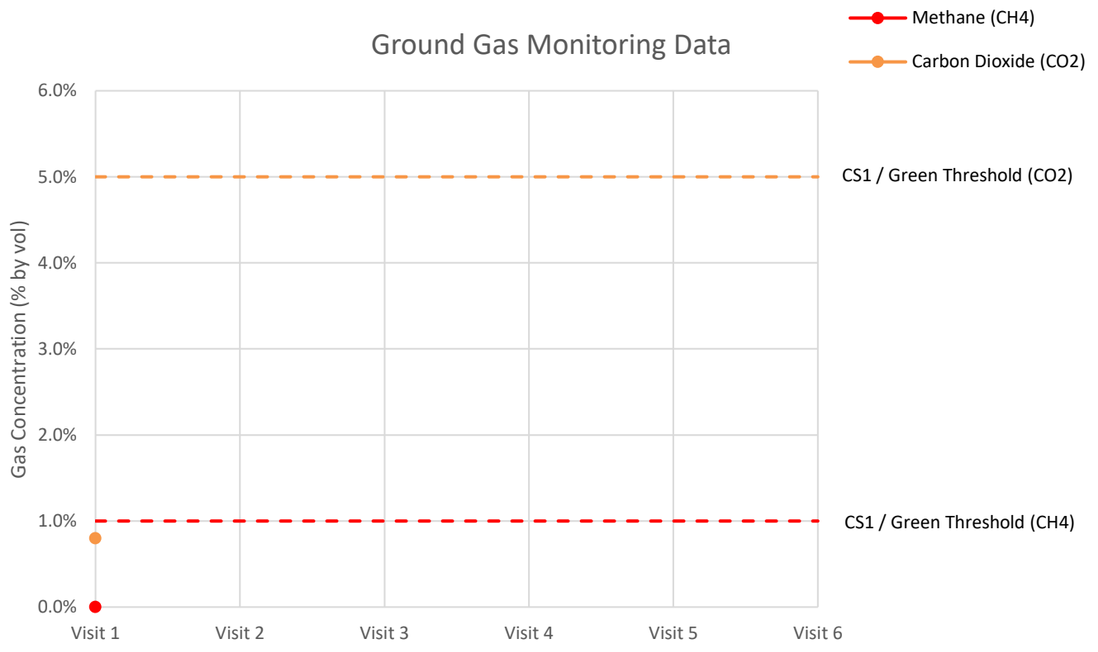
[2] Where maximum recorded flow is <0.1l/h, 0.1l/h has been used to calculate HGFR as recommended in CIRIA C665.

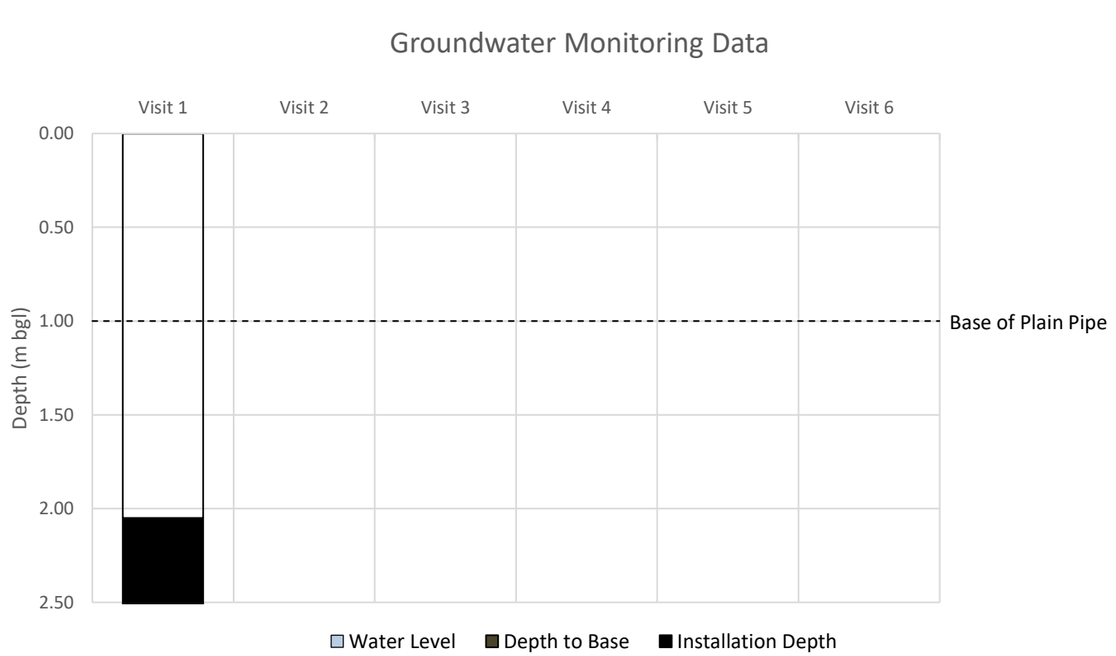
[3] Where maximum recorded concentration is <0.1%, 0.1% has been used as recommended in BS8485.

* Peak flow recorded is likely to be due to a build-up of hydraulic pressure caused by rising water trapping the gas within the solid section of pipe; the initial peak flow is not representative of the rate of gas generation within the ground and can be discounted from the dataset.

SUTCLIFFE INVESTIGATIONS	Site Details		Installation Details		Position Ref.:
	Job No.:	33585LG	Installation Date:	26/03/2025	WS103
TEL: 0151 227 3155	Site Name:	Apollo Pub, Miles Platting	Installation Depth (m bgl):	2.00	
FAX: 0151 227 3156	Client:	Jigsaw	Base of Plain Pipe (m bgl):	1.00	

Site Monitoring Visit Details							Gas and Groundwater Monitoring Data							Ground Gas Risk Assessment				
Visit No.	Visit Date	Logged By	Weather	Atmospheric Pressure	Pressure Trend	Relative Pressure (mb)	Flow Rate (l/h)	Max CH_4 (% LEL)	Max CH_4 (% by vol)	Max CO_2 (% by vol)	Min O_2 (% by vol)	Water Level (m bgl)	Depth to Base (m bgl)	Gas Type	Max Flow Rate[2] (l/h)	Max Gas Conc.[3] (% by vol)	HGFR[1] (l/h)	Characteristic Situation (CS)
Visit 1	01/05/2025	AW	Sunny, warm	1009	rising	-	0.00	#N/A	0.0%	0.8%	20.0%	Dry	2.05	CH_4	0.10	0.10	0.0001	CS1
Visit 2	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 3	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 4	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-	CO_2	0.10	0.80	0.0008	CS1
Visit 5	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 6	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					





Instrument Used:	Accuracy of Instrument (% by volume)	CH_4	CO_2	O_2	Comments:
GFM		± 0.5% @ 5%	± 0.5% @ 5%	± 1.0%	
		± 1.0% @15%	± 1.0% @15%		
		±3.0% @>15%	±3.0% @>15%		

[1] Hazardous Gas Flow Rate Assessment Methodology (HGFR) is the calculation of the maximum gas concentration for the location x maximum flow rate for the location.

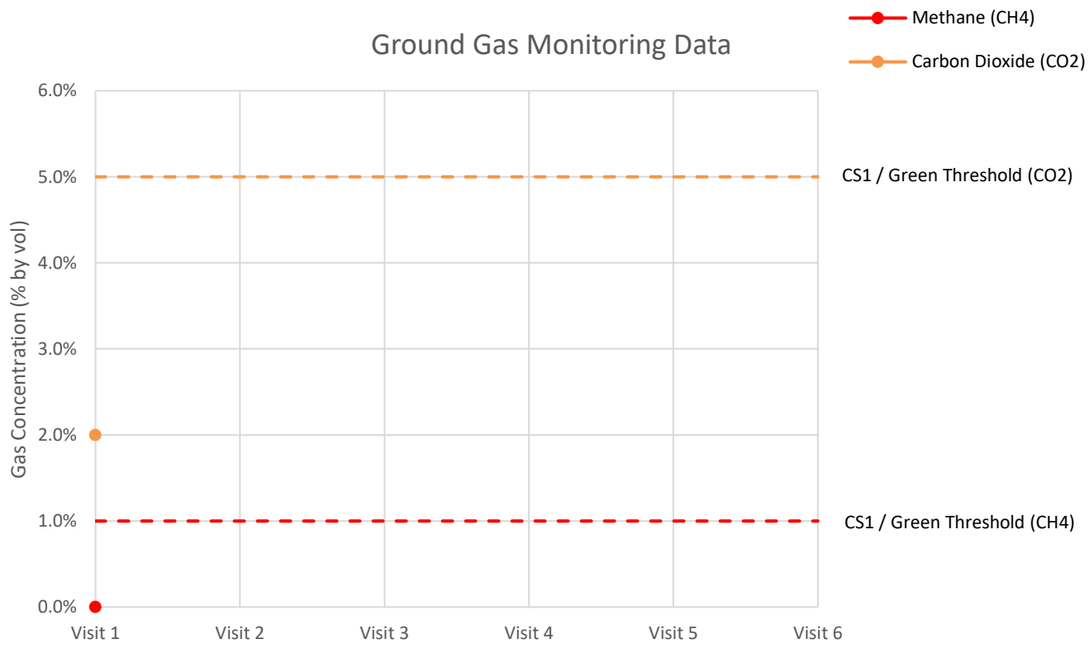
[2] Where maximum recorded flow is <0.1l/h, 0.1l/h has been used to calculate HGFR as recommended in CIRIA C665.

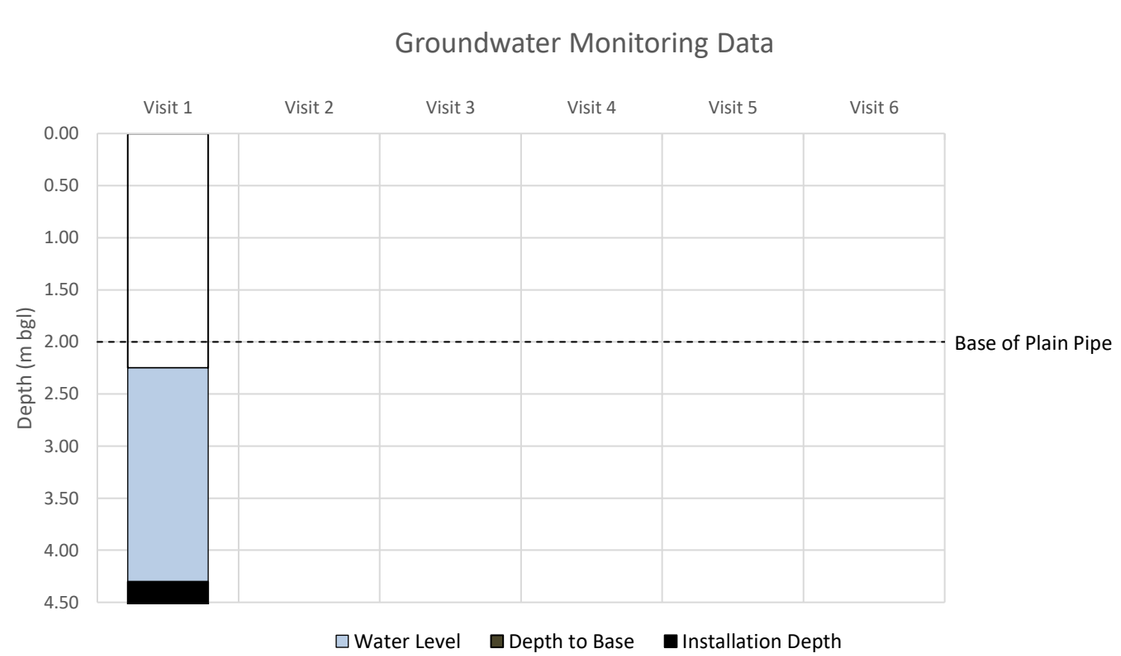
[3] Where maximum recorded concentration is <0.1%, 0.1% has been used as recommended in BS8485.

* Peak flow recorded is likely to be due to a build-up of hydraulic pressure caused by rising water trapping the gas within the solid section of pipe; the initial peak flow is not representative of the rate of gas generation within the ground and can be discounted from the dataset.

SUTCLIFFE INVESTIGATIONS	Site Details		Installation Details		Position Ref.:
	Job No.:	33585LG	Installation Date:	26/03/2025	WS105
TEL: 0151 227 3155	Site Name:	Apollo Pub, Miles Platting	Installation Depth (m bgl):	4.00	
FAX: 0151 227 3156	Client:	Jigsaw	Base of Plain Pipe (m bgl):	2.00	

Site Monitoring Visit Details							Gas and Groundwater Monitoring Data							Ground Gas Risk Assessment				
Visit No.	Visit Date	Logged By	Weather	Atmospheric Pressure	Pressure Trend	Relative Pressure (mb)	Flow Rate (l/h)	Max CH_4 (% LEL)	Max CH_4 (% by vol)	Max CO_2 (% by vol)	Min O_2 (% by vol)	Water Level (m bgl)	Depth to Base (m bgl)	Gas Type	Max Flow Rate[2] (l/h)	Max Gas Conc.[3] (% by vol)	HGFR[1] (l/h)	Characteristic Situation (CS)
Visit 1	01/05/2025	AW	Sunny, warm	1009	rising	-	0.00	#N/A	0.0%	2.0%	19.2%	2.25	4.30	CH_4	0.10	0.10	0.0001	CS1
Visit 2	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 3	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 4	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-	CO_2	0.10	2.00	0.0020	CS1
Visit 5	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					
Visit 6	-	-	-	-	-	-	-	#N/A	#N/A	#N/A	#N/A	-	-					





Instrument Used:	Accuracy of Instrument (% by volume)	CH_4	CO_2	O_2	Comments:
GFM		± 0.5% @ 5%	± 0.5% @ 5%	± 1.0%	
		± 1.0% @15%	± 1.0% @15%		
		±3.0% @>15%	±3.0% @>15%		

[1] Hazardous Gas Flow Rate Assessment Methodology (HGFR) is the calculation of the maximum gas concentration for the location x maximum flow rate for the location.

[2] Where maximum recorded flow is <0.1l/h, 0.1l/h has been used to calculate HGFR as recommended in CIRIA C665.

[3] Where maximum recorded concentration is <0.1%, 0.1% has been used as recommended in BS8485.

* Peak flow recorded is likely to be due to a build-up of hydraulic pressure caused by rising water trapping the gas within the solid section of pipe; the initial peak flow is not representative of the rate of gas generation within the ground and can be discounted from the dataset.

