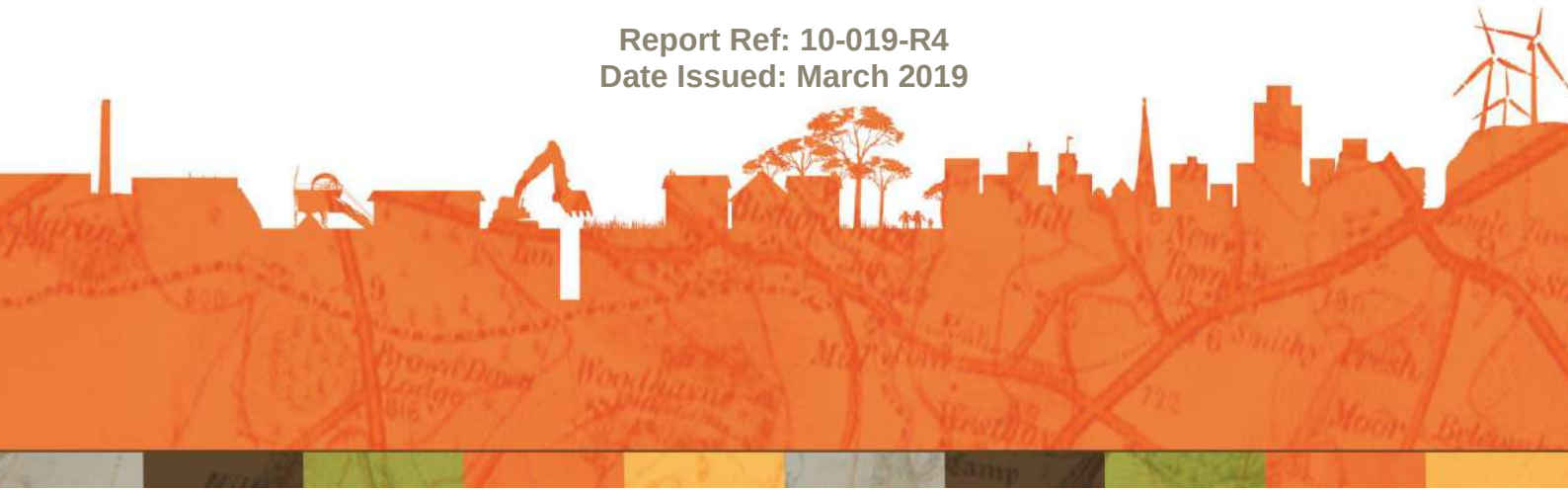
VALIDATION COMPLETION REPORT

Land off Vine Street
Gorton
Manchester
M18 8SR

Prepared for:

MULBURY HOMES

Report Ref: 10-019-R4
Date Issued: March 2019



e3p | Environmental | Energy | Engineering

E3P

Heliport Business Park,
Liverpool Road,
Eccles,
Manchester,
M30 7RU

Tel : + 00 (0) 161 707 9612
http:\\www. e3p.co.uk

Registered in England
No.: 807255262

QUALITY ASSURANCE

REMARKS	Final
DATE	March 2019
PREPARED BY	E. Fearn
QUALIFICATIONS	BSc (Hons), MSc, FGS
SIGNATURE	EFearn
CHECKED BY	R. Hodnett
QUALIFICATIONS	BSc (Hons), FGS
SIGNATURE	RHodnett
AUTHORISED BY	D. Cox
QUALIFICATIONS	BSc (Hons), PIEMA, FGS
SIGNATURE	
PROJECT NUMBER	10-019

Table of Contents

1. INTRODUCTION 2
1.1 Background 2
1.2 Objectives 2
1.3 Limitations 2
1.4 Confidentiality 2

2. GARDEN VALIDATION 3

3. CHEMICAL VALIDATION 4
3.1 Topsoil and Subsoil 4
3.2 Chemical Validation 4

4. CONCLUSIONS 7

APPENDICES

Appendix I Limitations
Appendix II Glossary
Appendix III Drawings
Appendix IV Chemical Testing Results
Appendix V Garden Validation Letters

1. INTRODUCTION

1.1 Background

E3P Ltd has been commissioned by Mulbury Homes to produce a Completion Report in relation to the validation of the garden plots at their newly constructed residential development off Vine Street, Gorton, Manchester.

Manchester City Council confirmed their general acceptance of the remediation works and subsequent validation works for the proposed residential development, pending the following information:

- *Validation of the 600mm cover system*

Interim validation letters pertaining to the above have been produced previously, however all outstanding information is included within this report.

All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.2 Objectives

E3P have been instructed to develop a detailed Validation Completion Report associated with the validation of the residential development that will incorporate the following:

- Overview of the validation works undertaken on the development site within the garden areas;
- Chemical laboratory analysis undertaken of the imported material.

1.3 Limitations

The limitations of this report are presented in Appendix I.

1.4 Confidentiality

E3P has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.

2. GARDEN VALIDATION

Independent validation of plots 1-46 were undertaken between 12th June 2018 and 6th February 2019. In total, nine visits were made during which the depth of the cover system was measured to confirm the installation of 450mm subsoil (imported) and 150mm topsoil (imported) with photographs taken by way of validation.

All material used for the cover system was confirmed chemically suitable for use through chemical analysis, discussed further in Section 3.0. All validation works have been completed in strict accordance with the specification previously agreed with Manchester City Council.

Table 2.1 below shows the Garden Validation reference and date of validation for each garden and landscaped area.

Table 2.1 Summary of Garden Validations

DATE	REPORT NUMBER	PLOT NUMBER
12th June 2018	10-019-V2	1 - 8
17th August 2018	10-019-V3	13 - 18
31st August 2018	10-019-V4	9 - 12
3rd October 2018	10-019-V5	19 - 21
12th October 2018	10-019-V6	22 - 24
26th November 2018	10-019-V7	25 - 28
3rd December 2018	10-019-V8	29 - 34
16th January 2019	10-019-V9	35 - 36
4th February 2019	10-019-V12	37 - 46

The full details of the cover system depths of each plot garden area are detailed within the individual letters issued, as per the report reference listed within Table 2.1. All garden validation letter reports are available on request.

3. CHEMICAL VALIDATION

3.1 Topsoil and Subsoil

All gardens and landscaped areas require a 600mm chemically suitable cover system comprising at least 450mm subsoil and 150mm topsoil.

Topsoil

No material deemed suitable for use as topsoil was present on-site and therefore an import of suitable material for use within the proposed development during the build-phase was deemed necessary.

Subsoil

Upon complete excavation and processing of all Made Ground deposits, the cut / fill earthworks to achieve a development platform as part of the proposed development removed natural granular soils. The resulting site won materials (~1250m3) were then stockpiled on site upon completion of the remediation and enabling works for use as subsoil within the 600mm cover system for garden and landscaped areas to be installed during the build phase of the development. These subsoils were used in plots 1-8.

An import of suitable subsoil material for use within the proposed development during the build-phase was deemed necessary for plots 9-46.

Subsoil and topsoil materials were tested prior to use within the proposed cover system to confirm their chemical suitability for use within the development.

3.2 Chemical Validation

Topsoil

Plots 1-8

120m^3 of topsoil was imported to site from Barlow Moor Road (Top Soil Sample only - certification amended to this certificate) for use within the garden cover system. E3P attended site on 12th June 2018 to obtain 3No. samples of placed topsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples TS101, TS102 and TS103 were obtained from 0.10mbgl. from plots 3, 5 and 7 respectively. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas. Chemical analysis results are included within lab reports 18-88735 and 18-88738.

Plots 9-46

Topsoil from Freeland Horticulture (Astley, Manchester) was imported to site for use within the garden cover system in plots 9-46. In total, circa. 327m^3 was imported to site, where chemical analysis was completed throughout the works as materials were brought to site as detailed below. All sampling was completed in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that

all imported topsoil deposits were chemically suitable for use within the proposed garden areas.

E3P attended site on 20th August 2018 to obtain 2No. samples of placed topsoil deposits. In-situ topsoil samples TS113 and TS116 were obtained from 0.10mbgl. from plots 13, and 16 respectively. Chemical analysis results are included within lab report 18-97159 (attached to this letter).

E3P attended site on 19th September 2018 to obtain 3No. samples of stockpiled topsoil deposits Chemical analysis results are included within lab report 18-11260 (attached to this letter).

E3P attended site on 12th October 2018 to obtain 3No. samples of placed topsoil. In-situ topsoil samples TS101, TS102 and TS103 were obtained from 0.10mbgl. from plots 22, 23 and 24 respectively. Chemical analysis results are included within lab report 18-14407 (attached to this letter).

In-situ topsoil samples TS101 (Plot 25) and TS103 (Plot 27) were taken along with TS105 from a stockpile on the 26th November 2018. Chemical analysis results are included within lab report 18-19986 (attached to this letter).

E3P attended site on the 16th January 2019 to collect a further sample of topsoil (TS101) where chemical results are included within the lab report 19-25098.

E3P also attended site on 4th February 2019 to collect a further four topsoil samples from a stockpile (TS101-TS104). These chemical results are included within the lab report 19-27469-1.

Subsoil

Plots 1-11

Upon complete excavation and processing of all Made Ground deposits, the cut / fill earthworks to achieve a development platform as part of the proposed development removed natural granular soils. The resulting site won materials (~1250m3) were then stockpiled on site upon completion of the remediation and enabling works for use as subsoil within the 600mm cover system for garden and landscaped areas to be installed during the build phase of the development.

During the remediation and enabling works 3No. samples were collected of the stockpiled materials, the results of which are presented within the I2 Analytical Report 17-51913 dated June 2017. E3P attended site on 31st May 2018 to obtain 2No, samples of the stockpiled subsoil, the results of which are presented within the I2 Analytical Report 18-87549. All samples have been collected in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy. The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Plots 12-21

Circa. 250m3 of subsoil was imported to site from Brooklands Primary School for use as subsoil within the 600mm cover system for gardens of plot 12. E3P attended site on 21st August 2018 to obtain 2No. samples of placed subsoil deposits in accordance with the

requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples SS114 and SS117 were obtained from 0.40m bgl. from plots 14 and 17 respectively. Chemical analysis confirmed that these topsoil deposit were chemically suitable for use within the proposed garden areas. Chemical analysis results are included within lab report 18-97329 (attached to this letter).

Plots 22-24

Circa. 24m^3 of subsoil was imported to site from Northfield Road for use as subsoil within the 600mm cover system for gardens of plot 22-24.

E3P attended site on the 12th October for obtain 3No. samples of placed subsoil and 1No. sample from stockpiled material in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ subsoil samples SS101, SS102 and SS103 were obtained from circa. 0.40m bgl. from plots 22, 23 and 24 respectively.

Chemical analysis confirmed that these subsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-14407 (attached to this letter).

Plots 25-36

For plots 25-36 E3P attended the source site of the subsoils (Old Lane, Little Hulton) on the 21st November 2018, where 3No. samples of stockpiled subsoil was undertaken in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that these subsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-19880 (attached to this letter).

Plots 37-46

Circa 360m3 of subsoils were imported to site from Hillside Central, Hatterseley Phase 3. E3P attended site on 31st January 2019, where two samples of stockpiled subsoil was collected in accordance of the sampling frequency stated in the E3P Remediation & Enabling Works Strategy. Samples SS102 and SS103 were taken and the results are included within the i2 Analytical Report 19-27352. Chemical analysis completed showed that material is suitable for use within the proposed garden areas.

A further sample of subsoil (PL46-2) was taken from plot 46 on the 7th February 2019, following placement and tested in accordance within the E3P Remediation & Enabling Works Strategy, the results are included within laboratory report 19-28076. The results of the chemical testing showed the material to be suitable for use within the garden cover systems.

Sufficient samples have been obtained and analysed to meet the agreed sample frequency of 1 sample per 50m^3 topsoil and 1 sample per 250m^3 subsoil. Laboratory certificates have been attached within the individual garden validation letters and are also included within Appendix IV of this report.

4. CONCLUSIONS

On completion of the validation works undertaken in relation to the installation of a chemically suitable cover system and gas protection measures, E3P can confirm that all works were undertaken in strict accordance with the agreed Remediation Strategy and therefore would deem the site suitable for use as a residential development.

E3P do not consider that any further work is necessary.

END OF REPORT

APPENDIX I
LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the Client as indicated in Section 1.2.

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

3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.

4. During the site walkover reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not be made known or accessible.

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

6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.

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

9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.

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

APPENDIX II
GLOSSARY

TERMS

AST	Above Ground Storage Tank
BGS	British Geological Survey
BSI	British Standards Institute
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CIEH	Chartered Institute of Environmental Health
CIRIA	Construction Industry Research Association
CLEA	Contaminated Land Exposure Assessment
CSM	Conceptual Site Model
DNAPL	Dense Non-Aqueous Phase Liquid (chlorinated solvents, PCB)
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	General Assessment Criteria
GL	Ground Level
GSV	Gas Screening Value
HCV	Health Criteria Value
ICSM	Initial Conceptual Site Model
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene)
ND	Not Detected
LMRL	Lower Method Reporting Limit
NR	Not Recorded
PAH	Poly Aromatic Hydrocarbon
PCB	Poly-Chlorinated Biphenyl
PID	Photo Ionisation Detector
QA	Quality Assurance
SGV	Soil Guideline Value
SPH	Separate Phase Hydrocarbon
Sp.TPH (CWG)	Total Petroleum Hydrocarbon (Criteria Working Group)
SPT	Standard Penetration Test
SVOC	Semi Volatile Organic Compound
UST	Underground Storage Tank
VCCs	Vibro Concrete Columns
VOC	Volatile Organic Compound
WTE	Water Table Elevation

UNITS

m	Metres
km	Kilometres
%	Percent
%v/v	Percent volume in air
mb	Milli Bars (atmospheric pressure)
l/hr	Litres per hour
µg/l	Micrograms per Litre (parts per billion)
ppb	Parts Per Billion

mg/kg	Milligrams per kilogram (parts per million)
ppm	Parts Per Million
mg/m^3	Milligram per metre cubed
m bgl	Metres Below Ground Level
m bcl	Metre Below Cover Level
mAOD	Metres Above Ordnance Datum (sea level)
kN/m^2	Kilo Newtons per metre squared
µm	Micro metre

APPENDIX III
DRAWINGS

2b4p house	17
3b5p house	29
Total	46
Site area	1.12ha/2.77 acres
	42 houses/hectare

Total of 4 visitor parking spaces

Existing tree to be retained

Existing tree to be removed

Notes
Western boundary based on OS Promap extract, digital topographical survey required for accuracy and levels.

Position of proposed care home development to the north of the site taken from scanned information. Though using best endeavors to recreate the scanned plans, Eden Building Design can take no responsibilities for discrepancies in the original information.

Positions of existing speed bumps to Vine Street taken from site photos.

/ Planning submission 05/02/14

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project: Proposed Housing Scheme at Vine Street, Gorton for Mulbury Homes	status: Planning	date: 03/02/14
	scale: 1:250 at A1	drawn by: APS
title: Proposed Site Plan	drawing no: 12-91-P02	checked by: APS

BUILDING DESIGN eden
Eden Building Design
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF
Tel: 01925 748531
Email: info@edenbuildingdesign.co.uk
Web: www.edenbuildingdesign.co.uk

APPENDIX IV
CHEMICAL TESTING RESULTS

Andy Garrity
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: agarrity@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 17-51913

Project / Site name:	Vine Street	**Samples received on:**	19/06/2017
Your job number:	10-019	**Samples instructed on:**	19/06/2017
Your order number:		**Analysis completed by:**	22/06/2017
Report Issue Number:	1	**Report issued on:**	22/06/2017
Samples Analysed:	3 soil samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 17-51913

Project / Site name: Vine Street

Lab Sample Number				768725	768726	768727		
Sample Reference				SAND 1	SAND 2	SAND 3		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				19/06/2017	19/06/2017	19/06/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	0.41	0.30	0.70		
Total mass of sample received	kg	0.001	NONE	0.53	0.55	0.53		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4	7.3	7.3		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	70	85	86		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	9.2	8.5	8.5		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	4.61	4.23	4.25		
Water Soluble SO4 as SO4 (2:1) Gallery 1h extraction	g/l	0.00125	MCERTS	0.0046	0.0042	0.0042		
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	< 50	< 50	< 50		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 17-51913

Project / Site name: Vine Street

Lab Sample Number				768725	768726	768727		
Sample Reference				SAND 1	SAND 2	SAND 3		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				19/06/2017	19/06/2017	19/06/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.9	1.4	2.9		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	4.8	3.5	4.6		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	9.3	9.1	7.5		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	3.3	4.1	3.4		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.3	5.5	5.8		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	21	18	18		

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 17-51913

Project / Site name: Vine Street

* 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 *
768725	SAND 1	None Supplied	None Supplied	Light brown sandy gravel.
768726	SAND 2	None Supplied	None Supplied	Light brown sandy gravel.
768727	SAND 3	None Supplied	None Supplied	Light brown sandy gravel.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 17-51913

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil by Gallery 1hr ex	Determination of water soluble Sulphate by discrete analyser (precipitation method). (1hr extraction)	In house method based on BS1377-3: 1990.	L082B-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-87549-A

Replaces Analytical Report Number : 18-87549, issue no. 1

Project / Site name:	Vine Street	**Samples received on:**	01/06/2018
Your job number:	10-019	**Samples instructed on:**	01/06/2018
Your order number:	10019-8891-BH	**Analysis completed by:**	06/06/2018
Report Issue Number:	2	**Report issued on:**	18/06/2018
Samples Analysed:	2 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Analytical Report Number: 18-87549-A

Project / Site name: Vine Street
Your Order No: 10019-8891-BH

Lab Sample Number				973108	973109			
Sample Reference				SS101	SS102			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/05/2018	31/05/2018			
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	%	N/A	NONE	2.4	1.7			
Total mass of sample received	kg	0.001	NONE	0.49	0.48			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.7	8.4			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	150	160			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	27	32			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.016			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	13.7	15.8			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	< 50	53			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.5	1.8			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	3.7	4.2			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	5.9	6.1			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.1	5.1			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	5.6	5.5			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	18	16			

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Analytical Report Number: 18-87549-A

Project / Site name: Vine Street
Your Order No: 10019-8891-BH

Lab Sample Number				973108	973109			
Sample Reference				SS101	SS102			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/05/2018	31/05/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0			
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10			
TPH Total C5 - C40	mg/kg	10	MCERTS	< 10	< 10			

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Analytical Report Number : 18-87549-A

Project / Site name: Vine Street

* 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 *
973108	SS101	None Supplied	None Supplied	Brown sand.
973109	SS102	None Supplied	None Supplied	Brown sand.

