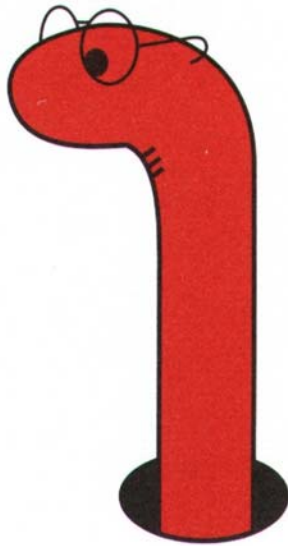


Electronic Report



WORMS EYE

Worms Eye Limited
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BB9 4HS

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Our Ref: Nell Lane/M21 7UH/2021
Date: 12 February 2024

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Denton Construction
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Salford
M3 6BZ

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NELL LANE/BROOKSTONE CLOSE, MANCHESTER, M21 7UH
IMPORTED SOIL

INTRODUCTION

A residential development has been built. Following an intrusive report (6/1/20), landfill/ground gas report (19/2/20), supplementary asbestos tests (20/3/21), and remediation strategy (22/3/21) instructions were to test imported soils.

SITE DESCRIPTION

The site, a roughly 'T' shaped plot, about 42 by 46 metres, is located to the northeast of Nell Lane in Manchester and at OS Grid Reference 382811, 392862. In 2020 the site comprised a grassed plot of land, with a tarmac road coming in at the northeast, leading to two parking spaces in the northwest.

PROPOSED DEVELOPMENT

A block of twelve apartments has been built. The original layout was amended and a communal garden at the northwest has been separated from the development by a fence. This has created public open space either side of a path leading from Nell Lane to nearby houses. The northeast of the site is a car park.

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Imported Soils

About 50m³ of soil was imported onto site and to complete the open space at the northwest. Imported soils were supplied by R Drapers, with a set of test result which show:

- Asbestos – No fibres were detected.
- Inorganic Contaminants – levels of heavy metals and inorganic contaminants are below residential thresholds.
- Hydrocarbons – levels of phenols, TPHs and PAHs were very low and below stringent residential thresholds.

To confirm the soil is suitable for use on site three trial holes (V1, V2 and V3) were excavated to the northwest of the building, to about 0.6m deep. These show the soil to comprise a brown topsoil, slightly sandy and clayey in places, with occasional gravel and brick pieces. This continued to at least 0.65m in V1, at least 0.55m in V3 and to 0.6m in V2 where it was underlain by clay.

Generic Assessment

Three samples, one per trial hole, were tested for a range of contaminants suitable for assessing imported soils. Maximum contamination values have been compared with Public Space (residential) C4Ls, soil guideline values provided by CLEA and values based on the LQM/CIEH S4ULS. In accordance with guidance provided by the AGS, threshold values from other sources have been used for screening purposes. This information is brought together on the enclosed Comparison Table.

The tests show:

- Asbestos – No asbestos fibres were seen.
- Inorganics (metals etc.) – Inorganic contaminants are below residential thresholds except in V1 where lead exceeds the threshold.
- TPHs and Phenols - low levels, below residential thresholds.
- PAHs - below their respective thresholds in V2 and V3 but benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(ah)anthracene exceed residential thresholds in V1.

Site Specific Assessment

PAHs exceed the generic thresholds in V1 and, to assess these further, the benzo-a-pyrene (BaP) surrogate marker approach was adopted, comparing genotoxic PAHs to soil PAH coal tar mixtures, to establish if BaP is a suitable surrogate marker for PAHs. The LQM PAH profiling tool was used and confirms the validity of the approach, showing BaP is a suitable surrogate marker for the PAH assessment as the following are met:

- BaP is present in all soil samples containing genotoxic PAHs being assessed.
- A similar profile of the genotoxic PAHs to BaP is present in all samples being assessed;
- The PAH profile of PAHs in the soil samples is similar to that present in the pivotal toxicity study on which toxicological criterion for benzo(a)pyrene was based (Culp et al., 1998).