TEST DATE AND CONDITIONS	
Date	17/2/25
Atmospheric pressure	1009mb
Ambient Temp	20.1°C
Environics Serial No.	2633

GAS DATA LTD
Unit D,
Earlplace Business Park,
Coventry,
CV4 9XL, UK
+44 (0) 24 7630 3311

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GFM436-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

INSTRUMENT DETAILS	
Serial No	Customer
13412	Sutcliffe Projects Ltd

INSTRUMENT CHECKS			
Keyboard	✓	Pump Flow	500cc/min
Display Contrast	✓	Pump Flow @ -200mB	350cc/min
Clock Set / Running	✓	S/W Version	G436.0027/0010
Labels Fitted	✓	Recalibration Date	17/02/26

GAS CHECKS							
Calibration Gas		Instrument Gas Channels Read					
Gas Type	Applied Conc.	CH4 (%)	tol. (% vol.)	CO2 (%)	tol. (% vol.)	O2 (%)	tol. (% vol.)
N2	100%	0.0	0.0	0.0	0.0	0.0	+/-0.1
CH4	5%	4.9	+/-0.3	0.0	0.0	0.0	+/-0.1
	60%	59.9	+/-3.0	0.0	0.0	0.0	+/-0.1
CO2	5%	0.0	0.0	5.0	+/-0.3	0.0	+/-0.1
	40%	0.0	0.0	39.8	+/-3.0	0.0	+/-0.1
O2	20.9%	0.0	0.0	0.1	+0.1	21.0	+/-0.5

OPTIONAL GAS CHECKS								
Calibration Gas		Instrument Gas Channels Read						
Gas Type	Applied Conc.	Label	H2S	CO			Hexane	tol. (% vol.)
		Range	5000ppm	2000ppm			2.00%	
N2	100%		0	0			0.000	0.0
H2S	1500ppm		1510	0				+/- 5.0
CO	1000ppm		60	996				+/- 5.0
Hexane	2.00%						1.866	+/- 10.0

PRESSURE CHECKS							
Calibration Pressure		Instrument Pressure Channels Read					
Pressure @	Applied Pressure	Atmospheric [Ap] (mB)	tol. (mB)				
All Ports	Current Atmospheric	1009	+/-2.0				
Ap Port (Internal)	+800mB(a)	799	+/-5.0				
	+1200mB(a)	1201	+/-5.0				

TEST DATE AND CONDITIONS	
Date	17/2/25
Atmospheric pressure	1009mb
Ambient Temp	20.1°C
Environics Serial No.	2633

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Coventry,
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GFM436-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

FLOW CHECKS					
Calibration Flow		Instrument Flow Channels Read			
Applied Flow (l/hour)	Applied Pressure (Pa)	Flow [Flow] (l/hour)	tol. (l/hour)	Differential Pressure [Dp] (Pa)	tol. (Pa)
-30.0	-393	-28.9	+/-3.0	-390	+/-50
-3.0	-18	-2.8	+/-1.0	-17	+/-6
0.0	0	0.0	0.0	0	0.0
+3.0	15	2.8	+/-0.5	14	+/-3
+30.0	341	29.8	+/-3.0	340	+/-50
+60.0	1034	59.5	+/-6.0	1021	+/-130
+90.0	2067	90.3	+/-9.0	2103	+/-250

TEMPERATURE CHECK		
Calibration Temperature	Instrument Temperature Channel Read	
Applied Equivalent Temperature (°C)	Temperature [Temp] (°C)	tol. (°C)
-10.0	-10.5	+/- 2.0
0.0	-0.5	+/- 1.0
30.0	30.0	+/- 1.0
60.0	60.0	+/- 1.0
100.0	99.5	+/- 1.0

Notes:

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to: BS EN ISO 9001:2015
BS EN ISO 14001:2015
BS EN ISO 45001:2018

TEST DATE AND CONDITIONS	
Date	18/2/25
Atmospheric pressure	1007 mb
Ambient Temp	18.5 °C
Environics Serial No.	2518

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Earlplace Business Park,
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GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS					
SO Number	Instrument Banner	Instrument Serial Number + SW Version	Job Number(s)		
341175	GFM 436	13412/27-1Φ	29670		

Calibration Technician ..... **DATE** 17/2/25

Inspection Technician ..... **DATE** 18/2/25

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable(NA)	INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P	Instrument		✓
	Keyboard Test (All keys)	P	Leather Case		X
	Backlight Test	P	Instrument Strap		✓
	Clock Set / Running	P	AC Battery Charger (UK)		✓
	Comms Test	P	AC Battery Charger (EURO)		X
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		X
	Overall Leak Test (30mb)	N/A	AC Battery Charger (AUS)		X
	Battery Charge Test	P	Gas Sample Pipe	x2	✓
	Service Date set to?	17/2/26	Hard Carry Case		✓
Channel Tests	Data Logging Enabled?	P	Spares Pot (BAG)		✓
	Verify CH4/LEL/Hexane/PID	P	Allen Key		X
	Verify CO2	P	Flow Sample Pipe	x3	✓
	Verify O2	P	Temperature Probe		X
	Verify H2S	P	Vane Anemometer		X
	Verify CO	P	USB Cable		✓
	Verify LEL	P	USB Memory Stick		✓
	Verify 1st Option gas	N/A	SM V5 Software	Ver	X
	Verify atmospheric pressure	P	Internal Filter Pack	Qty 1	✓
	Verify differential pressure	P	External Filter Pack	Qty 8	✓
	Verify flow	P	Field Guide		X
	Verify temperature probe input	P	EX Safety Flier		X
	Verify vane anemometer input	P	Extra Items: BAG OF 8 EXTERNAL FILTERS.		
DataBase Checks	Jobcard(s) completed and signed	P			
	Jobcard(s) booked off database	P			
	Calibration certificate completed	P			
	Complete & print QI record	N/A			
Label Checks	No. of Calibration label fitted	12935	Comments		
	MCERTS label not displayed	P			
	Warranty label fitted	P			
H2S Range	H2S Range from SO	50000 ppm			
	H2S Range from cal cert	50000 ppm			
	Over-range value correct?	P			

Appendix F – Geotechnical Laboratory Certificates

Units 1 & 2
Deltic Place
Deltic Way
Knowsley Industrial Estate
Liverpool
L33 7BU

Telephone: (0151) 545 2750
Fax: (0151) 548 7892
Email: enquiries@ccgeotechnical.com
www.ccgeotechnical.com

CC GEOTECHNICAL LTD
Consulting Geoenvironmental and Geotechnical Engineers

LABORATORY REPORT

CONTRACT NUMBER: CCG-C-25-15350

CONTRACT TITLE: APOLLO PUB, MILES PLATTING

CLIENT: SUTCLIFFE
18-20 Harrington Street, Liverpool L2 9QA

DATE RECEIVED: 28/03/25
DATE COMMENCED: 31/03/25
DATE COMPLETED: 08/04/25
REPORT DATE: 08/04/25

Test Description	Qty
Determination of Moisture Content BS 1377-2:1990 (a)	4
Determination of Liquid & Plastic Limits BS 1377-2:1990 (a)	4
Unconsolidated Undrained Triaxial Compression BS 1377-7:1990 (a)	2
Point Load Test ISRM 1985: Suggested Method (a)	23

Notes: Observations and interpretations are not accredited by UKAS
All testing undertaken at laboratory permanent facilities
# denotes non-accredited test
a denotes UKAS accredited test
s denotes test undertaken by approved subcontractor
Test results only relate to the samples tested
Sample and sample information supplied by client

This report is issued in accordance with the requirements of the United kingdom Accreditation Services and EN ISO/IEC 17025:2017. The results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without the prior written approval of the laboratory.
Approved Signatories: Chris Bolan (Managing Director) – Daniel Kerfoot (Laboratory Manager)

SUMMARY OF LABORATORY SOIL TEST RESULTS

BH / TP / WS Number	Sample Type	Depth From (m)	Depth To (m)	Moisture Content (%)	Bulk Density (Mg/m³)	Dry Density (Mg/m³)	Shear Strength (kN/m²)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425mm (%)	Soil Classification	UKAS accredited test (Y/N)	Description / Test Method Samples described in accordance with BS EN ISO 14688-2 2004
WS101A	U	3.00	4.00	27	-	-	50*	46	21	25	91	CI	Y	Brown/grey mottled slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone. (BS1377Pt2:3.2,4.4,5)
WS105	U	2.00	3.00	19	-	-	>110*	45	20	25	96	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone. (BS1377Pt2:3.2,4.4,5)
BH101	U	4.00	4.45	22	2.08	1.70	131	49	22	27	95	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone and coal. (BS1377Pt2:3.2,4.4,5,Pt7:8)
BH103	U	3.00	3.45	21	2.12	1.75	156	46	21	25	91	CI	Y	Brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium subangular mudstone. (BS1377Pt2:3.2,4.4,5,Pt7:8)

SITE: APOLLO PUB, MILES PLATTING (CCG-C-25-15350) DATE: 08.04.25

CLIENT: SUTCLIFFE

UKAS TESTING 4514

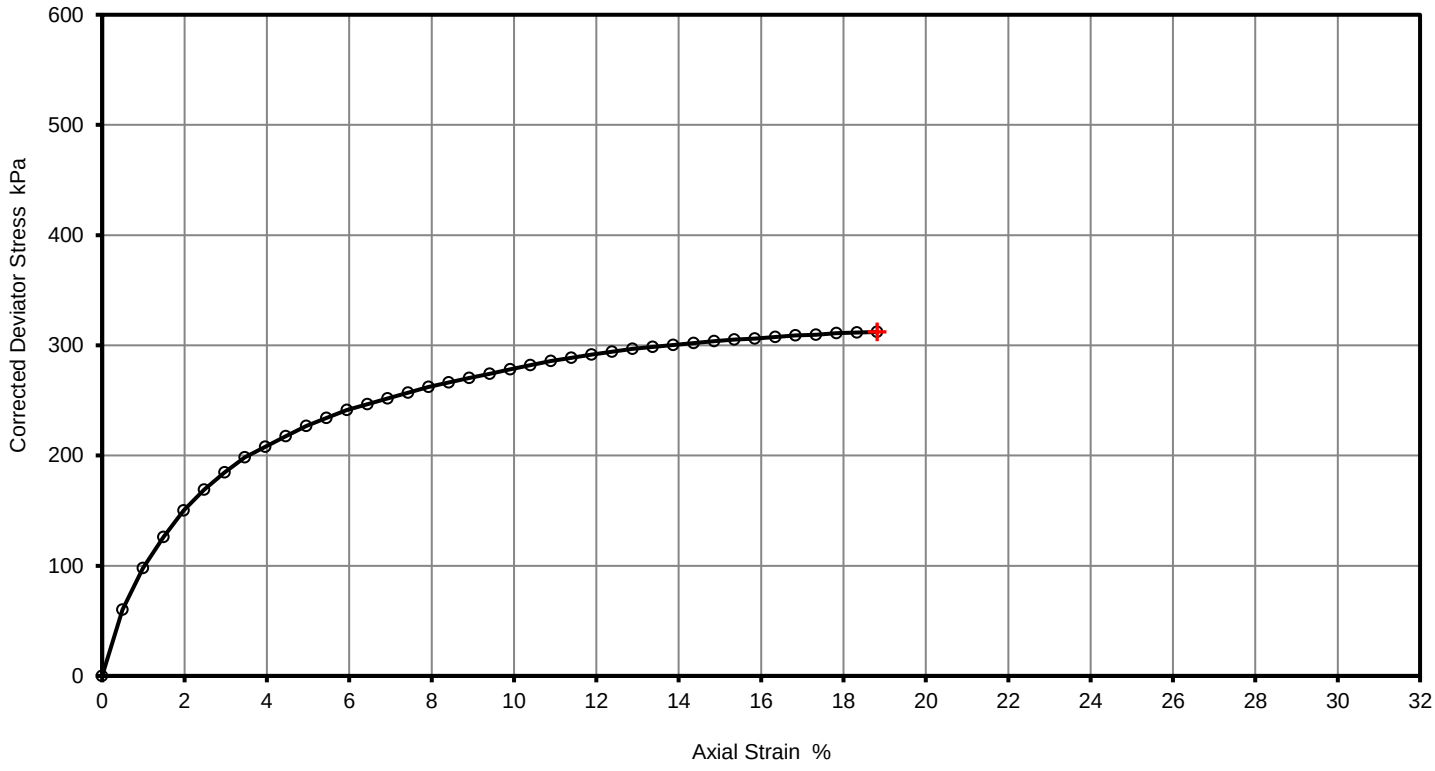
Key:- BD = Bulk Disturbed; SD = Small Disturbed; U100 = Undisturbed 100mm; WS = Window Sample
CL = Low Plasticity; CI = Intermediate; CH = High; CV = Very high; CE = Extremely high; NP = Non-plastic
(* Denotes Hand Shear Vane test result)
Sample description not accredited by UKAS

CC Geotechnical Ltd Tel: 0151 545 2750 e: lab@ccgeotechnical.com	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	CCG-C-25-15350
				Borehole/Pit No.	BH103
Site Name	APOLLO PUB, MILES PLATTING			Sample No.	1
Soil Description				Depth	3.00
Specimen Reference		Specimen Depth	m	Sample Type	U
Specimen Description	Brown slightly sandy slightly gravelly silty CLAY			Date of test	01/04/2025
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen				

UKAS TESTING 4514

Test Number		1	
Length		201.9	mm
Diameter		101.3	mm
Bulk Density		2.12	Mg/m3
Moisture Content		21.4	%
Dry Density		1.75	Mg/m3
Rate of Strain		2.0	%/min
Cell Pressure		60	kPa
At failure	Axial Strain	18.8	%
	Deviator Stress, (σ1 - σ3)f	312	kPa
	Undrained Shear Strength, cu	156	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Remarks

