



PHASE 2 SITE INVESTIGATION

**59 UPPER CHORLTON ROAD
WHALLEY RANGE
MANCHESTER
M16 7QR**

REPORT PREPARED FOR

**Armistead Property Limited
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TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	1
2.0 PHASE 1 SITE INVESTIGATION SUMMARY	2
2.1 Site Layout and Setting	2
2.2 Development Proposals	2
2.3 Potential Sources of Ground Contamination	2
2.4 Geology, Hydrogeology and Hydrology	3
2.5 Preliminary Risk Assessment	3
3.0 SITE INVESTIGATION DETAILS	4
3.1 Overview and Scope of Works	4
3.2 Underground Service Location	4
3.3 Trial Pitting	4
3.4 Soil Sampling	5
3.5 Laboratory Analytical Suites	5
4.0 GROUND INVESTIGATION RESULTS	6
4.1 Ground and Groundwater Conditions	6
4.2 Evidence of Potential Contamination	6
4.3 Laboratory Results	6
5.0 RISK ASSESSMENT	8
5.1 Generic Human Health Risk Assessment	8
5.1.1 Selection of HHACs	8
5.1.2 Data Comparison with HHACs	10
5.2 Controlled Waters Risk Assessment	11
5.3 Other Considerations	11
6.0 CONCLUSIONS & RECOMMENDATIONS	12
6.1 Conclusions	12
6.2 Recommendations	12
7.0 REFERENCES	14

TABLES

Table 1: Trial Pit Locations	4
Table 2: Soil Analysis for Metals, pH, Cyanide, Sulphate, TOC, Phenols, PAH & TPH in mg/kg	7
Table 3: Comparison of Soils Data with Adopted HHACs in mg/kg	10

FIGURES

Figure 1: Site Location Plan

Figure 2: Current and Proposed Development Layouts and Trial Pit Locations

Simon James Architects Drawing No. 089-PL-OS1revE: Recent Site Layout and Boundary Location

Simon James Architects Drawing No 089-PL-GL1revE: Proposed Site Layout

APPENDICES

Appendix A: Limitations & Exceptions of Assessment

Appendix B: Photographs

Appendix C: Trial Pit Logs

Appendix D: Laboratory Analytical Report

 PEAK ENVIRONMENTAL SOLUTIONS		Document Verification Schedule		
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1.0 INTRODUCTION

Peak Environmental Solutions Limited (PESL) has been commissioned by Armistead Property Limited to undertake a land contamination Phase 2 Site Investigation for a proposed residential development at 59 Upper Chorlton Road, Whalley Range, Manchester, M16 7QR ('the site'). Figure 1 shows the site location (centred on National Grid Reference 382827, 395640) and Figure 2 and Simon James Architects Drawing No. 089-PL-OS1revE show the recent site layout and boundary location.

In December 2019, Manchester City Council (MCC) granted planning permission for development at the site involving:

'Erection of four storey extension to rear elevation, dormer extension and elevational alterations involved in refurbishment of 10 existing 1 bed/bedsit flats to provide 17 flats (11 x 1 bed, 4 x 2 bed and 2 x 3 bed) following demolition of existing industrial units' (Ref: R124976/FO/2019).

The proposed development layout is shown in Simon James Architects Drawing No 089-PL-GL1revE.

The planning permission includes Condition 10, requiring that potential risks associated with ground contamination at the site be investigated and remediated. A Phase 1 Site Investigation was completed in October 2021, as follows:

Preliminary Environmental Assessment. 59 Upper Chorlton Road Whalley Range, Manchester, M16 7RQ prepared for Armistead Property Limited by Peak Environmental Solutions Limited. Report No. 42173R1/Iss-RevB.

This report should be referred to for a full description of the site, environmental setting and historical development. Summary information is also included in Section 2.0 of this report. The Phase 1 preliminary assessment identified potential risks to future site users and other environmental receptors and recommended Phase 2 investigation. The Phase 2 investigation scope was discussed and agreed via email with the Environmental Protection Team at MCC prior to implementation. The results are presented in this report.

The Phase 2 investigation undertaken in February 2022 and included machine excavated trial pits, laboratory analytical contamination testing and preliminary/generic quantitative contamination risk assessments. The scope of works is detailed in Section 3.0. The report has been prepared under umbrella frameworks laid out in non-statutory UK online gov.uk '*Land Contamination: Risk Management*' guidance and R&D66:2008 ('*Guidance for the safe development of housing on land affected by contamination*'), as well as in general accordance with the current National Planning Policy Framework (NPPF).

The report should only be used by competent persons for its intended purpose. The report was finalised in March 2022 and should be read in the light of any subsequent changes in legislation, statutory requirements, statutory and non-statutory guidance, relevant research and industry practices, and should be read in conjunction with the references in Section 7.0. Information provided to or obtained by PESL has been relied upon in good faith. This report is subject to our standard terms of business and the limitations & exceptions detailed in Appendix A.

2.0 PHASE 1 SITE INVESTIGATION SUMMARY

2.1 Site Layout and Setting

Figure 1 shows the site location and Figure 2 and Simon James Architects Drawing No. 089-PL-OS1revE, the current site layout. Current site photographs are included in Appendix B.

The ~0.17 hectare site is located in a predominantly residential suburb of Manchester ~2.5km to the south-west of the city centre. At the time of the Phase 2 investigation, warehousing that occupied the south-east of the site at the time of the Phase 1 walkover had been demolished, with the residual material largely removed for off-site disposal. The former residential building that will be converted and extended under the planning permission remained in place.

2.2 Development Proposals

The proposed development layout is shown in Simon James Architects Drawing No 089-PL-GStrevE and outlined in Figure 2.

The existing building will be extended and converted to form residential apartments. Soft landscape/amenity areas for the apartments will be located in the north-east and north-west of the site. Hard surfaced parking areas will be positioned in the south of the site with the main vehicular site access in its current location.

2.3 Potential Sources of Ground Contamination

The Phase 1 identified potential sources of ground contamination that could affect the development, as follows:

-) *'The site was developed and used as a residential house until sometime prior to 1922 when the buildings were expanded and the whole of the site appears to have been used as a laundry. The laundry gradually expanded over time and is recorded in the 1930s and beyond as a linen works.
If the laundry/linen works use included dry cleaning, this represents a potentially significant source of ground contamination in the form of chlorinated solvents which can remain in the ground for long periods. No information about the exact activities at the site during this period was obtained as part of the Phase 1 process.'*
-) *In the early 1970s, the site is recorded as a 'warehouse'. Recent use has included joinery and carpet storage. Significant ground contamination resulting from these more recent site uses is currently considered unlikely, but the exact use over the whole of this period remains unknown.*
-) *Based on their construction dates, the site buildings may include asbestos containing materials (ACMs). ACMs may also be present in site soils.*
-) *Garages are/have been located in relatively close proximity to the site and may represent a source of ground contamination that could migrate towards the site. Significant impacts from off-site sources of ground contamination are currently considered unlikely. '*

MCC Environmental Health provided some additional comment about the historic site use during the consultation process in advance of the Phase 2. MCC records suggest that the site was historically a 'large scale laundry and a linen works'. Chlorinated solvents associated with dry cleaning processes are not expected.

2.4 Geology, Hydrogeology and Hydrology

The 1:50,000 scale BGS geology map for the area records the presence of superficial deposits beneath the site consisting of Quaternary Devensian Glaciofluvial sand and gravel. Bedrock geology consists of the Triassic Wilmslow Sandstone Formation.

The superficial deposits are classified as a Secondary A Aquifer, indicating that they may represent an important local groundwater resource. The bedrock deposits are classified as a Principal Aquifer and may represent a regionally important groundwater resource. There are however no groundwater abstractions recorded on the EA database within 500m of the site. The site is not located within a Source Protection Zone (SPZ) set by the EA for the protection of important groundwater resources.

There are no surface water features shown on the local OS mapping within 1 km of the site (there may be culverted watercourses). Surface water from the site and the surrounding area is likely to eventually enter the River Irwell located to the north and flowing west.

