Phase 2 Ground Investigation Report

Abellio Bus Garage, North Hyde Gardens, Hayes, UB3 4QQ

A REPORT PREPARED FOR AND ON BEHALF OF:
Ark Data Centres Limited

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Business

Abellio Bus Garage, North Hyde Gardens, Hayes, UB3 4QQ

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For and on behalf of
Paragon Building Consultancy Limited

DASHBOARD SUMMARY

KEY INVESTIGATION FINDINGS

	Rationale for the Investigation
1.	The development site is situated at Abellio Bus Garage, North Hyde Gardens, Hayes, UB3 4QQ (Figure 1, Appendix 1). Ark Data Centres Limited (HPF) has appointed Paragon to complete a Phase 2 Ground Investigation as a part of a wider development comprising Bulls Bridge Industrial Estate in Hayes, for which Ark Data Centres Limited are the current freeholder. HPF has been appointed as the structural engineer for the development, which comprises a MV Energy Centre on the former Abellio plot. This investigation, by Paragon, is intended to facilitate the design process and to be submitted in support of a planning application for the development.
2.	The wider development site comprises five main parcels of land that are referred to as: Vodafone, Abellio, British Airways, Addison Lee and FM Conway (Maintenance Yard). This report only summarises the works completed at the Abellio Bus Garage which is hereafter referred to as 'the site'. The site has previously been un-investigated due to tenant activities at the site. The British Airways, Vodafone and Addison Lee plots have previously been investigated by Paragon. The site is relatively flat with reduced elevations in the eastern part of the site where a small area of soft landscaping is present. This area slopes down towards the Vodafone plot which is present to the east of the site. In addition, the Grand Union Canal is offsite and located within 5m of the southern boundary of the site. The former British Airways plot is situated beyond North Hyde Gardens to the north of the site and the North Hyde Gardens bridge is present to the west of the site.
3.	Paragon completed a previous Phase 1 Environmental Audit on behalf of Ark Data Centres Limited in 2020 for due diligence purposes. It is understood that the client has full reliance on the data collected in this investigation and relevant information is used and referred to herein. This document has been prepared to support a planning application which will be submitted at a later stage.
4.	The Phase 1 investigation identified the site has a history of being used as part of a creosote works, an oil fired power station and a former railway which extended into the land to the north. It is also understood from British Geological Survey (BGS) mapping that the site comprises artificial ground which is presumed to be from informal landfilling at the site.
5.	This report details the ground investigation completed by Paragon in 2021 on the Abellio plot which comprised 1 no. cable percussive borehole drilled to 35.00m below ground level (bgl), 8 no. windowless sample boreholes drilled to a maximum depth of 5.00mbgl and 2 no. hand excavated trial pits. In addition, chemical testing was undertaken on soils and groundwater, in-situ geotechnical testing including Standard Penetration Tests (SPTs) was completed in the boreholes, ex-situ geotechnical laboratory analysis was undertaken, and three indicative rounds of gas monitoring have been completed.

Ground Conditions

6. The site is mapped by the British Geological Survey as being underlain by Infilled Ground, the Lynch Hill Gravel or the Langley Silt over the London Clay. The boreholes drilled onsite encountered hardstanding over Made Ground (cohesive and granular lenses) to a maximum depth of 4.50-5.00mbgl over reworked Alluvium (cohesive and granular lenses) to 4.80-5.00mbgl over weathered London Clay Formation to 7.50mbgl, over London Clay Formation to a maximum drilled depth of 35.00mbgl.

7. Groundwater was encountered in the reworked Alluvium at around 2.30–3.00mbgl (28.31- 29.51mAOD).

8. An anomaly was recorded during the borehole clearance for Unexploded Ordnance (UXO) using the Magnetometer. This was identified within WS04 at a depth of 1.00mbgl. Due to the detection, the borehole was terminated. Recommendations for further assessment were made and this was subsequently completed under a sperate instruction. The assessment found no UXO and the anomaly was a metal rope.

Environmental Findings

9. A Geoenvironmental Risk Assessment was carried out on the chemical laboratory test data and a revised Conceptual Site Model was presented. Chemical test data found that the concentrations of contaminants testing within the Made Ground and natural soil were below the Generic Assessment Criteria (GAC) for a commercial land use. However, asbestos was encountered in two locations. The asbestos was quantified at <0.001% and as the site is to be almost entirely surfaced with hardstanding, the risks to future site users is considered to be low.

10. The results of the groundwater analysis found marginal exceedances of the Environmental Quality Standards for PAH and Heavy Metals. Nevertheless, the exceedances were marginal and no gross contamination was encountered. Therefore, the risk to Controlled Waters is considered to be low.

11. Three rounds of gas monitoring were completed as part of this investigation and the results identified that the elevated levels of carbon dioxide and methane. Based on a preliminary assessment using BS 8485:2015+A1:2019 '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*', the site falls within Characteristic Situation (CS) 2, whereby gas protection measures are required.

Geotechnical Findings

12. Geotechnical design parameters for the strata encountered have been provided. The parameters have been derived based on in-situ and ex-situ tests and published empirical relations. Geotechnical testing has included standard classification testing including plasticity index, moisture content, strength testing including SPTs, and undrained unconsolidated triaxial testing. A design groundwater level has also been derived based on groundwater strikes encountered and monitoring results from the current site investigation. DS and ACEC classifications are also provided for the Made Ground and Lynch Hill Gravel Member.

13. The recorded groundwater strikes and monitoring results appear to show that groundwater flows towards the Grand Union canal and River Crane/Yeading Brook. A design groundwater level of 29.50mOD is recommended.

14. Geotechnical recommendations are summarised below.

RECOMMENDATIONS

Environmental

1. The concentrations of contaminants within soil and groundwater are considered to be suitable for the proposed end use of the development, and no further investigation, monitoring or remediation is required. Therefore, a remediation strategy is not considered to be necessary. Instead, the following recommendations should be followed:
   - Capping layers (150mm topsoil and 450mm subsoil over a geotextile) are to be used in areas of soft landscaping;
   - Gas (methane and carbon dioxide) and vapour resistant membranes are to be used within future enclosed structures;
   - Asbestos control measures are to be used by the main contractor;
   - An audit trail for materials management and offsite waste disposal is to be maintained by the main contractor;
   - Whilst it is unlikely, in the event that previously unidentified contamination is uncovered during construction, works should cease until inspection and testing has been undertaken by an appropriately qualified person. Therefore, a watching brief and discovery strategy should be adopted on site during development; and
   - The main contractor will need to provide completion statements that will feed into the main verification report for the wider site.

Regulatory

2. This report should be submitted to the Local Planning Authority in support of a planning application for the development.

Geotechnical

3. Geotechnical design parameters for the strata encountered have been provided. The parameters have been derived based on in-situ and ex-situ tests and published empirical relations.

4. Given the thickness and variability of the Made Ground and existing obstructions, shallow foundations are not recommended. It is recommended that floor slabs should be suspended.

5. It is recommended that all excavations are supported. Mitigation measures should also be provided to control the ingress of groundwater.

6. A preliminary pile design has been provided based on three pile diameters. Based on the site investigations carried out to date, the ground conditions below the site have been proven to a maximum depth of 35m bgl and therefore the pile length has been limited to 30m. The pile capacities are dependent on the London Clay Formation, this stratum has been encountered in one location only and depth to surface may vary.

7. The proposed development is in close proximity to the River Crane, and ground conditions appear to have been influenced by this with alluvium locally encountered.

8.	A design CBR value of less than 2.5% is recommended for pavements and roads. If site levels are increased consideration should be given to potential long-term settlement and consolidation of organic/peat layers that may be present within the alluvium.
9.	Based on the results of the pH and sulphate testing carried out on samples from the Made Ground and Lynch Hill Gravel Member, the DS and ACEC classification for these strata is DS-2 and AC-2. The DS and ACEC for the London Clay Formation is DS-2 and AC-1s, assuming that all concrete placed in contact with the stratum will be due to placing of pile foundations.
	Unexploded Ordnance
10.	Due to the presence of an anomaly recorded during the UXO clearance of WS04, further assessment was recommended. At this stage, it is recommended that this area is excavated under the supervision of a UXO Engineer.
11.	The assessment was subsequently completed under a separate instruction and found no UXO and the anomaly was a metal rope.

CONTENTS

PHASE 2 GROUND INVESTIGATION REPORT

CLIENT NAME: Ark Data Centres Limited

PROPERTY ADDRESS: Abellio Bus Garage,
North Hyde Gardens,
Hayes,
UB3 4QQ

INSPECTION DATE: 22 June 2021

1.0 INSTRUCTIONS

1.1	Paragon Building Consultancy Limited (Paragon) was instructed by Ark Data Centres Limited to complete a Phase 2 Ground Investigation on a site referred to as Abellio Bus Garage, North Hyde Gardens, Hayes, UB3 4QQ. The investigation included an intrusive investigation, laboratory analysis and risk assessment. These works have been completed in connection with redevelopment of the site as a MV energy centre. This redevelopment forms a part of larger redevelopment scheme for development of a data centre with MV energy centre and substation.

2.0 AIMS AND OBJECTIVES

2.1	This document has been prepared to support a planning application. The aims of this report are: • To provide information on the geotechnical and environmental quality of the ground present onsite to highlight potential risks and abnormal development constraints associated with potential redevelopment of the site. • To assess the potential health and environmental risks to the potential development and other significant receptors from onsite sources. • To assess the potential offsite sources of contamination and their impact on the potential development. • To complete a gas risk assessment. • Provide provisional geotechnical recommendations in relation to the potential development.

2.2	The objectives of this report are: • To provide ground conditions information and recommendations in relation to the potential future redevelopment of the site. • Characterise the contamination onsite by completing an intrusive site investigation to characterise the site. • To suggest a potential remediation strategy should contamination be identified. • Determine the quality of the ground for geotechnical design by completing a ground investigation.

3.0 SCOPE OF WORKS

3.1	The ground investigation was undertaken in general accordance with the Code of Practice for Site Investigation British Standard BS5930:2015+A1:2020, Code of Practice for the Investigation of Potentially Contaminated Sites BS10175:2011+A2:2017, Land Contamination: Risk Management (LCRM) 2020. Due regard is made to the Environmental Protection Act (EPA) 1990 Part 2A in connection with the contamination risk assessment and requirements of the National Planning Policy Framework (NPPF).
3.2	Three previous phases of work have been completed by Paragon for the wider development: A Phase 1 Desk Study for the wider site, a Phase 1 Desk Study for the Abellio Plot and a Phase 2 Site Investigation on the neighbouring plots. • An earlier Phase 1 Environmental Risk Assessment was previously prepared by Paragon for the larger development (19.0633/CB/NW, 21 August 2019 – Revised for planning, Rev D – November 2021). It has outlined the potential health and environmental risks identified from desk-based searches including online searches of the historical maps, geological maps, planning records and review of data on the Environment Agency website. A site walkover was completed and an initial Conceptual Site Model (CSM) was presented. • A Phase I Environmental Audit was undertaken by Paragon at the Abellio site (200054, 27 February 2020 for acquisition purposes). The report outlined the potential health and environmental risks identified from the review of online searches, historical maps, geological maps, planning records, Environment Agency information and based on findings from a site walkover. • A Phase 2 Site Investigation Report was undertaken by Paragon (19.0633/CB/AW, 21 August 2019– Revised for planning, Rev D – November 2021) on the wider development plot, except for Abellio due to tenant activities that prevented access. This report documents the findings of an intrusive investigation (drilling boreholes and trial pitting), laboratory testing of soils, groundwater and gas, onsite monitoring and environmental and geotechnical risk assessment.

4.0 INTRODUCTION

4.1	**Site Location**
4.1.1	The following information has been obtained from the existing Phase 1 report completed in 2020 for acquisition purposes. The Phase 1 should be read in conjunction with this report; the following is a summary.
4.1.2	The site is centred approximately at National Grid Reference: 510435, 179211, and extends to 0.47Ha. The approximate elevation of the site is 31m Above Ordnance Datum (mAOD). Site information gathered during the preliminary report is summarised below and a location plan is as Figure 1, in Appendix 1.
4.1.3	The site is surrounded by the former British Airways (BA) plot and North Hyde Gardens to the north, the former Vodafone plot to the east, the Grand Union Canal to the south and the North Hyde Gardens bridge to the west.
4.2	**General Description and Current Site Use**
4.2.1	This subject site comprises of a warehouse used as a bus garage with associated two-storey office area operated by Abellio. The warehouse has an internal car wash and repair garage. The site has a small Petrol Filling Station at the site entrance and this was fed by an above ground diesel storage tank (AST). The pipework was observed to run above ground. In addition, an Ad-Blue tank and pump was situated at the entrance to the site.
4.2.2	The site has multiple parking areas for the site staff and buses in the central and eastern part of the site. The hardstanding at the site comprises of concrete and tarmac. There was some residual staining on the ground surface which has been assumed to be from leaks from parked buses.
4.2.3	There is a small service yard to the rear of the building in the western part of the site. Two small waste oil tanks (both ASTs) were observed to be present within this area. During drilling, a spill had occurred in this area and spill kits were placed on the ground surface to contain the oil.
4.3	**Proposed Development**
4.3.1	It is our understanding that a Phase 2 Ground Investigation Report is required to provide additional preliminary data on existing contamination, ground gas and geotechnical conditions at the site to facilitate the development of an MV energy centreon the former Abellio plot. The proposed layout is presented as Figure 2, in Appendix 1.
4.4	**Planning**
4.4.1	The wider site is being developed under planning application: 75111/APP/2020/1955. A proposed development layout is presented in Appendix 1. The plot is to be redeveloped into an Energy Centre.

4.5 Site History

4.5.1 The site formed open land from as early as 1868 until around 1935, where the site was part of a creosoting works, which extended offsite into the land to the north and east. By 1963, the site was shown as a pond, with embankments which were considered to be likely to be due to infilling activities. By 1982, the site was shown as being levelled but undeveloped. The current layout was shown by 2010.

4.5.2 The surrounding area has supported various industrial (potentially contaminative) land uses, including factories, brick fields, mills, railway, electricity substation, creosoting works, and rubber works.

4.5.3 Historical landfilling has been identified on site and east of the River Crane/Yeading Brook since 1936 and records indicate the landfill accepted commercial waste. In addition, the British Geological Survey (BGS) artificial ground mapping covers the entire site.

4.6 Geology

4.6.1 From a review of BGS mapping (269 and 270), the geology of the subject site is reported to comprise mostly of the Lynch Hill Gravel underlain by the London Clay Formation. The Langley Silt superficial deposits reportedly cover the south-western part of the site (yard at the rear of the building). The mapping also shows Artificial Ground and Alluvium within 75m of the site.

4.6.2 The surrounding area is known for being historically mined to extract the gravel. As such, there are many landfills and reservoirs in this area. It is therefore possible that the gravel deposits were largely extracted which allowed the landfilling to occur.

4.6.3 Paragon completed a Ground Investigation on the plot adjacent immediately to the north. A summary of the ground conditions are presented in Table 1 below.

Table 1. Ground Conditions

Depth From (min/max) (m)	Depth To (min/max) (m)	Soil Type	Description
0.0	0.1 / 0.05	Concrete / Tarmacadam	Concrete / Tarmacadam hardstanding.
0.05 / 0.1	1.5 / 5.8	Made Ground	Variable Made Ground comprising soft to firm, dark brown, gravelly clay. Gravel is brick, suspected slag, clinker, timber fragment, concrete and mixed lithologies.
1.5 / 5.8	5.7 / 10.2	Gravel	Yellowish orange brown sandy GRAVEL. Gravel is sub-rounded to well-rounded fine to coarse mixed lithologies. Lynch Hill Gravel.
5.7 / 10.2	Unproven	Clay	Firm to stiff silty CLAY. London Clay.

4.6.4	Groundwater was encountered in the Lynch Hill Gravel at around 29mAOD in the centre of the site and closest to the river at between 26.76 and 26.57mAOD. In comparison, the base of the River Crane channel to the east of the site is around 25.00mAOD based on Environment Agency LiDAR data. Perched groundwater was also encountered in the Made Ground and London Clay.
4.7	**Hydrogeology**
4.7.1	The Lynch Hill Gravel is classified as a Principal Aquifer of high permeability, while the Langley Silt Member is classified as a Secondary (A) Aquifer, and the London Clay Formation is classified as Unproductive Stratum.
4.7.2	The site is not located within Groundwater Source Protection Zone (SPZ).
4.7.3	There is one groundwater abstraction within a 1km radius which is approximately 530m southeast of the site and is used for evaporative cooling.
4.8	**Hydrology**
4.8.1	Grand Union Canal is located directly south of the site, and the River Crane is located approximately 75m to the east of the site. No surface water abstractions have been identified within 1km of the site.
4.8.2	There are three discharge consents within 250m of the site. These relate to records approximately 10m north for miscellaneous discharge to land, 85m south and 95m south of the site from trade discharges to the River Crane/Yeading Brook.
4.9	**Flooding**
4.9.1	Environment Agency data indicates that that the site is within Flood Zone 1, meaning the risk of flooding at the site is low.
4.10	**Regulatory Enquiries**
4.10.1	The Local Authority has not been contacted by Paragon at this time. However, it is considered unlikely that the site is currently designated as contaminated land under the provisions of the EPA 1990 Part 2A.
4.10.2	The Environment Agency has not been contacted by Paragon as part of this assessment at this stage.
4.11	**Environmental Database Information**
4.11.1	No Areas of Outstanding Natural Beauty, Environmentally Sensitive Areas, Sites of Special Scientific Interest or Special Protection Areas have been identified within a 1km radius of the site.
4.12	**Ground Stability Hazards**
4.12.1	Records indicate that the area in general has a moderate risk of subsidence hazards as a result of shrinking/swelling of underlying clay.
4.12.2	The site is not located within an area affected by coal mining activities.

4.13	**Unexploded Ordnance (UXO)**
4.13.1	Online information indicates that there were several bomb strikes recorded around the site located adjacent to the north during World War II. As such, a specialist assessment was undertaken by Brimstone Site Investigation Limited and comprised a Stage 2 Detailed UXO Risk Assessment (Dated: 3 July 2019, Ref DRA-19-1105) to identify constraints on the proposal. This has been reported separately and a summary is provided below.
4.13.2	The report reviewed the original London bomb plot maps covering the entire German bombing campaign. The data confirmed the wider study area was bombed on at least eight separate occasions, resulting in 29 large 'iron' bombs and one parachute mine within 500m of the site. No bomb strikes were recorded within the site boundary. In addition, no records were made for the first month of the 1940 Blitz and areas of soft landscaping would disguise entry points and be unobserved. As such, there is the potential for more unidentified bombs to be present.
4.13.3	The report concluded there was a low to moderate risk from UXO and recommended mitigation measures. The risk mitigation measures included UXO safety awareness briefings, onsite supervision during excavations and a magnetometer probe survey if piling is to be implemented.
4.14	**Radon**
4.14.1	The site is not located within a radon affected area. Less than 1% of homes are above the radon action levels, as such, no radon protection measures are considered necessary.
4.15	**Previous Reports**
4.15.1	Paragon prepared a Phase I Environmental Audit at the Abellio plot for pre-acquisition purposes on 27 February 2020. The report states that the site operates as active bus depot with parking for buses, an internal car wash, repair garage and petrol filling station. The key findings included historical uses of the site as part of a creosote works and landfill which were reported as a potential source of contamination and risk to groundwater and nearby River Crane.
4.15.2	Additionally, during the inspection, oil staining was observed in discrete areas on the surface of the site. It was considered likely to be due to minor leaks from parked buses and ongoing refuelling activities. Oil staining was also identified within some drains and along the eastern and southern boundaries of the site within areas of soft landscaping.
4.15.3	Furthermore, the potential for presence of Japanese Knotweed could not be discounted.
4.15.4	As such, the risk rating for continued commercial use was reported to be moderate, and further action was recommended associated with CCTV Drainage Survey and Japanese Knotweed Survey.
4.16	**Constraints**
4.16.1	The previous due diligence report was constrained by active works and parked buses across the site.

4.17	**Potential Contaminants of Concern**
4.17.1	Based on the foregoing, the potential contaminants of concern that require further investigation are associated with potential spills of diesel/oils as well as onsite landfill which has a potential for contamination and ground gas generation. Contaminants of concern include: • Made Ground including asbestos from historical site uses and landfilling activities; • Total Petroleum Hydrocarbons from current vehicle use on site and historical site uses ; • Biodegradable materials and other contaminants (heavy metals and Polycyclic Aromatic Hydrocarbons) within the infilled ground; and • UXO and historical ammunition.
4.18	**Potential Active Pathways**
4.18.1	Small areas of soft-landscaping are present on the eastern and southern boundaries of the site and could promote current and future pathways.
4.18.2	In addition, the underlying Lynch Hill Gravels would allow migration of contamination and ground gas (if present) due to its high permeability. The Langley Silt may also allow the migration of contamination (if present) albeit the permeability is likely to be significantly lower than the Lynch Hill Gravels.
4.19	**Potential Receptors**
4.19.1	Potential receptors identified include: • Future Site Users; • Construction Workers; • Offsite Users; • Controlled Waters (the River Crane, The Grand Union Canal and the Principal and Secondary Aquifers beneath the site); and • Proposed buildings and infrastructure.

5.0 PRELIMINARY CONCEPTUAL SITE MODEL

5.1	**Conceptual Site Model (CSM)**
5.1.1	Based on the risks identified within the Phase 1 Investigation a Preliminary Conceptual Site Model has been produced based on redeveloping the site. The model is based upon the source-pathway-contaminant linkage concept set out in the Environmental Protection Act 1990 and accompanying statutory guidance. For a site to be designated under Part 2A of the EPA 1990 as contaminated land, there must be at least one plausible contaminant linkage and a significant risk to the receptor must exist as a result.

5.1.2

Table 2. Preliminary Conceptual Site Model

Receptor	Potential sources	Pathways	Risk	Justification
Human Health				
Construction and maintenance workers / Users of the site	Organic and metal contamination	Direct contact, ingestion, and inhalation via outdoor soils or translocated soil and dust indoors.	M	**Moderate risk:** Ingestion, inhalation and dermal contact with contaminated soils in excavations or stockpiles cannot be discounted. Personal Protective Equipment (PPE) and Risk Assessments and Method Statements are required.
	Ground gas and vapours	Inhalation, Migration through granular and fractured soils into confined spaces.	M	**Moderate risk:** Inhalation of vapours from contaminated soils or groundwater below the site cannot be discounted due to the historical use of the site.
Future site users	Organic and metal contamination in soils and groundwater	Direct contact, ingestion, and inhalation of outdoor soils or translocated soil and dust indoors.	M	**Moderate risk:** Inhalation of vapours from contaminated soils or groundwater below the site cannot be discounted.
	Ground gas and vapour	Inhalation, migration through granular and fractured soils into confined spaces.	M	**Moderate risk:** Inhalation of vapours from contaminated soils or groundwater below the site cannot be discounted due to the historical use of the site.
Offsite Residents (270m southwest)	Organic and metal contamination in soils, groundwater and gas	Direct contact, ingestion, and inhalation of outdoor soils or translocated soil and dust indoors.	L	**Low risk:** Residents located approximately 270m southwest are unlikely to be at risk form contaminants arising from the site as they will be cut off by the Grand Union canal. The likelihood for migration to properties a similar distance to the northwest is minimal given the considerable distance to the properties and several other areas of industrial land in between.
Property				
Site structures and services	TPH in site soils	Direct contact between soil and structures or services.	M	**Moderate risk:** The risk from direct contact of building materials including foundations and buried services with contaminated soils and groundwater cannot be discounted at this stage.
	Ground gas and vapour	Migration through granular and fractured soils into confined spaces.	M	**Moderate risk:** The potential for migration of gases through soil pore space to the surface from underlying Made Ground and historical ground workings cannot be discounted at this stage.
Groundwater				
Principal Aquifer	Metals and organic contamination in soils	Soil leaching and migration of potential soil contamination.	M	**Moderate risk:** The potential for contamination associated with the historical use of the site to impact the Principal Aquifer cannot be discounted at this stage.
Secondary (A) Aquifer	Metals and organic contamination in soils	Soil leaching and migration of potential soil contamination.	M	**Moderate risk:** The potential for contamination associated with the historical use of the site to impact the Secondary (A) Aquifer cannot be discounted at this stage.

5.1.3 **Table 2. Preliminary Conceptual Site Model (Continued)**

Receptor	Potential sources	Pathways	Risk	Justification
Surface Water				
Grand Union Canal (directly south) River Crane/Yeading Brook (70m east)	Leachable metals and organic contamination	Soil leaching and migration into drains and sewers which discharge into the ditch.	M	**Moderate risk:** The potential for contamination associated with the historical use of the site to impact the nearby surface water features cannot be discounted at this stage.

5.2 Key Risks Requiring Further Investigation

5.2.1 Based on the above, the potential for some degree of ground contamination to exist as part of the historical site use cannot be discounted. In addition, in order to redevelop the site, the risk associated with land contamination will need to be quantified to determine the risk to human health and Controlled Waters.

6.0 GEOTECHNICAL RISK ASSESSMENT

6.1 Risk Assessment

6.1.1 The Preliminary Geotechnical Risk Assessment completed within the Phase 1 investigation has been expanded. The results of the assessment are provided in Table 3.

6.1.2 **Table 3. Geotechnical Risk Assessment**

Hazard	Risk	Rationale
Made Ground	M	**Moderate risk:** Made Ground has been mapped onsite and is considered to be due to historical landfilling that occurred at the site. Due to the highly variable nature of the Made Ground identified, foundations of the proposed development are likely to require deepening to ensure that a suitable bearing stratum is identified.
Collapsible / Unstable Excavations	M	**Moderate risk:** Due to the presence of Made Ground, there is the potential for excavations to be unstable and prone to collapse. An allowance for shoring should be considered during groundworks.
Shallow Groundwater	M	**Moderate risk:** Groundwater is likely to be present within the superficial deposits (as identified during previous investigations within the surrounding area). As such, there is the potential for shallow groundwater to impact the stability of excavations and as such dewatering may be required.
Compressible strata	M	**Moderate risk:** Made Ground, Alluvium and clay have been mapped as being onsite which indicate foundations will require deepening to a competent bearing stratum.

Aggressive ground conditions for concrete	M	**Moderate risk:** There is the potential for naturally occurring sulphate within the natural soils or Made Ground to produce ground that is aggressive to concrete. Formal analysis is required for concrete design.
Dissolution	L	**Low risk:** The site is unlikely to be affected by dissolution.
Landslide	L	**Low risk:** The topography of the site is relatively flat and the risk of landslides is low.
Mining	L	**Low risk:** The site has not been identified as being at risk of historical mining.

6.2 Summary of Desk Based Risk Assessment

6.2.1 Due to the variation in the geology and presence of Made Ground mapped by the British Geological Survey, further assessment is required to understand the ground conditions on site. This should also involve a deep borehole to determine the depth of Made Ground and potential for piled foundations.

6.2.2 Due to the potential for aggressive ground conditions for concrete to exist, sulphate testing and an assessment with reference to BRE Special Digest 1 should be undertaken to determine the concrete design.

7.0 GROUND INVESTIGATION

7.1 Investigation Rationale

7.1.1 The objectives for the investigation were to identify and characterise the ground conditions, the sources, pathways and receptors (in general accordance with the Environmental Protection 1990 Part 2A), to reduce uncertainties and to provide an overview of site conditions. Details of the site methods are presented in Appendix 3.

7.1.2 The ground investigation was undertaken in general accordance and with reference, where relevant to the following documents:

- Specification for Ground Investigation, Site Investigation Steering Group, Thomas Telford, 1994;
- British Standard BS10175:2011 (A2) Investigation of potentially contaminated sites – code of practice, as amended;
- Environment Agency (2000) Secondary model procedures for the development of appropriate soil sampling strategies for land contamination. Technical Report P5-066/TR; and
- BS IS0 5667-22:2010 Water quality. Sampling. Guidance on the design and installation of groundwater monitoring points.

7.1.3 The intrusive investigation was completed between 22 June and 30 June and comprised a total of eleven exploratory holes. This included:

- 1 no. Cable Percussive Borehole drilled to 35mbgl;
- 8 no. Windowless Sample Boreholes drilled to a maximum depth of 5.0mbgl;
- 2 no. Hand Excavated Trial Pits;
- Geotechnical laboratory testing (in situ Standard Penetration testing and ex situ sampling for laboratory testing);
- Geoenvironmental laboratory testing for soil and water commensurate with the findings of the CSM; and
- 3 no. groundwater and ground gas monitoring visits.

7.1.4 A site plan showing the locations of each exploratory hole is provided in Figure 3, Appendix 1.

7.2 Intrusive Locations

7.2.1 The scope for each exploratory location is presented below.

7.2.2 **Table 4. Intrusive Locations**

ID	Notes
BH01	Drilled to 35.00mbgl
WS01	Refused on concrete at 0.50mbgl
WS01a	Refused on concrete at 0.40mbgl
WS01b	Refused on concrete at 0.30mbgl
WS02	Drilled to 5.00mbgl
WS03	Refused on concrete at 0.40mbgl
WS04	Terminated at 1.00mbgl due to an anomaly with the magnetometer
WS04a	Refused on concrete at 0.30mbgl
WS05	Drilled to 5.00mbgl
HP101	Hand excavated pit within the soft landscaped area.
HP102	Hand excavated pit within the soft landscaped area.

7.2.3 Combined ground gas and groundwater wells were installed in the boreholes as outlined below. Full details of the installations are also provided on the borehole logs presented in Appendix 4.

Table 5. Monitoring Well Installation Details

ID	Drilling Depth mbgl	Slotted Well Section mbgl [AOD]
BH01 Deep	35.00	6.00 – 15.00
BH01 Shallow	35.00	1.00 – 4.50
WS02	5.00	1.00 – 5.00
WS05	5.00	1.00 – 3.50

7.3 Sampling and Testing Strategy

7.3.1 Soil samples were collected throughout the investigation for geotechnical and environmental analysis. Samples were submitted for geotechnical testing in accordance with relevant versions of BSEN ISO 17892-6:2017, BSEN ISO 14688-1:2002, and BSEN 1997-2:2007. Environmental samples were submitted under controlled conditions with a Chain of Custody to i2 Analytical a UKAS and MCerts accredited facility.

7.3.2 Environmental soil samples were tested for a suite of contaminants to assess the risks identified in the Phase 1 report:

- Heavy metals including; arsenic, cadmium, chromium (total and VI), copper, lead, mercury, nickel, selenium, and zinc;
- Cyanide and Phenols;
- Petroleum Hydrocarbons (PHC) – Total Petroleum Hydrocarbons Criteria Working Group (TPH-CWG);
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX);
- Polyaromatic Hydrocarbons (PAH) – Speciated 16;
- Asbestos screen and identification;
- Total Organic Carbon (TOC), Sulphates and pH; and
- Volatile and Semi-Volatile Organic Compounds.

7.3.3 In addition, two Waste Acceptance Criteria (WAC) tests were undertaken on the Made Ground soils.

7.3.4 The results of the soil analysis is presented in Appendix 5.

7.3.5	Groundwater was encountered in during subsequent rounds of monitoring. Groundwater sampling was undertaken from three occasions. The samples were submitted to i2 Analytical for the following analysis: • Heavy metals including; arsenic, cadmium, chromium (total and VI), copper, lead, mercury, nickel, selenium, and zinc; • Cyanide and Phenols; • Petroleum Hydrocarbons (PHC) – Total Petroleum Hydrocarbons Criteria Working Group (TPH-CWG); • Benzene, Toluene, Ethylbenzene and Xylene (BTEX); and • Polyaromatic Hydrocarbons (PAH) – Speciated 16; • Total Organic Carbon (TOC), Sulphates and pH; and • Volatile and Semi-Volatile Organic Compounds.
7.3.6	The results of the groundwater analysis is provided in Appendix 5.
7.3.7	Gas and groundwater monitoring was undertaken using a multi-probe gas analyser and dip meter. The results are presented in Appendix 6.
7.3.8	Soil samples were also recovered for geotechnical testing, which included: • Atterberg testing with natural moisture content; • Undrained Triaxial testing; and • Sulphates and pH.
7.3.9	The results of the geotechnical testing are presented in Appendix 7.

8.0 GROUND CONDITIONS

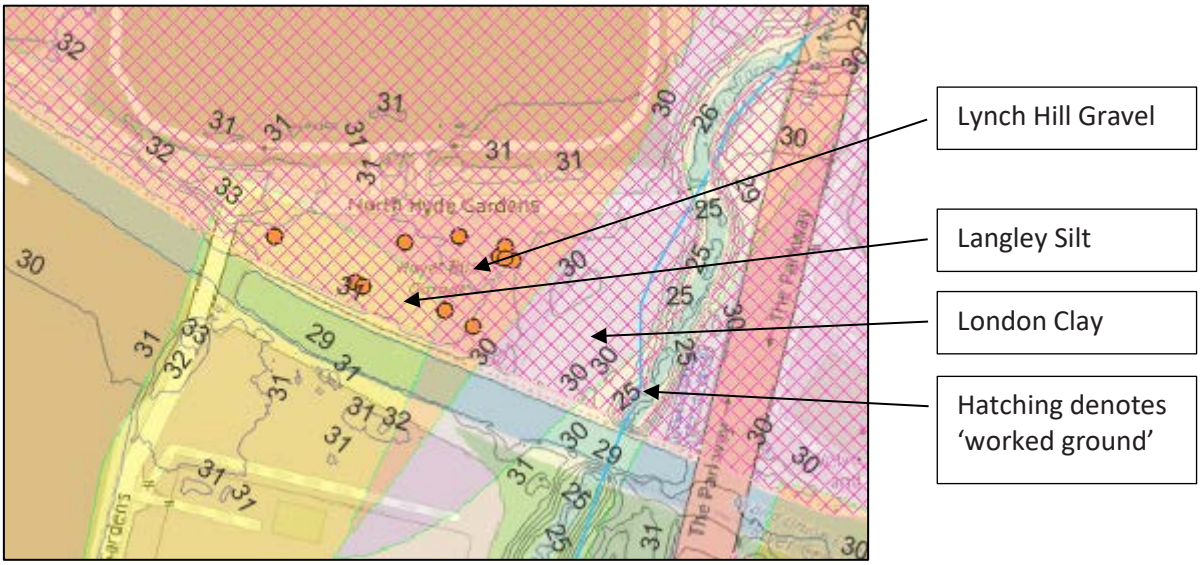
8.1	**General**
8.1.1	Published mapping from the British Geological Survey (BGS) shows the site to in an area of 'Worked Ground' with superficial Langley Silt in the western area of the site, over the Lynch Hill Gravel and London Clay Formation. The site is directly to the west of the River Crane, and to the north of the Grand Union Canal, historical alluvial deposits/construction fill associated with these watercourses may be present on site.
8.1.2	The ground conditions are described in detail in the logs that are presented within Appendix 4. A summary of the ground conditions is also presented in Table 6.

Table 6. Summary of Ground Conditions

Depth From (min/max) (m)	Depth To (min/max) (m)	Soil Type	Description	Notes
0.0	0.05 / 0.20	Tarmacadam / Topsoil	Tarmacadam hardstanding / topsoil	
0.05 / 0.20	3.50 / >5m	Made Ground	Variable Made Ground comprising very loose to medium dense brown and black sandy gravel. Gravel is concrete, brick, flint, glass, clinker, tile and mixed lithologies.	Concrete obstructions were encountered in WS01, WS01a-b and WS03 from depths between 0.20mbgl and 0.45mbgl.
3.50 / 4.50	4.80 / 5.00	Clay	Soft grey and black gravelly peaty clay. Gravel is mixed lithologies. Alluvium	Encountered in BH01 and WS05.
4.80	>5	Gravel	Medium dense, orange and brown sandy gravel. Gravel is flint. Lynch Hill Gravel Member	Only encountered in WS05.
5.00	7.50	Clay	Soft to firm brown, blue and grey clay. Weathered London Clay	Only encountered in BH01.
7.50	>35	Clay	Firm to stiff brown, blue and grey clay with selenite crystals. Weathered London Clay	Only encountered in BH01.