0.5mm membrane, correction factor = 1.80

Approved: DanielKerfoot

Printed: 02/04/2025 15:15

Fig. No. 1

Sheet 1

CC Geotechnical Ltd
Tel: 0151 545 2750
e: lab@ccgeotechnical.com

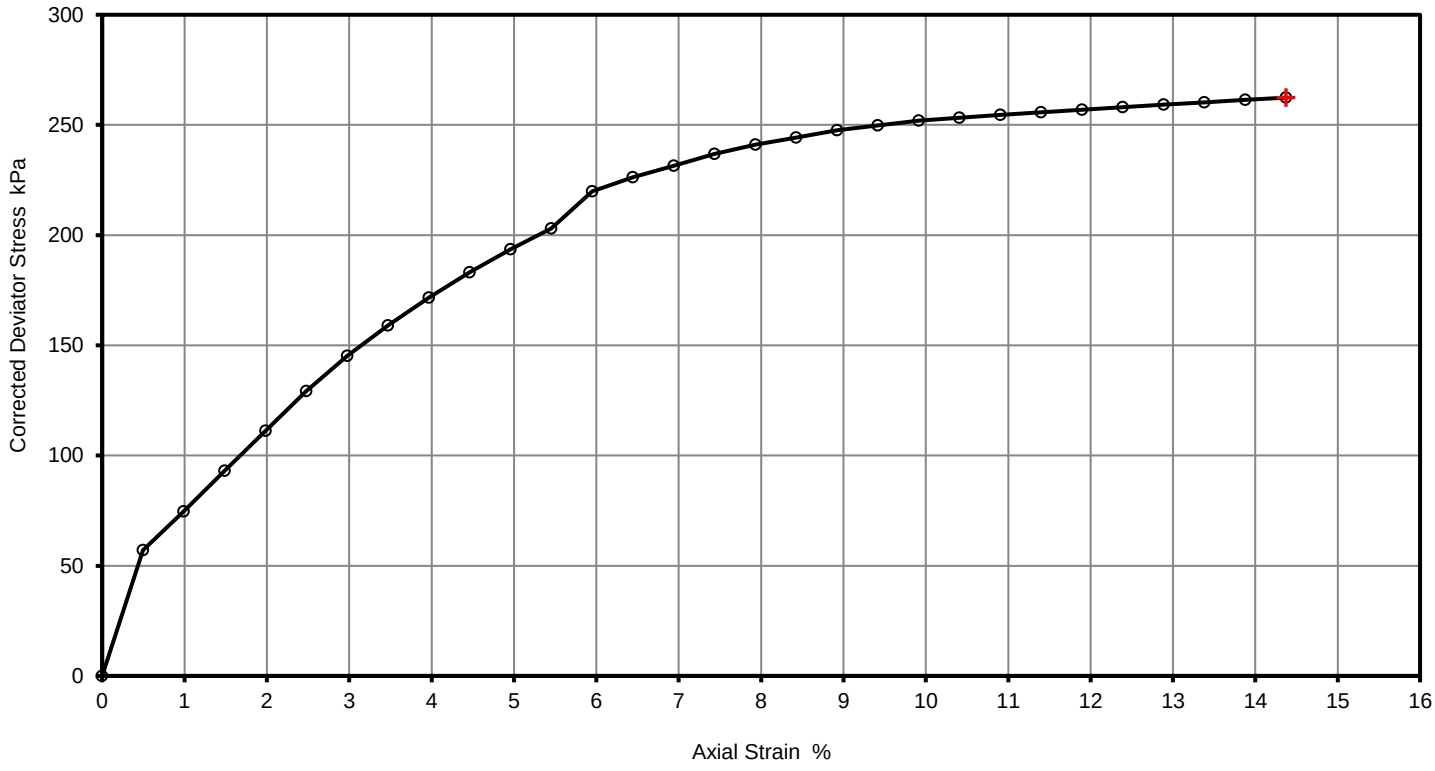
Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen

Job Ref	CCG-C-25-15350				
Borehole/Pit No.	BH101				
Site Name	APOLLO PUB, MILES PLATTING			Sample No.	1
Soil Description				Depth	4.00
Specimen Reference		Specimen Depth	m	Sample Type	U
Specimen Description	Brown slightly sandy slightly gravelly silty CLAY			Date of test	01/04/2025
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen				

UKAS TESTING 4514

Test Number		1	
Length		201.8	mm
Diameter		101.5	mm
Bulk Density		2.08	Mg/m3
Moisture Content		22.0	%
Dry Density		1.70	Mg/m3
Rate of Strain		2.0	%/min
Cell Pressure		80	kPa
At failure	Axial Strain	14.4	%
	Deviator Stress, (σ1 - σ3)f	262	kPa
	Undrained Shear Strength, cu	131	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

Deviator Stress v Axial Strain



Remarks

0.5mm membrane, correction factor = 1.45

Approved: DanielKerfoot

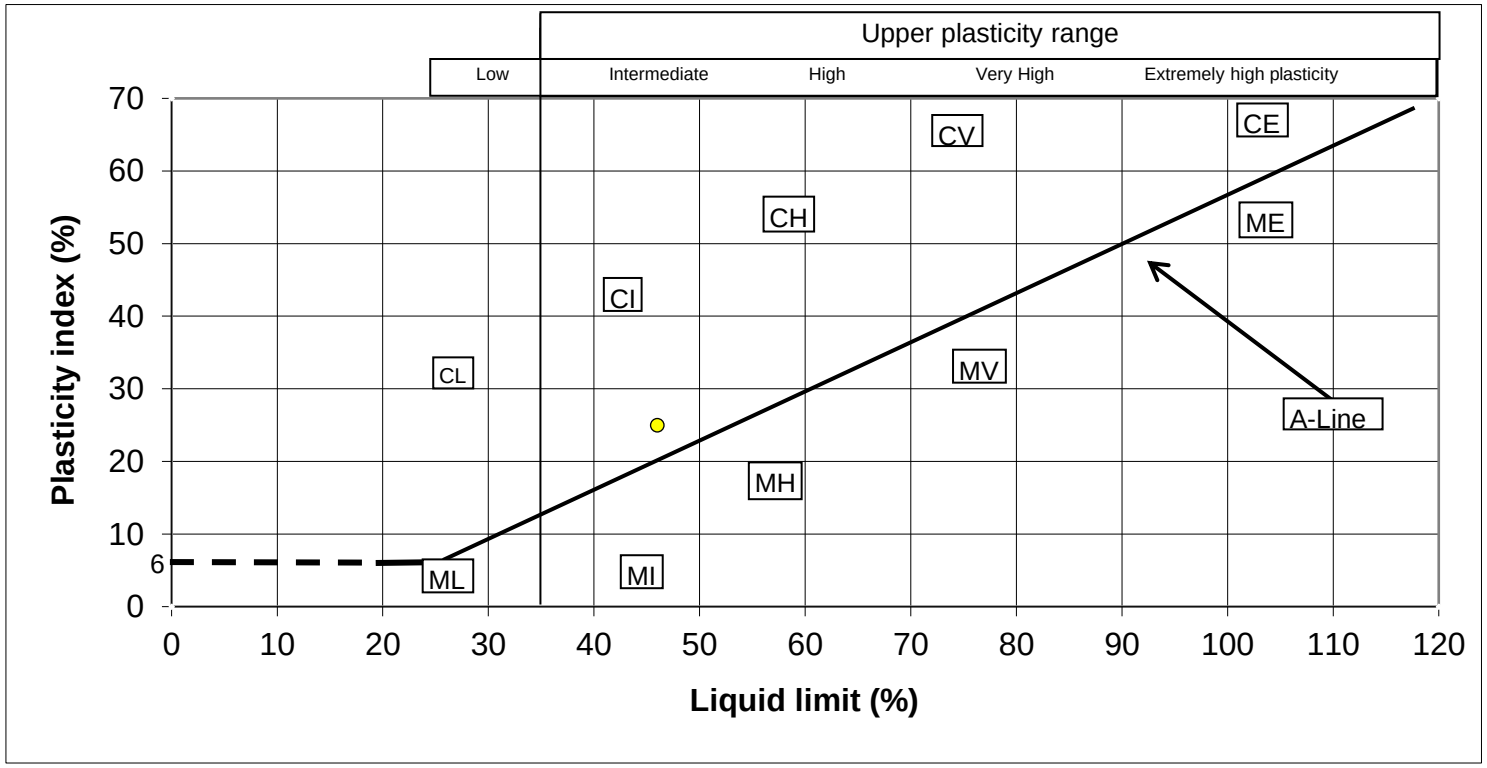
Printed: 02/04/2025 15:15

Fig. No. 1

Sheet 2

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS101A	3.00	46.0	25.0

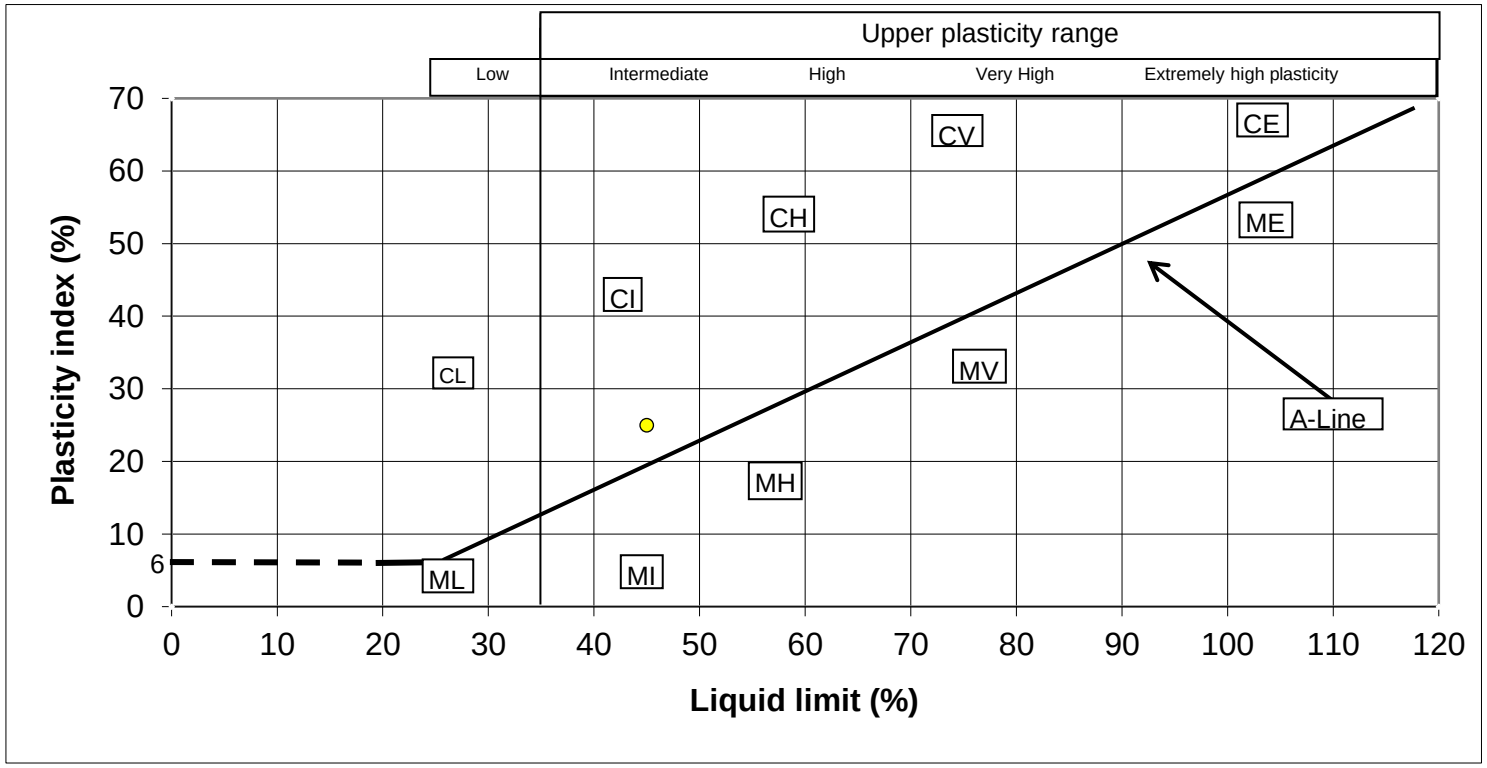
UKAS TESTING
4514

APPROVED BY	DK

CLIENT: SUTCLIFFE	SITE: APOLLO PUB, MILES PLATTING (CCG-C-25-15350)

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
WS105	2.00	45.0	25.0

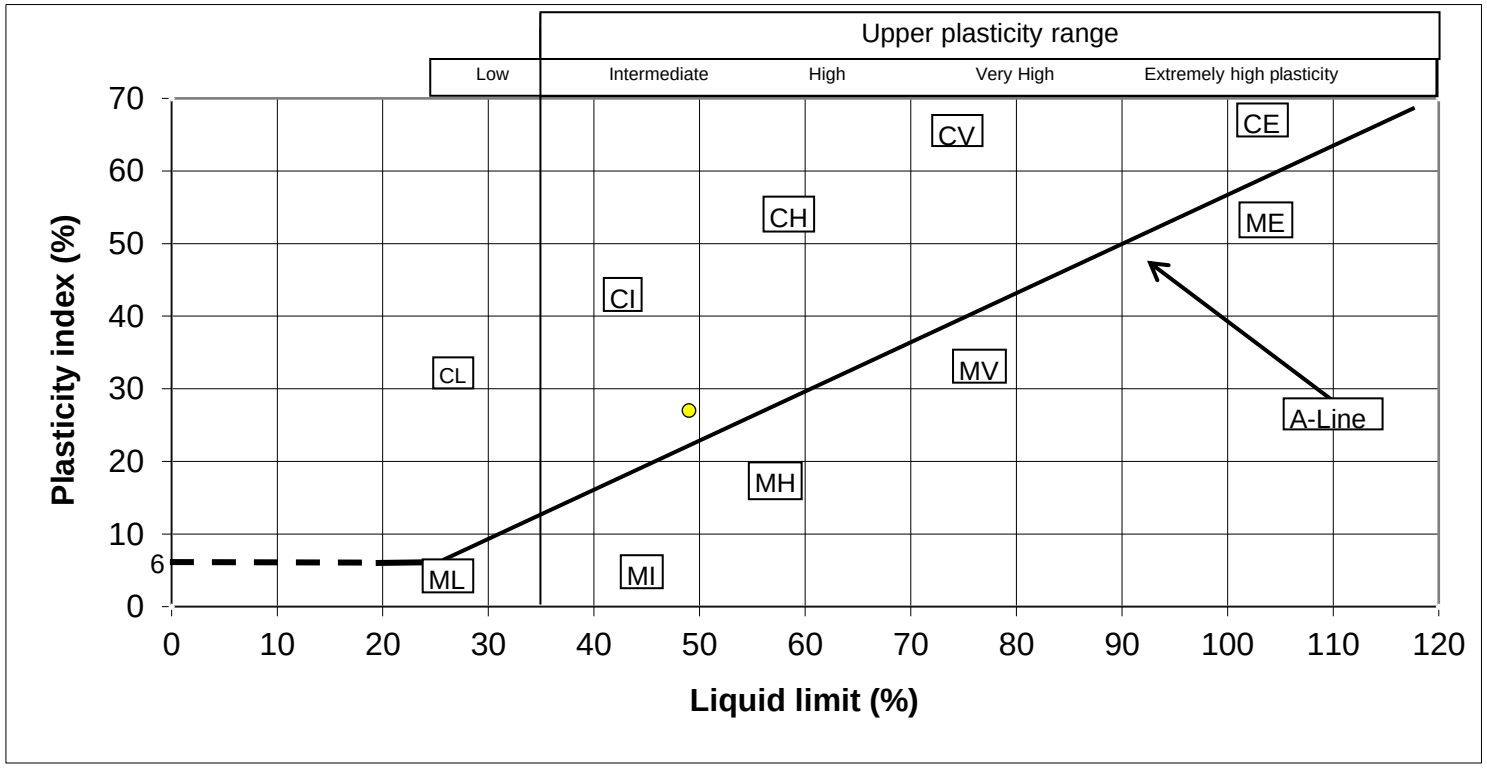
UKAS TESTING
4514

APPROVED BY	DK

CLIENT: SUTCLIFFE	SITE: APOLLO PUB, MILES PLATTING (CCG-C-25-15350)