2.5 Preliminary Risk Assessment

The preliminary risk assessment and conceptual site model included in the Phase 1 site investigation identified a series of relevant pollutant linkages for the redeveloped site use requiring further investigation as part of the Phase 2 (Moderate Risks or High Risks) as follows:

Future Residents & Buildings, Building Materials and Services

-) RPL-1. Contaminant (including ACMs) exposure via soil/dust ingestion, dermal contact, home-grown produce and indoor dust inhalation from contaminants in shallow soils in soft garden and soft landscaping areas. **Moderate Risk**
-) RPL-2. Risks to residents via vapour intrusion into future buildings and indoor vapour inhalation from organic contaminants sources under or close to future building footprints. **Moderate Risk**
-) RPL-3 Risks to residents via migration of organic contaminants into plastic water supply pipes. **Moderate Risk**

Controlled Waters (Groundwater & Surface Water)

-) RPL-4 Risk to sensitive groundwater resources posed by contaminants in soils & groundwater under the site. **Moderate Risk**

3.0 SITE INVESTIGATION DETAILS

3.1 Overview and Scope of Works

The site investigation was based around trial pitting across the site, soil logging in general accordance with BS5930:2015+A1:2020, visual inspection and laboratory soil chemical analysis. The Phase 2 was completed to identify the extent, thickness, physical nature and chemical quality of shallow soils, made ground and immediately underlying natural deposits.

3.2 Underground Service Location

Underground service location was completed by the client who also took responsibility for service protection in excavations. No underground services were encountered during the intrusive investigation.

3.3 Trial Pitting

Trial pitting was undertaken on the 9th February 2022. Trial pits TP-01 to TP-06 were excavated by the client to a maximum depth of 2.2m bgl under the instruction of a PESL site engineer. The ground conditions were logged by the PESL engineer in general accordance with BS5930:2015. Visual evidence for the presence of groundwater and any potential ground contaminants were also recorded on the trial pit logs.

The locations selected for investigation were determined following consideration of a variety of criteria including the historic site use, the proposed development layout, site coverage and underground service locations. The trial pit locations are shown in Figure 2 and relevant justification for the chosen locations detailed in Table 1.

Table 1: Trial Pit Locations

Location	Location and Target
TP-01	Current and future soft landscaped garden area
TP-02	Former warehouse and future building extension location
TP-03	Former warehouse and future soft landscaped area
TP-04	Possible waste disposal area in the corner of the site and future soft landscaped area
TP-05	Former warehouse and future soft landscaped area
TP-06	Former warehouse and future soft landscaped area

Following completion, the excavations were photographed and then left open for a minimum of twenty minutes to allow groundwater stabilisation. The excavations were then backfilled with arisings in approximately the reverse order of excavation.

The trial pit logs are presented in Appendix C, with photographs showing the ground conditions in Appendix B.

3.4 Soil Sampling

Selected soil samples were recovered from the trial pit locations and submitted for chemical analysis at a UKAS accredited laboratory. All samples were placed in laboratory-supplied containers, labelled with a unique ID, date, location and depth and stored in cooler boxes. The soil samples were shipped to the laboratory by a laboratory arranged courier under chain of custody documentation.

3.5 Laboratory Analytical Suites

The analytical schedule included a broad suite potential brownfield-land contaminants. Six shallow soil samples were selected from intrusive locations across the site and submitted for laboratory analysis.

The adopted analytical testing schedule to characterise potential soil contaminants included:

-)] TPH: banded fractions total petroleum hydrocarbons C6 to C35
-)] Speciated PAH: Sixteen 'priority' polycyclic aromatic hydrocarbons
-)] Other organic compounds: total monohydric phenols, total organic carbon (TOC)
-)] General inorganics: pH, total cyanide, total sulphate
-)] Arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc
-)] Asbestos screen: Identifying the presence of asbestos and if present, assessment of type.

The six soil samples were also analysed for a suite of volatile organic compounds to include chlorinated solvents. This analysis was completed with the aim of identifying evidence to suggest that past site use included dry cleaning processes.

The Laboratory Analytical Report is presented in Appendix D.

4.0 GROUND INVESTIGATION RESULTS

4.1 Ground and Groundwater Conditions

Trial pit locations, together with the proposed development layout are shown in Figure 2. Trial pit logs are included in Appendix C and photographs showing the ground conditions in Appendix B.

Consistent ground conditions were identified across the east of the site (TP-02 - TP-06). Made ground comprising dark brown silty sand and gravel with bricks, concrete and some other demolition material was identified at the surface. The made ground extended to a maximum of 1.0m bgl in TP-05 where a brick pillar and wall were observed in the south-west of the trial pit. In general, the made ground extended to between 0.5 and 0.7m bgl.

Beneath the made ground a thin (up to 0.4m, but generally 0.2m) layer of light brown/buff clayey silty fine sand with gravel was identified. This was underlain by orange brown fine to coarse sand with fine to coarse sub angular to rounded gravel. This extended to the base of all of the trial pits in the east of the site at a maximum depth of 2.2m bgl and was identified as Glaciofluvial sand and gravel.

In TP-01, located in the north-west of the site near to Upper Chorlton Road, 0.5m of made ground comprising dark brown sand and gravel with glass, coal and some ash was identified. This was underlain by light grey/buff very silty sandy clay that extended to the base of the trial pit at 1.4m bgl.

No groundwater or perched water was identified during the investigation, all of the trial pits remained dry throughout excavation and on being left open for a period of stabilisation.

4.2 Evidence of Potential Contamination

None of the made ground materials identified were associated with any hydrocarbon or other odours.

No significant biodegradable components/materials were identified in the made ground in the trial pits.

4.3 Laboratory Results

Shallow (<0.6m bgl) soil samples from the site investigation were submitted for a range of organic/inorganic chemical analysis. The analytical certificates are included in Appendix D.

The soil chemical analysis results are summarised in Table 2.

Table 2: Soil Analysis for Metals, pH, Cyanide, Sulphate, TOC, Phenols, PAH & TPH in mg/kg

Location	LOD	TP-01	TP-02	TP-03	TP-04	TP-05	TP-06
Depth (m bgl)		0.50	0.50	0.30	0.40	0.40	0.40
Arsenic	1.0	17	12	25	8.7	9.9	23
Cadmium	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	1.0	18	15	19	18	19	20
Copper	1.0	58	37	46	27	44	59
Lead	1.0	140	320	130	53	90	270
Mercury	0.3	< 0.3	0.8	0.7	< 0.3	< 0.3	0.9
Nickel	1.0	14	14	21	13	18	22
Selenium	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	1.0	26	21	30	23	27	33
Zinc	1.0	66	60	63	40	63	97
pH (pH Units)	N/A	7.2	8.2	7.3	7.5	7.3	7.8
Total Cyanide	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	4.3
Total Sulphate as SO4	50	290	450	2300	980	850	880
Total Organic Carbon (%)	0.1%	2.5	1.4	2.5	2.7	2.7	2.5
Total Phenols (monohydric)	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	0.05	< 0.05	0.24	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	0.05	0.83	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	0.05	0.45	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	0.05	4.7	0.79	0.43	< 0.05	0.29	0.59
Anthracene	0.05	0.81	0.20	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	0.05	6.9	2.3	0.54	< 0.05	0.52	1.2
Pyrene	0.05	6.7	2.2	0.56	< 0.05	0.54	1.2
Benzo(a)anthracene	0.05	3.6	1.4	0.37	< 0.05	0.31	0.80
Chrysene	0.05	3.2	1.0	0.28	< 0.05	0.29	0.60
Benzo(b)fluoranthene	0.05	3.5	1.3	0.36	< 0.05	0.30	0.61
Benzo(k)fluoranthene	0.05	1.2	0.41	0.18	< 0.05	0.18	0.44
Benzo(a)pyrene	0.05	3.1	1.2	0.37	< 0.05	0.31	0.67
Indeno(1,2,3-cd)pyrene	0.05	1.6	0.65	< 0.05	< 0.05	< 0.05	0.35
Dibenz(a,h)anthracene	0.05	0.50	0.19	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	0.05	2.0	0.76	< 0.05	< 0.05	< 0.05	0.48
Speciated Total 16 PAHs	0.8	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
TPH (C6 - C8)	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	4	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	1	13	11	11	< 1.0	4.5	11
TPH (C21 - C35)	1	25	22	61	< 1.0	19	20
TPH Total C6 - C35	10	38	33	72	< 10	23	31

Notes: LOD = Limit of Detection

No ACMs were identified in any of the six soil samples.

