REMEDIATION STRATEGY
FOR LAND AT
PLANT HILL ROAD
BLACKLEY
MANCHESTER

Prepared for: -

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From herein after GeoCon Site Investigations Ltd will be referred to as GeoCon.

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1.0 INTRODUCTION

1.1 Instruction

1.1.1 GeoCon Site Investigations Ltd (GeoCon) have been commissioned by R.P Tyson Construction Ltd to develop a Remediation Strategy on land at Plant Hill Road, Blackley, Manchester.

1.1.2 It is understood that development proposals comprise the development of thirteen detached two storey masonry residential properties and eight semi-detached two storey masonry residential properties at the site, which includes the demolition of existing structures on site.

1.2 Previous Surveys

1.2.1 Previous assessments conducted upon the site comprise the following, which should be read in conjunction with this strategy:

- Curtins Phase I Preliminary Risk Assessment' dated May 2021, referenced 077873-CUR-00-XX-RRP-GE-014.
- GeoCon report dated November 2023, referenced GSI 1941 MP PII Report V2, and entitled 'Phase II Site Investigation Report'.

1.3 Objectives

1.3.1 The objectives of this remediation strategy are as follows:

- To outline the remedial strategy proposed at the site and the proposed verification strategy for agreement by the Local Planning Authority (LPA).

1.4 Limitations

1.4.1 The assessment and interpretation of the factual data obtained as part of this report has been undertaken in accordance with standard consulting practise and with current national and international guidance.

1.4.2 This report presents the observations made during the geoenvironmental site investigations and the factual data obtained. The conclusions and recommendations in this report are limited to those which can be made based on the findings of the survey and information provided by third parties. GeoCon assumes all third-party data to be true and correct. No responsibility can be accepted by GeoCon for inaccuracies in the information provided by any other party.

1.4.3 This report is written in the context of an agreed scope of works and should not be used in a different context. Furthermore, new information, improved practises, and changes in legislation may require the reinterpretation of the report in whole or in part after its original issue. GeoCon reserve the right to alter their conclusions and recommendations in the light of further information that may become available. This report is provided for the sole use of the client and their professional advisers and is confidential to them unless agreed otherwise in writing.

1.4.4 Ground conditions can be variable and change rapidly, especially in areas of Made Ground, however it is assumed that the ground conditions encountered and observed are typical and representative of the site as a whole. Most specifically with regard to this limited investigation, the ground conditions have

been determined from a limited number of exploratory holes formed across the site, therefore only a small percentage of the total area of the site has been investigated. Interpolation between exploratory holes has enabled a general picture of the subsurface conditions to be produced. Conclusions drawn from the ground investigation should be read in this context. GeoCon cannot accept responsibility for any situations resulting from locally unforeseen ground conditions occurring between exploratory holes.

1.4.5 In addition, subsurface conditions including contaminant concentrations and groundwater levels may vary spatially with time. This factor should be given due consideration in the event that the information contained within this report is used after any significant period of time has elapsed.

2.0 SITE LOCATION AND DESCRIPTION

2.1.1 The site is located at the former police station on Plant Hill Road, Blackley, Manchester at approximate National Grid Reference NGR: SD 85190:03449 (centre of the site).

2.1.2 A site location plan is presented as Drawing No. GSI 2209/01 in Appendix A.

2.2 Site Description

2.2.1 The site description below is based on site conditions during the Phase II site investigation, however this may differ if any demolition or enabling works have been undertaken at site since.

2.2.2 The site is an irregular shaped piece of land with an approximate area of 0.19Ha.

2.2.3 The topography of the site is generally flat with localised undulations. Surrounding elevation slightly decreases towards the north.

2.2.4 The site is currently occupied by a derelict former police station with mixed hardstanding and soft landscaping overgrown with grass and shrubs. One storey building is located in the east of site which at the time of the walkover was boarded up. Underground tanks can be seen in the southwest of site

Table 2.1: Site Surface Covering

Type of Surface Cover	Distribution (%)
Soft Ground (grassed and landscaped areas)	10
Hardstanding	50
Roadways	-
Buildings	40
Water (ponds, streams)	-

2.2.5 The site is bound by Bank House Road to the east, Plant Hill Road in the south. The north is bound by a bricked wall separating the primary school and site. A one storey building separates the western boundary of site and adjacent mature tree line.

2.2.6 Access to the site is via Plant Hill Road from the south through two double metal padlocked gates.

2.3 Surrounding Area

2.3.1 The current surrounding land use to the site is generally a mixture of residential and commercial properties towards the north and west. Mature forest and playing fields south and east of site.

2.3.2 The topography of the surrounding area is generally flat; contour maps show a slight decline in elevation to the south east.

2.4 Future Site Usage

2.4.1 It is currently proposed to construct 21 housing units including a mixture of 1 bed 2 person units and 2 bed 3 person units: Development at the site includes a partial demolition of the existing police station on site, as shown on drawing (ref: E1236 – Plant Hill Road, Manchester) and contained with Appendix A.

3.0 BACKGROUND

3.1 General

3.1.1 The initial Phase I assessment identified historical landfills at significant distances from site and also an infilled water course. The site itself also has historical use so a risk to human health was identified as a being potentially present.

3.1.2 The intrusive Phase II Site Investigation was carried out by GeoCon between 30th and 31st August 2023, consisting of Ten Dynamic Sample boreholes drilled at the site (referenced DS01 to DS10) to depths of between 1.00 and 5.45mbgl.

3.1.3 Four of the Dynamic Sample boreholes were installed with combined gas and groundwater monitoring standpipes, with the monitoring period carried between 8th September and 5th July 2021.

3.2 Encountered Geology

3.2.1 A generalised summary of the ground conditions encountered, depths to base, and thickness recorded from the exploratory hole records is presented below Table 3.1.