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH101	4.00	49.0	27.0

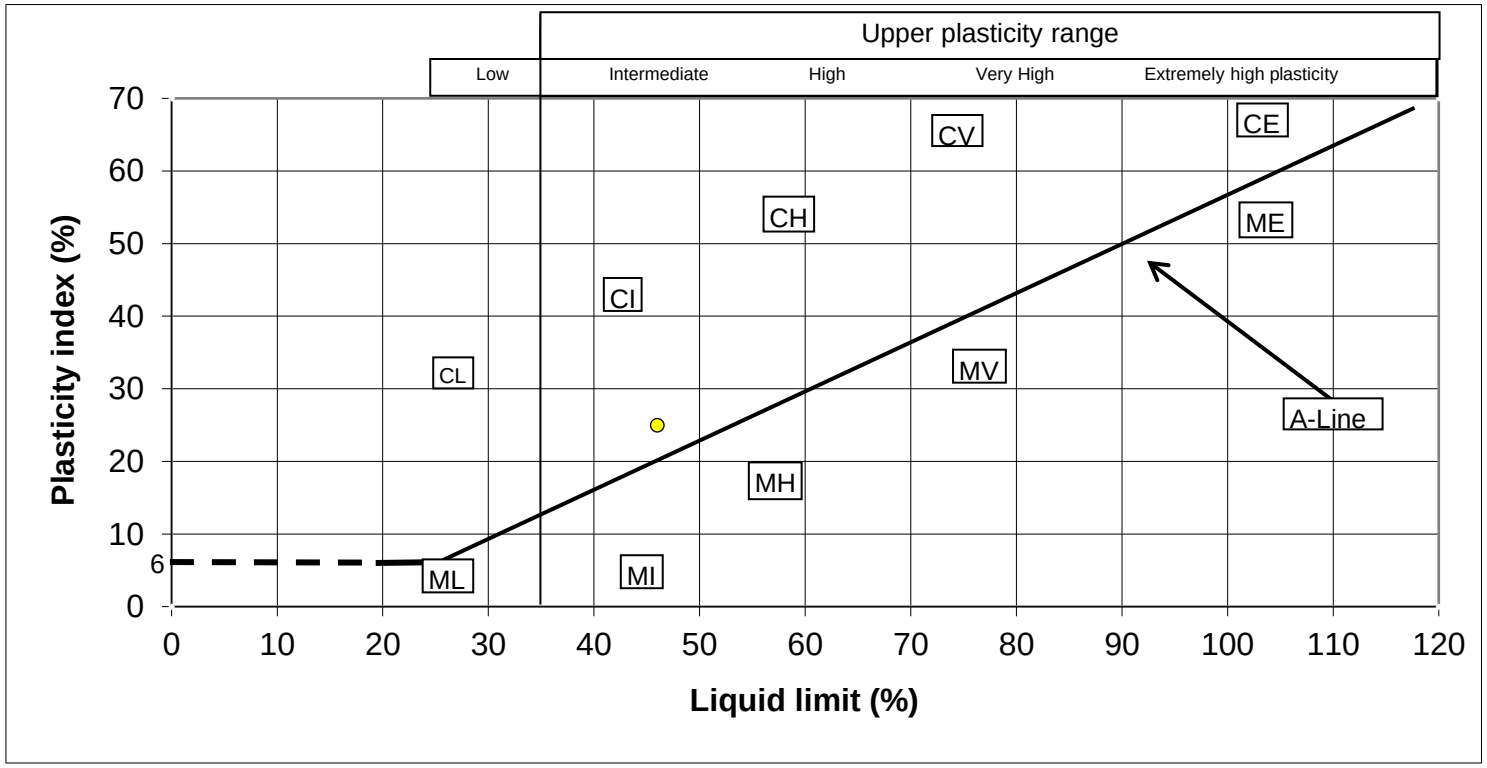
UKAS TESTING
4514

APPROVED BY	DK

CLIENT: SUTCLIFFE	SITE: APOLLO PUB, MILES PLATTING (CCG-C-25-15350)

ATTERBERG TEST RESULT SHEET
BS 1377:Part 2:1990:cl 4.4,5

SILT (M-SOIL), M plots below A-Line , CLAY,C, plots above A-Line, M and C may be combined as FINE SOIL, F.



BH	Sample Depth	Liquid limit	Plasticity index
BH103	3.00	46.0	25.0

UKAS TESTING
4514

APPROVED BY	DK

CLIENT: SUTCLIFFE	SITE: APOLLO PUB, MILES PLATTING (CCG-C-25-15350)

POINT LOAD TEST RESULTS

ISRM 1985: Suggested Method

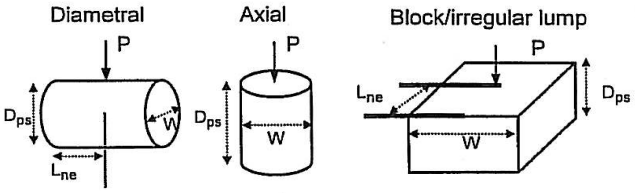
PROJECT No.:- CCG-C-25-15350 SITE:- APOLLO PUB, MILES PLATTING DATE: 1.4.25

Borehole Number	Depth (m)	Type of Test* a	d	i	Width (W) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MPa)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MPa)	Estimated Uniaxial Compressive Strength (MPa)	Water Content (NAT/SAT)	Orientation to plane of weakness
BH101	18.31	a			85	71	0.50	88	0.07	1.29	0.08	1.68	NAT	p
BH101	118.61		d		62	85	0.60	-	0.08	1.27	0.11	2.11	NAT	l
BH101	18.66	a			85	56	1.20	78	0.20	1.22	0.24	4.83	NAT	p
BH101	18.83	a			85	56	1.00	78	0.16	1.22	0.20	4.03	NAT	p
BH101	181.94		d		54	85	0.60	-	0.08	1.27	0.11	2.11	NAT	l
BH101	18.99	a			85	52	1.00	75	0.18	1.20	0.21	4.27	NAT	p
BH101	20.21	a			85	74	1.10	89	0.14	1.30	0.18	3.57	NAT	p
BH101	20.33	a			85	64	0.80	83	0.12	1.26	0.15	2.91	NAT	p
BH101	20.52	a			85	53	1.00	76	0.17	1.21	0.21	4.20	NAT	p
BH101	20.61	a			85	66	1.10	85	0.15	1.27	0.20	3.90	NAT	p
BH101	20.82	a			85	71	1.00	88	0.13	1.29	0.17	3.35	NAT	p
BH101	22.40			i	70	68	2.00	78	0.43	1.22	0.53	10.56	NAT	l

*NOTE- a = axial ; d = diametral ; i = irregular lump or block (see diagrams, right, for details)
p = perpendicular; l = parallel, u = unkown

DIA. KEY- P = load ; Dps = platen seperation ;
W = width of shortest dimension perpendicular to load ;
Lne = length from platens to nearest free end

UKAS TESTING 4514



TESTED BY: MH APPROVED BY: DK

POINT LOAD TEST RESULTS

ISRM 1985: Suggested Method

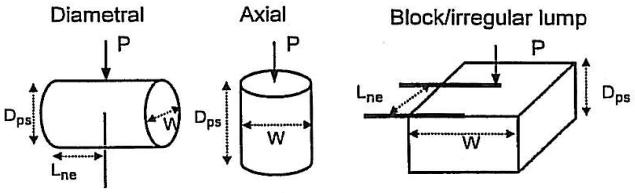
PROJECT No.:- CCG-C-25-15350 SITE:- APOLLO PUB, MILES PLATTING DATE: 1.4.25

Borehole Number	Depth (m)	Type of Test* a	d	i	Width (W) (mm)	Platen Separation (D) (mm)	Failure Load (P) (kN)	Equivalent Diameter (D_e) (mm)	Point Load (I_s) (MPa)	Size Factor (F)	Point Load Index ($I_{s(50)}$) (MPa)	Estimated Uniaxial Compressive Strength (MPa)	Water Content (NAT/SAT)	Orientation to plane of weakness
BH103	18.91	a			85	74	0.40	89	0.05	1.30	0.06	1.30	NAT	p
BH103	19.32	a			85	62	0.20	82	0.03	1.25	0.04	0.74	NAT	p
BH103	19.75	a			85	73	1.30	89	0.16	1.30	0.21	4.26	NAT	p
BH103	20.23	a			85	45	1.80	70	0.37	1.16	0.43	8.59	NAT	p
BH103	20.47	a			85	50	1.10	74	0.20	1.19	0.24	4.84	NAT	p
BH103	20.63	a			85	61	1.30	81	0.20	1.24	0.25	4.90	NAT	p
BH103	21.08	a			85	43	4.40	68	0.95	1.15	1.09	21.75	NAT	p
BH103	21.62	a			85	80	1.30	93	0.15	1.32	0.20	3.97	NAT	p
BH103	21.91	a			85	52	0.90	75	0.16	1.20	0.19	3.84	NAT	p
BH103	22.10	a			85	56	1.60	78	0.26	1.22	0.32	6.44	NAT	p
BH103	22.42	a			85	61	1.00	81	0.15	1.24	0.19	3.77	NAT	p

*NOTE- a = axial ; d = diametral ; i = irregular lump or block (see diagrams, right, for details)
p = perpendicular; l = parallel, u = unkown

DIA. KEY- P = load ; Dps = platen seperation ;
W = width of shortest dimension perpendicular to load ;
Lne = length from platens to nearest free end

UKAS TESTING 4514



TESTED BY: MH APPROVED BY: DK

CCG	Contract Name: Apollo Pub, Miles Platting		Client: Sutcliffe		Borehole ID: **BH101**
	Contract Number: CCG-C-25-15350	Date Started:	Loggged By: DK	Checked By: CB	Status: DRAFT — Sheet 1 of 3
Rotary Core Drilling Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew: — Scale: 1:50
Weather:		Termination:			

Samples & In Situ Testing						Strata Details				Groundwater	
Depth	TCR	SCR	RQD	FI	Water Added	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
							(16.50)				

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture spacing reported in mm as min, Average and Max values. TCR, SCR and RQD reported in %

CCG	Contract Name: Apollo Pub, Miles Platting		Client: Sutcliffe		Borehole ID: **BH101**
	Contract Number: CCG-C-25-15350	Date Started:	Loggged By: DK	Checked By: CB	Status: DRAFT — Sheet 2 of 3
Rotary Core Drilling Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew: — Scale: 1:50
Weather:		Termination:			

Samples & In Situ Testing						Strata Details				Groundwater	
Depth	TCR	SCR	RQD	FI	Water Added	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
16.50 - 18.00	97	7	7	NR NI 10 NI			16.50 (1.79)		Grey occasionally dark grey MUDSTONE with occasional inclusions of sub-rounded sandstone gravel. Highly weathered. Recovered as clayey gravel and gravel *NO RECOVERY - 16.50-16.54mbgl* *NON-INTACT. RECOVERED CLAYEY GRAVEL - 16.24-17.58mbgl* *NON-INTACT. RECOVERED AS SLIGHTLY CLAYEY GRAVEL - 17.68-18.30mbgl*		
18.00 - 19.50	100	43	43	9 NI 8 NI			18.29 (2.71)		Grey occasionally thinly laminated MUDSTONE with occasional inclusions of rounded sandstone gravel. Moderately weathered. Recovered locally as gravel. Discontinuities are very close to closely spaced, horizontal, clean, smooth and tight *NON-INTACT. RECOVERED AS GRAVEL - 18.41-18.68mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 19.20-19.50mbgl* *NO RECOVERY - 19.50-20.09mbgl*		
				NR							

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture spacing reported in mm as min, Average and Max values. TCR, SCR and RQD reported in %

Contract Name: Apollo Pub, Miles Platting		Client: Sutcliffe		Borehole ID: **BH101**
Contract Number: CCG-C-25-15350	Date Started:	Loggged By: DK	Checked By: CB	Status: DRAFT
Rotary Core Drilling Log	Easting:	Northing:	Ground Level:	Plant Used: / Rig Crew: / Scale: 1:50
Weather:	Termination:			Sheet 3 of 3

Samples & In Situ Testing						Strata Details				Groundwater	
Depth	TCR	SCR	RQD	FI	Water Added	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
19.50 - 21.00	61	61	42	9					Grey occasionally thinly laminated MUDSTONE with occasional inclusions of rounded sandstone gravel. Moderately weathered. Recovered locally as gravel. Discontinuities are very close to closely spaced, horizontal, clean, smooth and tight		
							21.00				
21.00 - 22.50	100	6	0	NI			(1.50)		Dark grey occasionally grey MUDSTONE inclusions of sandstone at 22.20mbgl. Highly weathered. Recovered as gravel *NON-INTACT. RECOVERED AS GRAVEL - 21.00-22.40mbgl*		
				10			22.50				

21 22 23 24 25 26 27 28 29 30

Start & End of Shift Observations				
Date	Time	Depth (m)	Casing (m)	Water (m)

Borehole Diameter	
Depth (m)	Dia (mm)

Casing Diameter	
Depth (m)	Dia (mm)

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture spacing reported in mm as min, Average and Max values. TCR, SCR and RQD reported in %

	Contract Name: Apollo Pub, Miles Platting		Client: Sutcliffe		Borehole ID: **BH103**
	Contract Number: CCG-C-25-15350	Date Started:	Loggged By: DK	Checked By: CB	Status: DRAFT — Sheet 1 of 3
Rotary Core Drilling Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew: — Scale: 1:50
Weather:		Termination:			

Samples & In Situ Testing						Strata Details				Groundwater	
Depth	TCR	SCR	RQD	FI	Water Added	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
							(18.00)				

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture spacing reported in mm as min, Average and Max values. TCR, SCR and RQD reported in %

	Contract Name: Apollo Pub, Miles Platting		Client: Sutcliffe		Borehole ID: **BH103**
	Contract Number: CCG-C-25-15350	Date Started:	Loggged By: DK	Checked By: CB	Status: DRAFT
Rotary Core Drilling Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew:
					Sheet 2 of 3
					Scale: 1:50
Weather:		Termination:			