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Analytical Report Number : 18-87549-A

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-88735

Replaces Analytical Report Number : 18-88735, issue no. 1

Project / Site name:	Vine Street	**Samples received on:**	12/06/2018
Your job number:	10-019	**Samples instructed on:**	12/06/2018
Your order number:	10019-8965-BH	**Analysis completed by:**	18/06/2018
Report Issue Number:	2	**Report issued on:**	18/06/2018
Samples Analysed:	2 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Analytical Report Number: 18-88735

Project / Site name: Vine Street
Your Order No: 10019-8965-BH

Lab Sample Number				980139	980140			
Sample Reference				TS101 Plot 3	TS102 Plot 5			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.1	0.1			
Date Sampled				12/06/2018	12/06/2018			
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	%	N/A	NONE	9.6	11			
Total mass of sample received	kg	0.001	NONE	0.47	0.46			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.7			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	370	450			
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.028	0.025			
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	57	50			
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	28.4	25.2			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	280	290			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.19			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.20			
Phenanthrene	mg/kg	0.05	MCERTS	0.89	1.7			
Anthracene	mg/kg	0.05	MCERTS	0.19	0.53			
Fluoranthene	mg/kg	0.05	MCERTS	1.6	2.8			
Pyrene	mg/kg	0.05	MCERTS	1.7	3.0			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.71	1.5			
Chrysene	mg/kg	0.05	MCERTS	0.79	1.4			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.80	1.6			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.40	0.49			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.80	1.5			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.39	0.62			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.41	0.68			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.61	16.1			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	13			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	13			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	29			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	59	62			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	0.7			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	13			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.1			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	52	64			

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Analytical Report Number: 18-88735

Project / Site name: Vine Street
Your Order No: 10019-8965-BH

Lab Sample Number				980139	980140			
Sample Reference				TS101 Plot 3	TS102 Plot 5			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.1	0.1			
Date Sampled				12/06/2018	12/06/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0			
TPH (C16 - C21)	mg/kg	1	MCERTS	25	28			
TPH (C21 - C35)	mg/kg	1	MCERTS	3.4	62			
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10			
TPH Total C5 - C40	mg/kg	10	MCERTS	31	91			

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Analytical Report Number : 18-88735

Project / Site name: Vine Street

* 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 *
980139	TS101 Plot 3	None Supplied	0.1	Brown sandy loam with gravel and vegetation.
980140	TS102 Plot 5	None Supplied	0.1	Brown sandy loam with gravel and vegetation.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-88735

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

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

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The results included within the report are representative of the samples submitted for analysis.

Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-88738

Replaces Analytical Report Number : 18-88738, issue no. 1

Project / Site name:	Vine Street	**Samples received on:**	12/06/2018
Your job number:	10-019	**Samples instructed on:**	12/06/2018
Your order number:	10019-8965-BH	**Analysis completed by:**	18/06/2018
Report Issue Number:	2	**Report issued on:**	18/06/2018
Samples Analysed:	1 soil sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-88738

Project / Site name: Vine Street
Your Order No: 10019-8965-BH

Lab Sample Number				980142				
Sample Reference				TS103 Plot 7				
Sample Number				None Supplied				
Depth (m)				0.1				
Date Sampled				12/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	2.2				
Moisture Content	%	N/A	NONE	10				
Total mass of sample received	kg	0.001	NONE	0.46				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	480				
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.030				
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	61				
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	30.4				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	340				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	0.92				
Anthracene	mg/kg	0.05	MCERTS	0.24				
Fluoranthene	mg/kg	0.05	MCERTS	1.6				
Pyrene	mg/kg	0.05	MCERTS	1.6				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.86				
Chrysene	mg/kg	0.05	MCERTS	0.93				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.2				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.42				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.0				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.49				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.47				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	9.70				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.9				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	72				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47				

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Analytical Report Number: 18-88738

Project / Site name: Vine Street
Your Order No: 10019-8965-BH

Lab Sample Number				980142				
Sample Reference				TS103 Plot 7				
Sample Number				None Supplied				
Depth (m)				0.1				
Date Sampled				12/06/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0				
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0				
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0				
TPH (C16 - C21)	mg/kg	1	MCERTS	19				
TPH (C21 - C35)	mg/kg	1	MCERTS	45				
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10				
TPH Total C5 - C40	mg/kg	10	MCERTS	66				

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Analytical Report Number : 18-88738

Project / Site name: Vine Street

* 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 *
980142	TS103 Plot 7	None Supplied	0.1	Brown loam and clay with stones and vegetation.

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Analytical Report Number : 18-88738

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

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

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CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 717707-1

Date of Report: 28-Feb-2018

Customer: Bemus Construction Group
Plot L2
Birch Business Park
Whittle Lane
Heywood
OL10 2SX

Customer Contact: Mr Ray Edwards

Customer Job Reference: CO0221
Customer Purchase Order: PO/CO0221/1788
Customer Site Reference: Barlow Moor Road
Date Job Received at Concept: 01-Feb-2018
Date Analysis Started: 23-Feb-2018
Date Analysis Completed: 28-Feb-2018

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

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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

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Miajan Miah
Customer Service Advisor

Issued by :
Miajan Miah
Customer Service Advisor

Concept Reference: 717707
Project Site: Barlow Moor Road
Customer Reference: CO0221

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**717707 001**	**717707 002**
				Customer Sample Reference	**Top Soil (712981/001)**	**Sub Soil (712981/002)**
				Date Sampled	**31-JAN-2018**	**31-JAN-2018**
				Matrix Class	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Moisture @105C	T162	AR	0.1	%	**16**	**15**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1

Concept Reference: 717707
Project Site: Barlow Moor Road
Customer Reference: CO0221

Soil Analysed as Soil
ICRCL (Maxi)

				Concept Reference	**717707 001**	**717707 002**
				Customer Sample Reference	**Top Soil (712981/001)**	**Sub Soil (712981/002)**
				Date Sampled	**31-JAN-2018**	**31-JAN-2018**
				Matrix Class	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Arsenic	T6	M40	2	mg/kg	**14**	**30**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1
Chromium	T6	M40	1	mg/kg	**10**	**27**
Chromium VI	T6	A40	1	mg/kg	<1	<1
Copper	T6	M40	1	mg/kg	**37**	**17**
Lead	T6	M40	1	mg/kg	**86**	**27**
Mercury	T6	M40	1	mg/kg	<1	<1
Nickel	T6	M40	1	mg/kg	**14**	**5**
Selenium	T6	M40	3	mg/kg	<3	<3
Zinc	T6	M40	1	mg/kg	**58**	**40**
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1
Cyanide(free)	T546	AR	1	mg/kg	<1	<1
pH	T7	A40			**5.9**	**6.5**
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.04**	**0.03**
Sulphide	T4	A40	10	mg/kg	<10	<10
Sulphur(Free)	T2	AR	500	mg/kg	<500	<500
Thiocyanate	T4	A40	10	mg/kg	<10	<10

Concept Reference: 717707
Project Site: Barlow Moor Road
Customer Reference: CO0221

Soil Analysed as Soil
TPH UKCWG

				Concept Reference	**717707 001**	**717707 002**
				Customer Sample Reference	**Top Soil (712981/001)**	**Sub Soil (712981/002)**
				Date Sampled	**31-JAN-2018**	**31-JAN-2018**
				Matrix Class	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	<100	<100
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	<100	<100
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 6**	(13) <2
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 8.0**	(13) N.D.
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	<100	<100
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	<100	<100
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 3**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 14**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 31**	**(13) 2**
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 48**	**(13) 2.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**(13) 56**	**(13) 2.0**

Concept Reference: 717707
Project Site: Barlow Moor Road
Customer Reference: CO0221

Soil Analysed as Soil
Total and Speciated USEPA16 PAH

				Concept Reference	**717707 001**	**717707 002**
				Customer Sample Reference	**Top Soil (712981/001)**	**Sub Soil (712981/002)**
				Date Sampled	**31-JAN-2018**	**31-JAN-2018**
				Matrix Class	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.5**	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.9**	<0.1
Pyrene	T207	M105	0.1	mg/kg	**0.9**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.4**	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.5**	<0.1
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	**0.7**	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.4**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**0.1**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.3**	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**4.9**	<0.1

Concept Reference:	717707
Project Site:	Barlow Moor Road
Customer Reference:	CO0221
Soil	Analysed as Soil
Asbestos	

				Concept Reference	**717707 001**	**717707 002**
				Customer Sample Reference	**Top Soil (712981/001)**	**Sub Soil (712981/002)**
				Date Sampled	**31-JAN-2018**	**31-JAN-2018**
				Matrix Class	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos ID	T27	AR			N.D.	N.D.

Index to symbols used in 717707-1

Value	Description
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
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

These samples have been analysed exceeding recommended holding times for pH, PAH, TPH, Free CN, and VOC. It is possible therefore that the results provided may be compromised.
Asbestos was subcontracted to REC Asbestos.

Method Index

Value	Description
T6	ICP/OES
T909	GCxGC
T2	Grav
T27	PLM
T546	Colorimetry (CF)
T4	Colorimetry
T209	GC/MS (Head Space)(MCERTS)
T85	Calc
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T7	Probe

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Asbestos ID	T27	AR			SU	001-002
Benzene	T209	M105	10	µg/kg	M	001-002
Toluene	T209	M105	10	µg/kg	M	001-002
EthylBenzene	T209	M105	10	µg/kg	M	001-002
M/P Xylene	T209	M105	10	µg/kg	M	001-002
O Xylene	T209	M105	10	µg/kg	M	001-002
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001-002
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	N	001-002
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	N	001-002
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	N	001-002
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001-002
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001-002

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001-002
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001-002
TPH (Aliphatic) total	T85	M105		mg/kg	N	001-002
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	N	001-002
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	N	001-002
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	N	001-002
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001-002
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001-002
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001-002
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001-002
TPH (Aromatic) total	T85	M105		mg/kg	N	001-002
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001-002
Arsenic	T6	M40	2	mg/kg	M	001-002
Boron (water-soluble)	T6	A40	1	mg/kg	N	001-002
Cadmium	T6	M40	1	mg/kg	M	001-002
Chromium	T6	M40	1	mg/kg	M	001-002
Chromium VI	T6	A40	1	mg/kg	N	001-002
Copper	T6	M40	1	mg/kg	M	001-002
Lead	T6	M40	1	mg/kg	M	001-002
Mercury	T6	M40	1	mg/kg	M	001-002
Nickel	T6	M40	1	mg/kg	M	001-002
Selenium	T6	M40	3	mg/kg	M	001-002
Zinc	T6	M40	1	mg/kg	M	001-002
Cyanide(Total)	T546	AR	1	mg/kg	M	001-002
Cyanide(free)	T546	AR	1	mg/kg	M	001-002
pH	T7	A40			M	001-002
Phenols(Mono)	T546	AR	1	mg/kg	M	001-002
SO4(Total)	T6	A40	0.01	%	N	001-002
Sulphide	T4	A40	10	mg/kg	N	001-002
Sulphur(Free)	T2	AR	500	mg/kg	N	001-002
Thiocyanate	T4	A40	10	mg/kg	N	001-002
Naphthalene	T207	M105	0.1	mg/kg	M	001-002
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-002
Acenaphthene	T207	M105	0.1	mg/kg	M	001-002
Fluorene	T207	M105	0.1	mg/kg	M	001-002
Phenanthrene	T207	M105	0.1	mg/kg	M	001-002
Anthracene	T207	M105	0.1	mg/kg	U	001-002
Fluoranthene	T207	M105	0.1	mg/kg	M	001-002
Pyrene	T207	M105	0.1	mg/kg	M	001-002
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-002
Chrysene	T207	M105	0.1	mg/kg	M	001-002
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	M	001-002
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-002
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-002
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-002
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-002
PAH(total)	T207	M105	0.1	mg/kg	U	001-002
Moisture @105C	T162	AR	0.1	%	N	001-002
Retained on 10mm sieve	T2	M40	0.1	%	N	001-002

Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-97159

Project / Site name:	Vine St	**Samples received on:**	20/08/2018
Your job number:	10-019	**Samples instructed on:**	20/08/2018
Your order number:	10019-9584-BH	**Analysis completed by:**	28/08/2018
Report Issue Number:	1	**Report issued on:**	28/08/2018
Samples Analysed:	2 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-97159

Project / Site name: Vine St
Your Order No: 10019-9584-BH

Lab Sample Number				1027489	1027490			
Sample Reference				TS113	TS116			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				17/08/2018	17/08/2018			
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	%	N/A	NONE	13	8.8			
Total mass of sample received	kg	0.001	NONE	0.44	0.45			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	8.0			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	310	580			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	160	150			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.078	0.077			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	77.5	77.4			
Sulphide	mg/kg	1	MCERTS	1.2	1.4			
Total Sulphur	mg/kg	50	MCERTS	290	280			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.20			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.27			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.24			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.2	3.1			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	10			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	12			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.4	7.1			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	60			

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Analytical Report Number: 18-97159

Project / Site name: Vine St
Your Order No: 10019-9584-BH

Lab Sample Number				1027489	1027490			
Sample Reference				TS113	TS116			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				17/08/2018	17/08/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0			
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH (C21 - C35)	mg/kg	1	MCERTS	18	16			
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10			
TPH Total C5 - C40	mg/kg	10	MCERTS	20	18			

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Analytical Report Number : 18-97159

Project / Site name: Vine St

* 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 *
1027489	TS113	None Supplied	None Supplied	Brown sandy loam with gravel and vegetation.
1027490	TS116	None Supplied	None Supplied	Brown sandy loam with gravel and vegetation.

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Analytical Report Number : 18-97159

Project / Site name: Vine St

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-97329

Project / Site name:	Vine St	**Samples received on:**	21/08/2018
Your job number:	10-019	**Samples instructed on:**	21/08/2018
Your order number:	10019-9600-BH	**Analysis completed by:**	29/08/2018
Report Issue Number:	1	**Report issued on:**	29/08/2018
Samples Analysed:	2 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Analytical Report Number: 18-97329

Project / Site name: Vine St
Your Order No: 10019-9600-BH

Lab Sample Number				1028508	1028509			
Sample Reference				SS114	SS117			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				21/08/2018	21/08/2018			
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	%	N/A	NONE	5.6	6.2			
Total mass of sample received	kg	0.001	NONE	0.54	0.47			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.3			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	210	280			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	37	63			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019	0.031			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	18.5	31.4			
Sulphide	mg/kg	1	MCERTS	1.2	1.5			
Total Sulphur	mg/kg	50	MCERTS	100	130			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.0	2.0			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	6.5	6.7			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.1	9.7			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.1	8.1			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.2	7.3			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	12	13			

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Analytical Report Number: 18-97329

Project / Site name: Vine St
Your Order No: 10019-9600-BH

Lab Sample Number				1028508	1028509			
Sample Reference				SS114	SS117			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				21/08/2018	21/08/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0			
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10			
TPH Total C5 - C40	mg/kg	10	MCERTS	< 10	< 10			

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Analytical Report Number : 18-97329

Project / Site name: Vine St

* 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 *
1028508	SS114	None Supplied	None Supplied	Brown sand with gravel.
1028509	SS117	None Supplied	None Supplied	Brown sand with gravel.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-97329

Project / Site name: Vine St

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

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

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 680784-1

Date of Report: 14-Sep-2017

Customer: Bemus Construction Group
Flint Glass Wharf
35 Radium Street
Ancoats Urban Village
Manchester
M4 6AD

Customer Contact: Mr Jon O'Connor

Customer Job Reference:
Date Job Received at Concept: 06-Sep-2017
Date Analysis Started: 08-Sep-2017
Date Analysis Completed: 14-Sep-2017

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

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Aleksandra Pacula
Customer Service Advisor

Issued by :
Aleksandra Pacula
Customer Service Advisor

Concept Reference: 680784
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**680784 001**
Customer Sample Reference	**Sample 001**
Date Sampled	**Deviating**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Moisture @105C	T162	AR	0.1	%	**12**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 680784
Customer Reference:

Soil Analysed as Soil
ICRCL (Maxi)

Concept Reference	**680784 001**
Customer Sample Reference	**Sample 001**
Date Sampled	**Deviating**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	<2
Boron (water-soluble)	T6	AR	1	mg/kg	<1
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**7**
Chromium VI	T6	AR	1	mg/kg	<1
Copper	T6	M40	1	mg/kg	**4**
Lead	T6	M40	1	mg/kg	**8**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**6**
Selenium	T6	M40	3	mg/kg	<3
Zinc	T6	M40	1	mg/kg	**13**
Cyanide(Total)	T546	AR	1	mg/kg	<1
Cyanide(free)	T546	AR	1	mg/kg	<1
pH	T7	AR			**7.4**
Phenols(Mono)	T546	AR	1	mg/kg	<1
SO4(Total)	T6	A40	0.01	%	**0.01**
Sulphide	T4	AR	10	mg/kg	<10
Sulphur(Free)	T2	AR	500	mg/kg	<500
Thiocyanate	T4	A40	10	mg/kg	<10

Concept Reference: 680784
Customer Reference:

Soil Analysed as Soil
TPH UKCWG

Concept Reference	**680784 001**
Customer Sample Reference	**Sample 001**
Date Sampled	**Deviating**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Benzene	T209	M105	10	µg/kg	(13) <10
Toluene	T209	M105	10	µg/kg	<10
EthylBenzene	T209	M105	10	µg/kg	<10
M/P Xylene	T209	M105	10	µg/kg	<10
O Xylene	T209	M105	10	µg/kg	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	(13) N.D.

