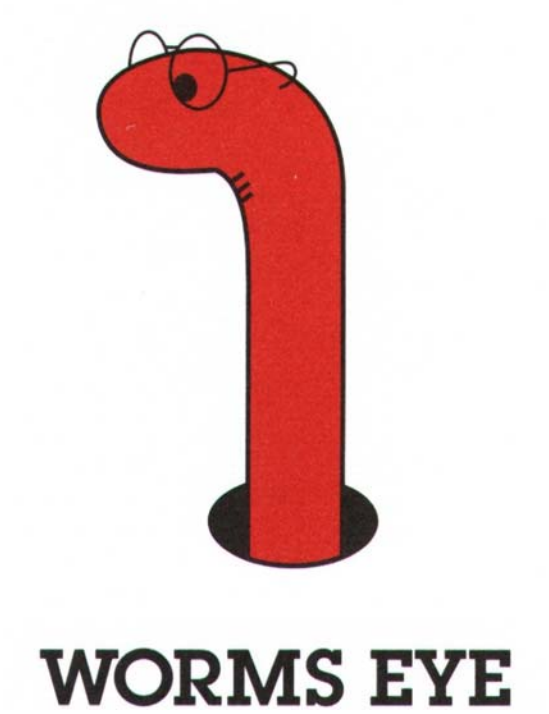
Electronic Report



WORMS EYE

52 Bank Parade
Burnley
BB11 1TS
Phone
01282 414649 / 458410

Our Ref: Inchfield Close/OL11 5SB/2018
Date: 11 February 2019

Steven Hartley
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2 INCHFIELD CLOSE, NORDEN, ROCHDALE, OL11 5SB
INTRUSIVE REPORT

INTRODUCTION

It is proposed to build a detached house. Following a Preliminary Risk Assessment (PRA 12/12/18), instructions were to carry out trial holes and tests, to investigate potential contamination issues.

Coal Mining issues have been dealt with separately by Worms Eye (CMRA 26/4/17).

SITE DESCRIPTION

The site is a vacant plot located to the east of Inchfield Close in Norden and at OS Grid Reference 386203, 413908. The site was previously occupied by a bungalow, destroyed by fire in 2016.

The site is a truncated rectangle, about 27 by 12 metres, located to the east of Inchfield Close in Norden and at OS Grid Reference 386203, 413908. The site comprises an empty plot which was slightly overgrown in the east where a small garden pond was found. In the garden to N^{o}. 28, just off the southwest corner of the site, a parking space has been cut out, requiring a stone retaining wall up to 1 metre high

The plot was largely unsurfaced with flagging and concrete along the north, south and east edges.

The site sloped down towards the west.

This is a residential area which slopes down to the southwest at about 1 in 25.

PROPOSED DEVELOPMENT

It is proposed to build a replacement detached house, on the foundations of a former burnt-out bungalow. There will be associated gardens.

PRELIMINARY RISK ASSESSMENT

Worms Eye carried out a PRA dated 12/12/18, the salient points were:

Contamination

The site comprises a burnt-out bungalow and gardens. Whilst this is not a use from which contamination would be expected, there is a risk of the fire introducing contaminants from building materials, or from burning substances into the ground. The action of the fire water may also spread potential contaminants around the site.

Contaminants are not expected at high levels, but may exceed stringent residential thresholds.

There was originally a small pond at the northeast corner, and a limited amount of, made ground (potentially contaminated), may be present in that area.

Surrounding the site is a large residential area. There has been no industrial, or other, land use likely to affect the site, and no pollution incidents on or close to the site.

It is proposed to build a replacement detached bungalow. Potential pollutant linkages are:

- Direct contact with soil.
- Ingestion of soil.
- From homegrown vegetables and soil attached to vegetables.
- Inhalation and ingestion of dust.
- Contaminants entering drinking water pipes.

An intrusive investigation is required, consisting of boreholes/trial holes and tests to confirm the presence/absence and extent of contamination on the site.

The suspected former pond at the northeast is a specific point sources for contamination, and the investigation will need to target this, proposed gardens (most sensitive part of the development), proposed house, and provide all round coverage.

PRA Re-Cap Continued

Controlled Waters

There is an underlying A aquifer beneath low permeability clay.

There are no nearby water courses, abstraction points, or source protection zones.

Although the gardens will allow rainwater to pass through the surface soils and migrate towards the aquifer, contamination is not expected at high levels. The anticipated underlying clay will further impede the migration of water and it is anticipated there will be only a very low risk to controlled waters.

No further action is considered necessary at this stage. This may need to be reviewed following the soil tests.

Landfill Gas/Ground Gas

There are no landfill sites within 250 metres.

There are two small, suspected, filled features within 250 metres of the site. These are potential sources of ground gases which could migrate to and present a risk to the development. Bearing in mind the size of the filled areas, distance from the site and underlying clay, it is considered that these are likely to be a very low risk to the development.

There is a small, suspected filled, ponds on-site, which may pose a gas risk. This is small and unlikely to generate significant levels of gas, and only a low risk is anticipated.

Coal Gas

There is a shallow coal seam and shafts nearby. It is considered that these pose a potential gas risk to the development and two options are available.

One option would be to carry out a period of gas monitoring. This would comprise a series of monitoring points around the site, targeting the proposed buildings.

The other option would be to install precautionary gas protection measures. As the proposal is for a single dwelling, this is likely to be an economical, proportionate solution.

Radon

Radon protection measures are not required.

PRA Re-Cap Continued

Industry Profile

Contaminants may be present from building material, a recent fire, or in madeground (if present).

Industry	Possible Contaminants
Potential Contaminants	Metals: e.g. copper, zinc, chromium, nickel, lead, arsenic, Inorganic compounds: cyanide, sulphates Mineral oils, fuel oils (TPHs) Asbestos General hydrocarbons (PAHs)

Pollutant Linkages

The potential pollutant linkages revealed by the PRA as requiring further investigation were:

Source	Receptors	Pathway	Potential/Likely Pollutant Linkage
Asbestos	Construction workers	Inhalation	Yes
	End-users	Inhalation	Yes
	Off-site	Migration off-site	Unlikely
Inorganic contaminants	Construction workers	Short-term direct contact, inhalation of dust, ingestion	Yes
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	Possibly
	Groundwater	Leaching towards	No
	River/stream	Leaching towards	No
Hydrocarbons	Construction workers	Short-term direct contact, inhalation of dust, ingestion	Yes
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	Yes
	Service pipes	Seeping into drinking water pipes	Unlikely
	Groundwater	Migrating towards	No
	River/stream	Migrating/leaching towards	No
Hydrocarbon vapours	Construction workers	Short-term inhalation	No
	Householders	Inhalation of vapours indoors and outdoors	No
Coal gas/ground gas	End-users - in buildings	Seeping into buildings, explosion, asphyxiation	Yes
Radon	End-users - in buildings	Seeping into buildings	No

End of PRA Re-Cap

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GROUND INVESTIGATIONS

A series of three trial holes (THA, THC and THD) was excavated to about 1.0 metre to collect shallow samples for testing. Details are given on the location plan and trial hole logs enclosed with this report.

Trial hole B was not carried out due to a concrete slab in that location.

The trial holes showed topsoil to 0.25 metres (THA & B), over madeground to about 0.7 metres (THA & B). There was clay in the base of the trial holes.

CONTAMINATION TESTING

Four samples (three shallow and one deeper) were tested for a range of contaminants indicated by the PRA. The results are included in table form with this report. Abbreviations and acronyms for chemical compounds are given after the appendix list.

CONTAMINATION COMPARISONS - INITIAL SCREENING

The maximum contamination values have been compared with residential C4Ls and soil guideline values provided by CLEA. Where these are not available, values are based on the LQM/CIEH S4ULS. In accordance with guidance provided by the AGS, threshold values from other sources have been used for screening purposes. This information has been brought together on the Comparison Table included with this report.

Asbestos

No asbestos fibres were detected.

Inorganics (metals etc.)

Levels of inorganic contaminants were low and below residential thresholds in THA and THD. However, in THC at 0.2 metres the levels of arsenic (59mg/kg) and lead (610 mg/kg) both exceed their residential thresholds (37 mg/kg arsenic and 200 mg/kg lead).

Sulphate

Water soluble sulphate levels were low and below the BRE action level for buried concrete.