No concentrations of VOCs, including chlorinated solvents, were identified at concentrations that exceeded the laboratory detection limit of 0.001 mg/kg. Full details of the analysis undertaken are included on the analytical certificates in Appendix D.

5.0 RISK ASSESSMENT

5.1 Generic Human Health Risk Assessment

5.1.1 Selection of HHACs

To assess the potential significance of the long-term risks to human health posed by substances identified in shallow site soils, a human health GQRA has been undertaken to compare soil data with relevant reference human health assessment criteria (HHACs). If representative concentrations are considered to be significantly above the relevant HHACs, then this would normally trigger further appropriate actions, such as additional investigation, further consideration or risk assessment and/or remediation/mitigation.

Relevant soil HHACs can be selected from the following UK resources/references:

-)] 2015 LQM/CIEH GACs: 'suitable for use levels' (S4UL); latest revision August 2015
-)] Current EA/DEFRA GACs: 'soil guideline values' (SGV)
-)] 2009 EIC GACs; published by CL:AIRE
-)] DEFRA funded C4SLs; revised December 2014
-)] *References are provided in Section 7.0.*

The SGVs, GACs, S4UL, C4SLs have been calculated within the broad contaminated land exposure assessment (CLEA) methodology framework, with amendments to the CLEA approach adopted within the S4UL and C4SL methodologies. These reference based HHACs are typically used within a tiered risk assessment as an initial means to evaluate the likely significance of long term human health risk posed by substances of concern concentrations identified in site soils.

The HHACs are provided for a number of standard land use scenarios and the residential land use without the consumption of home-grown produce (commonly referred to as 'residential use without plant uptake') has been adopted for the redeveloped site use as the best available standard fit with the proposed development comprising dwellings with communal amenity space where vegetables are very unlikely to be grown.

The available GACs (which include SGVs & S4ULs) are scientifically based screening criteria derived using the Agency CLEA computer model in accordance with the CLEA framework. Should soil concentrations be at or below a GAC relevant to the land use, then the long term health risks should be considered minimal/tolerable. The 2015 S4ULs have been adopted in preference to SGVs as the S4ULs reflect appropriate more recent changes to toxicological profiles and exposure conceptual model amendments.

The C4SLs for the Part 2A contaminated land regime have also been published for a number of soil contaminants and land uses and these provide additional soil screening criteria that may be used appropriately within the town and country planning regime. The published C4SLs (and range of provisional C4SLs detailed in the C4SL document appendices) provide criteria that should lie within Category 4, but would be expected to be generally closer to the Category 3/4 boundary than 'low/minimal risk' GACs, i.e. the C4SL describe a 'low' level of risk and are

intended to provide a 'higher simple test' for deciding whether land is suitable for use under the planning regime and definitely not Contaminated Land under Part 2A.

Where available, the 2015 S4ULs have generally been adopted in preference to the published C4SL (with C4SL shown for information) as the S4ULs reflect a lower ('minimal/tolerable' versus 'low') level of risk compared to the C4SL. For lead, the C4SL has been adopted given the absence of a current published UK reference GAC.

The adopted HHAC are presented in Table 3 for a 1% SOM (soil organic matter) in line with the majority of the analysis results for total organic carbon (TOC) and are reported to two/three significant figures. The HHACs selected from the C4SLs are for a 6% SOM soil (the official published values). All of the analytical results have been included in the initial data screening with no consideration of sampling depth, location or lithology.

For TPH, the lowest HHAC for the representative fractions has been selected. The former Health Protection Agency (Ref: 2010) recommended the use of a coal tar benzo-a-pyrene (BaP) surrogate marker approach for assessing carcinogenic/genotoxic risks posed by 8 of the 16 PAHs in soils, but only where there is sufficient confidence that the PAH profile was sufficiently similar to that of coal tar. The eight genotoxic PAHs are: benzo-a-anthracene, BaP, benzo-b-fluoranthene, benzo-ghi-perylene, benzo-k-fluoranthene, chrysene, dibenzo-ah-anthracene, fluoranthene, fluorene and indeno-123-cd-pyrene (8-PAHs). Given the historical site uses, the coal tar surrogate approach is not considered appropriate and individual HHACs have been adopted for the eight genotoxic PAHs.

For cyanide species, easily liberatable (free) cyanide is the primary cyanide species of concern. Where both easily liberatable (free) and total cyanide results are available, only easily liberatable (free) cyanide results would normally be compared against the HHAC. Where only total cyanide results are available, using the cyanide HHAC is considered very conservative as it is based on acute risks posed easily liberatable (free) cyanide. The cyanide HHAC is based on a precautionary approach for acute risk using the EA/DEFRA Tox-5 free (easily liberatable) toxicological data and CLEA receptor weight. The acute risk HHAC assumes intake of a 3 g soil bolus containing the equivalent of the Tox 5 TDSI (TDI less MDI by kg body weight). The acute risk HHAC is then given by $TDSI \times child\ body\ weight / (soil\ intake\ (kg/day))$.

The selected phenol HHAC considers potential acute risk exposures. Total Sulphate, pH and TOC are not of concern for chronic human health and do not require HHACs. The asbestos 'GAC' (minimal risk level) been taken as 'not-identified' (or <0.001% where quantified).

It is important that the HHACs are used carefully when comparing with site data and that their use appropriately takes into account the adopted sampling strategy. The HHACs are typically compared to average or representative source/averaging-area concentrations, rather than maximum or isolated elevated/peak levels. Where a HHAC represents a very low concentration (e.g. near to or less than method detection limit), due consideration should be given to adopting the method detection limit or other practical/pragmatic target as the HHAC. Background levels in the area may also need to taken into account when using the HHAC.

The references for the adopted HHACs are presented in Section 7.0.

5.1.2 Data Comparison with HHACs

A comparison of the site analytical data for all of the six samples recovered with the adopted HHAC is presented in Table 3.

Table 3: Comparison of Soils Data with Adopted HHACs in mg/kg

Substance	No. Analysed	HHAC Residential With Plant Uptake	Source	Data Comparison with HHAC
Arsenic	6	S4UL 40; C4SL 40	S4UL & C4SL	All <HHAC
Cadmium	6	S4UL 85; C4SL 150	S4UL & C4SL	All <HHAC
Chromium	6	910	S4UL	All <HHAC
Copper	6	7,100	S4UL	All <HHAC
Lead	6	C4SL 310	C4SL	1 sample >HHAC
Inorganic Mercury	6	56	S4UL	All <HHAC
Nickel	6	180	S4UL	All <HHAC
Selenium	6	430	S4UL	All <HHAC
Vanadium	6	1,200	S4UL	All <HHAC
Zinc	6	40,000	S4UL	All <HHAC
Total Cyanide	6	26	Acute	All <HHAC
Asbestos	6	Identified	See Text	All <HHAC
Naphthalene	6	2.3	S4UL	All <HHAC
Acenaphthylene	6	2,900	S4UL	All <HHAC
Acenaphthene	6	3,000	S4UL	All <HHAC
Fluorene	6	2,800	S4UL	All <HHAC
Phenanthrene	6	1,300	S4UL	All <HHAC
Anthracene	6	31,000	S4UL	All <HHAC
Fluoranthene	6	1,500	S4UL	All <HHAC
Pyrene	6	3,700	S4UL	All <HHAC
Benzo(a)anthracene	6	11	S4UL	All <HHAC
Chrysene	6	30	S4UL	All <HHAC
Benzo(b)fluoranthene	6	3.9	S4UL	All <HHAC
Benzo(k)fluoranthene	6	110	S4UL	All <HHAC
Benzo(a)pyrene	6	S4UL 3.2; C4SL 5.3	S4UL & C4SL	All <HHAC
Indeno(1,2,3-cd)pyrene	6	45	S4UL	All <HHAC
Dibenzo(a,h)anthracene	6	0.31	S4UL	All <HHAC
Benzo(ghi)perylene	6	360	S4UL	All <HHAC
Total Phenols	6	440	S4UL	All <HHAC
TPH (C6 - C8)	6	42 (aliphatic TPH C5 - C7)	S4UL*	All <HHAC
TPH (C8 - C10)	6	27 (aliphatic TPH C8 - C10)	S4UL*	All <HHAC
TPH (C10 - C12)	6	130 (aliphatic TPH C10 - 12)	S4UL*	All <HHAC
TPH (C12 - C16)	6	1100 (aliphatic TPH C12 - C16)	S4UL*	All <HHAC
TPH (C16 - C21)	6	1900 (aromatic TPH C16 - C21)	S4UL*	All <HHAC
TPH (C21 - C35)	6	1900 (aromatic TPH C21 - 35)	S4UL*	All <HHAC