Concept Reference: 680784
Customer Reference:

Soil Analysed as Soil
Total and Speciated USEPA16 PAH

Concept Reference	**680784 001**
Customer Sample Reference	**Sample 001**
Date Sampled	**Deviating**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1

Concept Reference:	680784
Customer Reference:	
Soil	Analysed as Soil
Miscellaneous	

Concept Reference	**680784 001**
Customer Sample Reference	**Sample 001**
Date Sampled	**Deviating**
Matrix Class	**Sandy Soil**

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

Index to symbols used in 680784-1

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
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
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos was subcontracted to REC Asbestos.
The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T909	GCxGC
T4	Colorimetry
T2	Grav
T7	Probe
T6	ICP/OES
T85	Calc
T209	GC/MS (Head Space)(MCERTS)
T546	Colorimetry (CF)
T27	PLM

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	001
Retained on 10mm sieve	T2	M40	0.1	%	N	001
Arsenic	T6	M40	2	mg/kg	M	001
Boron (water-soluble)	T6	AR	1	mg/kg	N	001
Cadmium	T6	M40	1	mg/kg	M	001
Chromium	T6	M40	1	mg/kg	M	001
Chromium VI	T6	AR	1	mg/kg	N	001
Copper	T6	M40	1	mg/kg	M	001
Lead	T6	M40	1	mg/kg	M	001
Mercury	T6	M40	1	mg/kg	M	001
Nickel	T6	M40	1	mg/kg	M	001
Selenium	T6	M40	3	mg/kg	M	001
Zinc	T6	M40	1	mg/kg	M	001

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Cyanide(Total)	T546	AR	1	mg/kg	M	001
Cyanide(free)	T546	AR	1	mg/kg	M	001
pH	T7	AR			M	001
Phenols(Mono)	T546	AR	1	mg/kg	M	001
SO4(Total)	T6	A40	0.01	%	N	001
Sulphide	T4	AR	10	mg/kg	N	001
Sulphur(Free)	T2	AR	500	mg/kg	N	001
Thiocyanate	T4	A40	10	mg/kg	N	001
Benzene	T209	M105	10	µg/kg	M	001
Toluene	T209	M105	10	µg/kg	M	001
EthylBenzene	T209	M105	10	µg/kg	M	001
M/P Xylene	T209	M105	10	µg/kg	M	001
O Xylene	T209	M105	10	µg/kg	M	001
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	N	001
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	N	001
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	N	001
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001
TPH (Aliphatic) total	T85	M105		mg/kg	N	001
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	N	001
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	N	001
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	N	001
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001
TPH (Aromatic) total	T85	M105		mg/kg	N	001
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001
Naphthalene	T207	M105	0.1	mg/kg	M	001
Acenaphthylene	T207	M105	0.1	mg/kg	U	001
Acenaphthene	T207	M105	0.1	mg/kg	M	001
Fluorene	T207	M105	0.1	mg/kg	M	001
Phenanthrene	T207	M105	0.1	mg/kg	M	001
Anthracene	T207	M105	0.1	mg/kg	U	001
Fluoranthene	T207	M105	0.1	mg/kg	M	001
Pyrene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001
Chrysene	T207	M105	0.1	mg/kg	M	001
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	M	001
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001
PAH(total)	T207	M105	0.1	mg/kg	U	001
Asbestos ID	T27	AR			SU	001

Freeland
HORTICULTURE LIMITED

Freeland Horticulture Ltd
Rosedale Nursery
College Road
Hextable
Kent
BR8 7LT

Attention: Philippa Lambourne

Our Ref: SLC-12-AN-0659-SA

10 July 2018

Dear Philippa

Topsoil Analysis Report : Astley, Greater Manchester Topsoil – July 2018

We have completed the analysis of the topsoil sample recently taken from the above site and have the pleasure of reporting our findings. The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes.

SOIL SAMPLING & EXAMINATION

At the time of our sampling visit the topsoil was stored in a stockpile. A series of 10 hand augered trial holes were constructed across the stockpile for the purpose of soil examination and sample collection. As the soil examination confirmed a consistent topsoil composition, the ten samples were combined together to form one composite sample for analysis purposes. The soil was described as a dark brown, slightly moist, friable *loamy sand* with a well developed, fine to medium granular structure. The soil contained a low fraction of small stones and no deleterious materials (eg. building waste materials, glass, roots or rhizomes of pernicious weeds) or unusual odours (eg. hydrocarbons) were recorded.

LABORATORY ANALYSIS

The topsoil sample was submitted to a UKAS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil. The following parameters were determined:

- pH & electrical conductivity values;
- major plant nutrients (N, P, K, Mg) & organic matter content;
- particle size distribution and stone content;
- heavy metals & potentially toxic elements (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- sulphate, sulphur, sulphide;
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16)
- banded aromatic and aliphatic petroleum hydrocarbons (C_5-C_{35}).

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

COMMENTS

pH & Electrical Conductivity (salinity) Values

The sample was alkaline in nature (pH 7.2) with a pH value that would be suitable for general landscaping purposes, and in particular for species classified as either *wide pH tolerant* or *lime tolerant*.

The electrical conductivity value using the soil:water extract was moderate (989µS/cm) indicating that soluble salts are not present at levels that would be harmful to plants.

Organic Matter & Nutrient Status

The sample was rich in organic matter and all major plant nutrients. No further additions of compost or fertiliser are required, or indeed recommended, for at least the first growing season.

Particle Size Distribution & Stone Content

The sample contained 79% sand and fell into the *sandy loam* texture class. This particle size distribution is considered suitable for a broad range of landscape applications, including tree and shrub planting, turfing and seeding.

The sample was free from stones of 50 mm and upwards in diameter and only contained a slight fraction of smaller stones (16%). As such, stones will not restrict the use of the soil for landscaping purposes.

Potential Contaminants

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil so the following comments are based on the Soil Guideline Values (SGVs) for residential end-use presented in the Contaminated Land Exposure Assessment (CLEA) Model (EA/DEFRA:2002). The SGVs currently only consider a limited range of parameters so where a potential contaminant is not covered by the CLEA Model other relevant schedules for contamination assessment, such as the Dutch Guidelines, and professional judgement have been used.

Of the potential contaminants determined, none was found at levels that would indicate significant contamination.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes. From the soil examination and laboratory analysis, the soil is described as an alkaline, non-saline, loamy sand. The organic matter and nutrient levels are acceptable and no significant contamination was found with respect to the parameters determined. This soil would adhere to the current BS3882 specification for 'multipurpose grade'.

To conclude, based on our findings, the topsoil would be considered well-suited to general landscaping purposes provided the physical condition of the soil is maintained.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

George Longmuir MSc Soil Sci. M.I Soil Sci.

Freeland HORTICULTURE LIMITED

Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	July 18
Our Ref	SLC-18-AN-0660-SA
Date	26 July 2018

		Composite sample
pH Value & Salinity		
pH value (1:2.5 soil/water ext)	units	7.2
Electrical Conductivity (1:2.5 soil/water ext)	µS/cm	989
Organic Matter & Nutrient Status		
Organic Matter (LOI)	%	6.9
Organic Carbon (Derived)	%	4.0
Total Nitrogen	%	0.309
Carbon:Nitrogen Ratio	:1	13
Available Phosphorus	mg/l	57.0
Available Potassium	mg/l	1146
Available Magnesium	mg/l	297
Particle Size Analysis & Stones		
Clay (<0.002mm)	%	7
Silt (0.063-0.002mm)	%	14
Sand (2.0-0.063mm)	%	79
Texture Class	UK Class	Loamy Sand
Stones 2-20mm	% by DW	0.6
Stones 20-50mm	% by DW	0.0
Stones >50mm	% by DW	0.0
Potential Contaminants		
Total Arsenic (As)	mg/kg	3.7
Total Cadmium (Cd)	mg/kg	0.13
Total Chromium (Cr)	mg/kg	10.3
Hexavalent Chromium (CR^{VI})	mg/kg	<0.1
Total Copper (Cu)	mg/kg	20.7
Total Lead (Pb)	mg/kg	20.8
Total Mercury (Hg)	mg/kg	<0.2
Total Nickel (Ni)	mg/kg	<10
Total Selenium (Se)	mg/kg	0.10
Total Zinc (Zn)	mg/kg	56.5
Total Beryllium (Be)	mg/kg	<1
Total Barium (Ba)	mg/kg	54.0
Total Vanadium (V)	mg/kg	15.1
Hot Water Soluble Boron (B)	mg/kg	1.4
Total Cyanide (CN)	mg/kg	<1
Elemental Sulphur (S)	mg/kg	<5
Easily Liberated Sulphide (S^{2-})	mg/kg	9.3
Water Soluble Sulphate (SO_4^{2-})	mg/l	<40
Total Phenols Index	mg/kg	<1
Asbestos Screen	-	N.D.

Chain of Custody requires a Freeland Horticulture Delivery Ticket-01322 619161

Freeland HORTICULTURE LIMITED

Job Name	Topsoil Analysis
Site	Astley, Greater Manchester
Month/Year	July 18
Our Ref	SLC-18-AN-0660-SA
Date	26 July 2018

Polyaromatic Hydrocarbons

Naphthalene	mg/kg	<0.05
Acenaphthylene	mg/kg	<0.05
Acenaphthene	mg/kg	<0.05
Fluorene	mg/kg	<0.05
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.05
Fluoranthene	mg/kg	0.1
Pyrene	mg/kg	<0.1
Benzo[a]anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo[b]fluoranthene	mg/kg	<0.1
Benzo[k]fluoranthene	mg/kg	<0.1
Benzo[a]pyrene	mg/kg	<0.1
Indeno[1,2,3-cd]pyrene	mg/kg	<0.1
Dibenzo[a,h]anthracene	mg/kg	<0.1
Benzo[g,h,i]perylene	mg/kg	<0.1
Total PAHs sum US EPA 16	mg/kg	<1

Banded Petroleum Hydrocarbons

Aliphatic TPH >C_5-C_6	mg/kg	<0.7
Aliphatic TPH >C_6-C_8	mg/kg	<0.4
Aliphatic TPH >C_8-C_{10}	mg/kg	<4
Aliphatic TPH >C_{10}-C_{12}	mg/kg	<4
Aliphatic TPH >C_{12}-C_{16}	mg/kg	<4
Aliphatic TPH >C_{16}-C_{21}	mg/kg	5.8
Aliphatic TPH >C_{21}-C_{35}	mg/kg	27.2
Aliphatic TPH >C_{35}-C_{44}	mg/kg	<12
Aromatic TPH >C_5-C_7	mg/kg	<0.02
Aromatic TPH >C_7-C_8	mg/kg	<0.02
Aromatic TPH >C_8-C_{10}	mg/kg	11.0
Aromatic TPH >C_{10}-C_{12}	mg/kg	<4
Aromatic TPH >C_{12}-C_{16}	mg/kg	<4
Aromatic TPH >C_{16}-C_{21}	mg/kg	<4
Aromatic TPH >C_{21}-C_{35}	mg/kg	51.3
Aromatic TPH >C_{35}-C_{44}	mg/kg	12.1
Total Petroleum Hydrocarbons (C_5-C_{44})	mg/kg	107

BTEX

Benzene	mg/kg	<0.02
Toluene	mg/kg	<0.2
Ethyl Benzene	mg/kg	<0.04
m- & p- Xylene	mg/kg	<0.2
o-Xylene	mg/kg	<0.1

Chain of Custody requires a Freeland Horticulture Delivery Ticket-01322 619161

Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-14407

Project / Site name:	Vine Street	**Samples received on:**	15/10/2018
Your job number:	10-019	**Samples instructed on:**	15/10/2018
Your order number:	10019-30447-BH	**Analysis completed by:**	22/10/2018
Report Issue Number:	1	**Report issued on:**	22/10/2018
Samples Analysed:	7 soil samples		

Signed: CCStone

Dr Claire Stone
Quality Manager
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.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068935	1068936	1068937	1068938	1068939
Sample Reference				TS101	SS101	TS102	SS102	TS103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				12/10/2018	12/10/2018	12/10/2018	12/10/2018	12/10/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	18	20	15	22
Total mass of sample received	kg	0.001	NONE	0.53	0.51	0.57	0.55	0.51
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	7.8	8.3	7.7	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	340	950	240	280	310
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	92	470	88	83	95
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.046	0.23	0.044	0.042	0.048
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	46.0	235	44.2	41.5	47.5
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	1.6	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	310	510	310	170	290
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.26	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.18	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.19	1.5	< 0.05	0.45	0.20
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.39	< 0.05	0.10	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.26	2.5	< 0.05	0.79	0.26
Pyrene	mg/kg	0.05	MCERTS	0.23	2.3	< 0.05	0.74	0.21
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.13	1.2	< 0.05	0.36	0.12
Chrysene	mg/kg	0.05	MCERTS	0.14	0.99	< 0.05	0.43	0.08
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.3	< 0.05	0.58	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.44	< 0.05	0.16	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.0	< 0.05	0.43	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.48	< 0.05	0.19	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.64	< 0.05	0.28	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	0.95	13.2	< 0.80	4.51	0.87

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Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068935	1068936	1068937	1068938	1068939
Sample Reference				TS101	SS101	TS102	SS102	TS103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				12/10/2018	12/10/2018	12/10/2018	12/10/2018	12/10/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.1	9.1	1.7	4.5	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.9	23	11	8.1	8.4
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	29	12	14	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	42	12	21	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.4	17	7.8	7.9	7.0
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	33	60	31	28	30

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	3.5	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	7.3	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	mg/kg	1	MCERTS	9.2	12	5.7	3.6	< 1.0
TPH (C21 - C35)	mg/kg	1	MCERTS	91	56	46	7.0	14
TPH (C35 - C40)	mg/kg	10	MCERTS	31	15	< 10	< 10	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	130	99	54	13	16

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Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068940	1068941			
Sample Reference				SS103	SS104			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				12/10/2018	12/10/2018			
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	%	N/A	NONE	12	9.6			
Total mass of sample received	kg	0.001	NONE	0.52	0.56			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.2			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	600	470			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	200	190			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.10	0.095			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	99.7	95.0			
Sulphide	mg/kg	1	MCERTS	< 1.0	1.2			
Total Sulphur	mg/kg	50	MCERTS	360	210			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.12	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	0.15	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	0.13	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	1.1	0.21			
Anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	1.7	0.30			
Pyrene	mg/kg	0.05	MCERTS	1.7	0.33			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.84	0.15			
Chrysene	mg/kg	0.05	MCERTS	0.94	0.19			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.93	0.21			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.59	0.12			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.84	0.17			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.45	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.61	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	10.3	1.68			

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Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068940	1068941			
Sample Reference				SS103	SS104			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				12/10/2018	12/10/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.2	6.3			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	6.9			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	12			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	44	22			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	8.8			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	53	25			

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	2.2	< 2.0			
TPH (C12 - C16)	mg/kg	4	MCERTS	6.9	< 4.0			
TPH (C16 - C21)	mg/kg	1	MCERTS	28	< 1.0			
TPH (C21 - C35)	mg/kg	1	MCERTS	120	< 1.0			
TPH (C35 - C40)	mg/kg	10	MCERTS	28	< 10			
TPH Total C5 - C40	mg/kg	10	MCERTS	180	< 10			

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Analytical Report Number : 18-14407

Project / Site name: Vine Street

* 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 *
1068935	TS101	None Supplied	None Supplied	Brown sandy clay with vegetation.
1068936	SS101	None Supplied	None Supplied	Brown clay and sand with gravel.
1068937	TS102	None Supplied	None Supplied	Brown sandy clay with vegetation.
1068938	SS102	None Supplied	None Supplied	Brown sand with gravel.
1068939	TS103	None Supplied	None Supplied	Brown sandy clay with vegetation and gravel
1068940	SS103	None Supplied	None Supplied	Brown sandy clay with gravel and vegetation.
1068941	SS104	None Supplied	None Supplied	Brown clay and sand.

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Analytical Report Number : 18-14407

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

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

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MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

Your reference CO0259/5403
Our reference OPD-MRN 3291-48
Date 24 August 2018

Bemus Construction Services Ltd
Brooke House
Morton Street
Middleton
M24 6AN

For the attention of Edmund Kenny Esq.

Dear Mr Kenny,

Re: Broad range Contamination & Asbestos ID Testing – Northfield Road, New Moston, Manchester M40 3RL

Further to your instructions the Broad Range Contamination testing to the ONE number sample, submitted by yourselves has now been completed.

Please find attached the i2 Analytical Ltd certificate of test relating to the samples submitted, our sample numbers relate to your site references as follows:

78833 – Sample 1

We have assessed the contamination results found for the various determinands against the latest Generic Assessment Criteria (GAC) from the Land Quality Management Ltd / Chartered Institute of Environmental Health (LQM/CIEH) S4UL values.

The results of this assessment find that the sample is suitable for a residential with home grown produce end use when compared to the Land Quality Management Ltd / Chartered Institute of Environmental Health (LQM/CIEH) S4UL values.

There was no asbestos present in the sample.

We trust the above and attached are satisfactory to yourselves. Should you require any further assistance, please do not hesitate to contact us.

Yours Faithfully
For Murray Rix

Owain Davies

UKAS TESTING 1580
33C, Vauxhall Industrial Estate, Greg Street, Reddish, Stockport SK5 7BR Tel: 0161 475 0870 Fax: 0161 475 0871
Email: steve@mtt-uk.com Website: www.murrayrix.com
Also at: London: 020 8523 1999
Murray Rix is the trading name of Murray Rix (Northern) Limited. Registered in England 2878361

4041 mCERTS

Environmental Science

Steve Hutchings
Murray Rix (Northern Ltd).
Unit 33c Vauxhall Ind. Est.
Greg Street
Reddish
Stockport
SK5 7BR

e: MurrayRix

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-10707

Project / Site name:	Northfield Road, New Moston, Manchester	**Samples received on:**	17/09/2018
Your job number:		**Samples instructed on:**	17/09/2018
Your order number:	18-186	**Analysis completed by:**	24/09/2018
Report Issue Number:	1	**Report issued on:**	24/09/2018
Samples Analysed:	1 soil sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

Analytical Report Number: 18-10707

Project / Site name: Northfield Road, New Moston, Manchester
Your Order No: 18-186

Lab Sample Number				1047575				
Sample Reference				788833				
Sample Number				Sample 1				
Depth (m)				None Supplied				
Date Sampled				14/09/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	13				
Total mass of sample received	kg	0.001	NONE	1.7				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0				
Organic Matter	%	0.1	MCERTS	5.6				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	0.97				
Anthracene	mg/kg	0.05	MCERTS	0.18				
Fluoranthene	mg/kg	0.05	MCERTS	2.2				
Pyrene	mg/kg	0.05	MCERTS	2.2				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.98				
Chrysene	mg/kg	0.05	MCERTS	1.2				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.65				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.2				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.56				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.14				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.82				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	12.3				

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4041 mCERTS

Environmental Science

Analytical Report Number: 18-10707

Project / Site name: Northfield Road, New Moston, Manchester
Your Order No: 18-186

Lab Sample Number				1047575				
Sample Reference				788833				
Sample Number				Sample 1				
Depth (m)				None Supplied				
Date Sampled				14/09/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	30				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (III)	mg/kg	1	NONE	21				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	89				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	190				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.2				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110				
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	ug/kg	1	MCERTS	< 1.0				
Ethylbenzene	ug/kg	1	MCERTS	< 1.0				
p & m-xylene	ug/kg	1	MCERTS	< 1.0				
o-xylene	ug/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

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Environmental Science

Analytical Report Number : 18-10707

Project / Site name: Northfield Road, New Moston, Manchester

* 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 *
1047575	788833	Sample 1	None Supplied	Brown loam with gravel and vegetation.