Table 3.1: Summary of Ground Conditions

Geology / Strata	Depth (mbgl)				Thickness (m)		Locations encountered
	Top		Base		Min	Max	
	Min	Max	Min	Max			
Made Ground	0.00	-	0.30	1.00	0.30	1.00	All Exploratory Locations
Till	0.30	1.00	4.45	5.45	3.45	5.15	DS01, DS03, DS04, DS05, DS06, DS07, DS08, DS09, DS10
Groundwater	**Strike depth (mbgl)**		**Rest Level (mbgl)**		**Locations encountered**		
	Min	**Max**	**Min**	**Max**			
Seepage	-	-	-	-	Not encountered		
Strike	1.00	2.00	-	-	DS01, DS02, DS05, DS06, DS07, DS08, DS09, DS10		
SWL only (no obvious strike)	-	-	-	-	Not encountered		

3.2.2 Made Ground was encountered in DS01 to DS08 exploratory hole locations from ground level to depths of between, 0.30 and 1.00mbgl.

3.2.3 Topsoil was encountered in DS09 and DS10 from ground level to depths of 0.10 mbgl, and generally comprised sandy gravelly clay, with frequent rootlets.

3.2.4 Clay deposits were encountered in all locations, with exception of DS02, directly beneath the made ground or sand deposits and were unproven to depths of between 0.50 and 5.45mbgl, and generally comprised soft to very stiff sandy gravelly clay.

3.2.5 Sand deposits were encountered in DS01, DS09, DS10 directly beneath the clay or made ground deposits and were proven to depths of between 0.30 and 5.45mbgl, and generally comprised medium dense gravelly sand.

3.3 Risks to Human Health

3.3.1 Given the proposed development of 21 housing units at the site all chemical results have initially been compared against screening criteria for a residential end use with plant uptake.

3.3.2 Seven soil samples were tested for a Metals, Asbestos, PAHs with four of the samples also tested for TPH-CWG suites.

3.3.3 No visual or olfactory evidence of contamination was encountered or observed during this ground investigation, in particular no obvious visual or olfactory evidence of mobile contamination was observed during the ground investigation.

3.3.4 Concentrations of contaminants reported above the screening criteria are presented in Table 3.2

Table 3.2: Summary of Soil Chemical Testing Results

Determinand	No. Of samples analysed	Screening value (mg/kg) (where applicable)	Determinand concentration range (mg/kg)		Samples exceeding screening value
			Min	Max	
Lead	7	210	13	310	DS03, DS06 &, DS07,

3.3.5 Seven samples were analysed for asbestos screen. Asbestos fibres were detected in one sample taken from DS03 at 0.40 mbgl.

3.3.6 Impacted soils indicated by chemical testing indicate that shallow Made Ground, encountered beneath the site to depths ranging between 0.30 and 0.70m, is affected by contamination. The Phase II site investigation therefore identified a moderate risk to site users and adjacent neighbours, and a low to moderate risk to construction workers, with remedial action required.

3.4 Risk to Controlled Waters

Groundwater

3.4.1 The Environmental Agency aquifer classification scheme indicates that the superficial aquifer designation for the site is classed as Secondary Undifferentiated Aquifer and the bedrock aquifer designation for the site is classed as Secondary B Aquifer.

3.4.2 There are no licensed groundwater abstraction points within 1000m of the site.

3.4.3 The site is not located within a source protection zone (SPZ).

3.4.4 Therefore, the Phase II's Conceptual Site Model indicated the risks to groundwater and drinking waters are considered to be **very low** at this stage.

Surface Water

3.4.5 There are no major surface water courses within 250m of the site.

3.4.6 The nearest surface water feature to the site is unnamed body of water located approximately 154m to the southwest. The water source located a steady decline in elevation from site.

3.4.7 Therefore, the Phase II's Conceptual Site Model indicated the risks to surface waters are considered to be **very low**.

3.5 Risks from Ground Gas

3.5.1 There are two historical landfill sites within 50m of the site boundary. There is an area of potentially infilled land located within 41m of the site.

3.5.2 Made Ground was also encountered beneath the site and was proven to depths of up to 1.00mbgl.

3.5.3 Gas monitoring has been carried out on six occasions over a three-month period to assess the risks to the proposed residential development from potential hazardous ground gasses.

3.5.4 Based on the findings of the Phase II site investigation and subsequent monitoring, the site has been categorised as falling under Characteristic Situation (CS2) low risk, with gas protection measures required.

4.0 REMEDIATION OUTLINE

4.1.1 The aim of this Remediation Strategy is to minimize risk to identified receptors. The following receptors have been identified:

- Future end users,
- Construction Workers,

4.1.2 Sources of contamination have been identified as the following:

Soils:

- Concentrations above guideline values of Lead within the Made Ground. And localised asbestos fibres.

Ground Gas

- Based on the gas monitoring information the site was categorised as falling under Characteristic Situation (CS)2 – Low Risk with gas protection measures required in the construction of new dwellings.

4.1.3 The investigation to date has been point specific, therefore there is potential for further contamination to be present on site in those areas not previously tested.

4.1.4 Based on the contamination profile identified and the proposed end use of the site, in order to meet the needs of this Remediation Strategy the recommendations as set out in Section 5.0 below are considered the appropriate approach.

5.0 REMEDIATION STRATEGY

5.1 Aims

5.1.1 The aims of this remediation strategy are the following:

- Resolve any identified contamination issues in order to protect human and environmental receptors and render the site suitable for the proposed development with respect to the National Planning Policy Framework (NPPF).
- Render the site as unlikely to be defined as Contaminated Land as defined under Part 2A of the EPA.

5.2 Construction Activities

5.2.1 During the construction works, especially the groundworks, construction workers will be subject to an elevated level of risk.

5.2.2 As such, all personnel on site will comply with guidance provided in the Health and Safety Executive (HSE) document "Protection of Workers and the general public during the redevelopment of potentially Contaminated Land". In summary, the following should be provided by the appointed contractor:

- All staff to be suitably trained and competent.
- Protective clothing, footwear, glasses, suitable dust masks and gloves. (Personnel should be instructed in why and how they are to be used).
- Hand-washing, eye-washing and boot-washing facilities.
- Damp down all exposed soils on site.
- Smoking shall be limited to designated areas.