Hydrocarbons

Tests for phenols, TPHs and PAHs were all low and below residential thresholds.

Drinking Water Pipes

Comparing test results against trigger levels for drinking water pipes shows levels of contaminants are below the threshold.

DISCUSSION

Contamination

Contamination tests show low levels in THA and THD, however, levels of arsenic and lead exceed their residential threshold in THC at 0.2 metres. Trial hole C represents the garden at the front (west) of the house and the findings suggest a risk to householders in that area, it is considered that remedial works are required in the garden around THC.

The results in THA and THD being low, this suggests that the risk may be confined to the front (west) garden, or a smaller area around THC.

The risks associated with arsenic and lead arise from householders having direct contact with the surface soils. Therefore, where the contaminated soils are below permanent hard surfacing (e.g. the house and a hard surface drive) there will be no risk to householders and no remedial works will be required in that area.

Water Soluble Sulphate levels are low and sulphate resistant concrete is not required.

The tests results suggest, subject to approval, the site is suitable for normal PE water pipes.

Levels of volatile hydrocarbons are below the thresholds and there is no risk from hydrocarbon vapours.

Controlled Waters

Regarding risks to controlled waters:

- The site is underlain by a Secondary A aquifer.
- There are no nearby water courses.
- The levels of contaminants in THA and THB are low and not excessive.
- Levels of arsenic and lead exceed the residential threshold in THC and contaminated soils will either be taken away or covered, removing or considerably reducing the opportunity for leaching.
- Clay underlying the site will be an aquitard.
- There are no nearby abstraction points.
- There are no nearby source protection zones.

Bearing in mind all of the above factors, it is considered that risks to groundwater are very low and that no significant pathway will arise.

Landfill Gas/Ground Gas/Coal Gas

Bearing in mind the proposals is for a single house it is considered that the anticipated gas risk can be adequately dealt with by installing precautionary gas protection measures, in-lieu of testing.

CONCEPTUAL MODEL

Contamination issues should be considered using the source-path-receptor concept assisted by the conceptual model diagram included at the end of the report.

Source	Receptors	Pathway	Complete Pollutant Linkage
Asbestos (none detected)	Construction workers	Inhalation	No
	End-users	Inhalation	No
	Off-site	Migration off-site	No
Inorganic contaminants (raised arsenic and lead in THC)	Construction workers	Short-term direct contact, inhalation of dust, ingestion	Yes
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	Yes (around THC)
	Groundwater	Leaching towards	No
	River/stream	Leaching towards	No
Hydrocarbons (low)	Construction workers	Short-term direct contact, inhalation of dust, ingestion	No
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	No
	Service pipes	Seeping into drinking water pipes	No
	Groundwater	Migrating towards	No
	River/stream	Migrating/leaching towards	No
Hydrocarbon vapours (low)	Construction workers	Short-term inhalation	No
	Householders	Inhalation of vapours indoors and outdoors	No
Coal gas/ground gas	End-users - in buildings	Seeping into buildings, explosion, asphyxiation	Possible
Radon	End-users - in buildings	Seeping into buildings	No

BREAKING PATHWAYS

Construction Workers

Normal precautions for an urban renewal type project are required. These would include the use of gloves and the provision of washing facilities to avoid ingestion of contaminants.

Garden/Landscaped Areas

Contamination by arsenic and lead was found to be present in THC at 0.2 metres, with results in THA and THD being well below screening thresholds. This suggesting a localised problem on the west of the site, or around THC.

One method would be to remove the source by excavating the contaminated material and disposing off site. This would require:

- Excavate to 0.6 metres at THC and for 3 metres on all sides, where this takes the excavation up to the site boundary or driveway excavations can cease in that direction.
- Dispose excavated soils off-site.
- Test garden sides of excavation for arsenic and lead, levels to be below residential thresholds.
- If levels still exceed residential threshold, widen excavation and re-test.
- Backfill excavation with imported soils, tested to confirm their suitability for use on-site.

Another method is to use a cover layer. This would require creating a 0.6 metre thick layer of imported soils, tested to confirm its suitability for use on site, over the front (west) garden).

Landfill/Ground Gases/Coal Gas

The following are considered to be appropriate measures for the anticipated level of risk.

- Ventilation of confined spaces within building
- A well-constructed ground slab/suspended floor with sub-floor venting.
- A low-permeability gas membrane (see membranes below).
- Minimum penetration of ground slab by services.
- Also gas precautions should continue across the cavity.

Membranes

The following membrane (or equivalent) is suggested:

- Suspended floor, with underfloor venting, Visqueen Low Permeability Gas Membrane (yellow).
- Ground bearing slab, Visqueen Gas Barrier (blue).

Each membrane should be used with the appropriate matching cavity tray (or cavity membrane), DPC and service duct ‘top hat’. Joints to be lapped and sealed.

The following might also be considered:

- Appointed contractor to be sufficiently experienced and/or qualified in installing gas protection measures.
- Gas protection measures to be installed as per the manufacturer's specification.
- The area of the membrane to be cleared of any debris or materials prior to laying.
- To ensure damage to the membrane will be prevented prior to the floor being install, post installation, **ALL** site personnel (including all trades) to be made aware of the presence of the membrane and that damage to the membrane must be prevented.
- To prevent damage, post installation, no materials or tools to be stored on the membrane, scaffolding not erected on the membrane, service penetrations to be cast into the slab, membrane to be left exposed for the minimum time possible, no work to be carried out on the exposed membrane (e.g. cutting, welding etc.)
- All joints to be sealed before any follow on work commences.
- The use of preformed 'top hats' and corners is beneficial.

Imported Soils

All soils (e.g. topsoil, bulk fill hardcore) and similar materials imported on-site to be proved to be uncontaminated. Imported material will require testing as follows:

- Greenfield soils – minimum of 3 tests or 1 test per 100m^3 (whichever is greater). Testing to include arsenic, cadmium, chromium (total), chromium VI, copper, mercury, nickel, lead, selenium, zinc, PAH (16 USEPA speciation), asbestos, TPHs (speciated), boron, cyanide, thiocyanate, sulphide, sulphur, sulphate, pH, Som.
- Brownfield/screened/manufactured soils – minimum of 3 tests or 1 test per 50m^3 (whichever is greater). Testing to include arsenic, cadmium, chromium (total), chromium VI, copper, mercury, nickel, lead, selenium, zinc, PAH (16 USEPA speciation) asbestos, TPHs (speciated), boron, cyanide, thiocyanate, sulphide, sulphur, sulphate, pH, Som.

Soil Screen Values

Tests carried out on the imported material, either by the supplier or the consultant, to be screed against appropriate residential thresholds, based on 1% SOM. If these are exceeded, site specific value may be derived, subject to them being appropriate.

Validation

A validation report will be required on completion, this will require but not necessarily be limited to:

- Tickets from waste removal contractor and receiving landfill.
- Test results for sides of excavation (if contaminated material is removed from site).
- Photographs of excavation to confirm depth.
- Contamination test results for tests on imported soils.
- Trial pits, with photographs, to show depth and thickness of individual cover layers.
- Document (receipt, delivery notes) to show soil types and sources.
- Independent inspection of gas membrane and report.
- Documented site inspection, including photographs.

This report is usually a collaboration between the contractor, who will collect the above documentation and Worms Eye, who can assist in preparing the Validation Report

DISPOSAL OF EXCAVATED SOIL

Test results suggest excavated soil would be non-hazardous. However, levels of organic matter (5% - 25% SOM) may exceed the level for disposal at hazardous waste landfill.

Disposal of soil is now a complex matter and the analysis should be submitted to the receiving site for confirmation of its status.

OPINION

Contaminated Soils

Test results show raised levels of arsenic and lead in THC, on the front (west) garden. These suggest a risk to householders in that area and remedial works are required. When the preferred solution has been agreed, a remediation strategy will be required.

Sulphate resistant concrete is not required.

Subject to approval the site is suitable for the use of normal PE water pipes.

There are no risks from hydrocarbon vapours.

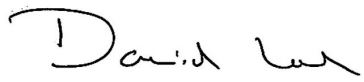
Controlled Waters

It is considered that, on completion there will be a very low risk to controlled waters and no further action is required.

Gas Testing

Precautionary gas protection measures are recommended, and considered and appropriate solution to the anticipated level of risk on this small development.