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Environmental Science

Analytical Report Number : 18-10707

Project / Site name: Northfield Road, New Moston, Manchester

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos Identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-19986

Project / Site name:	Vine Street	**Samples received on:**	26/11/2018
Your job number:	10-019	**Samples instructed on:**	26/11/2018
Your order number:	10019-30872-BH	**Analysis completed by:**	28/11/2018
Report Issue Number:	1	**Report issued on:**	28/11/2018
Samples Analysed:	3 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Analytical Report Number: 18-19986

Project / Site name: Vine Street
Your Order No: 10019-30872-BH

Lab Sample Number				1100301	1100303	1100305		
Sample Reference				TS101	TS103	TS105		
Sample Number				Plot 25	Plot 27	Stockpile		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				26/11/2018	26/11/2018	26/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	16	14	13		
Total mass of sample received	kg	0.001	NONE	0.43	0.44	0.45		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	9.0	8.4		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	510	520	300		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.15	0.15	0.067		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	310	300	130		
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	153	148	66.6		
Sulphide	mg/kg	1	MCERTS	5.8	2.6	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	410	400	270		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.25	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.59	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.51	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.33	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.32	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.32	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.13	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.27	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.12	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.17	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	3.01	< 0.80		

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Analytical Report Number: 18-19986

Project / Site name: Vine Street
Your Order No: 10019-30872-BH

Lab Sample Number				1100301	1100303	1100305		
Sample Reference				TS101	TS103	TS105		
Sample Number				Plot 25	Plot 27	Stockpile		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				26/11/2018	26/11/2018	26/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.8	4.1	4.0		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	9.1	10	9.4		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	19	15		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	17	18	14		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.0	8.4	7.4		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	43	33		

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
TPH (C16 - C21)	mg/kg	1	MCERTS	5.2	6.1	7.1		
TPH (C21 - C35)	mg/kg	1	MCERTS	76	44	52		
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	83	52	61		

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Analytical Report Number : 18-19986

Project / Site name: Vine Street

* 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 *
1100301	TS101	Plot 25	None Supplied	Brown loam and clay with gravel and vegetation.
1100303	TS103	Plot 27	None Supplied	Brown loam and clay with gravel and vegetation.
1100305	TS105	Stockpile	None Supplied	Brown loam and clay with gravel and vegetation.

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Analytical Report Number : 18-19986

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-19880

Project / Site name:	Old Lane	**Samples received on:**	23/11/2018
Your job number:		**Samples instructed on:**	23/11/2018
Your order number:		**Analysis completed by:**	30/11/2018
Report Issue Number:	1	**Report issued on:**	30/11/2018
Samples Analysed:	3 soil samples		

Signed _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Analytical Report Number: 18-19880

Project / Site name: Old Lane

Lab Sample Number				1099630	1099631	1099632		
Sample Reference				SS101	SS102	SS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				21/11/2018	21/11/2018	21/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	13	13	12		
Total mass of sample received	kg	0.001	NONE	0.64	0.50	0.54		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	6.0	6.0		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	160	120	97		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	40	44	33		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.020	0.022	0.017		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	19.9	21.8	16.6		
Sulphide	mg/kg	1	MCERTS	3.3	< 1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	550	92	85		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.3	5.1	11		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	21	21		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	29	32		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10	8.9	11		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	30	32		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.3	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	53	45	50		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 18-19880

Project / Site name: Old Lane

Lab Sample Number				1099630	1099631	1099632		
Sample Reference				SS101	SS102	SS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				21/11/2018	21/11/2018	21/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	< 10	< 10	< 10		

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Analytical Report Number : 18-19880

Project / Site name: Old Lane

* 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 *
1099630	SS101	None Supplied	None Supplied	Brown clay and sand with gravel.
1099631	SS102	None Supplied	None Supplied	Brown clay and sand with gravel.
1099632	SS103	None Supplied	None Supplied	Brown clay and sand with gravel.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 18-19880

Project / Site name: Old Lane

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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

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The results included within the report are representative of the samples submitted for analysis.

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

Your reference CO0235/6209
Our reference OPD-MRN 3297-59
Date 19 November 2018

Bemus Construction Services Ltd
Brooke House
Morton Street
Middleton
M24 6AN

For the attention of Craig Tennant Esq.

Dear Mr Tennant,

Re: Broad range Contamination & Asbestos ID – Old Lane, Little Hulton M38 9RZ

Further to your instructions the Broad Range Contamination testing to the three number samples, sampled by Murray Rix on 09 November 2018 has now been completed.

Please find attached the i2 Analytical Ltd certificate of test relating to the samples submitted, our sample numbers relate to your site references as follows:

79887 – Sample 1
79888 – Sample 2
79889 – Sample 3

We have assessed the contamination results found for the various determinands against the latest Generic Assessment Criteria (GAC) from the Land Quality Management Ltd / Chartered Institute of Environmental Health (LQM/CIEH) S4UL values.

The results of this assessment find that all three samples are suitable for a Residential with Home-Grown Produce end use when compared to the Land Quality Management Ltd / Chartered Institute of Environmental Health (LQM/CIEH) S4UL values.

The results of the Asbestos Identification testing show that none of the three samples were found to have asbestos.

We trust the above and attached are satisfactory to yourselves. Should you require any further assistance, please do not hesitate to contact us.

Yours Faithfully
For Murray Rix

Owain Davies

UKAS TESTING 1580
33C, Vauxhall Industrial Estate, Greg Street, Reddish, Stockport SK5 7BR Tel: 0161 475 0870 Fax: 0161 475 0871
Email: steve@mtt-uk.com Website: www.murrayrix.com
Also at: London: 020 8523 1999
Murray Rix is the trading name of Murray Rix (Northern) Limited. Registered in England 2878361

4041 mCERTS

Environmental Science

Steve Hutchings
Murray Rix (Northern Ltd).
Unit 33c Vauxhall Ind. Est.
Greg Street
Reddish
Stockport
SK5 7BR

e: MurrayRix

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-18125

Project / Site name:	Little Hulton	**Samples received on:**	12/11/2018
Your job number:		**Samples instructed on:**	12/11/2018
Your order number:	18-226	**Analysis completed by:**	19/11/2018
Report Issue Number:	1	**Report issued on:**	19/11/2018
Samples Analysed:	3 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Environmental Science

Analytical Report Number: 18-18125

Project / Site name: Little Hulton
Your Order No: 18-226

Lab Sample Number				1089543	1089544	1089545		
Sample Reference				79887 Sample 1	79888 Sample 2	79889 Sample 3		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				09/11/2018	09/11/2018	09/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	16	19	15		
Total mass of sample received	kg	0.001	NONE	1.4	1.6	1.4		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.7	6.6	6.1		
Organic Matter	%	0.1	MCERTS	1.3	1.3	1.5		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.2	5.2	4.2		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.69	0.53	0.84		
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.6	0.8		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (III)	mg/kg	1	NONE	24	21	23		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	22	23		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	16	25		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	11	12		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	16	23		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.1		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	23	24	23		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	37	56		

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Environmental Science

Analytical Report Number: 18-18125

Project / Site name: Little Hulton
Your Order No: 18-226

Lab Sample Number				1089543	1089544	1089545		
Sample Reference				79887 Sample 1	79888 Sample 2	79889 Sample 3		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				09/11/2018	09/11/2018	09/11/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		

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Environmental Science

Analytical Report Number : 18-18125

Project / Site name: Little Hulton

* 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 *
1089543	9887 Sample	None Supplied	None Supplied	Brown clay and sand with gravel.
1089544	9888 Sample	None Supplied	None Supplied	Brown clay and sand with gravel.
1089545	9889 Sample	None Supplied	None Supplied	Brown clay and sand with gravel.

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Environmental Science

Analytical Report Number : 18-18125

Project / Site name: Little Hulton

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
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

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-25098

Project / Site name:	Vine St	**Samples received on:**	16/01/2019
Your job number:	10-019	**Samples instructed on:**	16/01/2019
Your order number:	10019-31248-BH	**Analysis completed by:**	21/01/2019
Report Issue Number:	1	**Report issued on:**	21/01/2019
Samples Analysed:	1 soil sample		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-25098

Project / Site name: Vine St
Your Order No: 10019-31248-BH

Lab Sample Number				1132844				
Sample Reference				TS101				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				16/01/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	0.47				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.3				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	290				
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.064				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	63.8				
Sulphide	mg/kg	1	MCERTS	< 1.0				
Total Sulphur	mg/kg	50	MCERTS	230				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.9				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	9.8				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7.8				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.9				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	24				

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Analytical Report Number: 19-25098

Project / Site name: Vine St
Your Order No: 10019-31248-BH

Lab Sample Number				1132844				
Sample Reference				TS101				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				16/01/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0				
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0				
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0				
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0				
TPH (C21 - C35)	mg/kg	1	MCERTS	3.6				
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10				
TPH Total C5 - C40	mg/kg	10	MCERTS	< 10				

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Analytical Report Number : 19-25098

Project / Site name: Vine St

* 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 *
1132844	TS101	None Supplied	None Supplied	Brown loam with vegetation.

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Analytical Report Number : 19-25098

Project / Site name: Vine St

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-27469

Project / Site name:	Vine Street	**Samples received on:**	04/02/2019
Your job number:	10-019	**Samples instructed on:**	04/02/2019
Your order number:		**Analysis completed by:**	07/02/2019
Report Issue Number:	1	**Report issued on:**	07/02/2019
Samples Analysed:	4 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-27469

Project / Site name: Vine Street

Lab Sample Number				1147246	1147247	1147248	1147249	
Sample Reference				TS101	TS102	TS103	TS104	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				04/02/2019	04/02/2019	04/02/2019	04/02/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	4.3	6.6	
Moisture Content	%	N/A	NONE	21	20	18	19	
Total mass of sample received	kg	0.001	NONE	0.47	0.49	0.52	0.51	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.4	8.8	8.8	
Total Cyanide	mg/kg	1	MCERTS	1	< 1	< 1	< 1	
Total Sulphate as SO_4	mg/kg	50	MCERTS	460	390	460	460	
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	230	220	280	270	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.11	0.14	0.13	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	117	108	138	134	
Sulphide	mg/kg	1	MCERTS	4.6	3.6	3.0	2.6	
Total Sulphur	mg/kg	50	MCERTS	460	440	420	380	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.30	< 0.05	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.24	< 0.05	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	

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Analytical Report Number: 19-27469

Project / Site name: Vine Street

Lab Sample Number				1147246	1147247	1147248	1147249	
Sample Reference				TS101	TS102	TS103	TS104	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				04/02/2019	04/02/2019	04/02/2019	04/02/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	1.2	2.6	< 1.0	2.7	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	11	14	11	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	14	14	14	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	15	15	15	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.0	7.6	7.4	7.9	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	42	36	39	

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
TPH (C16 - C21)	mg/kg	1	MCERTS	3.1	6.4	3.0	3.4	
TPH (C21 - C35)	mg/kg	1	MCERTS	47	43	30	22	
TPH (C35 - C40)	mg/kg	10	MCERTS	14	< 10	< 10	< 10	
TPH Total C5 - C40	mg/kg	10	MCERTS	66	51	35	27	

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Analytical Report Number : 19-27469

Project / Site name: Vine Street

* 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 *
1147246	TS101	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.
1147247	TS102	None Supplied	None Supplied	Brown loam and clay with gravel and vegetation.
1147248	TS103	None Supplied	None Supplied	Brown loam and clay with stones and vegetation.
1147249	TS104	None Supplied	None Supplied	Brown loam and clay with stones and brick.

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Analytical Report Number : 19-27469

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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

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Soil Cover Validation Record

Job number	R2296B
Date	19.03.18
Site name / location	Hillside Central, Hattersley Phase 3
Plot / location:	Stockpiled in west of site
Compiled by:	SM

Depth ref:	R2296-R02-v1		Quality ref:		R2296-R02-v1			Other documents attached		✓	
Area use:	~~garden~~			~~landscaped~~		stockpile			~~other~~		
Size area (m):	n/a	Approx Area (m^2):	n/a	Approx Depth Top (m):	n/a	Approx Volume Top (m^3):	n/a	Approx Depth Sub (m):	n/a	Approx Volume Sub (m^3):	~4,100 m^3
Number depth entries required			n/a		Number samples required:			41 *(1 per 100m^3 for site won subsoil).* 41 SS samples provided.			

Quality Validation		inspection date/time:	13.02.18 / 23.02.2018	inspected by:	SM / CS	photographed:	✓

	notes (see below)	✓ / ×	
Source Topsoil	1.	×	n/a
Description Topsoil	2.	×	n/a
Sample Topsoil	3.	×	n/a
Source Subsoil	4.	✓	Sourced from site.
Description Subsoil	5.	✓	Soft to stiff brown grey-mottled slightly sandy silty clay with frequent gravel of stone including red brick fragments and cobbles of stone and red brick.
Sample Subsoil	6.	✓	41 samples were collected from various onsite stockpiles: ‘4’, ‘5’, ‘6’ & ‘7’. CLS references: 716060-1, 718076-1, 719757-1 & 718088-1.

Soil Cover Validation Record

Subsoil Analysis Summary

contaminant	soil standard adopted (mg/kg)	concentrations (mg/kg)	compliant?
asbestos Fibres	NAD	NAD	Yes
pH	-	6.8-8.9	-
soil organic matter	-	<0.1-3	-
arsenic	37	7-11	Yes
cadmium	11	<1-4	Yes
chromium III	910	20-30	Yes
chromium VI	6	<1	Yes
copper	2,400	14-30	Yes
lead	200	14-230	Yes*
mercury	40	<1	Yes
nickel	120	17-37	Yes
zinc	3,700	32-220	Yes
naphthalene	2.3	<0.1-0.2	Yes
acenaphthene	210	<0.1-0.3	Yes
acenaphthylene	170	<0.1	Yes
fluorene	170	<0.1-0.4	Yes
phenanthrene	95	<0.1-3.6	Yes
anthracene	2,400	<0.1-0.9	Yes
fluoranthene	280	<0.1-5.8	Yes
pyrene	620	<0.1-4.8	Yes
benzo(a)anthracene	7.2	<0.1-1.8	Yes
chrysene	15	<0.1-2	Yes
benzo(b/k)fluoranthene	2.6	<0.2-2.1	Yes
benzo(a)pyrene	2.2	<0.1-1.6	Yes
indeno(123cd)pyrene	27	<0.1-0.9	Yes

Contaminant	Soil standard adopted (mg/kg)	Concentrations (mg/kg)	Compliant?
dibenzo(ah)anthracene	0.24	<0.1-0.6	Yes#
benzo(ghi)perylene	320	<0.1-1.5	Yes
Aliphatic C5-C6	42	<0.1	Yes
Aliphatic C6-C8	100	<0.1	Yes
Aliphatic C8-C10	27	<0.1	Yes
Aliphatic C10-C12	130	<1-2	Yes
Aliphatic C12-C16	1,100	<1-2	Yes
Aliphatic C16-C21	65,000	<1-2	Yes
Aliphatic C21-C35	65,000	<2-27	Yes
Aromatic C6-C7	70	<0.1	Yes
Aromatic C7-C8	130	<0.1	Yes
Aromatic C8-C10	34	<0.1	Yes
Aromatic C10-C12	74	<2	Yes
Aromatic C12-C16	140	<1-2	Yes
Aromatic C16-C21	260	<1-7	Yes
Aromatic C21-C35	1,100	<1-19	Yes

*1 minor exceedance was reported for lead at 230mg/kg out of a total of 41 samples taken; statistical analysis has therefore been carried out to calculate the Upper Confidence Limit 95 value for lead within the material (attached) which was calculated at 33.14mg/kg, significantly below the utilised screening criteria.

1 minor exceedance was reported for dibenzo(ah)anthracene at 0.6mg/kg out of a total of 41 samples taken; a PAH ratio cross plot has been undertaken (attached) which indicates that the likely source of the material is of pyrolytic origin (coal) and is therefore unlikely to be readily bio-accessible. All other samples tested for dibenzo(ah)anthracene reported below the limit of detection (<0.1mg/kg).

The minor exceedances detected are not deemed to be representative of the material as a whole which has undergone extensive testing; it has therefore been considered that the material is suitable for its intended use in gardens or as general fill within the development.

Soil Cover Validation Record

Stockpile Validation	Inspection date/time:	13.02.18 / 23.02.2018	Inspected by:	CS / SM	Photographed:	✓
Source Subsoil	Sourced from site.					
Soil description	Soft to stiff brown grey-mottled slightly sandy silty clay with frequent gravel of stone including red brick fragments and cobbles of stone and red brick.					

Photograph (Stockpile 5)	Photograph (Stockpile 6-1)	Photograph (Stockpile 6-2)

Soil Cover Validation Record

Two minor exceedances have been detected within samples collected from the material for both lead and dibenzo(ah)anthracene. When taking into consideration the extensive testing carried out on the material and the subsequent statistical analysis undertaken (as described in the subsoil analysis summary) SGP considers that the material is suitable for use within gardens or as general fill within the development, however this is subject to regulatory approval.

These plots have PASSED testing for quality,

An additional inspection visit IS NOT required.

SGP Staff: S D Miller BSc Signed: 19.03.2018

SGP Member: B J Thomas BSc MSc MCIWEM C.Env Signed: 22.03.2017

Guide notes:

1.	Source Topsoil	As much information as possible: Date Delivered, volume/weight delivery, supplier, certification, source address (yard), original source address (site).
2.	Description Topsoil	Full Description: Grading (Particle Size: clay, silt, sand, gravel), organic content, colour, odour, minerals, stone, glass, slate, ash, clinker, coal, coke, tarmac, plastic, other?
3.	Sample Topsoil	Date sampled, date submitted, sample reference, laboratory, laboratory job number
4.	Source Subsoil	As much information as possible: Date Delivered, volume/weight delivery, supplier, certification, source address (yard), original source address (site).
5.	Description Subsoil	Full Description: Grading (Particle Size: clay, silt, sand, gravel), organic content, colour, odour, minerals, stone, glass, slate, ash, clinker, coal, coke, tarmac, plastic, other?
6.	Sample Subsoil	Date sampled, date submitted, sample reference, laboratory, laboratory job number
7.	Material Acceptability	Presence and amount of visible deleterious or otherwise unacceptable materials, e.g. glass, metal, plastic, Knotweed shoots etc.