Samples & In Situ Testing						Strata Details				Groundwater	
Depth	TCR	SCR	RQD	FI	Water Added	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
18.00 - 19.50	94	81	81	NR NI 3 NI 3 NI 3 NR 17 NI			18.00		Grey MUDSTONE with rare inclusions of rounded sandstone gravel and rare inclusion of coal at 18.80-19.12mbgl. Moderately weathered. Recovered locally as gravel. Discontinuities are very close to medium spaced, horizontal, clean, smooth and tight *NO RECOVERY - 18.00-18.09mbgl* *NON-INTACT. RECOVERED AS GRAVELLY CLAY - 18.09-18.18mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 18.77-18.85mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 19.16-19.18mbgl* *NO RECOVERY - 19.50-19.60mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 19.84-20.04mbgl*		

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Fracture spacing reported in mm as min, Average and Max values. TCR, SCR and RQD reported in %

Contract Name: Apollo Pub, Miles Platting			Client: Sutcliffe		Borehole ID: **BH103**
Contract Number: CCG-C-25-15350	Date Started:	Loggged By: DK	Checked By: CB	Status: DRAFT	Sheet 3 of 3
Rotary Core Drilling Log	Easting:	Northing:	Ground Level:	Plant Used:	Rig Crew: Scale: 1:50
Weather:		Termination:			

Samples & In Situ Testing						Strata Details				Groundwater	
Depth	TCR	SCR	RQD	FI	Water Added	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
19.50 - 21.00	93	59	7	11 NI 18 NI 30					Grey MUDSTONE with rare inclusions of rounded sandstone gravel and rare inclusion of coal at 18.80-19.12mbgl. Moderately weathered. Recovered locally as gravel. Discontinuities are very close to medium spaced, horizontal, clean, smooth and tight *NON-INTACT. RECOVERED AS GRAVEL - 20.23-20.33mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 20.67-20.90mbgl*		
21.00 - 22.50	97	91	69	~~NR~~ 17 NI 7			(4.78)		*NO RECOVERY - 21.00-21.04mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 21.22-21.33mbgl*		
22.50 - 24.00	91	51	46	NR NI NI 4 NI 8 ~~NI~~ ~~57~~ NI 9			22.78 (1.22) 24.00		*NO RECOVERY - 22.50-22.63mbgl* *NON-INTACT. RECOVERED CLAY - 22.63-22.77mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 22.77-22.90mbgl* Dark grey MUDSTONE. Moderately weathered. Recovered locally as gravel. Discontinuities are very close to medium spaced, horizontal, clean, smooth and tight *NON-INTACT. RECOVERED AS GRAVEL - 23.16-23.32mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 23.45-23.52mbgl* *NON-INTACT. RECOVERED AS GRAVEL - 23.59-23.67mbgl*		

21 22 23 24 25 26 27 28 29 30

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Flush Information				
Top (m)	Base (m)	Flush Type	Return	Flush Colour

Installation			
Top (m)	Base (m)	Type	Dia (mm)

Remarks:

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

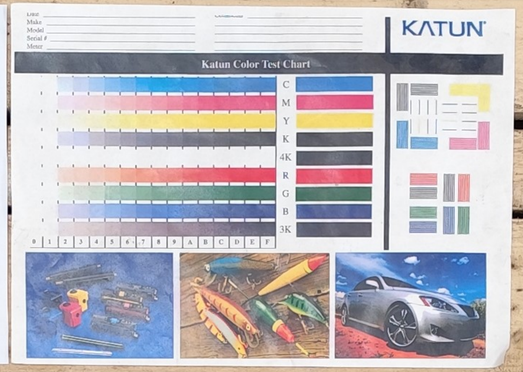
Fracture spacing reported in mm as min, Average and Max values. TCR, SCR and RQD reported in %

REF: CCG-C-25-15350

SITE: APOLLO PUB, MILES PLATTING

CLIENT: SUTCLIFFE

BH101 16.5-19.5m



16.5

18.0

18.0

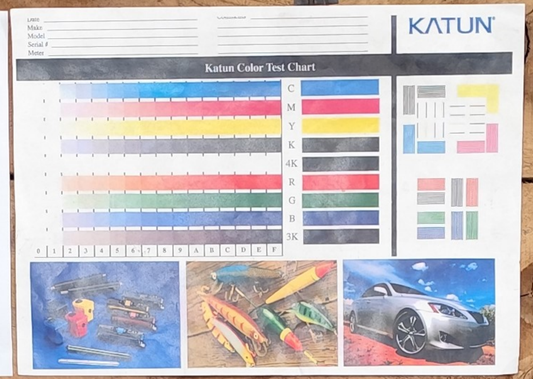
19.5

REF: CCG-C-25-15350

SITE: APOLLO PUB, MILES PLATTING

CLIENT: SUTCLIFFE

BH101 19.5-22.5m



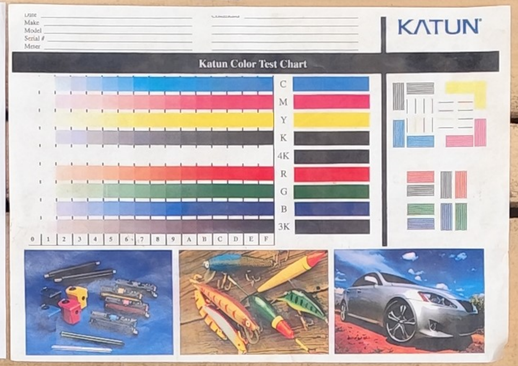
19.5

21.0

21.0

22.5

REF: CCG-C-25-15350
SITE: APOLLO PUB,
MILES PLATTING
CLIENT: SUTCLIFFE
BH103 18.0-21.0m



18.0

19.5

19.5

21.0

REF: CCG-C-25-15350
SITE: APOLLO PUB,
MILES PLATTING
CLIENT: SUTCLIFFE
BH103 21.0-24.0m
KATUN
Katun Color Test Chart
21.0
22.5
22.5
24.0

`Notes on Limitations
For
Geoenvironmental and Geotechnical Consultancy Services

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2. the consequences of use of this document by any party with whom an agreement has not been executed.

Phase I Environmental Audits / Desk Studies

The work undertaken to provide the basis of a Phase 1 Desk Study report comprises a study of available documented information from a variety of sources (including the client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in a Desk Study report have been dictated by finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in the report, CC GEOTECHNICAL LTD reserves the right to review such information and to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Factual Ground Investigations

The investigation of the site has been carried out in accordance with the scope and specification instructed by the Client. No interpretations of the data generated by the investigation have been provided or implied. The exploratory holes undertaken in this commission, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. Conditions may exist on the site which have not been detected by the works undertaken. Furthermore, the number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” or more widespread contamination where concentrations may be significantly higher than those actually encountered.

Interpretative Phase II Environmental Audits

The investigation of the site has been carried out with the intention of providing sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated to potential human targets, building materials, the environment (including adjacent land), and surface and groundwater.

The amount of exploratory work and chemical testing undertaken may have been restricted by factors including inter alia the Clients budget, the available timescale, access to all parts of the site, the existence of buried services etc., and where this is the case, a more comprehensive investigation may be required if the site is to be redeveloped, since a number of important engineering and environmental issues may need further assessment.

For those reasons, if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

It must be borne in mind, that the exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” or more widespread contamination where concentrations may be significantly higher than those actually encountered. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

Geoenvironmental Ground Investigations

The investigation of the site has been carried out within the constraints of Client budget, available timeframe, access to all parts of the site, the existence of buried services and a more comprehensive investigation may be required to provide sufficient information regarding the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions, to formulate a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to the site remediation, these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, investigate only a small volume of the ground in relation to the size of the site, and can only provide a general indication of the site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions present on the site which have not been disclosed by this investigation, and which have therefore not been taken into account in this report. The findings of the investigation are valid for the time of investigation and the passage of time may result in changes to the contamination status of the site, and a reassessment of the site may be required where significant time has elapsed.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal, weather, or other effects.

The risk assessment and opinions provided, inter alia, take into consideration currently available guidance relating to acceptable contamination concentrations and no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Appendix G – Soil Screening Tables

Sutcliffe	**SUTCLIFFE INVESTIGATIONS** TEL: 0151 227 3155 FAX: 0151 227 3156			**Concrete Classification Assessment**	
Job Name:	Apollo Pub Miles Platting		**Job No.:**	33585LG	
Site Class		**Water Table**		**Intended Working Life**	
Brownfield		Static		100 Years	
Soil Type	**Max. Sulphate (mg/l)**	**Min pH**	**DS Class**	**ACEC Class**	**DC Class**
Made Ground	40	5.63	**DS-1**	**AC-1s**	**DC-1**
Sample Ref. No.	**Depth (m bgl)**	**Soil Type**	**Water Soluble Sulphate (g/l)**	**Water Soluble Sulphate (mg/l)**	**pH**
BH101	0.1-0.5	Made Ground	0.02	20	5.63
WS105	0.2-0.5	Made Ground	0.03	30	6.93
WS101	0.2-0.4	Made Ground	0.04	40	8.23
WS103	0.4-0.6	Made Ground	0.02	20	7.78
TP103	0.08-1.0	Made Ground	0.01	<10	8.37
TP102	0.05-0.8	Made Ground	0.04	40	8.3

Sutcliffe	**SUTCLIFFE INVESTIGATIONS** TEL: 0151 227 3155 FAX: 0151 227 3156		**Controlled Waters Risk Assessment**			
	Job Name:	Apollo Pub Miles Platting	**Job No.:**	33585LG		
	Legend		**Sample Details**			
	Above EQS Threshold:					
	Above UK DWS Threshold:		**Lab Sample Ref.:**		25/03345/6	25/03345/8
	Above all Thresholds:		**Depth Top (m bgl):**		0.08	0.05
	Below Limit of Detection:	<0.01	**Depth Base (m bgl):**		1.0	0.8
	Not Tested:	n/t	**Date Sampled:**		26-Mar-25	26-Mar-25
	Contaminant Leachate Prep (10:1 Std NRA)*	**Units**	**EQS Threshold**	**UK DWS Threshold**	**TP103**	**TP102**
Metals / Non-Metals / Other Suite	Arsenic (Soluble)*	µg/l	50	10	5	5
	Boron (Soluble)	µg/l	1000	1000	<10	<10
	Cadmium (Soluble)	µg/l	0.45 - 1.5	5	<1	<1
	Chromium Trivalent (Soluble)	µg/l	4.7	50	<0.05	<0.05
	Chromium Hexavalent (Soluble)	µg/l	3.4	50	<0.05	<0.05
	Copper (Soluble)	µg/l	1	2000	**4**	<4
	Lead (Soluble)	µg/l	14	10	**11**	2
	Mercury (Soluble)	µg/l	0.07	1	<0.1	<0.1
	Nickel (Soluble)	µg/l	34	20	<2	<2
	Selenium (Soluble)*	µg/l	-	10	<1	<1
	Sulphur (Free)	mg/l	-	-	<0.1	<0.1
	Zinc (Soluble)	µg/l	10.9	5000	7	5
	Cyanide (Total)*	mg/l	1	50	0.006	<0.005
	Phenols (Total)	µg/l	7.7	-	<0.01	<0.01
	Sulphate as SO_3	mg/l	400	250	1.84	4.44
	Sulphide as S	µg/l	0.25	-	**0.3**	**0.3**
	pH	pH units	-	-	8	7.9
	TPH Total C6-C40 (leachable)		-	-	<80	<80
PAH Suite	naphthalene*	µg/l	130	-	<0.03	<0.01
	acenaphthylene*	µg/l	-	-	<0.01	<0.01
	acenaphthene*	µg/l	-	-	<0.01	<0.01
	fluorene*	µg/l	-	-	<0.01	<0.01
	phenanthrene*	µg/l	-	-	<0.01	<0.01
	anthracene*	µg/l	0.1	-	<0.01	<0.01
	fluoranthene*	µg/l	0.12	-	<0.01	<0.01
	pyrene*	µg/l	-	-	<0.01	<0.01
	benzo(a)anthracene*	µg/l	-	-	<0.01	<0.01
	chrysene*	µg/l	-	-	<0.01	<0.01
	benzo(b)fluoranthene*	µg/l	0.017	-	<0.01	<0.01
	benzo(k)fluoranthene*	µg/l	0.017	-	<0.01	<0.01
	benzo(a)pyrene*	µg/l	0.27	0.01	<0.01	<0.01
	dibenzo(ah)anthracene*	µg/l	-	-	<0.01	<0.01
	benzo(ghi)perylene*	µg/l	0.0082	-	<0.01	<0.01
	indeno(123cd)pyrene*	µg/l	0.002	-	<0.01	<0.01

SUTCLIFFE INVESTIGATIONS		Long Term Human Health Risk Assessment	
TEL: 0151 227 3155			
FAX: 0151 227 3156			
Job Name:	Apollo Pub Miles Platting	**Job No.:**	33585LG
Proposed Land Use:	Residential With Plant Uptake	**S.O.M. (%):**	6.0
Legend		**Sample Details**	
Above Threshold:		**Lab Sample Ref.:**	25/03345/1
Below Limit of Detection:	<0.01	**Depth Top (m bgl):**	0.1
Not Tested:	n/t	**Depth Base (m bgl):**	0.5
No Asbestos Detected:	NAD	**Date Sampled:**	25-Mar-25