* Analysis results have been compared against the aliphatic OR aromatic HHAC, whichever is lower; DL = Detection Limit

The screening criteria were exceeded as follows:

-  The sample from TP-02 (0.3m) was found to contain 320 mg/kg of lead which exceeded the C4SL of 310 mg/kg by 3%.

None of the other samples contained concentrations of contaminants that exceeded the adopted HHACs.

The Phase 1 Conceptual Model detailed in Table 1 identified moderate risks to the future site users via RPLs 1 - 3 set out in Section 2.5 and associated with contaminant exposure via:

-) Direct contact (Ingestion & Dermal)
-) Inhalation of soil dust
-) Internal and external inhalation of organic vapour
-) Migration of organic contaminants into plastic water supply pipes

The analytical results and the data comparison with the selected HHAC suggest that the soils present at the site are unlikely to affect the future site users via these exposure pathways.

The slightly elevated concentration of lead is not considered to represent a significant risk to the future site users. Lead is common in urban soils. The proposed soft landscaped areas at the site will also be further prepared prior to use under provisions detailed in Section 6.2.

Volatile organic contaminants (including chlorinated solvents) have not been identified in the soil samples analysed or via observations during the ground works. Future site residents are unlikely to be exposed to contaminants via the inhalation of organic vapours from site soils or the migration of organic contaminants into plastic water pipes.

No significant biodegradable elements were observed during the trial pitting and are unlikely to be present based on the Phase 1 assessment.

5.2 Controlled Waters Risk Assessment

The Phase 1 investigation identified that the superficial deposits immediately beneath the site are classified as a Secondary A Aquifer and that the bedrock deposits are classified as a Principal Aquifer therefore representing a sensitive groundwater resource. Surface water is not present in the vicinity.

No significant evidence to suggest the presence of ground contamination resulting from the historic site use has been gathered as part of the Phase 2 investigation. The proposed residential use is considered very unlikely to result in significant additional impacts on groundwater in the site vicinity. No further assessment of the potential impacts to controlled waters is considered necessary to facilitate the proposed development at the site.

5.3 Other Considerations

There is the potential for ground conditions between the exploration holes to be different from those encountered during the ground investigation. Should significantly different ground conditions be encountered, then the relevance of recommendations included in this report should be reviewed in the light of new information. Section 6.0 includes a recommendation for a 'discovery strategy' for the development scheme.

Prior to the finalisation of the scheme design, it is also recommended that the proposed design details for the development are discussed with the authority that will be responsible for building control, and if appropriate, the organisation providing warranty for the structures.

6.0 CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

The main objective of the Phase 2 investigation was to assist in the discharge of Condition 10 of the planning permission by identifying the shallow ground conditions and establishing site suitability for residential redevelopment (with respect to land contamination), by determining if the past use of the site had resulted in significant ground contamination issues that could adversely affect future site occupants or the environment.

The ground investigation identified:

-)] Up to 1m of made ground consistent with past development overlying natural deposits primarily comprising sands and gravels that extended to the base of the excavations at up to 2.2m bgl.
-)] No visual or olfactory evidence to suggest the presence of ground contamination.
-)] No groundwater or perched water in any of the excavations.
-)] No concentrations of contaminants in shallow soil samples that are likely to significantly affect the future site users via the identified contaminant exposure pathways.

Extensive use of chlorinated solvents for dry cleaning is very unlikely to have been carried out at the site.

Shallow soils at the site are considered by the developer to be physically unsuitable for use at surface in the proposed landscaped areas. Recommendations for the preparation of future soft landscaped areas are included in Section 6.2.

6.2 Recommendations

With respect to land contamination, Peak Environmental Solutions recommends that the following precautions should be taken at the appropriate stage during the development process:

1. A discovery strategy should be adopted for use during the redevelopment should unexpected impacted made ground deposits and/or natural soils and/or waste deposits be encountered. The strategy should include a protocol for characterising and dealing with any encountered contamination, including liaison with the MCC.
2. If unexpected ground contamination is identified during ground preparation, then works implemented under the Discovery Strategy should be documented in a verification report that should be submitted to MCC for approval.
3. The developer plans to import additional materials for use as surface cover in future soft landscaped areas as a result of the physical un-suitability of the existing shallow soils. The verification approach for the imported materials and the cover system design should be agreed with MCC before materials are imported to site. The approach should ensure that substances in imported shallow soils in exposed areas will not pose an unacceptable risk to human health or other receptors. The requirement for laboratory testing and number

of samples will be dependant on the material supplier(s) and volumes to be imported. (Guidance in *MCC Planning and Contaminated Land Technical Guidance, February 2021* should be followed).

4. New site services should be laid in clean service corridors.
5. Below ground water supply services should comply with industry best practice for site development and the requirements of the water utility company.

Prior to the finalisation of the scheme design, it is also recommended that the proposed design details for the development are discussed with the authority that will be responsible for building control, and if appropriate, the organisation providing warranty for the development.