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 716060-1

Date of Report: 28-Feb-2018

Customer: Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL

Customer Contact: Mr Ben Thomas

Customer Job Reference: R22963
Customer Site Reference: Hattersley Phase 3
Date Job Received at Concept: 13-Feb-2018
Date Analysis Started: 16-Feb-2018
Date Analysis Completed: 28-Feb-2018

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

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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

mCERTS

Report checked
and authorised by :
Aleksandra Pacula
Customer Service Advisor

Issued by :
Aleksandra Pacula
Customer Service Advisor

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**716060 001**	**716060 003**	**716060 005**	**716060 007**	**716060 009**
				Customer Sample Reference	**SP4 ES1**	**SP4 ES3**	**SP4 ES5**	**SP4 ES7**	**SP4 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**18**	**19**	**18**	**20**	**19**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**716060 011**	**716060 013**	**716060 015**	**716060 017**	**716060 019**
				Customer Sample Reference	**SP7 ES1**	**SP7 ES3**	**SP7 ES5**	**SP7 ES7**	**SP7 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**22**	**21**	**18**	**20**	**19**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**716060 021**
				Customer Sample Reference	**SP7 ES11**
				Date Sampled	**13-FEB-2018**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Moisture @105C	T162	AR	0.1	%	**20**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**716060 001**	**716060 003**	**716060 005**	**716060 007**	**716060 009**
				Customer Sample Reference	**SP4 ES1**	**SP4 ES3**	**SP4 ES5**	**SP4 ES7**	**SP4 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**9**	**10**	**9**	**9**	**7**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**27**	**26**	**27**	**24**	**23**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**23**	**25**	**21**	**23**	**14**
Lead	T6	M40	1	mg/kg	**37**	**36**	**22**	**31**	**14**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**29**	**27**	**29**	**27**	**17**
pH	T7	A40			**8.1**	**8.4**	**7.9**	**8.2**	**7.6**
Soil Organic Matter	T287	A40	0.1	%	**1.6**	**1.4**	**1.1**	**1.6**	**0.7**
Zinc	T6	M40	1	mg/kg	**82**	**64**	**58**	**59**	**32**

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**716060 011**	**716060 013**	**716060 015**	**716060 017**	**716060 019**
				Customer Sample Reference	**SP7 ES1**	**SP7 ES3**	**SP7 ES5**	**SP7 ES7**	**SP7 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**10**	**9**	**9**	**8**	**10**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**23**	**24**	**28**	**25**	**24**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**27**	**24**	**24**	**14**	**26**
Lead	T6	M40	1	mg/kg	**59**	**38**	**17**	**18**	**40**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**23**	**27**	**34**	**18**	**24**
pH	T7	A40			**8.1**	**8.8**	**7.5**	**6.8**	**8.9**
Soil Organic Matter	T287	A40	0.1	%	**2.7**	**1.2**	**1.5**	<0.1	**1.7**
Zinc	T6	M40	1	mg/kg	**80**	**72**	**62**	**39**	**68**

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**716060 021**
				Customer Sample Reference	**SP7 ES11**
				Date Sampled	**13-FEB-2018**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Arsenic	T6	M40	2	mg/kg	**10**
Asbestos ID	T27	AR			N.D.
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**28**
Chromium VI	T6	A40	1	mg/kg	<1
Copper	T6	M40	1	mg/kg	**23**
Lead	T6	M40	1	mg/kg	**17**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**36**
pH	T7	A40			**7.8**
Soil Organic Matter	T287	A40	0.1	%	<0.1
Zinc	T6	M40	1	mg/kg	**59**

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**716060 001**	**716060 003**	**716060 005**	**716060 007**	**716060 009**
				Customer Sample Reference	**SP4 ES1**	**SP4 ES3**	**SP4 ES5**	**SP4 ES7**	**SP4 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 1**	(13) <1	**(13) 1**	**(13) 1**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	**(13) 4**	(13) <2
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	(13) <1	**(13) 3**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 4**	(13) <1	**(13) 6**	(13) <1

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**716060 011**	**716060 013**	**716060 015**	**716060 017**	**716060 019**
				Customer Sample Reference	**SP7 ES1**	**SP7 ES3**	**SP7 ES5**	**SP7 ES7**	**SP7 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	**(13) 1**	**(13) 2**	**(13) 1**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	(13) <1	**(13) 1**	**(13) 1**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 2**	**(13) 6**	(13) <2	(13) <2	**(13) 12**
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	**(13) 2**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 3**	(13) <1	**(13) 1**	**(13) 4**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 11**	**(13) 2**	**(13) 2**	**(13) 19**

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**716060 021**
				Customer Sample Reference	**SP7 ES11**
				Date Sampled	**13-FEB-2018**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Benzene	T209	M105	10	µg/kg	(13) <10
Toluene	T209	M105	10	µg/kg	<10
EthylBenzene	T209	M105	10	µg/kg	<10
M/P Xylene	T209	M105	10	µg/kg	<10
O Xylene	T209	M105	10	µg/kg	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				Concept Reference	**716060 001**	**716060 003**	**716060 005**	**716060 007**	**716060 009**
				Customer Sample Reference	**SP4 ES1**	**SP4 ES3**	**SP4 ES5**	**SP4 ES7**	**SP4 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**1.1**	**0.2**	<0.1	**0.1**	<0.1
Anthracene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**1.3**	**0.3**	**0.2**	**0.5**	<0.1
Pyrene	T207	M105	0.1	mg/kg	**1.0**	**0.3**	**0.1**	**0.5**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.5**	**0.1**	<0.1	**0.2**	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.4**	**0.1**	<0.1	**0.2**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.5**	<0.1	<0.1	**0.3**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	**0.2**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.2**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.2**	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**6.4**	**1.2**	**0.3**	**2.5**	<0.1

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				Concept Reference	**716060 011**	**716060 013**	**716060 015**	**716060 017**	**716060 019**
				Customer Sample Reference	**SP7 ES1**	**SP7 ES3**	**SP7 ES5**	**SP7 ES7**	**SP7 ES9**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.2**	**0.6**	**0.3**	<0.1	**0.3**
Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.3**	**0.5**	**0.3**	<0.1	**0.4**
Pyrene	T207	M105	0.1	mg/kg	**0.3**	**0.4**	**0.2**	<0.1	**0.4**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.1**	**0.2**	<0.1	<0.1	**0.2**
Chrysene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**0.2**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.1**	**0.2**	<0.1	<0.1	**0.2**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.2**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**1.0**	**2.2**	**0.8**	<0.1	**2.0**

Concept Reference: 716060
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

Concept Reference	**716060 021**
Customer Sample Reference	**SP7 ES11**
Date Sampled	**13-FEB-2018**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1

Index to symbols used in 716060-1

Value	Description
A40	Assisted dried < 40C
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
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos was subcontracted to REC Asbestos.

Method Index

Value	Description
T7	Probe
T207	GC/MS (MCERTS)
T162	Grav (1 Dec) (105 C)
T909	GCxGC
T2	Grav
T27	PLM
T209	GC/MS (Head Space)(MCERTS)
T287	Calc TOC/0.58
T6	ICP/OES

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Arsenic	T6	M40	2	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Asbestos ID	T27	AR			SU	001,003,005,007,009,011,013,015,017,019,021
Cadmium	T6	M40	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Chromium	T6	M40	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Chromium VI	T6	A40	1	mg/kg	N	001,003,005,007,009,011,013,015,017,019,021
Copper	T6	M40	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Lead	T6	M40	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Mercury	T6	M40	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Nickel	T6	M40	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
pH	T7	A40			M	001,003,005,007,009,011,013,015,017,019,021
Soil Organic Matter	T287	A40	0.1	%	N	001,003,005,007,009,011,013,015,017,019,021
Zinc	T6	M40	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Benzene	T209	M105	10	µg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Toluene	T209	M105	10	µg/kg	M	001,003,005,007,009,011,013,015,017,019,021
EthylBenzene	T209	M105	10	µg/kg	M	001,003,005,007,009,011,013,015,017,019,021
M/P Xylene	T209	M105	10	µg/kg	M	001,003,005,007,009,011,013,015,017,019,021
O Xylene	T209	M105	10	µg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	N	001,003,005,007,009,011,013,015,017,019,021
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	N	001,003,005,007,009,011,013,015,017,019,021
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	N	001,003,005,007,009,011,013,015,017,019,021
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	N	001,003,005,007,009,011,013,015,017,019,021
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	N	001,003,005,007,009,011,013,015,017,019,021
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	N	001,003,005,007,009,011,013,015,017,019,021
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Naphthalene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Acenaphthylene	T207	M105	0.1	mg/kg	U	001,003,005,007,009,011,013,015,017,019,021
Acenaphthene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Fluorene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Phenanthrene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Anthracene	T207	M105	0.1	mg/kg	U	001,003,005,007,009,011,013,015,017,019,021
Fluoranthene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Pyrene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Chrysene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001,003,005,007,009,011,013,015,017,019,021
PAH(total)	T207	M105	0.1	mg/kg	U	001,003,005,007,009,011,013,015,017,019,021
Moisture @105C	T162	AR	0.1	%	N	001,003,005,007,009,011,013,015,017,019,021
Retained on 10mm sieve	T2	M40	0.1	%	N	001,003,005,007,009,011,013,015,017,019,021

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 718076-1

Date of Report: 14-Mar-2018

Customer: Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL

Customer Contact: Mr Scott Miller

Customer Job Reference: R2296B
Customer Site Reference: Hattersley Ph3
Date Job Received at Concept: 23-Feb-2018
Date Analysis Started: 26-Feb-2018
Date Analysis Completed: 14-Mar-2018

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

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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

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mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Aleksandra Pacula
Customer Service Advisor

Issued by :
Aleksandra Pacula
Customer Service Advisor

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**718076 001**	**718076 002**	**718076 003**	**718076 004**	**718076 005**
				Customer Sample Reference	**SP6(1) ES1**	**SP6(1) ES2**	**SP6(1) ES3**	**SP6(1) ES4**	**SP6(1) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**18**	**18**	**17**	**19**	**16**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**718076 006**	**718076 007**	**718076 008**	**718076 009**	**718076 010**
				Customer Sample Reference	**SP6(1) ES6**	**SP6(1) ES7**	**SP6(1) ES8**	**SP6(1) ES9**	**SP6(1) ES10**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**19**	**17**	**19**	**20**	**19**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**718076 001**	**718076 002**	**718076 003**	**718076 004**	**718076 005**
				Customer Sample Reference	**SP6(1) ES1**	**SP6(1) ES2**	**SP6(1) ES3**	**SP6(1) ES4**	**SP6(1) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**9**	**9**	**11**	**10**	**9**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**27**	**25**	**29**	**27**	**24**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**23**	**18**	**19**	**24**	**21**
Lead	T6	M40	1	mg/kg	**23**	**21**	**23**	**24**	**23**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**31**	**23**	**26**	**32**	**26**
pH	T7	A40			**8.1**	**7.8**	**7.9**	**7.8**	**7.9**
Soil Organic Matter	T287	A40	0.1	%	**1.3**	**1.3**	**1.4**	**1.2**	**1.5**
Zinc	T6	M40	1	mg/kg	**71**	**47**	**57**	**58**	**57**

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**718076 006**	**718076 007**	**718076 008**	**718076 009**	**718076 010**
				Customer Sample Reference	**SP6(1) ES6**	**SP6(1) ES7**	**SP6(1) ES8**	**SP6(1) ES9**	**SP6(1) ES10**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**9**	**8**	**9**	**9**	**8**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**26**	**23**	**25**	**25**	**24**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**18**	**20**	**22**	**22**	**22**
Lead	T6	M40	1	mg/kg	**19**	**22**	**34**	**46**	**21**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**23**	**27**	**27**	**28**	**32**
pH	T7	A40			**7.6**	**8.0**	**8.5**	**8.7**	**8.5**
Soil Organic Matter	T287	A40	0.1	%	**1.1**	**1.5**	**1.4**	**1.5**	**1.1**
Zinc	T6	M40	1	mg/kg	**45**	**70**	**71**	**67**	**58**

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**718076 001**	**718076 002**	**718076 003**	**718076 004**	**718076 005**
				Customer Sample Reference	**SP6(1) ES1**	**SP6(1) ES2**	**SP6(1) ES3**	**SP6(1) ES4**	**SP6(1) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	**(13) 2**
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 1**	**(13) 1**	**(13) 1**	**(13) 1**

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil

TPH (CWG) with MTBE, BTEX

				Concept Reference	**718076 006**	**718076 007**	**718076 008**	**718076 009**	**718076 010**
				Customer Sample Reference	**SP6(1) ES6**	**SP6(1) ES7**	**SP6(1) ES8**	**SP6(1) ES9**	**SP6(1) ES10**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	**(13) 21**	(13) <10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 15**	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 2**	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 6**	(13) <1	**(13) 1**	(13) <1	(13) <1

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil

PAH US EPA 16 (B and K split)

				Concept Reference	**718076 001**	**718076 002**	**718076 003**	**718076 004**	**718076 005**
				Customer Sample Reference	**SP6(1) ES1**	**SP6(1) ES2**	**SP6(1) ES3**	**SP6(1) ES4**	**SP6(1) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.1**	<0.1	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.1**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	**0.1**	<0.1

Concept Reference: 718076
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				Concept Reference	**718076 006**	**718076 007**	**718076 008**	**718076 009**	**718076 010**
				Customer Sample Reference	**SP6(1) ES6**	**SP6(1) ES7**	**SP6(1) ES8**	**SP6(1) ES9**	**SP6(1) ES10**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**1.7**	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.4**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	**1.3**	**0.2**
Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	**1.0**	**0.2**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.4**	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.4**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	**0.4**	<0.1	**6.9**	**0.5**

Index to symbols used in 718076-1

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
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.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos was subcontracted to REC Asbestos.

Method Index

Value	Description
T7	Probe
T287	Calc TOC/0.58
T2	Grav
T27	PLM
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T209	GC/MS (Head Space)(MCERTS)
T909	GCxGC
T6	ICP/OES

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	001-010
Retained on 10mm sieve	T2	M40	0.1	%	N	001-010
Arsenic	T6	M40	2	mg/kg	M	001-010
Asbestos ID	T27	AR			SU	001-010
Cadmium	T6	M40	1	mg/kg	M	001-010
Chromium	T6	M40	1	mg/kg	M	001-010
Chromium VI	T6	A40	1	mg/kg	N	001-010
Copper	T6	M40	1	mg/kg	M	001-010
Lead	T6	M40	1	mg/kg	M	001-010
Mercury	T6	M40	1	mg/kg	M	001-010
Nickel	T6	M40	1	mg/kg	M	001-010
pH	T7	A40			M	001-010
Soil Organic Matter	T287	A40	0.1	%	N	001-010
Zinc	T6	M40	1	mg/kg	M	001-010
Benzene	T209	M105	10	µg/kg	M	001-010
Toluene	T209	M105	10	µg/kg	M	001-010
EthylBenzene	T209	M105	10	µg/kg	M	001-010
M/P Xylene	T209	M105	10	µg/kg	M	001-010
O Xylene	T209	M105	10	µg/kg	M	001-010
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001-010
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	N	001-010
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	N	001-010
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	N	001-010
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001-010
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001-010
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001-010
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001-010
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	N	001-010
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	N	001-010
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	N	001-010
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001-010
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001-010
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001-010
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001-010
Naphthalene	T207	M105	0.1	mg/kg	M	001-010
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-010
Acenaphthene	T207	M105	0.1	mg/kg	M	001-010
Fluorene	T207	M105	0.1	mg/kg	M	001-010
Phenanthrene	T207	M105	0.1	mg/kg	M	001-010
Anthracene	T207	M105	0.1	mg/kg	U	001-010
Fluoranthene	T207	M105	0.1	mg/kg	M	001-010
Pyrene	T207	M105	0.1	mg/kg	M	001-010
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-010
Chrysene	T207	M105	0.1	mg/kg	M	001-010
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001-010
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001-010
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-010
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-010
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-010
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-010
PAH(total)	T207	M105	0.1	mg/kg	U	001-010

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 719757-1

Date of Report: 13-Mar-2018

Customer: Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL

Customer Contact: Mr Scott Miller

Customer Job Reference: R22963
Customer Site Reference: Hattersley Phase 3
Date Job Received at Concept: 13-Feb-2018
Date Analysis Started: 06-Mar-2018
Date Analysis Completed: 13-Mar-2018

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

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Aleksandra Pacula
Customer Service Advisor