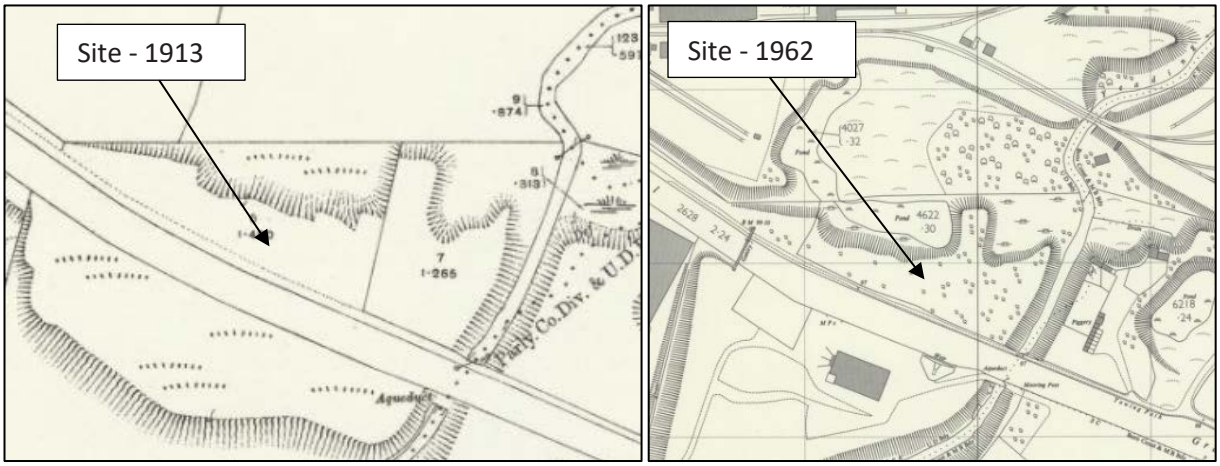
8.1.3 The geological mapping for the site is presented in Plate 1 below.

8.1.4 **Plate 1: Site Geology (BGS)**



8.1.5 In addition, historical mapping dated 1913 indicates the site to have been raised at this time, remaining in this condition until at least 1962, with marshland present at a lower level to the north of the site. This is presented in Plate 2 below.

8.1.6 **Plate 2. Historical Mapping**



8.2 Olfactory and Visible Evidence of Contamination

8.2.1 The olfactory and visible evidence of contamination is outlined in Table 7. Photo Ionisation Detector (PID) results greater than 10.0ppm from insitu soil screening are included in Table 8.

8.2.2 **Table 7. Summary of Olfactory and Visual Evidence of Contamination**

ID	Depth (m bgl)	Comments
BH01	4.50 to 5.00	Strong hydrocarbon odour
	0.20 to 4.50	Clinker
WS02	0.30	Geotextile
	0.90 to 5.00	Clinker
WS05	0.05 to 3.50	Slight hydrocarbon odour and clinker

8.2.3 **Table 8. PID Screening Results (above 10ppm)**

ID	Depth	Result (parts per million – ppm)
BH01	2.50m	13.4

8.3 Obstructions

8.3.1 Obstructions occurred during drilling of the following windowless samples: WS01, WS03, and WS04. All samples were dry and terminated at shallow depths. Paragon attempted to drill new holes nearby WS01 and WS04, however, all of these were also met with refusal (WS01a, WS01b and WS04a). A potential bomb was identified within the area of WS04 due to an anomaly with the magnetometer. As such this position was abandoned. These obstructions are summarised in Table 9.

8.3.2 **Table 9. Summary of Obstructions**

ID	Base Depth	Reason
WS01	0.50mbgl	Refusal on concrete at 0.50mbgl
WS01a	0.40mbgl	Refusal on concrete at 0.40mbgl
WS01b	0.30mbgl	Refusal on concrete at 0.30mbgl
WS03	0.40mbgl	Refusal on concrete at 0.40mbgl
WS04	1.00mbgl	Terminated at 1.00mbgl due to an anomaly with the magnetometer
WS04a	0.30mbgl	Refusal on Made Ground at 0.30mbgl

8.4 Groundwater

8.4.1 No groundwater strikes were recorded during drilling.

8.4.2 Groundwater was dipped on three occasions and the water levels are presented in Table 10.

8.4.3 During the third monitoring visit it was noted that the BH01 could not be located due to parked cars within the borehole area. As such, the gas readings and groundwater depth could not be taken on that day. The site was re-inspected for groundwater level monitoring on 3 August 2021.

8.4.4 **Table 10. Groundwater Monitoring Results**

ID	Elevation (mAOD)	Groundwater Level (mbgl) [mAOD]			
		8.7.2021	15.7.2021	23.7.2021	3.8.2021
BH01 Deep	30.86	2.62 [28.24]	2.51 [28.35]	N/A	2.50 [28.36]
BH01 Shallow	30.86	2.52 [28.34]	2.51 [28.35]	N/A	2.55 [28.31]
WS02	31.34	2.97 [28.37]	2.98 [28.36]	2.99 [28.35]	3.00 [28.34]
WS05	31.78	2.27 [29.51]	2.30 [29.48]	2.35 [29.43]	2.32 [29.46]

8.5 Gas Monitoring

8.5.1 Gas monitoring was undertaken on three occasions on 8 July 2021, 15 July 2021 and 23 July 2021.

8.5.2 The atmospheric pressure over the three visits ranged between 1017 and 1021mbar.

8.5.3 The results are presented in Section 10.

8.6 Constraints

8.6.1 The main constraints during the site investigations included pedestrian movements as well as parked and moving buses across the area. Due to active operations onsite, the positions of boreholes had to be previously agreed with the Abellio management and no boreholes were allowed to be drilled in the centre of the site.

8.7 UXO

8.7.1 An anomaly was recorded during the borehole clearance for Unexploded Ordnance (UXO) using the Magnetometer. This was identified within WS04 at a depth of 1.00mbgl. Due to the detection, the borehole was terminated. Recommendations for further assessment under the supervision of a UXO engineer were made.

8.7.2 It should be noted that the UXO anomaly was subsequently inspected under a separate instruction and it was found to be a metal rope.

9.0 GEOTECHNICAL RESULTS

9.1 Ground Conditions Discussion

9.1.1 The geotechnical laboratory and in-situ test results are summarised in Table 11 and Table 12. The geotechnical results can be found in Appendix 7.

9.1.2 **Table 11. Summary of Geotechnical Classification Testing Results.**

Stratum	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
Made Ground	-	-	-	-
Alluvium	-	-	-	-
Lynch Hill Gravel Member	-	-	-	-
Weathered London Clay	30	58	32	26
London Clay	23 to 28	52 to 57	27 to 30	25 to 28

9.1.3 **Table 12. Summary of In-situ and Laboratory Strength Testing**

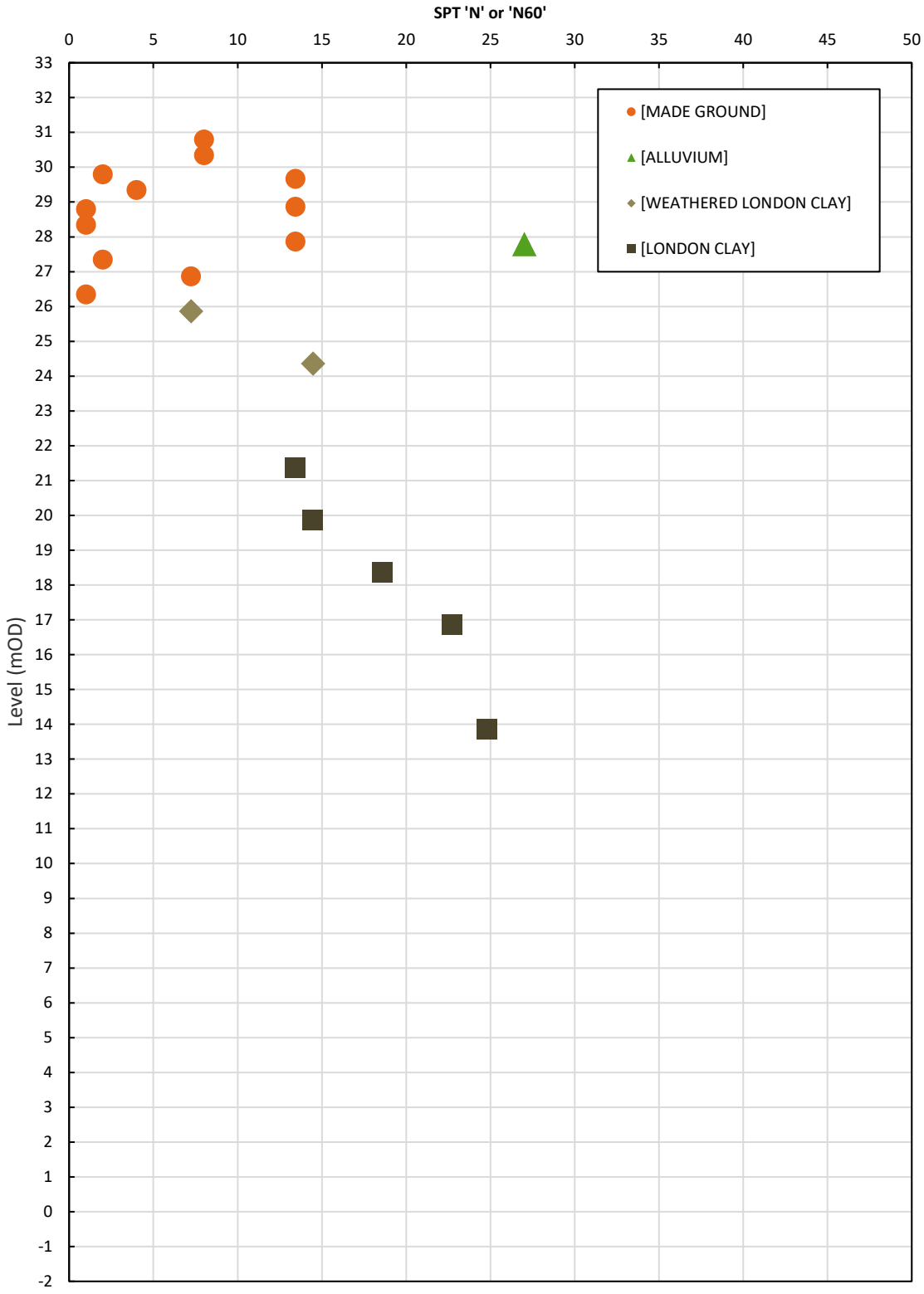
Stratum	SPT N or N60 Values	Undrained Unconsolidated Triaxial Results (kPa)
Made Ground - Cohesive	1 to 2	-
Made Ground - Granular	1 to 13	-
Alluvium	27	-
Lynch Hill Gravel Member - Granular	-	-
Weathered London Clay	7 to 14	-
London Clay	13 to 25	86 to 250

9.1.4 A plot of SPT 'N' or 'N60' values against elevation level is presented in Plate 3. The SPT 'N60' values were obtained by converting the 'N' values based on the SPT hammer energy report, which can be found in Appendix 7, which states the hammer has a 62% energy efficiency for BH01 and 93.29% for the Windowless Sample Boreholes.

9.1.5 A plot of undrained shear strength (cu) values against level is presented in Plate 4.

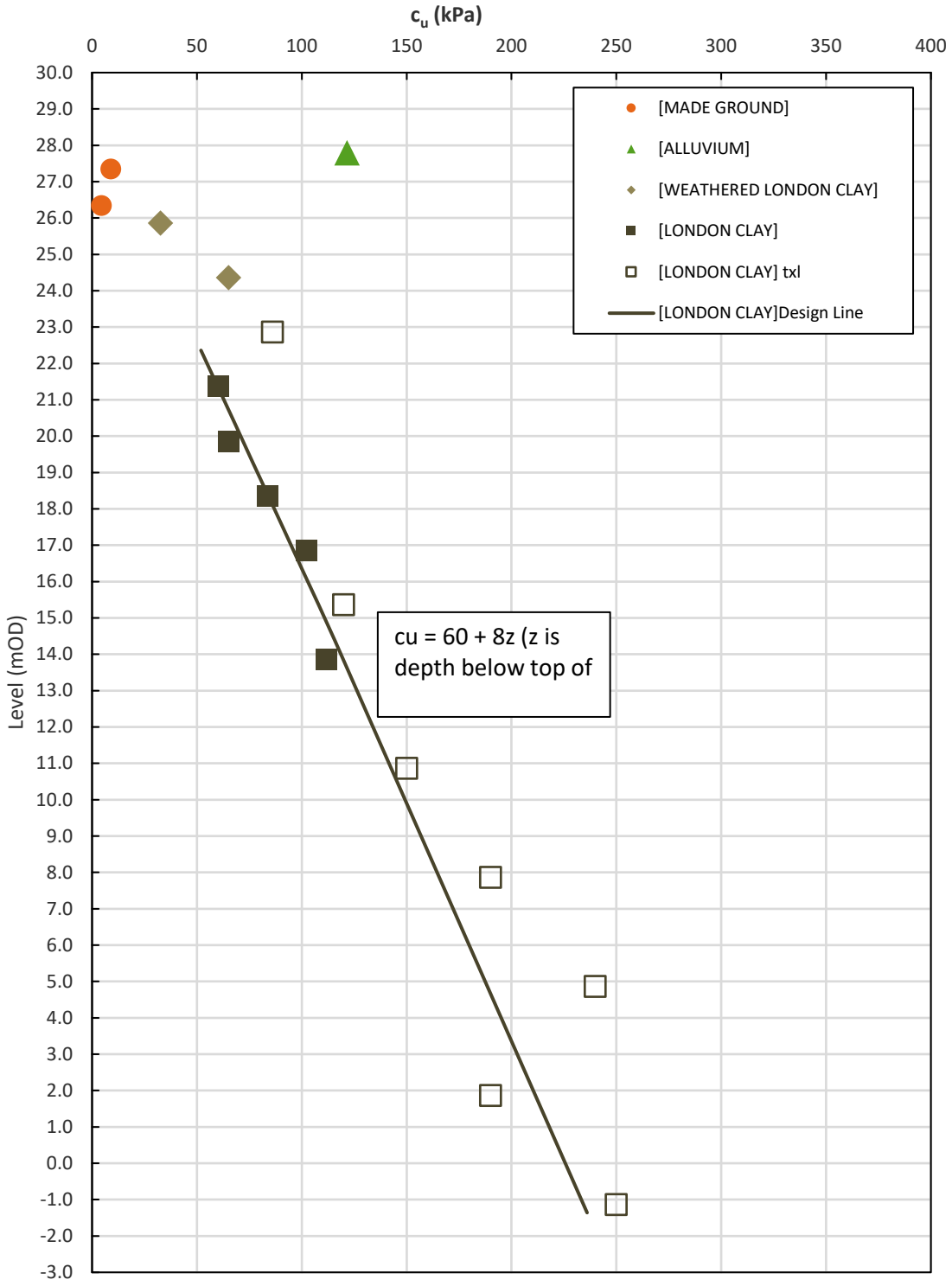
9.1.6

Plate 3. SPT 'N60' value against level



9.1.7

Plate 4. Undrained shear strength plotted against level.



10.0 GEOENVIRONMENTAL RESULTS

10.1 Analytical Test Results

10.1.1 Chemical testing was completed on soil and water samples from the investigation to determine the concentration of potential contaminants arising from existing and historical site uses, in line with the Conceptual Site Model. The results of the soil and groundwater analysis have been compared to a screening value to assess the degree of risk. The results are presented in a screening table in Appendix 5 and summarised below. The laboratory test certificates are also provided in Appendix 5.

10.1.2 The GACs used in this assessment are based on a Soil Organic Matter (SOM) content of 2.5% for the Made Ground and 1% for the natural soil, which is considered to reflect the conditions present onsite and provides the basis for a conservative assessment.

10.2 Analytical Test Results – Made Ground Soils

10.2.1 The results from the Made Ground have been compared to industry accepted screening values known as Generic Assessment Criteria (GAC) to determine the risks to human health. The GAC used in this investigation includes Category 4 Screening Levels and Suitable 4 Use Levels (C4SLs and S4ULs). The GAC selected is based on a commercial land use in line with the proposed development. The screening assessment is presented in Appendix 5. A detailed methodology for the assessment is presented in Appendix 8.

10.2.2 The results have identified Chrysotile Asbestos in the form of loose fibres in WS04 and BH01. The asbestos quantification results detected the asbestos to be below the limit of detection as shown in Table 13. Currently, there is no GAC for asbestos in soil. Industry guidance produced by CIRIA C7335 (2014) '*Asbestos in soil and made ground: a guide to understanding and managing risks*' states that "in the case of asbestos in soil, there is no published Soil Guideline Value (SGV) or C4SL.

10.2.3 **Table 13. Summary of Asbestos Quantifications**

ID	Stratum	Depth (mbgl)	Asbestos Identification	Quantification Result (%)
BH01	Made Ground	2.00 – 2.50	Chrysotile (loose fibres)	< 0.001
WS04	Made Ground	0.80	Chrysotile (loose fibres)	< 0.001

10.2.4 Agreement has yet to be reached in the UK on an appropriate toxicological criterion on which such a GAC could be based". However, asbestos is not considered to be mobile and based on the extensive hardstanding across the site, the risk to site users in its current layout is minimal. In the event of redevelopment, material management will be required when the ground is broken out. Furthermore, the risks to human health will need careful consideration.

10.2.5 No other exceedances, above acceptable thresholds for a commercial land use GAC, were identified of the contaminants tested from the Made Ground.

10.3	**Analytical Test Results – Natural Soils**
10.3.1	The results of the chemical analysis on the natural soil samples are presented in Appendix 5. The results were compared to the GAC for a commercial use in the same way as the Made Ground.
10.3.2	No exceedances, above acceptable thresholds for a commercial land use, were identified of the contaminants tested from natural soils.
10.4	**Analytical Test Results - Groundwater**
10.4.1	The results from the groundwater analysis have been compared with Tier 1 screening values, as for the soils. This has included Environmental Quality Standards (EQS) for freshwater, due to the presence of the Grand Union Canal directly south of the site, and River Crane/Yeading Brook approximately 70m east of the site, which would be considered the most sensitive surface water receptors. There is potential for dissolved phase contaminants in groundwater to migrate to the river if they are in continuity.
10.4.2	No assessment has been completed against the Drinking Water Standards (DWS) as there are no sensitive potable abstractions within a 1km radius and the site is not within an SPZ.
10.4.3	Groundwater was recovered from BH01, WS02 and WS05 on 8 July 2021. The results were directly compared to the EQS. The laboratory test certificates are presented in Appendix 5.
10.4.4	Marginal exceedances of the PAH compound Fluoranthene have been identified in BH01 (shallow and marginal exceedances for heavy metals have been found in all samples tested (Chromium, Copper, Nickel and Zinc.
10.5	**Gas Monitoring Results**
10.5.1	Pollutant linkages associated with risks from ground gas to the property and to human health have been assed using BS 8485:2015+A1:2019 '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*.
10.5.2	Three gas monitoring visits were undertaken on 8 July 2021, 15 July 2021 and 23 July 2021. During the third monitoring visit it was noted that the BH01 could not be located due to parked cars within the borehole area. As such, the gas readings could not be taken on that day. The gas monitoring records are presented in Table 14 and the monitoring records are presented in Appendix 6.

10.5.3 **Table 14. Gas Monitoring Results**

ID	Steady Flow (l/hr)	Steady Methane (%)	Steady Carbon Dioxide (%)	Minimum Oxygen (%)	Steady Hydrogen Sulphide (ppm)	Steady Carbon Monoxide (ppm)	VOC (ppm)
BH01 Deep	<0.1 – 0.1	<0.1 – 6.7	0.9 – 2.9	10.6 – 10.7	<1.0 – 1.0	2.0	<0.1 – 1.1
BH01 Shallow	<0.1 – 0.2	0.5 – 14.2	0.4 – 1.4	6.0 – 7.9	<1.0	1.0	<0.1 – 1.6
WS02	<0.1 – 0.2	0.1 – 0.6	10.3 – 11.8	0.4 – 1.6	<1.0 – 1.0	<1.0 – 2.0	<0.1 – 4.9
WS05	<0.1 – 0.2	<0.1 – 0.6	2.8 – 13.2	0.8 – 18.5	<1.0	1.0	<0.1 – 0.3

10.5.4 The results for the gas monitoring identified elevated levels of methane within BH01 and elevated levels of carbon dioxide in WS02 and WS05. Flow readings were low and ranged between the limit of detection <0.01 l/hr and 0.2 l/hr.

10.5.5 The ground gas monitoring was undertaken over periods of high atmospheric pressure ranging between 1017mb and 1021mb. No monitoring during atmospheric pressure events below 1000mb were undertaken due to the time available for the investigation and due to the investigation being completed throughout a period of dry weather.

10.6 Domestic Drinking Water Supply Pipework Assessment

10.6.1 The assessment for whether barrier pipework is likely to be required as part of the development has been undertaken by directly comparing the results from the soil testing with the Polyethylene (PE), metal and barrier pipe thresholds.

10.6.2 The results have shown that as the concentrations of contaminants are minor, it is considered that standard pipework could be used as part of the development. This should be agreed with the water services provider.

11.0 DISCUSSION

11.1 Environmental Findings

11.1.1 This section evaluates the risks to potential receptors at the site from identified chemical contamination. Potential receptors have been identified in line with the CSM presented in Table 2 and reference to environmental guidance, whereby all receptors have been considered. Additional information on the assessment is presented in Appendix 8.

11.2	**Risks to Human Health from Soil Derived Contaminants**
11.2.1	Due to the low levels of contaminants identified, the risk to human health is considered to be minimal. Nevertheless, the risk from asbestos should be managed during construction through the implementation of Risk Assessments and Method Statements which should describe Personal Protective Equipment (PPE) to be used and any mitigation measures when working with the Made Ground i.e. dust suppression.
11.2.2	In addition, the risks to offsite receptors from the soil derived contaminants is considered to be minimal.
11.2.3	As such, the risk to human health is considered to be **low to medium** and soils are to be managed in line with the works on the main site i.e. implementation of a discovery strategy for previously unidentified contamination, segregation of soils and hardstanding etc., and the disposal of hazardous material (if encountered).
11.3	**Risks to Human Health from Ground Gas**
11.3.1	The Gas Risk Assessment has been carried out in general accordance with BS8485:2015+A1:2019 whereby the Characteristic Situation (CS) of the site has been identified. The Characteristic Situation ranges are between 1 and 6 and determine the gas risk to the property and the level of protection required. The process calculates a Gas Screening Value (GSV) based on gas monitoring which was undertaken based on boreholes within the Made Ground and natural geology.
11.3.2	The GSV for the site has been calculated based on the maximum concentration of methane or carbon dioxide monitored and the maximum flow rate recorded in the boreholes using the equation: $$GSV = q\left(\frac{Chg}{100}\right)$$ Where: • Chg = Concentration of a specific hazardous gas expressed as a percentage of total gas volume (%v/v) • q = Total gas flow from a borehole in litres per hour (l/hr) • Qhg = Calculated flow rate of a specific hazardous gas from a borehole reading The results are then compared to tables set out in the guidance for assessment.
11.3.3	Based on the above calculation, the worst case GSV has been calculated as 0.028 which puts the site within CS1. However, due to the elevated levels of methane and carbon dioxide, the site has been moved into CS2 where gas protection would be necessary.
11.3.4	As such, the risk from ground gas impacting on or offsite receptors is considered to be **low to medium** as the concentrations identified on site are not considered to present a significant risk. Nevertheless, basic gas protection measures would be necessary. At this stage, a multi-gas and vapour membrane is considered to be required.

11.4	**Risks to Controlled Waters from Groundwater**
11.4.1	Groundwater samples were collected from BH01, WS02 and WS05 on one occasion. The results found marginal exceedances of the Environmental Quality Standards for freshwater as an assessment of the most sensitive receptor, which in this case is the River Crane.
11.4.2	The exceedances were found for the PAH compound (Fluoranthene) and heavy metals (Chromium, Copper, Nickel and Zinc).
11.4.3	Nevertheless, the concentrations were not considered to be significant, and as the site is situated 75m from the River Crane, the likelihood of significant contamination occurring is minimal therefore, the risk to Controlled Waters is considered to be **low** and a Detailed Quantitative Risk Assessment (DQRA) is not considered to be necessary.
11.5	**Property and Infrastructure**
11.5.1	Plant growth can be affected due to the presence of phytotoxic contaminants such as copper and zinc. However, due to the concentrations of contamination being low, the risk to plants and vegetation from phytotoxic contaminants is deemed to be **low**. Nevertheless, in areas of proposed soft landscaping, a clean capping of imported topsoil should be used.
11.5.2	From a preliminary risk assessment of the results to thresholds set in the UK Water Industry Research (2010) '*Guidance for the selection of water supply pipes to be used in brownfield sites*', it is possible that standard water pipes may be required for drinking water supply pipework. This is based on the low levels of contamination identified within the groundwater. As such, the risk rating is considered to be **low**.
11.6	**Risk Evaluation**
11.6.1	Following the implementation of the Phase 2 site investigation, the pollutant linkages identified in the CSM have been re-evaluated and re-classified in relation to the additional information obtained. The risk assessment has been completed for a continued use and for a potential redevelopment scenario.
11.6.2	The overall rating for the site based on a continued use is **low to medium**. The risk assessment is summarised in Table 15 below.

11.6.3

Table 15. *Revised Conceptual Site Model*

Receptor	Potential sources	Pathways	Risk	Justification
Human Health				
Construction and maintenance workers / Users of the site	Organic and metal contamination	Direct contact, ingestion, and inhalation via outdoor soils or translocated soil and dust indoors.	L M	**Low to medium risk:** Asbestos has been identified within two locations. As such, Personal Protective Equipment (PPE) and Risk Assessments and Method Statements are required for construction work.
	Ground gas and vapours	Inhalation, Migration through granular and fractured soils into confined spaces.	L M	**Low to medium risk:** The site has been classified as CS2 whereby gas protection measures will be required in new buildings. The risk to construction workers will be managed through PPE and Risk Assessments and Method Statements.
Future site users	Organic and metal contamination in soils and groundwater	Direct contact, ingestion, and inhalation of outdoor soils or translocated soil and dust indoors.	L M	**Low to medium risk:** Despite the presence of asbestos, the risk to future site users is considered to be minimal as the site is to be surfaced with hardstanding.
	Ground gas and vapour	Inhalation, migration through granular and fractured soils into confined spaces.	L M	**Low to medium risk:** The site has been classified as CS2 whereby gas protection measures will be required in new buildings. This will mitigate the risk to future site users.
Offsite Residents (270m southwest)	Organic and metal contamination in soils, groundwater and gas	Direct contact, ingestion, and inhalation of outdoor soils or translocated soil and dust indoors.	L	**Low risk:** The risk to offsite residents is considered to be minimal.
Property				
Site structures and services	TPH in site soils	Direct contact between soil and structures or services.	L	**Low risk:** No gross contamination has been identified and as such, standard pipework should be considered. This should be confirmed with the incoming water supplier.
	Ground gas and vapour	Migration through granular and fractured soils into confined spaces.	L M	**Low to medium risk:** The site has been classified as CS2 whereby gas protection measures will be required in new buildings. This will mitigate the risk to future site users.
Groundwater				
Principal Aquifer	Metals and organic contamination in soils	Soil leaching and migration of potential soil contamination.	L	**Low risk:** Despite the marginal PAH and heavy metals, the potential for a significant impact to the Principal Aquifer is considered to be minimal.
Secondary (A) Aquifer	Metals and organic contamination in soils	Soil leaching and migration of potential soil contamination.	L	**Low risk:** Despite the marginal PAH and heavy metals, the potential for a significant impact to the Secondary (A) Aquifer is considered to be minimal.

11.6.4

Table 15. ***Revised Conceptual Site Model (Continued)***

Receptor	Potential sources	Pathways	Risk	Justification
Surface Water				
Grand Union Canal (directly south) River Crane/Yeading Brook (70m east)	Leachable metals and organic contamination	Soil leaching and migration into drains and sewers which discharge into the ditch.	L	**Low risk:** Despite the marginal exceedances of PAH and heavy metals above the EQS, the potential for a significant impact to the River Crane and Grand Union Canal is considered to be minimal.

12.0 CONCLUSIONS

12.1 **Contamination and Remediation**

12.1.1 Overall, it is considered that there is a **Low to Moderate Risk** associated with the site in respect of land contamination. However, such risks are commensurate with a brownfield site of this nature and it is anticipated that many of the risks would be addressed / mitigated as part of the development process. Following inclusion of such measures (gas protection measures, PPE and material movement tracking) to the new development, it is anticipated that the risks identified would be reduced to low.

12.2 **Geotechnical**

12.2.1 Geotechnical design parameters have been derived based on the results from ex-situ and in-situ testing and published empirical relations. A design groundwater level has also been derived based on groundwater strikes encountered and monitoring results from the current site investigation. DS and ACEC classifications are also provided for the Made Ground and Lynch Hill Gravel Member.

12.2.2 Given the existing ground conditions and obstructions, shallow foundations are not recommended. A preliminary pile design has been provided based on the derived geotechnical parameters.

12.2.3 Depending on the proposed pile length, it may be necessary to carry out an additional site investigation to prove the ground conditions to sufficient depth. Guidance on the required investigation depth is provided.

13.0 GEOENVIRONMENTAL RECOMMENDATIONS

13.1 Contamination and Remediation

13.1.1 Whilst no formal remediation is required, the following recommendations have been made.

13.1.2 Where landscaped areas are proposed, a capping layer will be required to prevent contact with underlying contaminants (asbestos). At this stage, the following is deemed appropriate.

13.1.3 **Table 16. Composition of Capping Layer.**

Layer	Minimum Thickness
Topsoil	150
Subsoil	450
Geotextile	Terram 1,000 or similar

13.1.4 In addition, the Topsoil and Subsoil are to meet the requirements of BS3882, Specification for Topsoil. The supplier should provide a test certificate prior to purchase. It is then recommended to test the soils once they arrive onsite to ensure they meet the requirements for a commercial land use based on S4ULs and C4SLs.

13.1.5 Thickness and composition of the topsoil should be subject to inspection and validation by chemical analysis. The quality of the geotextile should also be undertaken through visual inspection.

13.2 Gas Protection Measures

13.2.1 Based on the proposed development which is understood to be an MV energy centre, the site use is considered to be less sensitive than if the site was used for residential purposes. The monitoring undertaken to date has analysed boreholes from across the site. The results have shown the Characteristic Situation (as outlined in BS8485:2015+A1:2019) for the site is CS2.

13.2.2 As such, gas protection measures should be implemented as part of the design. For a Type D development with a Characteristic Situation of CS2, a score of 1.5 will be needed. This could be reached by installing a high performance gas and VOC resistant membrane.

13.2.3 Based on the results of the gas risk assessments, it is possible additional monitoring in the footprint of the new building could reduce the risk rating.

13.3 Piling Works Risk Assessment

13.3.1 There may be an increased risk to Controlled Waters from the piling required for the scheme from vertical migration of groundwater from the Made Ground to the underlying aquifers mobilised during piling. This is of particular importance if the final loading of the building increases significantly than the loads used in this investigation, as this would mean deeper piles would be required which may penetrate the London Clay and terminate in the underlying Chalk, which is classified as a Principal Aquifer and drinking water resource.

13.3.2	During the investigation, minor concentrations of contaminants have been recorded, and as such the risk to Controlled Waters is considered to be low. As such, a Piling Works Risk Assessment is unlikely to be required. However, this may still be stipulated by the Local Authority as a requirement for the development. Reference should be made to the Environment Agency document relating to 'Piling into Contaminated Sites' (EA, 2002).
13.4	**Asbestos in Soil**
13.4.1	Based on the presence of asbestos fibres within the shallow soils onsite, it is likely that some degree of asbestos management will be required. The protection of workers from exposure to asbestos is regulated by the Control of Asbestos Regulations (HSE, 2012). As such, appropriate Risk Assessments and Method Statements should be put in place to ensure the risks are minimised. This should be not be limited to Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE), segregation of stockpiles, dust suppression by damping down stockpiles, and / or covering stockpiles with sheeting.
13.5	**Buried Services**
13.5.1	In accordance with the UK Water Research Guidance (2010) and due to the low concentrations of contaminant identified, standard pipework is considered suitable for the development. However, this report and appendices would be submitted to the local water authority to gain approval for the use of such pipes.
13.6	**Material Management and Waste**
13.6.1	Due to the presence of asbestos, some degree of segregation may be required. Whilst no formal waste assessment has been carried out, the soils are likely to be classified as non-hazardous waste. In addition, the quantification results for asbestos have been identified at concentrations below the threshold for hazardous waste.
13.6.2	During groundworks, asbestos fibres will require careful management through dampening down stockpiles / sheeting before disposal. In addition, a watching brief should be undertaken as part of the groundworks as there are areas of the site that were not investigated. A discovery strategy should also be put in place so that Paragon are contacted in the event that previously unidentified contamination is encountered. For the avoidance of doubt, this means any oil, malodourous or discoloured material.
13.6.3	The laboratory certificates and drilling logs, provided in the appendices, should be provided to the waste receivers to confirm their ability to accept waste arisings from the site. It is the waste producer's responsibility to classify and appropriately manage waste under duty of care (section 34 of the Environmental Protection Act 1990). Further asbestos qualification and WAC testing may be required as part of the future development.
13.7	**UXO**
13.7.1	An anomaly was recorded during the borehole clearance for Unexploded Ordnance (UXO) using the Magnetometer. This was identified within WS04 at a depth of 1.00mbgl. Due to the detection, the borehole was terminated. Recommendations for further assessment under the supervision of a UXO engineer have been made. This should involve excavating the material around WS04 and completing a visual and magnetometer assessment by a UXO engineer.

13.8	**Verification**
13.8.1	Once the groundworks has commenced and the watching brief has been undertaken. The information obtained onsite should be collated into a verification document. This should include site inspection records, photographs, laboratory results, details from the inspection of formation levels, inspection of gas protection measures, records where unexpected contamination are encountered, a review of Duty of Care / transfer records for the reuse, disposal and transport of soils.
13.8.2	Imported soils should be tested at source by the supplier. The validation engineers should then make spot checks as and when necessary once material has been imported.
13.8.3	Provision should also be made for dealing with further localised hotspots of contamination, which may come to light during construction. Any such soils should be inspected by the validation engineers and appropriate remedial action taken as necessary.

14.0 GEOTECHNICAL DISCUSSION

14.1	**Ground Conditions – Geotechnical Discussion**
14.1.1	Made Ground was encountered in every exploratory hole. The base was reached in BH01 and WS05, where it was between 3.50m and 4.50m thick, and the base was not reached in WS02 at 5mbgl. The Made Ground was predominantly granular with little cohesive material. The density of the granular material was variable from very loose to medium dense and the consistency of the cohesive material was 'very soft'.
14.1.2	The granular Made Ground was predominantly concrete and brick, occasionally with glass, mixed lithologies, slag, ceramic, tile, flint and roots and cobbles of concrete and brick. Shallow concrete obstructions were encountered in WS01a-b and WS03 at a top depth between 0.20m and 0.45mbgl. WS04a was terminated at 0.30mbgl due to refusal in Made Ground.
14.1.3	Alluvium was encountered in WS05 and BH01 only and consisted of grey peaty gravelly clay. The gravel comprised of mixed lithologies. An SPT 'N' value of 27 was recorded at the base of the alluvium, however it is likely that this test struck gravel at depth, giving an artificially high value for the alluvium.
14.1.4	Lynch Hill Gravel Member was encountered in WS05 only and consisted of orange and brown sandy gravel. The gravel comprised of flint.
14.1.5	London Clay was only reached in one borehole with the top of weathered London Clay at 25.86mOD. Nearby boreholes indicate that the top of the London Clay is approximately 25mOD in the surrounding area, deepening north of the site.
14.1.6	In summary, the ground conditions on site are variable, comprising a significant thickness of Made Ground over superficial deposits of alluvium or Lynch Hill Gravel Member, with the London Clay at depth. The ground conditions on site appear to have been influenced by the nearby River Crane to the east of the site, and there is the potential for further alluvium to be present associated with this river.