Yours faithfully
on behalf of Worms Eye Ltd



David Lord
BSc (Hons)
FGS, MIEnvSc, AIEMA

2 INCHFIELD CLOSE, NORDEN, ROCHDALE, OL11 5SB

List of Appendices – Intrusive Report

List of Acronyms

Existing site plan - showing trial hole locations

Proposed site plan

Trial Hole Logs

Contamination Test Results - Soil

Contamination Comparison Table - Soil

CONTAMINATION TEST UNITS

Conversion factor	Name	Symbol	Numerical Value	Alternative description	Commonly used for:
	per cent	%	1 in 100 (10^2)		total sulphur, hazardous waste
% x10	parts per thousand	‰	1 in 1000 (10^3)	g/l (grams per litre)	water soluble sulphate test
‰ x 1,000	parts per million	ppm	1 in 1,000,000 (10^6)	mg/kg (milligrams per kilogram)	most soil tests
				mg/l (milligrams per litre)	water tests
ppm x 1,000	parts per billion	ppb	1 in 1,000,000,000 (10^9)	μg/kg (micrograms per kilogram)	PAH soil tests
				μg/l (micrograms per litre)	water/leachate tests
ppb x 1,000	parts per trillion	ppt	1 in 1,000,000,000,000 (10^{12})	ng/kg (nanograms per kilogram)	PAH soil tests
				ng/l (nanograms per litre)	water/leachate tests

ABBREVIATIONS

Chemical	BAP	Benzo(a)pyrene
	BTEX	Benzene, toluene, ethylbenzene, xylene
	DAHA	Dibenzo(ah)anthracene
	MTBE	Methyl tertiaryt-butyl ether (additive to petrol)
	EPH	Extractable petroleum hydrocarbons (formerly diesel range organics – DRO)
	NFD	No fibres detected (asbestos test)
	PAH	Polycyclic aromatic hydrocarbons
	PCB	Polychlorinated biphenyls
	PCE	Perchloroethylene or tetrachloroethylene
	PID	Photo ionisation detector (screen for VOC)
	PRO/GRO	Petrol range organics/gasoline range organics
	SVOC	Semi-volatile organic compounds
	TCE	Trichloroethylene
	TPH	Total petroleum hydrocarbons
	VOC	Volatile organic compounds
Other	AGS	Association of Geotechnical Specialists
	BGS	British Geological Survey
	BRE	Building Research Establishment
	CBR	California Bearing Ratio
	CIEH	Chartered Institute of Environmental Health
	CIRIA	Construction Industry Research and Information Association
	CLEA	Contaminated Land Exposure Assessment (Environment Agency/DEFRA)
	CLR 8	Contaminated Land Research Report 8 (Environment Agency/DEFRA)
	DWQ	Drinking water quality
	EA	Environment Agency
	EQS	Environmental quality standards (for rivers etc.)
	ICRCL	Inter-departmental Commission for the Reclamation of Contaminated Land
	LQM	Land Quality Management Ltd (Land and Environmental Consultancy).
	NHBC	National House Builders Council
	SGV	Soil Guideline Values
	SPT	Standard penetration test

TPHWG TPH Working Group

1. This report should be considered in relation to the objectives agreed between Worms Eye and the Client, outlined in the introduction.

2. For the work, reliance has been placed on publicly available data, obtained from the sources identified in the report. The information is not exhaustive and further information may be available from other sources. When using the information it has been assumed it is correct, and no attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and guidelines, for land and groundwater contamination, enforced by the Local Authority and the Environment Agency.

4. During the site walkover, reasonable effort was made to obtain an overview of the site. However, no attempt was made to enter areas that are unsafe, a risk to health and safety, locked, barricaded, overgrown, or areas not made accessible.

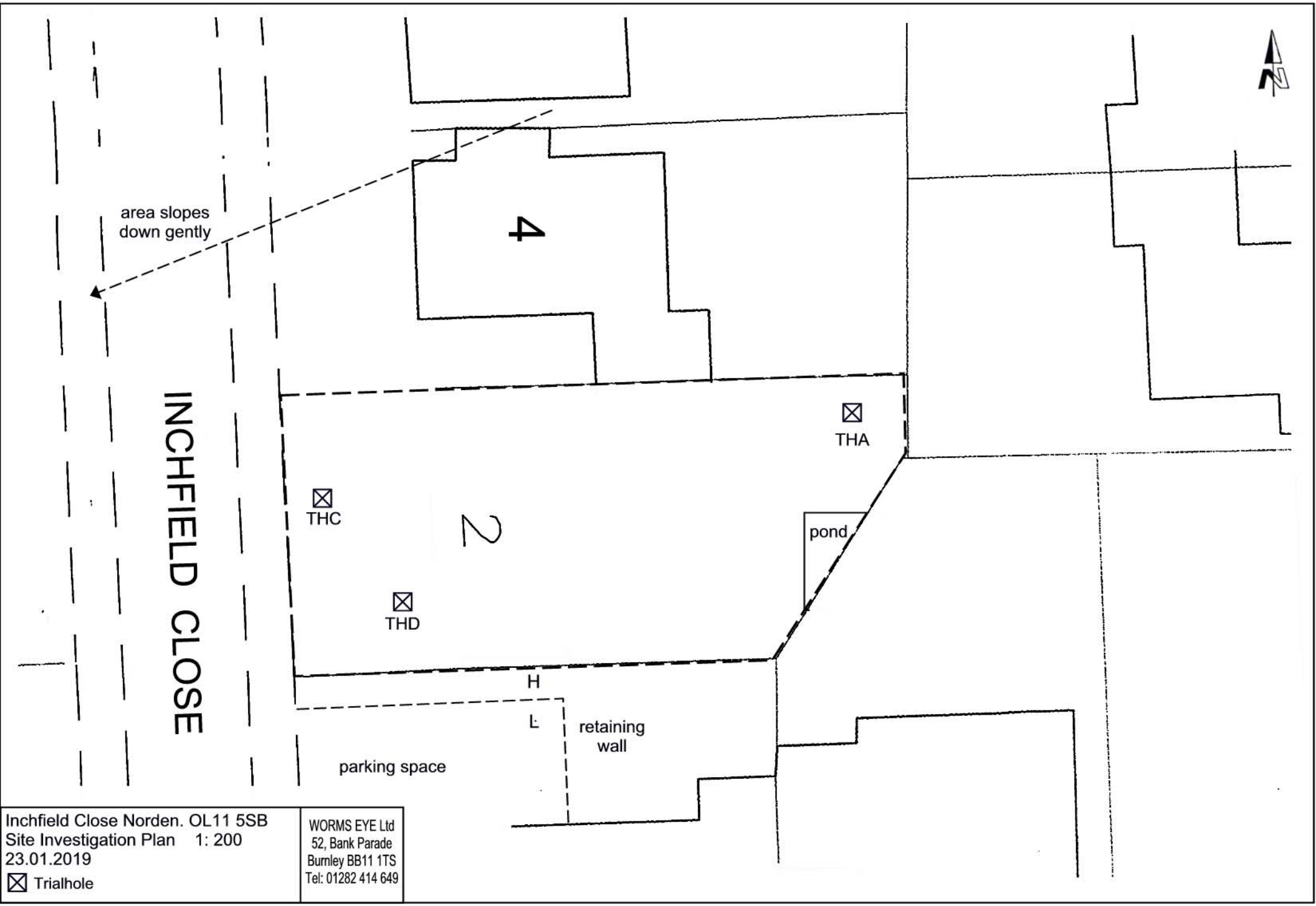
5. Access, the presence of services and activities on the site, limited locations where sampling could be carried out and the techniques that could be used.