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FIGURES

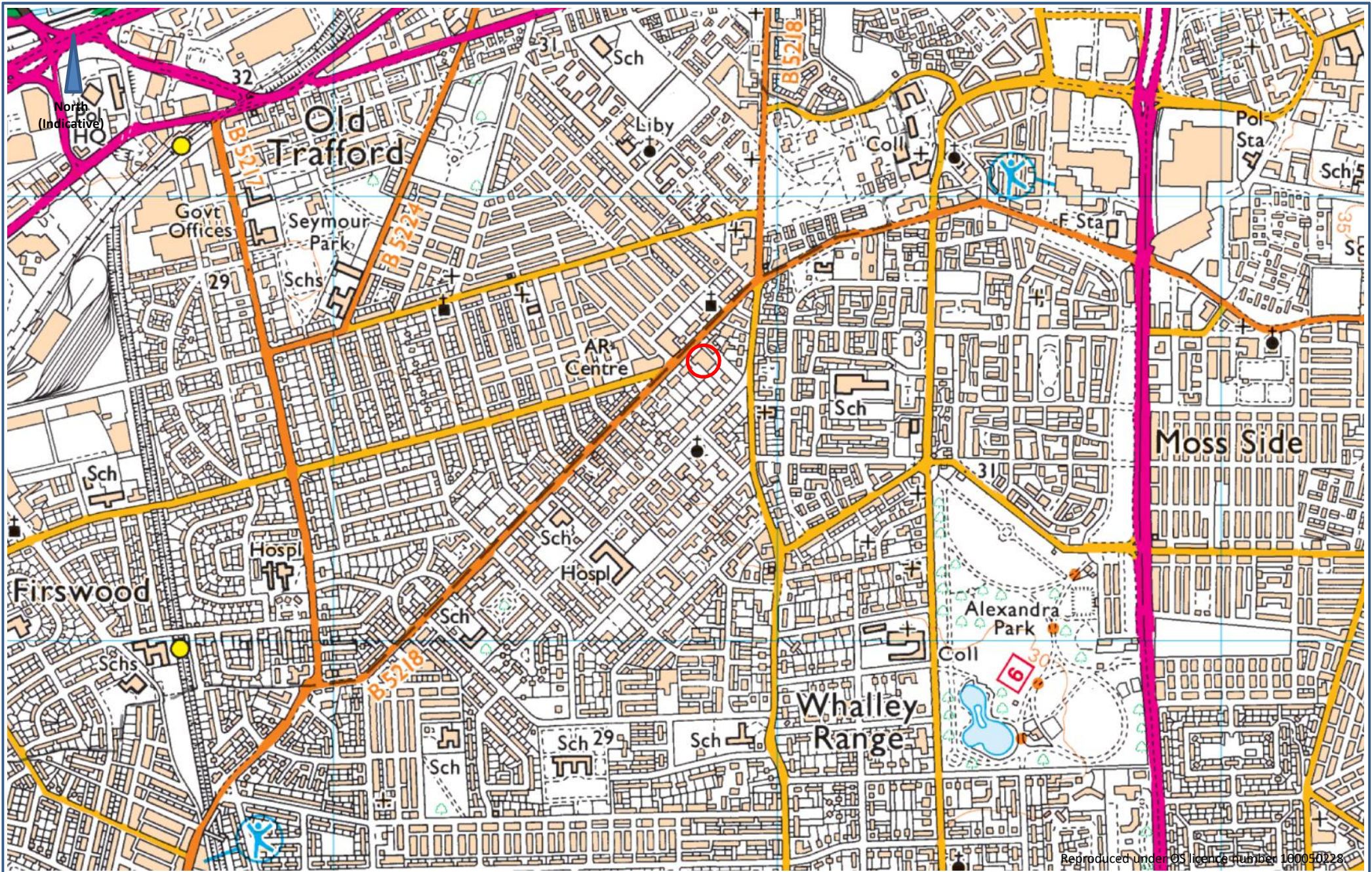


Figure 1 Site Location Plan

○ Site Location

Scale: Not to scale

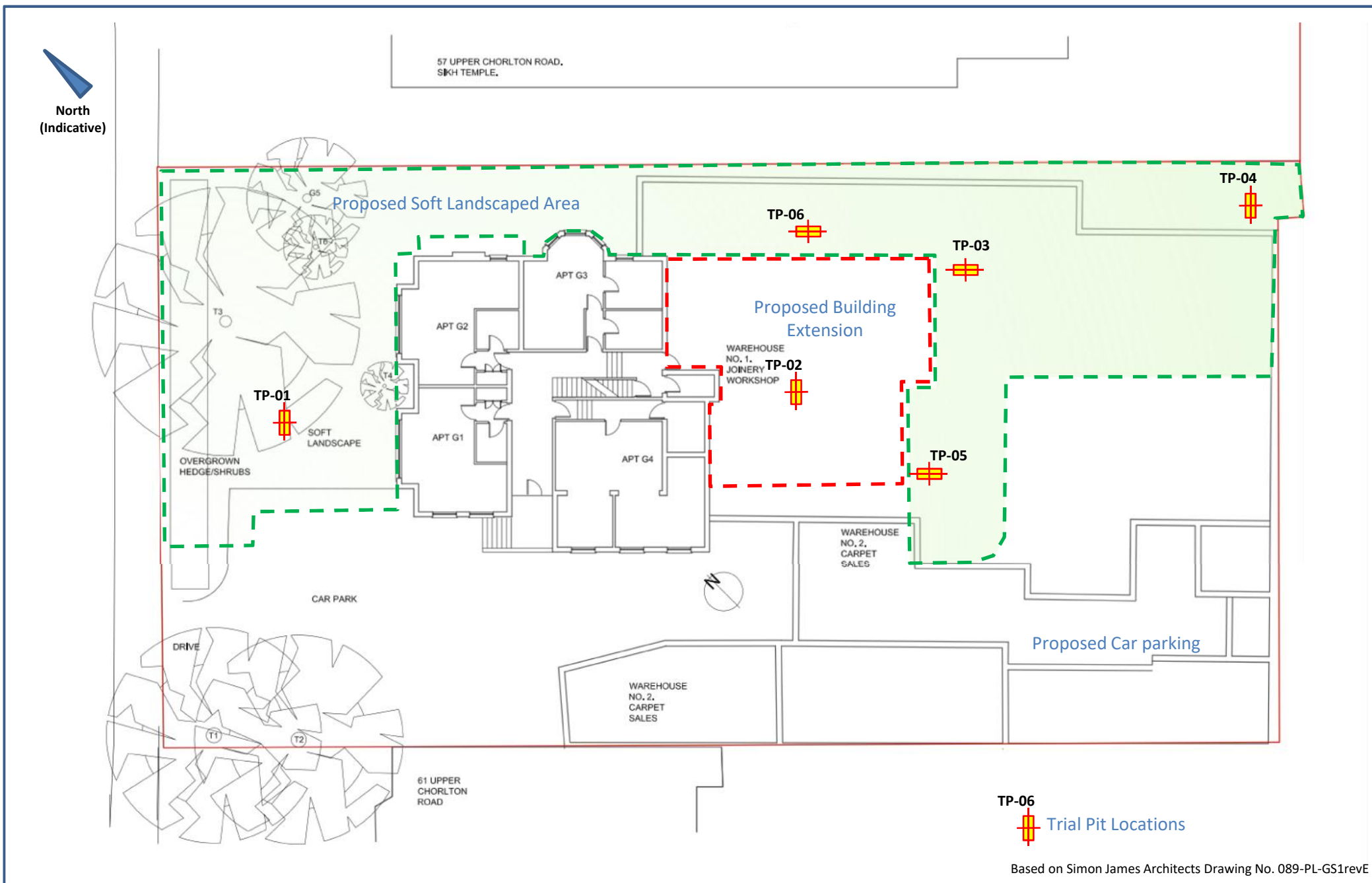


Figure 2 Current and Proposed Development Layout and Trial Pit Locations

Site Boundary (indicative)

Scale: Not to scale

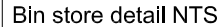
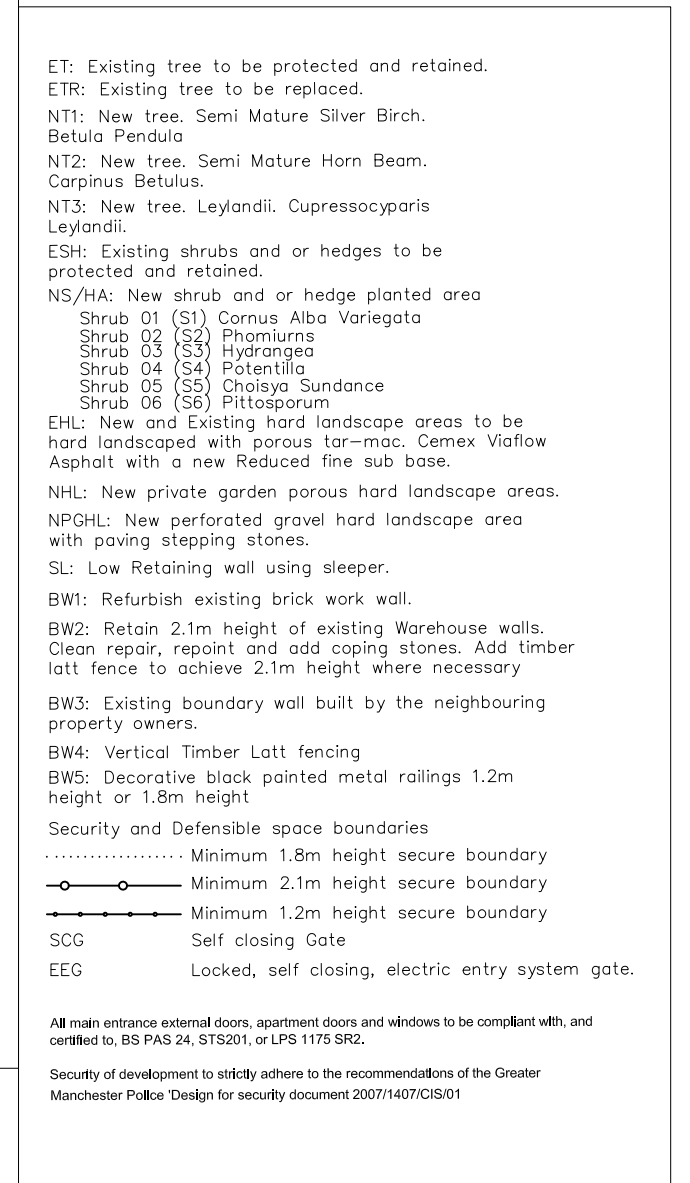