14.2 Geotechnical Design Parameters

14.2.1 Geotechnical design parameters are based on the in-situ Soil Penetration Tests (SPTs), results of the laboratory testing and published data for the well-studied London geology. Parameters have been provided in Table 17.

14.2.2 ***Table 17. Summary of In-situ and Laboratory Strength Testing***

Stratum	Design Level (mOD)	Bulk Weight, γ_b (kN/m^3)	Undrained Cohesion, c_u (kPa) [c']	Angle of friction, φ' (°)	Young's Modulus, E_u (MPa) [E']
Made Ground (Granular)	31.80	18	- [0]	29[a]	- [12][b]
Made Ground (Cohesive)	31.80	18	5	20	900 [675]
Alluvium	0.5m thick	18	40 [5][c]	25[d]	16[e] [9.6][f]
Lynch Hill Gravel Member	(26.99)	19	- [0]	32[a]	- [40][b]
London Clay	25.90	20	60 + 8z[g] [5][c]	25	36 + 4.8[h] [27 + 3.6][i]

a. Peck, R.B., Hanson, W.E., and Thornburn, T.H., Foundation Engineering, 2nd Edn, John Wiley, New York, 1967, p.310.
b. Based on design SPT x 2MPa
c. Burland, Standing J.R., and Jardine F.M. (eds) (2001), Building response to tunnelling, case studies from construction of the Jubilee Line Extension London, CIRIA Special Publication 200
d. BS 8002:2015 Code of practice for Earth retaining structures, British Standards institution.
e. Based on $400c_u$
f. Based on $0.6E_u$ - Burland, Standing J.R., and Jardine F.M. (eds) (2001), Building response to tunnelling, case studies from construction of the Jubilee Line Extension London, CIRIA Special Publication 200
g. Z is depth below the top of the strata
h. Based on $600c_u$
i. Based on $0.75E_u$ - Burland, Standing J.R., and Jardine F.M. (eds) (2001), Building response to tunnelling, case studies from construction of the Jubilee Line Extension London, CIRIA Special Publication 200

14.3 Groundwater

14.3.1 No groundwater strikes were recorded during drilling.

14.3.2 Groundwater monitoring was undertaken following the site investigation. The monitoring results can be found in Appendix 6. The monitoring results are summarised in Table 18.

14.3.3 **Table 18. Groundwater Monitoring Results**

ID	Elevation (mAOD)	Groundwater Level (mbgl) [mAOD]			
		8.7.2021	15.7.2021	23.7.2021	3.8.2021
BH01 Deep	30.86	2.62 [28.24]	2.51 [28.35]	N/A	2.50 [28.36]
BH01 Shallow	30.86	2.52 [28.34]	2.51 [28.35]	N/A	2.55 [28.31]
WS02	31.34	2.97 [28.37]	2.98 [28.36]	2.99 [28.35]	3.00 [28.34]
WS05	31.78	2.27 [29.51]	2.30 [29.48]	2.35 [29.43]	2.32 [29.46]

14.3.4 Based on the results of monitoring rounds, a design groundwater level within the Made Ground and Lynch Hill Gravel Member of 29.50mOD is recommended.

14.4 Shallow Foundations

14.4.1 The findings from the site investigation show a variable thickness of Made Ground across the site. Soft Alluvium was present in BH01 and WS05 and may be present in other areas across the site.

14.4.2 Given the thick and variable Made Ground, soft Alluvium and concrete obstructions present across the site, shallow foundations are not recommended.

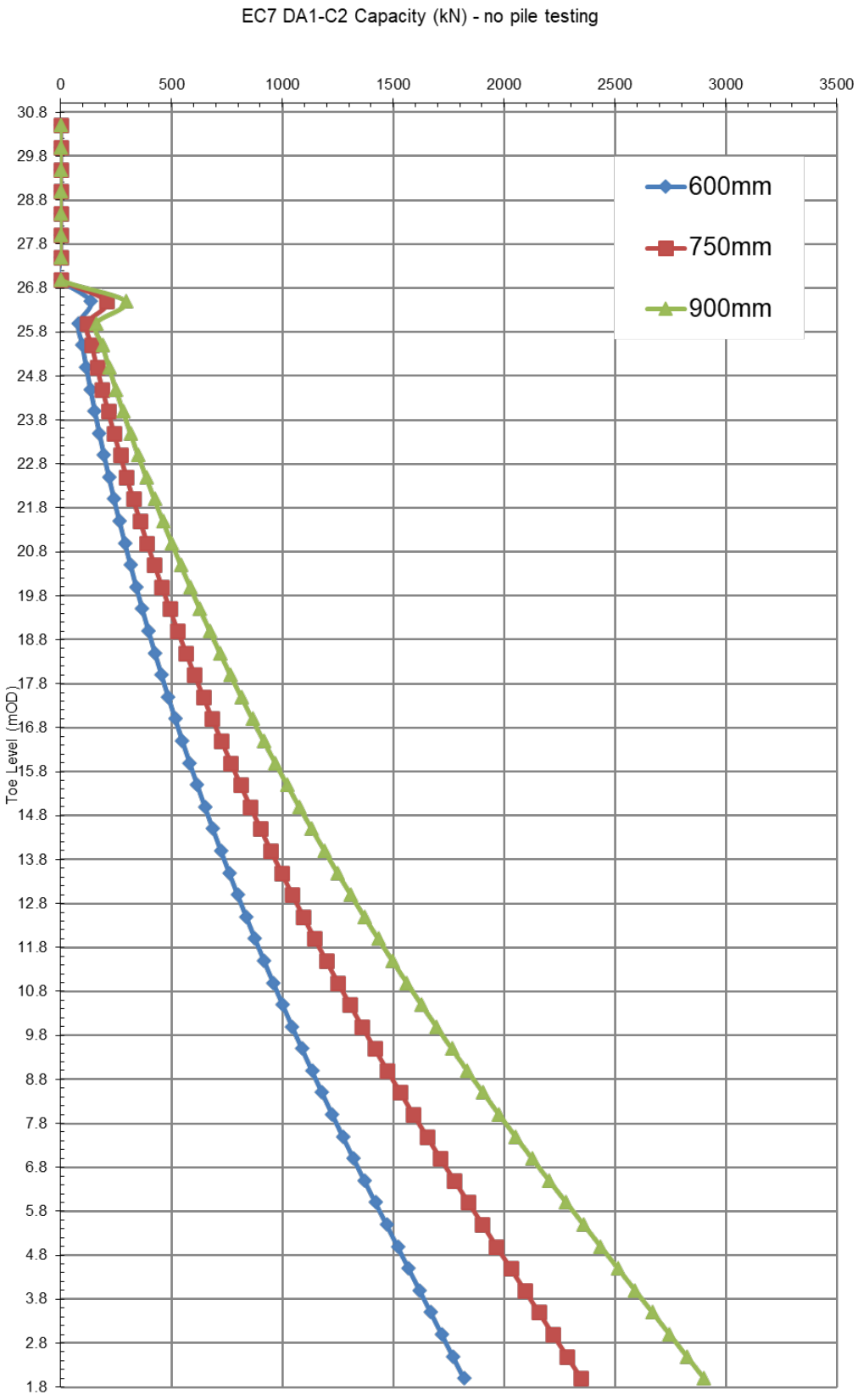
14.5 Piled Foundations

14.5.1 Pile foundations are considered feasible for the proposed scheme. Continuous Flight Auger (CFA) or bored piled foundations with isolated pile caps are considered suitable for the proposed development. CFA piling is typically limited to around 32m depth, while rotary bored piles are typically limited to 75m. It is recommended that a piling contractor be consulted to discuss the most appropriate pile construction method. Groundwater conditions should be taken into consideration when selecting piling methodology.

14.5.2	A preliminary pile design has been undertaken in accordance with Eurocode 7 Design Approach 1, Combination 2. The preliminary pile design is presented in Plate 5. The following assumptions have been made regarding the preliminary design. • All piles will be cast in-situ, Continuous Flight Auger (CFA) or bored; • A pile cut-off level of 30.5mOD and a pile platform level of 31mOD have been used; • The preliminary design has been carried out in accordance with Eurocode 7 Design Approach 1, Combination 2 assuming no working or preliminary pile loads: • Combination 2 applies partial factors to the dead and live loads of 1.0 and 1.3 respectively, with geotechnical partial factors of 1.6 for the skin friction, 2.0 for the base capacity and 1.4 for the model factor (model factor value is based on the case of no working or preliminary pile load tests); • The contribution from the Made Ground has been assumed to be negligible; • The top of the London Clay has been assumed to be 23mOD. The capacity calculation for the stratum assumes an end bearing capacity factor (Nc) of 9, an adhesion value of 0.6 and a limited skin friction of 110kPa;

14.5.3

Plate 5. Preliminary pile design



14.5.4 Eurocode 7 recommends that for pile foundations, the minimum borehole depth should be the largest of the following; note that current investigation data extends to 35m (approximately -2mOD), therefore on this data, pile toe levels should be restricted to a minimum level of +3mOD.

- Pile length + smaller side of the rectangle circumscribing the group of the piles forming the foundation at the level of pile base;
- Pile length + 5m;
- Pile length + (3 times the pile base diameter)

14.5.5 The current site investigation has proven the ground conditions to 35m below ground level. A further site investigation should be undertaken, if the recommended minimum investigation depth required under Eurocode 7 exceeds the existing site investigation depth.

14.6 Buried Concrete Sulphate Durability Classification

14.6.1 Soil samples from Made Ground, Alluvium and Lynch Hill Gravel Member were sent for laboratory testing to determine the sulfate concentrations and pH in general accordance with Building Research Establishment (BRE) SD1 guidance[1]. The test results can be found in be found in Appendix 5. A summary of the Design Sulphate (DS) and Aggressive Chemical Environment for Concrete [ACEC] classes are provided in Table 19. Total sulphur concentrations were not available, therefore classes based on total potential sulphate are not provided.

14.6.2 **Table 19. Design Sulphate (DS) classification for encountered soil strata**

Stratum	pH	Water Soluble Sulphate as SO_4 (2:1) mg/l	Total Sulphate as SO_4 (mg/kg)	Design Sulphate (DS) Class [ACEC]
Made Ground	7.9 to 10.3	34 to 830	540 to 4300	DS-2 [AC-2]
Alluvium	8.4	190	680	DS-1 [AC-1]
Lynch Hill Gravel Member	8.4	84	380	DS-1 [AC-1]

14.7 Floor Slabs

14.7.1 Given the variability of the Made Ground, the likelihood of obstructions in the ground and the presence of live services across the site, suspended floor slabs are recommended.

14.8 Pavements and Roads

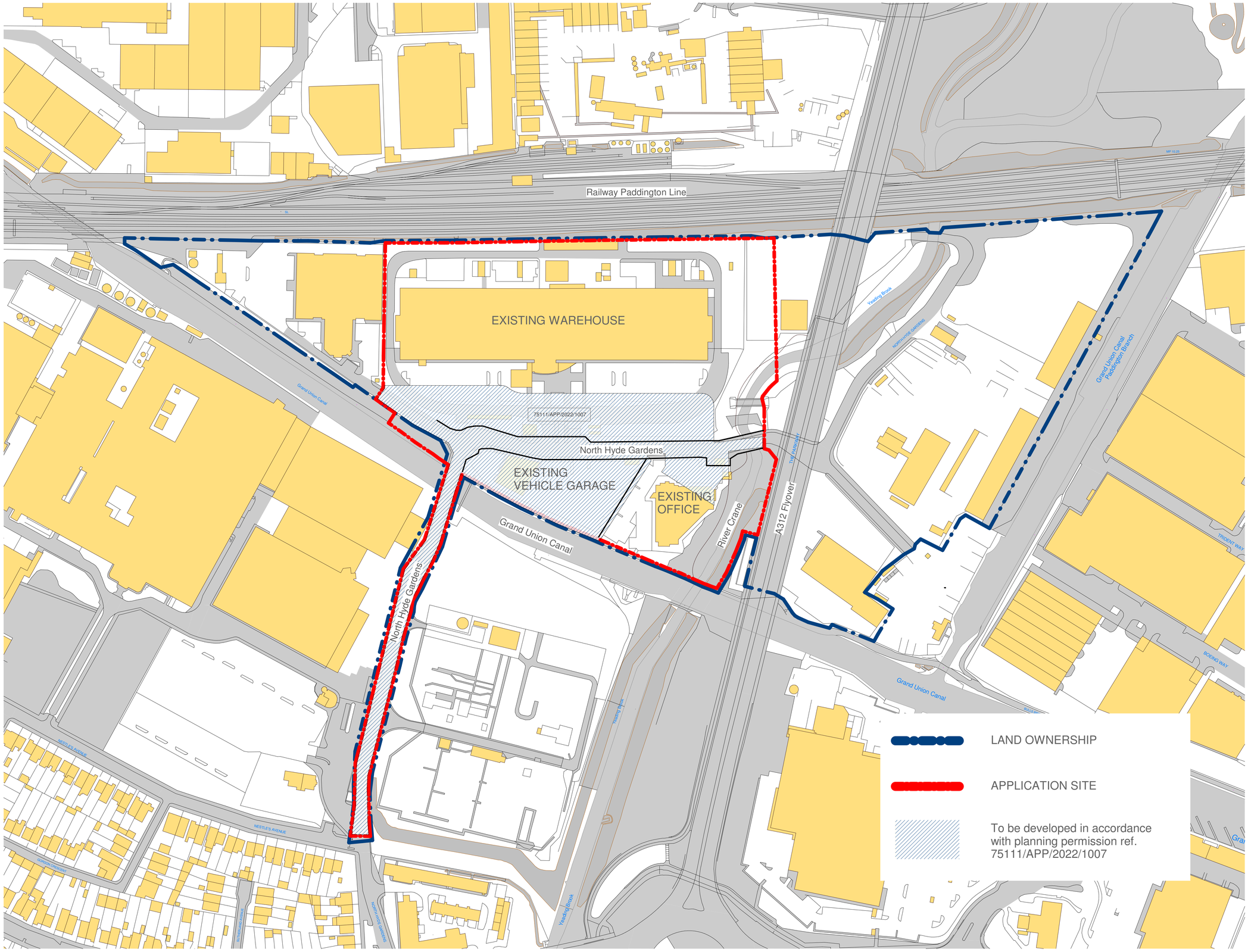
14.8.1 A design CBR value of less than 2.5% is recommended for pavements and roads. If site levels are increased consideration should be given to potential long-term settlement and consolidation of organic/peat layers that may be present within the alluvium.

[1] Building Research Establishment. (2005). Special Digest 1 – Concrete in aggressive ground, third edition.

14.9	**Excavations**
14.9.1	The Made Ground has been found to contain areas of very soft/loose material which could be unstable during excavations. It is therefore recommended that all excavations are supported. Due to the shallow groundwater level across the site excavations will likely require groundwater mitigation measures, such as sump pumps.

APPENDIX 1: FIGURES

A1



Site Location Plan

1 : 1250

True scale at 1:1

DO NOT Scale This Drawing
Dimensions to be checked on Site.

Notes:

Mark		Date	Description	Chk'd
	P02	01/09/2022	Extant of Application revised	AVC
	P01	09/06/2020	Issued for Planning	AVC

PLANNING

Client: ARK DATA CENTRES

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Project: Union Park at Bulls Bridge

Drawing Name: A01 - SITE LOCATION
Site Location Plan

Drawn Date: 27/03/20	Drawn By: AVC
Scale: As indicated @ A1	Approved By: NW

Drawing No: NWA- 0471-SN-ZZ-DR-A-01-000

Rev: P02

Plotted:08/09/2022 11:03:23

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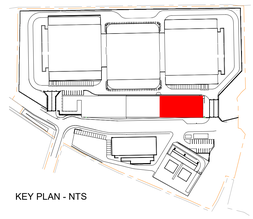
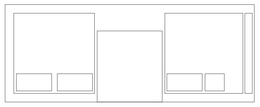
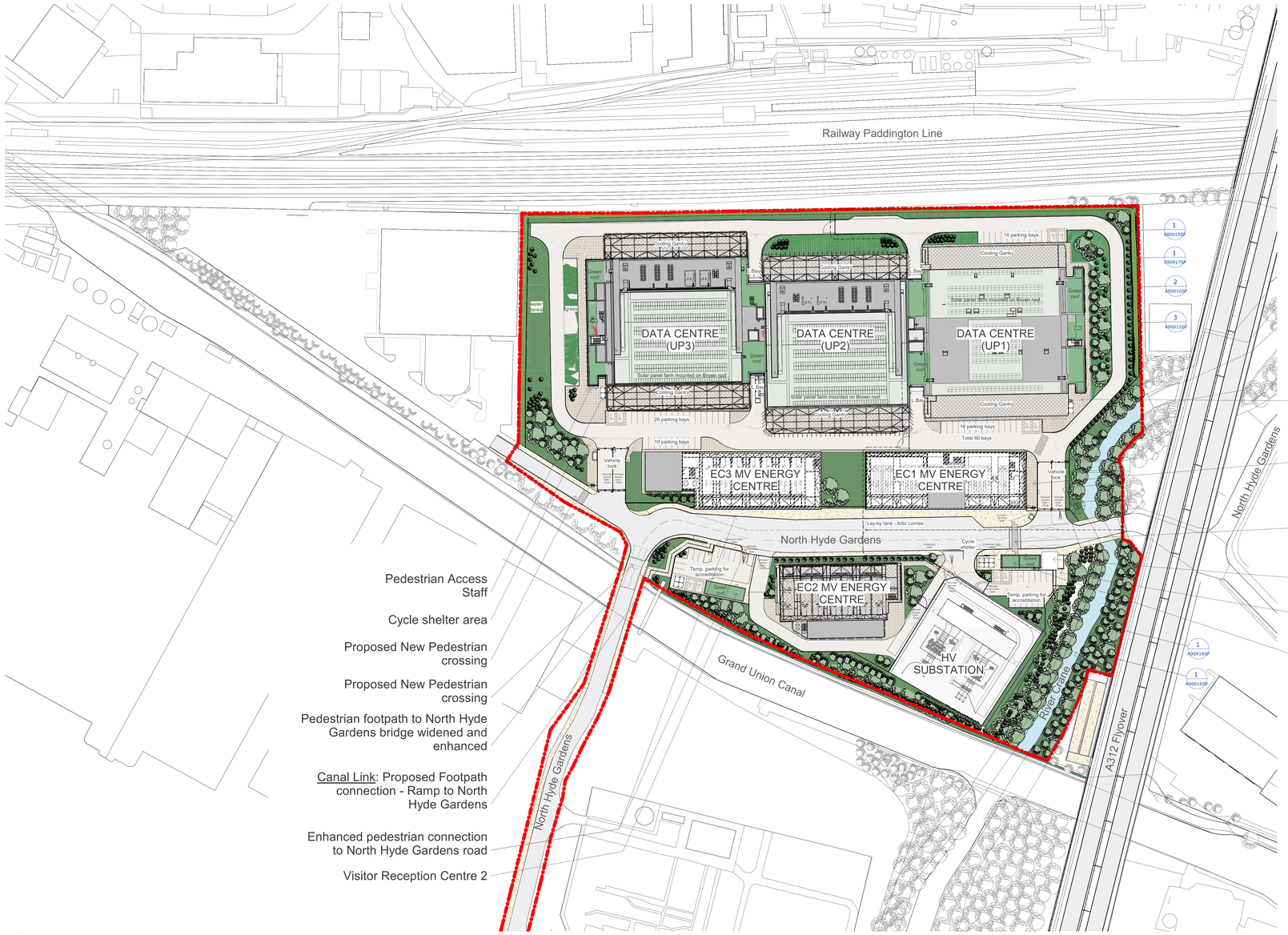
A0



KEY PLAN - NTS



EC1



1 Site Plan
1 : 750

DO NOT Scale This Drawing
Dimensions to be checked on Site.

Notes:

For Structural design and calculations refer to Specialist Engineer's drawings and documentation.

For Mechanical and Electrical design and calculations refer to Specialist Engineer's drawings and documentation.

Rev	Date	Description	By
P03	24/05/2022	S4 Suitable for Stage Approval - Drawing name ammended	YB
P02	20/05/2022	Issued for Stage 4	AVC
P01	05/05/2022	Issued for Stage 4	AVC

STAGE 4

Client:
SWEET PROJECTS
ON BEHALF OF ARK

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Project:
Union Park at Bulls Bridge

Drawing Name:
A90 - External Works
SW Site Plan Aerial View

Drawn Date: 27/03/20 | Drawn By: AVC
Scale: 1 : 750 @ A0 | Approved By: NW

Drawing No.: NWA- 0471-SW-ZZ-DR-A-A90005SP | Rev: P03

Plotted:24/05/2022 13:10:34 File Path: C:\Users\yacira.NWA\Documents\NWA-0514-SW-ZZ-M3-A-0003_yacira92DE2.rvt

True scale at 1:1

0 10 20 m

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Notes:

Basemap: Google 2021. Insert Map: Google 2021.

Key

- Cable Percussive Borehole
- Windowless Sample Borehole (Install)
- Windowless Sample Borehole (No install)
- Hand Excavated Pit

Rev	Description	Date

Project: Bulls Bridge, Hayes	Scale: 1:700
	Drawn by: CB
	Approved By: CK
Title: Borehole Location Plan	Drawing Number: 3
	Date: 25/08/2021

APPENDIX 2: PHOTOGRAPHS

01: Front of the Abellio Bus Garage (west part)

02: Site entrance (north part of the site)

03: Petrol Filling Area

04: Southeast part of the site facing west

05: Northeast part of the site with associated diesel oil AST in background

06: ASTs and spill identified at the rear of the building

07: Installed monitoring well

08: Drilling of BH01

APPENDIX 3: FIELD METHODS

FIELD METHODS

3.1.	**Design of Investigation**
3.1.1	The site investigation was broadly undertaken in general accordance and with reference, where relevant to the following documents: • Specification for Ground Investigation, Site Investigation Steering Group, Thomas Telford, 1994; • British Standard BS10175:2011 (A2) Investigation of potentially contaminated sites – code of practice, as amended; • Code of Practice for the Investigation of Potentially Contaminated Sites BS10175:2011+A2:2017; • Land Contamination: Risk Management (LCRM) 2020; • Environment Agency (2000) Secondary model procedures for the development of appropriate soil sampling strategies for land contamination. Technical Report P5-066/TR; • DEFRA/Environmental Agency Report: Land Contamination: Risk Management (LCRM) 2019; • BS5930, 2015. Code of Practice for Ground Investigation; • BS1377 (1990) Methods of test for Soils for Civil Engineering Purposes; • BS EN 1997-2 (2007) Eurocode 7 – Geotechnical Design – Ground Investigation and Testing; and • BS IS0 5667-22:2010 Water quality. Sampling Guidance on the design and installation of groundwater monitoring points.
3.1.2	The works were progressed on site by a subcontractor who have been scrutinised by Paragon and are on Paragon's approved sub-contractor list. The investigation was designed to provide a preliminary assessment of the ground conditions at the subject site. Prior to the progression of the site investigation, all areas were checked for services through the use of a Cable Avoidance Tool and by Ground Penetrating Radar (GPR).
3.2.	**Onsite Methods**
3.2.1	Eight boreholes were drilled using windowless drilling rig, and one borehole was drilled using cable percussion drilling rig. In addition, two hand excavated trial pits were completed.
3.2.2	Onsite geotechnical testing included Standard Penetration Testing (SPT).
3.2.3	Soils were logged by a qualified engineering geologist in general accordance with BS 5930: 1999+A2:2010 and BS EN ISO 14688 Pt 1&2.
3.2.4	A Photoionisation Detector (PID) was used to screen the soils onsite to provide an indication of contamination.

3.3.	**Constraints**
3.3.1	The ground conditions reported relate only to the point of excavation and do not necessarily guarantee a continuation of the ground conditions throughout the non-inspected area of the site. Whilst such exploratory holes would usually provide a reasonable indication as to the general ground conditions these cannot be determined with complete certainty.
3.3.2	A number of constraints were identified during investigation by Paragon. These included pedestrian movements as well as parked and moving buses across the area. Due to active operations onsite, the positions of boreholes were agreed with the Abellio management team and no boreholes were allowed to be drilled within the centre of the site.
3.3.3	Additionally, during drilling, dense Made Ground or concrete was encountered which led to refusals and boreholes terminating at shallow depths.
3.3.4	During drilling UXO clearance was provided using a Magnetometer. In one location a potential UXO was identified at 1.00mbgl. This led to the termination of the position.
3.4.	**Monitoring Well Installation**
3.4.1	Upon completion of the boreholes, where required a monitoring well was installed with 50mm HDPE well pipe to depths presented on the borehole logs. A slotted section of well pipe was surrounded by gravel to provide a 'response zone'. A plain section of pipe was surrounded by bentonite to produce a seal.
3.4.2	Groundwater levels within the monitoring wells were recorded during each visit using an electronic dip/interface meter.
3.5.	**Sampling and Testing Strategy**
3.5.1	All the exploratory holes were logged and sampled by a site engineer. Testing and sampling at the site was undertaken to investigate the ground conditions present.
3.5.2	Soil samples were collected from agrees locations across the site and at different depths within each trial position to provide an even coverage of the site.
3.5.3	Environmental soil samples representative of the underlying conditions were collected and submitted for a suite of determinants. The soil samples were transported to an appointed United Kingdom Accreditation Service (UKAS) accredited laboratory.
3.5.4	Geotechnical disturbed, bulk and undisturbed U100 samples were collected during drilling. These were submitted for testing at a geotechnical laboratory.
3.6.	**Quality Control**
3.6.1	The samples were despatched under a chain of custody procedure to a UKAS accredited laboratory, for subsequent chemical analysis. Where appropriate, samples were stored within cool boxes containing ice packs. A Chain of Custody is included with all sample consignments.

3.7.	**Gas Monitoring**
3.7.1	The wells were monitored for methane, carbon dioxide, oxygen and hydrogen sulphide using a multi-gas analyser (GFM436).
3.7.2	Ground gas monitoring was carried out in general accordance with the guidelines presented in CIRIA C665 'Assessing risk posed by hazard ground gases to buildings'. Flow was monitored for a period of two minutes where possible; maximum flow was recorded. Ground gases, including concentrations of methane, carbon dioxide, hydrogen sulphide and carbon monoxide were monitored for up to five minutes. During monitoring, ground gas readings were logged every thirty seconds.
3.7.3	Following gas monitoring, water levels were checked using an interface meter, which is also capable of detecting the presence of free product. If groundwater is present, then water samples were retrieved using bailers. Prior to groundwater sampling, up to three times the well volume was purged to remove stagnant / rain water.
3.8.	**Health and Safety**
3.8.1	A site-specific Risk Assessment and Method Statement (RAMS) was produced prior to the works beginning on site; works were completed in general accordance with the methodology set up in this assessment. No incidents occurred during this investigation.

APPENDIX 4: BOREHOLE LOGS

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 30/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510455.94 N179226.92
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	BH	30.86m AoD	CB	1:50	Sheet 1 of 4

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.20	30.66		MACADAM.
		0.50 - 1.00	B					MADE GROUND comprising brown and black slightly clayey sandy GRAVEL. Gravel is fine to coarse, sub-angular to angular brick, flint and concrete with occasional glass and clinker.
		0.50 - 1.00	ES					*PID reading at 0.50mbgl= 2.50ppm.*
		1.20	SPT	N=13 (4,2/2,3,4,4)				*PID reading at 1.00mbgl = 1.90ppm*
								PID reading at 1.20mbgl = 1.20ppm
								PID reading at 1.80mbgl = 0.80ppm
		2.00 - 2.50	B					*PID reading at 2.00mbgl = 5.00ppm*
		2.00 - 2.50	ES					
		2.00	SPT	N=13 (1,3/2,5,3,3)				*PID reading at 2.50mbgl = 13.50ppm*
		3.00	SPT	N=13 (1,1/2,2,4,5)				*PID reading at 3.00mbgl = 2.30ppm*
								PID reading at 3.50mbgl = 1.20ppm
		4.00	SPT	N=7 (1,1/1,1,2,3)				*PID reading at 4.00mbgl = 1.00ppm*
		4.50 - 5.00	B		4.50	26.36		Soft black gravelly peaty CLAY. Gravel is fine to coarse, sub-angular of mixed lithology. (ALLUVIUM)
		4.50 - 5.00	ES					*PID reading at 4.50mbgl = 2.30ppm*
		5.00	SPT	N=7 (1,1/1,2,2,2)	5.00	25.86		*Strong hydrocarbon odour between 4.50mbgl and 5.00mbgl.*
								Brown, blue and grey, mottled, slightly plastic CLAY. (WEATHERED LONDON CLAY)
								PID reading at 5.00mbgl = 0.70ppm
								PID reading at 6.00mbgl = 0.80ppm
		6.50 - 7.00	B					*PID reading at 6.50mbgl = 0.80ppm*
		6.50 - 7.00	ES					
		6.50	SPT	N=14 (3,3/3,3,4,4)				
					7.50	23.36		Brown, blue and grey, mottled, stiff to very stiff CLAY with selenite crystals.(LONDON CLAY)
								PID reading at 7.50mbgl = 0.60ppm
		8.00 - 8.45	U					
								PID reading at 9.00mbgl = 0.50ppm
		9.50	SPT	N=13 (2,2/2,3,3,5)				*PID reading at 9.50mbgl = 0.50ppm*

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Drilled using a cable percussive drilling rig. SPT Energy Ratio = 62%. Borehole remained dry.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 30/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510455.94 N179226.92
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	BH	30.86m AoD	CB	1:50	Sheet 2 of 4

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Brown, blue and grey, mottled, stiff to very stiff CLAY with selenite crystals.(LONDON CLAY)
		11.00	SPT	N=14 (2,2/3,3,4,4)				
		12.00 - 12.50	B					
		12.00 - 12.50	ES					
		12.50	SPT	N=18 (2,3/3,5,5,5)				
		14.00	SPT	N=22 (3,3/5,5,6,6)				
		15.50 - 15.95	U					
		17.00	SPT	N=24 (3,4/5,5,7,7)				

11 12 13 14 15 16 17 18 19 20

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Drilled using a cable percussive drilling rig. SPT Energy Ratio = 62%. Borehole remained dry.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 30/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510455.94 N179226.92
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	BH	30.86m AoD	CB	1:50	Sheet 3 of 4

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Brown, blue and grey, mottled, stiff to very stiff CLAY with selenite crystals.(LONDON CLAY)

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Drilled using a cable percussive drilling rig. SPT Energy Ratio = 62%. Borehole remained dry.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 30/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510455.94 N179226.92
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	BH	30.86m AoD	CB	1:50	Sheet 4 of 4

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Brown, blue and grey, mottled, stiff to very stiff CLAY with selenite crystals.(LONDON CLAY)
					35.00	-4.14		End of Borehole at 35.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Drilled using a cable percussive drilling rig. SPT Energy Ratio = 62%. Borehole remained dry.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510475.39 N179217.52
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS01	WS	30.89m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	30.79		MACADAM.
					0.25	30.64		MADE GROUND comprising orange, grey and redish brown sandy clayey GRAVEL. Gravel is coarse, sub-angular concrete.
					0.45	30.44		MADE GROUND comprising black and grey sandy GRAVEL. Gravel is fine to coarse, sub-angular brick, concrete, mixed lithology and occasional glass.
					0.50	30.39		*PID reading at 0.30mbgl = 0.1ppm.*
								CONCRETE.
								End of Borehole at 0.500m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Refusal on concrete at 0.50mbgl. No install.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510473.08 N179218.82
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS01a	WS	30.71m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	30.51		MACADAM.
					0.35	30.36		MADE GROUND comprising black and grey sandy GRAVEL. Gravel is fine to coarse, sub-angular brick, concrete, mixed lithology and occasional glass.
					0.40	30.31		CONCRETE.
								End of Borehole at 0.400m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Refusal on concrete at 0.40mbgl. No install.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510475.21 N179222.74
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS01b	WS	30.63m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	30.43		MACADAM.
					0.25	30.38		MADE GROUND comprising black and grey sandy GRAVEL. Gravel is fine to coarse, sub-angular brick, concrete, mixed lithology and occasional glass.
					0.30	30.33		CONCRETE.
								End of Borehole at 0.300m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Refusal on concrete at 0.30mbgl. No install.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510450.79 N179196.66
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS02	WS	31.34m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	31.14		MADADAM.
					0.30	31.04		MADE GROUND comprising pink and grey coarse GRAVEL of mixed lithologies. (Sub-base).
								MADE GROUND comprising brown and black sandy gravelly CLAY. Gravel is fine to coarse, sub-angular brick and concrete.
								Geotextile at 0.30mbgl.
								PID reading at 0.75mbgl = 0.5ppm.
					0.90	30.44		
		1.00	SPT	N=8 (3,3/2,2,2,2)				MADE GROUND comprising black and grey sandy GRAVEL. Gravel is fine to coarse, sub-angular brick, concrete, tile and rare clinker.
								PID reading at 1.50mbgl = 0.4ppm.
		2.00	SPT	N=4 (1,1/1,1,1,1)				
		3.00	SPT	N=1 (1,0/0,1,0,0)				
					3.50	27.84		MADE GROUND comprising brown and grey gravelly, sandy CLAY. Gravel is fine to coarse, sub-angular brick, tile and rare clinker.
		4.00	SPT	N=2 (1,1/0,1,0,1)				
								PID reading at 4.50mbgl = 0.1ppm.
								Becoming sandy.
		5.00	SPT	N=1 (1,0/1,0,0,0)	5.00	26.34		End of Borehole at 5.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510434.14 N179224.66
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS03	WS	31.32m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	31.22		MACADAM.
								MADE GROUND comprising black and grey sandy GRAVEL. Gravel is fine to coarse, sub-angular brick and concrete.
					0.35	30.97		
					0.40	30.92		*PID reading at 0.30mbgl = 0.3ppm.*
								CONCRETE.
								End of Borehole at 0.400m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Refusal on concrete at 0.40mbgl. No install.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510416.39 N179206.45
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS04	WS	31.74m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	31.64		MACADAM.
								MADE GROUND comprising grey and brown sandy GRAVEL. Gravel is fine to coarse, sub-angular concrete with occasional cobbles of brick.
					0.50	31.24		*PID reading at 0.30mbgl = 0.6ppm.*
								MADE GROUND comprising brown clayey sandy GRAVEL. Gravel is fine to coarse, sub-angular brick and concrete.
								PID reading at 0.80mbgl = 0.1ppm.
					1.00	30.74		End of Borehole at 1.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Terminated at 1.00mbgl due to an anomaly detected using the magnetometer. No install.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510413.00 N179208.00
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS04a	WS	31.74m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	31.64		MACADAM.
					0.30	31.44		MADE GROUND comprising grey and black sandy GRAVEL. Gravel is fine to coarse, sub-angular brick and concrete.
								End of Borehole at 0.300m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Refusal on Made Ground at 0.30mbgl. No install.

