

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 0.70m		Exploratory Hole
						S1-TP115
Project	Global Centre of Rail Excellence	Easting	284344.59	Equipment	Komatsu PC 210 LC	Sheet 1 of 3
Client	Walters UK Limited	Northing	210556.68	Method	TP	
Project No	G22069	Level	230.63 mAOD	Termination Reason	Terminated due to water ingress	

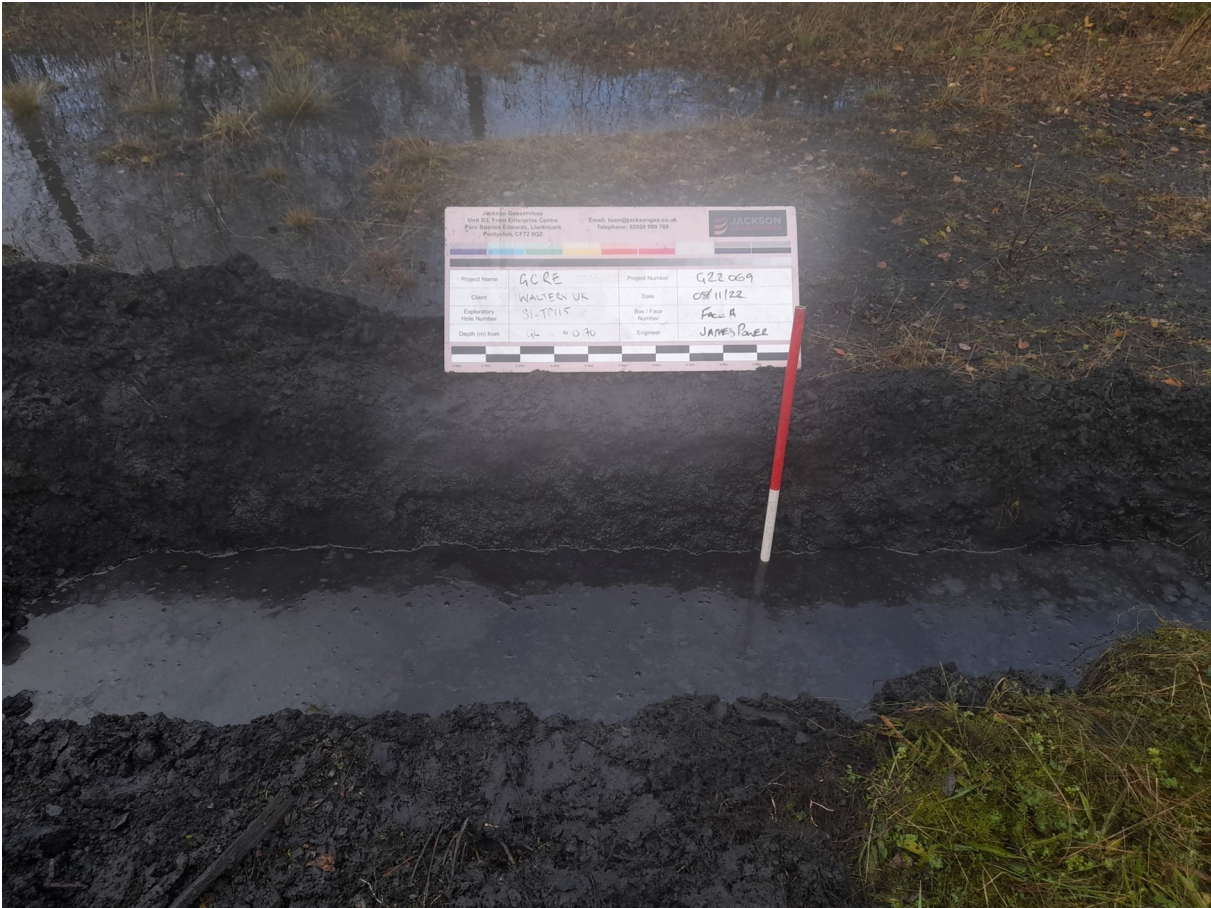


S1-TP115 Face D



S1-TP115 Spoil

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 0.70m		Exploratory Hole
						S1-TP115
Project	Global Centre of Rail Excellence	Easting	284344.59	Equipment	Komatsu PC 210 LC	Sheet 2 of 3
Client	Walters UK Limited	Northing	210556.68	Method	TP	
Project No	G22069	Level	230.63 mAOD	Termination Reason	Terminated due to water ingress	



S1-TP115 Face A



S1-TP115 Face C

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 0.70m		Exploratory Hole
						S1-TP115
Project	Global Centre of Rail Excellence	Easting	284344.59	Equipment	Komatsu PC 210 LC	Sheet 3 of 3
Client	Walters UK Limited	Northing	210556.68	Method	TP	
Project No	G22069	Level	230.63 mAOD	Termination Reason	Terminated due to water ingress	



S1-TP115 Face B



EXPLORATORY HOLE PHOTOGRAPHS

Remarks Machine excavated trial pit from GL to 2.00m.	Exploratory Hole
	Trial Emb Cut

Project	Global Centre of Rail Excellence	Easting	282924.46	Equipment	13 Tonne Tracked Excavator
Client	Walters UK Limited	Northing	211397.43	Method	TP
Project No	G22069	Level	304.87 mAOD	Termination Reason	Scheduled depth.

Sheet 1 of 3



Trial Embankment Cut - Face A



Trial Embankment Cut - Face B

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 2.00m.		Exploratory Hole
						Trial Emb Cut
Project	Global Centre of Rail Excellence	Easting	282924.46	Equipment	13 Tonne Tracked Excavator	Sheet 2 of 3
Client	Walters UK Limited	Northing	211397.43	Method	TP	
Project No	G22069	Level	304.87 mAOD	Termination Reason	Scheduled depth.	



