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FAO Mr Lee Knight
Caddick Construction (NW) Limited
Chepstow House
Trident Business Park
Warrington
WA3 6BX

Date: 20th March 2023
Your Ref: Milnrow
Our Ref: L-STV5961-L01

Dear Lee,

Soil Suitability Assessment at the proposed Milnrow Medical Centre, Rochdale

Introduction and brief

Further to our correspondence within February 2023, and your subsequent instructions, we are pleased to enclose our assessment on the suitability of an on-site stockpile of soil for reuse within the proposed development. It is understood the soil is proposed to be used for wildflower planting.

Soiltechnics' initial brief was to undertake analysis of the soil stockpile adjacent to Milnrow Medical Centre in Rochdale. Following a review of the initial analysis and due to potentially unacceptable levels of contaminants, a second visit was undertaken to undertake further testing and refine the assessment.

Site location and description

The site is located approximately 3.5km to the east of Rochdale town centre. The surrounding land is a mixed residential and commercial area, with a large area of public open space to the northwest.

Summary of findings

Aspect	Comments
Material tested	Site-won soil
Current placement	Stockpile
Approximate volume	100m ³
Physical suitability	No injurious or over-sized artefacts identified.
Chemical suitability	Contaminants are within acceptable levels.
Overall comments	Chemically and physical suitable for use. No further testing required.
Recommendations	None

Material origin

The material was stockpiled on site at the time of site visit. It is understood that the material is site-won.

Fieldwork

The initial site visit was undertaken on 15th February 2023 and comprised the collection of three topsoil samples.

The second visit was undertaken on 2nd March 2023 and comprised the collection of a further eight soil samples.

The soil is located within a stockpile on site, within the northeast of the site, as shown in the figure below. The soil comprised of dark brown slightly gravelly sandy clay, with frequent rootlets. Generally sampling was undertaken following the principles of the ISO 18400 series: '*Soil quality – Sampling*'.

It should be noted that a waste soil stockpile was also present on site, and contained undesirable and oversized material, such as brick, concrete, and general construction rubble. This stockpile was not part of the assessment.



Photograph 1: General site arrangement and topsoil stockpile on site.

Laboratory testing and rationale

Laboratory testing was carried out by an independent specialist testing house, which operates a quality assurance scheme.

The scope of testing was as follows, and the results are presented within Appendix A.

First Site Visit

- 3 No. samples, tested for a broad spectrum of contaminants to inform a human health assessment;
- 2 No. samples, tested in accordance with the BS:3882 suite to assess the suitability as a growing medium.

Second Site Visit

- 8 No. samples, tested for asbestos screening
- 8 No. samples, tested for speciated PAHs.

Generic Contamination Assessment Criteria

Assessment of laboratory test data has been carried out using published generic assessment criteria (GACs). The GACs act as screening values to provide a 'trigger' to an assessor that soil concentrations above these limits might present an unacceptable risk.

Specific details regarding the published GAC sources chosen and any parameter refinements made are summarised within Appendix B, along with the order of preference where multiple GAC sources are available.

Asbestos does not currently have published GACs which can be used for generic assessment purposes. At this stage we have adopted a present / absent trigger limit.

To determine the suitability of the material in terms of the risk to human health, we have adopted generic screening criteria based on a exposure model of Public Open Space (park). This is based on the intended scenario of a wildflower meadow adjacent to a medical centre.

A summary of the GAC screening assessment is presented in the table below, with the detailed assessment presented in Appendix B.

Contamination Assessment

Table summarising assessment of test data for human & water receptors				
Visit	CLEA model	Inorganic contaminants	Organic contaminants	Asbestos
1 st Visit	Public Open Space (park)	No Exceedances	1 of 3 exceedances, for Benzon(b)fluoranthene & dibenz(a,h) anthracene	Chrysotile Fibres (0.04%)
2 nd Visit		No Exceedances	No Exceedances	None detected

Following an assessment of the results from the first visit, the presence of asbestos fibres and marginally elevated PAH compounds indicated the soil may be unsuitable for use, in terms of the risks to human health.

A second round of sampling was undertaken which showed no further asbestos to be present, and no other PAH exceedances.