5.3 Removal of Below Ground Obstructions

5.3.1 Obstructions in the form of relic foundations and infrastructure may be found on site during groundworks.

5.3.2 Where relict structures are found to retain fluid contaminants, they shall be drained and removed from site. The engineer should be notified to ensure that the appropriate action is taken, and records made for final validation.

5.3.3 Deep excavations for the removal of structures etc. will be unstable in the short term and side support may be necessary.

5.3.4 Suitable materials derived from the grubbing-up shall be stored in a location on site, to be agreed with the engineer, prior to crushing. Any unsuitable materials shall be removed to a suitable licensed landfill site as stipulated within the Materials Management Plan.

5.4 Contaminated Soils

Human Health

5.4.1 Remedial measures are required with respect the new development.

5.4.2 In areas of the site where buildings and hardstanding are proposed the Made Ground can be left insitu as the buildings and hardstanding areas will break the 'pollutant linkage' and remove the pathway for contamination and come in to contact with the end users.

5.4.3 However, remedial measures are required with respect to any intended landscaped areas associated with the new construction. It is considered removal of a minimum of 600mm of Made Ground (or until natural strata where the Made Ground is <600mm thick) would reduce the risk to human health, by importing and providing a clean cover system in accordance with BRE Cover Systems for Land Regeneration which would reduce the risk to human health.

5.4.4 At this stage as a minimum, the Made Ground materials should be removed from site in accordance with BRE Cover systems for land regeneration 2004. This document recommends that based on the soil testing results, up to 600 mm of Made Ground below proposed formation level should be removed from site and replaced with clean inert materials comprising of clean inert imported topsoil material in line with BS 3882: 2015 Specification for topsoil.

5.4.5 During removal, it is recommended that a watching brief is present on site to record and validate the removal of materials.

5.4.6 Excavations should not be left open for longer than necessary, should be safely battered back and should be securely cordoned-off using 2.00m high safety fencing, with appropriate warning signs whenever excavations works are suspended

5.5 Export to Landfill

5.5.1 Any material exported from the site to landfill should be hauled by a registered waste carrier in accordance with the requirements of the Duty of Care Regulations, 1991 and the Landfill (England and Wales) Regulations 2005.

5.5.2 A transfer note should be completed, signed and retained by the parties involved.

5.5.3 All hazardous waste going for disposal at landfills must be classified according to the new European Waste Catalogue (EWC).

5.5.4 A Hazardous Waste Assessment should be carried out on any materials requiring removal and disposal from site. Waste Acceptance Criteria (WAC) testing may also be required and the results of the Hazardous Waste Assessment and WAC testing (if appropriate) should be presented to the landfill operator for their confirmation of waste category.

5.6 Dust Control

5.6.1 At all times during the excavation works, Best Practicable Means shall be employed to minimise dust and odour generation and their emission off site.

5.7 Previously Unidentified Contaminants

5.7.1 Should any suspected contaminated materials other than those detailed in this and previous reports be encountered during the re-development, then it should be excavated and stockpiled on an impermeable material and sampled and tested for an appropriate range of determinants.

5.7.2 Should any visual or olfactory evidence of contamination be identified during the removal of below ground obstructions and the turning over of Made Ground appropriate samples shall be taken by the Engineer for chemical analysis. The Engineer shall check the nature of materials excavated for visual and

olfactory evidence of hydrocarbon contamination throughout the remedial works. Depending on the results, the excavated materials shall either be returned to the works beneath the proposed cover system or disposed of, off-site to a suitable licensed facility.

5.7.3 Any grossly contaminated soil/fill found during construction works shall be placed in temporary stockpiles on hardstanding or high density Visqueen and be suitability covered to minimize the potential for dust/odour nuisance and prevent surface water runoff. Samples of arisings material will be taken to determine whether this material is suitable for re-use on site following crushing in line with the earthwork specification.

5.7.4 Once the laboratory analysis of the material is available an assessment should be undertaken to determine whether it can be retained on-site as part of the Material Management Plan or whether it should be disposed off-site.

5.7.5 Depending on the nature of any such impact it may be necessary to undertake validation testing of the excavation faces in order to demonstrate that no such materials are left in-situ.

5.8 Gas Protection Measures

5.8.1 This site has been categorised as falling under Characteristic Situation (CS) 2 – low risk.

5.8.2 BS 8485:2015+A1:2019 recommends a point system for protection measures. The proposed development would class as building type A, and therefore this development would require a total of 3.5 points. BS 8485:2015 provides details of the different options that can be used in order to make up the required points which include a combination of a structural barrier, ventilation measures and gas resistant membrane.

5.8.3 A gas membrane is required to be incorporated into the design in order to meet this requirement.

5.8.4 The gas resistant membrane should be designed to meet all of the following criteria:

- Sufficiently impervious to the gases with a methane transmission rate of <40.0 ml/day/m2/atm.
- Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions.
- Sufficiently strong to withstand in service stresses.
- Sufficiently strong to withstand the installation process and following trades until covered.
- Capable after installation of providing a complete barrier to the entry of the relevant gas.
- And, verified in accordance with CIRIA C735

5.8.5 Any structural barrier should have appropriate grading of waterproofing to afford further points of gas protection. The designer should also incorporate appropriate ventilation to account for the 3.5 points required.

5.9 Drainage and Services Installations

5.9.1 It is recommended that statutory services are consulted at an early stage, with respect to the ground conditions within which they will lay services, in order to enable them to assess if any protection measures are required.

5.9.2 Underground services, comprising BT Lines, gas mains, combined and foul sewers, CCTV and possible fibre optic cables may all impact the site and the design team and Client should familiarise themselves with their presence.

5.9.3 All drainage installations are anticipated to encounter Made Ground. Any suitable Made Ground arisings from drainage trenches etc., if not returned to the original excavation must be placed beneath proposed hard end-use areas of the site, placed beneath a cover of suitable thickness in garden and landscaped areas, or disposed off-site adhering to the guidelines outlined above.