Trial Embankment Cut - Face C



Trial Embankment Cut - Face D

		EXPLORATORY HOLE PHOTOGRAPHS		Remarks Machine excavated trial pit from GL to 2.00m.		Exploratory Hole
						Trial Emb Cut
Project	Global Centre of Rail Excellence	Easting	282924.46	Equipment	13 Tonne Tracked Excavator	Sheet 3 of 3
Client	Walters UK Limited	Northing	211397.43	Method	TP	
Project No	G22069	Level	304.87 mAOD	Termination Reason	Scheduled depth.	



Trial Embankment Cut - Spoil



Figure 10 is a line graph showing the relationship between Time (min) on the x-axis and Depth (m) on the y-axis. The x-axis ranges from 0 to 140 minutes, and the y-axis ranges from 0.00 to 2.00 meters. The graph displays 'Soakaway Data' as a series of black dots connected by a line, showing a rapid decrease in depth over time. Two horizontal red lines represent the '25% effective depth' at approximately 1.15m and the '75% effective depth' at approximately 1.70m. Vertical dashed lines indicate the time taken for the data to reach these depths: approximately 5 minutes for 25% and 15 minutes for 75%.

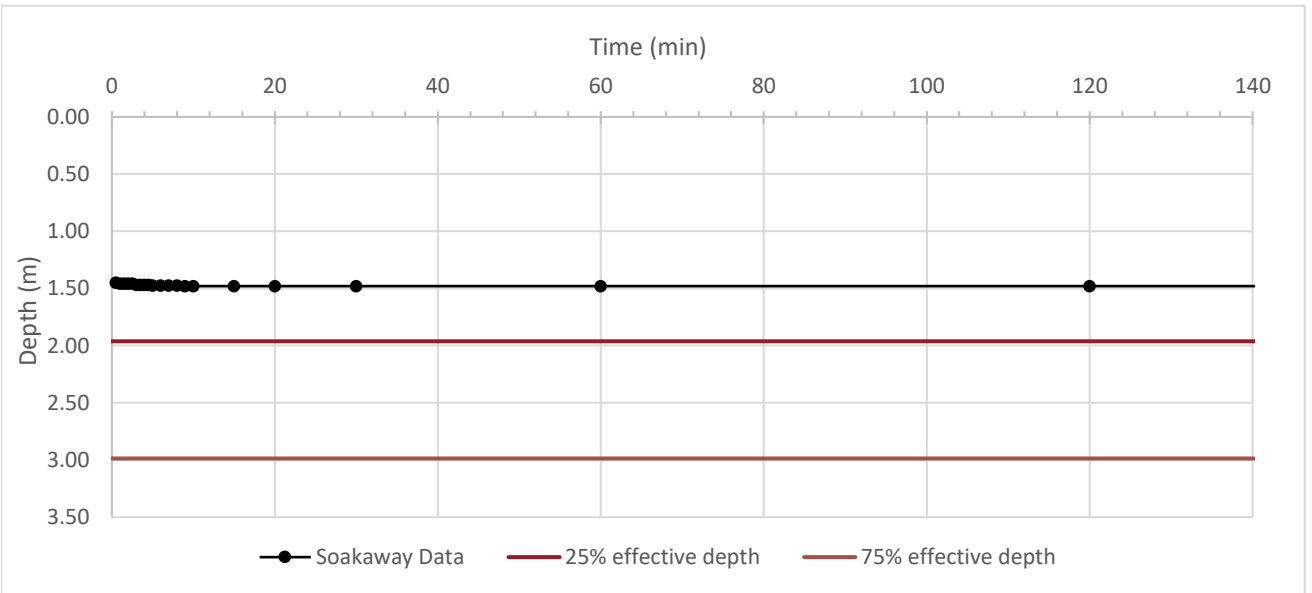
Time (min)	Depth (m)
0	1.05
1	1.02
2	1.00
3	1.05
4	1.10
5	1.15
6	1.20
7	1.25
8	1.30
9	1.35
10	1.40
11	1.45
12	1.50
13	1.55
14	1.60
15	1.65
16	1.70
17	1.75
18	1.80
19	1.85
20	1.90



The graph plots Depth (m) on the y-axis (0.00 to 2.00) against Time (min) on the x-axis (0 to 140). The 'Soakaway Data' is represented by black dots and a line, showing a decreasing trend. Two horizontal red lines indicate the '25% effective depth' at approximately 1.05m and the '75% effective depth' at approximately 1.65m. Two vertical dashed brown lines are drawn at approximately 5 minutes and 15 minutes.

Time (min)	Depth (m)
0	0.90
2	0.95
4	1.00
6	1.05
8	1.10
10	1.15
12	1.20
14	1.25
16	1.30
18	1.35
20	1.40
22	1.45
24	1.50
26	1.55
28	1.60
30	1.65
32	1.70
34	1.75
36	1.80
38	1.85
40	1.90