Percussion Drilling Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510379.77 N179227.16
Project No. : 211177	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS05	WS	31.78m AoD	CB	1:33	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05	31.74		MACADAM. MADE GROUND comprising black and grey clayey sandy GRAVEL. Gravel is fine to coarse, sub-angular concrete, brick, rare clinker and mixed lithologies. Occasional cobbles of brick present. *Slight hydrocarbon odour between 0.05mbgl and 3.50mbgl.* *PID reading at 0.80mbgl = 0.2ppm.*
		1.00	SPT	N=8 (3,2/2,2,2,2)				*PID reading at 1.50mbgl = 0.3ppm.*
		2.00	SPT	N=2 (1,1/1,0,1,0)				
		3.00	SPT	N=1 (1,0/0,1,0,0)				
					3.50	28.28		Soft grey gravelly CLAY. Gravel is fine to coarse, sub-angular of mixed lithology. (ALLUVIUM) *PID reading at 3.60mbgl = 0.5ppm.*
		4.00	SPT	N=27 (2,3/5,6,7,9)				
					4.80	26.98		Medium dense, orange and brown sandy GRAVEL. Gravel is fine to coarse, sub-angular flint.
					5.00	26.78		*PID reading at 4.90mbgl = 0.1ppm.* End of Borehole at 5.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Trial Pit Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510479.00 N179217.00
Project No. : 211177	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
HP101	TP	30.88m AoD	CB	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	30.68		MADE GROUND comprising black and brown slightly gravelly sandy TOPSOIL.
					0.50	30.38		MADE GROIND comprising brown and black sandy GRAVEL. Gravel is fine to coarse, sub-angular concrete and brick with occasional cobbles of concrete and roots.
								End of Borehole at 0.500m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

Hand excavated pit.

Trial Pit Log

Project Name: Abellio Bus Garage	Client: HDR	Date: 22/06/2021
Location: Abellio Bus Garage, Hayes, UB3 4QQ	Contractor: Oakland SI Ltd	Co-ords: E510462.00 N179190.00
Project No. : 211177	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
HP102	TP	31.34m AoD	CB	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	31.14		MADE GROUND comprising black and brown slightly gravelly sandy TOPSOIL.
					0.50	30.84		MADE GROIND comprising brown and black sandy GRAVEL. Gravel is fine to coarse, sub-angular concrete and brick with occasional cobbles of concrete and roots.
								End of Borehole at 0.500m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

Hand excavated pit.

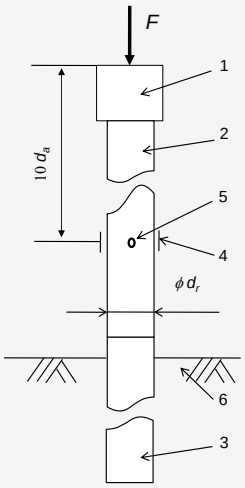
SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer		PREMIER
Test No		EQU2826
Client		OAKLANDS
Test Depth (m)		11.10
Mass of hammer	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of instrumented rod		0.558 m
Area	A =	11.61 cm²
Modulus	E_a =	206843 MPa



Key

1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

F Force
d_r Diameter of rod

Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

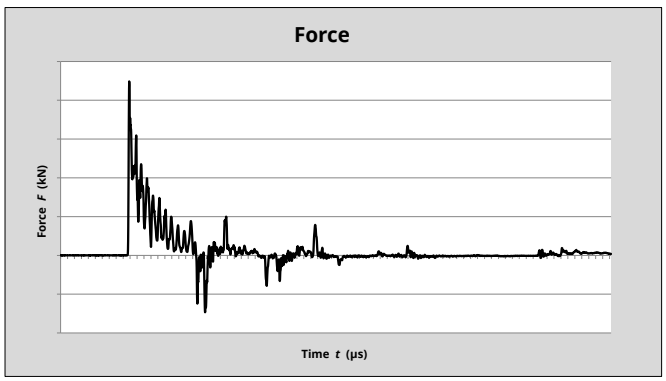
DATE OF TEST	VALID UNTIL	HAMMER ID
28/05/2021	28/05/2022	110-106

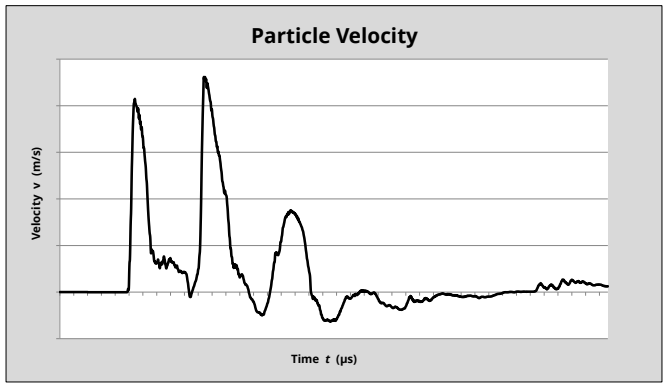
E_{meas} = **0.441** kN-m

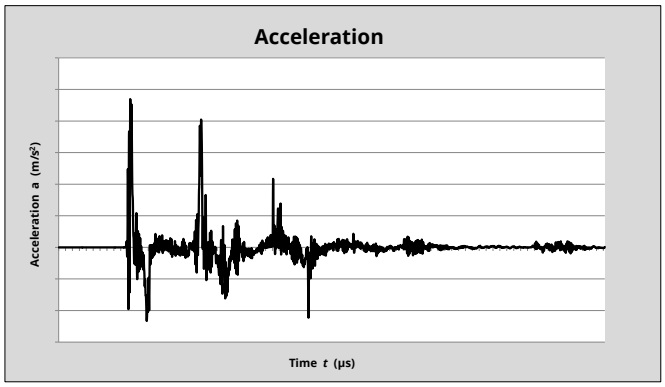
E_{theor} = **0.473** kN-m

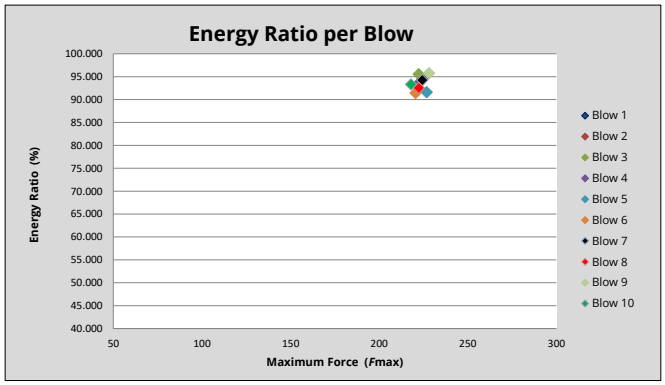
Comments

Energy Ratio (Er) = $\frac{E_{meas}}{E_{theor}}$ **93.29%**









Equipe SPT Analyzer Operator	Certificate prepared by	Certificate checked by	Certificate date
AF			02/06/2021

 Equipe Group, The Paddocks, Home Farm Offices, The Upton Estate, Banbury, Oxfordshire, OX15 6HU
Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

APPENDIX 5: ENVIRONMENTAL LABORATORY TESTING

building & ancient consultants

Abellio Bus Garage Made Ground Soil Analysis

Lab Sample Number	1914360	1914361	1914362	1914363	1914364	1914365	1914366	1914367	1914370	1914371	1925628	1925629	1925630
Sample Reference	WS01	WS02	WS02	WS02	WS03	WS04	WS05	WS05	HP101	HP102	BH01	BH01	BH01
Soil Type	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground
Depth (m)	0.3	0.75	1.5	4.5	0.3	0.8	0.8	1.5	0.1	0.1	0.50-1.00	2.00-2.50	4.50-5.00
Date Sampled	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	22/06/2021	30/06/2021	30/06/2021	30/06/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter	Units	Limit of Detection	Accreditation	Commercial 2.5% SOM	GAC Source													
GENERAL																		
Stone Content	%	0.1	NONE	N/A		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	N/A		4.9	17	11	13	4.4	16	7.7	21	9.7	14	15	15	28
Total mass of sample received	kg	0.001	NONE	N/A		1.1	1.1	1	1.5	1	1	1	1	1	1	1.2	1.4	1.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	N/A		-	-	-	-	-	Chrysotile	-	-	-	-	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	N/A		Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected	Detected	Not-detected
Asbestos Quantification				N/A		-	-	-	-	-	< 0.001	-	-	-	-	-	< 0.001	-
GENERAL INORGANICS																		
pH - Automated	pH Units	N/A	MCERTS	N/A		10.3	8.8	8.5	7.9	9.1	9.3	8.7	7.9	8.8	8.1	10.5	10	7.7
Electrical Conductivity	µS/cm	10	ISO 17025	N/A		230	310	580	150	180	350	210	190	200	97	890	580	770
Total Cyanide	mg/kg	1	MCERTS	N/A		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	N/A		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	N/A	Alkina ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	N/A		1800	2200	4300	540	1100	1900	1200	1100	1200	870	5700	3100	4300
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	N/A		0.32	0.39	0.83	0.26	0.24	0.38	0.34	0.18	0.075	0.034	0.61	0.59	2.7
Sulphide	mg/kg	1	MCERTS	N/A		2700	69	56	150	540	17	570	72	30	6.8	75	120	200
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	N/A		89	120	93	54	36	87	68	48	44	10	95	70	230
Ammonium as NH4	mg/kg	0.5	MCERTS	N/A		0.6	42	73	7.7	0.6	< 0.5	24	110	1.7	0.7	5.2	8.2	75
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	N/A		0.036	0.015	0.033	0.013	0.05	0.0042	0.022	0.039	0.052	0.041	0.017	0.023	0.041
Total Organic Carbon (TOC)	%	0.1	MCERTS	N/A		3.6	1.5	3.3	1.3	5	0.4	2.2	3.9	5.2	4	1.7	2.3	4.1
TOTAL PHENOLS																		
Total Phenols (monohydric)	mg/kg	1	MCERTS	1500	S4UL	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SPECIATED POLYAROMATIC HYDROCARBONS																		
Naphthalene	mg/kg	0.05	MCERTS	460(183)	S4UL	< 0.05	< 0.05	< 0.05	< 0.05	0.38	< 0.05	0.33	< 0.05	< 0.05	< 0.05	0.42	1.2	0.39
Acenaphthylene	mg/kg	0.05	MCERTS	97000(212)	S4UL	< 0.05	< 0.05	< 0.05	< 0.05	1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.82	0.12
Acenaphthene	mg/kg	0.05	MCERTS	97000(141)	S4UL	< 0.05	0.32	< 0.05	< 0.05	1.6	< 0.05	0.24	< 0.05	< 0.05	< 0.05	0.58	9.9	2.5
Fluorene	mg/kg	0.05	MCERTS	68000	S4UL	< 0.05	0.45	< 0.05	< 0.05	2.2	< 0.05	0.28	< 0.05	< 0.05	< 0.05	0.57	11	1.2
Phenanthrene	mg/kg	0.05	MCERTS	22000	S4UL	1.3	2.5	0.74	0.96	12	0.42	1.3	0.43	< 0.05	1.1	3.5	43	3.8
Anthracene	mg/kg	0.05	MCERTS	540000	S4UL	0.33	0.57	0.2	1.3	4.4	< 0.05	0.45	< 0.05	< 0.05	0.32	1.1	32	2
Fluoranthene	mg/kg	0.05	MCERTS	23000	S4UL	2.2	4.3	1.9	2.9	22	0.83	2	0.89	1.2	2.5	4.9	39	5.8
Pyrene	mg/kg	0.05	MCERTS	54000	S4UL	2.3	3.7	1.7	2.3	20	0.72	1.9	0.83	1.5	2.2	4.5	28	4.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	170	S4UL	1.1	2.6	1.3	2.2	11	0.52	1.2	0.53	< 0.05	1.4	1.7	7.5	1.7
Chrysene	mg/kg	0.05	MCERTS	350	S4UL	1	1.6	0.99	2	9.9	0.45	1.1	0.47	< 0.05	1.1	1.6	6.4	1.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	44	S4UL	1.3	1.9	1.1	2.5	11	0.48	1.3	0.59	< 0.05	1.6	1.7	4.4	1.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1200	S4UL	0.63	0.85	0.46	0.68	3.6	0.19	0.6	0.16	< 0.05	0.52	0.99	2.7	0.68
Benzo(a)pyrene	mg/kg	0.05	MCERTS	76	C4SL	0.94	1.7	0.94	2.2	9.1	0.36	0.85	0.4	< 0.05	1.3	1.5	3.9	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	510	S4UL	1	1.2	0.65	2	5.1	0.26	0.71	0.28	< 0.05	0.58	0.72	1.9	0.55
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	3.6	S4UL	0.28	0.37	< 0.05	0.45	1.6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.23	0.57	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4000	S4UL	1.2	1.3	0.71	2.6	5.7	0.27	0.82	0.31	< 0.05	0.72	0.87	2.2	0.62
TOTAL POLYAROMATIC HYDROCARBONS																		
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	N/A		13.7	23.4	10.7	22.1	121	4.5	13.2	4.49	2.67	13.2	24.9	194	28.5
HEAVY METALS / METALLOIDS																		
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	N/A	Alkina ATRISK SSV	3.6	6.2	15	3	3.4	3.3	4.2	6.3	11	4.4	< 1.0	4.9	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	640	C4SL	9	15	62	12	12	13	14	23	12	13	13	16	31
Barium (aqua regia extractable)	mg/kg	1	MCERTS	N/A	Alkina ATRISK SSV	230	130	560	46	160	85	220	200	140	110	140	290	160
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	12	S4UL	3.1	1.2	3.2	0.68	1.8	1.2	1.8	1.7	0.53	0.6	0.9	1.2	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	240000	S4UL	2.7	1.8	7.6	4	2.5	3.4	3.8	13	4.9	4.9	2.4	4.6	12
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	410	C4SL	0.5	< 0.2	< 0.2	< 0.2	0.5	< 0.2	0.6	0.9	0.6	0.7	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	49	C4SL	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8600	S4UL	31	38	37	20	26	34	30	33	33	19	32	36	44
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	N/A		5.3	14	15	8.3	6	12	9.2	13	8.4	7	8.3	13	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	68000	S4UL	13	44	580	19	21	38	54	110	110	37	56	100	72
Iron (aqua regia extractable)	mg/kg	40	MCERTS	N/A		11000	27000	47000	17000	14000	26000	20000	28000	16000	17000	30000	39000	48000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	2330	C4SL	93	140	2000	69	65	43	150	500	84	110	95	170	200
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	N/A		1800	420	530	140	1200	330	960	350	330	300	390	370	2600
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1100	S4UL	< 0.3	< 0.3	5.7	0.5	< 0.3	< 0.3	1.7	0.8	0.5	< 0.3	< 0.3	< 0.3	1.1
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	N/A	Alkina ATRISK SSV	0.75	0.89	6.3	0.77	0.95	0.8	1.8	2.5	3.7	1	1.7	2.2	2.2
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	980	S4UL	11	31	40	17	12	31	23	34	19	15	22	32	32
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		270	400	2400	320	290	430	450	1100	910	1200	490	680	880
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	12000	S4UL	< 1.0	< 1.0	< 1.0	< 1.0	1.6	< 1.0	1.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tin (aqua regia extractable)	mg/kg	1	MCERTS	N/A		2.9	6.8	280	5.2	2.5	6	16	46	9.2	8.3	8	17	15
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	9000	S4UL	59	64	65	33	55	54	52	61	38	33	46	55	59
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	730000	S4UL	68	120	810	45	72	82	160	340	270	200	120	190	190
Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		76000	30000	46000	9400	70000	22000	72000	16000	30000	16000	85000	50000	44000
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		7200	6300	2300	1500	7800	5300	8400	4100	6000	1700	3300	4700	5500
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		2400	3400	1900	1000	1500	3700	2100	3000	1300	1300	2400	2700	2900
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		710	410	960	150	500	470	390	310	220	150	440	350	420
MONOAROMATICS AND OXYGENATES																		
Benzene	mg/kg		MCERTS	N/A	C4SL	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	mg/kg		MCERTS	110000(1920)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	mg/kg		MCERTS	13000(1220)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	mg/kg		MCERTS			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	mg/kg		MCERTS	15000(1120)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	mg/kg		MCERTS		Alkina ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
PETROLEUM HYDROCARBONS																		
Mineral Oil [C10 - C40)	mg/kg	10	NONE	N/A		530	< 10	< 10	< 10	1200	< 10	280	< 10	12000	< 10	140	200	170
TPH C10 - C40	mg/kg	10	MCERTS	N/A		950	41	46	65	2700	< 10	400	25	12000	66	320	650	500
TPH2 (C8 - C10)	mg/kg	0.1	MCERTS	N/A		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	5900 (558)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	17000 (322)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	4800 (190)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	23000 (118)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5.7
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	82000 (59)	S4UL	3.8	< 2.0	< 2.0	< 2.0	14	< 2.0	< 2.0	< 2.0	90	< 2.0	8.4	13	11
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	1700000	S4UL	21	< 8.0	< 8.0	< 8.0	72	< 8.0	13	< 8.0	1100	< 8.0	23	43	32
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS			200	< 8.0	< 8.0	< 8.0	430	< 8.0	110	< 8.0	8000	< 8.0	61	97	99
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	N/A		230	< 10	< 10	< 10	520	< 10	120	< 10	9200	< 10	94	150	150
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	46000 (2260)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	110000 (1920)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	8100 (1500)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	28000 (899)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	12
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	37000	S4UL	< 2.0	< 2.0	< 2.0	< 2.0	31	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	6.3	79	37
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	28000		12	19	17	12	170	< 10	20	< 10	< 10	14	27	230	100
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	28000		200	23	29	39	780	< 10	100	21	< 10	34	76	100	150
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	N/A	N/A	220	41	46	51	980	< 10	120	25	< 10	49	110	410	300
TPH (C10 - C25)	mg/kg	10	MCERTS	N/A		71	25	24	20	460	< 10	55	< 10	9500	29	89	430	340

Abellio Bus Garage Made Ground Soil Analysis

Analytical Parameter	Units	Limit of Detection	Accreditation	Commercial 2.5% SOM	GAC Source	Lab Sample Number	1914360	1914361	1914362	1914363	1914364	1914365	1914366	1914367	1914370	1914371	1925828	1925829	1925830
						Sample Reference	WS01	WS02	WS02	WS02	WS03	WS04	WS05	WS05	HP101	HP102	BH01	BH01	BH01
						Soil Type	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground	Made Ground
						Depth (m)	0.3	0.75	1.5	4.5	0.3	0.8	0.8	1.5	0.1	0.1	0.50-1.00	2.00-2.50	4.50-5.00
						Date Sampled	22/05/2221	22/05/2221	22/05/2221	22/05/2221	22/05/2221	22/05/2221	22/05/2221	22/05/2221	22/05/2221	22/05/2221	30/05/2021	30/05/2021	30/05/2021
						Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
VOLATILE ORGANIC COMPOUNDS																			
Chloromethane	mg/kg	1	ISO 17025		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	mg/kg	1	NONE		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	mg/kg	1	NONE	0.077	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	mg/kg	1	NONE		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	mg/kg	1	MCERTS	170	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	mg/kg	1	MCERTS	1300	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	mg/kg	1	MCERTS	0.97	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	mg/kg	1	NONE		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	mg/kg	1	MCERTS	6.3	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	mg/kg	1	MCERTS	2.6	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	mg/kg	1	ISO 17025		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	mg/kg	1	NONE	42	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	mg/kg	1	MCERTS	130	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	mg/kg	1	MCERTS	250	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	mg/kg	1	MCERTS	950	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	mg/kg	1	MCERTS		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	mg/kg	1	ISO 17025		Atkins ATRISK SSV		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	mg/kg	1	ISO 17025	73	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	mg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	mg/kg	1	MCERTS	4800 (1370)	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	mg/kg	1	MCERTS	10000 (540)	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	mg/kg	1	MCERTS	530	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	mg/kg	1	ISO 17025	250	S4UL		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SEMI-VOLATILE ORGANIC COMPOUNDS																			
Aniline	mg/kg	0.1	NONE				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025		Atkins ATRISK SSV		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS				< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	73	S4UL		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	4800 (1370)	S4UL		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	10000 (540)	S4UL		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS		Atkins ATRISK SSV		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS		Atkins ATRISK SSV		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS				< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE		Atkins ATRISK SSV		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS				< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS				< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS		Atkins ATRISK SSV		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS				< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	530	S4UL		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS				< 0.05	< 0.05	< 0.05	< 0.05	0.38	< 0.05	0.33	< 0.05	< 0.05	< 0.05	0.42	1.2	0.39
2,4-Dichlorophenol	mg/kg	0.3	MCERTS				< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS				< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS		Atkins ATRISK SSV		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS		Atkins ATRISK SSV		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS				< 0.05	< 0.05	< 0.05	< 0.05	1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.82	0.12
Acenaphthene	mg/kg	0.05	MCERTS				< 0.05	0.32	< 0.05	< 0.05	1.6	< 0.05	0.24	< 0.05	< 0.05	< 0.05	0.58	9.9	2.5
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS		Atkins ATRISK SSV		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS				< 0.2	< 0.2	< 0.2	< 0.2	1.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	5.5	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025				< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS		Atkins ATRISK SSV		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS				< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS				< 0.05	0.45	< 0.05	< 0.05	2.2	< 0.05	0.29	< 0.05	< 0.05	< 0.05	0.97	11	1.2
Azobenzene	mg/kg	0.3	MCERTS				< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS				< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	120	S4UL		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS				1.3	2.5	0.74	0.96	12	0.42	1.3	0.49	< 0.05	1.1	3.5	43	3.8
Anthracene	mg/kg	0.05	MCERTS				0.33	0.57	0.2	1.3	4.4	< 0.05	0.45	< 0.05	< 0.05	0.32	1.1	32	2
Carbazole	mg/kg	0.3	MCERTS				< 0.3	< 0.3	< 0.3	< 0.3	1.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	3.6	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS				< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS				< 0.3	< 0.3	< 0.3	< 0.3	1.4	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS				2.2	4.3	1.9	2.9	22	0.83	2	0.69	1.2	2.5	4.9	39	5.8
Pyrene	mg/kg	0.05	MCERTS				2.3	3.7	1.7	2.3	20	0.72	1.9	0.63	1.5	2.2	4.5	28	4.7
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025		Atkins ATRISK SSV		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS				1.1	2.6	1.3	2.2	11	0.52	1.2	0.53	< 0.05	1.4	1.7	7.5	1.7
Chrysene	mg/kg	0.05	MCERTS				1	1.6	0.99	2	9.9	0.45	1.1	0.47	< 0.05	1.1	1.6	6.4	1.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS				1.3	1.9	1.1	2.5	11	0.48	1.3	0.59	< 0.05	1.6	1.7	4.4	1.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS				0.63	0.85	0.46	0.68	3.6	0.19	0.6	0.16	< 0.05	0.52	0.99	2.7	0.66
Benzo(a)pyrene	mg/kg	0.05	MCERTS				0.94	1.7	0.94	2.2	9.1	0.36	0.85	0.4	< 0.05	1.3	1.5	3.9	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS				1	1.2	0.65	2	5.1	0.26	0.71	0.28	< 0.05	0.58	0.72	1.9	0.55
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS				0.28	0.37	< 0.05	0.45	1.6	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.23	0.57	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS				1.2	1.3	0.71	2.6	5.7	0.27	0.82	0.31	< 0.05	0.72	0.87	2.2	0.62

building & project consultants

Abellio Bus Garage Natural Soil Analysis

Lab Sample Number	1914368	1914369	1925631	1925632
Sample Reference	WS05	WS05	BH01	BH01
Soil Type	Natural	Natural	Natural	Natural
Depth (m)	3.6	4.9	6.50-7.00	12.00-12.50
Date Sampled	22/06/0221	22/06/0221	30/06/2021	30/06/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter	Units	Limit of Detection	Accreditation	GAC Commercial 1% SOM	GAC Source				
GENERAL									
Stone Content	%	0.1	NONE	N/A		< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	N/A		18	6.1	14	14
Total mass of sample received	kg	0.001	NONE	N/A		1	1	1.4	1.2
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	N/A		-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	N/A		Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification				N/A		-	-	-	-
						-	-	-	-
GENERAL INORGANICS									
pH - Automated	pH Units	N/A	MCERTS	N/A		8.4	8.4	8.2	8.5
Electrical Conductivity	µS/cm	10	ISO 17025	N/A		130	120	290	500
Total Cyanide	mg/kg	1	MCERTS	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	N/A	Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	N/A		680	380	910	1300
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	N/A		0.19	0.084	0.31	0.99
Sulphide	mg/kg	1	MCERTS	N/A		31	< 1.0	210	26
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	N/A		46	36	32	66
Ammonium as NH4	mg/kg	0.5	MCERTS	N/A		7.2	2.1	1.1	3.8
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	N/A		0.013	0.014	0.0039	0.0099
Total Organic Carbon (TOC)	%	0.1	MCERTS	N/A		1.3	1.4	0.4	1
TOTAL PHENOLS									
Total Phenols (monohydric)	mg/kg	1	MCERTS	760	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
SPECIATED POLYAROMATIC HYDROCARBONS									
Naphthalene	mg/kg	0.05	MCERTS	190(76.4)	S4UL	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	83000(86.1)	S4UL	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	84000(57)	S4UL	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	63000(30.9)	S4UL	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	22000	S4UL	2	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	520000	S4UL	0.91	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	23000	S4UL	4.4	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	54000	S4UL	4	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	170	S4UL	3.9	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	350	S4UL	2.6	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	44	S4UL	2.9	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1200	S4UL	1.8	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	76	C4SL	3	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	500	S4UL	1.1	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	3.5	S4UL	0.51	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3900	S4UL	1.2	< 0.05	< 0.05	< 0.05
TOTAL POLYAROMATIC HYDROCARBONS									
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	N/A		28.3	< 0.80	< 0.80	< 0.80
HEAVY METALS / METALLOIDS									
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	N/A	Atkins ATRISK SSV	6.6	4	< 1.0	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	640	C4SL	20	22	14	18
Barium (aqua regia extractable)	mg/kg	1	MCERTS	N/A	Atkins ATRISK SSV	90	51	52	55
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	12	S4UL	1	0.98	1.2	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	240000	S4UL	4.7	6.6	4.4	5.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	410	C4SL	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	49	C4SL	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8600	S4UL	22	33	46	42
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	N/A		11	10	16	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	68000	S4UL	39	29	21	22
Iron (aqua regia extractable)	mg/kg	40	MCERTS	N/A		25000	37000	52000	51000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	2330	C4SL	150	43	17	16
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	N/A		230	280	260	270
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1100	S4UL	3.4	< 0.3	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	N/A	Atkins ATRISK SSV	2.6	1.2	0.75	0.75
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	980	S4UL	22	29	37	36
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		670	300	490	480
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	12000	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Tin (aqua regia extractable)	mg/kg	1	MCERTS	N/A		220	21	2.5	2.6
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	9000	S4UL	42	52	74	64
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	730000	S4UL	93	58	78	77
Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		30000	4400	24000	23000
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		2100	1800	17000	16000
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		1500	1500	5000	4800
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	N/A		250	190	340	450
MONOAROMATICS AND OXYGENATES									
Benzene	mg/kg		MCERTS	27	C4SL	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	mg/kg		MCERTS	56000(869)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	mg/kg		MCERTS	5700(518)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	mg/kg		MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	mg/kg		MCERTS	6600(478)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	mg/kg		MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
PETROLEUM HYDROCARBONS									
Mineral Oil (C10 - C40)	mg/kg	10	NONE	N/A		< 10	350	< 10	< 10
TPH C10 - C40	mg/kg	10	MCERTS	N/A		78	350	< 10	< 10
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	N/A		< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	3200 (304)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	7800 (144)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	2000 (78)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	9700 (48)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	59000 (24)	S4UL	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	1600000	S4UL	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS			< 8.0	250	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	N/A		< 10	260	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	26000 (1220) sol	S4UL	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	56000 (869)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	3500 (613)	S4UL	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	16000 (364)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	36000 (169)	S4UL	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	28000		25	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	28000		53	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	N/A	N/A	78	< 10	< 10	< 10
TPH (C10 - C25)	mg/kg	10	MCERTS	N/A		41	48	< 10	< 10

Abellio Bus Garage Natural Soil Analysis

Lab Sample Number	1914368	1914369	1925631	1925632
Sample Reference	WS05	WS05	BH01	BH01
Soil Type	Natural	Natural	Natural	Natural
Depth (m)	3.6	4.9	6.50-7.00	12.00-12.50
Date Sampled	22/06/0221	22/06/0221	30/06/2021	30/06/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter	Units	Limit of Detection	Accreditation	GAC Commercial 1% SOM	GAC Source				
VOLATILE ORGANIC COMPOUNDS									
Chloromethane	mg/kg	1	ISO 17025		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	mg/kg	1	NONE		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	mg/kg	1	NONE	0.059	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE			< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	mg/kg	1	NONE		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	mg/kg	1	MCERTS	99	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	mg/kg		MCERTS	660	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	mg/kg	1	MCERTS	0.67	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	mg/kg	1	NONE		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	mg/kg	1	MCERTS	2.9	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	mg/kg	1	MCERTS	1.2	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	27900 (834 vap)		< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	mg/kg	1	ISO 17025		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	mg/kg	1	NONE	19	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	mg/kg	1	MCERTS	56	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	mg/kg	1	MCERTS	110	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	7660 (507 vap)		< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	2720 (564 saol)		< 1.0	< 1.0	< 1.0	< 1.0
Styrene	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE			< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	3030 (467 sol)		< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	mg/kg	1	MCERTS	270	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	mg/kg	1	MCERTS	5760 (387 sol)	Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	mg/kg	1	MCERTS		Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	mg/kg	1	ISO 17025	165	Atkins ATRISK SSV	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	mg/kg	1	ISO 17025	30	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	mg/kg	1	MCERTS	2000 (571)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	mg/kg	1	MCERTS	4400 (224)	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025			< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	mg/kg	1	MCERTS	220	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS			< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	mg/kg	1	ISO 17025	102	S4UL	< 1.0	< 1.0	< 1.0	< 1.0
SEMI-VOLATILE ORGANIC COMPOUNDS									
Aniline	mg/kg	0.1	NONE			< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025		Atkins ATRISK SSV	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS			< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS			< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	30	S4UL	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	2000 (571)	S4UL	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	4400 (224)	S4UL	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS			< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS		Atkins ATRISK SSV	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS		Atkins ATRISK SSV	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS			< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE		Atkins ATRISK SSV	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS			< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS			< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS		Atkins ATRISK SSV	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS			< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	220	S4UL	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS			< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS			< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE			< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS			< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE			< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS			< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS			< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE			< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS		Atkins ATRISK SSV	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS			< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS		Atkins ATRISK SSV	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS			< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS			< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS		Atkins ATRISK SSV	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS			< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025			< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS		Atkins ATRISK SSV	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS			< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS			< 0.05	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS			< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS			< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	110 (0.20)	S4UL	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS			2	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS			0.91	< 0.05	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS			< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS			< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS			< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS			4.4	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS			4	< 0.05	< 0.05	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025		Atkins ATRISK SSV	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS			3.9	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS			2.6	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS			2.9	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS			1.8	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS			3	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS			1.1	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS			0.51	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS			1.2	< 0.05	< 0.05	< 0.05

Abellio Bus Garage Groundwater Analysis

Lab Sample Number	1934680	1934681	1934682	1934683
Sample Reference	BH01_Shallow	BH01_Deep	WS02	WS05
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	4.50-4.50	14.00-14.00	4.00-4.00	4.00-4.00
Date Sampled	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter (Water Analysis)	Units	Limit of Detection	Accreditation	Environmental Quality Standard					
GENERAL INORGANICS									
pH	pH Units	N/A	ISO 17025	N/A		7.1	7.4	6.9	6.9
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	N/A		1500	930	1700	1600
Total Cyanide	µg/l	10	ISO 17025	N/A		< 10	< 10	< 10	< 10
Complex Cyanide	µg/l	10	ISO 17025	N/A		< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	N/A		< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	N/A		194000	110000	421000	403000
Sulphide	µg/l	5	NONE	N/A		< 5.0	< 5.0	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	N/A		100	73	140	190
Ammonium as NH_4	µg/l	15	ISO 17025	N/A		6300	1300	6000	2700
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	N/A		28	14.7	10.3	6.54
TOTAL PHENOLS									
Total Phenols (monohydric)	µg/l	10	ISO 17025	N/A		< 10	< 10	< 10	< 10
SPECIATED PAHs									
Naphthalene	µg/l	0.01	ISO 17025	10		< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	N/A		2.12	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	N/A		0.38	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	0.1		< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.1		0.26	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	N/A		0.16	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	0.036		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	0.036		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	0.056		< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	0.0026		< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	0.0026		< 0.01	< 0.01	< 0.01	< 0.01
				N/A					
TOTAL PAH									
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	N/A		2.92	< 0.16	< 0.16	< 0.16
HEAVY METALS									
Antimony (dissolved)	µg/l	0.4	ISO 17025	N/A		2.7	0.9	0.6	0.6
Arsenic (dissolved)	µg/l	0.15	ISO 17025	50		3.81	1.34	8.28	21.7
Barium (dissolved)	µg/l	0.06	ISO 17025	N/A		210	93	79	68
Beryllium (dissolved)	µg/l	0.1	ISO 17025	15		< 0.1	< 0.1	< 0.1	< 0.1
Boron (dissolved)	µg/l	10	ISO 17025	N/A		920	540	740	640
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.08		0.03	< 0.02	0.02	0.04
Calcium (dissolved)	mg/l	0.012	ISO 17025	N/A		240	120	360	380
Chromium (hexavalent)	µg/l	5	ISO 17025	3.4		< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	4.7		9.7	5.5	8.8	7.5
Cobalt (dissolved)	µg/l	0.2	ISO 17025	N/A		4.4	1.6	17	12
Copper (dissolved)	µg/l	0.5	ISO 17025	1		3.8	6.2	4.3	3.2
Iron (dissolved)	mg/l	0.004	ISO 17025	N/A		0.042	0.075	17	0.077
Lead (dissolved)	µg/l	0.2	ISO 17025	N/A		0.8	0.4	< 0.2	0.4
Magnesium (dissolved)	mg/l	0.005	ISO 17025	N/A		110	37	25	39
Manganese (dissolved)	µg/l	0.05	ISO 17025	N/A		410	89	6200	4000
Mercury (dissolved)	µg/l	0.05	ISO 17025	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	N/A		3.9	1.3	11	18
Nickel (dissolved)	µg/l	0.5	ISO 17025	4		14	7.9	30	12
Phosphorus (dissolved)	µg/l	20	ISO 17025	N/A		49.5	30.2	< 20.0	42.9
Potassium (dissolved)	mg/l	0.025	ISO 17025	N/A		15	8.8	12	16
Selenium (dissolved)	µg/l	0.6	ISO 17025	N/A		6.9	13	1.9	1.5
Sodium (dissolved)	mg/l	0.01	ISO 17025	N/A		88	94	110	110
Tin (dissolved)	µg/l	0.2	ISO 17025	N/A		0.38	0.48	< 0.20	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	N/A		3.1	1	1.2	0.8
Zinc (dissolved)	µg/l	0.5	ISO 17025	10.9		12	8	15	48
MONOAROMATICS AND OXYGENATES									
Benzene	µg/l	1	ISO 17025	10		< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	74		< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	50		< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
PETROLEUM HYDROCARBONS									
Mineral Oil (C10 - C40)	µg/l	10	NONE	10		< 10.0	< 10.0	< 10.0	< 10.0
Diesel Range Organics (C10 - C25)	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH1 (C10 - C40)	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH2 (C6 - C10)	µg/l	10	ISO 17025	10		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	10		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	10		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	10		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	10		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	10		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	10		< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	10		< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	10		< 10	< 10	< 10	< 10

Abellio Bus Garage Groundwater Analysis

Lab Sample Number	1934680	1934681	1934682	1934683
Sample Reference	BH01_Shallow	BH01_Deep	WS02	WS05
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	4.50-4.50	14.00-14.00	4.00-4.00	4.00-4.00
Date Sampled	08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter (Water Analysis)	Units	Limit of Detection	Accreditation	Environmental Quality Standard					
VOLATILE ORGANIC COMPOUNDS									
Chloromethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	50		< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	N/A		< 1.0	< 1.0	< 1.0	< 1.0
SEMI-VOLATILE ORGANIC COMPOUNDS									
Aniline	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	2		< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	N/A		2.1	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	N/A		0.38	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	0.1		< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	0.1		0.26	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	N/A		0.16	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	N/A		< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	0.036		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	0.036		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	0.056		< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	0.0026		< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	N/A		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	0.0026		< 0.01	< 0.01	< 0.01	< 0.01

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Analytical Report Number : 21-82945

Replaces Analytical Report Number: 21-82945, issue no. 1
Additional analysis undertaken.