Overall, having 1 of 11 samples containing asbestos fibres is considered to be representative of sporadic occurrences of trace levels of asbestos and does not pose a risk to end users of the site, or groundworkers.

To support the assessment of PAH compounds, statistical analysis was undertaken in line with the CL:AIRE 2020 guidance on '*Comparing Soil Contamination Data with a Critical Concentration*'. The statistical analysis is presented within Appendix B and shows that we can be confident that the mean concentration of both contaminants falls below the screening criteria.

In summary, the analysis shows that the soil stockpiled on site would be chemically suitable for reuse within a public open space setting, in terms of the contamination risks to human health.

Suitability as a growing medium

Soil analysis to BS3882 was undertaken for the purpose of assessing the suitability of soil as a growing medium.

The results show the material is largely suitable, with no unacceptable levels of undesirable artefacts (plastics, sharps, over-sized materials, etc), and no elevated levels of phytotoxic elements.

Results from both samples show a high stone content; however, the soil texture, mass loss, pH, and conductivity levels are acceptable.

The results suggest the soil is nutrient poor if used as a multi-purpose growing medium, and conversely, slightly elevated levels of phosphorus suggest the soil may be unsuitable for the proposed wildflower planting scheme, which tend to prefer low fertility soils.

Concluding remarks

Overall, the material is considered suitable for reuse on site.

No unacceptable levels of contamination were detected, and the material did not contain any meaningful amounts of undesirable materials, such as plastics, sharps or over-sized materials.

If the soil is to be used in a general planting scheme as a multi-purpose soil, it would be recommended to add fertiliser and organic matter to improve its' ability to support plant growth. This could be achieved through mixing in manure, or commercial soil improvers/conditioners.

The soil is likely to be suitable for use as growing medium for the proposed wildflower planting scheme; however, we would recommend the BS3882 results are provided to the landscaper to confirm suitability.

We trust this report provides you with the information you require. If you have any queries please do not hesitate to contact us.

Yours sincerely,

Mark Hamill BSc, MSc, CEnv, MEnvSc
Technical Director, Soiltechnics Limited

APPENDIX A



Final Report

Report No.: 23-05887-1
Initial Date of Issue: 02-Mar-2023
Client Soiltechnics Limited
Client Address: 1st Floor Unit 9 Westpoint Enterprise
Park
Clarence Avenue
Trafford Park
Manchester
M17 1QS
Contact(s): Admin
Project STV5961 Milnrow Medical Centre,
Rochdale

Quotation No.:		Date Received:	21-Feb-2023
Order No.:	POR014720	Date Instructed:	21-Feb-2023
No. of Samples:	3		
Turnaround (Wkdays):	9	Results Due:	03-Mar-2023
Date Approved:	02-Mar-2023		

Approved By:

Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: STV5961 Milnrow Medical Centre, Rochdale

Client: Soiltechnics Limited	Chemtest Job No.:				23-05887	23-05887	23-05887
Quotation No.:	Chemtest Sample ID.:				1594169	1594170	1594171
Order No.: POR014720	Client Sample Ref.:				1	2	3
	Client Sample ID.:				ST010.101	ST010.202	ST010.303
	Sample Location:				ST01-01	ST01-02	ST01-03
	Sample Type:				SOIL	SOIL	SOIL
	Date Sampled:				15-Feb-2023	15-Feb-2023	15-Feb-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
ACM Type	U	2192		N/A	Fibres/Clumps	-	-
Asbestos Identification	U	2192		N/A	Chrysotile	No Asbestos Detected	No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001	0.004		
Total Asbestos	U	2192	%	0.001	0.004		
Moisture	N	2030	%	0.020	4.6	1.9	3.1
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand
pH	M	2010		4.0	8.2	8.1	8.1
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.79	< 0.40	1.9
Cyanide (Complex)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	< 0.5	20	3.9
Beryllium	U	2455	mg/kg	0.5	< 0.5	1.2	< 0.5
Cadmium	M	2455	mg/kg	0.10	< 0.10	0.35	0.12
Chromium	M	2455	mg/kg	0.5	< 0.5	21	6.8
Copper	M	2455	mg/kg	0.50	0.98	77	15
Mercury	M	2455	mg/kg	0.05	< 0.05	0.12	0.09
Nickel	M	2455	mg/kg	0.50	< 0.50	36	7.6
Lead	M	2455	mg/kg	0.50	2.8	90	41
Selenium	M	2455	mg/kg	0.25	< 0.25	1.1	0.33
Vanadium	U	2455	mg/kg	0.5	< 0.5	22	9.4
Zinc	M	2455	mg/kg	0.50	2.6	120	40
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
LOI	M	2610	%	0.10	6.8	8.6	7.1
Organic Matter	M	2625	%	0.40	6.6	5.8	2.6
TPH >C5-C6	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C6-C7	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C7-C8	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	N	2670	mg/kg	1.0	9.5	15	8.2
TPH >C16-C21	N	2670	mg/kg	1.0	20	17	17
TPH >C21-C35	N	2670	mg/kg	1.0	66	47	200
Total TPH >C5-C35	N	2670	mg/kg	10	95	79	220