5.10 Soakaway Drainage

5.10.1 Should soakaways be utilised at the site, these should not be placed within significantly contaminated Made Ground, thereby preventing the potential for leachate generation.

5.11 Materials Management Plan

5.11.1 The Materials Management Plan should allow for remediation of the site soils in the landscaped areas during the appropriate phase of the works.

5.11.2 The Materials Management Plan should also refer to this strategy in respect to:

- Materials arising from the encountering of previously unidentified contamination.
- Materials arising from the removal of below ground obstructions.
- Control of water.
- Contamination related Health and Safety issues, including dust control.

5.11.3 GeoCon does not provide advice on Materials Management Plans, expert advice should be sought.

6.0 VALIDATION

6.1.1 Validation chemical testing should be provided by the supplier of any capping material to be imported to confirm its suitability for use on site. All soil imported should be certified prior to import to be suitable for use as BS2883:2015 compliant for topsoil.

6.1.2 Irrespective of the above, all materials to be used within soft landscaping areas, irrespective of its source, should be independently tested for its chemical composition in terms of soil contamination as identified in Section 6.1.3 below.

6.1.3 GeoCon has adopted the approach as identified in the YALPAG Verification Requirements for Cover Systems: Technical Guidance for Developers, Landowners and Consultants: Version 4.1 – June 2021 in its verification process. The minimum analysis to be undertaken on materials for use within the cover system is detailed in Table 6.1 below.

Table 6.1: Proposed Testing frequency and analysis

Soil Source	Testing Frequency	Minimum	Analysis suite
Site sourced soils	1 sample per 50m^3	6	Heavy metals/metalloids, and inorganics, Speciated PAH, TPH CWG, asbestos screen.
Imported soils: brownfield source	1 sample per 50m^3	6	Heavy metals/metalloids, and inorganics, Speciated PAH, TPH CWG, asbestos screen.
Imported soils: greenfield / manufactured soil source	1 sample per 250m^3	3	Heavy metals/metalloids, and inorganics, Speciated PAH, TPH CWG, asbestos screen.

6.1.4 Where any material is deemed to be unsuitable for use in the 600mm capping layer, either by GeoCon or the Local Authority/Environment Agency, the Contractor shall make provision for the costs of sampling, testing and removal of, said unacceptable materials from excavations and shall make provisions for delays associated with material testing and classification prior to disposal.

6.1.5 Depth validation of the capping system will be required within landscaped areas. The validation will comprise a hand dug pits, with photographic record and insitu testing of all soil will be undertaken as part of the verification. Samples should be taken from each validation pit for subsequent testing. The Validation Report will include the following:

- Remediation Strategy (including copies of confirmation from regulatory authorities agreeing criteria).
- Photographic evidence of the removal of material from site.
- Detailed drawings of the excavated areas showing the extent of the material removal operation.
- Details of the provenance of the subsoil and topsoil (to be provided by contractor).
- Copy of Consignment Notes relating to the movement of wastes to a licensed waste management facility.
- Laboratory analysis of validation soil samples and assessment of suitability for use.
- Logs indicating the minimum 600mm thickness of cover soils within each pit excavated.

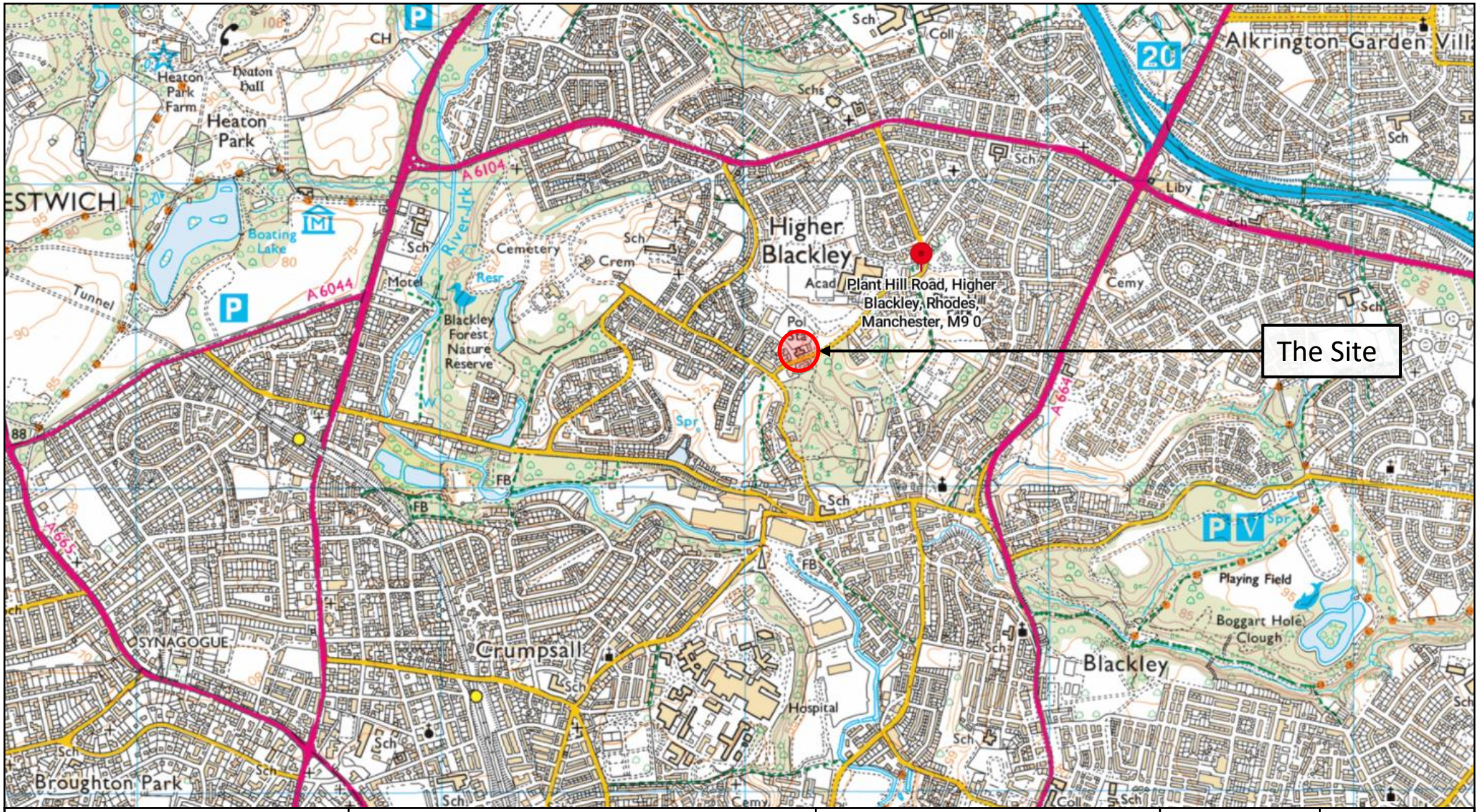
- A drawing indicating the location of cover thickness validation pits.
- Detailed drawings showing all sampling locations for chemical testing.
- Details of the design of the gas/vapour protection measures adopted for the development.
- Details of any gas membrane installation, including confirmation of compliance with the installation specification by the installer and independent validator in accordance with CIRIA C735.
- Photographic evidence obtained during the installation process of the gas protection membrane.
- Details of any variation from the adopted strategy due to unforeseen circumstances.
- Details of any previously unidentified contamination encountered.
- Details of any potentially contaminative activity occurrences that took place.
- Production of a Validation Report.