Project / Site name:	Abellio	**Samples received on:**	23/06/2021
Your job number:	211177	**Samples instructed on/ Analysis started on:**	23/06/2021
Your order number:	211177 AM	**Analysis completed by:**	07/07/2021
Report Issue Number:	2	**Report issued on:**	07/07/2021
Samples Analysed:	12 soil samples		

Signed: Karolina Marek

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914360	1914361	1914362	1914363	1914364
Sample Reference				WS01	WS02	WS02	WS02	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.75	1.50	4.50	0.30
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	4.9	17	11	13	4.4
Total mass of sample received	kg	0.001	NONE	1.1	1.1	1.0	1.5	1.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.3	8.8	8.5	7.9	9.1
Electrical Conductivity	µS/cm	10	ISO 17025	230	310	580	150	180
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	1800	2200	4300	540	1100
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.32	0.39	0.83	0.26	0.24
Sulphide	mg/kg	1	MCERTS	2700	69	56	150	540
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	89	120	93	54	36
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	0.6	42	73	7.7	0.6
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.036	0.015	0.033	0.013	0.050
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.6	1.5	3.3	1.3	5.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.38
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.0
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.32	< 0.05	< 0.05	1.6
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	< 0.05	2.2
Phenanthrene	mg/kg	0.05	MCERTS	1.3	2.5	0.74	0.96	12
Anthracene	mg/kg	0.05	MCERTS	0.33	0.57	0.20	1.3	4.4
Fluoranthene	mg/kg	0.05	MCERTS	2.2	4.3	1.9	2.9	22
Pyrene	mg/kg	0.05	MCERTS	2.3	3.7	1.7	2.3	20
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	2.6	1.3	2.2	11
Chrysene	mg/kg	0.05	MCERTS	1.0	1.6	0.99	2.0	9.9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	1.9	1.1	2.5	11
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.63	0.85	0.48	0.68	3.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.94	1.7	0.94	2.2	9.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.0	1.2	0.65	2.0	5.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.28	0.37	< 0.05	0.45	1.6
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	1.3	0.71	2.6	5.7
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	13.7	23.4	10.7	22.1	121

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914360	1914361	1914362	1914363	1914364
Sample Reference				WS01	WS02	WS02	WS02	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.75	1.50	4.50	0.30
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.6	6.2	15	3.0	3.4
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.0	15	62	12	12
Barium (aqua regia extractable)	mg/kg	1	MCERTS	230	130	560	46	160
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	3.1	1.2	3.2	0.68	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	2.7	1.8	7.6	4.0	2.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	< 0.2	< 0.2	< 0.2	0.5
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	38	37	20	26
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	5.3	14	15	6.3	6.0
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	44	560	19	21
Iron (aqua regia extractable)	mg/kg	40	MCERTS	11000	27000	47000	17000	14000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	93	140	2000	69	65
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	1800	420	530	140	1200
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	5.7	0.5	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.75	0.89	6.3	0.77	0.95
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	31	40	17	12
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	270	450	2400	320	290
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.6
Tin (aqua regia extractable)	mg/kg	1	MCERTS	2.9	6.8	280	5.2	2.5
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	59	64	65	33	55
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	120	810	45	72
Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	76000	30000	46000	9400	70000
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	7200	6300	2300	1500	7800
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	2400	3400	1900	1000	1500
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	710	410	960	150	500
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914360	1914361	1914362	1914363	1914364
Sample Reference				WS01	WS02	WS02	WS02	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.75	1.50	4.50	0.30
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
Diesel Range Organics (C10 - C28)	mg/kg	50	NONE	240	< 50	< 50	< 50	950
Mineral Oil (C10 - C40)	mg/kg	10	NONE	530	< 10	< 10	< 10	1200
TPH C10 - C40	mg/kg	10	MCERTS	950	41	46	65	2700
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	3.8	< 2.0	< 2.0	< 2.0	14
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	21	< 8.0	< 8.0	< 8.0	72
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	200	< 8.0	< 8.0	< 8.0	430
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	230	< 10	< 10	< 10	520
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	31
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	12	19	17	12	170
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	200	23	29	39	780
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	220	41	46	51	980
TPH (C10 - C25)	mg/kg	10	MCERTS	71	25	24	20	460
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914360	1914361	1914362	1914363	1914364
Sample Reference				WS01	WS02	WS02	WS02	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.75	1.50	4.50	0.30
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.38
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914360	1914361	1914362	1914363	1914364
Sample Reference				WS01	WS02	WS02	WS02	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.75	1.50	4.50	0.30
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	0.4
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	1.0
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.32	< 0.05	< 0.05	1.6
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	1.1
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	< 0.05	2.2
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	1.3	2.5	0.74	0.96	12
Anthracene	mg/kg	0.05	MCERTS	0.33	0.57	0.20	1.3	4.4
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	1.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	1.4
Fluoranthene	mg/kg	0.05	MCERTS	2.2	4.3	1.9	2.9	22
Pyrene	mg/kg	0.05	MCERTS	2.3	3.7	1.7	2.3	20
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	2.6	1.3	2.2	11
Chrysene	mg/kg	0.05	MCERTS	1.0	1.6	0.99	2.0	9.9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	1.9	1.1	2.5	11
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.63	0.85	0.48	0.68	3.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.94	1.7	0.94	2.2	9.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.0	1.2	0.65	2.0	5.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.28	0.37	< 0.05	0.45	1.6
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	1.3	0.71	2.6	5.7

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914365	1914366	1914367	1914368	1914369
Sample Reference				WS04	WS05	WS05	WS05	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.80	1.50	3.60	4.90
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	7.7	21	18	6.1
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0	1.0	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.3	8.7	7.9	8.4	8.4
Electrical Conductivity	µS/cm	10	ISO 17025	350	210	190	130	120
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	1900	1200	1100	680	380
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.38	0.34	0.18	0.19	0.084
Sulphide	mg/kg	1	MCERTS	17	570	72	31	< 1.0
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	87	68	48	46	36
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	< 0.5	24	110	7.2	2.1
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.0042	0.022	0.039	0.013	0.014
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.4	2.2	3.9	1.3	1.4

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.33	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.24	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.42	1.3	0.43	2.0	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	0.91	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.83	2.0	0.69	4.4	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.72	1.9	0.63	4.0	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.52	1.2	0.53	3.9	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.45	1.1	0.47	2.6	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.48	1.3	0.59	2.9	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.19	0.60	0.16	1.8	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.36	0.85	0.40	3.0	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.26	0.71	0.28	1.1	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.51	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.27	0.82	0.31	1.2	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.50	13.2	4.49	28.3	< 0.80

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914365	1914366	1914367	1914368	1914369
Sample Reference				WS04	WS05	WS05	WS05	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.80	1.50	3.60	4.90
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.3	4.2	6.3	6.6	4.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	14	23	20	22
Barium (aqua regia extractable)	mg/kg	1	MCERTS	85	220	200	90	51
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.8	1.7	1.0	0.98
Boron (water soluble)	mg/kg	0.2	MCERTS	3.4	3.8	13	4.7	6.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.6	0.9	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	30	33	22	33
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	12	9.2	13	11	10
Copper (aqua regia extractable)	mg/kg	1	MCERTS	38	54	110	39	29
Iron (aqua regia extractable)	mg/kg	40	MCERTS	26000	20000	28000	25000	37000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	43	150	500	150	43
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	330	960	350	230	280
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	1.7	3.4	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	0.80	1.8	2.5	2.6	1.2
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	23	34	22	29
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	450	450	1100	670	300
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.5	< 1.0	< 1.0	< 1.0
Tin (aqua regia extractable)	mg/kg	1	MCERTS	6.0	16	46	220	21
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	54	52	61	42	52
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82	160	340	93	58
Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	22000	72000	16000	30000	4400
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	5300	8400	4100	2100	1800
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	3700	2100	3000	1500	1500
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	470	390	310	250	190
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914365	1914366	1914367	1914368	1914369
Sample Reference				WS04	WS05	WS05	WS05	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.80	1.50	3.60	4.90
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
Diesel Range Organics (C10 - C28)	mg/kg	50	NONE	< 50	140	< 50	65	200
Mineral Oil (C10 - C40)	mg/kg	10	NONE	< 10	280	< 10	< 10	350
TPH C10 - C40	mg/kg	10	MCERTS	< 10	400	25	78	350
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	13	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	110	< 8.0	< 8.0	250
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	120	< 10	< 10	260
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	20	< 10	25	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	100	21	53	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	120	25	78	< 10
TPH (C10 - C25)	mg/kg	10	MCERTS	< 10	55	< 10	41	48
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914365	1914366	1914367	1914368	1914369
Sample Reference				WS04	WS05	WS05	WS05	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.80	1.50	3.60	4.90
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.33	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914365	1914366	1914367	1914368	1914369
Sample Reference				WS04	WS05	WS05	WS05	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.80	1.50	3.60	4.90
Date Sampled				22/06/0221	22/06/0221	22/06/0221	22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.24	< 0.05	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.28	< 0.05	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.42	1.3	0.43	2.0	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	0.91	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	0.83	2.0	0.69	4.4	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.72	1.9	0.63	4.0	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.52	1.2	0.53	3.9	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.45	1.1	0.47	2.6	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.48	1.3	0.59	2.9	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.19	0.60	0.16	1.8	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.36	0.85	0.40	3.0	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.26	0.71	0.28	1.1	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.51	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.27	0.82	0.31	1.2	< 0.05

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914370	1914371
Sample Reference				HP101	HP102
Sample Number				None Supplied	None Supplied
Depth (m)				0.10	0.10
Date Sampled				22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.7	14
Total mass of sample received	kg	0.001	NONE	1.0	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	8.1
Electrical Conductivity	µS/cm	10	ISO 17025	200	97
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	1200	870
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.075	0.034
Sulphide	mg/kg	1	MCERTS	30	6.8
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	44	10
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	1.7	0.7
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.052	0.041
Total Organic Carbon (TOC)	%	0.1	MCERTS	5.2	4.0

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.32
Fluoranthene	mg/kg	0.05	MCERTS	1.2	2.5
Pyrene	mg/kg	0.05	MCERTS	1.5	2.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.4
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.1
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.52
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.58
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.72

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.67	13.2

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914370	1914371
Sample Reference				HP101	HP102
Sample Number				None Supplied	None Supplied
Depth (m)				0.10	0.10
Date Sampled				22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	11	4.4
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	13
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140	110
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.53	0.60
Boron (water soluble)	mg/kg	0.2	MCERTS	4.9	4.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.7
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	19
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	6.4	7.0
Copper (aqua regia extractable)	mg/kg	1	MCERTS	110	37
Iron (aqua regia extractable)	mg/kg	40	MCERTS	18000	17000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	84	110
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	330	300
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	0.5
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	3.7	1.0
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	15
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	910	1200
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Tin (aqua regia extractable)	mg/kg	1	MCERTS	9.2	8.3
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	270	200
Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	30000	16000
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	6000	1700
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	1300	1300
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	220	150
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914370	1914371
Sample Reference				HP101	HP102
Sample Number				None Supplied	None Supplied
Depth (m)				0.10	0.10
Date Sampled				22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Petroleum Hydrocarbons					
Diesel Range Organics (C10 - C28)	mg/kg	50	NONE	10000	< 50
Mineral Oil (C10 - C40)	mg/kg	10	NONE	12000	< 10
TPH C10 - C40	mg/kg	10	MCERTS	12000	66
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	90	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	1100	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	8000	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	9200	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	14
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	34
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	49
TPH (C10 - C25)	mg/kg	10	MCERTS	9500	29
VOCs					
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914370	1914371
Sample Reference				HP101	HP102
Sample Number				None Supplied	None Supplied
Depth (m)				0.10	0.10
Date Sampled				22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Lab Sample Number				1914370	1914371
Sample Reference				HP101	HP102
Sample Number				None Supplied	None Supplied
Depth (m)				0.10	0.10
Date Sampled				22/06/0221	22/06/0221
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.32
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	1.2	2.5
Pyrene	mg/kg	0.05	MCERTS	1.5	2.2
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.4
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.1
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.52
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.58
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.72

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-82945
Project / Site name: Abellio
Your Order No: 211177 AM

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1914365	WS04	0.80	155	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

Analytical Report Number : 21-82945
Project / Site name: Abellio

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1914360	WS01	None Supplied	0.3	Brown loam with gravel.
1914361	WS02	None Supplied	0.75	Brown clay and loam with vegetation.
1914362	WS02	None Supplied	1.5	Brown loam with gravel.
1914363	WS02	None Supplied	4.5	Brown clay and loam with gravel.
1914364	WS03	None Supplied	0.3	Brown loam with gravel.
1914365	WS04	None Supplied	0.8	Brown clay and loam with gravel.
1914366	WS05	None Supplied	0.8	Brown loam and clay with gravel.
1914367	WS05	None Supplied	1.5	Brown clay and loam with gravel and vegetation.
1914368	WS05	None Supplied	3.6	Brown clay and loam with gravel and vegetation.
1914369	WS05	None Supplied	4.9	Brown clay and loam with gravel.
1914370	HP101	None Supplied	0.1	Brown loam with vegetation and gravel
1914371	HP102	None Supplied	0.1	Brown loam with gravel and vegetation.

Analytical Report Number : 21-82945
Project / Site name: Abellio

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Cations in soil by ICP-OES	Determination of cations in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	ISO 17025
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
DRO C10-28 (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Electrical conductivity of soil	Determination of electrical conductivity in soil by electrometric measurement.	In-house method	L031-PL	D	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS

Analytical Report Number : 21-82945
Project / Site name: Abellio

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
DRO (Soil)	Determination of extractable hydrocarbons in soil by GC-MS/FID.	In-house method with silica gel split/clean up.	L076-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 21-82945
Project / Site name: Abellio

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
HP101	None Supplied	S	1914370	c	Free cyanide in soil	L080-PL	c
HP101	None Supplied	S	1914370	c	Hexavalent chromium in soil	L080-PL	c
HP101	None Supplied	S	1914370	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
HP101	None Supplied	S	1914370	c	Ammonium as NH4 in soil	L082-PL	c
HP101	None Supplied	S	1914370	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
HP101	None Supplied	S	1914370	c	Chloride, water soluble, in soil	L082-PL	c
HP101	None Supplied	S	1914370	c	Complex Cyanide in soil	L080-PL	c
HP101	None Supplied	S	1914370	c	DRO (Soil)	L076-PL	c
HP101	None Supplied	S	1914370	c	DRO C10-28 (Soil)	L076-PL	c
HP101	None Supplied	S	1914370	c	Electrical conductivity of soil	L031-PL	c
HP101	None Supplied	S	1914370	c	Fraction of Organic Carbon in soil	L009-PL	c
HP101	None Supplied	S	1914370	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
HP101	None Supplied	S	1914370	c	Monohydric phenols in soil	L080-PL	c
HP101	None Supplied	S	1914370	c	Organic matter (Automated) in soil	L009-PL	c
HP101	None Supplied	S	1914370	c	Semi-volatile organic compounds in soil	L064-PL	c
HP101	None Supplied	S	1914370	c	Speciated EPA-16 PAHs in soil	L064-PL	c
HP101	None Supplied	S	1914370	c	Sulphide in soil	L010-PL	c
HP101	None Supplied	S	1914370	c	TPH Banding in Soil by FID	L076-PL	c
HP101	None Supplied	S	1914370	c	TPH2 (Soil)	L088-PL	c
HP101	None Supplied	S	1914370	c	TPHCWG (Soil)	L088/76-PL	c
HP101	None Supplied	S	1914370	c	Total cyanide in soil	L080-PL	c
HP101	None Supplied	S	1914370	c	Total organic carbon (Automated) in soil	L009-PL	c
HP101	None Supplied	S	1914370	c	Volatile organic compounds in soil	L073B-PL	c
HP101	None Supplied	S	1914370	c	pH in soil (automated)	L099-PL	c
HP102	None Supplied	S	1914371	c	Free cyanide in soil	L080-PL	c
HP102	None Supplied	S	1914371	c	Hexavalent chromium in soil	L080-PL	c
HP102	None Supplied	S	1914371	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
HP102	None Supplied	S	1914371	c	Ammonium as NH4 in soil	L082-PL	c
HP102	None Supplied	S	1914371	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
HP102	None Supplied	S	1914371	c	Chloride, water soluble, in soil	L082-PL	c
HP102	None Supplied	S	1914371	c	Complex Cyanide in soil	L080-PL	c
HP102	None Supplied	S	1914371	c	DRO (Soil)	L076-PL	c
HP102	None Supplied	S	1914371	c	DRO C10-28 (Soil)	L076-PL	c
HP102	None Supplied	S	1914371	c	Electrical conductivity of soil	L031-PL	c
HP102	None Supplied	S	1914371	c	Fraction of Organic Carbon in soil	L009-PL	c
HP102	None Supplied	S	1914371	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
HP102	None Supplied	S	1914371	c	Monohydric phenols in soil	L080-PL	c
HP102	None Supplied	S	1914371	c	Organic matter (Automated) in soil	L009-PL	c
HP102	None Supplied	S	1914371	c	Semi-volatile organic compounds in soil	L064-PL	c
HP102	None Supplied	S	1914371	c	Speciated EPA-16 PAHs in soil	L064-PL	c
HP102	None Supplied	S	1914371	c	Sulphide in soil	L010-PL	c
HP102	None Supplied	S	1914371	c	TPH Banding in Soil by FID	L076-PL	c
HP102	None Supplied	S	1914371	c	TPH2 (Soil)	L088-PL	c
HP102	None Supplied	S	1914371	c	TPHCWG (Soil)	L088/76-PL	c
HP102	None Supplied	S	1914371	c	Total cyanide in soil	L080-PL	c
HP102	None Supplied	S	1914371	c	Total organic carbon (Automated) in soil	L009-PL	c
HP102	None Supplied	S	1914371	c	Volatile organic compounds in soil	L073B-PL	c
HP102	None Supplied	S	1914371	c	pH in soil (automated)	L099-PL	c
WS01	None Supplied	S	1914360	c	Free cyanide in soil	L080-PL	c
WS01	None Supplied	S	1914360	c	Hexavalent chromium in soil	L080-PL	c
WS01	None Supplied	S	1914360	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS01	None Supplied	S	1914360	c	Ammonium as NH4 in soil	L082-PL	c
WS01	None Supplied	S	1914360	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS01	None Supplied	S	1914360	c	Chloride, water soluble, in soil	L082-PL	c
WS01	None Supplied	S	1914360	c	Complex Cyanide in soil	L080-PL	c
WS01	None Supplied	S	1914360	c	DRO (Soil)	L076-PL	c
WS01	None Supplied	S	1914360	c	DRO C10-28 (Soil)	L076-PL	c
WS01	None Supplied	S	1914360	c	Electrical conductivity of soil	L031-PL	c
WS01	None Supplied	S	1914360	c	Fraction of Organic Carbon in soil	L009-PL	c
WS01	None Supplied	S	1914360	c	Mineral Oil (Soil) C10 - C40	L076-PL	c

Sample Deviation Report

Analytical Report Number : 21-82945
Project / Site name: Abellio

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
HP101	None Supplied	S	1914370	c	Free cyanide in soil	L080-PL	c
WS01	None Supplied	S	1914360	c	Monohydric phenols in soil	L080-PL	c
WS01	None Supplied	S	1914360	c	Organic matter (Automated) in soil	L009-PL	c
WS01	None Supplied	S	1914360	c	Semi-volatile organic compounds in soil	L064-PL	c
WS01	None Supplied	S	1914360	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS01	None Supplied	S	1914360	c	Sulphide in soil	L010-PL	c
WS01	None Supplied	S	1914360	c	TPH Banding in Soil by FID	L076-PL	c
WS01	None Supplied	S	1914360	c	TPH2 (Soil)	L088-PL	c
WS01	None Supplied	S	1914360	c	TPHCWG (Soil)	L088/76-PL	c
WS01	None Supplied	S	1914360	c	Total cyanide in soil	L080-PL	c
WS01	None Supplied	S	1914360	c	Total organic carbon (Automated) in soil	L009-PL	c
WS01	None Supplied	S	1914360	c	Volatile organic compounds in soil	L073B-PL	c
WS01	None Supplied	S	1914360	c	pH in soil (automated)	L099-PL	c
WS02	None Supplied	S	1914361	c	Free cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914361	c	Hexavalent chromium in soil	L080-PL	c
WS02	None Supplied	S	1914361	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS02	None Supplied	S	1914361	c	Ammonium as NH4 in soil	L082-PL	c
WS02	None Supplied	S	1914361	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS02	None Supplied	S	1914361	c	Chloride, water soluble, in soil	L082-PL	c
WS02	None Supplied	S	1914361	c	Complex Cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914361	c	DRO (Soil)	L076-PL	c
WS02	None Supplied	S	1914361	c	DRO C10-28 (Soil)	L076-PL	c
WS02	None Supplied	S	1914361	c	Electrical conductivity of soil	L031-PL	c
WS02	None Supplied	S	1914361	c	Fraction of Organic Carbon in soil	L009-PL	c
WS02	None Supplied	S	1914361	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS02	None Supplied	S	1914361	c	Monohydric phenols in soil	L080-PL	c
WS02	None Supplied	S	1914361	c	Organic matter (Automated) in soil	L009-PL	c
WS02	None Supplied	S	1914361	c	Semi-volatile organic compounds in soil	L064-PL	c
WS02	None Supplied	S	1914361	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS02	None Supplied	S	1914361	c	Sulphide in soil	L010-PL	c
WS02	None Supplied	S	1914361	c	TPH Banding in Soil by FID	L076-PL	c
WS02	None Supplied	S	1914361	c	TPH2 (Soil)	L088-PL	c
WS02	None Supplied	S	1914361	c	TPHCWG (Soil)	L088/76-PL	c
WS02	None Supplied	S	1914361	c	Total cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914361	c	Total organic carbon (Automated) in soil	L009-PL	c
WS02	None Supplied	S	1914361	c	Volatile organic compounds in soil	L073B-PL	c
WS02	None Supplied	S	1914361	c	pH in soil (automated)	L099-PL	c
WS02	None Supplied	S	1914362	c	Free cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914362	c	Hexavalent chromium in soil	L080-PL	c
WS02	None Supplied	S	1914362	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS02	None Supplied	S	1914362	c	Ammonium as NH4 in soil	L082-PL	c
WS02	None Supplied	S	1914362	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS02	None Supplied	S	1914362	c	Chloride, water soluble, in soil	L082-PL	c
WS02	None Supplied	S	1914362	c	Complex Cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914362	c	DRO (Soil)	L076-PL	c
WS02	None Supplied	S	1914362	c	DRO C10-28 (Soil)	L076-PL	c
WS02	None Supplied	S	1914362	c	Electrical conductivity of soil	L031-PL	c
WS02	None Supplied	S	1914362	c	Fraction of Organic Carbon in soil	L009-PL	c
WS02	None Supplied	S	1914362	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS02	None Supplied	S	1914362	c	Monohydric phenols in soil	L080-PL	c
WS02	None Supplied	S	1914362	c	Organic matter (Automated) in soil	L009-PL	c
WS02	None Supplied	S	1914362	c	Semi-volatile organic compounds in soil	L064-PL	c
WS02	None Supplied	S	1914362	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS02	None Supplied	S	1914362	c	Sulphide in soil	L010-PL	c
WS02	None Supplied	S	1914362	c	TPH Banding in Soil by FID	L076-PL	c
WS02	None Supplied	S	1914362	c	TPH2 (Soil)	L088-PL	c
WS02	None Supplied	S	1914362	c	TPHCWG (Soil)	L088/76-PL	c
WS02	None Supplied	S	1914362	c	Total cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914362	c	Total organic carbon (Automated) in soil	L009-PL	c

Sample Deviation Report

Analytical Report Number : 21-82945
Project / Site name: Abellio

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
HP101	None Supplied	S	1914370	c	Free cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914362	c	Volatile organic compounds in soil	L073B-PL	c
WS02	None Supplied	S	1914362	c	pH in soil (automated)	L099-PL	c
WS02	None Supplied	S	1914363	c	Free cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914363	c	Hexavalent chromium in soil	L080-PL	c
WS02	None Supplied	S	1914363	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS02	None Supplied	S	1914363	c	Ammonium as NH4 in soil	L082-PL	c
WS02	None Supplied	S	1914363	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS02	None Supplied	S	1914363	c	Chloride, water soluble, in soil	L082-PL	c
WS02	None Supplied	S	1914363	c	Complex Cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914363	c	DRO (Soil)	L076-PL	c
WS02	None Supplied	S	1914363	c	DRO C10-28 (Soil)	L076-PL	c
WS02	None Supplied	S	1914363	c	Electrical conductivity of soil	L031-PL	c
WS02	None Supplied	S	1914363	c	Fraction of Organic Carbon in soil	L009-PL	c
WS02	None Supplied	S	1914363	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS02	None Supplied	S	1914363	c	Monohydric phenols in soil	L080-PL	c
WS02	None Supplied	S	1914363	c	Organic matter (Automated) in soil	L009-PL	c
WS02	None Supplied	S	1914363	c	Semi-volatile organic compounds in soil	L064-PL	c
WS02	None Supplied	S	1914363	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS02	None Supplied	S	1914363	c	Sulphide in soil	L010-PL	c
WS02	None Supplied	S	1914363	c	TPH Banding in Soil by FID	L076-PL	c
WS02	None Supplied	S	1914363	c	TPH2 (Soil)	L088-PL	c
WS02	None Supplied	S	1914363	c	TPHCWG (Soil)	L088/76-PL	c
WS02	None Supplied	S	1914363	c	Total cyanide in soil	L080-PL	c
WS02	None Supplied	S	1914363	c	Total organic carbon (Automated) in soil	L009-PL	c
WS02	None Supplied	S	1914363	c	Volatile organic compounds in soil	L073B-PL	c
WS02	None Supplied	S	1914363	c	pH in soil (automated)	L099-PL	c
WS03	None Supplied	S	1914364	c	Free cyanide in soil	L080-PL	c
WS03	None Supplied	S	1914364	c	Hexavalent chromium in soil	L080-PL	c
WS03	None Supplied	S	1914364	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS03	None Supplied	S	1914364	c	Ammonium as NH4 in soil	L082-PL	c
WS03	None Supplied	S	1914364	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS03	None Supplied	S	1914364	c	Chloride, water soluble, in soil	L082-PL	c
WS03	None Supplied	S	1914364	c	Complex Cyanide in soil	L080-PL	c
WS03	None Supplied	S	1914364	c	DRO (Soil)	L076-PL	c
WS03	None Supplied	S	1914364	c	DRO C10-28 (Soil)	L076-PL	c
WS03	None Supplied	S	1914364	c	Electrical conductivity of soil	L031-PL	c
WS03	None Supplied	S	1914364	c	Fraction of Organic Carbon in soil	L009-PL	c
WS03	None Supplied	S	1914364	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS03	None Supplied	S	1914364	c	Monohydric phenols in soil	L080-PL	c
WS03	None Supplied	S	1914364	c	Organic matter (Automated) in soil	L009-PL	c
WS03	None Supplied	S	1914364	c	Semi-volatile organic compounds in soil	L064-PL	c
WS03	None Supplied	S	1914364	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS03	None Supplied	S	1914364	c	Sulphide in soil	L010-PL	c
WS03	None Supplied	S	1914364	c	TPH Banding in Soil by FID	L076-PL	c
WS03	None Supplied	S	1914364	c	TPH2 (Soil)	L088-PL	c
WS03	None Supplied	S	1914364	c	TPHCWG (Soil)	L088/76-PL	c
WS03	None Supplied	S	1914364	c	Total cyanide in soil	L080-PL	c
WS03	None Supplied	S	1914364	c	Total organic carbon (Automated) in soil	L009-PL	c
WS03	None Supplied	S	1914364	c	Volatile organic compounds in soil	L073B-PL	c
WS03	None Supplied	S	1914364	c	pH in soil (automated)	L099-PL	c
WS04	None Supplied	S	1914365	c	Free cyanide in soil	L080-PL	c
WS04	None Supplied	S	1914365	c	Hexavalent chromium in soil	L080-PL	c
WS04	None Supplied	S	1914365	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS04	None Supplied	S	1914365	c	Ammonium as NH4 in soil	L082-PL	c
WS04	None Supplied	S	1914365	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS04	None Supplied	S	1914365	c	Chloride, water soluble, in soil	L082-PL	c
WS04	None Supplied	S	1914365	c	Complex Cyanide in soil	L080-PL	c
WS04	None Supplied	S	1914365	c	DRO (Soil)	L076-PL	c

Sample Deviation Report

Analytical Report Number : 21-82945
Project / Site name: Abellio

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
HP101	None Supplied	S	1914370	c	Free cyanide in soil	L080-PL	c
WS04	None Supplied	S	1914365	c	DRO C10-28 (Soil)	L076-PL	c
WS04	None Supplied	S	1914365	c	Electrical conductivity of soil	L031-PL	c
WS04	None Supplied	S	1914365	c	Fraction of Organic Carbon in soil	L009-PL	c
WS04	None Supplied	S	1914365	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS04	None Supplied	S	1914365	c	Monohydric phenols in soil	L080-PL	c
WS04	None Supplied	S	1914365	c	Organic matter (Automated) in soil	L009-PL	c
WS04	None Supplied	S	1914365	c	Semi-volatile organic compounds in soil	L064-PL	c
WS04	None Supplied	S	1914365	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS04	None Supplied	S	1914365	c	Sulphide in soil	L010-PL	c
WS04	None Supplied	S	1914365	c	TPH Banding in Soil by FID	L076-PL	c
WS04	None Supplied	S	1914365	c	TPH2 (Soil)	L088-PL	c
WS04	None Supplied	S	1914365	c	TPHCWG (Soil)	L088/76-PL	c
WS04	None Supplied	S	1914365	c	Total cyanide in soil	L080-PL	c
WS04	None Supplied	S	1914365	c	Total organic carbon (Automated) in soil	L009-PL	c
WS04	None Supplied	S	1914365	c	Volatile organic compounds in soil	L073B-PL	c
WS04	None Supplied	S	1914365	c	pH in soil (automated)	L099-PL	c
WS05	None Supplied	S	1914366	c	Free cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914366	c	Hexavalent chromium in soil	L080-PL	c
WS05	None Supplied	S	1914366	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS05	None Supplied	S	1914366	c	Ammonium as NH4 in soil	L082-PL	c
WS05	None Supplied	S	1914366	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS05	None Supplied	S	1914366	c	Chloride, water soluble, in soil	L082-PL	c
WS05	None Supplied	S	1914366	c	Complex Cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914366	c	DRO (Soil)	L076-PL	c
WS05	None Supplied	S	1914366	c	DRO C10-28 (Soil)	L076-PL	c
WS05	None Supplied	S	1914366	c	Electrical conductivity of soil	L031-PL	c
WS05	None Supplied	S	1914366	c	Fraction of Organic Carbon in soil	L009-PL	c
WS05	None Supplied	S	1914366	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS05	None Supplied	S	1914366	c	Monohydric phenols in soil	L080-PL	c
WS05	None Supplied	S	1914366	c	Organic matter (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914366	c	Semi-volatile organic compounds in soil	L064-PL	c
WS05	None Supplied	S	1914366	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS05	None Supplied	S	1914366	c	Sulphide in soil	L010-PL	c
WS05	None Supplied	S	1914366	c	TPH Banding in Soil by FID	L076-PL	c
WS05	None Supplied	S	1914366	c	TPH2 (Soil)	L088-PL	c
WS05	None Supplied	S	1914366	c	TPHCWG (Soil)	L088/76-PL	c
WS05	None Supplied	S	1914366	c	Total cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914366	c	Total organic carbon (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914366	c	Volatile organic compounds in soil	L073B-PL	c
WS05	None Supplied	S	1914366	c	pH in soil (automated)	L099-PL	c
WS05	None Supplied	S	1914367	c	Free cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914367	c	Hexavalent chromium in soil	L080-PL	c
WS05	None Supplied	S	1914367	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS05	None Supplied	S	1914367	c	Ammonium as NH4 in soil	L082-PL	c
WS05	None Supplied	S	1914367	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS05	None Supplied	S	1914367	c	Chloride, water soluble, in soil	L082-PL	c
WS05	None Supplied	S	1914367	c	Complex Cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914367	c	DRO (Soil)	L076-PL	c
WS05	None Supplied	S	1914367	c	DRO C10-28 (Soil)	L076-PL	c
WS05	None Supplied	S	1914367	c	Electrical conductivity of soil	L031-PL	c
WS05	None Supplied	S	1914367	c	Fraction of Organic Carbon in soil	L009-PL	c
WS05	None Supplied	S	1914367	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS05	None Supplied	S	1914367	c	Monohydric phenols in soil	L080-PL	c
WS05	None Supplied	S	1914367	c	Organic matter (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914367	c	Semi-volatile organic compounds in soil	L064-PL	c
WS05	None Supplied	S	1914367	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS05	None Supplied	S	1914367	c	Sulphide in soil	L010-PL	c
WS05	None Supplied	S	1914367	c	TPH Banding in Soil by FID	L076-PL	c

Sample Deviation Report

Analytical Report Number : 21-82945
Project / Site name: Abellio

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
HP101	None Supplied	S	1914370	c	Free cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914367	c	TPH2 (Soil)	L088-PL	c
WS05	None Supplied	S	1914367	c	TPHCWG (Soil)	L088/76-PL	c
WS05	None Supplied	S	1914367	c	Total cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914367	c	Total organic carbon (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914367	c	Volatile organic compounds in soil	L073B-PL	c
WS05	None Supplied	S	1914367	c	pH in soil (automated)	L099-PL	c
WS05	None Supplied	S	1914368	c	Free cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914368	c	Hexavalent chromium in soil	L080-PL	c
WS05	None Supplied	S	1914368	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS05	None Supplied	S	1914368	c	Ammonium as NH4 in soil	L082-PL	c
WS05	None Supplied	S	1914368	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS05	None Supplied	S	1914368	c	Chloride, water soluble, in soil	L082-PL	c
WS05	None Supplied	S	1914368	c	Complex Cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914368	c	DRO (Soil)	L076-PL	c
WS05	None Supplied	S	1914368	c	DRO C10-28 (Soil)	L076-PL	c
WS05	None Supplied	S	1914368	c	Electrical conductivity of soil	L031-PL	c
WS05	None Supplied	S	1914368	c	Fraction of Organic Carbon in soil	L009-PL	c
WS05	None Supplied	S	1914368	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS05	None Supplied	S	1914368	c	Monohydric phenols in soil	L080-PL	c
WS05	None Supplied	S	1914368	c	Organic matter (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914368	c	Semi-volatile organic compounds in soil	L064-PL	c
WS05	None Supplied	S	1914368	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS05	None Supplied	S	1914368	c	Sulphide in soil	L010-PL	c
WS05	None Supplied	S	1914368	c	TPH Banding in Soil by FID	L076-PL	c
WS05	None Supplied	S	1914368	c	TPH2 (Soil)	L088-PL	c
WS05	None Supplied	S	1914368	c	TPHCWG (Soil)	L088/76-PL	c
WS05	None Supplied	S	1914368	c	Total cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914368	c	Total organic carbon (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914368	c	Volatile organic compounds in soil	L073B-PL	c
WS05	None Supplied	S	1914368	c	pH in soil (automated)	L099-PL	c
WS05	None Supplied	S	1914369	c	Free cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914369	c	Hexavalent chromium in soil	L080-PL	c
WS05	None Supplied	S	1914369	c	Ammoniacal Nitrogen as N in soil	L082-PL	c
WS05	None Supplied	S	1914369	c	Ammonium as NH4 in soil	L082-PL	c
WS05	None Supplied	S	1914369	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS05	None Supplied	S	1914369	c	Chloride, water soluble, in soil	L082-PL	c
WS05	None Supplied	S	1914369	c	Complex Cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914369	c	DRO (Soil)	L076-PL	c
WS05	None Supplied	S	1914369	c	DRO C10-28 (Soil)	L076-PL	c
WS05	None Supplied	S	1914369	c	Electrical conductivity of soil	L031-PL	c
WS05	None Supplied	S	1914369	c	Fraction of Organic Carbon in soil	L009-PL	c
WS05	None Supplied	S	1914369	c	Mineral Oil (Soil) C10 - C40	L076-PL	c
WS05	None Supplied	S	1914369	c	Monohydric phenols in soil	L080-PL	c
WS05	None Supplied	S	1914369	c	Organic matter (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914369	c	Semi-volatile organic compounds in soil	L064-PL	c
WS05	None Supplied	S	1914369	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS05	None Supplied	S	1914369	c	Sulphide in soil	L010-PL	c
WS05	None Supplied	S	1914369	c	TPH Banding in Soil by FID	L076-PL	c
WS05	None Supplied	S	1914369	c	TPH2 (Soil)	L088-PL	c
WS05	None Supplied	S	1914369	c	TPHCWG (Soil)	L088/76-PL	c
WS05	None Supplied	S	1914369	c	Total cyanide in soil	L080-PL	c
WS05	None Supplied	S	1914369	c	Total organic carbon (Automated) in soil	L009-PL	c
WS05	None Supplied	S	1914369	c	Volatile organic compounds in soil	L073B-PL	c
WS05	None Supplied	S	1914369	c	pH in soil (automated)	L099-PL	c

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Analytical Report Number : 21-82950

Project / Site name:	Abellio	**Samples received on:**	23/06/2021
Your job number:	211177	**Samples instructed on/ Analysis started on:**	23/06/2021
Your order number:	211177 AM	**Analysis completed by:**	05/07/2021
Report Issue Number:	1	**Report issued on:**	05/07/2021
Samples Analysed:	2 10:1 WAC samples		

Signed: A. Czerwińska

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

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

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Waste Acceptance Criteria Analytical Results

Report No:	**21-82950**						
					Client:	**PARAGONBC**	
Location	**Abellio**						
Lab Reference (Sample Number)	1914390 / 1914391				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	22/06/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS02						
Depth (m)	0.75						
Solid Waste Analysis							
TOC (%)**	0.7				3%	5%	6%
Loss on Ignition (%) **	3.3				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	130				500	--	--
Total PAH (WAC-17) (mg/kg)	23.0				100	--	--
pH (units)**	8.3				--	>6	--
Acid Neutralisation Capacity (mol / kg)	7.2				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0021			0.0164	0.5	2	25
Barium *	0.0332			0.264	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0011			0.0086	0.5	10	70
Copper *	0.012			0.093	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0133			0.106	0.5	10	30
Nickel *	0.0062			0.049	0.4	10	40
Lead *	0.0037			0.030	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0073			0.058	4	50	200
Chloride *	21			170	800	15000	25000
Fluoride	1.3			11	10	150	500
Sulphate *	73			580	1000	20000	50000
TDS*	160			1200	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	17.2			137	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.1						
Dry Matter (%)	83						
Moisture (%)	17						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Waste Acceptance Criteria Analytical Results

Report No:	**21-82950**						
					Client:	**PARAGONBC**	
Location	**Abellio**						
Lab Reference (Sample Number)	1914392 / 1914393				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	22/06/2021				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS05						
Depth (m)	0.80						
Solid Waste Analysis							
TOC (%)**	2.8				3%	5%	6%
Loss on Ignition (%) **	5.5				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	14.4				100	--	--
pH (units)**	8.4				--	>6	--
Acid Neutralisation Capacity (mol / kg)	7.2				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1 mg/l			10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.0010			< 0.0100	0.5	2	25
Barium *	0.0763			0.713	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0011			0.010	0.5	10	70
Copper *	0.014			0.13	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0384			0.359	0.5	10	30
Nickel *	0.0043			0.040	0.4	10	40
Lead *	0.0012			0.011	0.5	10	50
Antimony *	0.020			0.19	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0058			0.054	4	50	200
Chloride *	8.4			78	800	15000	25000
Fluoride	0.62			5.8	10	150	500
Sulphate *	62			570	1000	20000	50000
TDS*	140			1300	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	11.2			104	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.0						
Dry Matter (%)	92						
Moisture (%)	7.7						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.
*= UKAS accredited (liquid eluate analysis only)
Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation
** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Analytical Report Number : 21-82950
Project / Site name: Abellio

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1914390	WS02	None Supplied	0.75	Brown clay and loam with vegetation.
1914392	WS05	None Supplied	0.8	Brown loam and clay with gravel.