To assess risk from PAHs, Site Specific Assessment Criteria was derived for BaP, based on a sandy clay loam with a pH of 8.3 and Soil Organic Matter of 1.1%. This shows a BaP threshold of 10mg/kg and, comparing BaP levels in the soil against the SSAC shows the levels are all below the threshold.

CONCLUSION

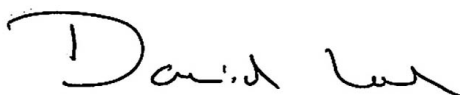
The findings confirm soils have been imported onto open space northwest of the building, to at least 0.6m deep. These have been tested and found to have levels of contaminants below appropriate thresholds in V2 and V3 and are considered suitable for use on site. However, in V1 there are raised levels of PAHs which exceed residential thresholds.

V1 represents the southwest part of the public open space where topsoil was used to complete the open space, outside the line of the site and lining the pathway. PAH profiling shows that BaP can be used as a surrogate marker. Using this approach shows the level of BaP in V1 is below the SSAC indicating there is no risk from PAHs.

Therefore, imported soils are considered suitable for use to complete the public space to the northwest of the site.

Yours faithfully

on behalf of Worms Eye Ltd



David Lord
BSc (Hons)
FGS, MEnvSc, AIEMA

NELL LANE/BROOKSTONE CLOSE, MANCHESTER, M21 7UH

List of Appendices – Imported Soils

List of Acronyms

Proposed Site Plan – Showing Validation Trial Holes

Trial Hole Logs

Photographs of Excavations

Contamination Test Results for Imported Soils

Contamination Comparison Table

CLEA Calculation Results

PAH Profiling

CONTAMINATION TEST UNITS

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

ABBREVIATIONS

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

1. This report should be considered in relation to the objectives agreed between Worms Eye and the Client, outlined in the introduction.
2. For the work, reliance has been placed on publicly available data, obtained from the sources identified in the report. The information is not exhaustive and further information may be available from other sources. When using the information it has been assumed it is correct, and no attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and guidelines, for land and groundwater contamination, enforced by the Local Authority and the Environment Agency.
4. During the site walkover, reasonable effort was made to obtain an overview of the site. However, no attempt was made to enter areas that are unsafe, a risk to health and safety, locked, barricaded, overgrown, or areas not made accessible.
5. Access, the presence of services and activities on the site, limited locations where sampling could be carried out and the techniques that could be used.
6. Assessments are based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. The conclusions and recommendations provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
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CHECK ALL DIMENSIONS ON SITE.

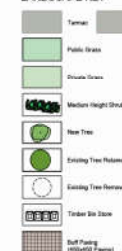
DRAWING TO BE READ IN CONJUNCTION WITH THE HEALTH & SAFETY PLAN AND ALL RELEVANT RISK ASSESSMENTS AND THE FOLLOWING DRAWINGS:

SCHEDULE OF ACCOMMODATION

Type	Area	Total
HouseType G. store	61m ²	12

Car parking: 19No.
(Existing parking 9 spaces, increase of 10 spaces)

LANDSCAPE KEY



BOUNDARY TREATMENT KEY



CO-ORDINATES KEY



C03	04.04.22	JH	Plan amended to suit store size increase next to front entrance door. SVP in plot 4 has been moved from the kitchen to the store.
C02	17.01.22	MM	Ground Floor FFL added.
C01	25.08.21	JH	Co ordinates and overlooking distances added.
P04	05.03.21	MM	Building/position amended. Additional tree removed.
P03	12.04.21	MM	Key updated: Building Regulations issue.
P02	18.02.21	MM	Co-ordinates updated.
Rev	Date	By	Remarks