Results - Soil

Project: STV5961 Milnrow Medical Centre, Rochdale

Client: Soiltechnics Limited	Chemtest Job No.:				23-05887	23-05887	23-05887
Quotation No.:	Chemtest Sample ID.:				1594169	1594170	1594171
Order No.: POR014720	Client Sample Ref.:				1	2	3
	Client Sample ID.:				ST010.101	ST010.202	ST010.303
	Sample Location:				ST01-01	ST01-02	ST01-03
	Sample Type:				SOIL	SOIL	SOIL
	Date Sampled:				15-Feb-2023	15-Feb-2023	15-Feb-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
Naphthalene	M	2800	mg/kg	0.10	0.14	1.3	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	0.46	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	0.87	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	0.75	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.66	7.8	< 0.10
Anthracene	M	2800	mg/kg	0.10	0.30	2.8	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	1.9	20	3.3
Pyrene	M	2800	mg/kg	0.10	1.5	15	2.9
Benzo[a]anthracene	M	2800	mg/kg	0.10	1.1	11	< 0.10
Chrysene	M	2800	mg/kg	0.10	1.0	11	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	1.2	16	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.33	4.4	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	0.93	11	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.63	6.9	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.13	1.9	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.57	6.2	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	10	120	6.2
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 23-05887
 Chemtest Sample ID.: 1594169
 Client Sample Ref.: 1
 Sample Location: ST01-01
 Client Sample ID.: ST010.101
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 15-Feb-2023
 Time Sampled:

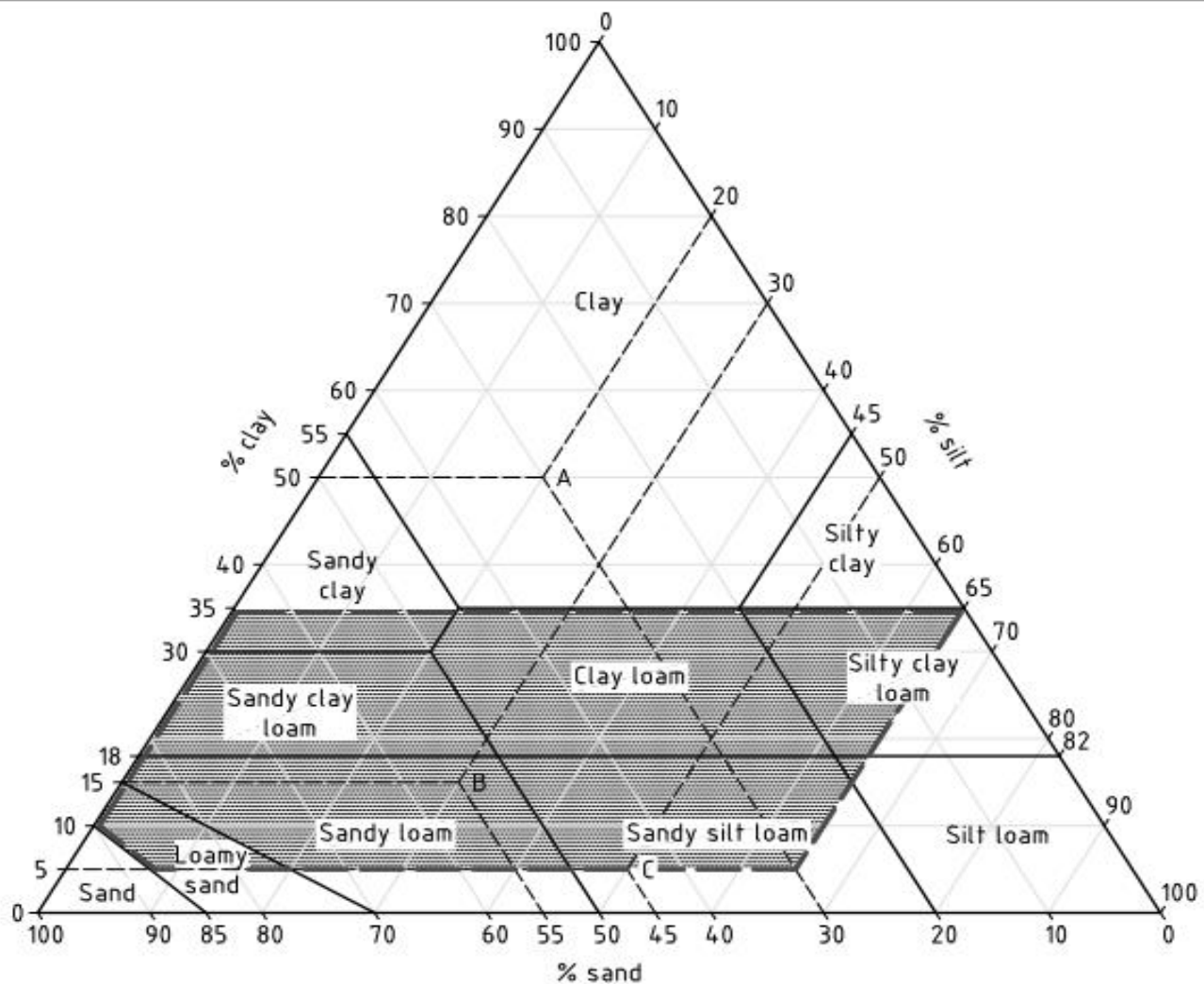
Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content	%		4.8				
Silt content	%		21				
Sand content	%		74				
Soil texture class		See Attached Chart	Sandy Loam	NO			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	4.9	NO	NO	YES	NO
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm		0-30	38	NO			
>20mm		0-10	29	NO			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	8.2	YES	NO	YES	YES
Carbonate (Calcareous only)	%		< 0.10				NO
Electrical Conductivity	µS/cm	If >3300 do ESP	2000	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.26	YES	YES		YES
Extractable phosphorus	mg/l	16-140	39	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	270	YES	YES		YES
Extractable magnesium	mg/l	51-600	37	NO	NO		NO
Carbon : Nitrogen Ratio		<20:1	11.1/1	YES	YES	YES	YES
Exchangeable sodium	%	<15	1.5				
Available Calcium	mg/l		340				
Available Sodium	mg/l		33				
Phytotoxic Contaminants (by soil pH)		< 6.0	6.0-7.0	> 7.0			
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	77	YES	
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	41	YES	
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	22	YES	
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 23-05887
 Chemtest Sample ID.: 1594171
 Client Sample Ref.: 3
 Sample Location: ST01-03
 Client Sample ID.: ST010.303
 Top Depth (m):
 Bottom Depth (m):
 Date Sampled: 15-Feb-2023
 Time Sampled:

Parameter	Units	Multipurpose Range	Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture					Acid	Low F	Calc.
Clay content	%		13				
Silt content	%		19				
Sand content	%		68				
Soil texture class		See Attached Chart	Sandy Loam	YES			
Mass Loss on Ignition							
Clay 5-20%		3.0-20	4.0	YES	YES	YES	YES
Clay 20-35%		5.0-20					
Stone Content	% m/m						
>2mm		0-30	41	NO			
>20mm		0-10	15	NO			
>50mm		0	< 0.020	YES			
Soil pH value		5.5-8.5	8.1	YES	NO	YES	YES
Carbonate (Calcareous only)	%		< 0.10				NO
Electrical Conductivity	µS/cm	If >3300 do ESP	2100	YES			
Available Nutrient Content							
Nitrogen %		>0.15	0.26	YES	YES		YES
Extractable phosphorus	mg/l	16-140	49	YES	YES	NO	YES
Extractable potassium	mg/l	121-1500	250	YES	YES		YES
Extractable magnesium	mg/l	51-600	50	NO	NO		NO
Carbon : Nitrogen Ratio		<20:1	9.0/1	YES	YES	YES	YES
Exchangeable sodium	%	<15	1.1				
Available Calcium	mg/l		400				
Available Sodium	mg/l		28				
Phytotoxic Contaminants (by soil pH)		< 6.0	6.0-7.0	> 7.0			
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	15	YES	
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	5.5	YES	
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	< 5.0	YES	
Visible Contaminants	% mm						
>2mm		<0.5	0.000	YES			
..... of which plastics		<0.25	0.000	YES			
..... man-made sharps		zero in 1kg	0.000	YES			