	Contaminant	Units	Threshold Source	Threshold Value	BH101	WS105	WS101	WS103	TP103	TP102
Metals / Non-Metals / Other Suite	Arsenic (Total)	mg/kg	LQM S4UL	37	17	25	20	10	18	11
	Boron (Soluble)	mg/kg	LQM S4UL	290	<1.0	2.2	<1.0	1.5	<1.0	<1.0
	Cadmium (Total)	mg/kg	LQM S4UL	11	0.6	0.6	0.7	0.5	0.6	0.7
	Chromium III	mg/kg	LQM S4UL	910	14	18	29	21	21	18
	Chromium VI	mg/kg	LQM S4UL	6	<1	<1	<1	<1	<1	<1
	Copper (Total)	mg/kg	LQM S4UL	2400	46	132	113	54	79	49
	Lead (Total)	mg/kg	C4SL	200	155	**245**	195	**226**	**443**	103
	Mercury (Total)	mg/kg	LQM S4UL	40	<0.17	0.58	0.3	0.37	0.38	0.86
	Nickel (Total)	mg/kg	LQM S4UL	130	11	24	18	24	17	15
	Selenium (Total)	mg/kg	LQM S4UL	250	1	<1	<1	<1	<1	<1
	Zinc (Total)	mg/kg	LQM S4UL	3700	72	116	121	74	132	94
	Cyanide (Total)	mg/kg	ATKINS	34	<1	5	1	<1	2	<1
	Phenols (Total)	mg/kg	LQM S4UL	380	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Organic matter	%	LQM S4UL	N/a	12.2	18.8	15.8	7.44	8.67	12.2
	Sulphate (Acid Soluble)	mg/kg	LQM S4UL	N/a	860	550	580	470	1200	330
	Sulphate as Water Soluble	g/l	LQM S4UL	N/a	0.02	0.03	0.04	0.02	0.01	0.04
	Sulphide	mg/kg	LQM S4UL	N/a	<50	<25	<25	<25	<5	<25
	pH	pH units	LQM S4UL	N/a	5.63	6.93	8.23	7.78	8.37	8.3
	Sulphur (Elemental)	mg/kg	LQM S4UL	N/a	7	29	180	90	15	16
Asbestos Suite	Asbestos in soil	N/a	-	N/a	NAD	NAD	NAD	NAD	NAD	NAD
	Asbestos Matrix (visual)	N/a	-	N/a	-	-	-	-	-	-
	Asbestos Matrix (microscope)	N/a	-	N/a	-	-	-	-	-	-
	Suitable for Water Absorption Test?	N/a	-	N/a	N/A	N/A	N/A	N/A	N/A	N/A
	Asbestos Quantification	% w/w	-	0.001	n/t	n/t	n/t	n/t	n/t	n/t
TPH Suite	C5 to C6 aliphatic	mg/kg	LQM S4UL	160	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C6 to C8 aliphatic	mg/kg	LQM S4UL	530	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C8 to C10 aliphatic	mg/kg	LQM S4UL	150	<1	<1	<1	<1	<1	<1
	C10 to C12 aliphatic	mg/kg	LQM S4UL	760	<1	<1	1	<1	<1	<1
	C12 to C16 aliphatic	mg/kg	LQM S4UL	4300	<1	1	4	<1	2	<1
	C16 to C21 aliphatic	mg/kg	-	N/a	<1	3	5	<1	4	2
	C21 to C35 aliphatic	mg/kg	-	N/a	11	18	41	4	27	28
	C16 to C35 aliphatic (as Calc.)	mg/kg	LQM S4UL	110000	12	21	46	5	31	30
	C35 to C44 aliphatic	mg/kg	LQM S4UL	110000	3	5	26	<1	20	10
	Total Aliphatic	mg/kg	-	N/a	14	27	76	4	53	40
	C5 to C7 aromatic (Benzene)	mg/kg	LQM S4UL	300	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C7 to C8 aromatic (Toluene)	mg/kg	LQM S4UL	660	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	C8 to C10 aromatic	mg/kg	LQM S4UL	190	<1	1	<1	<1	<1	<1
	C10 to C12 aromatic	mg/kg	LQM S4UL	380	<1	1	1	<1	1	<1
	C12 to C16 aromatic	mg/kg	LQM S4UL	660	3	5	7	1	7	2
	C16 to C21 aromatic	mg/kg	LQM S4UL	930	7	11	50	2	47	4
	C21 to C35 aromatic	mg/kg	LQM S4UL	1700	28	38	236	11	257	20
	C35 to C44 aromatic	mg/kg	LQM S4UL	1700	1	3	25	<1	18	7
	Total Aromatic	mg/kg	-	N/a	39	59	319	15	331	34
	TPH (Total)	mg/kg	-	N/a	54	86	395	19	384	74
BTEX Suite	benzene	mg/kg	LQM S4UL	0.37	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	toluene	mg/kg	LQM S4UL	660	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	ethylbenzene	mg/kg	LQM S4UL	260	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	M&P Xylene	mg/kg	LQM S4UL	310	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	O-Xylene	mg/kg	LQM S4UL	330	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PAH Suite	naphthalene	mg/kg	LQM S4UL	13	<0.03	0.25	0.27	<0.03	<0.03	<0.03
	acenaphthylene	mg/kg	LQM S4UL	920	<0.01	0.05	0.05	0.02	0.02	<0.01
	acenaphthene	mg/kg	LQM S4UL	1100	0.03	0.15	0.44	0.04	0.2	0.04
	fluorene	mg/kg	LQM S4UL	860	0.01	0.21	0.34	0.05	0.1	0.02
	phenanthrene	mg/kg	LQM S4UL	440	0.27	1.77	5.48	0.56	1.6	0.26
	anthracene	mg/kg	LQM S4UL	11000	0.06	0.3	1.31	0.11	0.33	0.06
	fluoranthene	mg/kg	LQM S4UL	890	0.44	1.15	8.57	0.6	2.78	0.5
	pyrene	mg/kg	LQM S4UL	2000	0.45	1.05	8.13	0.64	2.46	0.58
	benzo(a)anthracene	mg/kg	LQM S4UL	13	0.23	0.75	3.91	0.26	1.7	0.28
	chrysene	mg/kg	LQM S4UL	27	0.3	0.88	4.09	0.35	1.94	0.44
	benzo(b)fluoranthene	mg/kg	LQM S4UL	3.7	0.31	0.83	**4.52**	0.3	2.29	0.44
	benzo(k)fluoranthene	mg/kg	LQM S4UL	100	<0.07	0.29	1.66	<0.07	0.7	0.13
	benzo(a)pyrene	mg/kg	LQM S4UL	3	0.21	0.64	**4.16**	0.26	1.77	0.3
	dibenzo(ah)anthracene	mg/kg	LQM S4UL	0.3	<0.04	0.09	**0.5**	<0.04	0.27	<0.04
	benzo(ghi)perylene	mg/kg	LQM S4UL	350	0.14	0.37	2.28	0.14	1.4	0.18
	indeno(123cd)pyrene	mg/kg	LQM S4UL	41	0.14	0.34	2.13	0.11	1.19	0.16

SUTCLIFFE INVESTIGATIONS		New Pipeline Risk Assessment			
	TEL: 0151 227 3155				
	FAX: 0151 227 3156				
Job Name:	Apollo Pub Miles Platting	**Job No.:**	33585LG		
Legend		**Sample Details**			
Within Pipeline Depth (0.75-1.25):	0.80	**Lab Sample Ref.:**		25/03345/7	25/03345/9
Above P.E. Pipe Threshold:		**Depth Top (m bgl):**		0.75	0.80
Below Limit of Detection:	<0.01	**Depth Base (m bgl):**		1.20	1.20
Not Tested:	n/t	**Date Sampled:**		26-Mar-25	26-Mar-25

PSRAS	Units	P.E. Threshold	TP103	TP102
Total VOCs	mg/kg	0.5	<0.25	<0.01
Total BTEX & MTBE	mg/kg	0.1	<0.01	<0.01
Total SVOCs (exl. PAH and *)	mg/kg	2	<1	<0.1
EC5-EC10 aliphatic and aromatic hydrocarbons	mg/kg	2	<0.01	<0.01
EC10-EC16 aliphatic and aromatic hydrocarbons	mg/kg	10	**16**	2
EC16-EC40 aliphatic and aromatic hydrocarbons	mg/kg	500	**504**	24
Phenols* (from SVOC analysis)	mg/kg	2	<1	<0.1
Cresols and chlorinated phenols* (from SVOC analysis)	mg/kg	2	<1	<0.1

Appendix H – Waste Classification Report

Waste Classification Report

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

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

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

MKTVK-3CLF7-E3HV1

Report is invalid if pages are removed.

Job name

Former Apollo Public House

Description/Comments

Project

33585

Site

Former Apollo Public House

Classified by

Name:
Daniel Evans
Date:
23 Apr 2025 10:53 GMT
Telephone:
0151 227 3155

Company:
Sutcliffe Projects Ltd
18-20 Harrington St
Liverpool
L2 9QA

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

HazWasteOnline™ Certification: -

Course	Date
Hazardous Waste Classification	-

Purpose of classification

4 - Classification of Waste Products

Address of the waste

Apollo Pub, Miles Platting, Manchester **Post Code** M40 8EE

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Redevelopment of derelict site.

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

Clearance of contaminated surface material.

Description of the waste

Topsoil and former site refuse.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH101	0.1-0.5	Non Hazardous		3
2	WS105	0.2-0.5	Non Hazardous		6
3	WS101	0.2-0.4	Non Hazardous		9
4	WS103	0.4-0.6	Non Hazardous		12
5	TP103	0.08-1.0	Non Hazardous		15
6	TP102	0.05-0.8	Non Hazardous		18

Related documents

#	Name	Description
1	Sutcliffe Suite 2 2025	waste stream template used to create this Job

Report

Created by: Daniel Evans

Created date: 23 Apr 2025 10:53 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	23

Classification of sample: BH101

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

Sample details

Sample name:
BH101
Sample Depth:
0.1-0.5 m
Moisture content:
29%
(no correction)

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

Hazard properties

None identified

Determinands

Moisture content: 29% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17 mg/kg	1.32	22.446 mg/kg	0.00224 %		
2	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<**LOD**
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6 mg/kg	1.142	0.685 mg/kg	0.0000685 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		46 mg/kg	1.126	51.791 mg/kg	0.00518 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	155 mg/kg	1.56	241.771 mg/kg	0.0155 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.17 mg/kg	1.353	<0.23 mg/kg	<0.000023 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		11 mg/kg	2.976	32.739 mg/kg	0.00327 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1 mg/kg	2.554	2.554 mg/kg	0.000255 %		
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		72 mg/kg	2.774	199.739 mg/kg	0.02 %		
12	TPH (C6 to C40) petroleum group			TPH		54 mg/kg		54 mg/kg	0.0054 %		
13	pH			PH		5.63 pH		5.63 pH	5.63 pH		
14	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			205-917-1	208-96-8									
16		acenaphthene				0.03	mg/kg		0.03	mg/kg	0.000003 %		
			201-469-6	83-32-9									
17		fluorene				0.01	mg/kg		0.01	mg/kg	0.000001 %		
			201-695-5	86-73-7									
18		phenanthrene				0.27	mg/kg		0.27	mg/kg	0.000027 %		
			201-581-5	85-01-8									
19		anthracene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
			204-371-1	120-12-7									
20		fluoranthene				0.44	mg/kg		0.44	mg/kg	0.000044 %		
			205-912-4	206-44-0									
21		pyrene				0.45	mg/kg		0.45	mg/kg	0.000045 %		
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.23	mg/kg		0.23	mg/kg	0.000023 %		
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		601-048-00-0	205-923-4	218-01-9									
24		benzo[b]fluoranthene				0.31	mg/kg		0.31	mg/kg	0.000031 %		
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
26		benzo[a]pyrene; benzo[def]chrysene				0.21	mg/kg		0.21	mg/kg	0.000021 %		
		601-032-00-3	200-028-5	50-32-8									
27		indeno[123-cd]pyrene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			205-893-2	193-39-5									
28		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
29		benzo[ghi]perylene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			205-883-8	191-24-2									
30		benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
31		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
32		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
										Total:	0.0542 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations below this threshold are too low to be considered a flammable risk.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0054%)

Classification of sample: WS105

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

Sample details

Sample name:
WS105
Sample Depth:
0.2-0.5 m
Moisture content:
20.9%
(no correction)

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

Hazard properties

None identified

Determinands

Moisture content: 20.9% No Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		25	mg/kg	1.32	33.008	mg/kg	0.0033 %		
2		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				5	mg/kg	1.884	9.42	mg/kg	0.000942 %		
3		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18	mg/kg	1.462	26.308	mg/kg	0.00263 %		
5		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<**LOD**
6		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		132	mg/kg	1.126	148.617	mg/kg	0.0149 %		
7		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	245	mg/kg	1.56	382.155	mg/kg	0.0245 %		
8		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.58	mg/kg	1.353	0.785	mg/kg	0.0000785 %		
9		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		24	mg/kg	2.976	71.43	mg/kg	0.00714 %		
10		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
11		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		116	mg/kg	2.774	321.801	mg/kg	0.0322 %		
12		TPH (C6 to C40) petroleum group			TPH		86	mg/kg		86	mg/kg	0.0086 %		
13		pH			PH		6.93	pH		6.93	pH	6.93 pH		
14		naphthalene	601-052-00-2	202-049-5	91-20-3		0.25	mg/kg		0.25	mg/kg	0.000025 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		acenaphthylene				0.05	mg/kg		0.05	mg/kg	0.000005 %		
			205-917-1	208-96-8									
16		acenaphthene				0.15	mg/kg		0.15	mg/kg	0.000015 %		
			201-469-6	83-32-9									
17		fluorene				0.21	mg/kg		0.21	mg/kg	0.000021 %		
			201-695-5	86-73-7									
18		phenanthrene				1.77	mg/kg		1.77	mg/kg	0.000177 %		
			201-581-5	85-01-8									
19		anthracene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
			204-371-1	120-12-7									
20		fluoranthene				1.15	mg/kg		1.15	mg/kg	0.000115 %		
			205-912-4	206-44-0									
21		pyrene				1.05	mg/kg		1.05	mg/kg	0.000105 %		
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.75	mg/kg		0.75	mg/kg	0.000075 %		
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.88	mg/kg		0.88	mg/kg	0.000088 %		
		601-048-00-0	205-923-4	218-01-9									
24		benzo[b]fluoranthene				0.83	mg/kg		0.83	mg/kg	0.000083 %		
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.29	mg/kg		0.29	mg/kg	0.000029 %		
		601-036-00-5	205-916-6	207-08-9									
26		benzo[a]pyrene; benzo[def]chrysene				0.64	mg/kg		0.64	mg/kg	0.000064 %		
		601-032-00-3	200-028-5	50-32-8									
27		indeno[123-cd]pyrene				0.34	mg/kg		0.34	mg/kg	0.000034 %		
			205-893-2	193-39-5									
28		dibenz[a,h]anthracene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
		601-041-00-2	200-181-8	53-70-3									
29		benzo[ghi]perylene				0.37	mg/kg		0.37	mg/kg	0.000037 %		
			205-883-8	191-24-2									
30		benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
31		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
32		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
										Total:	0.0952 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations below this threshold are too low to be considered a flammable risk.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0086%)

Classification of sample: WS101

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

Sample details

Sample name:
WS101
Sample Depth:
0.2-0.4 m
Moisture content:
14.4%
(no correction)