Client: Southway Housing

Project Name: Nell Lane

Drawing Name: Proposed Site Plan

Drawing Purpose: CONSTRUCTION

Project Number: 20.057 Drawing Number: G. 1.03

Project	Origin	Vol/Sys	Level	Type	Role	Number	Revision
NEL	TRI	Z1	ZZ	DR	A	4003	C03

Status	Scale	Drawn	Checked	Date
S1	1:200	HR		JAN 2021



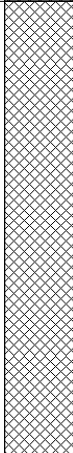
Tel: 0161 272 3500
E-mail: studio@trianglearchitects.co.uk
Web: www.trianglearchitects.co.uk
Twitter: @TriangleArch

Raven House,
113 Fairfield Street,
Manchester,
M12 6EL



Proposed Site Plan

scale 1:200 0 10m

Worms Eye Limited				PO Box 1157 COLNE, BB9 4HS		Site NELL LANE/BROOKSTONE CLOSE, MANCHESTER		Trial Pit Number V1		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD)		Client			Job Number M21 7UH	
		Location Southwest side of northwest landscaped area		Dates 19/12/2023		Project Contractor Worms Eye Ltd.			Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description			Legend	Water
					(0.05) 0.05	Turf.				
					Dark brown soil with gravel.					
					(0.60)					
					0.65	Complete at 0.65m				



Remarks

Scale (approx)

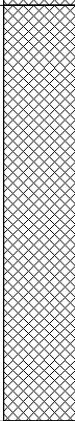
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Logged By

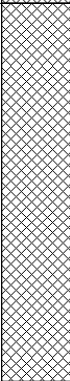
EW

Figure No.

M21 7UH.V1

Worms Eye Limited				PO Box 1157 COLNE, BB9 4HS		Site NELL LANE/BROOKSTONE CLOSE, MANCHESTER		Trial Pit Number V2		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD)		Client			Job Number M21 7UH	
		Location Northwest side of northwest landscaped area		Dates 19/12/2023		Project Contractor Worms Eye Ltd.			Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description			Legend	Water
					(0.05) 0.05	Turf.				
					Brown, slightly sandy, clayey soil with brick and gravel.					
					(0.55)					
(0.60) (0.05) 0.65	Brown clay.									
Complete at 0.65m										

<div>  </div>	<div> <div>Remarks</div> </div>		
	<div> <div>Scale (approx)</div> <div>1:10</div> </div>	<div> <div>Logged By</div> <div>EW</div> </div>	<div> <div>Figure No.</div> <div>M21 7UH.V2</div> </div>

Worms Eye Limited				PO Box 1157 COLNE, BB9 4HS		Site NELL LANE/BROOKSTONE CLOSE, MANCHESTER		Trial Pit Number V3		
Excavation Method Trial Pit		Dimensions		Ground Level (mOD)		Client			Job Number M21 7UH	
		Location Northeast side of northwest landscaped area		Dates 19/12/2023		Project Contractor Worms Eye Ltd.			Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description			Legend	Water
					(0.05) 0.05	Turf.				
					Brown sandy soil with hardcore, gravel and sand.					
					(0.50)					
					0.55	Complete at 0.55m				



Remarks

Scale (approx)

1:10

Logged By

EW

Figure No.

M21 7UH.V3



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f: 01923 237404
e: reception@i2analytical.com

e: david@wormseye.co.uk

Analytical Report Number : 23-76173

Project / Site name:	Nell Lane Manchester	Samples received on:	21/12/2023
Your job number:	M21 7UH	Samples instructed on/ Analysis started on:	21/12/2023
Your order number:		Analysis completed by:	02/01/2024
Report Issue Number:	1	Report issued on:	03/01/2024
Samples Analysed:	3 soil samples		

Signed: _____

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-76173
Project / Site name: Nell Lane Manchester