6. Assessments are based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. The conclusions and recommendations provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

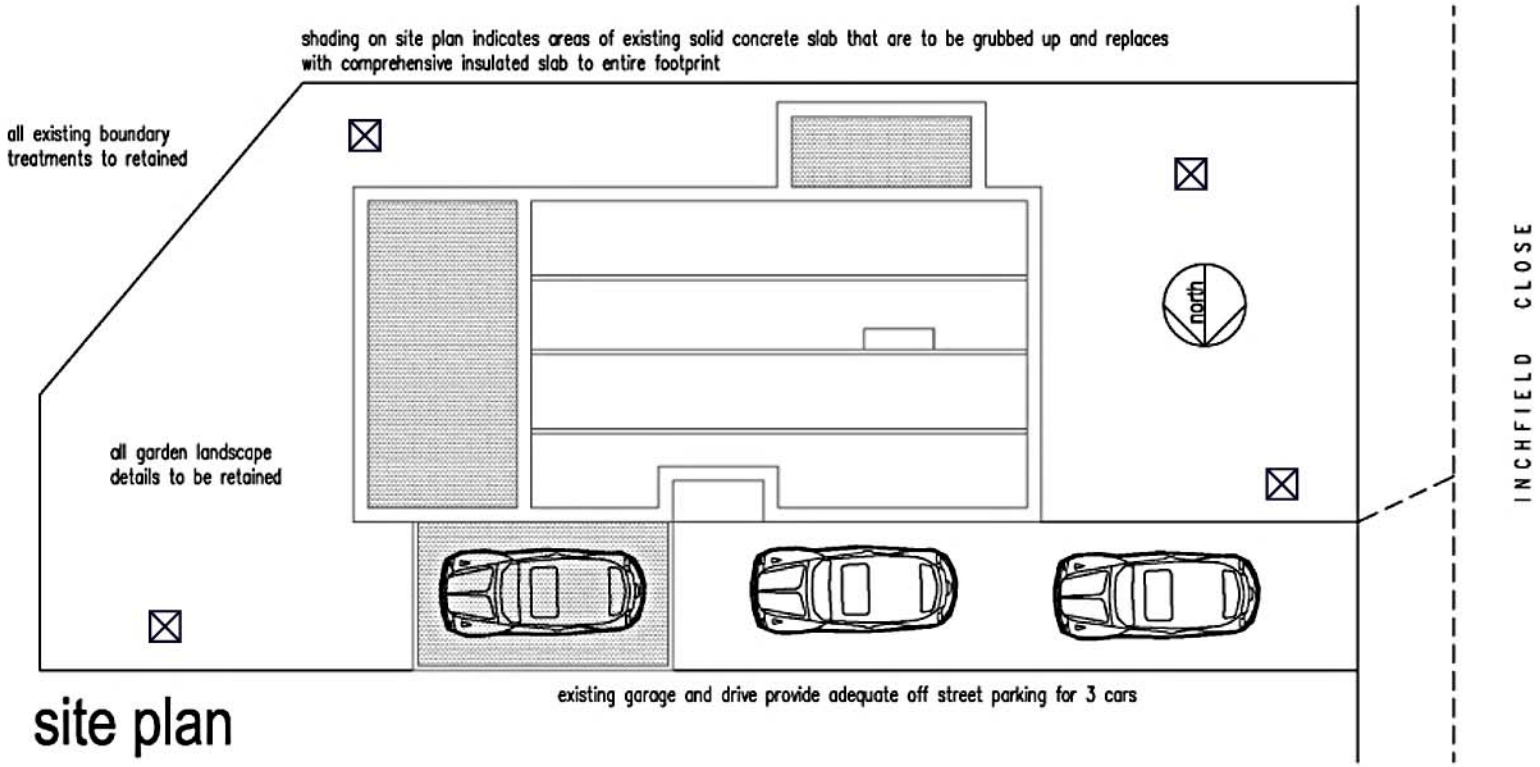
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9. New information, revised practices, or changes in legislation, may necessitate the re-interpretation of the report, in whole or in part.



Inchfield Close Norden. OL11 5SB
Site Investigation Plan 1: 200
23.01.2019
☒ Trialhole

WORMS EYE Ltd
52, Bank Parade
Burnley BB11 1TS
Tel: 01282 414 649



site plan

☒ Trialhole

Inchfield Close, Norden, OL11 5SB:

Trial Holes 23.01.2019

Trial Hole A

Depth (m)	Findings
0 - 0.25	Dark grey/brown TOPSOIL with roots and occasional gravel
0.25 – 0.60	Grey and mottled brown clay with rare brick fragments and rare cobbles MADE GROUND
0.60 – 0.85	Soft brown/orange slightly sandy CLAY with occasional sandstone fragments
Notes	Dry, no smell, stable

Trial Hole C

Depth (m)	Findings
0.0 – 0.25	Dark brown clayey TOPSOIL with roots
0.25 – 1.00	Firm – stiff light brown mottled grey slightly sandy CLAY
Notes	Dry, no smell, stable

Trial Hole D

Depth (m)	Findings
0 – 0.80	Grey/dark brown topsoily clay with abundant cobbles at 0.55m patches of decomposed turf and roots MADE GROUND red pen lid seen at 0.70m
0.80 – 1.00	Firm – stiff light brown mottled grey CLAY
Notes	Dry, strong stench, stable

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Certificate of Analysis

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Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 798147-1

Date of Report: 08-Feb-2019

Customer: Worms Eye Ltd
Cannon House
52
Bank Parade
Burnley
Lancashire
BB11 1TS

Customer Contact: Mr Stuart Hartley

Customer Job Reference:
Customer Site Reference: Inchfield close, Rochdale
Date Job Received at Concept: 25-Jan-2019
Date Analysis Started: 28-Jan-2019
Date Analysis Completed: 07-Feb-2019

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

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

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Toni Morris
Customer Service Advisor

Issued by :
Zoe Gunter
Customer Service Advisor

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
Asbestos ID

Concept Reference	**798147 001**	**798147 002**	**798147 003**
Customer Sample Reference	**THA**	**THC**	**THD**
Depth	**0.30**	**0.20**	**0.30**
Date Sampled	**25-JAN-2019**	**25-JAN-2019**	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units			
Asbestos	T27	AR			N.D.	N.D.	N.D.

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
Worms Eye Suite

Concept Reference	**798147 001**	**798147 002**	**798147 003**
Customer Sample Reference	**THA**	**THC**	**THD**
Depth	**0.30**	**0.20**	**0.30**
Date Sampled	**25-JAN-2019**	**25-JAN-2019**	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units			
Arsenic	T6	A40	1	mg/kg	**9**	**59**	**12**
Cadmium	T6	A40	1	mg/kg	<1	**2**	<1
Chromium	T6	A40	1	mg/kg	**30**	**110**	**64**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1
Copper	T6	A40	1	mg/kg	**31**	**360**	**60**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1
Cyanide(free)	T4	AR	1	mg/kg	<1	<1	<1
Lead	T6	A40	1	mg/kg	**81**	**610**	**82**
Mercury	T6	A40	1	mg/kg	<1	<1	<1
Nickel	T6	A40	1	mg/kg	**22**	**75**	**24**
pH	T7	A40			**6.5**	**6.1**	**6.4**
Phenols(Mono)	T4	AR	1	mg/kg	<1	<1	<1
Selenium	T6	A40	3	mg/kg	<3	<3	<3
Soil Organic Matter	T287	A40	0.1	%	**2.5**	**26**	**4.3**
SO4(Total)	T102	A40	0.01	%	**0.03**	**0.17**	**0.03**
(Water Soluble) SO4 expressed as SO4	T242	A40	50	mg/l	<50	<50	<50
Sulphide	T4	A40	10	mg/kg	<10	<10	<10
Sulphur(Free)	T2	AR	500	mg/kg	<500	<500	<500
Thiocyanate	T4	A40	10	mg/kg	<10	<10	<10
Total Organic Carbon	T21	A40	0.1	%	**1.4**	**15**	**2.5**
Zinc	T6	A40	1	mg/kg	**79**	**600**	**96**

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
BTEX, MTBE

Concept Reference	**798147 004**
Customer Sample Reference	**THC**
Depth	**0.90**
Date Sampled	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units	
Benzene	T54	AR	0.001	mg/kg	<0.001[13]
EthylBenzene	T54	AR	0.001	mg/kg	<0.001
M/P Xylene	T54	AR	0.001	mg/kg	<0.001
Methyl tert-Butyl Ether	T54	AR	0.001	mg/kg	<0.001
O Xylene	T54	AR	0.001	mg/kg	<0.001
Toluene	T54	AR	0.001	mg/kg	<0.001
Total BTEX & MTBE	T85	AR	0.001	mg/kg	<0.001

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
Wormseye TPH (CWG)