		SOIL SOAKAWAY INFILTRATION TEST									
Project		Global Centre of Rail Excellence		Project No		G22069		Client		Walters UK Limited	
Exploratory Hole ID		Test No		Easting		Northing		Ground Level		Depth (m)	
S1-TP111		1		284443.58		210631.42				3.50	
Length (m)		Width (m)									
4.20		0.70									
Test Data				Soakaway Construction		Vertical sides trimmed square. No fill material.					
Time Elapsed (mins)		Water Depth (m bgl)		Date of Test		15/11/2022		Weather		Dry overcast	
0.50		1.45		Fill Porosity				Test Duration (mins)		168	
1.00		1.46		Operative		JJ		Checked by			
1.50		1.46									
2.00		1.46									
2.50		1.46									
3.00		1.47									
3.50		1.47									
4.00		1.47									
4.50		1.47									
5.00		1.475									
6.00		1.475									
7.00		1.475									
8.00		1.475									
9.00		1.48									
10.00		1.48									
15.00		1.48									
20.00		1.48									
30.00		1.48									
60.00		1.48									
120.00		1.48									
168.00		1.48									
Water Depth Test Start (m)				1.45		Base base area (m ²)		2.94			
Water Depth Test End (m)				1.48		Pit sides area (m ²)		14.7			
75% effective depth (m)				1.96		Vp75-25 (m ³)		3.0135			
50% effective depth (m)				2.48		ap50 (m ²)		3.087			
25% effective depth (m)				2.99							
Time water level reaches 75% effective depth (Tp75) (mins)											
Time water level reaches 25% effective depth (Tp25) (mins)											
Soil Infiltration Rate (f) (m/s)								Unable to determine			
Remarks Undertaken in accordance with BRE digest 365 (2016) Soakaway terminated due to lack of infiltration.											

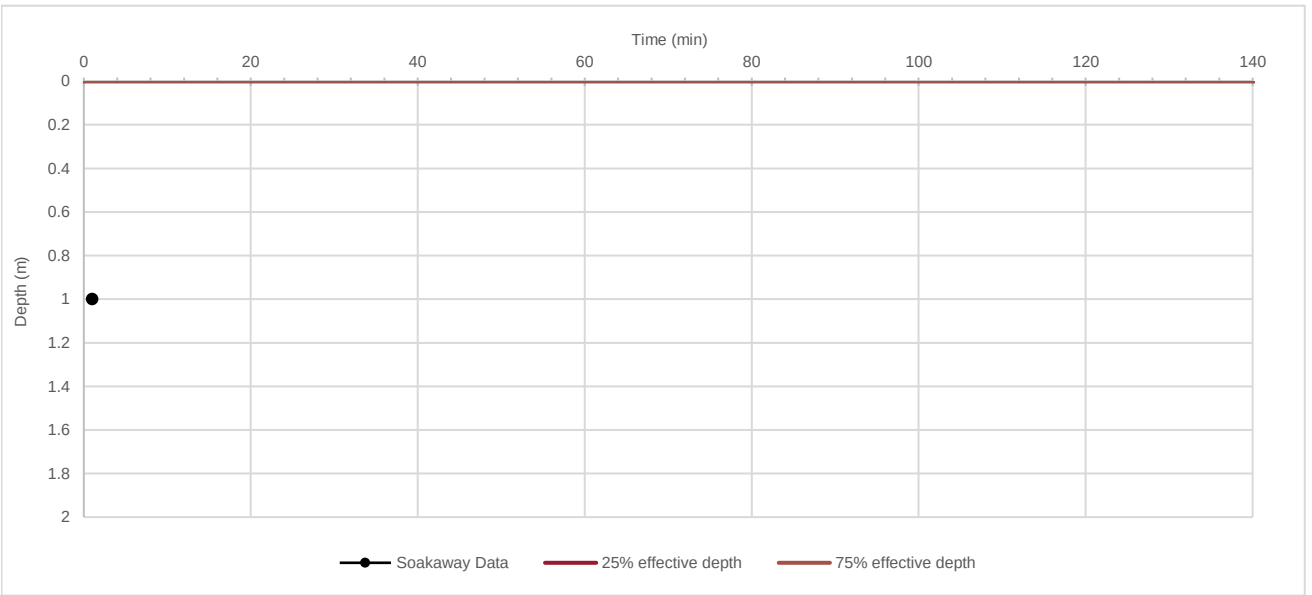




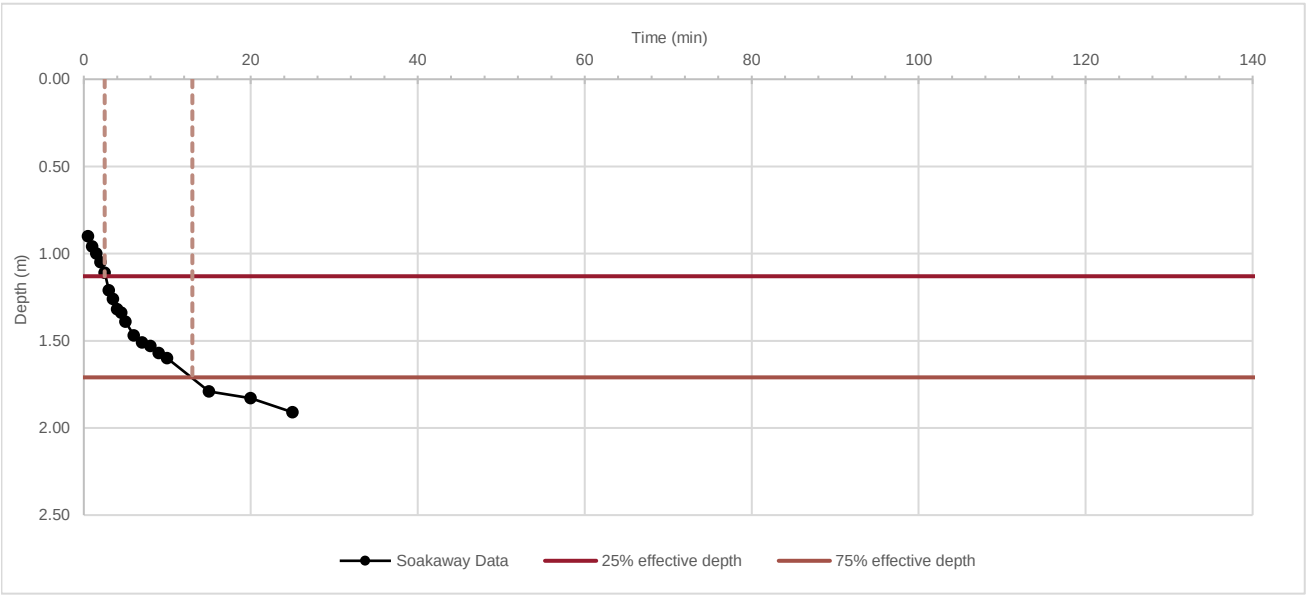
The graph displays the relationship between Time (min) and Depth (m). The x-axis represents Time (min) from 0 to 140, and the y-axis represents Depth (m) from 0 to 2.5. A single data point for 'Soakaway Data' is plotted at (0, 1.0). Two horizontal lines represent '25% effective depth' at approximately 0.15m and '75% effective depth' at approximately 0.05m.