Lab Sample Number				2918111	2918112	2918113
Sample Reference				V1	V2	V3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.50	0.10-0.50	0.10-0.50
Date Sampled				19/12/2023	19/12/2023	19/12/2023
Time Taken				1300	1300	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	12	8.6
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	8.6	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Thiocyanate as SCN	mg/kg	5	NONE	< 5.0	< 5.0	< 5.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.058	0.037	0.029
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	36	89	74
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.018	0.0443	0.0372
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	18	44.3	37.2
Sulphide	mg/kg	1	MCERTS	27	15	8.3
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3.1	0.9	0.7

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.27	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.47	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.94	0.09	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.85	0.08	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	8.6	0.81	0.23
Anthracene	mg/kg	0.05	MCERTS	2.2	0.2	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	16	1.7	0.4
Pyrene	mg/kg	0.05	MCERTS	16	1.6	0.43
Benzo(a)anthracene	mg/kg	0.05	MCERTS	8.6	0.9	0.24
Chrysene	mg/kg	0.05	MCERTS	8	0.98	0.29
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	11	1	0.34
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	3.7	0.55	0.14
Benzo(a)pyrene	mg/kg	0.05	MCERTS	9.8	0.9	0.28
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4	0.42	0.16
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.2	0.13	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.8	0.56	0.18

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	96.5	9.86	2.69
-----------------------------	-------	-----	-----------	------	------	------

Analytical Report Number: 23-76173
Project / Site name: Nell Lane Manchester

Lab Sample Number				2918111	2918112	2918113
Sample Reference				V1	V2	V3
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.50	0.10-0.50	0.10-0.50
Date Sampled				19/12/2023	19/12/2023	19/12/2023
Time Taken				1300	1300	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	7.3	4.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	0.3	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	95	21	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	53	23	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	210	49	42
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	15	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	60	43

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	11	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	12	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	3.3	< 2.0	3.2
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	30	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	87	13	< 10
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	120	19	19

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

Analytical Report Number : 23-76173

Project / Site name: Nell Lane 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 *
2918111	V1	None Supplied	0.10-0.50	Brown loam and sand with gravel and vegetation.
2918112	V2	None Supplied	0.10-0.50	Brown clay and loam with gravel and vegetation.
2918113	V3	None Supplied	0.10-0.50	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 23-76173
Project / Site name: Nell Lane Manchester

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
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
Thiocyanate in soil	Determination of thiocyanate in soil by extraction in water followed by acidification followed by addition of ferric nitrate followed by discrete analyser (spectrophotometer).	In-house method	L082-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 23-76173
Project / Site name: Nell Lane Manchester

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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Comparison of Contamination Test Results with Various Thresholds

PUBLIC SPACE (Near Residential Housing) - Hydrocarbons at 1% SOM

Contaminant	Max Value	Threshold	Pass/Fail	SSAC	Pass/ Fail	Failed Samples
HEAVY METALS						
- Arsenic	11	79*	✓			
- Cadmium	0.7	120*	✓			
- Chromium III	95	1500*	✓			
- Chromium VI	<1.8	7.7*	✓			
- Copper	53	12000*	✓			
- Lead	210	630▲	✓			
- Inorganic Mercury	<0.3	120*	✓			
- Methyl Mercury	<0.3	40*	✓			
- Nickel	15	230*	✓			
- Selenium	<1.0	1100*	✓			
- Zinc	110	81000*	✓			
OTHER INORGANICS						
- Asbestos	None detected		✓			
- Cyanide (total)	<1.0	20 (D)	✓			
- pH range	8.3 – 8.8					
- Sulphate (g/l)	0.0443	0.5 (B)	✓			
- Sulphide	27	250 (E)	✓			
- Thiocyanate	<5.0					
-TOC range (%)	0.7 – 3.1					
-SOM Range						

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

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

Sources

- Soil Guideline Values ▲ - C4SL ® - CLEA 1.06 Software

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(D) – Dutch (B) - BRE – Building Research Establishment (E) - EA Disposal Threshold 2002

SSAC – Site Specific Assessment Criteria (derived with CLEA 1.06 software)