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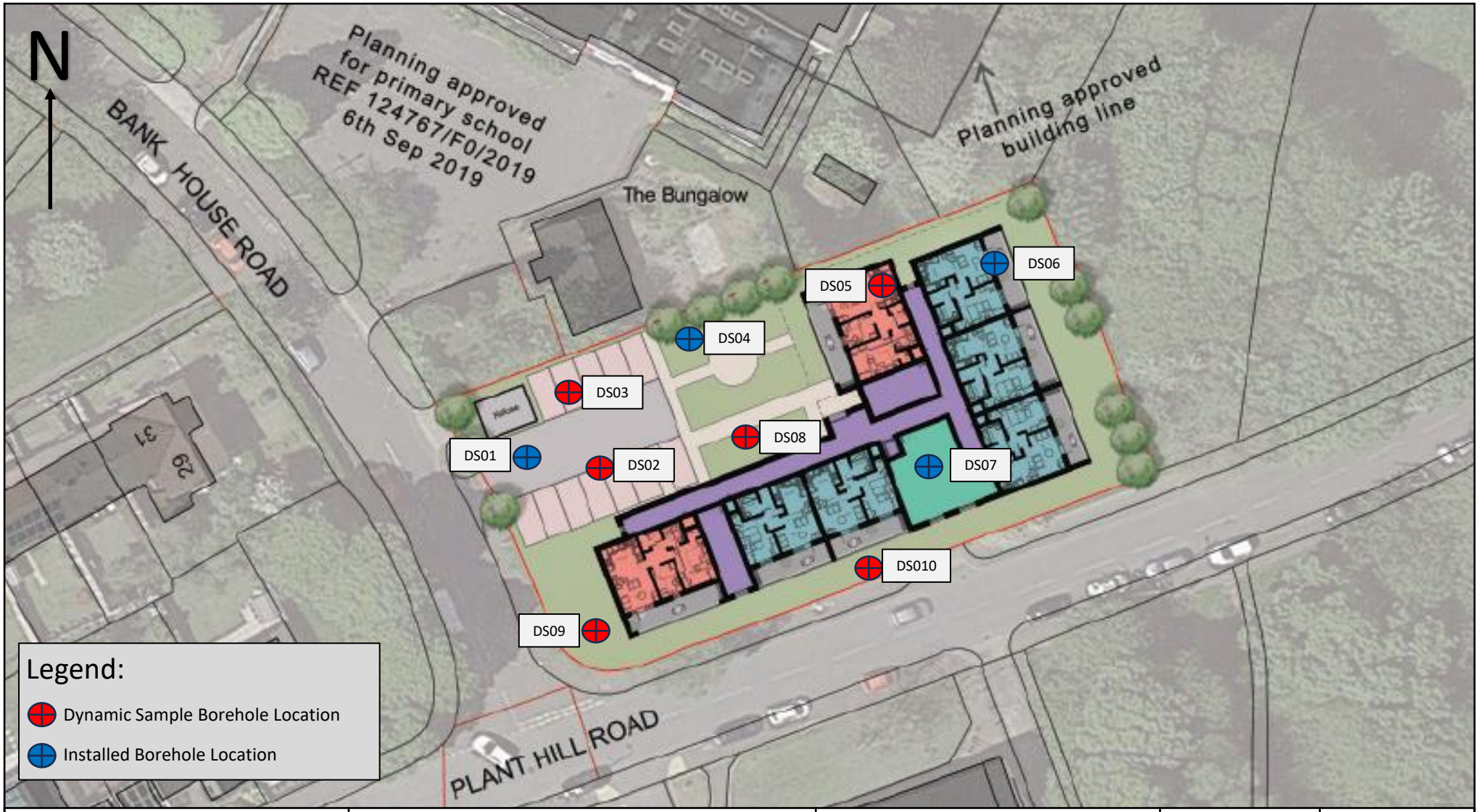
APPENDIX A

DRAWINGS



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PROJECT ID	DRAWING NUMBER	SCALE
GSI 1941 Plant Hill, Manchester	GSI 2209/01	N.T.S
TITLE	**DATE**	**DRAWN BY**
Site Location Plan	September 2024	MP



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PROJECT ID	DRAWING NUMBER	SCALE
GSI 1941 Plant Hill, Manchester	GSI 2209/02	N.T.S
TITLE	**DATE**	**DRAWN BY**
Exploratory Hole Location Plan (on the proposed development plan)	September 2024	MP