Texture Classification Chart**Key**

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

- Soil A with 30% sand, 20% silt and 50% clay is in the "clay" textural class.
- Soil B with 55% sand, 30% silt and 15% clay is in the "sandy loam" textural class.
- Soil C with 45% sand, 50% silt and 5% clay is in the "sandy silt loam" textural class.

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Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2400	Cations	Cations	ICP-MS
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



2183

Final Report

Report No.: 23-07604-1
Initial Date of Issue: 10-Mar-2023
Client Soiltechnics Limited
Client Address: Cedar Barn
White Lodge
Walgrave
Northampton
Northamptonshire
NN6 9PY
Contact(s): Admin
Project STV5961 Milnrow Medical Centre,
Rochdale

Quotation No.:		Date Received:	07-Mar-2023
Order No.:	POR014826	Date Instructed:	07-Mar-2023
No. of Samples:	8		
Turnaround (Wkdays):	5	Results Due:	13-Mar-2023
Date Approved:	10-Mar-2023		

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: STV5961 Milnrow Medical Centre, Rochdale

Client: Soiltechnics Limited	Chemtest Job No.:				23-07604	23-07604	23-07604	23-07604	23-07604	23-07604	23-07604	23-07604
Quotation No.:	Chemtest Sample ID.:				1602262	1602263	1602264	1602265	1602266	1602267	1602268	1602269
Order No.: POR014826	Client Sample Ref.:				4	6	7	8	10	11	12	14
	Client Sample ID.:				ST01-1010.04	ST01-1020.06	ST01-1030.07	ST01-1040.08	ST01-1050.010	ST01-1060.011	ST01-1070.012	ST01-1080.014
	Sample Location:				ST01 - 101	ST01 - 102	ST01 - 103	ST01 - 104	ST01 - 105	ST01 - 106	ST01 - 107	ST01 - 108
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Date Sampled:				02-Mar-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023	02-Mar-2023
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD								
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	22	25	27	24	29	24	26	20
Naphthalene	U	2700	mg/kg	0.10	0.40	< 0.10	0.31	0.35	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.13	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	0.70	< 0.10	0.26	0.41	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	0.50	< 0.10	0.33	0.30	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	4.4	1.2	2.4	3.0	1.0	0.72	1.2	0.81
Anthracene	U	2700	mg/kg	0.10	0.95	0.34	0.41	0.57	0.20	0.12	0.37	0.13
Fluoranthene	U	2700	mg/kg	0.10	4.6	1.8	3.0	3.8	1.4	1.1	1.9	1.3
Pyrene	U	2700	mg/kg	0.10	4.5	1.7	3.0	3.9	1.6	1.4	2.0	1.4
Benzo[a]anthracene	U	2700	mg/kg	0.10	1.7	0.62	1.3	2.4	0.72	< 0.10	0.99	0.70
Chrysene	U	2700	mg/kg	0.10	3.8	1.6	2.8	4.2	2.2	< 0.10	2.5	1.9
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	2.1	< 0.10	1.6	2.6	1.2	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	2.1	< 0.10	1.3	1.5	1.6	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	1.7	< 0.10	1.2	1.7	0.93	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	1.2	< 0.10	0.89	1.2	0.60	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	0.72	< 0.10	< 0.10	0.90	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	2.3	< 0.10	1.6	2.4	1.1	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	32	7.3	21	29	13	3.3	9.0	6.2