Issued by :
Aleksandra Pacula
Customer Service Advisor

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**719757 001**	**719757 002**	**719757 003**	**719757 004**	**719757 005**
				Customer Sample Reference	**SP4-ES2 (716060/002)**	**SP4-ES4 (716060/004)**	**SP4-ES6 (716060/006)**	**SP4-ES8 (716060/008)**	**SP4-ES10 (716060/010)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**20**	**18**	**18**	**16**	**18**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**719757 006**	**719757 007**	**719757 008**	**719757 009**	**719757 010**
				Customer Sample Reference	**SP7-ES2 (716060/012)**	**SP7-ES4 (716060/014)**	**SP7-ES6 (716060/016)**	**SP7-ES8 (716060/018)**	**SP7-ES10 (716060/020)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**20**	**20**	**20**	**17**	**18**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**719757 011**
				Customer Sample Reference	**SP7-ES12 (716060/022)**
				Date Sampled	**13-FEB-2018**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Moisture @105C	T162	AR	0.1	%	**20**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**719757 001**	**719757 002**	**719757 003**	**719757 004**	**719757 005**
				Customer Sample Reference	**SP4-ES2 (716060/002)**	**SP4-ES4 (716060/004)**	**SP4-ES6 (716060/006)**	**SP4-ES8 (716060/008)**	**SP4-ES10 (716060/010)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**9**	**9**	**8**	**9**	**8**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	**1**	<1	<1
Chromium	T6	M40	1	mg/kg	**28**	**25**	**24**	**29**	**25**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**24**	**24**	**14**	**23**	**20**
Lead	T6	M40	1	mg/kg	**33**	**37**	**52**	**20**	**23**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**29**	**27**	**17**	**31**	**28**
pH	T7	A40			**8.2**	**8.5**	**6.8**	**7.9**	**8.2**
Soil Organic Matter	T287	A40	0.1	%	**2.3**	**1.9**	**1.8**	**1.7**	**1.1**
Zinc	T6	M40	1	mg/kg	**67**	**75**	**100**	**62**	**55**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**719757 006**	**719757 007**	**719757 008**	**719757 009**	**719757 010**
				Customer Sample Reference	**SP7-ES2 (716060/012)**	**SP7-ES4 (716060/014)**	**SP7-ES6 (716060/016)**	**SP7-ES8 (716060/018)**	**SP7-ES10 (716060/020)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**8**	**8**	**8**	**9**	**9**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**25**	**30**	**26**	**25**	**26**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**25**	**20**	**18**	**29**	**22**
Lead	T6	M40	1	mg/kg	**39**	**16**	**16**	**31**	**30**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**25**	**26**	**23**	**26**	**26**
pH	T7	A40			**8.1**	**7.7**	**7.0**	**8.2**	**8.7**
Soil Organic Matter	T287	A40	0.1	%	**1.9**	**1.0**	**1.4**	**2.3**	**1.4**
Zinc	T6	M40	1	mg/kg	**68**	**48**	**46**	**63**	**63**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**719757 011**
				Customer Sample Reference	**SP7-ES12 (716060/022)**
				Date Sampled	**13-FEB-2018**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Arsenic	T6	M40	2	mg/kg	**8**
Asbestos ID	T27	AR			N.D.
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**27**
Chromium VI	T6	A40	1	mg/kg	<1
Copper	T6	M40	1	mg/kg	**23**
Lead	T6	M40	1	mg/kg	**23**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**30**
pH	T7	A40			**8.3**
Soil Organic Matter	T287	A40	0.1	%	**2.3**
Zinc	T6	M40	1	mg/kg	**66**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**719757 001**	**719757 002**	**719757 003**	**719757 004**	**719757 005**
				Customer Sample Reference	**SP4-ES2 (716060/002)**	**SP4-ES4 (716060/004)**	**SP4-ES6 (716060/006)**	**SP4-ES8 (716060/008)**	**SP4-ES10 (716060/010)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 2**	**(13) 1**	(13) <1	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 2**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 8**	**(13) 27**	**(13) 8**	**(13) 6**	**(13) 11**
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 7**	(13) <1	**(13) 1**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 5**	**(13) 16**	**(13) 5**	**(13) 3**	**(13) 4**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**719757 006**	**719757 007**	**719757 008**	**719757 009**	**719757 010**
				Customer Sample Reference	**SP7-ES2 (716060/012)**	**SP7-ES4 (716060/014)**	**SP7-ES6 (716060/016)**	**SP7-ES8 (716060/018)**	**SP7-ES10 (716060/020)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	**(13) 1**	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	**(13) 1**	**(13) 1**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 6**	**(13) 4**	**(13) 7**	**(13) 8**	**(13) 11**
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	**(13) 1**	**(13) 2**	**(13) 2**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 2**	(13) <1	**(13) 5**	**(13) 6**	**(13) 4**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**719757 011**
				Customer Sample Reference	**SP7-ES12 (716060/022)**
				Date Sampled	**13-FEB-2018**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Benzene	T209	M105	10	µg/kg	(13) <10
Toluene	T209	M105	10	µg/kg	<10
EthylBenzene	T209	M105	10	µg/kg	<10
M/P Xylene	T209	M105	10	µg/kg	<10
O Xylene	T209	M105	10	µg/kg	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 10**
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 3**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				Concept Reference	**719757 001**	**719757 002**	**719757 003**	**719757 004**	**719757 005**
				Customer Sample Reference	**SP4-ES2 (716060/002)**	**SP4-ES4 (716060/004)**	**SP4-ES6 (716060/006)**	**SP4-ES8 (716060/008)**	**SP4-ES10 (716060/010)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.2**
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.3**
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.4**
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	**0.8**	<0.1	<0.1	**3.6**
Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**0.9**
Fluoranthene	T207	M105	0.1	mg/kg	**0.2**	**0.9**	<0.1	**0.1**	**5.8**
Pyrene	T207	M105	0.1	mg/kg	**0.2**	**0.9**	<0.1	**0.1**	**4.8**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.4**	<0.1	<0.1	**1.8**
Chrysene	T207	M105	0.1	mg/kg	<0.1	**0.4**	<0.1	<0.1	**2.0**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.6**	<0.1	<0.1	**1.5**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**0.6**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.3**	<0.1	<0.1	**1.6**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1	**0.9**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.6**
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**1.5**
PAH(total)	T207	M105	0.1	mg/kg	**0.3**	**4.9**	<0.1	**0.2**	**27**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				Concept Reference	**719757 006**	**719757 007**	**719757 008**	**719757 009**	**719757 010**
				Customer Sample Reference	**SP7-ES2 (716060/012)**	**SP7-ES4 (716060/014)**	**SP7-ES6 (716060/016)**	**SP7-ES8 (716060/018)**	**SP7-ES10 (716060/020)**
				Date Sampled	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**	**13-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	**0.2**	**0.7**
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.2**
Fluoranthene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	**0.3**	**1.2**
Pyrene	T207	M105	0.1	mg/kg	**0.4**	<0.1	**0.1**	**0.3**	**1.1**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.2**	**0.5**
Chrysene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.1**	**0.4**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.2**	**0.5**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.2**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.2**	**0.4**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.2**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.2**
PAH(total)	T207	M105	0.1	mg/kg	**1.7**	<0.1	**0.1**	**1.4**	**5.7**

Concept Reference: 719757
Project Site: Hattersley Phase 3
Customer Reference: R22963

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

Concept Reference	**719757 011**
Customer Sample Reference	**SP7-ES12 (716060/022)**
Date Sampled	**13-FEB-2018**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1

Index to symbols used in 719757-1

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
A40	Assisted dried < 40C
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
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

These samples have been analysed exceeding recommended holding times for pH, PAH, BTEX and TPH. It is possible therefore that the results provided may be compromised.
Asbetsos testing was subcontracted to REC Asbestos

Method Index

Value	Description
T287	Calc TOC/0.58
T6	ICP/OES
T7	Probe
T2	Grav
T209	GC/MS (Head Space)(MCERTS)
T162	Grav (1 Dec) (105 C)
T27	PLM
T207	GC/MS (MCERTS)
T909	GCxGC

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Arsenic	T6	M40	2	mg/kg	M	001-011
Asbestos ID	T27	AR			SU	001-011
Cadmium	T6	M40	1	mg/kg	M	001-011
Chromium	T6	M40	1	mg/kg	M	001-011
Chromium VI	T6	A40	1	mg/kg	N	001-011
Copper	T6	M40	1	mg/kg	M	001-011
Lead	T6	M40	1	mg/kg	M	001-011
Mercury	T6	M40	1	mg/kg	M	001-011
Nickel	T6	M40	1	mg/kg	M	001-011
pH	T7	A40			M	001-011
Soil Organic Matter	T287	A40	0.1	%	N	001-011
Zinc	T6	M40	1	mg/kg	M	001-011
Benzene	T209	M105	10	µg/kg	M	001-011
Toluene	T209	M105	10	µg/kg	M	001-011
EthylBenzene	T209	M105	10	µg/kg	M	001-011
M/P Xylene	T209	M105	10	µg/kg	M	001-011
O Xylene	T209	M105	10	µg/kg	M	001-011
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001-011
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	N	001-011
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	N	001-011
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	N	001-011
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001-011
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001-011
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001-011
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001-011
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	N	001-011
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	N	001-011
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	N	001-011
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001-011
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001-011
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001-011
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001-011
Naphthalene	T207	M105	0.1	mg/kg	M	001-011
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-011
Acenaphthene	T207	M105	0.1	mg/kg	M	001-011
Fluorene	T207	M105	0.1	mg/kg	M	001-011
Phenanthrene	T207	M105	0.1	mg/kg	M	001-011
Anthracene	T207	M105	0.1	mg/kg	U	001-011
Fluoranthene	T207	M105	0.1	mg/kg	M	001-011
Pyrene	T207	M105	0.1	mg/kg	M	001-011
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-011
Chrysene	T207	M105	0.1	mg/kg	M	001-011
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001-011
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001-011
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-011
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-011
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-011
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-011
PAH(total)	T207	M105	0.1	mg/kg	U	001-011
Moisture @105C	T162	AR	0.1	%	N	001-011
Retained on 10mm sieve	T2	M40	0.1	%	N	001-011

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 718088-1

Date of Report: 09-Mar-2018

Customer: Smith Grant LLP
Station House
Station Road
Ruabon
Wrexham
LL14 6DL

Customer Contact: Mr Scott Miller

Customer Job Reference: R2296B
Customer Site Reference: Hattersley Ph3
Date Job Received at Concept: 23-Feb-2018
Date Analysis Started: 26-Feb-2018
Date Analysis Completed: 09-Mar-2018

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

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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

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Aleksandra Pacula
Customer Service Advisor

Issued by :
Aleksandra Pacula
Customer Service Advisor

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**718088 001**	**718088 002**	**718088 003**	**718088 004**	**718088 005**
				Customer Sample Reference	**SP5 ES1**	**SP5 ES2**	**SP5 ES3**	**SP5 ES4**	**SP6(2) ES1**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**18**	**20**	**18**	**17**	**18**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**718088 006**	**718088 007**	**718088 008**	**718088 009**
				Customer Sample Reference	**SP6(2) ES2**	**SP6(2) ES3**	**SP6(2) ES4**	**SP6(2) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Moisture @105C	T162	AR	0.1	%	**19**	**17**	**15**	**12**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**718088 001**	**718088 002**	**718088 003**	**718088 004**	**718088 005**
				Customer Sample Reference	**SP5 ES1**	**SP5 ES2**	**SP5 ES3**	**SP5 ES4**	**SP6(2) ES1**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**9**	**7**	**9**	**8**	**8**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	**4**	<1	<1
Chromium	T6	M40	1	mg/kg	**26**	**23**	**30**	**26**	**24**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**23**	**20**	**23**	**21**	**20**
Lead	T6	M40	1	mg/kg	**17**	**14**	**230**	**52**	**23**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**37**	**29**	**24**	**27**	**25**
pH	T7	A40			**8.0**	**8.5**	**8.0**	**8.5**	**8.3**
Soil Organic Matter	T287	A40	0.1	%	**0.9**	**1.1**	**3.0**	**1.4**	**1.6**
Zinc	T6	M40	1	mg/kg	**61**	**52**	**220**	**74**	**52**

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
Smith Grant Standard Suite 1

				Concept Reference	**718088 006**	**718088 007**	**718088 008**	**718088 009**
				Customer Sample Reference	**SP6(2) ES2**	**SP6(2) ES3**	**SP6(2) ES4**	**SP6(2) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**8**	**7**	**9**	**10**
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**24**	**20**	**27**	**23**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	**22**	**21**	**23**	**30**
Lead	T6	M40	1	mg/kg	**88**	**40**	**20**	**44**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**28**	**22**	**32**	**24**
pH	T7	A40			**8.8**	**8.9**	**8.3**	**8.5**
Soil Organic Matter	T287	A40	0.1	%	**1.8**	**1.5**	**1.2**	**2.4**
Zinc	T6	M40	1	mg/kg	**62**	**59**	**59**	**72**

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
TPH (CWG) with MTBE, BTEX

				Concept Reference	**718088 001**	**718088 002**	**718088 003**	**718088 004**	**718088 005**
				Customer Sample Reference	**SP5 ES1**	**SP5 ES2**	**SP5 ES3**	**SP5 ES4**	**SP6(2) ES1**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 1**	**(13) 2**	(13) <1	(13) <1

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil

TPH (CWG) with MTBE, BTEX

				Concept Reference	**718088 006**	**718088 007**	**718088 008**	**718088 009**
				Customer Sample Reference	**SP6(2) ES2**	**SP6(2) ES3**	**SP6(2) ES4**	**SP6(2) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Benzene	T209	M105	10	µg/kg	(13) <10	(13) <10	(13) <10	(13) <10
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 3**	(13) <2	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 2**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 2**	(13) <1	(13) <1	(13) <1

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil

PAH US EPA 16 (B and K split)

				Concept Reference	**718088 001**	**718088 002**	**718088 003**	**718088 004**	**718088 005**
				Customer Sample Reference	**SP5 ES1**	**SP5 ES2**	**SP5 ES3**	**SP5 ES4**	**SP6(2) ES1**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	**0.7**
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.1**
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	**0.4**	**0.7**
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	**0.3**	**0.6**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.1**	**0.2**
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	**0.2**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.3**	**1.4**	**2.5**

Concept Reference: 718088
Project Site: Hattersley Ph3
Customer Reference: R2296B

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				Concept Reference	**718088 006**	**718088 007**	**718088 008**	**718088 009**
				Customer Sample Reference	**SP6(2) ES2**	**SP6(2) ES3**	**SP6(2) ES4**	**SP6(2) ES5**
				Date Sampled	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**	**23-FEB-2018**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.7**	**0.3**	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.7**	**0.4**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	**0.6**	**0.4**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.2**	**0.1**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.2**	**0.1**	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**2.4**	**1.4**	<0.1	<0.1

Index to symbols used in 718088-1

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
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
AR	As Received
A40	Assisted dried < 40C
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos was subcontracted to REC Asbestos.

Method Index

Value	Description
T7	Probe
T909	GCxGC
T287	Calc TOC/0.58
T207	GC/MS (MCERTS)
T209	GC/MS (Head Space)(MCERTS)
T2	Grav
T6	ICP/OES
T27	PLM
T162	Grav (1 Dec) (105 C)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Arsenic	T6	M40	2	mg/kg	M	001-009
Asbestos ID	T27	AR			SU	001-009
Cadmium	T6	M40	1	mg/kg	M	001-009
Chromium	T6	M40	1	mg/kg	M	001-009
Chromium VI	T6	A40	1	mg/kg	N	001-009
Copper	T6	M40	1	mg/kg	M	001-009
Lead	T6	M40	1	mg/kg	M	001-009
Mercury	T6	M40	1	mg/kg	M	001-009
Nickel	T6	M40	1	mg/kg	M	001-009
pH	T7	A40			M	001-009
Soil Organic Matter	T287	A40	0.1	%	N	001-009
Zinc	T6	M40	1	mg/kg	M	001-009
Benzene	T209	M105	10	µg/kg	M	001-009
Toluene	T209	M105	10	µg/kg	M	001-009
EthylBenzene	T209	M105	10	µg/kg	M	001-009
M/P Xylene	T209	M105	10	µg/kg	M	001-009
O Xylene	T209	M105	10	µg/kg	M	001-009
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	001-009
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	N	001-009
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	N	001-009
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	N	001-009
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001-009
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001-009
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001-009
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001-009
TPH (C6-C7 aromatic)	T209	M105	0.10	mg/kg	N	001-009
TPH (C7-C8 aromatic)	T209	M105	0.10	mg/kg	N	001-009
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	N	001-009
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001-009
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001-009
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001-009
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001-009
Naphthalene	T207	M105	0.1	mg/kg	M	001-009
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-009
Acenaphthene	T207	M105	0.1	mg/kg	M	001-009
Fluorene	T207	M105	0.1	mg/kg	M	001-009
Phenanthrene	T207	M105	0.1	mg/kg	M	001-009
Anthracene	T207	M105	0.1	mg/kg	U	001-009
Fluoranthene	T207	M105	0.1	mg/kg	M	001-009
Pyrene	T207	M105	0.1	mg/kg	M	001-009
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-009
Chrysene	T207	M105	0.1	mg/kg	M	001-009
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001-009
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001-009
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-009
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-009
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-009
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-009
PAH(total)	T207	M105	0.1	mg/kg	U	001-009
Moisture @105C	T162	AR	0.1	%	N	001-009
Retained on 10mm sieve	T2	M40	0.1	%	N	001-009

Job name	Hattersley Phase 3
Job no.	R2296B
Date:	19.03.2018
Author:	SM
Laboratory:	CLS
Lab. Reference:	719757-1

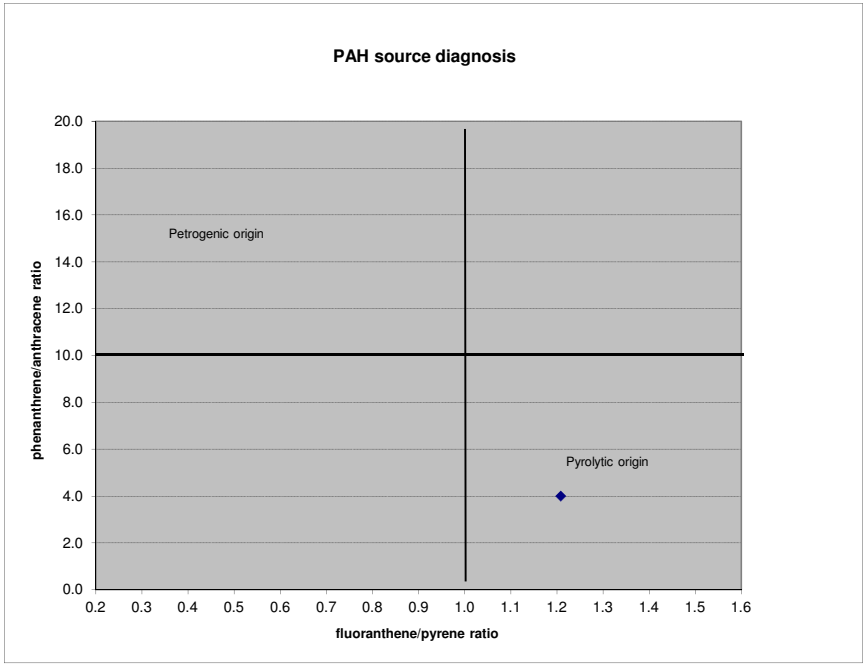
PAH concentrations

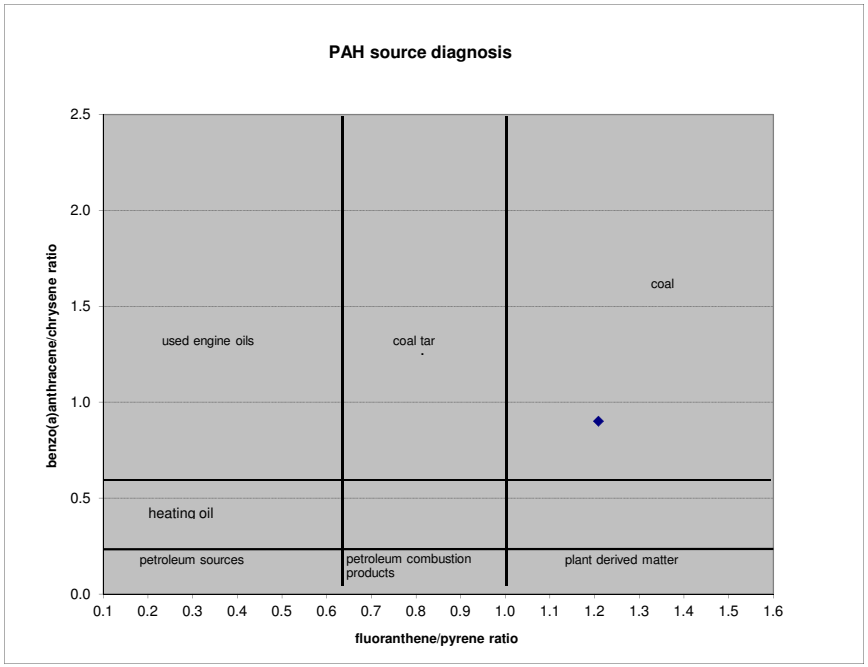
sample identity	SP4-ES10
phenanthrene	3.6
anthracene	0.9
fluoranthene	5.8
pyrene	4.8
benz(a)anthracene	1.8
chrysene	2