**PEAK ENVIRONMENTAL
SOLUTIONS**

Site: 59 Chorlton Road, Whalley Range, Manchester, M16 7QR

Project: 42173R2

Beechfield, Ninelands Road, Hathersage
Derbyshire, S32 1BJ
Tel: 01433 659071
www.peakenvironmentalsolutions.com



Revision E. 30/09/19. Revised scheme submission .			
PROJECT 59 Upper Chorlton Road, Whalley Range, Manchester.			
SCALE 1 : 200 @ A3		CLIENT David Evans	
DWG No. 089 -PL- GL1revE		DRAWING TITLE	
CONTRACT NO: 089	STAGE CODE Planning	REV. —	Proposed site plan
ISSUED	30/09/19	e	 simon james arq ltd/architects UK: 120 Grosvenor st, Al Saints, Manchester, M1 7HL Spain: Enrique Larreta 1, 4b, Chamartin, Madrid, 29036



Revision E. 30/09/19. Revised scheme submission .

PROJECT			59 Upper Chorlton Road, Whalley Range, Manchester.	
SCALE		1 : 500 @ A4		CLIENT
DWG No.		089 -PL- OS1 revE		David Evans
CONTRACT NO:	STAGE CODE	REV.	DRAWING TITLE	
089	Planning	—	Location plan	
ISSUED	30/09/19	e	 simon james arq ltd/architects UK: 120 Grosvenor st, All Saints, Manchester, M1 7HL Spain: Enrique Larreta 1, 4b, Chamartín, Madrid, 28036	



APPENDICES



APPENDIX A: LIMITATIONS & EXCEPTIONS OF ASSESSMENT

LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

Armistead Property Limited (the Client) has requested that a Phase 2 Site Investigation (the 'Project') be performed at the site. The report (and any copies of it) have been prepared for the sole use and reliance of the Client. This report s (and any copies of it) shall not be relied upon or transferred to any other parties without the express written authorisation of Peak Environmental Solutions limited. If an unauthorised third party comes into possession of this report, (and any copies of it) they rely on it at their peril and the authors owe them no duty of care and skill. Findings and opinions conveyed in the services should only be used by competent persons acting on the behalf of the Client and the findings and opinions conveyed in the services should only be used for the intended use. Copyright of reports & documents remains with Peak Environmental Solutions Limited. The project and report are subject to Peak Environmental Solutions standard terms and conditions.

Authorised or unauthorised copies of this document may come into the possession of organisations that are designated under the Freedom of Information Act 2000 ("the Act"). Such organisations that are designated in the Act are requested by Peak Environmental Solutions to respect the above statements relating to confidentiality and copyright.

The findings and opinions conveyed via this report are based on information obtained from a variety of sources as detailed within this report, and which Peak Environmental Solutions Limited believes are reliable. Nevertheless, Peak Environmental Solutions Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon. The report represents the findings and opinions of experienced geo-environmental consultants. Peak Environmental Solutions Limited does not provide legal advice and the advice of lawyers may also be required.

The opinions presented in this report are based on a review of records, available investigation reports and historical sources. Peak Environmental Solutions Limited has found indicators that suggest that geo-environmental hazards may exist at the site and these may warrant mitigation or consideration appropriate to the end use stated by the Client. Not finding such indicators does not mean that geo-environmental hazards do not exist at the site. In addition, the Risk Assessment did not include any enquiry with respect to substances not included within the substances of concern.

The Client is advised that the geo-environmental conditions stated within reports supplied to Peak Environmental Solutions Limited are subject to change. Certain indicators of the presence of geo-environmental hazards may have been latent at the time of the most recent site reconnaissance and may subsequently have become observable. It is possible that Peak Environmental Solutions research, while fully appropriate for the Project, failed to indicate the existence of important information sources. Assuming such sources actually exist, their information could not have been considered in the formulation of Peak Environmental Solutions findings and opinions.

Certain indicators or evidence of geo-environmental hazards may have been outside the very limited portion of the subsurface investigated or monitored, latent at the time of this work or only partially intercepted by the works and thus their full significance could not have been appreciated. Groundwater levels are particularly susceptible to variations due to seasonal or other effects. Accordingly, it is possible that Peak Environmental Solutions work, whilst fully appropriate for the Project failed to indicate the presence or significance of geo-environmental hazards. Assuming the presence of a hazard, it could not have been considered in the formulation of Peak Environmental Solutions findings and opinions. The subsurface geological profiles and other descriptions are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested.

The geotechnical comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of geotechnical and analytical tests made in the field and laboratory. However, there may be special geotechnical conditions prevailing at the site which have not been disclosed by the investigation and which have not been taken into account in the report. Accordingly, a careful watch should be maintained in any future groundworks and the geotechnical findings and recommendations of this report reviewed, if necessary as work proceeds.

Any interpretation of the results of the Project have been based on the proposed site usage and the findings are not valid should the proposed land use and/or the regulatory regime/guidance change. Where interpretation is based on public domain guidance/protocols/models/software/code, Peak Environmental Solutions is not liable for errors in the guidance/protocols/models/software/code.

Peak Environmental Solutions Limited believes that providing information about limitations is essential to help the Client identify and thereby manage their risks. These risks can be mitigated, but they cannot be eliminated, through additional research. Peak Environmental Solutions Limited will on request, advise the client of the additional research opportunities available, their impact on risk, and their cost.

In preparing this report, it has been assumed that all past and present occupants have provided all relevant and other information, especially relating to known or potential geo-environmental hazards. This report is not required to identify insufficiencies or mistakes in the information provided by the user/owner or from any other source, but has sought to compensate for these where obvious in the light of other information.



APPENDIX B: PHOTOGRAPHS



Photo 1: The north-west of the site in February 2022



Photo 2: The south of the site in February 2022



**PEAK ENVIRONMENTAL
SOLUTIONS**

Site: 59 Chorlton Road, Whalley Range, Manchester, M16 7QR

Project: 42173R1

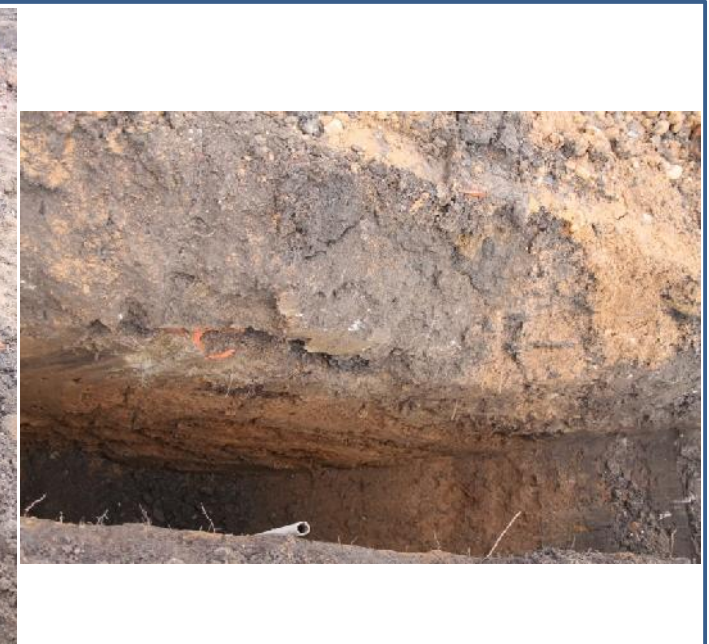
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Photos 3-5: TP-01