		SOIL SOAKAWAY INFILTRATION TEST						
Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole ID	Test No	Easting	Northing		Ground Level	Depth (m)	Length (m)	Width (m)
Trial Emb Cut	3					2.00	3.00	1.00
Test Data		Soakaway Construction		Vertical sides trimmed square. No fill material.				
Time Elapsed (mins)	Water Depth (m bgl)	Date of Test		25/11/2022	Weather		Sunny	
		Fill Porosity			Test Duration (mins)		1	
		Operative		SC	Checked by			
		Water Depth Test Start (m)		1.41	Base base area (m ²)		3	
		Water Depth Test End (m)		2	Pit sides area (m ²)		6	
		75% effective depth (m)		1.56	Vp75-25 (m ³)		0.885	
		50% effective depth (m)		1.71	ap50 (m ²)		5.36	
		25% effective depth (m)		1.85				
		Time water level reaches 75% effective depth (Tp75) (mins)						
		Time water level reaches 25% effective depth (Tp25) (mins)						
		Soil Infiltration Rate (f) (m/s)			Unable to determine			
Remarks		Undertaken in accordance with BRE digest 365 (2016) Water bowser emptied, 9000L in to pit with fast infiltration. Infiltration too quick to accurately measure rate.						



		SOIL SOAKAWAY INFILTRATION TEST						
Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole ID	Test No	Easting	Northing		Ground Level	Depth (m)	Length (m)	Width (m)
Emb 2 Soakaway	1					2.00	3.20	1.20
Test Data		Soakaway Construction		Vertical sides trimmed square. No fill material.				
Time Elapsed (mins)	Water Depth (m bgl)	Date of Test		25/11/2022	Weather		Dry	
0.50	0.90	Fill Porosity			Test Duration (mins)		25	
1.00	0.96	Operative		SC	Checked by			
1.50	1.00	Water Depth Test Start (m)		0.84	Base base area (m ²)		3.84	
2.00	1.05	Water Depth Test End (m)		1.91	Pit sides area (m ²)		6.4	
2.50	1.11	75% effective depth (m)		1.13	Vp75-25 (m ³)		2.2272	
3.00	1.21	50% effective depth (m)		1.42	ap50 (m ²)		8.548	
3.50	1.26	25% effective depth (m)		1.71				
4.00	1.32	Time water level reaches 75% effective depth (Tp75) (mins)		2.5				
4.50	1.34	Time water level reaches 25% effective depth (Tp25) (mins)		13				
5.00	1.39	Soil Infiltration Rate (f) (m/s)		4.14E-04				
6.00	1.47	Remarks Undertaken in accordance with BRE digest 365 (2016) Water bowser emptied completely (9000L)						
7.00	1.51							
8.00	1.53							
9.00	1.57							
10.00	1.60							
15.00	1.79							
20.00	1.83							
25.00	1.91							



Appendix III

Monitoring

Gas Monitor Calibration Certificate

Certificate Number:

G504748_1/31650

Gas and Groundwater Monitoring

Well Development Records

S1-BH101 to S10BH103,

S1-BH105, S1-BH108,

S1-BH112 Instrument 1 and 2,

S1-BH113, S1-BH121,

S1-BH122 and SOP003.16

Purging and Sampling Records

Not completed to date

CERTIFICATION OF CALIBRATION



Date Of Calibration: 21-Nov-2022

Certificate Number: G504748_1/31650

Issued by: QED Environmental Systems Ltd.

Customer: Jackson Drilling Ltd

Jackson Drilling Northwood Farm Coxbridge Road Baltonsborough
GLASTONBURY Somerset BA6 8RA UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G504748

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	5.1	0.072
15.0	15.2	0.13
60.0	59.9	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.074
15.0	14.8	0.13
40.0	40.3	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.2	21.3	0.25

The inwards assessment was carried out 15-Nov-2022.

The maximum adjustment is larger than the specification limit.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 30.7 °C ± 2.5 °C

O₂ readings recorded at : 22.0 °C ± 2.5 °C

Barometric Pressure : 0984 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.