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

APPENDIX B

QRA Screening

Assessments	Status	Date	Created by
Acute human health risk - Soils	Not undertaken		
Chronic human health risk - Soils	Completed	20/03/2023	MOH
Chronic human health risk - Groundwater vapour	Not undertaken		
Controlled waters risk - Surface water	Not undertaken		
Controlled waters risk - Drinking water	Not undertaken		
Controlled waters - Free phase indicator	Not undertaken		
Phytotoxicity	Not undertaken		
Ecotoxicity	Not undertaken		

Key

Assessment	Abbr.	QRA Source (in order of preference)	Last Update
All	NGA	No guideline value available	-
Chronic human health risk - Soils	C4SL	Category 4 Screening Levels (DEFRA)	May 2021
	S4UL	Suitable 4 Use Levels (LQM)	August 2015
	ATK	Atrisk Soil Screening Values (Atkins)	June 2017
	CL:AIRE	Generic Assessment Criteria (CL:AIRE)	Jan 2010

Chronic human health risk (soils)

Scenario																																
End user		Current and proposed site user																														
Receptor		POS (Park)																														
SOM		2.50%																														
GAC Preference		C4SLs over S4ULs																														
Unspecified TPH GAC		Worst-case aliphatic/aromatic																														
Contaminant	Guideline source	Guideline value (mg/kg)	Max value (mg/kg)	Location																												
				Depth (m)																												
				Date																												
ST01-01	ST01-02	ST01-03	ST01-101	ST01-102	ST01-103	ST01-104	ST01-105	ST01-106	ST01-107	ST01-108																						
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00																						
15/02/23	15/02/23	15/02/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23	02/03/23																						
Inorganics - Metals																																
Arsenic	C4SL	170	20	< 0.5	20	3.9																										
Beryllium	S4UL	63	1.2	< 0.5	1.2	< 0.5																										
Boron	S4UL	46000	1.9	0.79	< 0.40	1.9																										
Cadmium	C4SL	880	0.35	< 0.10	0.35	0.12																										
Chromium (III)	S4UL	33000	21	< 0.5	21	6.8																										
Chromium (VI)	C4SL	250	<LoD	< 0.50	< 0.50	< 0.50																										
Copper	S4UL	44000	77	0.98	77	15																										
Cyanide - Free	-	-	<LoD	< 0.50	< 0.50	< 0.50																										
Lead	C4SL	1300	90	2.8	90	41																										
Mercury	S4UL	240	0.12	< 0.05	0.12	0.09																										
Nickel	S4UL	800	36	< 0.50	36	7.6																										
Selenium	S4UL	1800	1.1	< 0.25	1.1	0.33																										
Vanadium	S4UL	5000	22	< 0.5	22	9.4																										
Zinc	S4UL	170000	120	2.6	120	40																										
Inorganics - Asbestos																																
Asbestos Type		N/A																														
Asbestos Screen		N/A																														
Asbestos Quantification (%)		N/A	0.004																													
Inorganics - Soil Parameters																																
Organic matter		N/A																														
Organics - PAH & Phenol																																
Acenaphthene	S4UL	30000	0.87	< 0.10	0.87	< 0.10	0.7	< 0.10	0.26	0.41	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10																	
Acenaphthylene	S4UL	30000	0.46	< 0.10	0.46	< 0.10	< 0.10	< 0.10	0.13	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10																	
Anthracene	S4UL	150000	2.8	0.3	2.8	< 0.10	0.95	0.34	0.41	0.57	0.2	0.12	0.37	0.13	0.13																	
Benzo(a)anthracene	S4UL	56	11	1.1	11	< 0.10	1.7	0.62	1.3	2.4	0.72	< 0.10	0.99	0.7	0.7																	
Benzo(a)pyrene	C4SL	21	11	0.93	11	< 0.10	1.7	< 0.10	1.2	1.7	0.93	< 0.10	< 0.10	< 0.10	< 0.10																	
Benzo(b)fluoranthene	S4UL	15	16	1.2	16	< 0.10	2.1	< 0.10	1.6	2.6	1.2	< 0.10	< 0.10	< 0.10	< 0.10																	
Benzo(ghi)perylene	S4UL	1500	6.2	0.57	6.2	< 0.10	2.3	< 0.10	1.6	2.4	1.1	< 0.10	< 0.10	< 0.10	< 0.10																	
Benzo(k)fluoranthene	S4UL	410	4.4	0.33	4.4	< 0.10	2.1	< 0.10	1.3	1.5	1.6	< 0.10	< 0.10	< 0.10	< 0.10																	
Chrysene	S4UL	110	11	1	11	< 0.10	3.8	1.6	2.8	4.2	2.2	< 0.10	2.5	1.9	1.9																	
Dibenz(a,h)anthracene	S4UL	1.3	1.9	0.13	1.9	< 0.10	0.72	< 0.10	< 0.10	0.9	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10																	
Fluoranthene	S4UL	6300	20	1.9	20	3.3	4.6	1.8	3	3.8	1.4	1.1	1.9	1.3	1.3																	
Fluorene	S4UL	20000	0.75	< 0.10	0.75	< 0.10	0.5	< 0.10	0.33	0.3	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10																	
Indeno(1,2,3-cd)pyrene	S4UL	170	6.9	0.63	6.9	< 0.10	1.2	< 0.10	0.89	1.2	0.6	< 0.10	< 0.10	< 0.10	< 0.10																	
Naphthalene	S4UL	1900	1.3	0.14	1.3	< 0.10	0.4	< 0.10	0.31	0.35	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10																	
Phenanthrene	S4UL	6200	7.8	0.66	7.8	< 0.10	4.4	1.2	2.4	3	1	0.72	1.2	0.81	0.81																	
Phenol	S4UL	690	<LoD	< 0.10	< 0.10	< 0.10																										
Pyrene	S4UL	15000	15	1.5	15	2.9	4.5	1.7	3	3.9	1.6	1.4	2	1.4	1.4																	
Organics - Banded TPH (unspecified)																																
EC >5-EC6 (unspecified)	S4UL	84000	<LoD	< 1.0	< 1.0	< 1.0																										
EC >6-EC7 (unspecified)	S4UL	84000	<LoD	< 1.0	< 1.0	< 1.0																										
EC >7-EC8 (unspecified)	S4UL	95000	<LoD	< 1.0	< 1.0	< 1.0																										
EC >08-EC10 (unspecified)	S4UL	8500	<LoD	< 1.0	< 1.0	< 1.0																										
EC >10-EC12 (unspecified)	S4UL	9700	<LoD	< 1.0	< 1.0	< 1.0																										
EC >12-EC16 (unspecified)	S4UL	10000	15	9.5	15	8.2																										
EC >16-EC21 (unspecified)	S4UL	7700	20	20	17	17																										
EC >21-EC35 (unspecified)	S4UL	7800	200	66	47	200																										