					Concept Reference	**798147 001**	**798147 002**	**798147 003**
					Customer Sample Reference	**THA**	**THC**	**THD**
					Depth	**0.30**	**0.20**	**0.30**
					Date Sampled	**25-JAN-2019**	**25-JAN-2019**	**25-JAN-2019**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Benzene	T54	AR	0.001	mg/kg	<0.001(13)	<0.001(13)	<0.002(110,13)
Toluene	T54	AR	0.001	mg/kg	<0.001	<0.001	<0.002(110)
EthylBenzene	T54	AR	0.001	mg/kg	<0.001	<0.001	<0.002(110)
M/P Xylene	T54	AR	0.001	mg/kg	<0.001	<0.001	<0.002(110)
O Xylene	T54	AR	0.001	mg/kg	<0.001	<0.001	<0.002(110)
Methyl tert-Butyl Ether	T54	AR	0.001	mg/kg	<0.001	<0.001	<0.002(110)
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.020(110)
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.020(110)
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.020(110)
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	<1(13)	<1(13)	<1(13)
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	<1(13)	<1(13)	<1(13)
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	<1(13)	**1(13)**	<1(13)
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	<2(13)	**3(13)**	<2(13)
TPH (Aliphatic) total	T85	M105		mg/kg	N.D.(13)	**4.0(13)**	N.D.(13)
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.020(110)
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.020(110)
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.020(110)
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	<2(13)	<2(13)	<2(13)
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	<1(13)	**2(13)**	<1(13)
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	<1(13)	**4(13)**	**1(13)**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	<1(13)	**15(13)**	**1(13)**
TPH (Aromatic) total	T85	M105		mg/kg	N.D.(13)	**21(13)**	**2.0(13)**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N.D.(13)	**25.0(13)**	**2.00(13)**

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
TPH C5-C10 (ali/aro + sum)

					Concept Reference	**798147 004**
					Customer Sample Reference	**THC**
					Depth	**0.90**
					Date Sampled	**25-JAN-2019**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Total Petroleum Hydrocarbons (C5 - C10 aliphatic/aromatic)	T85	AR	0.010	mg/kg	<0.010	
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	<0.010	
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
TPH C10-C16 (ali/aro + sum)

Concept Reference	**798147 004**
Customer Sample Reference	**THC**
Depth	**0.90**
Date Sampled	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units	
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	<1[13]
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	<1[13]
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	<2[13]
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	<1[13]
Total Petroleum Hydrocarbons (C10-C16 aliphatic/aromatic)	T85	M105	1	mg/kg	<1[13]

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
TPH C16-C40 (ali/aro + sum)

Concept Reference	**798147 004**
Customer Sample Reference	**THC**
Depth	**0.90**
Date Sampled	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units	
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	<1[13]
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	<2[13]
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	<1[13]
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	<1[13]
Total Petroleum Hydrocarbons (C16-C40 aliphatic/aromatic)	T85	M105	1	mg/kg	<1[13]
TPH (C35-C40 aliphatic)	T909	M105	1	mg/kg	<1[13]
TPH (C35-C40 aromatic)	T909	M105	1	mg/kg	<1[13]

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
UU Pipe Selection Risk Assess Sum (UKWIR)

Concept Reference	**798147 004**
Customer Sample Reference	**THC**
Depth	**0.90**
Date Sampled	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units	
Cresols and Chlorinated Phenols (Total)	T85	AR	0.10	mg/kg	<0.10
SVOC screen	T16	AR	0.1	mg/kg	Hexadecanoic Acid **1.2**
					Octadecanoic Acid **0.2**
					Unidentified Aliphatic Hydrocarbon circa C26 **0.2**
					Unidentified aliphatic hydrocarbon circa C22 **1.5**
					Unidentified Aliphatic Hydrocarbon circa C26 **0.2**
					Unidentified Aliphatic Hydrocarbon circa C26 **0.3**
					Unidentified Aliphatic Hydrocarbon circa C26 **0.2**
					Unidentified Aliphatic Hydrocarbon circa C26 **0.2**
					Unidentified Aliphatic Hydrocarbon circa C26 **0.1**
					Unidentified aliphatic hydrocarbon circa c35 **0.2**
Tertiary amyl methyl ether	T54	AR	0.005	mg/kg	<0.005
Total SVOC (exc PAH & Specific Phenols)	T85	AR	0.1	mg/kg	<0.1
VOC Screen (Extra Peaks)	T54	AR	0.10	mg/kg	<0.10

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
Total and Speciated USEPA16 PAH

				Concept Reference	**798147 001**	**798147 002**	**798147 003**
				Customer Sample Reference	**THA**	**THC**	**THD**
				Depth	**0.30**	**0.20**	**0.30**
				Date Sampled	**25-JAN-2019**	**25-JAN-2019**	**25-JAN-2019**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Acenaphthylene	T149	AR	0.01	mg/kg	<0.01	<0.01	<0.01
Acenaphthene	T149	AR	0.01	mg/kg	**0.02**	**0.01**	<0.01
Anthracene	T149	AR	0.01	mg/kg	**0.02**	**0.01**	**0.01**
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	**0.04**	**0.06**	**0.03**
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	**0.03**	**0.07**	**0.04**
Benzo(b/k)Fluoranthene	T149	AR	0.01	mg/kg	**0.06**	**0.14**	**0.08**
Benzo(b)fluoranthene	T149	AR	0.01	mg/kg	**0.03**	**0.08**	**0.04**
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	**0.02**	**0.06**	**0.04**
Benzo(k)fluoranthene	T149	AR	0.01	mg/kg	**0.03**	**0.06**	**0.03**
Chrysene	T149	AR	0.01	mg/kg	**0.04**	**0.07**	**0.04**
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	**0.01**	**0.02**	**0.01**
Fluoranthene	T149	AR	0.01	mg/kg	**0.10**	**0.10**	**0.06**
Fluorene	T149	AR	0.01	mg/kg	**0.01**	<0.01	<0.01
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	**0.02**	**0.05**	**0.03**
Naphthalene	T149	AR	0.01	mg/kg	**0.01**	**0.06**	**0.01**
Phenanthrene	T149	AR	0.01	mg/kg	**0.10**	**0.07**	**0.04**
Pyrene	T149	AR	0.01	mg/kg	**0.08**	**0.08**	**0.05**
PAH(total)	T149	AR	0.01	mg/kg	**0.56**	**0.80**	**0.44**

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil

Semi-Volatile Organic Compounds (USEPA 625)