PAH units	mg/kg

PAH ratios

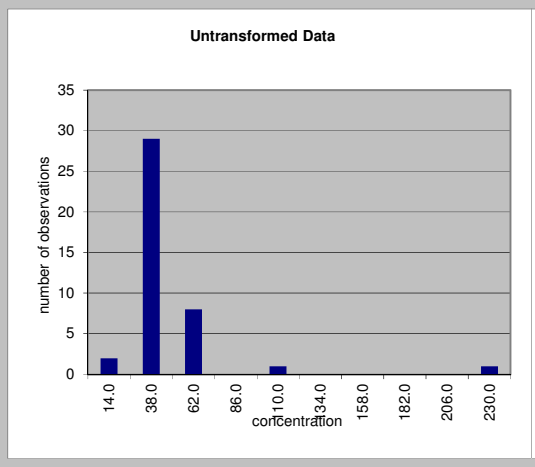
phe/ant	4.000
flu/pyr	1.208
baa/chr	0.900

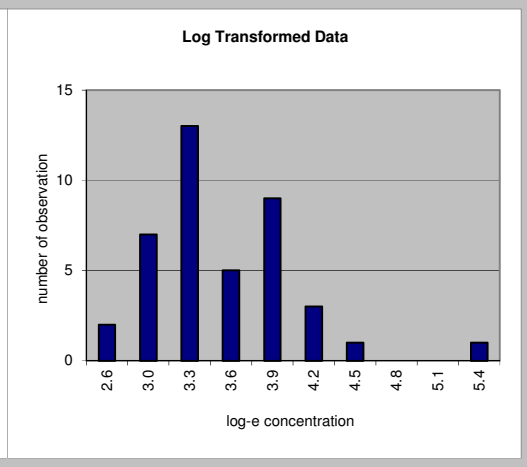




Contaminated Land Assessment - Statistical Spreadsheet

1. Data review bell-shaped histograms indicate a normal-type distribution





Use log-transformed data?

yes

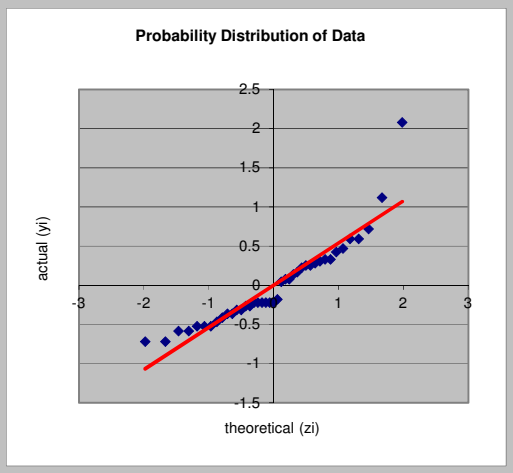
2. Check for statistical outliers Grubbs Test - assumes that data other than outlier(s) are normally distributed

T_{crit} =	2.88	T_n =	5.65	$\log_e$ transformed T_n =	3.85

log maximum value 5.438079 mg/kg is an outlier at 95% confidence level

note: outliers should only be removed in particular circumstances

3. Assessment of normal distribution



Shapiro-Wilk normality test

W = 0.495

signficance level	0.01	0.05
critical level	0.92	0.942

W is less than the critical value at 5% significance level

Are data points aligned close to red line, indicating a normal distribution? yes

One-sample T test is appropriate

4. Significance Tests Against Critical Value

One-sample T Test

sample mean = 34.951 mg/kg

sample unbiased standard deviation = 34.504 mg/kg

log transformed mean = 28.744 mg/kg

log transformed t = -22.966

critical value $t_{(n-1,\ 0.95)}$ = -1.684

t statistic is less than critical value **null hypothesis can be rejected**

upper confidence limit (UCL 0.95) = 33.138 mg/kg

Ref:	R2296B	Date:	09.03.18
Site:	Hattersley Ph 3	Author:	SM
Substance:	Lead		

Smith Grant LLP, 29/07/2011, v2

Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-27352

Project / Site name:	Vine Street	**Samples received on:**	01/02/2019
Your job number:	10-019	**Samples instructed on:**	01/02/2019
Your order number:	10019-31367-BH	**Analysis completed by:**	06/02/2019
Report Issue Number:	1	**Report issued on:**	06/02/2019
Samples Analysed:	3 soil samples		

Signed: _____

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-27352

Project / Site name: Vine Street
Your Order No: 10019-31367-BH

Lab Sample Number				1146645	1146646	1146647		
Sample Reference				SS101	SS102	SS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				31/01/2019	31/01/2019	31/01/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	7.7	< 0.1	7.5		
Moisture Content	%	N/A	NONE	11	13	12		
Total mass of sample received	kg	0.001	NONE	0.51	0.58	0.52		
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-		
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-		
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.6	8.3	8.3		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	470	370	580		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	290	240	340		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.14	0.12	0.17		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	143	122	168		
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Total Sulphur	mg/kg	50	MCERTS	230	180	260		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80		

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-27352

Project / Site name: Vine Street
Your Order No: 10019-31367-BH

Lab Sample Number				1146645	1146646	1146647		
Sample Reference				SS101	SS102	SS103		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				31/01/2019	31/01/2019	31/01/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.0	7.3	6.0		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	20	15		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	14	13		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	10	11		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	20	14		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	30	36	36		

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0		
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH (C21 - C35)	mg/kg	1	MCERTS	13	< 1.0	2.8		
TPH (C35 - C40)	mg/kg	10	MCERTS	40	20	< 10		
TPH Total C5 - C40	mg/kg	10	MCERTS	55	22	< 10		

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Analytical Report Number: 19-27352
Project / Site name: Vine Street
Your Order No: 10019-31367-BH

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

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

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

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

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1146645	SS101		130	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-27352

Project / Site name: Vine Street

* 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 *
1146645	SS101	None Supplied	None Supplied	Brown sandy clay with stones.
1146646	SS102	None Supplied	None Supplied	Brown sandy clay with gravel.
1146647	SS103	None Supplied	None Supplied	Brown sandy clay with stones.

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Analytical Report Number : 19-27352

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-28076

Project / Site name:	Vine Street	**Samples received on:**	07/02/2019
Your job number:	10-019	**Samples instructed on:**	07/02/2019
Your order number:	10019-31439-BH	**Analysis completed by:**	12/02/2019
Report Issue Number:	1	**Report issued on:**	12/02/2019
Samples Analysed:	1 soil sample		

Signed: CCStone

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-28076

Project / Site name: Vine Street
Your Order No: 10019-31439-BH

Lab Sample Number				1150749				
Sample Reference				PL46-2				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				07/02/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	26				
Total mass of sample received	kg	0.001	NONE	0.50				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO_4	mg/kg	50	MCERTS	440				
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	270				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.13				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	133				
Sulphide	mg/kg	1	MCERTS	4.8				
Total Sulphur	mg/kg	50	MCERTS	380				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-28076

Project / Site name: Vine Street
Your Order No: 10019-31439-BH

Lab Sample Number				1150749				
Sample Reference				PL46-2				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				07/02/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.7				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.3				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	36				

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0				
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1				
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0				
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0				
TPH (C16 - C21)	mg/kg	1	MCERTS	7.2				
TPH (C21 - C35)	mg/kg	1	MCERTS	40				
TPH (C35 - C40)	mg/kg	10	MCERTS	< 10				
TPH Total C5 - C40	mg/kg	10	MCERTS	50				

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Analytical Report Number : 19-28076

Project / Site name: Vine Street

* 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 *
1150749	PL46-2	None Supplied	None Supplied	Brown sandy clay with gravel and vegetation.

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Analytical Report Number : 19-28076

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-27352-A

Replaces Analytical Report Number : 19-27352, issue no. 1

Project / Site name:	Vine Street	**Samples received on:**	01/02/2019
Your job number:	10-019	**Samples instructed on:**	01/02/2019
Your order number:	10019-31367-BH	**Analysis completed by:**	06/02/2019
Report Issue Number:	2	**Report issued on:**	15/03/2019
Samples Analysed:	2 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-27352-2A

Project / Site name: Vine Street
Your Order No: 10019-31367-BH

Lab Sample Number				1146646	1146647			
Sample Reference				SS102	SS103			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/01/2019	31/01/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	7.5			
Moisture Content	%	N/A	NONE	13	12			
Total mass of sample received	kg	0.001	NONE	0.58	0.52			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.3	8.3			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	370	580			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	240	340			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.17			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	122	168			
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0			
Total Sulphur	mg/kg	50	MCERTS	180	260			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.3	6.0			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	15			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	10	11			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	14			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	36	36			

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-27352-2A

Project / Site name: Vine Street
Your Order No: 10019-31367-BH

Lab Sample Number				1146646	1146647			
Sample Reference				SS102	SS103			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				31/01/2019	31/01/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	< 4.0			
TPH (C16 - C21)	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH (C21 - C35)	mg/kg	1	MCERTS	< 1.0	2.8			
TPH (C35 - C40)	mg/kg	10	MCERTS	20	< 10			
TPH Total C5 - C40	mg/kg	10	MCERTS	22	< 10			

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Analytical Report Number : 19-27352-2A

Project / Site name: Vine Street

* 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 *
1146646	SS102	None Supplied	None Supplied	Brown sandy clay with gravel.
1146647	SS103	None Supplied	None Supplied	Brown sandy clay with stones.

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Analytical Report Number : 19-27352-2A

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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

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Rebecca Hodnett
e3p
Office 4
Heliport Business Park
Eccles
Liverpool Road
Manchester
M30 7RU

t: 0161 707 9612

e: rhodnett@e3p.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-14407

Project / Site name:	Vine Street	**Samples received on:**	15/10/2018
Your job number:	10-019	**Samples instructed on:**	15/10/2018
Your order number:	10019-30447-BH	**Analysis completed by:**	22/10/2018
Report Issue Number:	1	**Report issued on:**	22/10/2018
Samples Analysed:	7 soil samples		

Signed: CCStone

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068935	1068936	1068937	1068938	1068939
Sample Reference				TS101	SS101	TS102	SS102	TS103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				12/10/2018	12/10/2018	12/10/2018	12/10/2018	12/10/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	18	20	15	22
Total mass of sample received	kg	0.001	NONE	0.53	0.51	0.57	0.55	0.51
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	7.8	8.3	7.7	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	340	950	240	280	310
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	92	470	88	83	95
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.046	0.23	0.044	0.042	0.048
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	46.0	235	44.2	41.5	47.5
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	1.6	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	310	510	310	170	290
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.26	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.18	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.19	1.5	< 0.05	0.45	0.20
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.39	< 0.05	0.10	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.26	2.5	< 0.05	0.79	0.26
Pyrene	mg/kg	0.05	MCERTS	0.23	2.3	< 0.05	0.74	0.21
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.13	1.2	< 0.05	0.36	0.12
Chrysene	mg/kg	0.05	MCERTS	0.14	0.99	< 0.05	0.43	0.08
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.3	< 0.05	0.58	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.44	< 0.05	0.16	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.0	< 0.05	0.43	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.48	< 0.05	0.19	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.64	< 0.05	0.28	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	0.95	13.2	< 0.80	4.51	0.87

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Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068935	1068936	1068937	1068938	1068939
Sample Reference				TS101	SS101	TS102	SS102	TS103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				12/10/2018	12/10/2018	12/10/2018	12/10/2018	12/10/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.1	9.1	1.7	4.5	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.9	23	11	8.1	8.4
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	29	12	14	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	42	12	21	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.4	17	7.8	7.9	7.0
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	33	60	31	28	30

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12)	mg/kg	2	MCERTS	< 2.0	3.5	< 2.0	< 2.0	< 2.0
TPH (C12 - C16)	mg/kg	4	MCERTS	< 4.0	7.3	< 4.0	< 4.0	< 4.0
TPH (C16 - C21)	mg/kg	1	MCERTS	9.2	12	5.7	3.6	< 1.0
TPH (C21 - C35)	mg/kg	1	MCERTS	91	56	46	7.0	14
TPH (C35 - C40)	mg/kg	10	MCERTS	31	15	< 10	< 10	< 10
TPH Total C5 - C40	mg/kg	10	MCERTS	130	99	54	13	16

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Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068940	1068941			
Sample Reference				SS103	SS104			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				12/10/2018	12/10/2018			
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	%	N/A	NONE	12	9.6			
Total mass of sample received	kg	0.001	NONE	0.52	0.56			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.2			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO_4	mg/kg	50	MCERTS	600	470			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	200	190			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.10	0.095			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	99.7	95.0			
Sulphide	mg/kg	1	MCERTS	< 1.0	1.2			
Total Sulphur	mg/kg	50	MCERTS	360	210			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.12	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	0.15	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	0.13	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	1.1	0.21			
Anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	1.7	0.30			
Pyrene	mg/kg	0.05	MCERTS	1.7	0.33			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.84	0.15			
Chrysene	mg/kg	0.05	MCERTS	0.94	0.19			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.93	0.21			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.59	0.12			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.84	0.17			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.45	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.61	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	10.3	1.68			

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Analytical Report Number: 18-14407

Project / Site name: Vine Street
Your Order No: 10019-30447-BH

Lab Sample Number				1068940	1068941			
Sample Reference				SS103	SS104			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				12/10/2018	12/10/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.2	6.3			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	6.9			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	12			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	44	22			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	8.8			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	53	25			

Petroleum Hydrocarbons

TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0			
TPH (C6 - C8)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C8 - C10)	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH (C10 - C12)	mg/kg	2	MCERTS	2.2	< 2.0			
TPH (C12 - C16)	mg/kg	4	MCERTS	6.9	< 4.0			
TPH (C16 - C21)	mg/kg	1	MCERTS	28	< 1.0			
TPH (C21 - C35)	mg/kg	1	MCERTS	120	< 1.0			
TPH (C35 - C40)	mg/kg	10	MCERTS	28	< 10			
TPH Total C5 - C40	mg/kg	10	MCERTS	180	< 10			

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Analytical Report Number : 18-14407

Project / Site name: Vine Street

* 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 *
1068935	TS101	None Supplied	None Supplied	Brown sandy clay with vegetation.
1068936	SS101	None Supplied	None Supplied	Brown clay and sand with gravel.
1068937	TS102	None Supplied	None Supplied	Brown sandy clay with vegetation.
1068938	SS102	None Supplied	None Supplied	Brown sand with gravel.
1068939	TS103	None Supplied	None Supplied	Brown sandy clay with vegetation and gravel
1068940	SS103	None Supplied	None Supplied	Brown sandy clay with gravel and vegetation.
1068941	SS104	None Supplied	None Supplied	Brown clay and sand.

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Analytical Report Number : 18-14407

Project / Site name: Vine Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
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
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	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
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
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total 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 sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	MCERTS

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

APPENDIX V
GARDEN VALIDATION LETTERS

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V2
Date: 18th June 2018

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 1-8

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 1-8 at the site off Vine Street in Gorton.

In total 8No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

120m^3 of topsoil was imported to site from Barlow Moor Road (Top Soil Sample only - certification amended to this certificate) for use within the garden cover system. E3P attended site on 12th June 2018 to obtain 3No. samples of placed topsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples TS101, TS102 and TS103 were obtained from 0.10mbgl. from plots 3, 5 and 7 respectively. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab reports 18-88735 and 18-88738 (attached to this letter).

Subsoil

Upon complete excavation and processing of all Made Ground deposits, the cut / fill earthworks to achieve a development platform as part of the proposed development removed natural granular soils. The resulting site won materials (~1250m^3) were then stockpiled on site upon completion of the remediation and enabling works for use as subsoil within the 600mm cover system for garden and landscaped areas to be installed during the build phase of the development.

During the remediation and enabling works 3No. samples were collected of the stockpiled materials, the results of which are presented within the I2 Analytical Report 17-51913 dated June 2017. E3P attended site on 31st May 2018 to obtain 2No, samples of the stockpiled subsoil, the results of which are presented within the I2 Analytical Report 18-87549. All samples have been collected in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy.

The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 12-06-2018	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: T. Preston
Plot Numbers Validated: 1-8	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 1		
Depth of Strata (m bgl)	0.00-0.23	Validated TOPSOIL
	0.23-0.68	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 2		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 3		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 4		
Depth of Strata (m bgl)	0.00-0.30	Validated TOPSOIL
	0.30-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 5		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.66	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 6		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.75	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 7		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.65	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 8		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.65	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V4
Date: 6th September 2018

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 9-12

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 9-12 at the site off Vine Street in Gorton.

In total 4No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

Circa. 50m^3 of topsoil was imported to site Astley, Manchester (Top Soil Sample only - certification amended to this certificate) for use within the garden cover system. E3P attended site on 20th August 2018 to obtain 2No. samples of placed topsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples TS113 and TS116 were obtained from 0.10mbgl. from plots 13, and 16 respectively. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-97159 (attached to this letter).

Subsoil

Upon complete excavation and processing of all Made Ground deposits, the cut / fill earthworks to achieve a development platform as part of the proposed development removed natural granular soils. The resulting site won materials (~1250m^3) were then stockpiled on site upon completion of the remediation and enabling works for use as subsoil within the 600mm cover system for garden and landscaped areas to be installed during the build phase of the development.