Human health GAC statistics assessment

Contaminant	Benzo(b)fluoranthene
Zone under consideration	Entire site - taken as a single averaging zone
Sampling strategy	Judgemental / Targeted sampling
Composite samples	Composite samples are not included in this dataset
Model	POS (Park)
Scenario	Planning scenario
Non detects	Taken as dection limit

Data distribution	Fat-tailed	Outliers excluded	None
Justification of outliers	Sample size is considered sufficient as the distribution reflects a fat-tailed scenario well, and apparent 'outliers' are included in the dataset.		

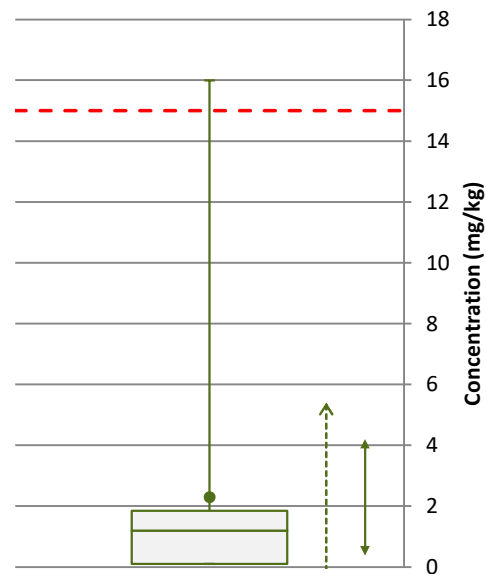
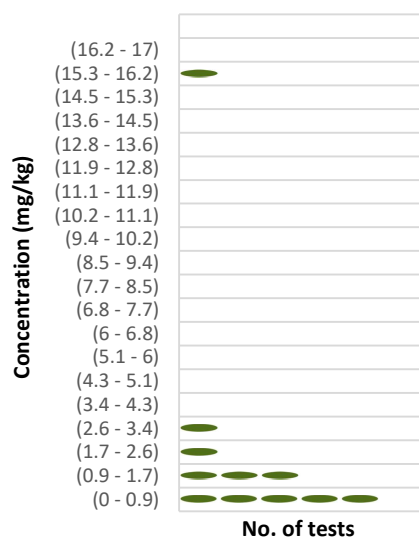
Critical concentration	15
Mean	2.3
No. samples	11
Standard Deviation	4.6
Interquartile Range	1.8