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Comparison of Contamination Test Results with Various Thresholds

PUBLIC SPACE (Near Residential Housing) - Hydrocarbons at 1% SOM

Contaminant	Max Value	Threshold	Pass/ Fail	PAH Profile	Pass/ Fail	PAH Profiling	Pass/ Fail	Failed Samples
PAHs								
- Acenaphthene	0.94	15000*	✓	10 ®	✓			
- Acenaphthylene	0.47	15000*	✓					
- Anthracene	2.2	74000*	✓					
- Benz(a)anthracene	8.6	29*	✓					
- Benzo(a)pyrene (BAP)*	9.8	5.7*	X					V1 – 0.1-0.5m
- Benzo(b)fluoranthene	11	7.1	X					V1 – 0.1-0.5m
- Benzo(ghi)perylene	4.8	640*	✓					
- Benzo(k)fluoranthene	3.7	190*	✓					
- Chrysene	8	57*	✓					
- Dibenz(ah)anthracene (DBA)	1.2	0.57	X					V1 – 0.1-0.5m
- Fluoranthene	16	7100*	✓					
- Fluorene	0.85	9900*	✓					
- Indene (123-cd) pyrene	4	82*	✓					
- Phenanthrene	8.6	3100*	✓					
- Pyrene	16	7400*	✓					
- Naphthalene	0.27	4900*	✓					
OTHER COMPOUNDS								
Phenols	<1.0	3200*	✓					

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

Hydrocarbon values derived using 6% SOM

BAP is a marker for genotoxic PAHs

Sources

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Comparison of Contamination Test Results with Various Thresholds

PUBLIC SPACE (Near Residential Housing) - Hydrocarbons at 1% SOM

Contaminant	Max Value	Threshold	Pass/Fail	SSAC	Pass/Fail	Failed Samples
BTEX COMPOUNDS						
- Benzene	<0.005	73*	✓			
- Toluene	<0.005	56000*	✓			
- Ethyl-benzene	<0.005	25000*	✓			
- Xylene - O	<0.005	43000*	✓			
- M/P	<0.005	43000*	✓			
TPHs						
Aliphatics						
C ₅ – C ₆	<0.020	570000*	✓			
C ₆ – C ₈	<0.020	60000*	✓			
C ₈ – C ₁₀	<0.050	13000*	✓			
C ₁₀ – C ₁₂	<1.0	13000*	✓			
C ₁₂ – C ₁₆	<2.0	13000*	✓			
C ₁₆ – C ₃₅	19	250000*	✓			
Aromatics						
C ₅ – C ₇	<0.010	56000*	✓			
C ₇ – C ₈	<0.010	56000*	✓			
C ₈ – C ₁₀	<0.050	5000*	✓			
C ₁₀ – C ₁₂	<1.0	5000*	✓			
C ₁₂ – C ₁₆	3.3	5000*	✓			
C ₁₆ – C ₂₁	30	3800*	✓			
C ₂₁ – C ₃₅	87	3800*	✓			

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

Hydrocarbon values derived using 6% SOM

Vap – vapour saturation limit Soil – solubility saturation limit

Sources

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SSAC – Site Specific Assessment Criteria (derived with CLEA 1.06 software)