APPENDIX B

CHEMICAL TESTING RESULTS

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Analytical Report Number : 23-54608

Project / Site name:	Plant Hill Road	**Samples received on:**	01/09/2023
Your job number:	GSI 1941	**Samples instructed on/ Analysis started on:**	05/09/2023
Your order number:	PO 23 0438	**Analysis completed by:**	13/09/2023
Report Issue Number:	1	**Report issued on:**	13/09/2023
Samples Analysed:	7 soil samples		

Signed:

Adam Fenwick
Technical Reviewer
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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Analytical Report Number: 23-54608
Project / Site name: Plant Hill Road
Your Order No: PO 23 0438

Lab Sample Number				2800684	2800685	2800686	2800687	2800688
Sample Reference				DS03	DS05	DS06	DS07	DS08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.15	0.30	0.70	0.40
Date Sampled				31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	25	72	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	1.8	12	13	15
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.9	0.8	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile- Loose Fibres	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	DSO	DSO	DSO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.5	8.9	8.5	7.8	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.4	2.9	1.2	0.6	1.9
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	0.12	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	1.3	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.16	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.77	0.1	0.14	0.05	0.28
Anthracene	mg/kg	0.05	MCERTS	0.15	0.31	0.05	< 0.05	0.06
Fluoranthene	mg/kg	0.05	MCERTS	1.2	0.34	0.3	0.08	0.32
Pyrene	mg/kg	0.05	MCERTS	1.1	0.72	0.33	0.08	0.34
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.5	0.13	0.16	< 0.05	0.21
Chrysene	mg/kg	0.05	MCERTS	0.58	0.35	0.2	< 0.05	0.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.62	0.9	0.26	< 0.05	0.24
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.31	0.4	0.12	< 0.05	0.09
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.42	0.91	0.21	< 0.05	0.18
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.23	0.65	0.11	< 0.05	0.09
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.17	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.26	0.82	0.14	< 0.05	0.12
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	6.38	7.21	2.02	< 0.80	2.13
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	2.4	10	8.6	15
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.2	1.4	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	28	16	18	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	41	49	61	31	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	330	13	260	270	76
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	98	26	16	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	56	140	49	47

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Analytical Report Number: 23-54608
Project / Site name: Plant Hill Road
Your Order No: PO 23 0438

Lab Sample Number				2800684	2800685	2800686	2800687	2800688
Sample Reference				DS03	DS05	DS06	DS07	DS08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.15	0.30	0.70	0.40
Date Sampled				31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-	< 5.0	-	< 5.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.1	NONE	< 0.10	-	< 0.10	-	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.1	NONE	< 0.10	-	< 0.10	-	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.1	NONE	0.1	-	< 0.10	-	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	3.2	-	3.2	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	12	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	47	-	61	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	62	-	73	-	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.1	NONE	< 0.10	-	< 0.10	-	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.1	NONE	< 0.10	-	< 0.10	-	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.1	NONE	< 0.10	-	< 0.10	-	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	-	< 10	-	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	24	-	67	-	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	33	-	69	-	< 10

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

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Analytical Report Number: 23-54608
Project / Site name: Plant Hill Road
Your Order No: PO 23 0438

Lab Sample Number				2800689	2800690
Sample Reference				DS09	DS10
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.30
Date Sampled				31/08/2023	31/08/2023
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	7.9	11
Total mass of sample received	kg	0.001	NONE	0.9	0.8
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO
General Inorganics					
pH - Automated	pH Units	N/A	MCERTS	7.7	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5	0.9
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.06
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	0.09	0.39
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.08
Fluoranthene	mg/kg	0.05	MCERTS	0.18	0.6
Pyrene	mg/kg	0.05	MCERTS	0.17	0.53
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	0.3
Chrysene	mg/kg	0.05	MCERTS	0.09	0.39
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.09	0.38
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.16
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.08	0.28
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.15
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.17
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	3.49
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.4	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	5.1	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	120
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	4.4	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	15	64

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Analytical Report Number: 23-54608
Project / Site name: Plant Hill Road
Your Order No: PO 23 0438

Lab Sample Number				2800689	2800690
Sample Reference				DS09	DS10
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.30
Date Sampled				31/08/2023	31/08/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Monoaromatics & Oxygenates					
Benzene	µg/kg	5	MCERTS	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	-	< 5.0
o-xylene	µg/kg	5	MCERTS	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	< 5.0
Petroleum Hydrocarbons					
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.1	NONE	-	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.1	NONE	-	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.1	NONE	-	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	-	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.1	NONE	-	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.1	NONE	-	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.1	NONE	-	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	-	< 10

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

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Analytical Report Number : 23-54608
Project / Site name: Plant Hill Road

* 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 *
2800684	DS03	None Supplied	0.4	Brown clay and sand with stones and gravel
2800685	DS05	None Supplied	0.15	Brown clay and sand with stones and gravel
2800686	DS06	None Supplied	0.3	Brown clay and sand with gravel and vegetation.
2800687	DS07	None Supplied	0.7	Brown clay and sand with gravel.
2800688	DS08	None Supplied	0.4	Brown clay and sand with gravel.
2800689	DS09	None Supplied	0.2	Brown clay and sand with gravel and vegetation.
2800690	DS10	None Supplied	0.3	Brown clay and sand with brick and vegetation.