Photos 6-7: TP-02



Photos 8-10: TP-03



Photos 11-13: TP-04



Photos 14-16: TP-05



Photos 17-19: TP-06



APPENDIX C: TRIAL PIT LOGS

 PEAK ENVIRONMENTAL SOLUTIONS info@peakenvironmentalsolutions.com www.peakenvironmentalsolutions.com					Peak Environmental Solutions Limited Beechfield Ninelands Road Hathersage Derbyshire S32 1BJ Tel: 01433 659071		Project No 42173		TP-01 Page 1 of 1	
Client: Armitstead Property Project: 59 Upper Chorlton Rd Location: Whalley Range					Date: 09 Feb 2022 Contractor: Client Method: Midi 360		Depth: 1.4 mbgl Length: 1.5 m Width: 0.5 m		Gr Elevation: mDatum TOC Elevation: mDatum Coords: 53.457409 -2.260331	
Depth (mbgl)	Elevation (m)	Samples	Tests/VOCs	SPT N Values	Soil or Rock Field Material Description			Depth (mbgl)	Well Details & Groundwater Levels	
0.0					MADE GROUND. Dark brown silty sand and gravel with pottery, glass, coal and occasional ash.			0		
0.5		D1	Lab							
1.0					Light grey/buff very silty very sandy CLAY with occasional fine to coarse sub angular to rounded gravel.			0.5		
1.5					Base of trial pit.			1.4		
2.0										
2.5										
3.0										
Remarks: 1: Gen Accordance BS5930:2015 2: No hydrocarbon odour 3: Sides stable					4: Dry, no groundwater 5: Coord via GoogleEarthPro 6:		Key: D = Disturbed Sample U = Undisturbed Sample B = Bulk Sample W = Water Sample VOC = PID Volatiles N Value = Stan Pen Test SWL = Standing Water Level		Driller: Client Logged: C Dainton Drawn: C Dainton	
									Checked: C F Dainton Approved: C Dainton	

 PEAK ENVIRONMENTAL SOLUTIONS info@peakenvironmentalsolutions.com www.peakenvironmentalsolutions.com					Peak Environmental Solutions Limited Beechfield Ninelands Road Hathersage Derbyshire S32 1BJ Tel: 01433 659071		Project No 42173		TP-02 Page 1 of 1	
Client: Armitstead Property Project: 59 Upper Chorlton Rd Location: Whalley Range					Date: 09 Feb 2022 Contractor: Client Method: Midi 360		Depth: 2 mbgl Length: 1.5 m Width: 0.5 m		Gr Elevation: mDatum TOC Elevation: mDatum Coords: 53.457245 -2.259998	
Depth (mbgl)	Elevation (m)	Samples	Tests/VOCs	SPT N Values	Soil or Rock Field Material Description		Depth (mbgl)	Well Details & Groundwater Levels		
0.0					MADE GROUND. Dark brown silty sand and gravel with bricks, brick fragments, concrete, occasional pottery and some light grey ash. Light brown/buff clayey silty SAND with sub angular to rounded fine to coarse gravel. Orange brown silty fine to coarse SAND with sub angular to rounded fine to coarse gravel. Base of trial pit.		0			
0.5		D1	Lab				0.7			
1.0							0.9			
1.5										
2.0							2			
2.5										
3.0										
Remarks: 1: Gen Accordance BS5930:2015 2: No hydrocarbon odours 3: Sides stable					4: Dry, no groundwater 5: Coord via GoogleEarthPro 6:		Key: D = Disturbed Sample U = Undisturbed Sample B = Bulk Sample W = Water Sample VOC = PID Volatiles N Value = Stan Pen Test SWL = Standing Water Level		Driller: Client Logged: C Dainton Drawn: C Dainton	
							Checked: C F Dainton Approved: C Dainton			

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Client: Armitstead Property Project: 59 Upper Chorlton Rd Location: Whalley Range					Date: 09 Feb 2022 Contractor: Client Method: Midi 360		Depth: 2.2 mbgl Length: 1.5 m Width: 0.5 m		Gr Elevation: mDatum TOC Elevation: mDatum Coords: 53.457248 -2.259868	
Depth (mbgl)	Elevation (m)	Samples	Tests/VOCs	SPT N Values	Soil or Rock Field Material Description			Depth (mbgl)	Well Details & Groundwater Levels	
0.0					MADE GROUND. Dark brown silty sand and gravel with bricks, brick fragments, concrete. Broken clay pipe at 0.7m			0		
		D1	Lab							
0.5										
					Light brown/buff clayey silty SAND with sub angular to rounded fine to coarse gravel.			0.7		
1.0					Orange brown silty fine to coarse SAND with sub angular to rounded fine to coarse gravel.			0.9		
1.5										
2.0					Base of trial pit.			2.2		
2.5										
3.0										
Remarks: 1: Gen Accordance BS5930:2015 2: No hydrocarbon odours 3: Sides stable					4: Dry, no groundwater 5: Coord via GoogleEarthPro 6:		Key: D = Disturbed Sample U = Undisturbed Sample B = Bulk Sample W = Water Sample VOC = PID Volatiles N Value = Stan Pen Test SWL = Standing Water Level		Driller: Client Logged: C Dainton Drawn: C Dainton	
									Checked: C F Dainton Approved: C Dainton	

 PEAK ENVIRONMENTAL SOLUTIONS info@peakenvironmentalsolutions.com www.peakenvironmentalsolutions.com					Peak Environmental Solutions Limited Beechfield Ninelands Road Hathersage Derbyshire S32 1BJ Tel: 01433 659071		Project No 42173		TP-04 Page 1 of 1	
Client: Armitstead Property Project: 59 Upper Chorlton Rd Location: Whalley Range					Date: 09 Feb 2022 Contractor: Client Method: Midi 360		Depth: 1.6 mbgl Length: 1.5 m Width: 0.5 m		Gr Elevation: mDatum TOC Elevation: mDatum Coords: 53.457164 -2.259667	
Depth (mbgl)	Elevation (m)	Samples	Tests/VOCs	SPT N Values	Soil or Rock Field Material Description			Depth (mbgl)	Well Details & Groundwater Levels	
0.0					MADE GROUND. Dark brown silty sand and gravel with bricks, brick fragments, concrete. Light brown/buff clayey silty SAND with sub angular to rounded fine to coarse gravel. Orange brown silty fine to coarse SAND with sub angular to rounded fine to coarse gravel. Base of trial pit.			0		
0.5		D1	Lab					0.5		
1.0								0.9		
1.5								1.6		
2.0										
2.5										
3.0										
Remarks: 1: Gen Accordance BS5930:2015 2: No hydrocarbon odours 3: Sides stable					4: Dry, no groundwater 5: Coord via GoogleEarthPro 6:		Key: D = Disturbed Sample U = Undisturbed Sample B = Bulk Sample W = Water Sample VOC = PID Volatiles N Value = Stan Pen Test SWL = Standing Water Level		Driller: Client Logged: C Dainton Drawn: C Dainton	
									Checked: C F Dainton Approved: C Dainton	