CLEA Software Version 1.071

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Report generated 12-Feb-24

Report title Park Grove, Manchester

Created by David Lord at Worms Eye LTd



RESULTS

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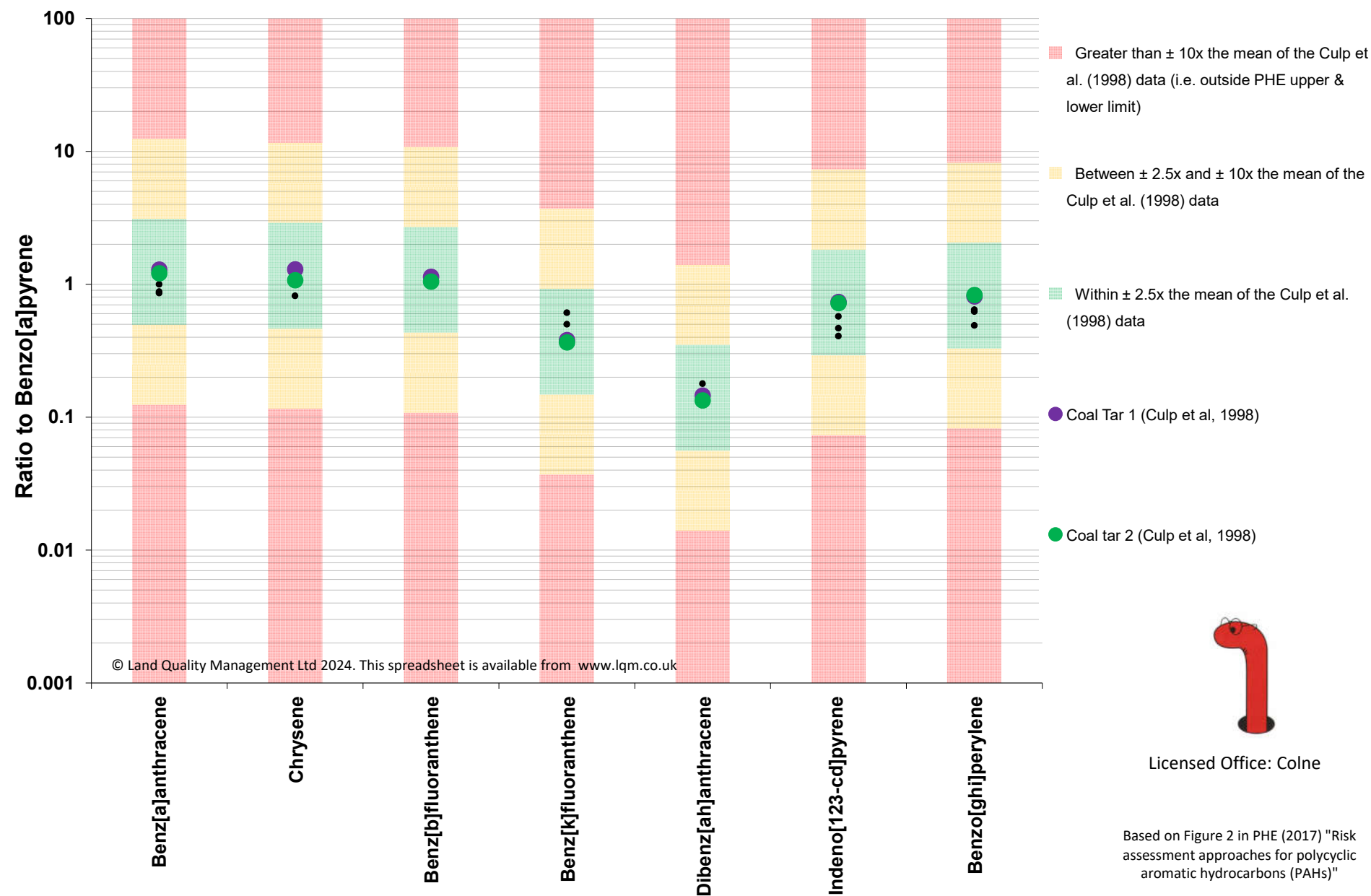
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	Direct soil ingestion Consumption of homegrown produce and attached soil Dermal contact with soil and dust Inhalation