Concept Reference	**798147 004**
Customer Sample Reference	**THC**
Depth	**0.90**
Date Sampled	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units	
Phenol	T16	AR	0.1	mg/kg	<0.1
Bis (2-chloroethyl) ether	T16	AR	0.1	mg/kg	<0.1
2-Chlorophenol	T16	AR	0.1	mg/kg	<0.1
1,3-Dichlorobenzene	T16	AR	0.1	mg/kg	<0.1
1,4-Dichlorobenzene	T16	AR	0.1	mg/kg	<0.1
1,2-Dichlorobenzene	T16	AR	0.1	mg/kg	<0.1
Bis (2-chloroisopropyl) ether	T16	AR	0.1	mg/kg	<0.1
2-methyl phenol	T16	AR	0.1	mg/kg	<0.1
3/4-Methylphenol	T16	AR	0.1	mg/kg	<0.1
Hexachloroethane	T16	AR	0.1	mg/kg	<0.1
Nitrobenzene	T16	AR	0.1	mg/kg	<0.1
Isophorone	T16	AR	0.1	mg/kg	<0.1
2,4-Dimethylphenol	T16	AR	0.1	mg/kg	<0.1
Bis (2-chloroethoxy) methane	T16	AR	0.1	mg/kg	<0.1(131)
2,4-Dichlorophenol	T16	AR	0.1	mg/kg	<0.1
1,2,4-Trichlorobenzene	T16	AR	0.1	mg/kg	<0.1(131)
Naphthalene	T16	AR	0.1	mg/kg	<0.1
4-Chloroaniline	T16	AR	0.1	mg/kg	<0.1
Hexachlorobutadiene	T16	AR	0.1	mg/kg	<0.1
4-Chloro-3-methylphenol	T16	AR	0.1	mg/kg	<0.1
2-Methylnaphthalene	T16	AR	0.1	mg/kg	<0.1
Hexachlorocyclopentadiene	T16	AR	0.1	mg/kg	<0.2(131,162)
2,4,6-Trichlorophenol	T16	AR	0.1	mg/kg	<0.1
2,4,5-Trichlorophenol	T16	AR	0.1	mg/kg	<0.1
2-Chloronaphthalene	T16	AR	0.1	mg/kg	<0.1
2-Nitroaniline	T16	AR	0.1	mg/kg	<0.1
Dimethyl phthalate	T16	AR	0.1	mg/kg	<0.1
2,6-Dinitrotoluene	T16	AR	0.1	mg/kg	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	<0.1
3-Nitroaniline	T16	AR	0.1	mg/kg	<0.1
Dibenzofuran	T16	AR	0.1	mg/kg	<0.1
2,4-Dinitrophenol	T16	AR	0.1	mg/kg	<0.2(131)
2,4-Dinitrotoluene	T16	AR	0.1	mg/kg	<0.1
2-Nitrophenol	T16	AR	0.1	mg/kg	<0.1
Diethyl phthalate	T16	AR	0.1	mg/kg	<0.1
Fluorene	T16	AR	0.1	mg/kg	<0.1
4-Chlorophenyl phenylether	T16	AR	0.1	mg/kg	<0.1
4-Nitroaniline	T16	AR	0.1	mg/kg	<0.1
Azobenzene	T16	AR	0.1	mg/kg	<0.1
4-Bromophenyl phenylether	T16	AR	0.1	mg/kg	<0.1
Hexachlorobenzene	T16	AR	0.1	mg/kg	<0.1
Pentachlorophenol	T16	AR	0.1	mg/kg	<0.1
Phenanthrene	T16	AR	0.1	mg/kg	<0.1
Anthracene	T16	AR	0.1	mg/kg	<0.1
Carbazole	T16	AR	0.1	mg/kg	<0.1
Di-n-butylphthalate	T16	AR	0.1	mg/kg	<0.1
Fluoranthene	T16	AR	0.1	mg/kg	<0.1
Pyrene	T16	AR	0.1	mg/kg	<0.1
Butyl benzylphthalate	T16	AR	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	<0.1
Chrysene	T16	AR	0.1	mg/kg	<0.1
4-Nitrophenol	T16	AR	0.1	mg/kg	<0.1
Bis (2-ethylhexyl)phthalate	T16	AR	0.1	mg/kg	<0.1
Di-n-octylphthalate	T16	AR	0.1	mg/kg	<0.1
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	<0.1

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil

Semi-Volatile Organic Compounds (USEPA 625)

Concept Reference	**798147 004**
Customer Sample Reference	**THC**
Depth	**0.90**
Date Sampled	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units	
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	<0.1

Concept Reference: 798147
Project Site: Inchfield close, Rochdale
Customer Reference:

Soil Analysed as Soil
United Utilities Total VOC Suite

Concept Reference	**798147 004**
Customer Sample Reference	**THC**
Depth	**0.90**
Date Sampled	**25-JAN-2019**

Determinand	Method	Test Sample	LOD	Units	
1,1,1,2-Tetrachloroethane	T54	AR	0.005	mg/kg	<0.005
1,1,1-Trichloroethane	T54	AR	0.005	mg/kg	<0.005
1,1,2,2-Tetrachloroethane	T54	AR	0.005	mg/kg	<0.005
1,1,2-Trichloroethane	T54	AR	0.005	mg/kg	<0.005
1,1,2-Trichloroethylene	T54	AR	0.005	mg/kg	<0.005
1,1-Dichloroethane	T54	AR	0.005	mg/kg	<0.005
1,1-Dichloroethylene	T54	AR	0.005	mg/kg	<0.005
1,1-Dichloropropene	T54	AR	0.005	mg/kg	<0.005
1,2,3-Trichloropropane	T54	AR	0.005	mg/kg	<0.005
1,2,4-Trimethylbenzene	T54	AR	0.005	mg/kg	<0.005
1,2-dibromoethane	T54	AR	0.005	mg/kg	<0.005
1,2-Dichlorobenzene	T54	AR	0.005	mg/kg	<0.005
1,2-Dichloroethane	T54	AR	0.005	mg/kg	<0.005
1,2-Dichloropropane	T54	AR	0.005	mg/kg	<0.005
1,3,5-Trimethylbenzene	T54	AR	0.005	mg/kg	<0.005
1,3-Dichlorobenzene	T54	AR	0.005	mg/kg	<0.005
1,3-Dichloropropane	T54	AR	0.005	mg/kg	<0.005
1,4-Dichlorobenzene	T54	AR	0.005	mg/kg	<0.005
2,2-Dichloropropane	T54	AR	0.005	mg/kg	<0.005
2-Chlorotoluene	T54	AR	0.005	mg/kg	<0.005
4-Chlorotoluene	T54	AR	0.005	mg/kg	<0.005
Bromobenzene	T54	AR	0.005	mg/kg	<0.005
Bromochloromethane	T54	AR	0.005	mg/kg	<0.005
Bromodichloromethane	T54	AR	0.005	mg/kg	<0.005
Bromoform	T54	AR	0.005	mg/kg	<0.005
Bromomethane	T54	AR	0.005	mg/kg	<0.005
Carbon tetrachloride	T54	AR	0.005	mg/kg	<0.005
Chlorobenzene	T54	AR	0.005	mg/kg	<0.005
Chlorodibromomethane	T54	AR	0.005	mg/kg	<0.005
Chloroethane	T54	AR	0.005	mg/kg	<0.005
Chloroform	T54	AR	0.005	mg/kg	<0.005
Chloromethane	T54	AR	0.005	mg/kg	<0.005
Cis-1,2-Dichloroethylene	T54	AR	0.005	mg/kg	<0.005
Cis-1,3-Dichloropropene	T54	AR	0.005	mg/kg	<0.005
Dibromomethane	T54	AR	0.005	mg/kg	<0.005
Dichlorodifluoromethane	T54	AR	0.005	mg/kg	<0.005
Isopropyl benzene	T54	AR	0.005	mg/kg	<0.005
Methylene Chloride	T54	AR	0.050	mg/kg	<0.050
n-Propylbenzene	T54	AR	0.005	mg/kg	<0.005
Naphthalene	T54	AR	0.050	mg/kg	<0.050
p-Isopropyltoluene	T54	AR	0.005	mg/kg	<0.005
S-Butylbenzene	T54	AR	0.005	mg/kg	<0.005
Styrene	T54	AR	0.005	mg/kg	<0.005
T-Butylbenzene	T54	AR	0.005	mg/kg	<0.005
Tetrachloroethene	T54	AR	0.005	mg/kg	<0.005
Trans-1,2-Dichloroethene	T54	AR	0.005	mg/kg	<0.005
Trans-1,3-Dichloropropene	T54	AR	0.005	mg/kg	<0.005
Trichlorofluoromethane	T54	AR	0.005	mg/kg	<0.005
Vinyl chloride	T54	AR	0.005	mg/kg	<0.005
VOC(Total)	T85	AR	0.005	mg/kg	<0.005

Index to symbols used in 798147-1

Value	Description
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C

A40	Assisted dried < 40C
N.D.	Not Detected
13	Results have been blank corrected.
110	LOD raised due to low internal standard recovery.
131	Result is outside of the scope of accreditation due to a QC Failure
162	LOD determined by matrix spike recovery
S	Analysis was subcontracted
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos testing was subcontracted.
Samples submitted for GC/MS (Headspace) analysis were submitted in inappropriate containers. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T2	Grav
T27	PLM
T149	GC/MS (SIR)
T4	Colorimetry
T16	GC/MS
T54	GC/MS (Headspace)
T287	Calc TOC/0.58
T6	ICP/OES
T21	OX/IR
T85	Calc
T102	ICP/OES (HCl extract)
T909	GCxGC
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T7	Probe