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Client: Armitstead Property Project: 59 Upper Chorlton Rd Location: Whalley Range					Date: 09 Feb 2022 Contractor: Client Method: Midi 360		Depth: 1.7 mbgl Length: 1.5 m Width: 0.5 m		Gr Elevation: mDatum TOC Elevation: mDatum Coords: 53.457168 -2.259987		
Depth (mbgl)	Elevation (m)	Samples	Tests/VOCs	SPT N Values	Soil or Rock Field Material Description				Depth (mbgl)	Well Details & Groundwater Levels	
0.0					MADE GROUND. Dark brown silty sand and gravel with bricks, brick fragments and concrete. Brick pillar in and wall in the SW of pit extending to ~0.8 mbgl.				0		
0.5		D1	Lab								
1.0					Orange brown silty fine to coarse SAND with sub angular to rounded fine to coarse gravel.				1		
1.5											
2.0					Base of trial pit.				1.7		
2.5											
3.0											
Remarks: 1: Gen Accordance BS5930:2015 2: No hydrocarbon odours 3: Sides stable					Key: D = Disturbed Sample U = Undisturbed Sample B = Bulk Sample		W = Water Sample VOC = PID Volatiles N Value = Stan Pen Test SWL = Standing Water Level		Driller: Client Logged: C Dainton Drawn: C Dainton		Checked: C F Dainton Approved: C Dainton

 PEAK ENVIRONMENTAL SOLUTIONS info@peakenvironmentalsolutions.com www.peakenvironmentalsolutions.com					Peak Environmental Solutions Limited Beechfield Ninelands Road Hathersage Derbyshire S32 1BJ Tel: 01433 659071		Project No 42173		TP-06 Page 1 of 1	
Client: Armitstead Property Project: 59 Upper Chorlton Rd Location: Whalley Range					Date: 09 Feb 2022 Contractor: Client Method: Midi 360		Depth: 2.1 mbgl Length: 1.5 m Width: 0.5 m		Gr Elevation: mDatum TOC Elevation: mDatum Coords: 53.457311 -2.259928	
Depth (mbgl)	Elevation (m)	Samples	Tests/VOCs	SPT N Values	Soil or Rock Field Material Description		Depth (mbgl)	Well Details & Groundwater Levels		
0.0					MADE GROUND. Dark brown silty sand and gravel with bricks, brick fragments, concrete, occasional pottery. Light brown/buff clayey silty SAND with sub angular to rounded fine to coarse gravel. Orange brown silty fine to coarse SAND with sub angular to rounded fine to coarse gravel. Base of trial pit.		0			
0.5		D1	Lab				0.7			
1.0							0.9			
1.5							2.1			
2.0										
2.5										
3.0										
Remarks: 1: Gen Accordance BS5930:2015 2: No hydrocarbon odours 3: Sides stable					4: Dry, no groundwater 5: Coord via GoogleEarthPro 6:		Key: D = Disturbed Sample U = Undisturbed Sample B = Bulk Sample W = Water Sample VOC = PID Volatiles N Value = Stan Pen Test SWL = Standing Water Level		Driller: Client Logged: C Dainton Drawn: C Dainton	
							Checked: C F Dainton Approved: C Dainton			



APPENDIX D: LABORATORY ANALYSIS CERTIFICATES

**Clare Dainton**

Peak Environmental Solutions
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Analytical Report Number : 22-39476

Project / Site name:	59 Upper Chorlton Road, Whalley Range	Samples received on:	11/02/2022
Your job number:	42173	Samples instructed on/ Analysis started on:	11/02/2022
Your order number:	42173	Analysis completed by:	22/02/2022
Report Issue Number:	1	Report issued on:	22/02/2022
Samples Analysed:	6 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

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.

Analytical Report Number: 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Your Order No: 42173

Lab Sample Number				2171798	2171799	2171800	2171801	2171802
Sample Reference				TP-01	TP-02	TP-03	TP-04	TP-05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30	0.40	0.40
Date Sampled				09/02/2022	09/02/2022	09/02/2022	09/02/2022	09/02/2022
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	18	15	16	13	16
Total mass of sample received	kg	0.001	NONE	0.30	0.30	0.30	0.30	0.30

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	8.2	7.3	7.5	7.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	290	450	2300	980	850
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.5	1.4	2.5	2.7	2.7

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.24	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.83	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.45	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.7	0.79	0.43	< 0.05	0.29
Anthracene	mg/kg	0.05	MCERTS	0.81	0.20	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	6.9	2.3	0.54	< 0.05	0.52
Pyrene	mg/kg	0.05	MCERTS	6.7	2.2	0.56	< 0.05	0.54
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.6	1.4	0.37	< 0.05	0.31
Chrysene	mg/kg	0.05	MCERTS	3.2	1.0	0.28	< 0.05	0.29
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.5	1.3	0.36	< 0.05	0.30
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.2	0.41	0.18	< 0.05	0.18
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.1	1.2	0.37	< 0.05	0.31
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.6	0.65	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.50	0.19	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.0	0.76	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	38.9	12.6	3.09	< 0.80	2.74
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	12	25	8.7	9.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	15	19	18	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	58	37	46	27	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	140	320	130	53	90
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.8	0.7	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	14	21	13	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26	21	30	23	27
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	60	63	40	63

Analytical Report Number: 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Your Order No: 42173

Lab Sample Number				2171798	2171799	2171800	2171801	2171802
Sample Reference				TP-01	TP-02	TP-03	TP-04	TP-05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30	0.40	0.40
Date Sampled				09/02/2022	09/02/2022	09/02/2022	09/02/2022	09/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	13	11	11	< 1.0	4.5
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	25	22	61	< 1.0	19
TPH Total C6 - C35 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	38	33	72	< 10	23

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
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-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

Analytical Report Number: 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Your Order No: 42173

Lab Sample Number				2171798	2171799	2171800	2171801	2171802
Sample Reference				TP-01	TP-02	TP-03	TP-04	TP-05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.50	0.30	0.40	0.40
Date Sampled				09/02/2022	09/02/2022	09/02/2022	09/02/2022	09/02/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
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

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

Analytical Report Number: 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Your Order No: 42173

Lab Sample Number				2171803
Sample Reference				TP-06
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	12
Total mass of sample received	kg	0.001	NONE	0.30

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8
Total Cyanide	mg/kg	1	MCERTS	4.3
Total Sulphate as SO ₄	mg/kg	50	MCERTS	880
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.5

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.59
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.2
Pyrene	mg/kg	0.05	MCERTS	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.80
Chrysene	mg/kg	0.05	MCERTS	0.60
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.61
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.44
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.67
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.35
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.48

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.98
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	59
Lead (aqua regia extractable)	mg/kg	1	MCERTS	270
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	97

Analytical Report Number: 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Your Order No: 42173

Lab Sample Number				2171803
Sample Reference				TP-06
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Petroleum Hydrocarbons				
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	MCERTS	< 0.1
TPH (C10 - C12) EH_ID_TOTAL	mg/kg	2	MCERTS	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	MCERTS	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	11
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	20
TPH Total C6 - C35 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	31

VOCs

Chloromethane	µg/kg	1	ISO 17025	< 1.0
Chloroethane	µg/kg	1	NONE	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0
Vinyl Chloride	µg/kg	1	NONE	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0
1,1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0
Tetrachloroethene	µg/kg	1	NONE	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0
Tribromomethane	µg/kg	1	NONE	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0

Analytical Report Number: 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Your Order No: 42173

Lab Sample Number				2171803
Sample Reference				TP-06
Sample Number				None Supplied
Depth (m)				0.40
Date Sampled				09/02/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0
Butylbenzene	µg/kg	1	MCERTS	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0

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

Analytical Report Number : 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

* 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 *
2171798	TP-01	None Supplied	0.5	Brown clay and loam with gravel and vegetation.
2171799	TP-02	None Supplied	0.5	Brown loam and sand with gravel and brick.
2171800	TP-03	None Supplied	0.3	Brown loam and sand with gravel and brick.
2171801	TP-04	None Supplied	0.4	Brown loam and clay with vegetation and gravel
2171802	TP-05	None Supplied	0.4	Brown loam and clay with vegetation and gravel
2171803	TP-06	None Supplied	0.4	Brown loam and clay with vegetation and gravel

Analytical Report Number : 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
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
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
Total sulphate (as SO ₄ 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
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
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE

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.

Analytical Report Number : 22-39476

Project / Site name: 59 Upper Chorlton Road, Whalley Range

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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