Maximum	16
Upper Quartile	1.85
Median	1.2
Lower Quartile	0.1
Minimum	0.1

95 % Confidence Intervals	
Upper confidence limit	5.4
Lower confidence limit	-0.8

80% Confidence Intervals	
Upper confidence limit	4.2
Lower confidence limit	0.4

Findings	We can be confident that the mean concentration of the contaminant falls below the critical concentration
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All units are in mg/kg

Following the methodology and guidance within the CL:AIRE (2020) Professional Guidance document "Comparing Soil Contamination Data with a Critical Concentration"

Human health GAC statistics assessment

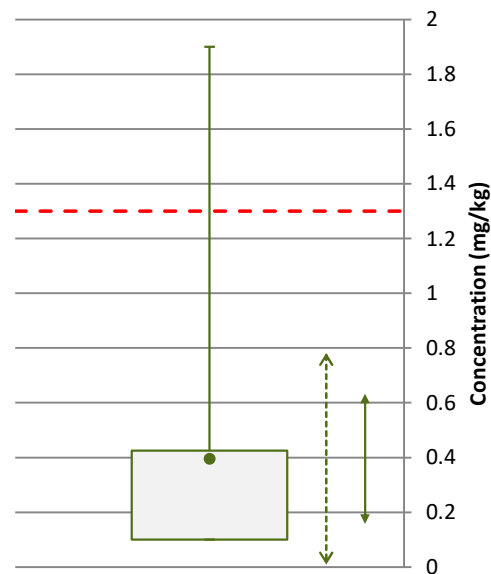
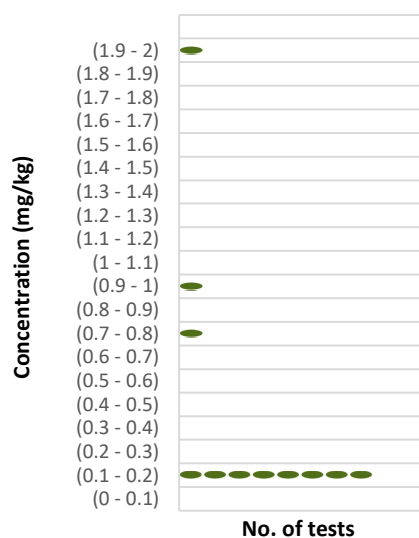
Contaminant	Dibenz(a,h)anthracene
Zone under consideration	Entire site - taken as a single averaging zone
Sampling strategy	Judgemental / Targeted sampling
Composite samples	Composite samples are not included in this dataset
Model	POS (Park)
Scenario	Planning scenario
Non detects	Taken as dection limit

Data distribution	Log-symmetric	Outliers excluded	None
Justification of outliers	Sample size is considered sufficient as the distribution reflects a fat-tailed scenario well, and apparent 'outliers' are included in the dataset.		

Critical concentration	1.3	Maximum	1.9
Mean	0.4	Upper Quartile	0.425
No. samples	11	Median	0.1
Standard Deviation	0.6	Lower Quartile	0.1
Interquartile Range	0.3	Minimum	0.1

95 % Confidence Intervals		80% Confidence Intervals	
Upper confidence limit	0.8	Upper confidence limit	0.6
Lower confidence limit	0.0	Lower confidence limit	0.2

Findings	We can be confident that the mean concentration of the contaminant falls below the critical concentration
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All units are in mg/kg

Following the methodology and guidance within the CL:AIRE (2020) Professional Guidance document "Comparing Soil Contamination Data with a Critical Concentration"