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Cresols and Chlorinated Phenols (Total)	T85	AR	0.10	mg/kg	N	004
SVOC screen	T16	AR	0.1	mg/kg	N	004
Tertiary amyl methyl ether	T54	AR	0.005	mg/kg	U	004
Total SVOC (exc PAH & Specific Phenols)	T85	AR	0.1	mg/kg	U	004
VOC Screen (Extra Peaks)	T54	AR	0.10	mg/kg	N	004
Phenol	T16	AR	0.1	mg/kg	U	004
Bis (2-chloroethyl) ether	T16	AR	0.1	mg/kg	U	004
2-Chlorophenol	T16	AR	0.1	mg/kg	U	004
1,3-Dichlorobenzene	T16	AR	0.1	mg/kg	U	004
1,4-Dichlorobenzene	T16	AR	0.1	mg/kg	U	004
1,2-Dichlorobenzene	T16	AR	0.1	mg/kg	U	004
Bis (2-chloroisopropyl) ether	T16	AR	0.1	mg/kg	U	004
2-methyl phenol	T16	AR	0.1	mg/kg	U	004
3/4-Methylphenol	T16	AR	0.1	mg/kg	U	004
Hexachloroethane	T16	AR	0.1	mg/kg	U	004
Nitrobenzene	T16	AR	0.1	mg/kg	U	004
Isophorone	T16	AR	0.1	mg/kg	U	004
2,4-Dimethylphenol	T16	AR	0.1	mg/kg	U	004
Bis (2-chloroethoxy) methane	T16	AR	0.1	mg/kg	U	004
2,4-Dichlorophenol	T16	AR	0.1	mg/kg	U	004
1,2,4-Trichlorobenzene	T16	AR	0.1	mg/kg	U	004
Naphthalene	T16	AR	0.1	mg/kg	U	004
4-Chloroaniline	T16	AR	0.1	mg/kg	U	004
Hexachlorobutadiene	T16	AR	0.1	mg/kg	U	004
4-Chloro-3-methylphenol	T16	AR	0.1	mg/kg	U	004
2-Methylnaphthalene	T16	AR	0.1	mg/kg	U	004
Hexachlorocyclopentadiene	T16	AR	0.1	mg/kg	SU	004
2,4,6-Trichlorophenol	T16	AR	0.1	mg/kg	U	004
2,4,5-Trichlorophenol	T16	AR	0.1	mg/kg	U	004
2-Chloronaphthalene	T16	AR	0.1	mg/kg	U	004
2-Nitroaniline	T16	AR	0.1	mg/kg	U	004
Dimethyl phthalate	T16	AR	0.1	mg/kg	U	004

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
2,6-Dinitrotoluene	T16	AR	0.1	mg/kg	U	004
Acenaphthylene	T16	AR	0.1	mg/kg	U	004
Acenaphthene	T16	AR	0.1	mg/kg	U	004
3-Nitroaniline	T16	AR	0.1	mg/kg	U	004
Dibenzofuran	T16	AR	0.1	mg/kg	U	004
2,4-Dinitrophenol	T16	AR	0.1	mg/kg	N	004
2,4-Dinitrotoluene	T16	AR	0.1	mg/kg	U	004
2-Nitrophenol	T16	AR	0.1	mg/kg	U	004
Diethyl phthalate	T16	AR	0.1	mg/kg	U	004
Fluorene	T16	AR	0.1	mg/kg	U	004
4-Chlorophenyl phenylether	T16	AR	0.1	mg/kg	U	004
4-Nitroaniline	T16	AR	0.1	mg/kg	U	004
Azobenzene	T16	AR	0.1	mg/kg	U	004
4-Bromophenyl phenylether	T16	AR	0.1	mg/kg	U	004
Hexachlorobenzene	T16	AR	0.1	mg/kg	U	004
Pentachlorophenol	T16	AR	0.1	mg/kg	SU	004
Phenanthrene	T16	AR	0.1	mg/kg	U	004
Anthracene	T16	AR	0.1	mg/kg	U	004
Carbazole	T16	AR	0.1	mg/kg	U	004
Di-n-butylphthalate	T16	AR	0.1	mg/kg	U	004
Fluoranthene	T16	AR	0.1	mg/kg	U	004
Pyrene	T16	AR	0.1	mg/kg	U	004
Butyl benzylphthalate	T16	AR	0.1	mg/kg	U	004
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	U	004
4-Nitrophenol	T16	AR	0.1	mg/kg	N	004
Chrysene	T16	AR	0.1	mg/kg	U	004
Bis (2-ethylhexyl)phthalate	T16	AR	0.1	mg/kg	U	004
Di-n-octylphthalate	T16	AR	0.1	mg/kg	U	004
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	U	004
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	U	004
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	U	004
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	U	004
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	U	004
Total Petroleum Hydrocarbons (C10-C16 aliphatic/aromatic)	T85	M105	1	mg/kg	N	004
Total Petroleum Hydrocarbons (C16-C40 aliphatic/aromatic)	T85	M105	1	mg/kg	N	004
TPH (C35-C40 aliphatic)	T909	M105	1	mg/kg	N	004
TPH (C35-C40 aromatic)	T909	M105	1	mg/kg	N	004
1,1,1,2-Tetrachloroethane	T54	AR	0.005	mg/kg	U	004
1,1,1-Trichloroethane	T54	AR	0.005	mg/kg	U	004
1,1,2,2-Tetrachloroethane	T54	AR	0.005	mg/kg	U	004
1,1,2-Trichloroethane	T54	AR	0.005	mg/kg	U	004
1,1,2-Trichloroethylene	T54	AR	0.005	mg/kg	U	004
1,1-Dichloroethane	T54	AR	0.005	mg/kg	U	004
1,1-Dichloroethylene	T54	AR	0.005	mg/kg	U	004
1,1-Dichloropropene	T54	AR	0.005	mg/kg	U	004
1,2,3-Trichloropropane	T54	AR	0.005	mg/kg	U	004
1,2,4-Trimethylbenzene	T54	AR	0.005	mg/kg	U	004
1,2-dibromoethane	T54	AR	0.005	mg/kg	U	004
1,2-Dichlorobenzene	T54	AR	0.005	mg/kg	U	004
1,2-Dichloroethane	T54	AR	0.005	mg/kg	U	004
1,2-Dichloropropane	T54	AR	0.005	mg/kg	U	004
1,3,5-Trimethylbenzene	T54	AR	0.005	mg/kg	U	004
1,3-Dichlorobenzene	T54	AR	0.005	mg/kg	U	004
1,3-Dichloropropane	T54	AR	0.005	mg/kg	U	004
1,4-Dichlorobenzene	T54	AR	0.005	mg/kg	U	004
2,2-Dichloropropane	T54	AR	0.005	mg/kg	U	004
2-Chlorotoluene	T54	AR	0.005	mg/kg	U	004
4-Chlorotoluene	T54	AR	0.005	mg/kg	U	004
Bromobenzene	T54	AR	0.005	mg/kg	U	004
Bromochloromethane	T54	AR	0.005	mg/kg	U	004
Bromodichloromethane	T54	AR	0.005	mg/kg	U	004
Bromoform	T54	AR	0.005	mg/kg	U	004
Bromomethane	T54	AR	0.005	mg/kg	U	004
Carbon tetrachloride	T54	AR	0.005	mg/kg	U	004
Chlorobenzene	T54	AR	0.005	mg/kg	U	004
Chlorodibromomethane	T54	AR	0.005	mg/kg	U	004
Chloroethane	T54	AR	0.005	mg/kg	U	004
Chloroform	T54	AR	0.005	mg/kg	U	004
Chloromethane	T54	AR	0.005	mg/kg	U	004
Cis-1,2-Dichloroethylene	T54	AR	0.005	mg/kg	U	004