The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:114 IGC Instance:114

Page 1 of 2 | LP015GIUKAS-2.5

www.qedenv.com +44 (0) 333 800 0088 sales@qedenv.co.uk

QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 21-Nov-2022

Certificate Number: G504748_1/31650

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
984	985

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	505	505
H ₂ S	260	260

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5.0	5.0
10.0	10.0

Date of Issue : 23-Nov-2022

Approved by Signatory

Laura McBride

Laboratory Inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance: 114 IGC Instance: 114

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH101	1	20/12/2022 15:54	Water Level	10.56	m	0.01	Dip Meter	Base dipped at 13.49m
S1-BH101	1	21/12/2022 13:59	Water Level	10.54	m	0.01	Dip Meter	Base dipped at 13.48m
S1-BH101	1	22/12/2022 12:31	Water Level	10.52	m	0.01	Dip Meter	Base dipped at 13.48m
S1-BH101	1	09/01/2023 13:49	Steady Oxygen	19.1	%	1	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Barometric Pressure	979	mbar	5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Oxygen	19.1	%	1	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Carbon Monoxide	23	ppm	2	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Gas Flow Rate	-7.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Differential Pressure	-0.09	mbar	4	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:49	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH101	1	09/01/2023 13:51	Water Level	10.44	m	0.01	Dip Meter	Base dipped at 13.74m. No LNAPL detected.
S1-BH102	1	21/11/2022 12:31	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	22/11/2022 11:05	Water Level	0.68	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	23/11/2022 13:50	Water Level	0.48	m	0.01	Dip Meter	Base dipped at 8.93m
S1-BH102	1	24/11/2022 09:01	Water Level	0.53	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	25/11/2022 10:41	Water Level	0.61	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	28/11/2022 11:48	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.94m
S1-BH102	1	29/11/2022 13:42	LNAPL	0.74	m	0.01	Interface Probe	Base dipped at 8.86m. No LNAPL detected.
S1-BH102	1	30/11/2022 15:51	LNAPL	0.7	m	0.01	Interface Probe	Base dipped at 8.86m.
S1-BH102	1	01/12/2022 11:53	LNAPL	0.72	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	02/12/2022 15:04	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.85m.
S1-BH102	1	05/12/2022 12:05	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.85m.
S1-BH102	1	06/12/2022 08:48	LNAPL	0.66	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	07/12/2022 12:29	LNAPL	0.65	m	0.01	Interface Probe	Base dipped at 8.85m.
S1-BH102	1	08/12/2022 09:16	LNAPL	0.62	m	0.01	Interface Probe	Depth to base 2.98m
S1-BH102	1	09/12/2022 09:34	LNAPL	0.68	m	0.01	Interface Probe	Depth to base 2.98m
S1-BH102	1	12/12/2022 12:39	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 8.82m
S1-BH102	1	13/12/2022 12:30	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	14/12/2022 14:32	Water Level	0.69	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	15/12/2022 11:03	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	16/12/2022 11:03	Water Level	0.64	m	0.01	Dip Meter	Base dipped at 8.84m
S1-BH102	1	20/12/2022 14:59	Water Level	0.66	m	0.01	Dip Meter	Base dipped at 8.77m
S1-BH102	1	22/12/2022 10:06	Water Level	0.63	m	0.01	Dip Meter	Base dipped at 8.85m
S1-BH102	1	09/01/2023 11:01	Steady Methane	8.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Steady Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence		Project No	G22069	Client	Walters UK Limited		
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH102	1	09/01/2023 11:01	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Oxygen	14.4	%	1	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Methane	8.2	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Steady Oxygen	14.4	%	1	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Peak Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:01	Gas Flow Rate	-8.8	l/hr	0.3	GA5000 SN:G504748	
S1-BH102	1	09/01/2023 11:03	Water Level	0.5	m	0.01	Dip Meter	Base dipped at 8.77m. No LNAPL detected.
S1-BH103	1	02/12/2022 14:11	LNAPL	3.32	m	0.01	Interface Probe	Base dipped at 5.22m.
S1-BH103	1	05/12/2022 12:13	LNAPL	3.35	m	0.01	Interface Probe	Base dipped at 5.20m.
S1-BH103	1	06/12/2022 08:58	LNAPL	3.42	m	0.01	Interface Probe	Base dipped at 5.20m.
S1-BH103	1	07/12/2022 12:32	LNAPL	3.42	m	0.01	Interface Probe	Base dipped at 5.20m.
S1-BH103	1	08/12/2022 10:05	LNAPL	3.42	m	0.01	Interface Probe	Depth to base 5.67m
S1-BH103	1	09/12/2022 11:22	LNAPL	3.42	m	0.01	Interface Probe	Depth to base 5.67m
S1-BH103	1	12/12/2022 12:10	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 12.10m
S1-BH103	1	13/12/2022 12:40	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 5.67m
S1-BH103	1	14/12/2022 13:56	Water Level	3.42	m	0.01	Dip Meter	Base dipped at 5.67m
S1-BH103	1	16/12/2022 12:38	Water Level	3.4	m	0.01	Dip Meter	Base dipped at 5.67m
S1-BH103	1	20/12/2022 15:13	Water Level	3.14	m	0.01	Dip Meter	Base dipped at 5.51m
S1-BH103	1	22/12/2022 10:13	Water Level	3.12	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH103	1	09/01/2023 11:34	Water Level	2.85	m	0.01	Dip Meter	Base dipped at 5.75m. No LNAPL detected.
S1-BH103	1	09/01/2023 11:35	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Peak Carbon Dioxide	4.7	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Peak Oxygen	15.9	%	1	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Steady Oxygen	15.9	%	1	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Steady Carbon Dioxide	4.7	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Peak Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH103	1	09/01/2023 11:35	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH105	1	06/12/2022 08:59	LNAPL	6.47	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH105	1	07/12/2022 12:34	LNAPL	6.46	m	0.01	Interface Probe	Base dipped at 15.48m.
S1-BH105	1	08/12/2022 10:25	LNAPL	6.45	m	0.01	Interface Probe	Depth to base 15.63m
S1-BH105	1	09/12/2022 11:29	LNAPL	6.43	m	0.01	Interface Probe	Depth to base 15.63m
S1-BH105	1	12/12/2022 12:00	Water Level	6.45	m	0.01	Dip Meter	Base dipped at 15.64m