Analytical Report Number : 23-54608
Project / Site name: Plant Hill Road

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 dispersion 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
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

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

Analytical Report Number : 23-54608
Project / Site name: Plant Hill Road

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

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

APPENDIX C

CHEMICAL SCREENING CRITERIA

GeoCon Site Investigations Ltd

GENERIC SCREENING CRITERIA
FOR
GENERIC QUANTITATIVE RISK ASSESSMENT

January 2023

Compound / Determinands	Source / Reference	Residential WITH consumption of home-grown vegetables			Residential WITHOUT consumption of home-grown vegetables			Commercial			Allotments			Public Open Space - Residential			Public Open Space - Parks		
		1 % SOM	2.5% SOM	6 % SOM	1 % SOM	2.5% SOM	6 % SOM	1 % SOM	2.5% SOM	6 % SOM	1 % SOM	2.5% SOM	6 % SOM	1 % SOM	2.5% SOM	6 % SOM	1 % SOM	2.5% SOM	6 % SOM
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals																			
Antimony	C	141	-	222	437	-	437	4650	-	4650	-	-	58.3	749	-	749	3090	-	3090
Arsenic	A	37	37	37	40	40	40	640	640	640	43	43	43	79	79	79	170	170	170
Barium	C	56.8	-	110	1340	-	1340	22000	-	22000	-	-	18.1	2680	-	2680	5770	-	63
Beryllium	A	1.7	1.7	1.7	1.7	1.7	1.7	12	12	12	35	35	35	2.2	2.2	2.2	532	532	532
Boron	A	290	290	290	11000	11000	11000	240000	240000	240000	45	45	45	21000	21000	21000	46000	46000	46000
Cadmium (pH 6, 7, 8)	A	11	11	11	85	85	85	190	190	190	1.9	1.9	1.9	120	120	120	532	532	532
Chromium III	A	910	910	910	910	910	910	8600	8600	8600	18000	18000	18000	1500	1500	1500	33000	33000	33000
Chromium VI	A	6	6	6	6	6	6	33	33	33	1.8	1.8	1.8	7.7	7.7	7.7	220	220	220
Copper	A	2400	2400	2400	7100	7100	7100	68000	68000	68000	520	520	520	12000	12000	12000	44000	44000	44000
Lead	B	210	210	210	330	330	330	6000	6000	6000	84	84	84	760	760	760	1400	1400	1400
Mercury (elemental)	A	1.2	1.2	1.2	1.2	1.2	1.2	58	58	58	21	21	21	16	16	16	30	30	30
Mercury (Inorganic)	A	40	40	40	56	56	56	1100	1100	1100	19	19	19	120	120	120	240	240	240
Mercury (methyl)	A	11	11	11	15	15	15	320	320	320	6	6	6	40	40	40	68	68	68
Molybdenum	C	95.2	-	97.4	673	673	673	17600	17600	17600	17	17	17	1360	1360	1360	2880	2880	2880
Nickel	A	180	180	180	180	180	180	980	980	980	230	230	230	230	230	230	3400	3400	3400
Selenium	A	250	250	250	430	430	430	12000	12000	12000	88	88	88	1100	1100	1100	1800	1800	1800
Vanadium	A	410	410	410	1200	1200	1200	9000	9000	9000	91	91	91	2000	2000	2000	5000	5000	5000
Zinc	A	3700	3700	3700	40000	40000	40000	730000	730000	730000	620	620	620	81000	81000	81000	170000	170000	170000
Non-Metals / Inorganics																			
Free-Cyanide (Total)	C	34	34	34	34	34	34	373	373	373	34	34	34	34	34	34	34	34	34
Phenol and Chlorophenols																			
Phenol	A	280	550	1100	750	1300	2300	760	1500	3200	66	140	280	760	1500	3200	760	1500	3200
Chlorophenols	A	0.87	2	4.5	94	150	210	3500	4000	4300	0.13	0.3	0.7	620	620	620	1100	1100	1100
Pentachlorophenol	A	0.22	0.52	1.2	27	29	31	400	400	400	0.03	0.08	0.19	60	60	60	110	120	120
Poly Aromatic Hydrocarbons (PAH)																			
Acenaphthene	A	210	510	1100	3000	4700	6000	84000	97000	100000	34	85	200	15000	15000	15000	29000	30000	30000
Acenaphthylene	A	170	420	920	2900	4600	6000	83000	97000	100000	28	69	160	15000	15000	15000	29000	30000	30000
Anthracene	A	2400	5400	11000	31000	35000	37000	520000	540000	540000	380	950	2200	74000	74000	74000	150000	150000	150000
Benzo(a)anthracene	A	7.2	11	13	11	14	15	170	170	180	2.9	6.5	13	29	29	29	49	56	62
Benzo(a)pyrene	A	2.2	2.7	3	3.2	3.2	3.2	35	35	36	0.97	2	3.5	5.7	5.7	5.7	11	12	13
Benzo(b)fluoranthene	A	2.6	3.3	3.7	3.9	4	4	44	44	45	0.99	2.1	3.9	7.1	7.2	7.2	13	15	16
Benzo(ghi)perylene	A	320	340	350	360	360	360	3900	4000	4000	290	470	640	640	640	640	1400	1500	1600
Benzo(k)fluoranthene	A	77	93	100	110	110	110	1200	1200	1200	37	75	130	190	190	190	370	410	440
Chrysene	A	15	22	27	30	31	32	350	350	350	4.1	9.4	19	57	57	57	93	110	120
Dibenzo(ah)anthracene	A	0.24	0.28	0.3	0.31	0.32	0.32	3.5	3.6	3.6	0.14	0.27	0.43	0.57	0.57	0.58	1.1	1.3	1.4
Fluoranthene	A	280	560	890	1500	1600	1600	23000	23000	23000	52	130	290	3100	3100	3100	6300	6300	6400
Fluorene	A	170	400	860	2800	3800	4500	63000	68000	71000	27	67	160	9900	9900	9900	20000	20000	20000
Indeno(123-cd)pyrene	A	27	36	41	45	46	46	500	510	510	9.5	21	39	82	82	82	150	170	180
Naphthalene	A	2.3	5.6	13	2.3	5.6	13	190	460	1100	4.1	10	24	4900	4900	4900	1200	1900	3000
Phenanthrene	A	95	220	440	1300	1500	1500	2200	22000	23000	15	38	90	3100	3100	3100	6200	6200	6300
Pyrene	A	620	1200	2000	3700	3800	3800	54000	54000	54000	110	270	620	7400	7400	7400	15000	15000	15000
PAH (Total 16)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons (TPH CWG)																			
MTBE	C	27.6	-	220	33.3	-	318	3140	-	22400	-	-	108	73600	-	75000	70800	-	117000
Benzene	A	0.087	0.17	0.37	0.38	0.7	1.4	27	47	90	0.017	0.034	0.075	72	72	73	90	100	110
Toluene	A	130	290	660	880	1900	3900	56000	110000	180000	22	51	120	56000	56000	56000	87000	95000	100000
Ethylbenzene	A	47	110	260	83	190	440	5700	13000	27000	16	39	91	24000	24000	25000	17000	22000	27000
o-Xylene	A	60	140	330	88	210	480	6600	15000	33000	28	67	160	41000	42000	43000	17000	24000	33000
m-Xylene	A	59	140	320	82	190	450	6200	14000	31000	31	74	170	41000	42000	43000	17000	24000	32000
p-Xylene	A	56	130	310	79	180	430	5900	14000	30000	29	69	160	41000	42000	43000	17000	24000	31000
TPH Aliphatic EC5-6	A	42	78	160	42	78	160	3200	5900	12000	730	1700	3900	570000	590000	600000	95000	130000	180000
TPH Aliphatic EC>6-8	A	100	230	530	100	230	530	7800	17000	40000	2300	5600	13000	600000	610000	620000	150000	220000	320000
TPH Aliphatic EC>8-10	A	27	65	150	27	65	150	2000	4800	11000	320	770	1700	13000	13000	13000	14000	18000	21000
TPH Aliphatic EC>10-12	A	130	330	760	130	330	770	9700	23000	47000	2200	4400	7300	13000	13000	13000	21000	23000	24000
TPH Aliphatic EC>12-16	A	1100	2400	4300	1100	2400	4400	59000	82000	90000	11000	13000	13000	13000	13000	13000	25000	25000	26000
TPH Aliphatic EC>16-35	A	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	260000	270000	270000	250000	250000	250000	450000	480000	490000
TPH Aliphatic EC>35-44	A	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	260000	270000	270000	250000	250000	250000	450000	480000	490000
TPH Aromatic EC5-7	A	70	140	300	370	690	1400	26000	46000	86000	13	27	57	56000	56000	56000	76000	84000	92000
TPH Aromatic EC>7-8	A	130	290	660	860	1800	3900	56000	110000	180000	22	51	120	56000	56000	56000	87000	95000	100000
TPH Aromatic EC>8-10	A	34	83	190	47	110	270	3500	8100	17000	8.6	21	51	5000	5000	5000	7200	8500	9300
TPH Aromatic EC>10-12	A	74	180	380	250	590	1200	16000	28000	34000	13	31	74	5000	5000	5000	9200	9700	10000
TPH Aromatic EC>12-16	A	140	330	660	1800	2300	2500	36000	37000	38000	23	57	130	5100	5100	5000	10000	10000	10000
TPH Aromatic EC>16-21	A	260	540	930	1900	1900	1900	28000	28000	28000	46	110	260	3800	3800	3800	7600	7700	7800
TPH Aromatic EC>21-35	A	1100	1500	1700	1900	1900	1900	28000	28000	28000	370	820	1600	3800	3800	3800	7800	7800	7900
TPH Aromatic EC>35-44	A	1100	1500	1700	1900	1900	1900	28000	28000	28000	370	820	1600	3800	3800	3800	7800	7800	7900
TPH Aliphatic + Aromatic EC>44-70	A	1600	1800	1900	1900	1900	1900	28000	28000	28000	1200	2100	3000	3800	3800	3800	7800	7800	7900