Analytical Report Number : 21-82950
Project / Site name: Abellio

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-82950
Project / Site name: Abellio

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 21-84763

Replaces Analytical Report Number: 21-84763, issue no. 1
Additional analysis undertaken.

Project / Site name:	Abellio	**Samples received on:**	02/07/2021
Your job number:		**Samples instructed on/ Analysis started on:**	02/07/2021
Your order number:	211177CB	**Analysis completed by:**	20/07/2021
Report Issue Number:	2	**Report issued on:**	20/07/2021
Samples Analysed:	5 soil samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

Analytical Report Number: 21-84763
Project / Site name: Abellio
Your Order No: 211177CB

Lab Sample Number				1925628	1925629	1925630	1925631	1925632
Sample Reference				BH01	BH01	BH01	BH01	BH01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	2.00-2.50	4.50-5.00	6.50-7.00	12.00-12.50
Date Sampled				30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	15	28	14	14
Total mass of sample received	kg	0.001	NONE	1.2	1.4	1.3	1.4	1.2
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.5	10.0	7.7	8.2	8.5
Electrical Conductivity	µS/cm	10	ISO 17025	890	580	770	290	500
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	5700	3100	4300	910	1300
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.61	0.59	2.7	0.31	0.99
Sulphide	mg/kg	1	MCERTS	75	120	200	210	26
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	95	70	230	32	66
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	5.2	8.2	75	1.1	3.8
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	0.017	0.023	0.041	0.0039	0.0099
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.7	2.3	4.1	0.4	1.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.42	1.2	0.39	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.82	0.12	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.58	9.9	2.5	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.57	11	1.2	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	3.5	43	3.8	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.1	32	2.0	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	4.9	39	5.8	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	4.5	28	4.7	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	7.5	1.7	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.6	6.4	1.5	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.7	4.4	1.6	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.99	2.7	0.66	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5	3.9	1.3	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.72	1.9	0.55	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.23	0.57	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.87	2.2	0.62	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	24.9	194	28.5	< 0.80	< 0.80

Analytical Report Number: 21-84763
Project / Site name: Abellio
Your Order No: 211177CB

Lab Sample Number				1925628	1925629	1925630	1925631	1925632
Sample Reference				BH01	BH01	BH01	BH01	BH01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	2.00-2.50	4.50-5.00	6.50-7.00	12.00-12.50
Date Sampled				30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	4.9	< 1.0	< 1.0	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	18	31	14	18
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140	250	160	52	55
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.90	1.2	1.3	1.2	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	2.4	4.6	12	4.4	5.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	36	44	46	42
Cobalt (aqua regia extractable)	mg/kg	0.15	MCERTS	8.3	13	15	16	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	56	100	72	21	22
Iron (aqua regia extractable)	mg/kg	40	MCERTS	30000	39000	48000	52000	51000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	95	170	200	17	16
Manganese (aqua regia extractable)	mg/kg	1	MCERTS	390	370	2600	260	270
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	1.1	< 0.3	< 0.3
Molybdenum (aqua regia extractable)	mg/kg	0.25	MCERTS	1.7	2.2	2.2	0.75	0.75
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	32	32	37	36
Phosphorus (aqua regia extractable)	mg/kg	20	ISO 17025	490	680	880	490	480
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tin (aqua regia extractable)	mg/kg	1	MCERTS	8.0	17	15	2.5	2.6
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46	55	59	74	64
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	190	190	78	77
Calcium (aqua regia extractable)	mg/kg	20	ISO 17025	85000	50000	44000	24000	23000
Magnesium (aqua regia extractable)	mg/kg	20	ISO 17025	3300	4700	5500	17000	16000
Potassium (aqua regia extractable)	mg/kg	20	ISO 17025	2400	2700	2900	5000	4800
Sodium (aqua regia extractable)	mg/kg	20	ISO 17025	440	350	420	340	450
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 21-84763
Project / Site name: Abellio
Your Order No: 211177CB

Lab Sample Number				1925628	1925629	1925630	1925631	1925632
Sample Reference				BH01	BH01	BH01	BH01	BH01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	2.00-2.50	4.50-5.00	6.50-7.00	12.00-12.50
Date Sampled				30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
Diesel Range Organics (C10 - C28)	mg/kg	50	NONE	130	490	400	< 50	< 50
Mineral Oil (C10 - C40)	mg/kg	10	NONE	140	200	170	< 10	< 10
TPH C10 - C40	mg/kg	10	MCERTS	320	650	500	< 10	< 10
TPH2 (C6 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	5.7	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	8.4	13	11	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	23	43	32	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	61	97	99	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	94	150	150	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	12	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	6.3	79	37	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	27	230	100	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	76	100	150	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	110	410	300	< 10	< 10
TPH (C10 - C25)	mg/kg	10	MCERTS	89	430	340	< 10	< 10
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Lab Sample Number				1925628	1925629	1925630	1925631	1925632
Sample Reference				BH01	BH01	BH01	BH01	BH01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	2.00-2.50	4.50-5.00	6.50-7.00	12.00-12.50
Date Sampled				30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	0.42	1.2	0.39	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

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Lab Sample Number				1925628	1925629	1925630	1925631	1925632
Sample Reference				BH01	BH01	BH01	BH01	BH01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	2.00-2.50	4.50-5.00	6.50-7.00	12.00-12.50
Date Sampled				30/06/2021	30/06/2021	30/06/2021	30/06/2021	30/06/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	1.0	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.82	0.12	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.58	9.9	2.5	< 0.05	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	5.5	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.57	11	1.2	< 0.05	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	3.5	43	3.8	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.1	32	2.0	< 0.05	< 0.05
Carbazole	mg/kg	0.3	MCERTS	< 0.3	3.6	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	4.9	39	5.8	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	4.5	28	4.7	< 0.05	< 0.05
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	7.5	1.7	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.6	6.4	1.5	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.7	4.4	1.6	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.99	2.7	0.66	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5	3.9	1.3	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.72	1.9	0.55	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.23	0.57	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.87	2.2	0.62	< 0.05	< 0.05

U/S = Unsuitable Sample I/S = Insufficient Sample

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Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1925629	BH01	2.00-2.50	156	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1925628	BH01	None Supplied	0.50-1.00	Brown loam and clay with gravel and brick.
1925629	BH01	None Supplied	2.00-2.50	Brown clay and loam with gravel.
1925630	BH01	None Supplied	4.50-5.00	Brown clay.
1925631	BH01	None Supplied	6.50-7.00	Brown clay.
1925632	BH01	None Supplied	12.00-12.50	Brown clay.

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Cations in soil by ICP-OES	Determination of cations in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	ISO 17025
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
DRO C10-28 (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Electrical conductivity of soil	Determination of electrical conductivity in soil by electrometric measurement.	In-house method	L031-PL	D	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS

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Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
DRO (Soil)	Determination of extractable hydrocarbons in soil by GC-MS/FID.	In-house method with silica gel split/clean up.	L076-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 21-86317

Project / Site name:	Abello Bus Gasage	**Samples received on:**	09/07/2021
Your job number:		**Samples instructed on/ Analysis started on:**	12/07/2021
Your order number:	211177_CB	**Analysis completed by:**	21/07/2021
Report Issue Number:	1	**Report issued on:**	21/07/2021
Samples Analysed:	4 water samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

Analytical Report Number: 21-86317
Project / Site name: Abello Bus Gasage

Your Order No: 211177_CB

Lab Sample Number				1934680	1934681	1934682	1934683
Sample Reference				BH01_Shallow	BH01_Deci	WS02	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50-4.50	14.00-14.00	4.00-4.00	4.00-4.00
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
General Inorganics							
pH	pH Units	N/A	ISO 17025	7.1	7.4	6.9	6.9
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	1500	930	1700	1600
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Complex Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Sulphate as SO4	µg/l	45	ISO 17025	194000	110000	421000	403000
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	100	73	140	190
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025	6300	1300	6000	2700
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	28.0	14.7	10.3	6.54
Total Phenols							
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Speciated PAHs							
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	2.12	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	0.38	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.26	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	0.16	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH							
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	2.92	< 0.16	< 0.16	< 0.16

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Lab Sample Number				1934680	1934681	1934682	1934683
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Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50-4.50	14.00-14.00	4.00-4.00	4.00-4.00
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Boron (dissolved)	µg/l	10	ISO 17025	920	540	740	640
Calcium (dissolved)	mg/l	0.012	ISO 17025	240	120	360	380
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	0.042	0.075	17	0.077
Magnesium (dissolved)	mg/l	0.005	ISO 17025	110	37	25	39
Phosphorus (dissolved)	µg/l	20	ISO 17025	49.5	30.2	< 20.0	42.9
Potassium (dissolved)	mg/l	0.025	ISO 17025	15	8.8	12	16
Sodium (dissolved)	mg/l	0.01	ISO 17025	88	94	110	110
Antimony (dissolved)	µg/l	0.4	ISO 17025	2.7	0.9	0.6	0.6
Arsenic (dissolved)	µg/l	0.15	ISO 17025	3.81	1.34	8.28	21.7
Barium (dissolved)	µg/l	0.06	ISO 17025	210	93	79	68
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03	< 0.02	0.02	0.04
Chromium (dissolved)	µg/l	0.2	ISO 17025	9.7	5.5	8.8	7.5
Cobalt (dissolved)	µg/l	0.2	ISO 17025	4.4	1.6	17	12
Copper (dissolved)	µg/l	0.5	ISO 17025	3.8	6.2	4.3	3.2
Lead (dissolved)	µg/l	0.2	ISO 17025	0.8	0.4	< 0.2	0.4
Manganese (dissolved)	µg/l	0.05	ISO 17025	410	89	6200	4000
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	3.9	1.3	11	18
Nickel (dissolved)	µg/l	0.5	ISO 17025	14	7.9	30	12
Selenium (dissolved)	µg/l	0.6	ISO 17025	6.9	13	1.9	1.5
Tin (dissolved)	µg/l	0.2	ISO 17025	0.38	0.48	< 0.20	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	3.1	1.0	1.2	0.8
Zinc (dissolved)	µg/l	0.5	ISO 17025	12	8.0	15	48
Monoaromatics & Oxygenates							
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

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Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50-4.50	14.00-14.00	4.00-4.00	4.00-4.00
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Petroleum Hydrocarbons							
Mineral Oil (C10 - C40)	µg/l	10	NONE	< 10.0	< 10.0	< 10.0	< 10.0
Diesel Range Organics (C10 - C25)	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH2 (C6 - C10)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10
VOCs							
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

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Sample Reference				BH01_Shallow	BH01_Deci	WS02	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50-4.50	14.00-14.00	4.00-4.00	4.00-4.00
Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
SVOCs							
Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05

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Date Sampled				08/07/2021	08/07/2021	08/07/2021	08/07/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	2.1	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	0.38	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	0.26	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	0.16	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-86317
Project / Site name: Abello Bus Gasage

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Complex cyanide in water	Determination of complex cyanide by calculation. Accredited matrices SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Mineral Oil (Waters) C10 - C40	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
TPH2 (Waters)	Determination of hydrocarbons C6-C10 by headspace GC-MS. Accredited Matrices SW, PW. GW.	In-house method based on USEPA8260	L088-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025

Analytical Report Number : 21-86317
Project / Site name: Abello Bus Gasage

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
DRO (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 21-86317
Project / Site name: Abello Bus Gasage

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH01_Deci	None Supplied	W	1934681	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH01_Deci	None Supplied	W	1934681	c	Ammonium as NH4 in water	L082-PL	c
BH01_Deci	None Supplied	W	1934681	c	Electrical conductivity at 20oC of water	L031-PL	c
BH01_Deci	None Supplied	W	1934681	c	pH at 20oC in water (automated)	L099-PL	c
BH01_Shallow	None Supplied	W	1934680	c	Ammoniacal Nitrogen as N in water	L082-PL	c
BH01_Shallow	None Supplied	W	1934680	c	Ammonium as NH4 in water	L082-PL	c
BH01_Shallow	None Supplied	W	1934680	c	Electrical conductivity at 20oC of water	L031-PL	c
BH01_Shallow	None Supplied	W	1934680	c	pH at 20oC in water (automated)	L099-PL	c
WS02	None Supplied	W	1934682	c	Ammoniacal Nitrogen as N in water	L082-PL	c
WS02	None Supplied	W	1934682	c	Ammonium as NH4 in water	L082-PL	c
WS02	None Supplied	W	1934682	c	Electrical conductivity at 20oC of water	L031-PL	c
WS02	None Supplied	W	1934682	c	pH at 20oC in water (automated)	L099-PL	c
WS05	None Supplied	W	1934683	c	Ammoniacal Nitrogen as N in water	L082-PL	c
WS05	None Supplied	W	1934683	c	Ammonium as NH4 in water	L082-PL	c
WS05	None Supplied	W	1934683	c	Electrical conductivity at 20oC of water	L031-PL	c
WS05	None Supplied	W	1934683	c	pH at 20oC in water (automated)	L099-PL	c

APPENDIX 6: MONITORING RESULTS

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS: Abellio Bus Garage, Hayes
Client: Paragon
Site: Abellio Bus Garage, Hayes
Date: 08/07/2021

Quote No: Q2021.389
Visit No: 1 **of** 3
Operator: Toby McCusker **Project Manager:** Dan Stodgell

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH01_deep	7.2	6.7	>>>>>	>>>>>	2.9	2.9	3	2	1	1	10.7	10.7	ND	ND	0.0	0.0	-0.25	30	2.62	14.32	BH in good condition, Soft muddy base
BH01_shallow	14.2	14.2	>>>>>	>>>>>	0.4	0.4	1	1	ND	ND	7.9	7.9	ND	ND	0.0	0.0	-0.11	30	2.52	5.00	BH in good condition
WS02	0.5	0.4	10.0	8.0	10.3	10.3	1	1	ND	ND	1.1	1.1	ND	ND	0.0	0.0	-0.44	30	2.97	4.44	BH in good condition
WS05	0.6	0.6	12.0	12.0	13.2	13.2	1	1	ND	ND	13.2	13.2	ND	ND	0.0	0.0	0.07	30	2.27	4.25	BH in good condition
Max	**14.2**	**14.2**	**12.0**	**12.0**	**13.2**	**13.2**	**3**	**2**	**1**	**1**	**13.2**	**13.2**	**NR**	**ND**	**0.0**	**0.0**	**0**	**30**	**2.97**	**14.32**	
Min	**0.5**	**0.4**	**10.0**	**8.0**	**0.4**	**0.4**	**1**	**1**	**ND**	**ND**	**1.1**	**1.1**	**NR**	**ND**	**0.0**	**0.0**	**-0.4**	**30**	**2.27**	**4.25**	

ND - Not detected
NR - Not recorded
NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground:	X	Dry		Moist		Wet		Snow		Frozen
Wind:		Calm	X	Light		Moderate		Strong		
Cloud cover:		None		Slight		Cloudy	X	Overcast		
Precipitation:	X	None		Slight		Moderate		Heavy		
Time monitoring performed:			11:15	Start			13:10	End		
Barometric pressure (mbar):			1017	Start			1017	End		
Pressure trend (Daily):				Falling	X	Steady		Rising		
Source:										
Air Temperature (Deg. C):			20	Before			20	After		

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA5000; G500671
Gas Range: **CH_4** 0 - 100% **CO_2** 0 - 100% **O_2** 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 25/01/2021
Date of next calibration: 25/07/2021

Ambient air check: **CH_4** 0.0 **CO_2** 0.1 **O_2** 20.9

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Paragon
Site: Abellio Bus Garage
Date: 15/07/2021
Quote No: Q2021.389
Visit No: 2 **of** 3
Operator: Hugh Leekam **Project Manager:** Dan Stodgell

	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH01 Deep	1.7	1.7	34.0	34.0	0.9	0.9	2	2	ND	ND	10.6	10.6	1.1	NA	0.1	0.1	-0.14	30	2.51	14.30	
BH01 Shallow	0.5	0.5	10.0	10.0	1.4	1.4	1	1	ND	ND	6.0	6.0	1.6	NA	0.2	0.1	-0.16	30	2.51	4.98	
WS02	0.1	0.1	2.0	2.0	11.8	11.8	ND	ND	1	1	1.6	1.6	4.9	NA	0.2	0.2	-0.28	30	2.98	4.49	
WS05	ND	ND	ND	ND	2.8	2.8	1	1	ND	ND	18.5	18.5	0.3	NA	0.2	0.1	-0.26	30	2.30	4.21	
Max	**1.7**	**1.7**	**34.0**	**34.0**	**11.8**	**11.8**	**2**	**2**	**1**	**1**	**18.5**	**18.5**	**NR**	**ND**	**0.2**	**0.2**	**0**	**30**	**2.98**	**14.30**	
Min	**ND**	**ND**	**ND**	**ND**	**0.9**	**0.9**	**ND**	**ND**	**ND**	**ND**	**1.6**	**1.6**	**NR**	**0.0**	**0.1**	**0.1**	**-0.3**	**30**	**2.30**	**4.21**	

ND - Not detected
NR - Not recorded
NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground:	X	Dry		Moist		Wet		Snow		Frozen
Wind:		Calm	X	Light		Moderate		Strong		
Cloud cover:		None		Slight		Cloudy	X	Overcast		
Precipitation:	X	None		Slight		Moderate		Heavy		
Time monitoring performed:			10:30	Start			12:30	End		
Barometric pressure (mbar):			1021	Start			1021	End		
Pressure trend (Daily):				Falling	X	Steady		Rising		
Source:										
Air Temperature (Deg. C):			21	Before			21	After		

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA5000; G501842
Gas Range: **CH_4** 0 - 100% **CO_2** 0 - 100% **O_2** 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 05/07/2021
Date of next calibration: 05/01/2022

Ambient air check: **CH_4** 0.0 **CO_2** 0.1 **O_2** 20.8

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Paragon
Site: Abellio Bus Garage
Date: 23/07/2021
Quote No: Q2021.389
Visit No: 3 **of** 3
Operator: Richard Ward
Project Manager: Dan Stodgell

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
BH01 Deep	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Unable to locate BH, suspected under parked vehicles but could not be seen under the vehicles in question.
BH01 Shallow	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Unable to locate BH, suspected under parked vehicles but could not be seen under the vehicles in question.
WS02	0.6	0.6	12.0	12.0	11.3	11.3	2	2	ND	ND	0.4	0.4	ND	ND	0.0	0.0	0.28	30	2.99	4.34	All good.
WS05	ND	ND	ND	ND	13.0	13.0	1	1	ND	ND	0.8	0.8	ND	ND	0.0	0.0	0.21	30	2.35	4.08	All good.
Max	**0.6**	**0.6**	**12.0**	**12.0**	**13.0**	**13.0**	**2**	**2**	**ND**	**ND**	**0.8**	**0.8**	**NR**	**ND**	**0.0**	**0.0**	**0**	**30**	**2.99**	**4.34**	
Min	**ND**	**ND**	**ND**	**ND**	**11.3**	**11.3**	**1**	**1**	**ND**	**ND**	**0.4**	**0.4**	**NR**	**ND**	**0.0**	**0.0**	**0.2**	**30**	**2.35**	**4.08**	

ND - Not detected
NR - Not recorded
NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground:	x	Dry		Moist		Wet		Snow		Frozen
Wind:	x	Calm		Light		Moderate		Strong		
Cloud cover:		None	x	Slight		Cloudy		Overcast		
Precipitation:	x	None		Slight		Moderate		Heavy		
Time monitoring performed:			8:00	Start			10:00	End		
Barometric pressure (mbar):			1018	Start			1017	End		
Pressure trend (Daily):				Falling	x	Steady		Rising		
Source:	timeanddate.com									
Air Temperature (Deg. C):			23	Before			25	After		

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA5000; G505315
Gas Range: **CH_4** 0 - 100% **CO_2** 0 - 100% **O_2** 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 28/01/2021
Date of next calibration: 28/07/2021

Ambient air check: **CH_4** 0.0 **CO_2** 0.1 **O_2** 20.8

APPENDIX 7: GEOTECHNICAL LABORATORY TESTING

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
30412	Abellio Bus Garage	Samples received	06/07/2021
		Schedule received	14/07/2021
Project No.	Client	Project started	15/07/2021
211177	Paragon	Testing Started	05/08/2021

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top m	Base m	Type		%	%	%	%	%	
BH01		6.50	7.00	B	Brown slightly mottled dark grey and occasional light grey silty CLAY	30	100	58	32	26	
BH01	19	12.00	12.50	B	Dark grey silty CLAY	27	100	56	30	26	
BH01	30	18.00	-	D	Dark grey silty CLAY	28	100	55	30	25	
BH01	40	23.45	-	D	Brown silty CLAY	26	100	57	29	28	
BH01	48	30.00	-	D	Brownish grey silty CLAY	27	100	55	28	27	
BH01	52	34.50	-	D	Brown and occasional dark grey silty CLAY	23	100	52	27	25	

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3, 4.4 and 5.0

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials **J.P**

Date: 09/08/2021

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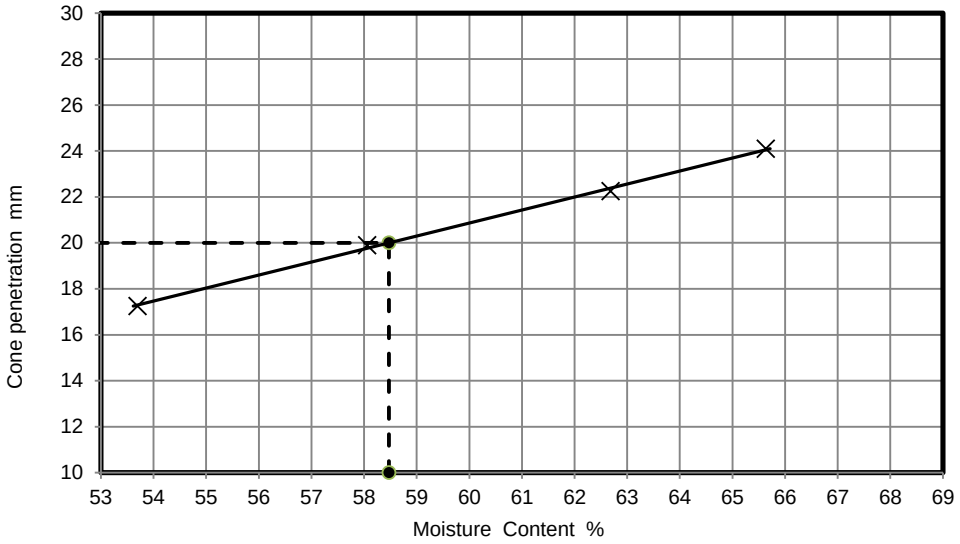
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

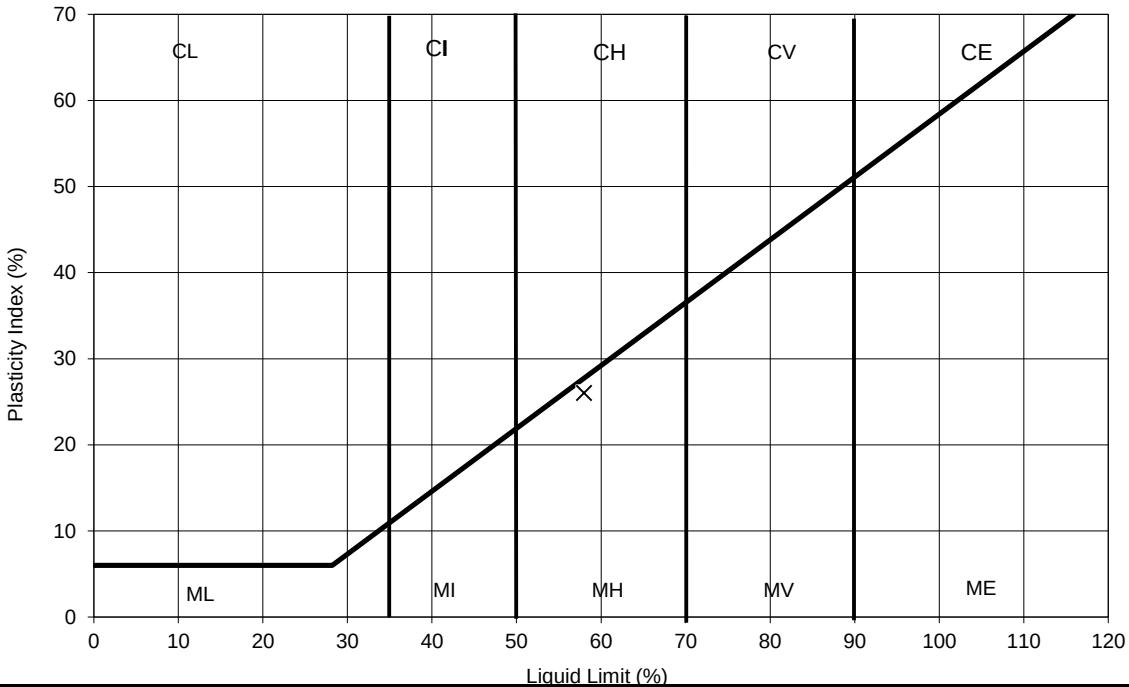
Site Name	Abellio Bus Garage			Job No.	30412
				Borehole/Pit No.	BH01
Project No.	211177	Client	Paragon	Sample No.	-
				Depth Top	6.50 m
Soil Description	Brown slightly mottled dark grey and occasional light grey silty CLAY			Depth Base	7.00 m
				Sample Type	B
				Samples received	06/07/2021
				Schedules received	14/07/2021
				Project Started	15/07/2021
				Date Tested	05/08/2021



NATURAL MOISTURE CONTENT	**30**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**58**	**%**
PLASTIC LIMIT	**32**	**%**
PLASTICITY INDEX	**26**	**%**

Remarks

PLASTICITY INDEX



TEST METHOD

BS1377: Part 2 :Clause 4.3 : 1990 Determination of the liquid limit by the cone penetrometer method
BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying method

Checked and Approved

Initials: J.P
Date: 09/08/2021

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

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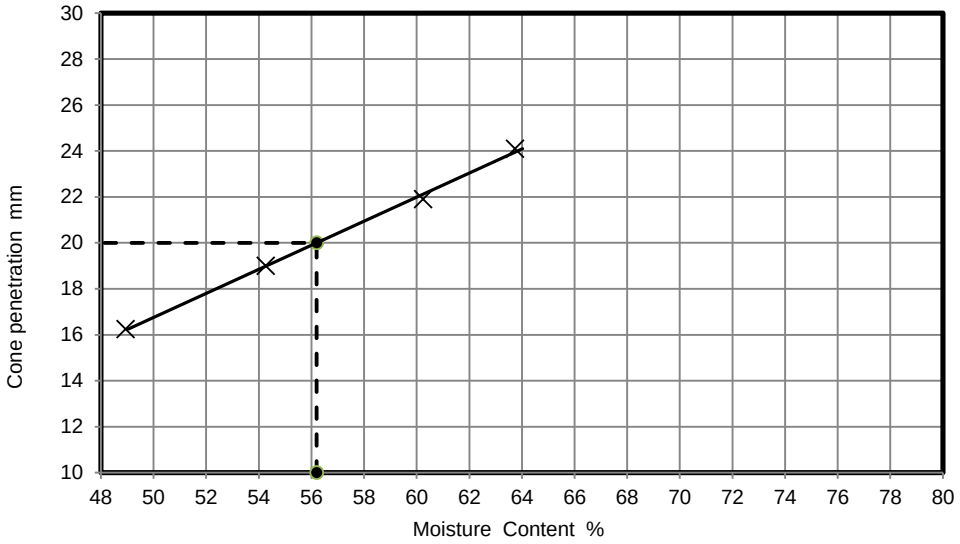
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5 R2

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

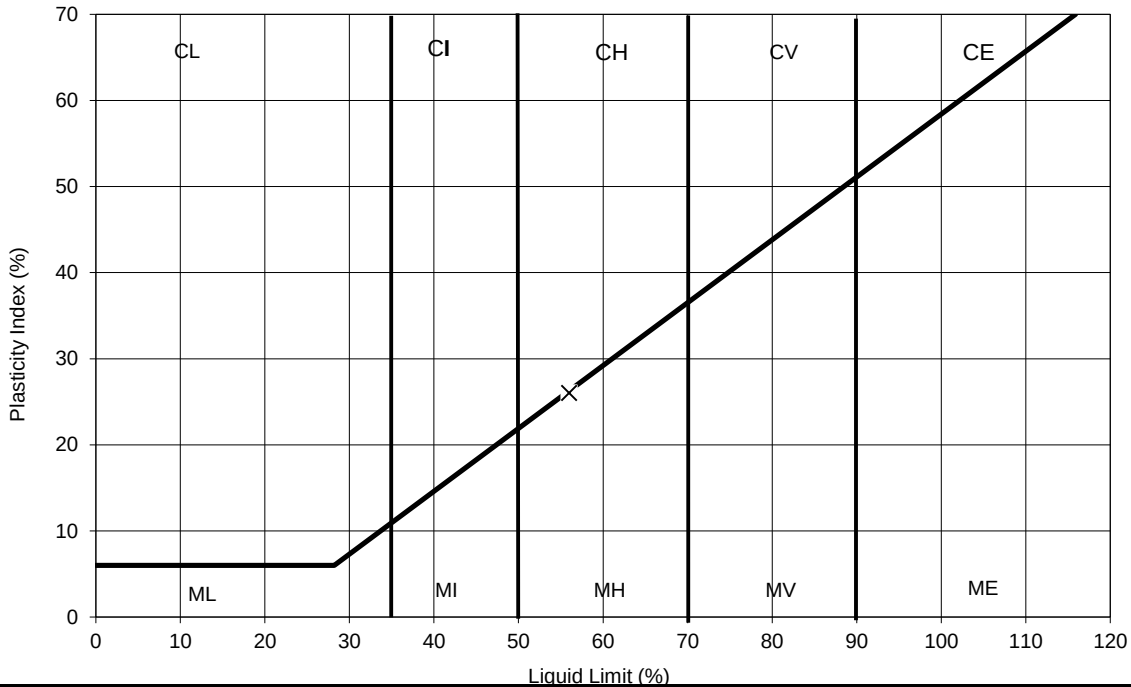
Site Name	Abellio Bus Garage			Job No.	30412
				Borehole/Pit No.	BH01
Project No.	211177	Client	Paragon	Sample No.	-
				Depth Top	12.00 m
Soil Description	Dark grey silty CLAY			Depth Base	12.50 m
				Sample Type	B
				Samples received	06/07/2021
				Schedules received	14/07/2021
				Project Started	15/07/2021
				Date Tested	05/08/2021



NATURAL MOISTURE CONTENT	**27**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**56**	**%**
PLASTIC LIMIT	**30**	**%**
PLASTICITY INDEX	**26**	**%**

Remarks

PLASTICITY INDEX



TEST METHOD

BS1377: Part 2 :Clause 4.3 : 1990 Determination of the liquid limit by the cone penetrometer method
BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying method