During the remediation and enabling works 3No. samples were collected of the stockpiled materials, the results of which are presented within the I2 Analytical Report 17-51913 dated June 2017. E3P attended site on 31st May 2018 to obtain 2No, samples of the stockpiled subsoil, the results of which are presented within the I2 Analytical Report 18-87549. All samples have been collected in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy.

Plots 9-11 contain the subsoils detailed above.

Circa. 250m3 of subsoil was imported to site from Brooklands Primary School for use as subsoil within the 600mm cover system for gardens of plot 12.

E3P attended site on 21st August 2018 to obtain 2No. samples of placed subsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples SS114 and SS117 were obtained from 0.40m bgl. from plots 14 and 17 respectively. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-97329 (attached to this letter).

The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 31-08-2018	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: S. Murray
Plot Numbers Validated: 9-12	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 9		
Depth of Strata (m bgl)	0.00-0.23	Validated TOPSOIL
	0.23-0.68	Validated SUBSOIL

Depth of Cover System Materials

Depth of Cover System Materials

Depth of Cover System at Ground Level

Depth of Cover System in Relation to Plot

Plot No: 10		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 11		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 12		
Depth of Strata (m bgl)	0.00-0.30	Validated TOPSOIL
	0.30-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V3
Date: 5th September 2018

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 13-18

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 13-18 at the site off Vine Street in Gorton.

In total 6No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

Circa. 50m^3 of topsoil was imported to site Astley, Manchester (Top Soil Sample only - certification amended to this certificate) for use within the garden cover system. E3P attended site on 20th August 2018 to obtain 2No. samples of placed topsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples TS113 and TS116 were obtained from 0.10mbgl. from plots 13, and 16 respectively. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-97159 (attached to this letter).

Subsoil

Circa. 250m3 of subsoil was imported to site from Brooklands Primary School for use as subsoil within the 600mm cover system for garden and landscaped areas.

E3P attended site on 21st August 2018 to obtain 2No. samples of placed subsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples SS114 and SS117 were obtained from 0.40m bgl. from plots 14 and 17 respectively. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-97329 (attached to this letter).

The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 17-08-2018	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: J. Newall
Plot Numbers Validated: 13-18	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 13		
Depth of Strata (m bgl)	0.00-0.23	Validated TOPSOIL
	0.23-0.68	Validated SUBSOIL

Depth of Cover System Materials

Depth of Cover System Materials

Depth of Cover System at Ground Level

Depth of Cover System in Relation to Plot

Plot No: 14		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 15		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 16		
Depth of Strata (m bgl)	0.00-0.30	Validated TOPSOIL
	0.30-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 17		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.66	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 18		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***

Depth of Cover System at Ground Level

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V5
Date: 15th October 2018

Chris Kelly
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Chris,

Garden Validation – Vine Street, Gorton- Plots 19-21

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 19-21 at the site off Vine Street in Gorton.

In total 3No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

50m^3 of topsoil was imported to site from Astley, Manchester (Top Soil Sample only - certification amended to this certificate) for use within the garden cover system.

E3P attended site on 19th September 2018 to obtain 3No. samples of stockpiled topsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab reports 18-11260 (attached to this letter).

Subsoil

Circa. 250m3 of subsoil was imported to site from Brooklands Primary School for use as subsoil within the 600mm cover system for garden and landscaped areas.

E3P attended site on 21st August 2018 to obtain 2No. samples of placed subsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples SS114 and SS117 were obtained from 0.40m bgl. from plots 14 and 17 respectively. Chemical analysis confirmed that these subsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-97329 (attached to this letter). The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Cover system validation photographs are enclosed within this letter. I trust this information is satisfactory to your requirements, and should I be

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 03-10-2018	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: T. Preston
Plot Numbers Validated: 19-21	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 19		
Depth of Strata (m bgl)	0.00-0.23	Validated TOPSOIL
	0.23-0.68	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 20		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 21		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V6
Date: 23rd Oct 2018

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 22-24

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 22-24 at the site off Vine Street in Gorton.

In total 3No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

Circa. 50m^3 of topsoil was imported to site Astley, Manchester (Top Soil Sample only - certification amended to this certificate) for use within the garden cover system. E3P attended site on 12th October 23, 2018 to obtain 3No. samples of placed topsoil deposits in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples TS101, TS102 and TS103 were obtained from 0.10mbgl. from plots 22, 23 and 24 respectively. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-14407 (attached to this letter).

Subsoil

Circa. 24m3 of subsoil was imported to site from Northfield Road for use as subsoil within the 600mm cover system for gardens of plot 12.

E3P attended site on the 12th October for obtain 3No. samples of placed subsoil and 1No. sample from stockpiled material in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. In-situ subsoil samples SS101, SS102 and SS103 were obtained from circa. 0.40m bgl. from plots 22, 23 and 24 respectively. Chemical analysis confirmed that these subsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-14407 (attached to this letter).

The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 12-10-2018	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: T. Preston
Plot Numbers Validated: 22-24	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 22		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 23		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.65	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 24		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

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Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V7
Date: 10th December 2018

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 25-28

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 25-28 at the site off Vine Street in Gorton.

In total 4No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

No suitable source of topsoil was identified on site; therefore, it was required that topsoil was imported to site for use.

E3P attended site to obtain three samples of the imported topsoil from a site in Astely, Manchester (certification amended to this certificate), which were analysed in accordance with the Remediation Strategy. In-situ topsoil samples TS101 (Plot 25) and TS103 (Plot 27) were taken along with TS105 from a stockpile.

Chemical analysis identified no contaminant exceedances, therefore it has been determined that the topsoil would be suitable for utilisation within the proposed gardens.

Chemical analysis results are included within lab report 18-19986 (attached to this letter).

Subsoil

No suitable source of subsoil was identified on site; therefore, it was required that subsoil was imported to site for use.

E3P attended the source site of the subsoils (Old Lane, Little Hulton) on the 21st November 2018, where 3No. samples of stockpiled subsoil was undertaken in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that these subsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-19880 (attached to this letter).

The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Further chemical analysis will be undertaken as further topsoil and subsoil is imported to ensure a sampling frequency is undertaken in accordance with the regulatory approved Remediation Strategy.

E3P is therefore of the opinion that the requirements of the specification for importation, analysis and placement of topsoil and subsoil as a cover system within the residential garden have been met and as such the site is suitable for the intended use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 26-11-2018	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: J. Newall
Plot Numbers Validated: 25-28	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 25		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.68	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 26		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.78	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 27		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 28		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.65	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612
info@E3P.co.uk

http://www.E3P.co.uk

Ref: 10-019-V8
Date: 10th Dec 2018

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 29-34

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 29-34 at the site off Vine Street in Gorton.

In total 6No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

No suitable source of topsoil was identified on site; therefore, it was required that topsoil was imported to site for use.

E3P attended site to obtain three samples of the imported topsoil from a site in Astely, Manchester (certification amended to this certificate), which were analysed in accordance with the Remediation Strategy. In-situ topsoil samples TS101 (Plot 25) and TS103 (Plot 27) were taken along with TS105 from a stockpile.

Chemical analysis identified no contaminant exceedances, therefore it has been determined that the topsoil would be suitable for utilisation within the proposed gardens.

Chemical analysis results are included within lab report 18-19986 (attached to this letter).

Subsoil

No suitable source of subsoil was identified on site; therefore, it was required that subsoil was imported to site for use.

E3P attended the source site of the subsoils (Old Lane, Little Hulton) on the 21st November 2018, where 3No. samples of stockpiled subsoil was undertaken in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that these subsoil deposits were chemically suitable for use within the proposed garden areas.

Chemical analysis results are included within lab report 18-19880 (attached to this letter).

The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Further chemical analysis will be undertaken as further topsoil and subsoil is imported to ensure a sampling frequency is undertaken in accordance with the regulatory approved Remediation Strategy.

E3P is therefore of the opinion that the requirements of the specification for importation, analysis and placement of topsoil and subsoil as a cover system within the residential garden have been met and as such the site is suitable for the intended use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 03-12-2018	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: J. Newall
Plot Numbers Validated: 29-34	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 29		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 30		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.65	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 31		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 32		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 33		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.60	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 34		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.70	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V9
Date: 22nd January 2019

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 35 & 36

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 35 & 36 at the site off Vine Street in Gorton.

In total 2No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

No suitable source of topsoil was identified on site; therefore, it was required that topsoil was imported to site for use. Circa.

Circa. 177m^3 of topsoil has currently been imported to site from a site in Freeland Horticulture Limited (Astley, Manchester; certification amended to this certificate). E3P attended site to obtain three samples of the imported topsoil on the 26th November 2018, which were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples TS101 (Plot 25) and TS103 (Plot 27) were taken along with TS105 from a stockpile. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas. Chemical analysis results are included within lab report 18-19986 (attached to this letter). E3P attended site on the 16th January 2019 to collect a further sample of topsoil (TS101) where chemical results are included within the lab report 19-25098. Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Subsoil

No suitable source of subsoil was identified on site; therefore, it was required that subsoil was imported to site for use.

E3P attended the source site of the subsoils (Old Lane, Little Hulton) on the 21st November 2018, where 3No. samples of stockpiled subsoil was undertaken in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy and were analysed in accordance with the E3P Remediation Strategy. Chemical analysis confirmed that these subsoil deposits were chemically suitable for use within the proposed garden areas. Circa. 423.75m^3 of subsoil from this source has been imported to site thus far.

Chemical analysis results are included within lab report 18-19880 (attached to this letter).

The results of this analysis confirm that the soil is suitable for use as subsoil within the context of the proposed residential end use.

Further chemical analysis will be undertaken as further topsoil and subsoil is imported to ensure a sampling frequency is undertaken in accordance with the regulatory approved Remediation Strategy.

E3P is therefore of the opinion that the requirements of the specification for importation, analysis and placement of topsoil and subsoil as a cover system within the residential garden have been met and as such the site is suitable for the intended use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 16-01-2019	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: T. Preston
Plot Numbers Validated: 35 & 36	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 35		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.68	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 36		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.78	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

E3P
Heliport Business Park
Liverpool Road
Eccles
Manchester
M30 7RU

Manchester / London / Edinburgh
0161 707 9612

info@E3P.co.uk
http://www.E3P.co.uk

Ref: 10-019-V12
Date: 21st February 2019

Glyn Barrett
Mulbury Homes
Great Oak Farm
Mag Lane
Lymm
Cheshire
WA13 0TF

BY Email

Dear Glyn,

Garden Validation – Vine Street, Gorton- Plots 37-46

An E3P engineer attended the above site to validate the thickness of the cover system that had been placed within the rear garden of plots 37-46 at the site off Vine Street in Gorton.

In total 10No. hand excavated trial pits were advanced with the resulting strata detailed to the rear of this letter.

All trial pits were completed to highlight the required cover system of 600mm (150mm topsoil and 450mm subsoil).

E3P can confirm that our independent validation demonstrates that all gardens have been installed with 150mm of certified topsoil and at least 450mm subsoil in accordance with the NHBC requirements for a site of this nature.

Topsoil

No suitable source of topsoil was identified on site; therefore, it was required that topsoil was imported to site for use.

Circa. 177m^3 of topsoil has currently been imported to site from a site in Freeland Horticulture Limited (Astley, Manchester; certification amended to this certificate). E3P attended site to obtain three samples of the imported topsoil on the 26th November 2018, which were analysed in accordance with the E3P Remediation Strategy. In-situ topsoil samples TS101 (Plot 25) and TS103 (Plot 27) were taken along with TS105 from a stockpile.

Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas. Chemical analysis results are included within lab report 18-19986 (attached to this letter).

E3P attended site on the 4th February 2019 to collect a further four samples of topsoil from a stockpile (TS101-TS104) and chemical results are included within the lab report 19-27469-1.

Chemical analysis confirmed that these topsoil deposits were chemically suitable for use within the proposed garden areas.

Subsoil

No suitable source of subsoil was identified on site; therefore, it was required that subsoil was imported to site for use.

Circa. 360m^3 of subsoils were imported to site from Hillside Central, Hattersley Phase 3. E3P attended site on the 31st January 2019, where 3No. samples of stockpiled subsoil were collected in accordance with the requirements of the sampling frequency as stated within the E3P Remediation & Enabling Works Strategy. The results are included within i2 Analytical Report 19-27352 which show that <0.001% asbestos was detected within one of the three samples. All other chemical analysis completed showed the material to be suitable for use within the proposed garden areas.

The “trace” levels of asbestos identified within the stockpile is not defined as "clearly identifiable" as per the CL:AIRE CAR-SOIL guidance therefore it could be argued that the Control of Asbestos Regulations 2012 do not apply, in this instance.

However, for the avoidance of doubt, E3P then undertook 10 No. further tests in each plot to confirm the absence of asbestos of which the results are included within i2 Analytical Report 19-28075. All testing showed not asbestos fibres detected. A further sample of subsoil (PL46-2) was taken from plot 46 on the 7th of February following placement and tested in accordance with the E3P Remediation & Enabling Works Strategy, the results of which are included within I2 Analytical Report 19-28076 is amended to this report. Results showed the materials to be suitable for use within the garden cover system.

E3P is therefore of the opinion that the requirements of the specification for importation, analysis and placement of topsoil and subsoil as a cover system within the residential garden have been met and as such the site is suitable for the intended use.

Cover system validation photographs are enclosed within this letter.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

RHodnett

Rebecca Hodnett
Geo- Environmental Consultant Project Manager

Site: Vine Street, Gorton

Date: 04-02-2019	Project Number: 10-019
Project Manager: R. Hodnett	E3P Engineer: J. Newall
Plot Numbers Validated: 37-46	

Chemical Laboratory Analysis

Analysis for topsoil and subsoil undertaken by I2 Analytical Laboratory using UKAS accredited methods where applicable.

Chemical analysis suite comprises heavy metals, sulphates, phenols, speciated Polycylic Aromatic Hydrocarbons (PAHs), speciated and total Petroleum Hydrocarbons (TPH) and asbestos.

Sampling frequency in accordance with the agreed Remediation Strategy.

Laboratory analysis certificates attached to this validation certificate.

	Topsoil	**Subsoil**
Chemical analysis confirmed materials suitable?	Pass	Pass
Further Comments	N/A	N/A

Plot No: 37		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.68	Validated SUBSOIL

Depth of Cover System Materials

Depth of Cover System Materials

Depth of Cover System at Ground Level

Depth of Cover System in Relation to Plot

Plot No: 38		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.78	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 39		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.68	Validated SUBSOIL

Depth of Cover System Materials

Depth of Cover System Materials

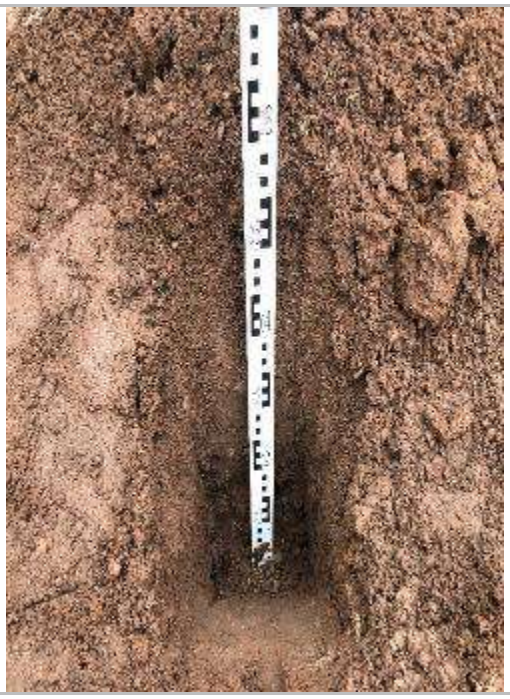
Depth of Cover System at Ground Level

Depth of Cover System in Relation to Plot

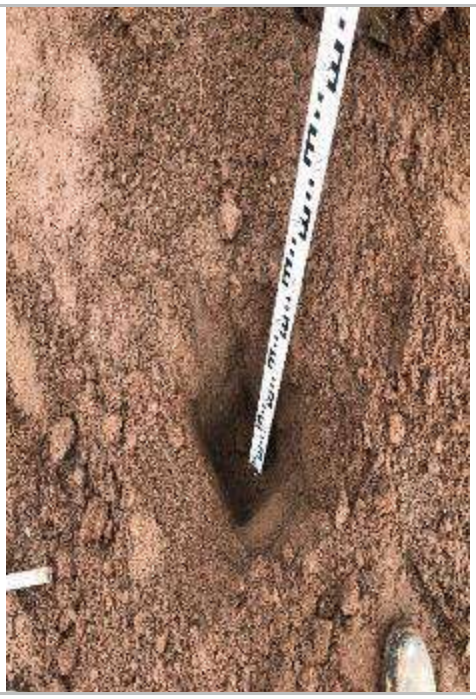
Plot No: 40		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.78	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 41		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.78	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
	
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

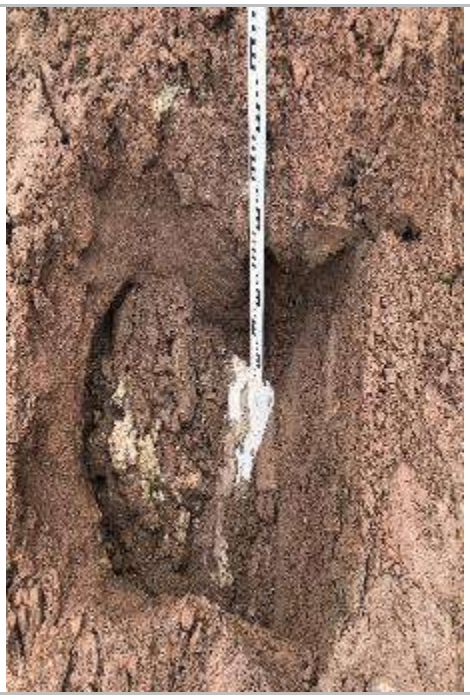
Plot No: 42		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.68	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
	
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 43		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.78	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 44		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.68	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
	
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 45		
Depth of Strata (m bgl)	0.00-0.20	Validated TOPSOIL
	0.20-0.78	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***

Plot No: 46		
Depth of Strata (m bgl)	0.00-0.15	Validated TOPSOIL
	0.15-0.68	Validated SUBSOIL

Depth of Cover System Materials	***Depth of Cover System Materials***
Depth of Cover System at Ground Level	***Depth of Cover System in Relation to Plot***