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Cis-1,3-Dichloropropene	T54	AR	0.005	mg/kg	U	004
Dibromomethane	T54	AR	0.005	mg/kg	U	004
Dichlorodifluoromethane	T54	AR	0.005	mg/kg	U	004
Isopropyl benzene	T54	AR	0.005	mg/kg	U	004
Methylene Chloride	T54	AR	0.050	mg/kg	N	004
n-Propylbenzene	T54	AR	0.005	mg/kg	U	004
Naphthalene	T54	AR	0.050	mg/kg	U	004
p-Isopropyltoluene	T54	AR	0.005	mg/kg	U	004
S-Butylbenzene	T54	AR	0.005	mg/kg	U	004
Styrene	T54	AR	0.005	mg/kg	U	004
T-Butylbenzene	T54	AR	0.005	mg/kg	U	004
Tetrachloroethene	T54	AR	0.005	mg/kg	U	004
Trans-1,2-Dichloroethene	T54	AR	0.005	mg/kg	U	004
Trans-1,3-Dichloropropene	T54	AR	0.005	mg/kg	U	004
Trichlorofluoromethane	T54	AR	0.005	mg/kg	U	004
Vinyl chloride	T54	AR	0.005	mg/kg	U	004
VOC(Total)	T85	AR	0.005	mg/kg	U	004
Total BTEX & MTBE	T85	AR	0.001	mg/kg	U	004
Total Petroleum Hydrocarbons (C5 - C10 aliphatic/aromatic)	T85	AR	0.010	mg/kg	N	004
Benzene	T54	AR	0.001	mg/kg	U	001-004
Toluene	T54	AR	0.001	mg/kg	U	001-004
EthylBenzene	T54	AR	0.001	mg/kg	U	001-004
M/P Xylene	T54	AR	0.001	mg/kg	U	001-004
O Xylene	T54	AR	0.001	mg/kg	U	001-004
Methyl tert-Butyl Ether	T54	AR	0.001	mg/kg	U	001-004
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	N	001-004
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	N	001-004
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	N	001-004
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	U	001-004
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	U	001-004
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	U	001-004
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	U	001-004
TPH (Aliphatic) total	T85	M105		mg/kg	N	001-003
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	N	001-004
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	N	001-004
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	N	001-004
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	U	001-004
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	U	001-004
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	U	001-004
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	U	001-004
TPH (Aromatic) total	T85	M105		mg/kg	N	001-003
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001-003
Arsenic	T6	A40	1	mg/kg	U	001-003
Cadmium	T6	A40	1	mg/kg	U	001-003
Chromium	T6	A40	1	mg/kg	U	001-003
Chromium VI	T6	A40	1	mg/kg	N	001-003
Copper	T6	A40	1	mg/kg	U	001-003
Cyanide(Total)	T4	AR	1	mg/kg	U	001-003
Cyanide(free)	T4	AR	1	mg/kg	U	001-003
Lead	T6	A40	1	mg/kg	U	001-003
Mercury	T6	A40	1	mg/kg	U	001-003
Nickel	T6	A40	1	mg/kg	U	001-003
pH	T7	A40			U	001-003
Phenols(Mono)	T4	AR	1	mg/kg	U	001-003
Selenium	T6	A40	3	mg/kg	U	001-003
Soil Organic Matter	T287	A40	0.1	%	N	001-003
SO4(Total)	T102	A40	0.01	%	U	001-003
(Water Soluble) SO4 expressed as SO4	T242	A40	50	mg/l	U	001-003
Sulphide	T4	A40	10	mg/kg	N	001-003
Sulphur(Free)	T2	AR	500	mg/kg	N	001-003
Thiocyanate	T4	A40	10	mg/kg	N	001-003
Total Organic Carbon	T21	A40	0.1	%	N	001-003
Zinc	T6	A40	1	mg/kg	U	001-003
Acenaphthylene	T149	AR	0.01	mg/kg	U	001-003
Acenaphthene	T149	AR	0.01	mg/kg	U	001-003
Anthracene	T149	AR	0.01	mg/kg	U	001-003
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	U	001-003
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	U	001-003
Benzo(b/k)Fluoranthene	T149	AR	0.01	mg/kg	U	001-003
Benzo(b)fluoranthene	T149	AR	0.01	mg/kg	U	001-003

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	U	001-003
Benzo(k)fluoranthene	T149	AR	0.01	mg/kg	U	001-003
Chrysene	T149	AR	0.01	mg/kg	U	001-003
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	U	001-003
Fluoranthene	T149	AR	0.01	mg/kg	U	001-003
Fluorene	T149	AR	0.01	mg/kg	U	001-003
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	U	001-003
Naphthalene	T149	AR	0.01	mg/kg	U	001-003
Phenanthrene	T149	AR	0.01	mg/kg	U	001-003
Pyrene	T149	AR	0.01	mg/kg	U	001-003
PAH(total)	T149	AR	0.01	mg/kg	U	001-003
Asbestos	T27	AR			SU	001-003

INCHFIELD CLOSE, NORDEN, ROCHDALE. OL11 5SB

Comparison of Contamination Test Results with Various Thresholds

RESIDENTIAL WITH HOMEGROWN VEGETABLES

Hydrocarbons at 2.5% SOM

Contaminant	Max Value	Threshold	Pass/ Fail	SSAC	Pass/ Fail	Failed Samples
HEAVY METALS						
- Arsenic	59	37*	X			THC – 0.2m
- Cadmium	2	11*	√			
- Chromium III	110	910*	√			
- Chromium VI	<1	6*	√			
- Copper	360	2400*	√			
- Lead	610	200▲	X			THC – 0.2m
- Inorganic Mercury	<1	40*	√			
- Methyl Mercury	<1	11*	√			
- Nickel	75	180*	√			
- Selenium	<3	350#	√			
- Zinc	600	3700*	√			
OTHER INORGANICS						
- Asbestos	ND		√			
- Cyanide (total)	<1	20 (D)	√			
- pH range	6.1 – 6.5		√			
- Sulphate (g/l)	0.17	0.5 (B)	√			
- Sulphide	<10	250 (E)	√			
- Thiocyanate	<10		√			
-TOC range (%)	1.4 – 15		√			
-SOM Range	2.5 - 26		√			

All units mg/kg (parts per million/ppm) unless shown otherwise

Metals & inorganic values derived using 6% SOM (soil organic mater)

Sources

- Soil Guideline Values ▲ - C4SL

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Comparison of Contamination Test Results with Various Thresholds

RESIDENTIAL WITH HOMEGROWN VEGETABLES

Hydrocarbons at 2.5% SOM

Contaminant	Max Value	Threshold	Pass/ Fail	SSAC	Pass/ Fail	Failed Samples
PAHs						
- Acenapthene	0.02	510*	√			
- Acenapthylene	<0.01	420*	√			
- Anthracene	0.02	5400*	√			
- Benz(a)anthracene	0.06	11*	√			
- Benzo(a)pyrene (BAP)*	0.07	2.7*	√			
- Benzo(b)fluoranthene	0.08	3.3*	√			
- Benzo(ghi)perylene	0.06	340*	√			
- Benzo(k)fluoranthene	0.06	93*	√			
- Chrysene	0.07	22*	√			
- Dibenz(ah)anthracene (DBA)	0.02	0.28*	√			
- Fluoranthene	0.10	560*	√			
- Fluorene	0.01	400*	√			
- Indene (123-cd) pyrene	0.05	36*	√			
- Naphthalene	0.06	5.6*	√			
- Phenanthrene	0.10	220*	√			
- Pyrene	0.08	1200*	√			
OTHER COMPOUNDS						
Phenols	<1	550*	√			
PID (VOC screen) ppm	0.0		√			
MTBE	<0.002		√			

All units mg/kg (parts per million/ppm) unless shown otherwise

Hydrocarbon values derived using 2.5% SOM

BAP is a marker for genotoxic PAHs

Sources

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Comparison of Contamination Test Results with Various Thresholds

RESIDENTIAL WITH HOMEGROWN VEGETABLES

Hydrocarbons at 2.5% SOM

Contaminant	Max Value	Threshold	Pass/ Fail	SSAC	Pass/ Fail	Failed Samples
BTEX COMPOUNDS						
- Benzene	<0.002	0.17*	√			
- Toluene	<0.002	290*	√			
- Ethyl-benzene	<0.002	110*	√			
- Xylene - O	<0.002	140*	√			
- M/P	<0.002	130*	√			
TPHs						
Aliphatics						
$C_5 – C_6$	<0.02	78*	√			
$C_6 – C_8$	<0.02	230*	√			
$C_8 – C_{10}$	<0.02	65*	√			
$C_{10} – C_{12}$	<1	330 (118 vap)*	√			
$C_{12} – C_{16}$	<1	2400 (59 sol)*	√			
$C_{16} – C_{35}$	4	92000 (21 sol)*	√			
Aromatics						
$C_5 – C_7$	<0.02	140*	√			
$C_7 – C_8$	<0.02	290*	√			
$C_8 – C_{10}$	<0.02	83*	√			
$C_{10} – C_{12}$	<2	180*	√			
$C_{12} – C_{16}$	2	330*	√			
$C_{16} – C_{21}$	4	540*	√			
$C_{21} – C_{35}$	15	1500*	√			
TPH Sum	25	1,000 (H)	√			

All units mg/kg (parts per million/ppm) unless shown otherwise

Hydrocarbon values derived using 2.5% SOM

Vap – vapour saturation limit Soil – solubility saturation limit

Sources

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