Checked and Approved

Initials: J.P
Date: 09/08/2021

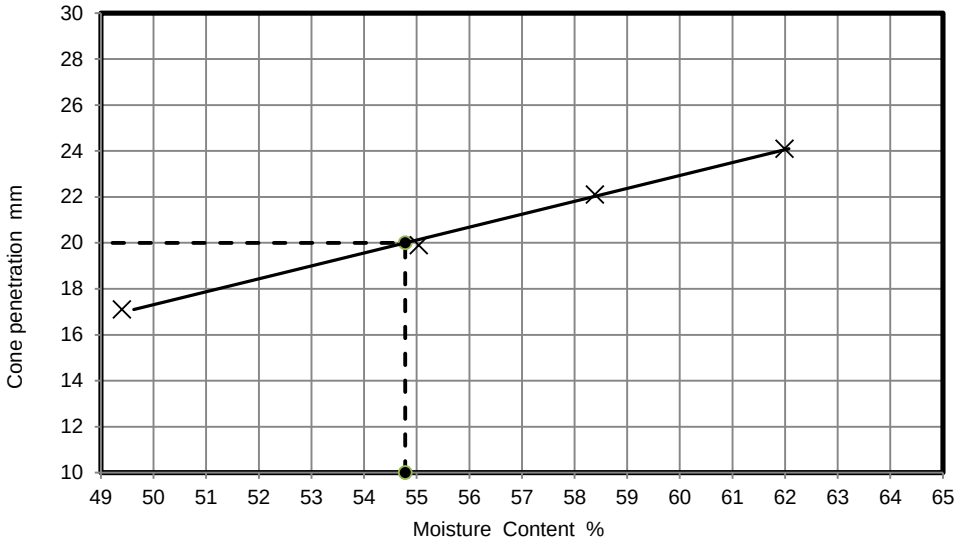
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

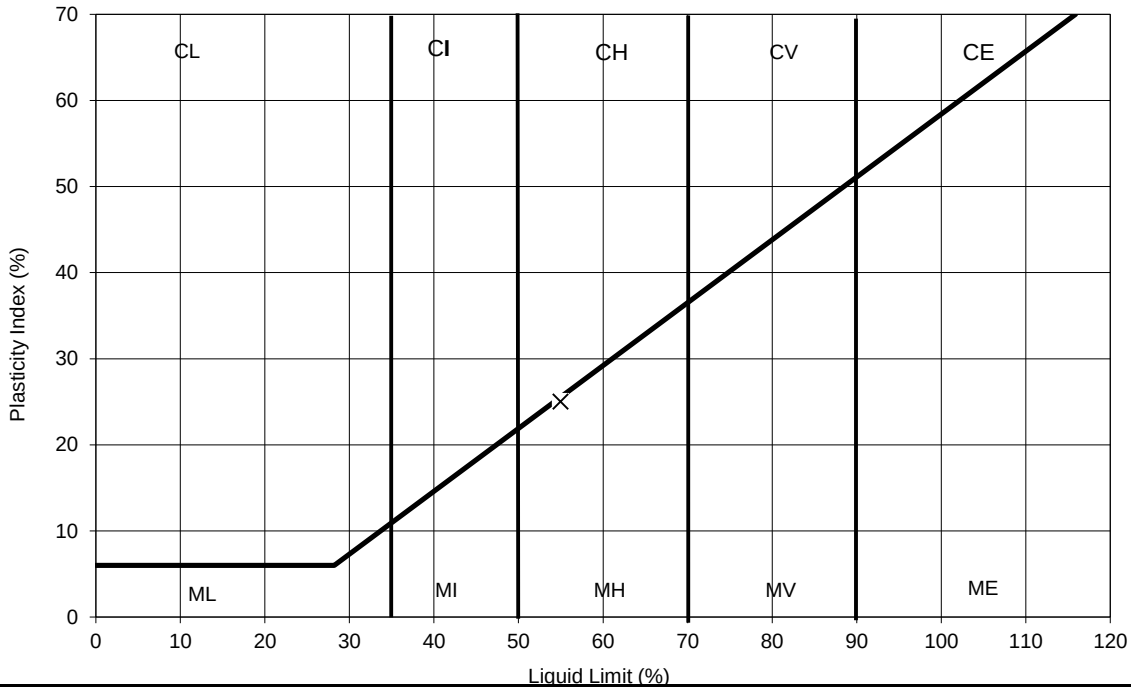
Site Name	Abellio Bus Garage			Job No.	30412
				Borehole/Pit No.	BH01
Project No.	211177	Client	Paragon	Sample No.	-
				Depth Top	18.00 m
Soil Description	Dark grey silty CLAY			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2021
				Schedules received	14/07/2021
				Project Started	15/07/2021
				Date Tested	05/08/2021



NATURAL MOISTURE CONTENT	**28**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**55**	**%**
PLASTIC LIMIT	**30**	**%**
PLASTICITY INDEX	**25**	**%**

Remarks

PLASTICITY INDEX



TEST METHOD

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BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying method

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Initials: J.P
Date: 09/08/2021

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

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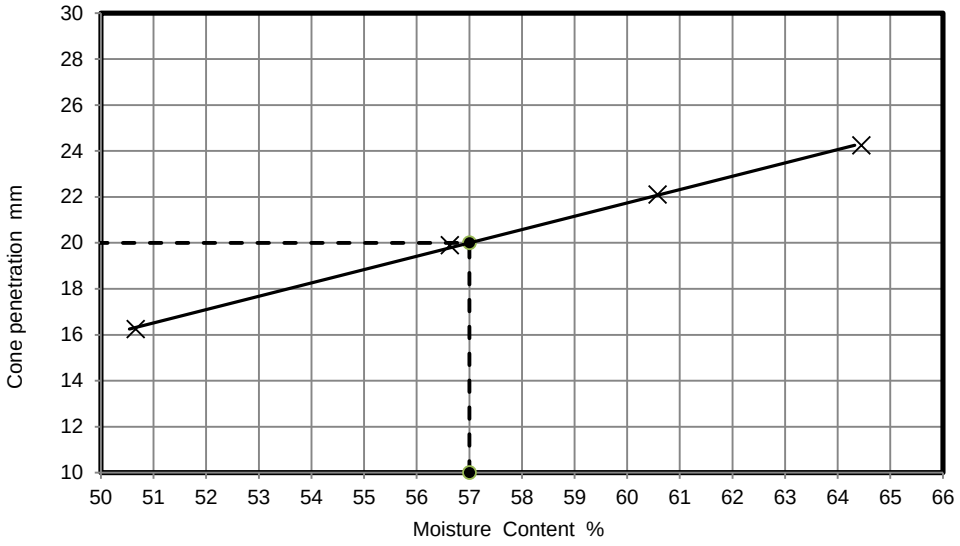
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5 R2

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

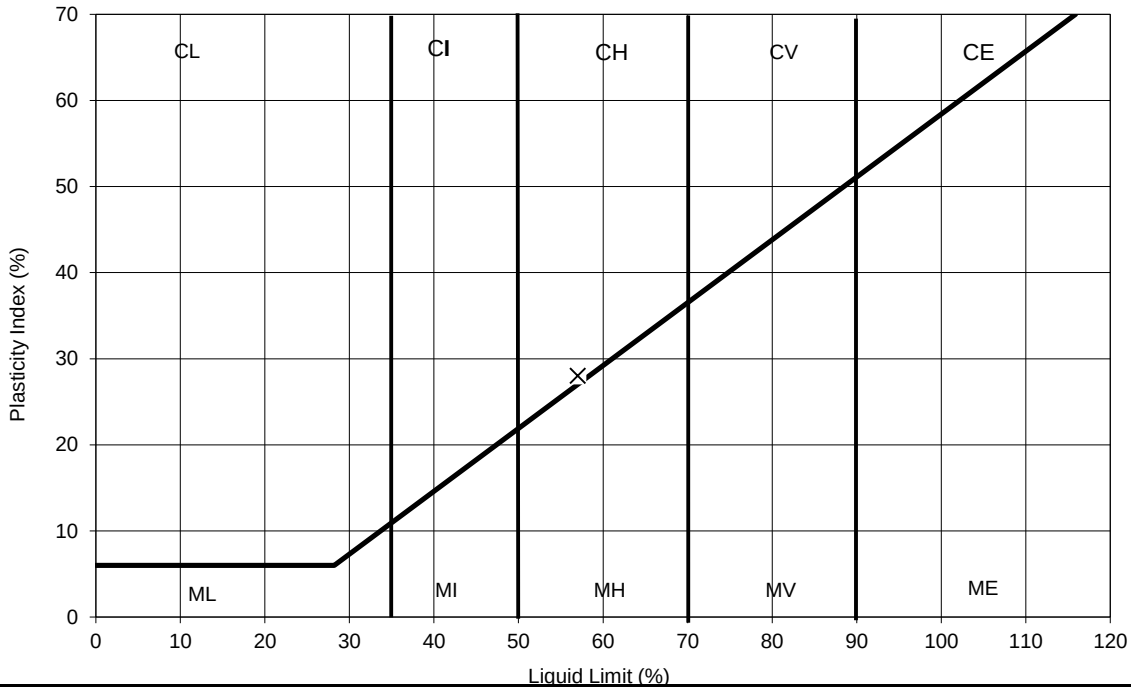
Site Name	Abellio Bus Garage			Job No.	30412
				Borehole/Pit No.	BH01
Project No.	211177	Client	Paragon	Sample No.	-
				Depth Top	23.45 m
Soil Description	Brown silty CLAY			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2021
				Schedules received	14/07/2021
				Project Started	15/07/2021
				Date Tested	05/08/2021



NATURAL MOISTURE CONTENT	**26**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**57**	**%**
PLASTIC LIMIT	**29**	**%**
PLASTICITY INDEX	**28**	**%**

Remarks

PLASTICITY INDEX



TEST METHOD

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BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying method

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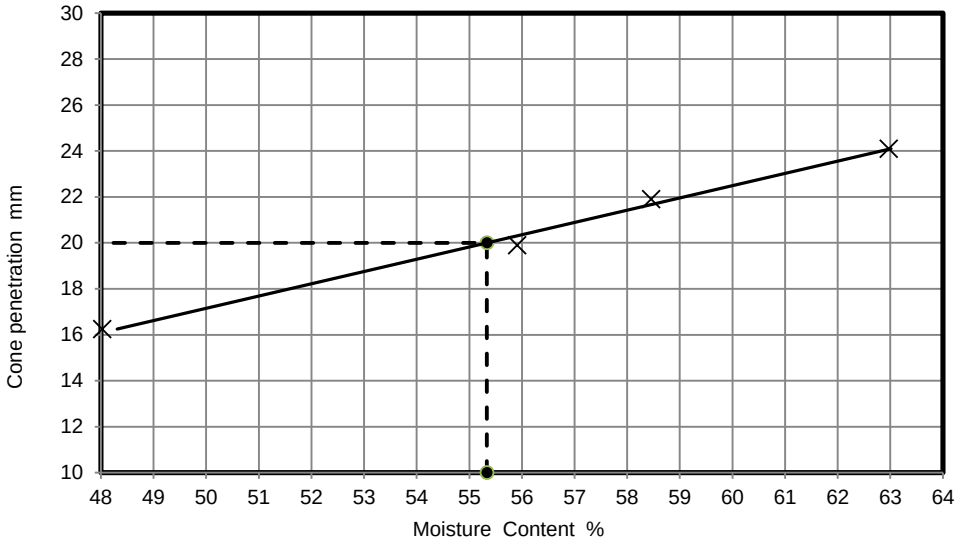
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

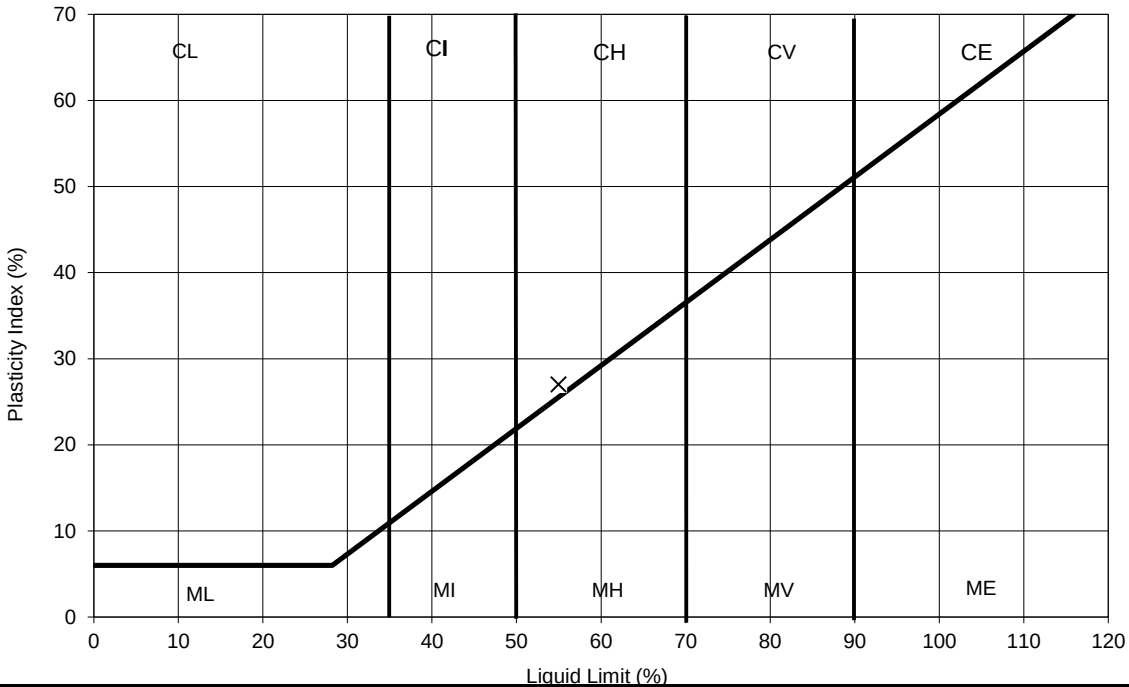
Site Name	Abellio Bus Garage			Job No.	30412
				Borehole/Pit No.	BH01
Project No.	211177	Client	Paragon	Sample No.	-
				Depth Top	30.00 m
Soil Description	Brownish grey silty CLAY			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2021
				Schedules received	14/07/2021
				Project Started	15/07/2021
				Date Tested	06/08/2021



NATURAL MOISTURE CONTENT	**27**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**55**	**%**
PLASTIC LIMIT	**28**	**%**
PLASTICITY INDEX	**27**	**%**

Remarks

PLASTICITY INDEX



TEST METHOD

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BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying method

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Date: 09/08/2021

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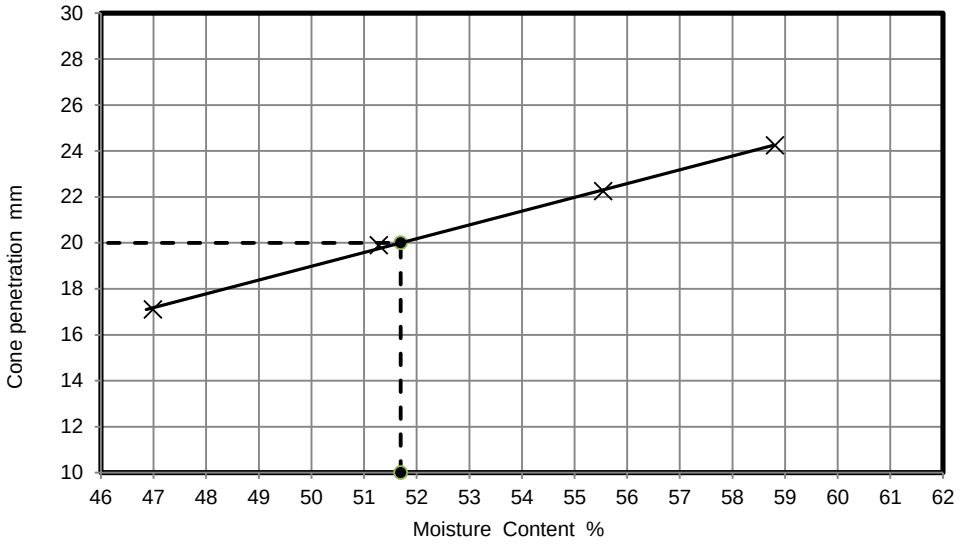
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5 R2

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

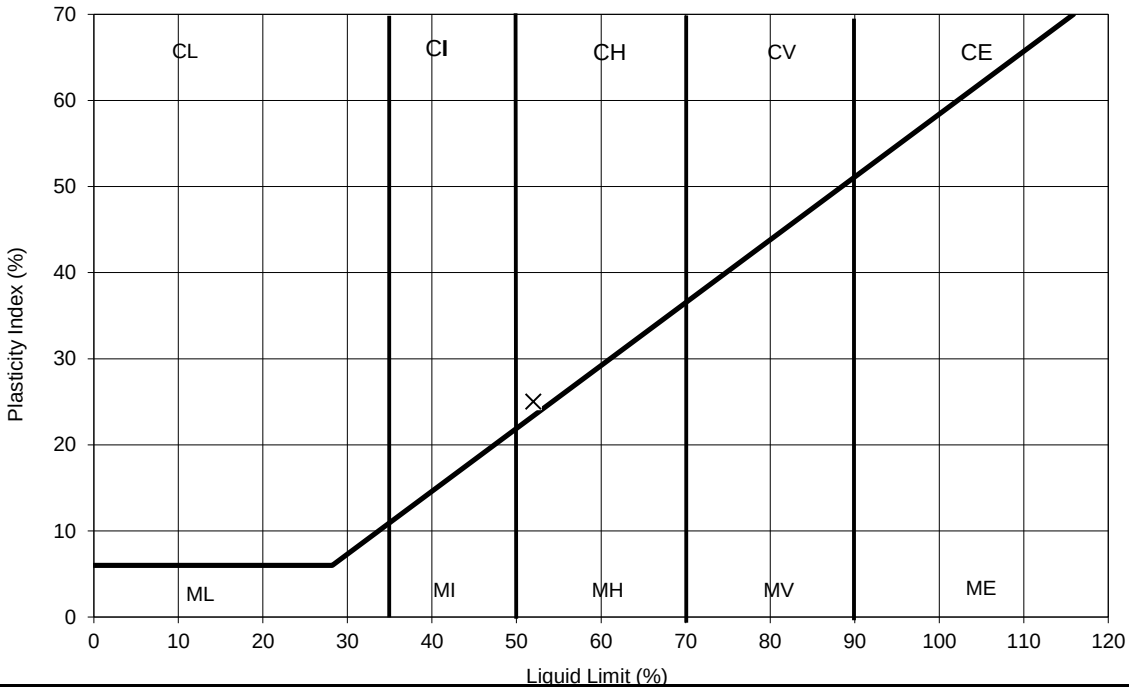
Site Name	Abellio Bus Garage			Job No.	30412
				Borehole/Pit No.	BH01
Project No.	211177	Client	Paragon	Sample No.	-
				Depth Top	34.50 m
Soil Description	Brown and occasional dark grey silty CLAY			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2021
				Schedules received	14/07/2021
				Project Started	15/07/2021
				Date Tested	06/08/2021



NATURAL MOISTURE CONTENT	**23**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**52**	**%**
PLASTIC LIMIT	**27**	**%**
PLASTICITY INDEX	**25**	**%**

Remarks

PLASTICITY INDEX



TEST METHOD

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BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying method

Checked and Approved

Initials: J.P
Date: 09/08/2021

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Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

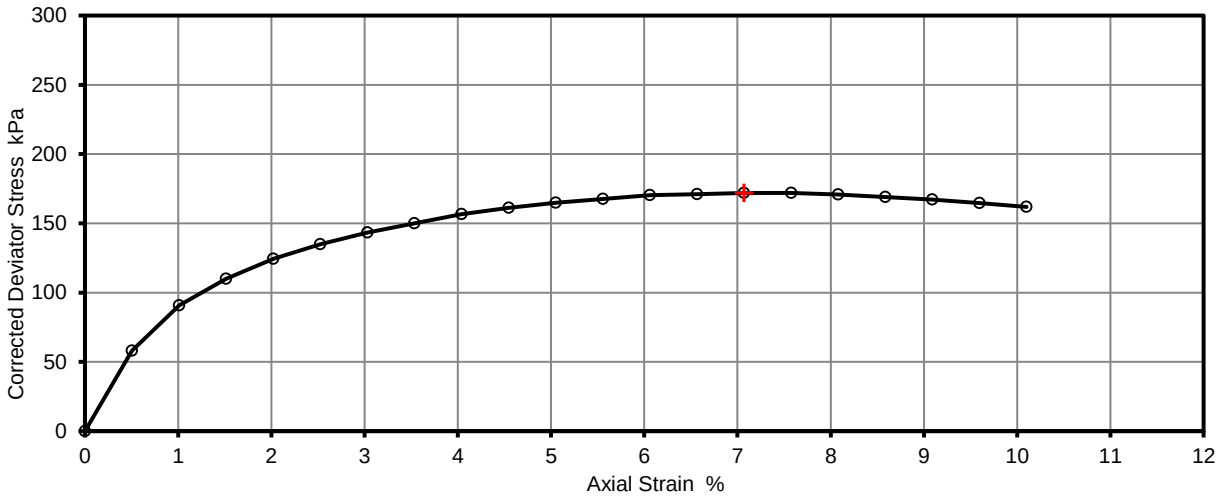
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	30412
				Borehole/Pit No.	BH01
Site Name	Abellio Bus Garage			Sample No.	19
Project No.	211177	Client	Paragon	Depth Top	8.00 m
Soil Description	High strength dark grey silty CLAY with rare fm claystone fragments			Depth Base	8.45 m
				Sample Type	U
				Samples received	06/07/2021
				Schedules received	14/07/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	28/07/2021

Remarks

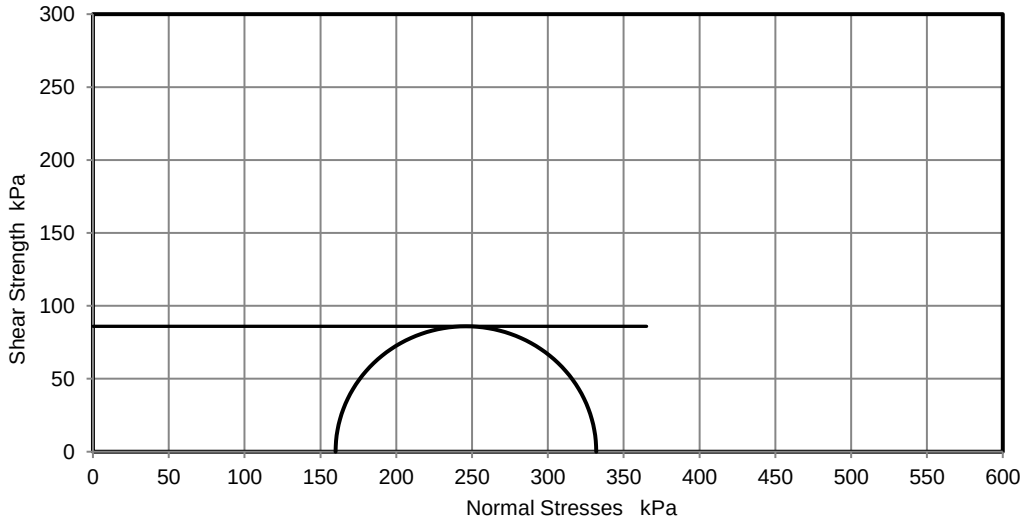
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	2.01	Mg/m3
Moisture Content	32	%
Dry Density	1.53	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	160	kPa
Axial Strain	7.1	%
Deviator Stress, (σ1 - σ3)f	172	kPa
Undrained Shear Strength, cu	86	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Test Report by K4 SOILS LABORATORY
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Checked and Approved
Initials: J.P
Date 09/08/2021

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

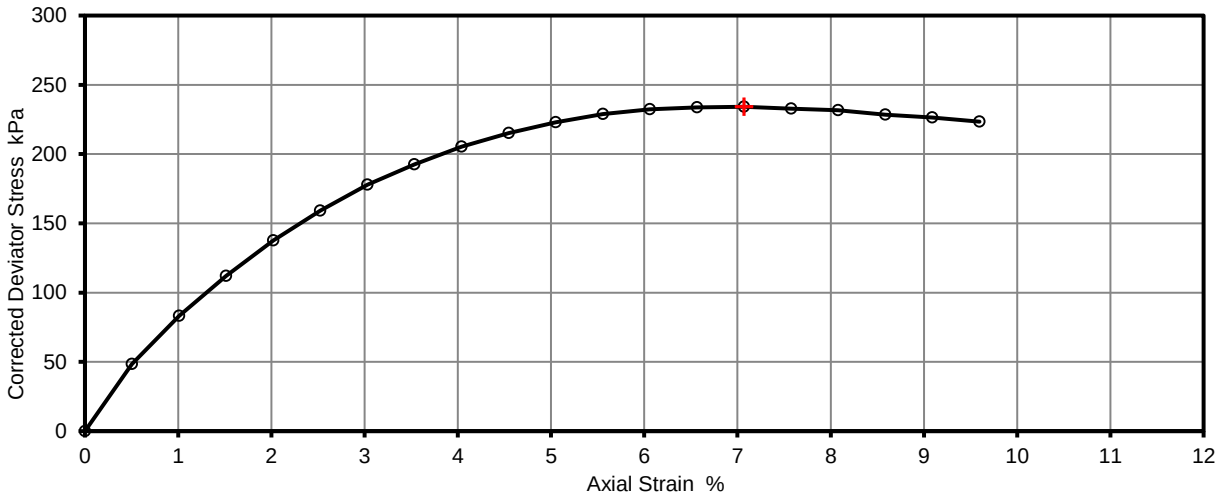
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	30412
				Borehole/Pit No.	BH01
Site Name	Abellio Bus Garage			Sample No.	30
Project No.	211177	Client	Paragon	Depth Top	15.50 m
Soil Description	High strength dark grey slightly sandy silty CLAY with occasional fm pyrite nodules			Depth Base	15.95 m
				Sample Type	U
				Samples received	06/07/2021
				Schedules received	14/07/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	28/07/2021

Remarks

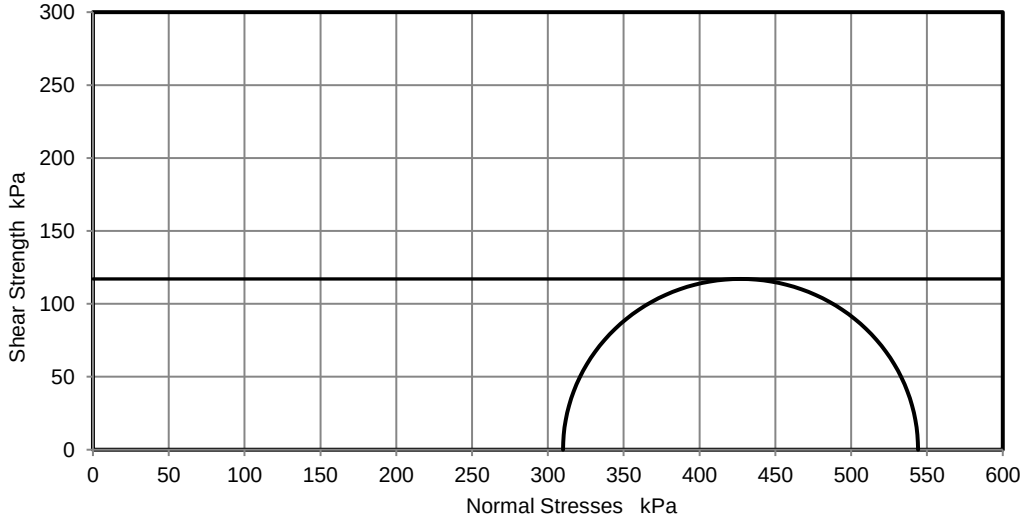
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	2.08	Mg/m3
Moisture Content	24	%
Dry Density	1.69	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	310	kPa
Axial Strain	7.1	%
Deviator Stress, (σ1 - σ3)f	234	kPa
Undrained Shear Strength, cu	117	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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Checked and Approved
Initials: J.P
Date 09/08/2021

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

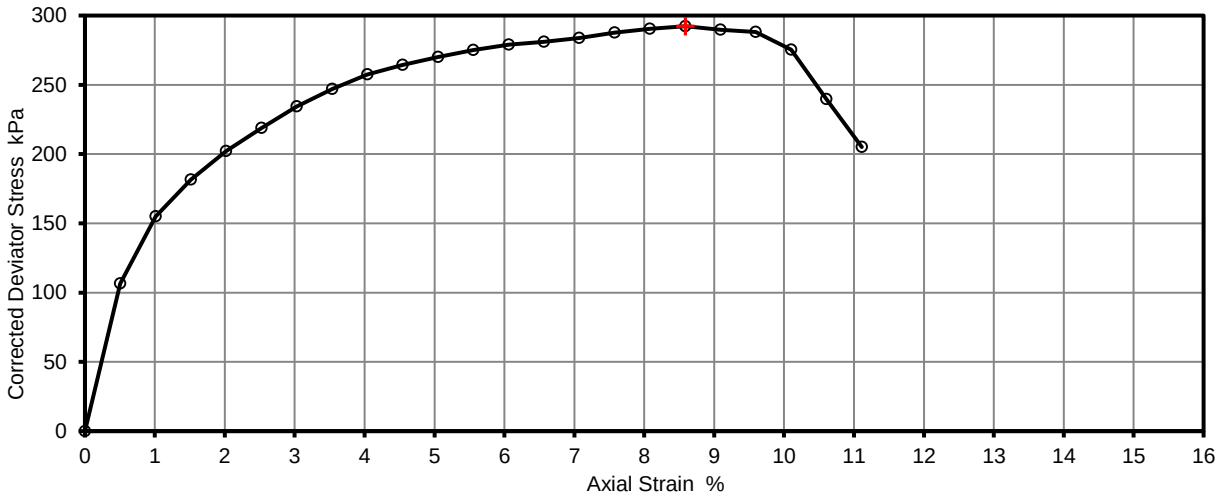
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	30412
				Borehole/Pit No.	BH01
Site Name	Abellio Bus Garage			Sample No.	36
Project No.	211177	Client	Paragon	Depth Top	20.00 m
Soil Description	High strength dark grey silty CLAY			Depth Base	20.45 m
				Sample Type	U
				Samples received	06/07/2021
				Schedules received	14/07/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	28/07/2021

Remarks

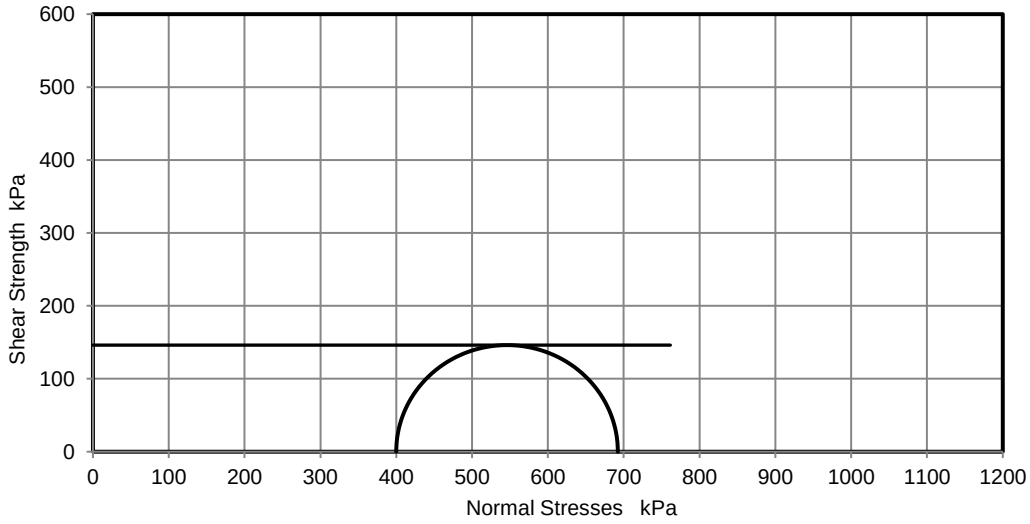
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	2.03	Mg/m3
Moisture Content	31	%
Dry Density	1.55	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	400	kPa
Axial Strain	8.6	%
Deviator Stress, (σ1 - σ3)f	292	kPa
Undrained Shear Strength, cu	146	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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Date 09/08/2021

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	30412
				Borehole/Pit No.	BH01
Site Name	Abellio Bus Garage			Sample No.	40
Project No.	211177	Client	Paragon	Depth Top	23.00 m
Soil Description	Very high strength dark grey silty CLAY			Depth Base	23.45 m
				Sample Type	U
				Samples received	06/07/2021
				Schedules received	14/07/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	28/07/2021

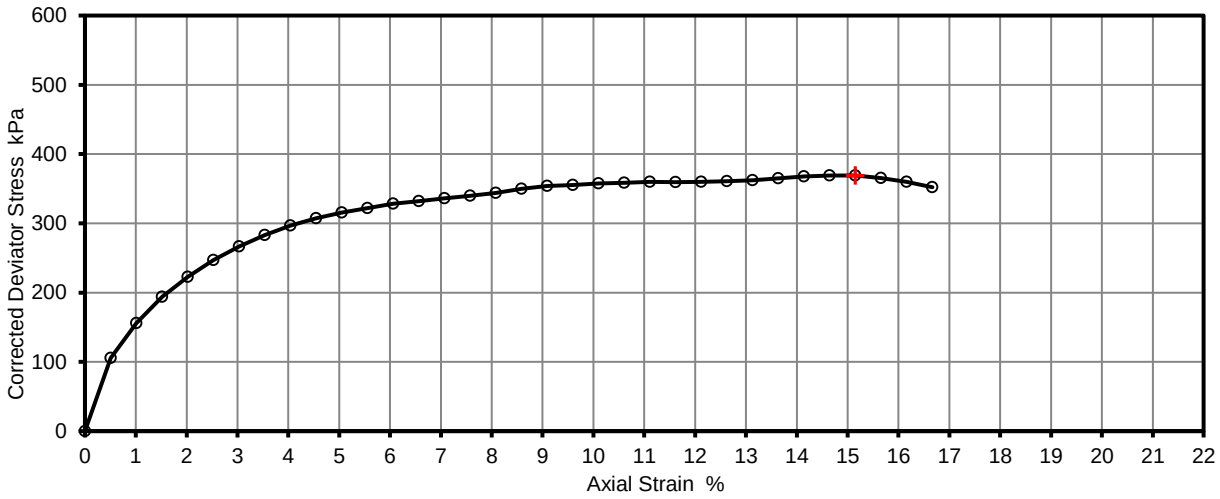
Remarks

Sample slightly disturbed, partically remoulded on top

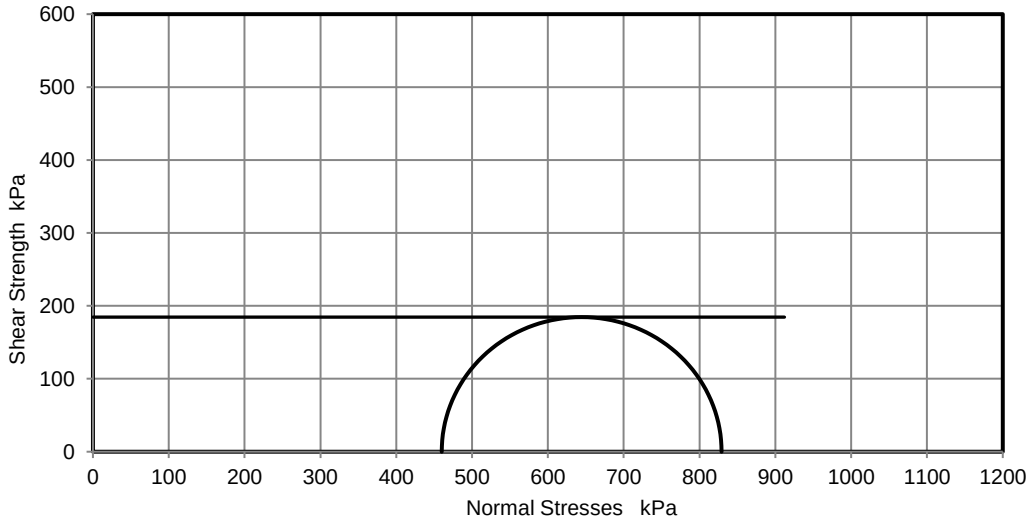
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	1.99	Mg/m3
Moisture Content	27	%
Dry Density	1.57	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	460	kPa
Axial Strain	15	%
Deviator Stress, (σ1 - σ3)f	369	kPa
Undrained Shear Strength, cu	185	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	30412
				Borehole/Pit No.	BH01
Site Name	Abellio Bus Garage			Sample No.	44
Project No.	211177	Client	Paragon	Depth Top	26.00 m
Soil Description	Very high strength dark grey silty CLAY			Depth Base	26.45 m
				Sample Type	U
				Samples received	06/07/2021
				Schedules received	14/07/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	28/07/2021