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH105	1	13/12/2022 13:15	Water Level	8.84	m	0.01	Dip Meter	Base dipped at 15.61m
S1-BH105	1	14/12/2022 13:46	Water Level	8.83	m	0.01	Dip Meter	Base dipped at 15.60m
S1-BH105	1	15/12/2022 10:14	Water Level	6.51	m	0.01	Dip Meter	Base dipped at 15.61m
S1-BH105	1	16/12/2022 11:53	Water Level	6.5	m	0.01	Dip Meter	Base dipped at 15.62m
S1-BH105	1	20/12/2022 15:19	Water Level	6.4	m	0.01	Dip Meter	Base dipped at 15.39m
S1-BH105	1	22/12/2022 10:21	Water Level	6.38	m	0.01	Dip Meter	Base dipped at 15.61m
S1-BH105	1	09/01/2023 12:11	Barometric Pressure	977	mbar	5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Carbon Dioxide	3.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Oxygen	5	%	1	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Steady Carbon Dioxide	3.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Gas Flow Rate	-8.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Peak Methane	25.9	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Steady Methane	25.8	%	0.5	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:11	Steady Oxygen	5	%	1	GA5000 SN:G504748	
S1-BH105	1	09/01/2023 12:14	Water Level	6.3	m	0.01	Dip Meter	Base dipped at 15.50m. No LNAPL detected.
S1-BH108	1	25/11/2022 10:28	Water Level	1.78	m	0.01	Dip Meter	Base dipped at 15.50m
S1-BH108	1	28/11/2022 10:20	Water Level	1.4	m	0.01	Dip Meter	Base dipped at 15.50m
S1-BH108	1	29/11/2022 13:41	LNAPL	1.35	m	0.01	Interface Probe	Base dipped at 15.43m. No LNAPL detected.
S1-BH108	1	30/11/2022 15:47	LNAPL	1.49	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH108	1	01/12/2022 11:51	LNAPL	1.5	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH108	1	02/12/2022 14:59	LNAPL	1.69	m	0.01	Interface Probe	Base dipped at 15.50m.
S1-BH108	1	05/12/2022 12:00	Water Level	1.84	m	0.01	Dip Meter	Base dipped at 15.48m.
S1-BH108	1	06/12/2022 08:44	LNAPL	0	m	0.01	Interface Probe	Heavy damage from machine strike, unable to dip due to bent post.
S1-BH108	1	07/12/2022 08:46	Water Level	1.79	m	0.01	Dip Meter	Base dipped at 15.47m.
S1-BH108	1	08/12/2022 09:30	LNAPL	1.8	m	0.01	Interface Probe	Depth to base 15.77m
S1-BH108	1	09/12/2022 09:17	LNAPL	1.97	m	0.01	Interface Probe	Depth to base 15.77m
S1-BH108	1	12/12/2022 12:19	Water Level	2.23	m	0.01	Dip Meter	Base dipped at 12.19m
S1-BH108	1	13/12/2022 10:05	Water Level	2.43	m	0.01	Dip Meter	Base dipped at 15.75m
S1-BH108	1	14/12/2022 14:10	Water Level	2.44	m	0.01	Dip Meter	Base dipped at 15.75m
S1-BH108	1	15/12/2022 09:14	Water Level	2.47	m	0.01	Dip Meter	Base dipped at 2.47m
S1-BH108	1	16/12/2022 12:42	Water Level	2.49	m	0.01	Dip Meter	Base dipped at 15.71m
S1-BH108	1	20/12/2022 14:48	Water Level	2.23	m	0.01	Dip Meter	Base dipped at 15.45m
S1-BH108	1	22/12/2022 09:57	Water Level	2.25	m	0.01	Dip Meter	Base dipped at 15.51m
S1-BH108	1	09/01/2023 10:16	Peak Carbon Dioxide	0.9	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Gas Flow Rate	-3.4	l/hr	0.3	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Barometric Pressure	976	mbar	5	GA5000 SN:G504748	



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S1-BH108	1	09/01/2023 10:16	Steady Carbon Dioxide	0.6	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Steady Oxygen	20.7	%	1	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Peak Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Steady Methane	0	%	0.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Peak Oxygen	20.6	%	1	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:16	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH108	1	09/01/2023 10:21	Water Level	1.19	m	0.01	Dip Meter	Base dipped at 15.60m. No LNAPL detected.
S1-BH112	1	20/12/2022 15:32	Water Level	2.09	m	0.01	Dip Meter	Base dipped at 3.34m
S1-BH112	2	20/12/2022 15:47	Water Level	9.74	m	0.01	Dip Meter	Base dipped at 15.23m
S1-BH112	1	21/12/2022 12:22	Water Level	2.25	m	0.01	Dip Meter	Base dipped at 3.31m
S1-BH112	2	21/12/2022 12:24	Water Level	9.62	m	0.01	Dip Meter	Base dipped at 15.00m
S1-BH112	1	22/12/2022 10:33	Water Level	2.08	m	0.01	Dip Meter	Base dipped at 3.3m
S1-BH112	2	23/12/2022 10:35	Water Level	9.62	m	0.01	Dip Meter	Base dipped at 14.99m
S1-BH112	1	09/01/2023 12:46	Steady Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Differential Pressure	0.1	mbar	4	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Peak Oxygen	9	%	1	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Methane	0.1	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Peak Carbon Dioxide	1.4	%	0.5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Steady Oxygen	9	%	1	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:46	Gas Flow Rate	0.2	l/hr	0.3	GA5000 SN:G504748	
S1-BH112	1	09/01/2023 12:53	Water Level	2.41	m	0.01	Dip Meter	Base dipped at 3.37m. No LNAPL detected.
S1-BH112	2	09/01/2023 13:06	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Steady Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Differential Pressure	0.03	mbar	4	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Oxygen	8.5	%	1	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Gas Flow Rate	-3	l/hr	0.3	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Carbon Monoxide	1	ppm	2	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Steady Carbon Dioxide	2.3	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Peak Carbon Dioxide	2.3	%	0.5	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:06	Steady Oxygen	8.5	%	1	GA5000 SN:G504748	
S1-BH112	2	09/01/2023 13:09	Water Level	8.87	m	0.01	Dip Meter	Base dipped at 15.12m. No LNAPL detected.