of dust Inhalation of vapour Background (oral) Background (inhalation)	Direct soil ingestion Consumption of homegrown produce Dermal contact with soil and dust Inhalation of dust Inhalation of vapour (indoor) Inhalation of vapour (outdoor) Background (oral) Background (inhalation)
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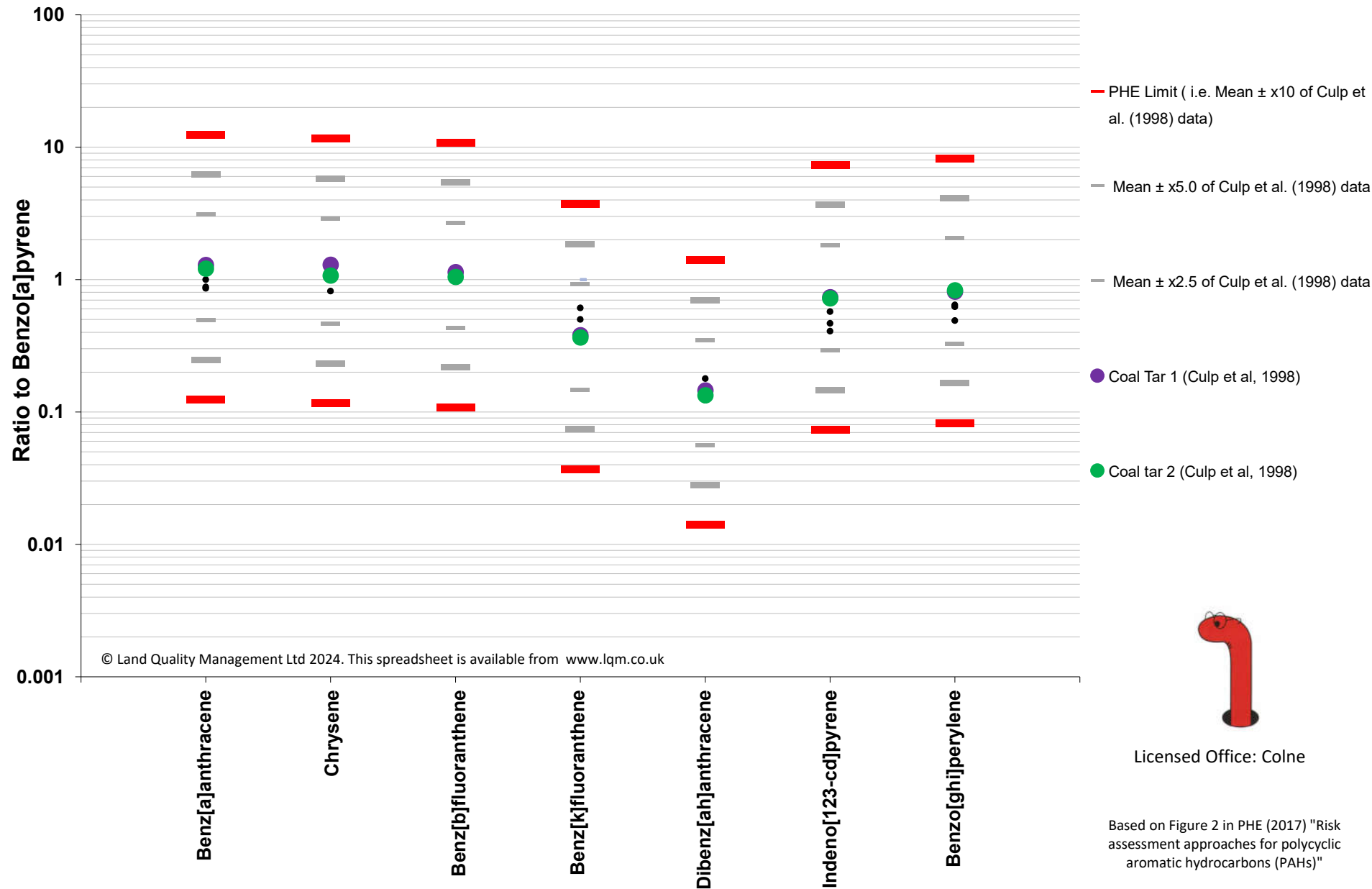
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Validation - 19.12.2023