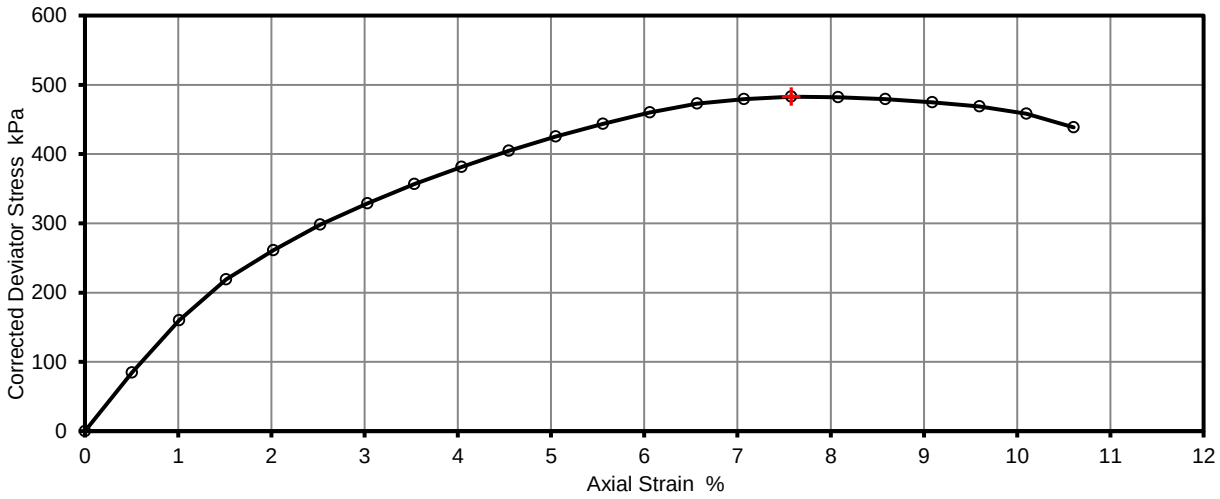
Remarks

Sample slightly disturbed, partcially remoulded on top

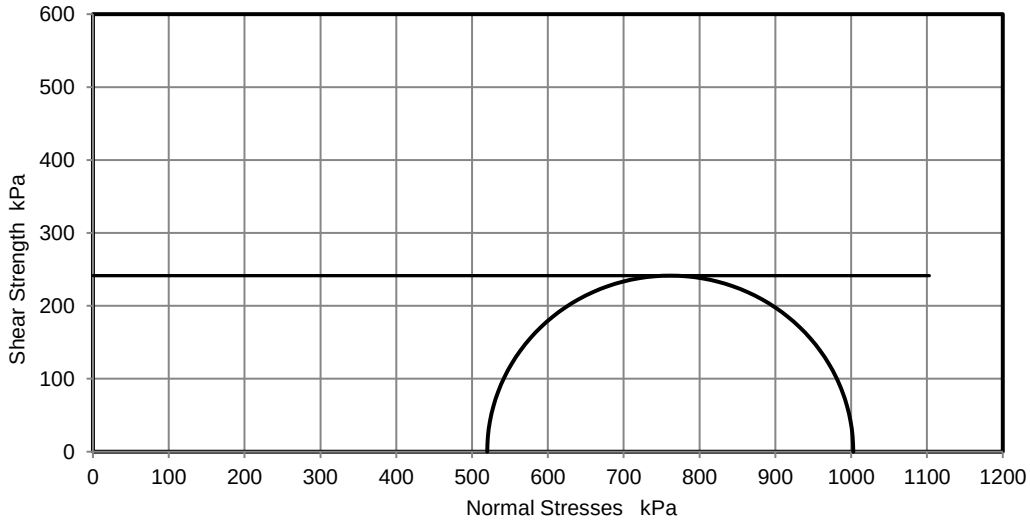
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	2.00	Mg/m3
Moisture Content	27	%
Dry Density	1.58	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	520	kPa
Axial Strain	7.6	%
Deviator Stress, (σ1 - σ3)f	483	kPa
Undrained Shear Strength, cu	241	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	30412
				Borehole/Pit No.	BH01
Site Name	Abellio Bus Garage			Sample No.	48
Project No.	211177	Client	Paragon	Depth Top	29.00 m
Soil Description	Very high strength dark grey silty CLAY			Depth Base	29.45 m
				Sample Type	U
				Samples received	06/07/2021
				Schedules received	14/07/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	28/07/2021

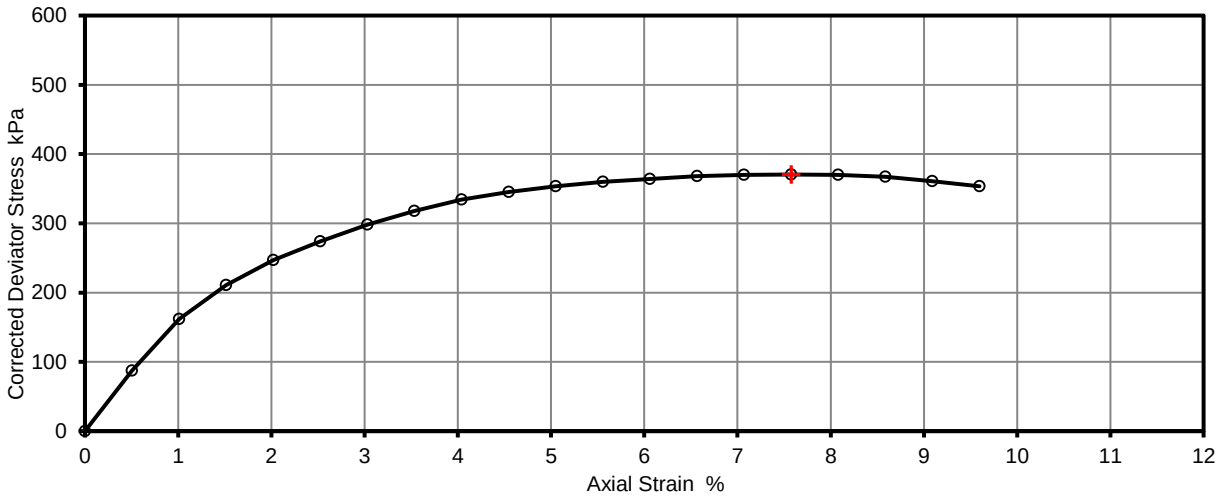
Remarks

Sample slightly disturbed, partcially remoulded on top

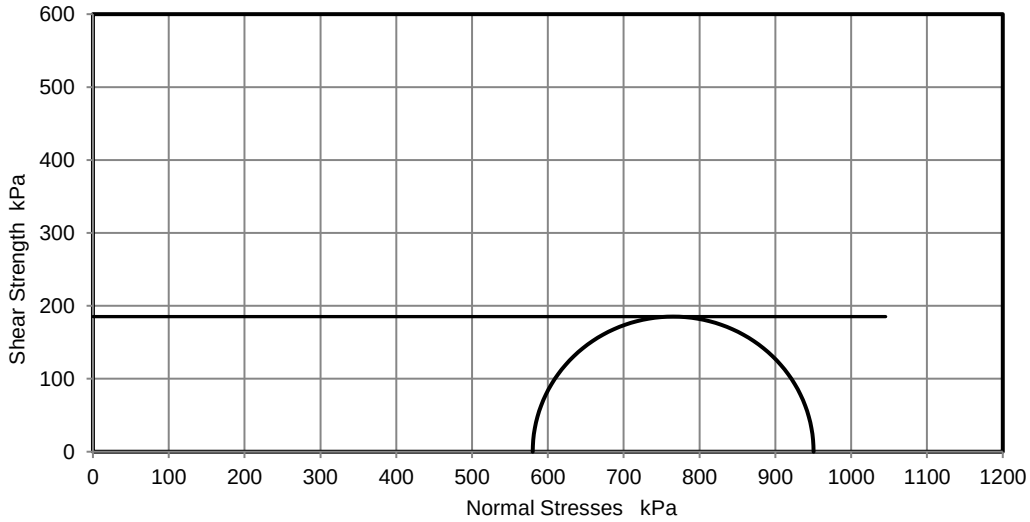
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	1.98	Mg/m3
Moisture Content	26	%
Dry Density	1.57	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	580	kPa
Axial Strain	7.6	%
Deviator Stress, (σ1 - σ3)f	370	kPa
Undrained Shear Strength, cu	185	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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Checked and Approved
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Date 09/08/2021

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Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	30412
				Borehole/Pit No.	BH01
Site Name	Abellio Bus Garage			Sample No.	52
Project No.	211177	Client	Paragon	Depth Top	32.00 m
Soil Description	Very high strength dark grey silty CLAY			Depth Base	32.45 m
				Sample Type	U
				Samples received	06/07/2021
				Schedules received	14/07/2021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	28/07/2021

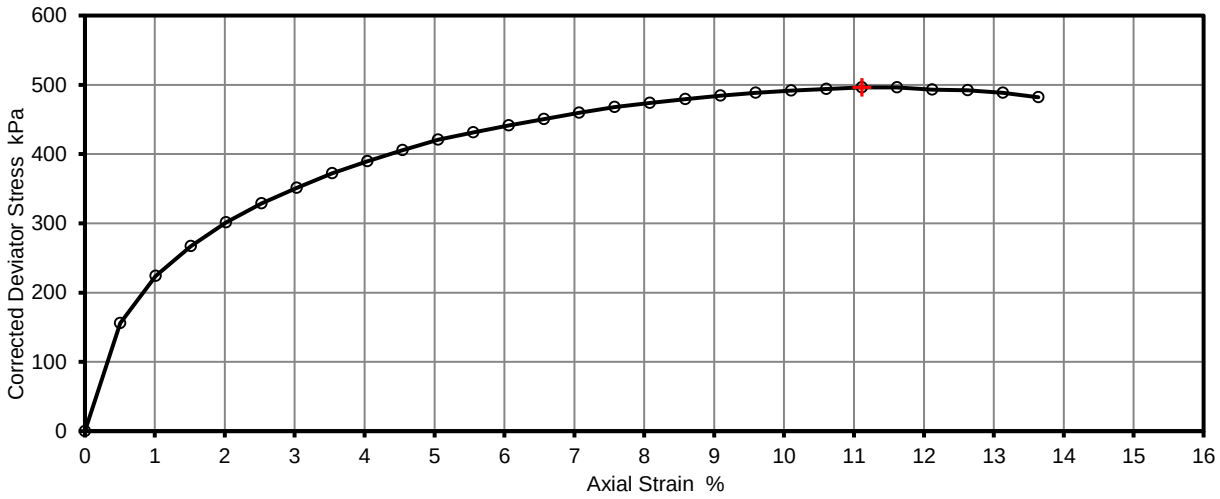
Remarks

Sample very disturbed, partcially remoulded on top

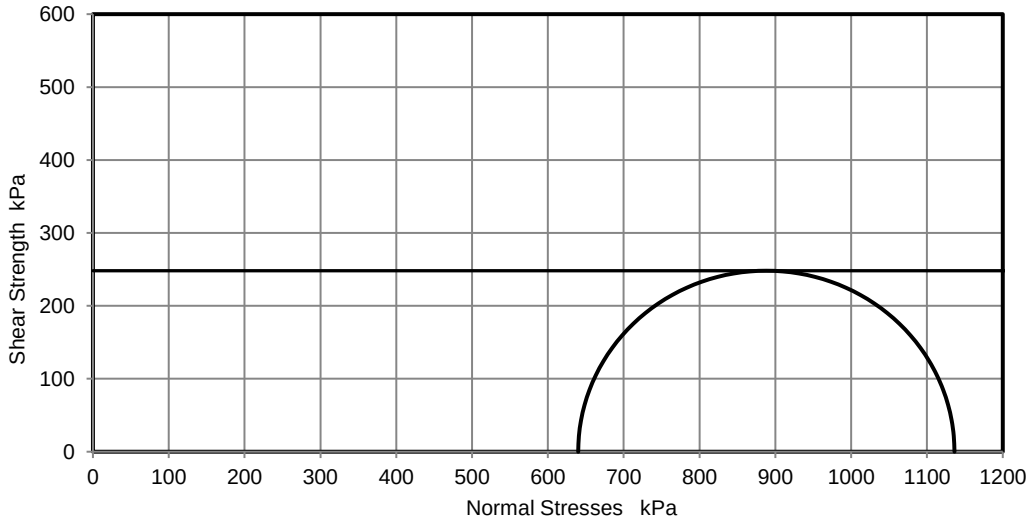
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	1.96	Mg/m3
Moisture Content	25	%
Dry Density	1.56	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	640	kPa
Axial Strain	11	%
Deviator Stress, (σ1 - σ3)f	496	kPa
Undrained Shear Strength, cu	248	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials: J.P
Date 09/08/2021

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Unconsolidated Undrained Triaxial Compression tests without measurement of pore pressure
Summary of Results

Tests carried out in accordance with BS1377:Part 7 : 1990 clause 8 or 9 as appropriate to test type.

Job No.	Project Name	Programme	
30412	Abellio Bus Garage	Samples received	06/07/2021
		Schedule received	14/07/2021
Project No.	Client	Project started	15/07/2021
211177	Paragon	Testing Started	28/07/2021

Hole No.	Sample				Soil Description	Test Type	Density		w	Length	Diameter	σ3	At failure				Remarks
	Ref	Top	Base	Type			bulk	dry					Axial strain	σ1 - σ3	cu	Mode	
		m	m				Mg/m3		%	mm	mm	kPa	%	kPa	kPa		
BH01	19	8.00	8.45	U	High strength dark grey silty CLAY with rare fm claystone fragments	UU	2.01	1.53	32	198	102	160	7.1	172	86	C	
BH01	30	15.50	15.95	U	High strength dark grey slightly sandy silty CLAY with occasional fm pyrite nodules	UU	2.08	1.69	24	198	102	310	7.1	234	117	C	
BH01	36	20.00	20.45	U	High strength dark grey silty CLAY	UU	2.03	1.55	31	198	102	400	8.6	292	146	C	
BH01	40	23.00	23.45	U	Very high strength dark grey silty CLAY	UU	1.99	1.57	27	198	102	460	15	369	185	C	Sample slightly disturbed, partcially remoulded on top
BH01	44	26.00	26.45	U	Very high strength dark grey silty CLAY	UU	2.00	1.58	27	198	102	520	7.6	483	241	C	Sample slightly disturbed, partcially remoulded on top
BH01	48	29.00	29.45	U	Very high strength dark grey silty CLAY	UU	1.98	1.57	26	198	102	580	7.6	370	185	C	Sample slightly disturbed, partcially remoulded on top
BH01	52	32.00	32.45	U	Very high strength dark grey silty CLAY	UU	1.96	1.56	26	198	102	640	11	496	248	C	Sample very disturbed, partcially remoulded on top

Legend
UU - single stage test (single and multiple specimens) | σ3 Cell pressure | Mode of failure ; B - Brittle
UUM - Multistage test on a single specimen | σ1 - σ3 Maximum corrected deviator stress | P - Plastic
suffix R - remoulded or recompacted | cu Undrained shear strength, ½ (σ1 - σ3) | C - Compound

Test Report by K4 SOILS LABORATORY
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2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	21-35087
Issue:	1
Date of Issue:	02/08/2021
Contact:	James Phaure
Customer Details:	K4 Soils Laboratory Ltd Unit 8 Watford HertfordshireWD18 9RU
Quotation No:	Q16-00568
Order No:	Not Supplied
Customer Reference:	30412
Date Received:	27/07/2021
Date Approved:	02/08/2021
Details:	Abellio Bus Garage
Approved by:	

Tim Reeve, Quality Officer

Sample Summary

Report No.: 21-35087, issue number 1

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
246027	BH01 6.50	Not Provided	27/07/2021	Clayey loam	a
246028	BH01 19 12.00	Not Provided	27/07/2021	Clay	a
246029	BH01 36 20.45	Not Provided	27/07/2021	Clay	a
246030	BH01 48 30.00	Not Provided	27/07/2021	Clay	a
246031	BH01 52 34.50	Not Provided	27/07/2021	Clay	a

Results Summary

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Report No.: 21-35087, issue number 1

ELAB Reference				246027	246028	246029	246030	246031
Customer Reference					19	36	48	52
Sample ID								
Sample Type				BULK	BULK	DISTURBED	DISTURBED	DISTURBED
Sample Location				BH01	BH01	BH01	BH01	BH01
Sample Depth (m)				6.50	12.00	20.45	30.00	34.50
Sampling Date				Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Determinand	**Codes**	**Units**	**LOD**					
Soil sample preparation parameters								
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	none	none	none	none	none
Metals								
Magnesium	U	mg/kg	25	10700	13100	13500	15200	11200
Anions								
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40
Water Soluble Nitrate	M	mg/kg	40	80	124	145	110	171
Water Soluble Sulphate	M	mg/l	20	57	188	143	379	179
Miscellaneous								
pH	M	pH units	0.1	8.3	8.4	8.9	8.5	9.1

Method Summary

Report No.: 21-35087, issue number 1

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	29/07/2021	113	Electromeric
Water soluble anions	M	Air dried sample	29/07/2021	172	Ion Chromatography
Aqua regia extractable metals	U	Air dried sample	29/07/2021	300	ICPMS

Report Information

Report No.: 21-35087, issue number 1

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"
LOD	LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.

ELAB are unable to provide an interpretation or opinion on the content of this report.

The results relate only to the sample received.

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

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

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

APPENDIX 8: GENERIC ENVIRONMENTAL ASSESSMENT

GENERIC ENVIRONMENTAL ASSESSMENT

8.1	**Introduction**
8.1.1	This appendix provides additional background information on certain approaches and methods used by Paragon in the preparation of this report.
8.1.2	This report uses the term 'geoenvironmental' to describe aspect relating to ground related environmental issues, such as contamination. The term 'geotechnical' is used to describe aspects relating to the physical nature of the site, such as foundation requirements.
8.1.3	A two-staged approach is used to classify land: • The first stage is referred to as a Phase 1 Investigation which includes a desk study and site walkover. Following this a preliminary conceptual site model (CSM) is developed to identify geotechnical and geoenvironmental risks. • The second stage is referred to as Phase 2 Site Investigation, which comprises the intrusive ground investigation, laboratory testing and provision of a risk assessment whereby the CSM identified in the CSM is updated based on the site conditions.
8.1.4	The Geoenvironmental Phase 1 and Phase 2 Investigations have been completed in general accordance with BS10175:2011+A1:2017.
8.1.5	The Geotechnical aspects of the report have been broadly written in general accordance with Eurocode 7 (BS EN 1997-2:2007) and are written with the intention of fulfilling the general requirements of a Ground Investigation Report (GIR) outlined in Section 6.
8.2	**Phase 1 Investigation**
8.2.1	The preliminary risk assessment is made of both geotechnical and geoenvironmental hazards identified at the desk study stage. This is then updated based on the findings of the Phase 2 Investigation. The risk associated with hazards uses a matrix of probability of occurrence vs the consequence. Geotechnical risks are assessed using a ground model.
8.2.2	In the context of geoenvironmental risks, in order for there to be a risk there must be a viable pollutant linkage, which means there must be a source of contaminations, a potential receptor and a pathway linking the two. The purpose of the Preliminary Conceptual Site Model is to identify all of the potential contaminant linkages and qualitatively assess the potential risks associated with these linkages. Contaminant linkages are potentially unacceptable risks in terms of current contaminated land regime legal framework and require either further assessment through the ground investigation. Should one of the three linkages be absent then there is no linkage and no further action is required.
8.2.3	Geoenvironmental risks are also outlined within Environmental Protection Act 1990, Part 2A which uses the term 'significant harm or significant possibility of significant harm (SPOSH)', where the term 'harm' is significant.

8.2.4 Paragon has adopted a classification level based on definitions within CIRIA Report C552 and professional judgement. Paragon's Rationale for Risk Ratings is presented in Table A. The classification for the probability of harm is presented in Table B. This information feeds into a matrix in Table C, which is used to assign a risk rating.

8.2.5 **Table A. Rationale for Risk Ratings**

Risk Rating	Risk Rating	Rationale	Examples
High	H	Contaminants very likely or known to represent an unacceptable risk, SPOSH. Equivalent to EA Category 1 pollution incident including persistent and/or extensive detrimental effects on water quality, closure of a potable abstraction point. Site not suitable for proposed use. Enforcement action possible. Urgent action required.	Significant short-term effects to humans is defined as serious injury, defects or death. Die-back of plants in landscaped areas. Short term pollution of controlled waters, major fish kill. Elevated contaminants close to potable abstraction. Major damage to buildings i.e. explosion.
Medium to High	M H	Contaminants likely or known to represent an unacceptable risk. Action required.	Possible short-term effects and likely long-term effects to humans is defined as serious injury, defects or death. Buildings unsafe to occupy. Ingress of contaminants through plastic pipes. Stress or dead plants in landscaped areas. Pollution of sensitive water resources.
Medium	M	Contaminants likely to exceed assessment criteria and may to represent an unacceptable risk. Some damage to property (crops, buildings etc.). Some action required.	Significant long-term effects to humans is defined as serious injury, defects or death. Buildings unsafe to occupy. Potential ingress of contaminants through plastic pipes. Stress or dead plants in landscaped areas. Pollution of sensitive water resources.
Low to Medium	L M	Contaminants may exceed assessment criteria but no harm as no unacceptable intake or contact. Minor or short-lived damage to property, ecosystems. Site likely to be suitable for proposed use. Action unlikely whilst in current use.	Harm not significant, pollutant linkage broken. Minor damage to plants in landscaped areas. Minor damage to buildings.
Low	L	Contaminants likely or known to have no risk of harm. Site likely to be suitable for proposed use. Repairable effects to damage to property etc. No further action required.	No measurable effects. No significant impact to property, plants, ecosystems.

8.2.6 **Table B. Classification of Probability of Geoenvironmental Risks**

Classification	Risk Rating
High Likelihood	There is a contaminant 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 contaminant linkage and all the elements are present, which means that it is probable that an event will occur.
Low Likelihood	There is a contaminant linkage and circumstances are possible under which an event could occur. However, it is no means certain that even over a longer period such event could take place and is less likely in the shorter term.
Unlikely	There is a contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.

8.2.7 **Table C. Probability / Consequence Graphic**

		Consequence				
		High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk
	Likely	High Risk	Moderate Risk	Low / Moderate Risk	Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Low / Moderate Risk	Low Risk	Low Risk	Very Low Risk
	Unlikely	Low / Moderate Risk	Low Risk	Very Low Risk	Very Low Risk	Very Low Risk
	No Linkage	No Risk				

8.3 Contaminant Analysis

8.3.1 The procedures set out in DEFRA/Environmental Agency Report: Land Contamination: Risk Management (LCRM) 2020, ISO 10381-5:2005 Soil Quality – Sampling and the DoE Industry Profiles provide good summaries of priority pollutants for UK sites. These have been used during the Phase 1 assessment to scope the analysis of chemicals of concern.

8.4	**Generic Tier 1 Human Health Risk Assessment**
8.4.1	Generic Assessment Criteria (GAC) are used as the limit at which exceedances would cause harm. GAC are developed based on assumptions of characteristics and behaviours or sources, pathways and receptors. These are largely conservative and are calculated using the Contaminated Land Exposure Assessment (CLEA) model, which uses exposure to the receptor and toxicology data of the contaminant in the assessment. Published and industry recognised GACs have been produced for a range of environments: • Residential with homegrown produce • Residential without homegrown produce • Commercial • Allotments • Public Open Space – Park (POS_{park}) • Public Open Space – Residential (POS_{Resi}).
8.4.2	The results of the chemical laboratory testing were screened using GACs based on two sources: • Category 4 Screening Levels (C4SLs) including cadmium, Benzo(a)pyrene, benzene, arsenic, lead and chromium VI, produced by LQM CIEH. • Suitable 4 Use Levels (S4UL) produced by LQM CIEH (2015).
8.4.3	In general accordance with Health Protection Agency (HPA) guidance for the risk assessment approaches for Polycyclic Aromatic Hydrocarbons (PAH), 2010, benzo(a)pyrene has been used as a surrogate marker for carcinogenic PAHs. The threshold PAHs have been assessed individually.
8.4.4	Statistical analysis has been carried out on populations of greater than six results. Where the population is less than six, statistical analysis has been deemed inappropriate. Therefore, the maximum concentration of each contaminant has been recorded. The Upper Confidence Level or U_{95} has been calculated to present the level at which we would be 95% confident that the true mean is less than the GAC. All non-detect values have been treated as being equal to half the limit of detection.
8.4.5	These results have been used to carry out a Level 1: Quantitative Human Health Assessment for the ground contamination present against standards for the proposed commercial land use. These results can also be used for a preliminary assessment for off-site disposal classification.
8.4.6	In general accordance with Health Protection Agency (HPA) guidance for the risk assessment approaches for Polycyclic Aromatic Hydrocarbons (PAH), 2010, benzo(a)pyrene has been used as a surrogate marker for carcinogenic PAHs. The threshold PAHs have been assessed individually.
8.5	**Controlled Waters Risk Assessment**
8.5.1	The Environment Agency Groundwater Protection Policy (GP3) outlines the legal framework, detailed policies, technical background and the tools to be used in the protection of groundwater. The Water Framework Directive (2000/60/EC) set out the protocol for controlling water quality of the whole water environment. During Groundwater Risk Assessments the impact on controlled waters is outlined. Controlled waters include groundwater, surface water, coastal waters, inland waters and reservoirs.

8.5.2	Aquifers are classified based on their sensitivity. The following aquifer definitions are adopted. • Principal Aquifers - These are 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 Aquifers - These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types: o Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers; and o Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers. • Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. • Unproductive Strata - These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
8.5.3	To determine the impact of contaminants on groundwater and surface water Environmental Quality Standards (EQS) have been used as screening criteria.
8.6	**Gas Risk Assessment**
8.6.1	The pragmatic approach to ground gas risk assessment by Card et al 2012 has been followed to determine the gas risk of the site. This method compares the Total Organic Content (TOC) of the Made Ground, and the age and depth of the fill to provide a basis to determine the Characteristic Situation of the site.
8.6.2	The risks associated with methane and carbon dioxide are assessed using BS8485:2015 and guidelines from CIRIA (Wilson et al 2007), the NHBC (Boyle and Witherington 2007) and CL:AIRE RB17 (Card et al 2012).
8.6.3	These methods use the gas monitoring results to produce a Gas Screening Value, which is compared to Tables set out within the guidance. Information on the proposed development is then used to determine the level of gas protection required via a scoring system. Each gas protection measure is assigned a score and combinations of the measures are used to meet the score required. The following tables are used to assess the gas risk.

8.6.4 **Table D. BS8485:2015 CS Classification**

CS	Hazard Potential	Site Characteristic GSV (l/hr)	Additional Factors
CS1	Very Low	<0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider and increase to CS2)
CS2	Low	0.07 to <0.7	Typical measured flow rate <70l/hr (otherwise consider an increase to CS3)
CS3	Moderate	0.7 to <3.5	
CS4	Moderate to High	3.5 to <15	
CS5	High	15 to <70	
CS6	Very High	>70	

8.6.5 **Table E. BS8485:2015 Building Type**

Building Types				
	Type A	**Type B**	**Type C**	**Type D**
Ownership	Private	Private or commercial/public, possible multiple	Commercial / public	Commercial / industrial
Control (change of use, structural alterations, ventilation)	None	Some but not all	Full	Full
Room sizes	Small	Small/medium	Small to large	Large industrial / retail park style

8.6.6 **Table F. BS8485:2015 Gas Protection Score by CS and Type of Building**

CS	Minimum Gas Protection Score			
	High Risk		**Medium Risk**	**Low Risk**
	Type A Building	**Type B Building**	**Type C Building**	**Type D Building**
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5 [A]	5.5	4.5	6.5
5	[B]	6.5[A]	5.5	4.5
6	[B]	[B]	7.5	6.5

Notes:

A. Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

B. The gas hazard is too high for this empirical method to be used to define the gas protection measure.

8.7 **Property – Water Supply Pipes**

8.7.1 Standard Water Supply Pipe Assessment has been undertaken in general accordance with UK Water Industry Research (UKWIR) Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. Ref 10/WM/03/21, published 2010. The results of soil testing have been used to identify which pipes should be used, from options including, ductile iron, steel, polyethylene (PE), PE barrier, PVC and copper.

8.7.2

Test Group	Testing Required	PE (mg/kg)	PVC (mg/kg)	Barrier Pipe (PE-Al-PE) (mg/kg)	Wrapped Steel	Wrapped Ductile Iron	Copper
Total VOCs	Where Preliminary Risk ssessment (PRA) has identified land potentially affected by contamination	0.5	0.125	Pass	Pass	Pass	Pass
Total BTEX & MTBE		0.1	0.03	Pass	Pass	Pass	Pass
Total SVOCs		2	1.4	Pass	Pass	Pass	Pass
EC5–EC10 aliphatic and aromatic hydrocarbons		2	1.4	Pass	Pass	Pass	Pass
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	Pass	Pass	Pass	Pass
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	Pass	Pass	Pass	Pass
Phenols		2	0.4	Pass	Pass	Pass	Pass
Creosols and chlorinated phenols		2	0.04				
Ethers	Only where identified	0.5	1	Pass	Pass	Pass	Pass
Nitrobenzene		0.5	0.4	Pass	Pass	Pass	Pass
Ketones		0.5	0.02	Pass	Pass	Pass	Pass
Aldehydes		0.5	0.02	Pass	Pass	Pass	Pass
Amines		Fail	Pass	Pass	Pass	Pass	Pass
Corrosive	Conductivity Redox pH	Pass	Pass	Pass	*Corrosive if pH <7 and conductivity >400us/cm*	*Corrosive if pH<5, Eh not neutral and conductivity >400us/cm*	*Corrosive if pH<5 or >8 and Eh positive*

APPENDIX 9: EXTENT OF SURVEY AND LIMITATIONS

EXTENT OF SURVEY AND LIMITATIONS

This report is for your sole use, and consequently no responsibility whatsoever is undertaken or accepted to any third party for the whole or any part of its contents. Paragon accept no responsibility or liability for the consequences of this document being used for any purpose or project other than for which it was commissioned or a third party with whom an agreement has not been executed. Should any third party which to use or rely upon the contents of the report, written approval must be sought from Paragon, a charge may be levied against such approval.

The report has been designed to address potential source, pathway and receptor pollutant linkages associated with the proposed development, by means of intrusive investigation. The content and findings of the report are based on data obtained by employing site assessment methods and techniques, considered appropriate to the site as far as can be interpreted from desk-based materials and a visual walkover of the site. Such techniques and methods are subject to limitations and constraints set out in the report. The findings and opinions are relevant at the time of writing, and should not be relied upon at a substantially later date as site conditions can changes. For example, seasonal groundwater levels, natural degradation of contaminants etc.

No liability can be accepted for the conditions that have not been revealed by the exploratory hole locations, or those which occur between each location. Whilst every effort will be made to interpolate the conditions between exploratory locations, such information is only indicative and liability cannot be accepted for its accuracy. By their nature, exploratory holes provide a relatively small and localised snapshot of the ground conditions relative to the size of the site.

Specific comment is made regarding the site's status under Part 2A of the Environmental Protection Act (EPA) 1990, which provides a statutory definition of Contaminated Land and as revised under The Contaminated Land (England) (Amendment) Regulations 2012. Unless specifically stated as relating to this definition, references to 'contamination' and 'contaminants' relate in general terms to the presence of potentially hazardous substances in, on or under the site.

The opinions given within this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. If additional information or data becomes available which may affect the opinions expressed in this report, Paragon reserves the right to review such information and, if warranted, to modify the opinions accordingly. Paragon reserves the right to charge additional fees for; un-anticipated second opinion reviewing of previous reports.

Paragon has prepared this report with reasonable skill, care and diligence. The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted industry practices at this time. The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources. We cannot provide guarantees or warranties for the accuracy of third-party data, which is reviewed in good faith and assumed to be representative and accurate.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed. No liability can be accepted for the effects of any future changes to such guidelines and legislation. In the event that guidance / legislation changes it may be necessary for Paragon to update or modify reports. The risk assessment is completed in line with the relevant land use agreed for the site and the time of completing the works. Changes to site conditions or land use may require a reassessment.

DEFINITIONS

For the avoidance of doubt, Paragon Building Consultancy Limited (Paragon) has prepared the following alphabetical list of definitions and reservations to aid the client in understanding the content of our advice and or written reports(s):

Accuracy	Level of agreement between true value and observed value.
ACM's	Asbestos Containing Materials
Conceptual Site Model	Textual and or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the base of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process. **Note 1:** The conceptual exposure model is initially derived from the information obtained by the preliminary investigation. This conceptual model is used to focus subsequent investigations, where these are considered to be necessary, in order to meet the objectives of the investigations and the risk assessment. The results of the field investigation can provide additional data that can be used to further refine the conceptual model.
Contamination	Presence of a substance which is in, on or under land, and which has the potential to cause significant harm or to cause significant pollution of controlled water. **Note 1:** There is no assumption in this definition that harm results from the presence of the contamination. **Note 2:** Naturally enhanced concentrations of harmful substances can fall within this definition of contamination. **Note 3:** Contamination may relate to soils, groundwater or ground gas.
Controlled Water	Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three-mile limit of territorial waters. **Note 1:** See Section 104 of The Water Resources Act 1991.
Enquiries	Any enquiries undertaken by Paragon of local authorities and statutory undertakers are made verbally in respect of environmental issues. Local searches are not undertaken and no responsibility is accepted for any inaccurate information provided. It is further assumed unless otherwise stated that all necessary licences, permits etc. either run with the property or are transferable to a new occupier as appropriate.
Harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case humans, including property.
Hazard	Inherently dangerous quality of a substance, procedure or event.
Pathway	Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.
Precision	Level of agreement within a series of measurements of a parameter.
Receptor	Persons, living organisms, ecological systems, controlled water, atmosphere, structures and utilities that could be adversely affected by the contaminant(s).

Risk	Probability of the occurrence, magnitude and consequences of an unwanted adverse effect on a receptor.
Risk Assessment	Process of establishing, to the extent possible, the existence, nature and significance of risk.
Sampling	Methods and techniques used to obtain a representative sample of the material under investigation.
Soil	Upper layer of the earth's crust composed of mineral parts, organic substance, water, air and living matter. **Note 1:** In general accordance with BS 10175:2001 the term soil has the meaning ascribed to it through general use in civil engineering and includes topsoil and subsoil; deposits such as clays, silt, sand, gravel, cobbles, boulders and organic deposits such as peat; and material of natural or human origin (e.g. fills and deposited wastes). The term embraces all components of soil, including mineral matter, organic matter, soil gas and moisture, and living organisms.
Source	Location from which contamination is, or was, derived. **Note 1:** This could be the location of the highest soil or groundwater concentration of the contaminant(s).
Uncertainty	Parameter, associated with the result of a measurement that characterises the dispersion of the values that could reasonably be attributed to the measurement.

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