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH113	1	25/11/2022 11:00	Water Level	4.17	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	28/11/2022 12:42	Water Level	4.1	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	29/11/2022 13:44	LNAPL	4.09	m	0.01	Interface Probe	Base dipped at 5.50m. No LNAPL detected.
S1-BH113	1	30/11/2022 15:52	LNAPL	4.29	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	01/12/2022 11:55	LNAPL	4.33	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	02/12/2022 12:08	Water Level	4.37	m	0.01	Dip Meter	Base dipped at 5.50m.
S1-BH113	1	05/12/2022 14:08	Water Level	4.55	m	0.01	Dip Meter	Base dipped at 5.50m.
S1-BH113	1	06/12/2022 08:51	LNAPL	4.5	m	0.01	Interface Probe	Base dipped at 5.50m.
S1-BH113	1	07/12/2022 12:35	LNAPL	4.52	m	0.01	Interface Probe	Base dipped at 5.49m.
S1-BH113	1	08/12/2022 10:40	LNAPL	4.52	m	0.01	Interface Probe	Depth to base 5.85m
S1-BH113	1	09/12/2022 11:34	LNAPL	4.55	m	0.01	Interface Probe	Depth to base 5.85m
S1-BH113	1	12/12/2022 11:51	Water Level	4.52	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	13/12/2022 13:18	Water Level	4.7	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	14/12/2022 13:31	Water Level	4.7	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	15/12/2022 10:03	Water Level	4.71	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	16/12/2022 11:48	Water Level	4.8	m	0.01	Dip Meter	Base dipped at 5.58m
S1-BH113	1	20/12/2022 15:25	Water Level	4.13	m	0.01	Dip Meter	Base dipped at 5.50m
S1-BH113	1	22/12/2022 10:26	Water Level	4.11	m	0.01	Dip Meter	Base dipped at 5.52m
S1-BH113	1	09/01/2023 12:30	Peak Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Carbon Monoxide	6	ppm	2	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Gas Flow Rate	0.3	l/hr	0.3	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Steady Carbon Dioxide	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:30	Water Level	3.69	m	0.01	Dip Meter	Base dipped at 5.53m. No LNAPL detected.
S1-BH113	1	09/01/2023 12:32	Steady Methane	4.5	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:32	Peak Methane	0.2	%	0.5	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:33	Steady Oxygen	1.8	%	1	GA5000 SN:G504748	
S1-BH113	1	09/01/2023 12:33	Peak Oxygen	4.5	%	1	GA5000 SN:G504748	
S1-BH121	1	15/11/2022 15:00	Water Level	0.52	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	16/11/2022 10:00	Water Level	0.43	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	17/11/2022 09:50	Water Level	0.53	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	21/11/2022 12:30	Water Level	0.44	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	22/11/2022 11:00	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.37m
S1-BH121	1	23/11/2022 13:49	Water Level	0.44	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	24/11/2022 08:56	Water Level	0.47	m	0.01	Dip Meter	Base dipped at 3.36m
S1-BH121	1	25/11/2022 10:36	Water Level	0.48	m	0.01	Dip Meter	Base dipped at 3.35m
S1-BH121	1	28/11/2022 11:08	Water Level	0.43	m	0.01	Dip Meter	Base dipped at 3.38m
S1-BH121	1	29/11/2022 13:41	LNAPL	0.6	m	0.01	Interface Probe	Base dipped at 3.40m. No LNAPL detected.