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GeoCon Site Investigations Ltd

January 2023

GENERIC SCREENING CRITERIA

FOR

GENERIC QUANTITATIVE RISK ASSESSMENT

Generic Screening Criteria Reference Guide:	
Soils - Generic Screening Criteria Source Reference	
A	LQM/CIEH S4ULs for Human Health Risk Assessment Values 2015
B	Defra C4SL's 2014
C	AtRisk Soil Screening Values and Water Screening Values Produced by Atkins 2017
D	NHBC Technical Extra 15 - 2014
E	UK (CLEA) Soil Guideline Value 2009
F	CL:AIRE GAC Values December 2009
Waters - Generic Screening Criteria Source Reference	
1	Environmental Quality Standard from List 2 EC Dangerous Substances Directive (76/464/EEC) - Freshwater
2	Environmental Quality Standard from EC Surface Water Abstraction Directive (75/440/EEC) - Imperative (A1)
3	Drinking Water Standard from World Health Organisation (WHO) Guidelines for Drinking Water Quality, 1984 - health value
4	Environmental Quality Standard from List 2 EC Dangerous Substances Directive (76/464/EEC) - Freshwater (hardness related)
5	Environmental Quality Standard from EC Surface Water Abstraction Directive (75/440/EEC) - Imperative (A2)
6	Drinking Water Standard from World Health Organisation (WHO) Guidelines for Drinking Water Quality, 1984 - ATO
7	Ayscough *et al.* (2002) Proposed Environmental Quality Standards for Ethylbenzene in Water (EA R&D Technical Report P2-115/TR4).
8	UK Drinking Water Inspectorate - threshold for objectionable odour/taste of 5µg/l to 10µg/l
9	US EPA advisory limits (1997). As published in Environment Agency "The fuel additive MTBE a groundwater protection issue?" booklet.
10	Ahlberg *et al.* (2001) An Environmental Risk Assessment of MTBE use in Europe. ECETOC/EFOA Task Force on ERA of MTBE.
11	Environmental Quality Standard from List 1 EC Dangerous Substances Directive (76/464/EEC) - Freshwater
12	As Presented in Appendix 8 "Selected Water Quality Standards" in Hydrogeological Risk Assessments for Landfills (LFTGN01 - Environment Agency, March 2003).
13	UK Drinking Water Standards (DWS)
14	Environment Agency, Environmental Quality Standards (EQS) 2015
Abbreviations	
SOM	Soil Organic Matter

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