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

Hazard properties

None identified

Determinands

Moisture content: 14.4% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20 mg/kg	1.32	26.407 mg/kg	0.00264 %		
2	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				1 mg/kg	1.884	1.884 mg/kg	0.000188 %		
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7 mg/kg	1.142	0.8 mg/kg	0.00008 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	42.385 mg/kg	0.00424 %		
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		113 mg/kg	1.126	127.225 mg/kg	0.0127 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	195 mg/kg	1.56	304.164 mg/kg	0.0195 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.3 mg/kg	1.353	0.406 mg/kg	0.0000406 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18 mg/kg	2.976	53.573 mg/kg	0.00536 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		121 mg/kg	2.774	335.672 mg/kg	0.0336 %		
12	TPH (C6 to C40) petroleum group			TPH		395 mg/kg		395 mg/kg	0.0395 %		
13	pH			PH		8.23 pH		8.23 pH	8.23 pH		
14	naphthalene	601-052-00-2	202-049-5	91-20-3		0.27 mg/kg		0.27 mg/kg	0.000027 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		acenaphthylene				0.05	mg/kg		0.05	mg/kg	0.000005 %		
			205-917-1	208-96-8									
16		acenaphthene				0.44	mg/kg		0.44	mg/kg	0.000044 %		
			201-469-6	83-32-9									
17		fluorene				0.34	mg/kg		0.34	mg/kg	0.000034 %		
			201-695-5	86-73-7									
18		phenanthrene				5.48	mg/kg		5.48	mg/kg	0.000548 %		
			201-581-5	85-01-8									
19		anthracene				1.31	mg/kg		1.31	mg/kg	0.000131 %		
			204-371-1	120-12-7									
20		fluoranthene				8.57	mg/kg		8.57	mg/kg	0.000857 %		
			205-912-4	206-44-0									
21		pyrene				8.13	mg/kg		8.13	mg/kg	0.000813 %		
			204-927-3	129-00-0									
22		benzo[a]anthracene				3.91	mg/kg		3.91	mg/kg	0.000391 %		
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				4.09	mg/kg		4.09	mg/kg	0.000409 %		
		601-048-00-0	205-923-4	218-01-9									
24		benzo[b]fluoranthene				4.52	mg/kg		4.52	mg/kg	0.000452 %		
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				1.66	mg/kg		1.66	mg/kg	0.000166 %		
		601-036-00-5	205-916-6	207-08-9									
26		benzo[a]pyrene; benzo[def]chrysene				4.16	mg/kg		4.16	mg/kg	0.000416 %		
		601-032-00-3	200-028-5	50-32-8									
27		indeno[123-cd]pyrene				2.13	mg/kg		2.13	mg/kg	0.000213 %		
			205-893-2	193-39-5									
28		dibenz[a,h]anthracene				0.5	mg/kg		0.5	mg/kg	0.00005 %		
		601-041-00-2	200-181-8	53-70-3									
29		benzo[ghi]perylene				2.28	mg/kg		2.28	mg/kg	0.000228 %		
			205-883-8	191-24-2									
30		benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
31		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
32		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
										Total:	0.123 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations below this threshold are too low to be considered a flammable risk.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0395%)

Classification of sample: WS103

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

Sample details

Sample name:
WS103
Sample Depth:
0.4-0.6 m
Moisture content:
19.9%
(no correction)

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

Hazard properties

None identified

Determinands

Moisture content: 19.9% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10	mg/kg	1.32	13.203	mg/kg	0.00132 %		
2	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.571	mg/kg	0.0000571 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21	mg/kg	1.462	30.693	mg/kg	0.00307 %		
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		54	mg/kg	1.126	60.798	mg/kg	0.00608 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	226	mg/kg	1.56	352.518	mg/kg	0.0226 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.37	mg/kg	1.353	0.501	mg/kg	0.0000501 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		24	mg/kg	2.976	71.43	mg/kg	0.00714 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		74	mg/kg	2.774	205.287	mg/kg	0.0205 %		
12	TPH (C6 to C40) petroleum group			TPH		19	mg/kg		19	mg/kg	0.0019 %		
13	pH			PH		7.78	pH		7.78	pH	7.78 pH		
14	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		acenaphthylene				0.02	mg/kg		0.02	mg/kg	0.000002 %		
			205-917-1	208-96-8									
16		acenaphthene				0.04	mg/kg		0.04	mg/kg	0.000004 %		
			201-469-6	83-32-9									
17		fluorene				0.05	mg/kg		0.05	mg/kg	0.000005 %		
			201-695-5	86-73-7									
18		phenanthrene				0.56	mg/kg		0.56	mg/kg	0.000056 %		
			201-581-5	85-01-8									
19		anthracene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
			204-371-1	120-12-7									
20		fluoranthene				0.6	mg/kg		0.6	mg/kg	0.00006 %		
			205-912-4	206-44-0									
21		pyrene				0.64	mg/kg		0.64	mg/kg	0.000064 %		
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.26	mg/kg		0.26	mg/kg	0.000026 %		
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.35	mg/kg		0.35	mg/kg	0.000035 %		
		601-048-00-0	205-923-4	218-01-9									
24		benzo[b]fluoranthene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				<0.07	mg/kg		<0.07	mg/kg	<0.000007 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
26		benzo[a]pyrene; benzo[def]chrysene				0.26	mg/kg		0.26	mg/kg	0.000026 %		
		601-032-00-3	200-028-5	50-32-8									
27		indeno[123-cd]pyrene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
			205-893-2	193-39-5									
28		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
29		benzo[ghi]perylene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			205-883-8	191-24-2									
30		benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
31		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
32		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
										Total:	0.0631 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations below this threshold are too low to be considered a flammable risk.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0019%)

Classification of sample: TP103

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

Sample details

Sample name:
TP103
Sample Depth:
0.08-1.0 m
Moisture content:
18.7%
(no correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18.7% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18 mg/kg	1.32	23.766 mg/kg	0.00238 %		
2	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				2 mg/kg	1.884	3.768 mg/kg	0.000377 %		
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6 mg/kg	1.142	0.685 mg/kg	0.0000685 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21 mg/kg	1.462	30.693 mg/kg	0.00307 %		
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		79 mg/kg	1.126	88.945 mg/kg	0.00889 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	443 mg/kg	1.56	690.998 mg/kg	0.0443 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.38 mg/kg	1.353	0.514 mg/kg	0.0000514 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17 mg/kg	2.976	50.597 mg/kg	0.00506 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		132 mg/kg	2.774	366.187 mg/kg	0.0366 %		
12	TPH (C6 to C40) petroleum group			TPH		384 mg/kg		384 mg/kg	0.0384 %		
13	pH			PH		8.37 pH		8.37 pH	8.37 pH		
14	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		acenaphthylene				0.02	mg/kg		0.02	mg/kg	0.000002 %		
			205-917-1	208-96-8									
16		acenaphthene				0.2	mg/kg		0.2	mg/kg	0.00002 %		
			201-469-6	83-32-9									
17		fluorene				0.1	mg/kg		0.1	mg/kg	0.00001 %		
			201-695-5	86-73-7									
18		phenanthrene				1.6	mg/kg		1.6	mg/kg	0.00016 %		
			201-581-5	85-01-8									
19		anthracene				0.33	mg/kg		0.33	mg/kg	0.000033 %		
			204-371-1	120-12-7									
20		fluoranthene				2.78	mg/kg		2.78	mg/kg	0.000278 %		
			205-912-4	206-44-0									
21		pyrene				2.46	mg/kg		2.46	mg/kg	0.000246 %		
			204-927-3	129-00-0									
22		benzo[a]anthracene				1.7	mg/kg		1.7	mg/kg	0.00017 %		
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				1.94	mg/kg		1.94	mg/kg	0.000194 %		
		601-048-00-0	205-923-4	218-01-9									
24		benzo[b]fluoranthene				2.29	mg/kg		2.29	mg/kg	0.000229 %		
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.7	mg/kg		0.7	mg/kg	0.00007 %		
		601-036-00-5	205-916-6	207-08-9									
26		benzo[a]pyrene; benzo[def]chrysene				1.77	mg/kg		1.77	mg/kg	0.000177 %		
		601-032-00-3	200-028-5	50-32-8									
27		indeno[123-cd]pyrene				1.19	mg/kg		1.19	mg/kg	0.000119 %		
			205-893-2	193-39-5									
28		dibenz[a,h]anthracene				0.27	mg/kg		0.27	mg/kg	0.000027 %		
		601-041-00-2	200-181-8	53-70-3									
29		benzo[ghi]perylene				1.4	mg/kg		1.4	mg/kg	0.00014 %		
			205-883-8	191-24-2									
30		benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
31		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
32		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
										Total:	0.141 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations below this threshold are too low to be considered a flammable risk.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0384%)

Classification of sample: TP102

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

Sample details

Sample name:
TP102
Sample Depth:
0.05-0.8 m
Moisture content:
10.7%
(no correction)

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

Hazard properties

None identified

Determinands

Moisture content: 10.7% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
2	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<**LOD**
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7 mg/kg	1.142	0.8 mg/kg	0.00008 %		
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		49 mg/kg	1.126	55.169 mg/kg	0.00552 %		
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	103 mg/kg	1.56	160.661 mg/kg	0.0103 %		
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.86 mg/kg	1.353	1.164 mg/kg	0.000116 %		
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15 mg/kg	2.976	44.644 mg/kg	0.00446 %		
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
11	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		94 mg/kg	2.774	260.77 mg/kg	0.0261 %		
12	TPH (C6 to C40) petroleum group			TPH		74 mg/kg		74 mg/kg	0.0074 %		
13	pH			PH		8.3 pH		8.3 pH	8.3 pH		
14	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
15		acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
			205-917-1	208-96-8									
16		acenaphthene				0.04	mg/kg		0.04	mg/kg	0.000004 %		
			201-469-6	83-32-9									
17		fluorene				0.02	mg/kg		0.02	mg/kg	0.000002 %		
			201-695-5	86-73-7									
18		phenanthrene				0.26	mg/kg		0.26	mg/kg	0.000026 %		
			201-581-5	85-01-8									
19		anthracene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
			204-371-1	120-12-7									
20		fluoranthene				0.5	mg/kg		0.5	mg/kg	0.00005 %		
			205-912-4	206-44-0									
21		pyrene				0.58	mg/kg		0.58	mg/kg	0.000058 %		
			204-927-3	129-00-0									
22		benzo[a]anthracene				0.28	mg/kg		0.28	mg/kg	0.000028 %		
		601-033-00-9	200-280-6	56-55-3									
23		chrysene				0.44	mg/kg		0.44	mg/kg	0.000044 %		
		601-048-00-0	205-923-4	218-01-9									
24		benzo[b]fluoranthene				0.44	mg/kg		0.44	mg/kg	0.000044 %		
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
		601-036-00-5	205-916-6	207-08-9									
26		benzo[a]pyrene; benzo[def]chrysene				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		601-032-00-3	200-028-5	50-32-8									
27		indeno[123-cd]pyrene				0.16	mg/kg		0.16	mg/kg	0.000016 %		
			205-893-2	193-39-5									
28		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
29		benzo[ghi]perylene				0.18	mg/kg		0.18	mg/kg	0.000018 %		
			205-883-8	191-24-2									
30		benzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
31		toluene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
32		ethylbenzene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
33		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
34		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
										Total:	0.0584 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations below this threshold are too low to be considered a flammable risk.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0074%)

Appendix A: Classifier defined and non GB MCL determinands

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

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

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

pH (CAS Number: PH)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

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

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

Worst Case

cadmium {cadmium oxide}

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

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

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

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

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

copper {dicopper oxide; copper (I) oxide}

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

lead {lead chromate}

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

mercury {mercury dichloride}

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

nickel {nickel chromate}

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

selenium {nickel selenate}

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

zinc {zinc chromate}

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

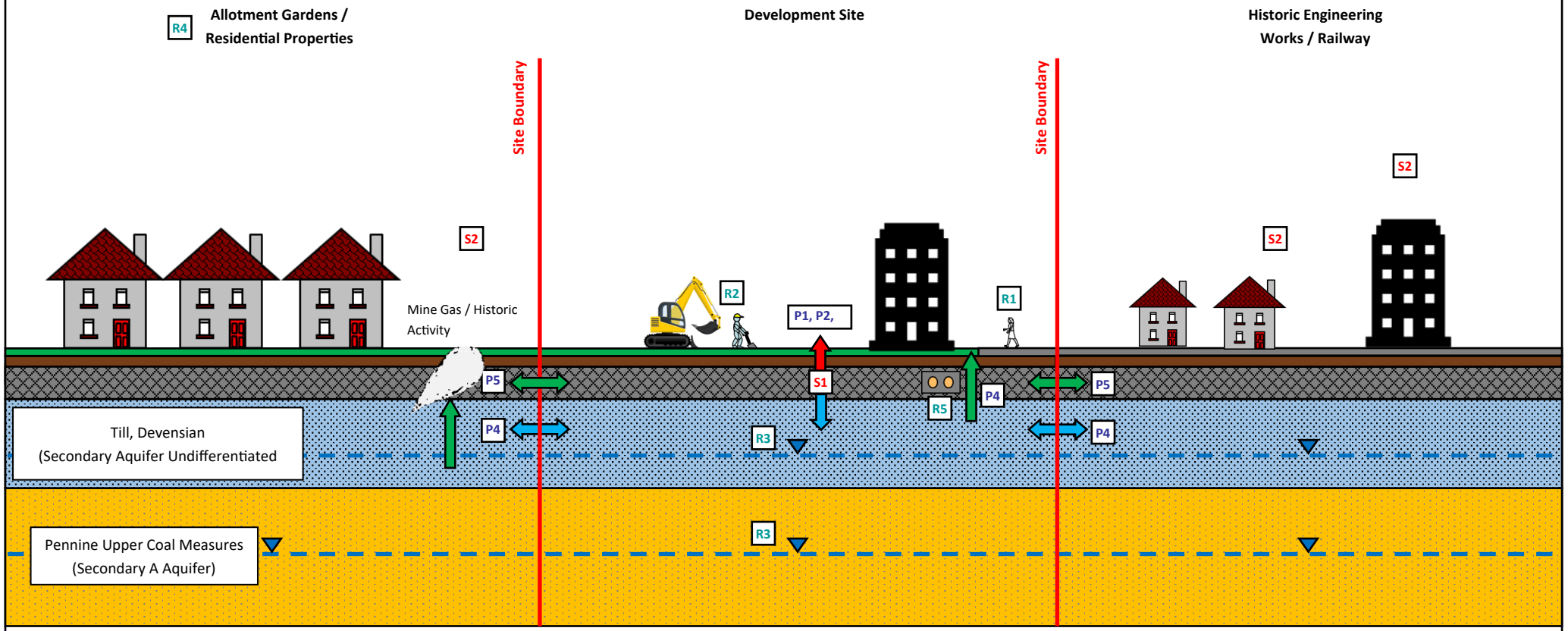
Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.112.6576.11963 (22 Apr 2025)
HazWasteOnline Database: 2025.112.6576.11963 (22 Apr 2025)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021
GB MCL List v2.0 - version 2.0 of 20th October 2023
GB MCL List v3.0 - version 3.0 of 11th January 2024
GB MCL List v4.0 - version 4.0 of 2nd March 2024
GB MCL List v5.0 - version 5.0 of 26th June 2024
GB MCL List v6.0 - version 6.0 of 15th February 2025

Figure 3 – Preliminary Conceptual Site Model

Preliminary Conceptual Site Model (CSM)



Contamination Source	
S1	Made Ground / Peat —Onsite
S2	Offsite Sources

Legend	
	Infilled / Made Ground
	Underground Services
	Inferred Water Table

Receptor	
R1	Future Site Users
R2	Construction Workers
R3	Controlled Waters
R4	Adjacent Site Users
R5	Infrastructure & Buried Services

Pathway	
	Direct Contact / Ingestion
	Leachate Migration
	Ground Gas Migration
P1	Direct Contact
P2	Ingestion
P3	Inhalation
P4	Leaching & Migration
P5	Vertical & Lateral migration of Ground Gas

Sutcliffe

Client: Jigsaw Homes

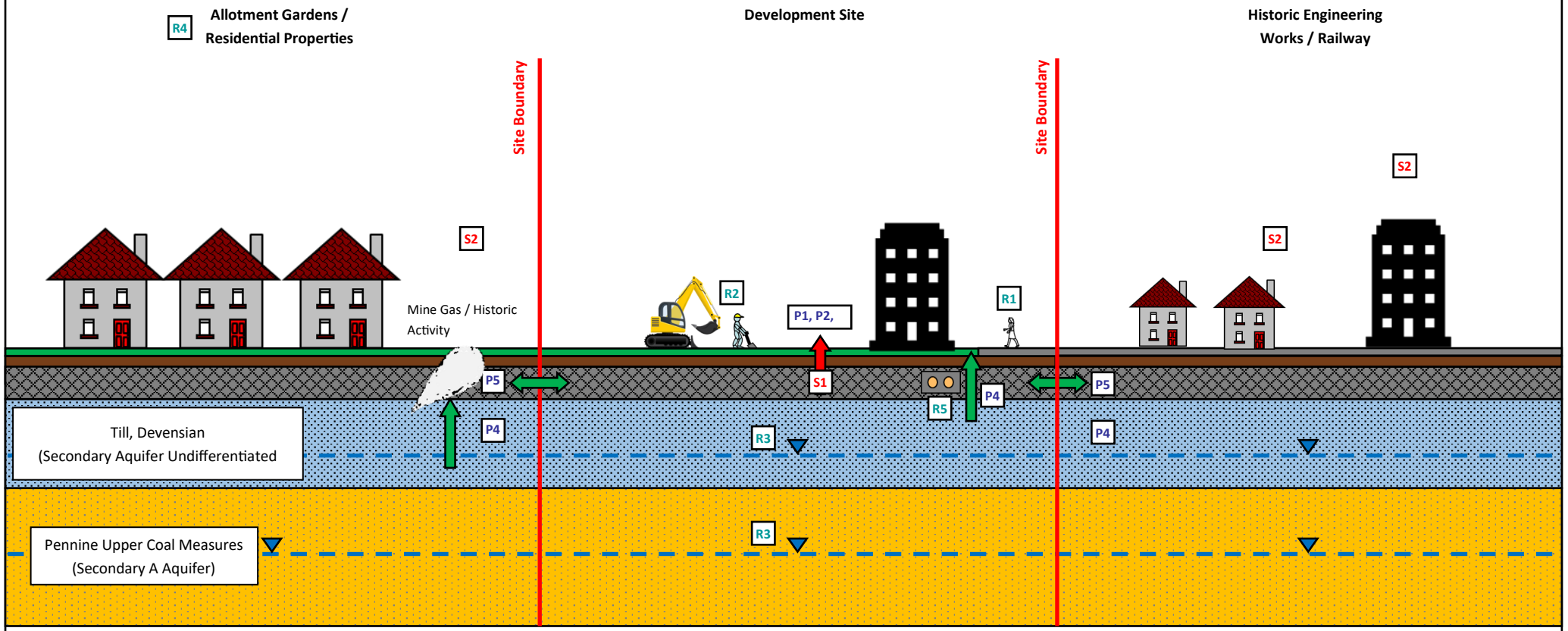
Project: 33585-SUT-ZZ-00-RP-G-7101

Site: Former Apollo Public House, Manchester

Preliminary Conceptual Site Model (CSM)	Draft	1	Scale (at A3): Not to scale
	Issue	1	
Issuing Office: Liverpool	Drawing number: 4		Version: A
Telephone: 0151 227 3155			

Figure 10 – Revised Conceptual Site Model

Revised Conceptual Site Model (CSM)



Contamination Source	
S1	Made Ground / Peat — Onsite
S2	Offsite Sources

Legend	
	Infilled / Made Ground
	Underground Services
	Inferred Water Table

Receptor	
R1	Future Site Users
R2	Construction Workers
R3	Controlled Waters
R4	Adjacent Site Users
R5	Infrastructure & Buried Services

Pathway	
	Direct Contact / Ingestion
	Leachate Migration
	Ground Gas Migration
P1	Direct Contact
P2	Ingestion
P3	Inhalation
P4	Leaching & Migration
P5	Vertical & Lateral migration of Ground Gas

Sutcliffe

Client: Jigsaw Homes

Project: 33585-SUT-ZZ-00-RP-G-7201

Site: Former Apollo Public House, Manchester

Revised Conceptual Site Model (CSM)	Draft	1	Scale (at A3): Not to scale
	Issue	1	
Issuing Office: Liverpool	Drawing number: 4		Version: A
Telephone: 0151 227 3155			

Drawing Ref. – LS5628-T (Site Existing Layout)

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File Name:LS5628-T-3D_recover.dwg

North Arrow

NOTES:

Survey plotted on a plane Local Grid, Orientated to National Grid.
All levels relate to OS (Newlyn) Datum, Established using Network RTK.

LEGEND:

AV	AIR VALVE	CR88.88	CROWN LEVEL
BH	BOREHOLE	DH88.88	DOOR HEAD
BIN	BIN	EL88.88	EAVES LEVEL
BOL	BOLLARD	FFL88.88	FINISHED FLOOR LEVEL
BM	BENCH MARK	HB88.88	HARD BED
BS	BUS STOP	HL88.88	HEAD LEVEL
BT	BT INSPECTION COVER	IL88.88	INVERT LEVEL
CB	CATCH PIT	PL88.88	PARAPET LEVEL
CCTV	CCTV CAMERA POST	RL88.88	RIDGE LEVEL
COL	COLUMN	SB8.88	SILL LEVEL
COM	TELECOMS INSPECTION COVER	SB88.88	SOFT BED
CTV	CABLE TV COVER	SPR8.88	SPRINGING POINT
DP	DRAIN PIPE	WL88.88	WATER LEVEL
DR	DRAIN		
DW	DOORWAY	B/W	BARBED WIRE
EIC	ELECTRIC INSPECTION COVER	C/B	CLOSED BOARD
ELB	ELECTRIC BOX	C/L	CHAIN LINK
EP	ELECTRICITY POLE	C/P	CONCRETE PANEL
ER	ELECTRIC	HAG	HAGGING
EVC	ELECTRIC VEHICLE CHARGING	PAL	PALISADE
FH	FIRE HYDRANT	P/R	POST & RAIL
G	GULLEY	P/W	POST & WIRE
GLT	GROUND LIGHT	W/M	WIRE MESH
GST	GAS STOP TAP	BW	BRICK WALL
GSV	GAS STOP VALVE	CW	CONCRETE WALL
GTY	GANTRY	SW	STONE WALL
IC	INSPECTION COVER	D.C	DRAINAGE CHANNEL
KO	KERB OUTLET		BUILDING
LP	LAMP POST		CANOPY
MH	MANHOLE		CHANGE/FACE CHANGE
MKR	MARKER POST		KERB
MW	MONITORING WELL		WALL
NP	NAME PLATE		FENCE
PB	POST BOX		BOTTOM OF BANK
PIPE	PIPE		TOP OF BANK
PT	POST		OVERHEAD TELECOMS
RE	RIDDING EYE		OVER HEAD ELECTRIC
RISER	SERVICE RISER		PIPE CENTRE LINE
RS	ROAD SIGN		
RWP	RAIN WATER PIPE		BORE HOLE
SAT	SATELLITE		EDGE OF TRACE
SIGN	STREET SIGN		GATE
STUMP	TREE STUMP		SURVEY STATION
SVP	SOIL VENT PIPE		BENCHMARK
TB	TRAFFIC BOLLARD		
TC	TRAFFIC LIGHT CONTROL		
TIE	TIE WIRE		
TL	TRAFFIC LIGHT		
TM	TICKET MACHINE		
TP	TELEGRAPH POLE		
VP	VENT PIPE		
WO	WATER OUTLET VALVE		
WSR	WATER METER		
WST	WATER STOP TAP		
WSV	WATER STOP VALVE		

SURVEY STATIONS

Name	Easting	Northing	Height
LS1	385739.613	399553.429	53.615
LS2	385794.250	399614.931	54.876
LS3	385636.348	399668.955	56.118
LS11	385801.309	399594.309	55.571
LS12	385754.256	399614.931	55.876
TW1	385810.279	399626.840	55.668
TW2	385823.229	399636.099	56.069

SHEET LAYOUT

Scale Bar (m): 0 2 4 6 8 10

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SEE THE COMPLETE PICTURE

REV	DATE	DESCRIPTION

CLIENT
Sutcliffe

PROJECT TITLE
Topographical Survey of Land at:
Apollo Pub
Miles Platting
M40 8DR

Drawing Ref. LS5628-T			Rev #
Surveyed A.Love	Drawn J.Macgregor	Checked B.Brady	
Scale 1:200	Date Nov 24	Size A1	No. 01

Drawing Ref. – 1349-1012 (Proposed Site Plan)

Apollo Pub, Miles Platting

DK-Architects

Drawing Title:	Ground Floor Plan
Date:	18.02.2025
Drawing no:	1349-1012
Scale:	1:200 @ A3
Drawn:	NS / KJ

revision: D

revision notes:

D	23/04/2025	Access road geometry updated following comments from Sutcliffe
C	04/04/2025	Scheme Updated to reflect 60% 2 bed accommodation
B	01/04/2025	layout Updated following comments from M&E consultant and site access arrangement updated

0m 2m 4m 10m 20m

Accommodation Schedule

13no 1b2p apartments - 40%

19no. 2b3p apartments - 60%

32no. apartments total

16no. car parking spaces

2no M(4)3 apartments

Jigsaw

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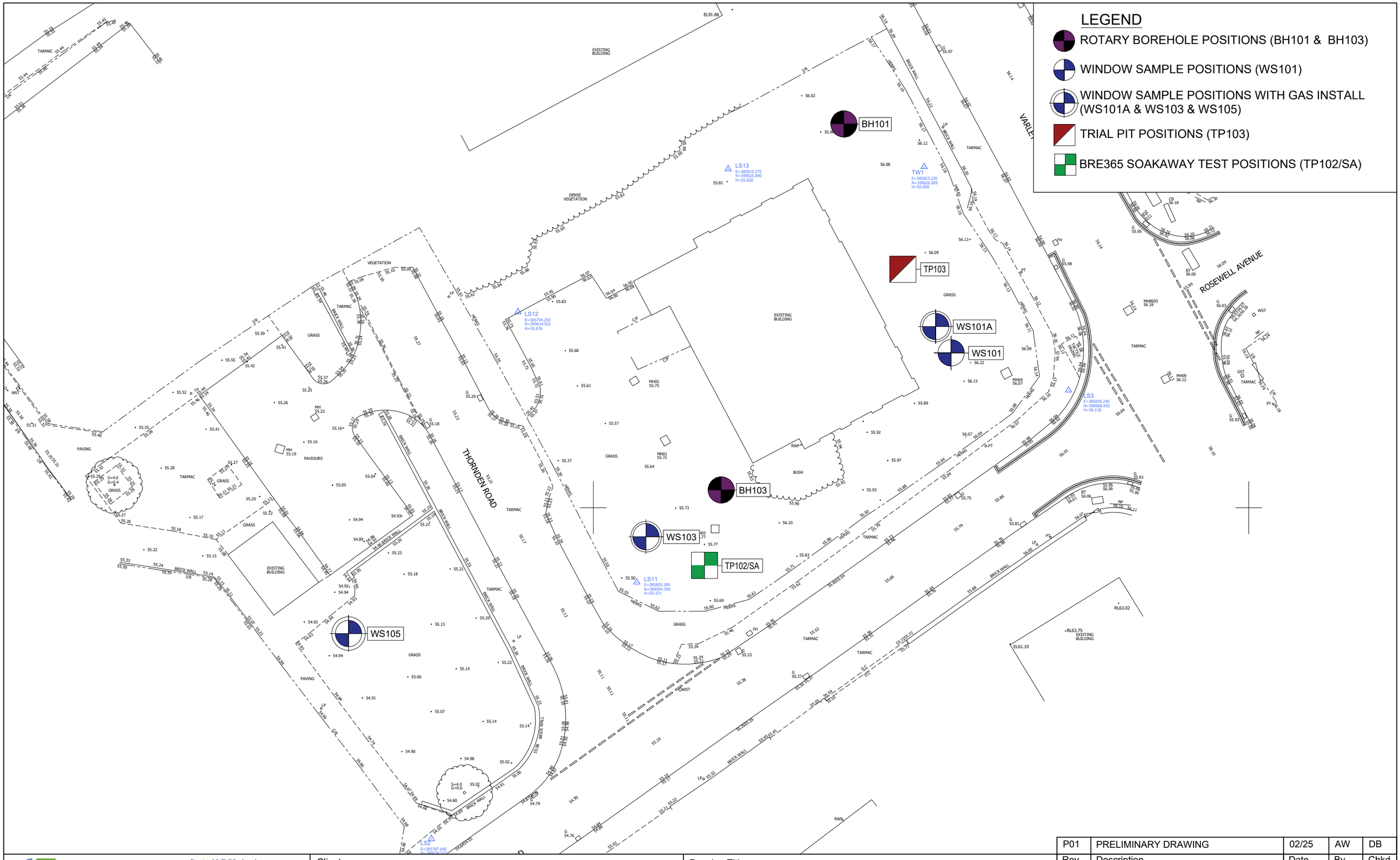
Drawing Ref. – 33585-SUT-ZZ-XX-DR-G-7252 (Site Investigation on Existing Layout)



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Structural & Civil Engineering
Geotechnical & Environmental Investigations
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London Office: 020 8016 4320

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Drawing Status
FOR INFORMATION ONLY

Client
JIGSAW

Project
FORMER APOLLO PUB
MILES PLATTING

Drawing Title
PROPOSED SITE INVESTIGATION
ON EXISTING LAYOUT

Rev	Description	Date	By	Chkd
P01	PRELIMINARY DRAWING	02/25	AW	DB

Date	Drawn By	Checked By
FEB 2025	A WOODS	D BOWEN

Scale at A3	Project Number
AS SHOWN	33585

Sheet Number	Revision
33585-SUT-ZZ-XX-DR-G-7252	P01