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH121	1	30/11/2022 15:49	LNAPL	0.62	m	0.01	Interface Probe	Base dipped at 3.39m.
S1-BH121	1	01/12/2022 11:52	LNAPL	0.64	m	0.01	Interface Probe	Base dipped at 3.40m.
S1-BH121	1	02/12/2022 14:02	Water Level	0.65	m	0.01	Dip Meter	Base dipped at 3.40m.
S1-BH121	1	05/12/2022 12:02	Water Level	0.71	m	0.01	Dip Meter	Base dipped at 3.40m.
S1-BH121	1	06/12/2022 08:47	LNAPL	0.71	m	0.01	Interface Probe	Base dipped at 3.41m.
S1-BH121	1	07/12/2022 12:27	LNAPL	0.7	m	0.01	Interface Probe	Base dipped at 3.40m.
S1-BH121	1	08/12/2022 09:45	LNAPL	0.77	m	0.01	Interface Probe	Depth to base 3.41m
S1-BH121	1	09/12/2022 09:34	LNAPL	0.7	m	0.01	Interface Probe	Depth to base 3.41m
S1-BH121	1	12/12/2022 12:48	Water Level	0.7	m	0.01	Dip Meter	Base dipped at 12.48m
S1-BH121	1	13/12/2022 12:16	Water Level	0.75	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	14/12/2022 14:19	Water Level	0.75	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	15/12/2022 10:34	Water Level	0.72	m	0.01	Dip Meter	Base dipped at 3.33m
S1-BH121	1	16/12/2022 12:06	Water Level	0.76	m	0.01	Dip Meter	Base dipped at 3.32m
S1-BH121	1	20/12/2022 14:55	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.28m
S1-BH121	1	23/12/2022 10:03	Water Level	0.46	m	0.01	Dip Meter	Base dipped at 3.40m
S1-BH121	1	09/01/2023 10:36	Water Level	0.45	m	0.01	Dip Meter	Base dipped at 3.31m. No LNAPL detected
S1-BH121	1	09/01/2023 10:37	Peak Carbon Dioxide	2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Barometric Pressure	977	mbar	5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Gas Flow Rate	-12	l/hr	0.3	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Carbon Dioxide	2	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Peak Oxygen	20.1	%	1	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Steady Oxygen	20.1	%	1	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH121	1	09/01/2023 10:37	Differential Pressure	-0.02	mbar	4	GA5000 SN:G504748	
S1-BH122	1	15/11/2022 15:05	Water Level	0.205	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	16/11/2022 10:05	Water Level	0.17	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	17/11/2022 09:53	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	21/11/2022 12:31	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.83m
S1-BH122	1	22/11/2022 11:10	Water Level	0.21	m	0.01	Dip Meter	Base dipped at 1.83m
S1-BH122	1	23/11/2022 13:51	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.82m
S1-BH122	1	24/11/2022 09:04	Water Level	0.18	m	0.01	Dip Meter	Base dipped at 1.83m.
S1-BH122	1	25/11/2022 10:45	Water Level	0.2	m	0.01	Dip Meter	Base dipped at 1.82m
S1-BH122	1	28/11/2022 07:32	Water Level	0.19	m	0.01	Dip Meter	Base dipped at 1.84m
S1-BH122	1	29/11/2022 13:43	LNAPL	0.43	m	0.01	Interface Probe	Base dipped at 1.85m. No LNAPL detected.
S1-BH122	1	30/11/2022 15:51	LNAPL	0.29	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	01/12/2022 11:54	LNAPL	0.28	m	0.01	Interface Probe	Base dipped at 1.85m.



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Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
S1-BH122	1	02/12/2022 14:06	Water Level	0.28	m	0.01	Dip Meter	Base dipped at 1.85m.
S1-BH122	1	05/12/2022 12:06	Water Level	0.26	m	0.01	Dip Meter	Base dipped at 1.85m.
S1-BH122	1	06/12/2022 08:49	LNAPL	0.24	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	07/12/2022 12:30	LNAPL	0.25	m	0.01	Interface Probe	Base dipped at 1.85m.
S1-BH122	1	08/12/2022 09:50	LNAPL	0.4	m	0.01	Interface Probe	Depth to base 2.00m
S1-BH122	1	09/12/2022 09:43	LNAPL	0.33	m	0.01	Interface Probe	Depth to base 2.00m
S1-BH122	1	12/12/2022 12:30	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 1.80m
S1-BH122	1	13/12/2022 12:42	Water Level	0.42	m	0.01	Dip Meter	Base dipped at 2.45m
S1-BH122	1	14/12/2022 14:46	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 2.46m
S1-BH122	1	15/12/2022 10:52	Water Level	0.32	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	16/12/2022 12:25	Water Level	0.36	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	20/12/2022 15:03	Water Level	0.17	m	0.01	Dip Meter	Base dipped at 1.80m
S1-BH122	1	23/12/2022 10:09	Water Level	0.21	m	0.01	Dip Meter	Base dipped at 1.79m
S1-BH122	1	09/01/2023 11:16	Steady Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Steady Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Oxygen	19.4	%	1	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Steady Oxygen	19.4	%	1	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Carbon Monoxide	0	ppm	2	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Barometric Pressure	978	mbar	5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Peak Carbon Dioxide	2.2	%	0.5	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:16	Gas Flow Rate	-2.1	l/hr	0.3	GA5000 SN:G504748	
S1-BH122	1	09/01/2023 11:19	Water Level	0.15	m	0.01	Dip Meter	Base dipped at 1.77m. No LNAPL detected.
SOP003.16	1	09/12/2022 13:33	Water Level		m	0.01	Dip Meter	Dry. Base dipped at 13.88m
SOP003.16	1	12/12/2022 11:30	Water Level	11.3	m	0.01	Dip Meter	Base dipped at 13.86m
SOP003.16	1	13/12/2022 13:53	Water Level	11.34	m	0.01	Dip Meter	Base dipped at 13.37m
SOP003.16	1	14/12/2022 13:05	Water Level	11.36	m	0.01	Dip Meter	Base dipped at 13.34m
SOP003.16	1	15/12/2022 09:54	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.86m
SOP003.16	1	16/12/2022 11:40	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.90m
SOP003.16	1	20/12/2022 13:45	Water Level	11.35	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	21/12/2022 08:35	Water Level	11.34	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	22/12/2022 10:15	Water Level	12.35	m	0.01	Dip Meter	Base dipped at 13.88m
SOP003.16	1	09/01/2023 13:21	Barometric Pressure	979	mbar	5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Oxygen	15.8	%	1	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Peak Oxygen	15.8	%	1	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Hydrogen Sulphide	0	ppm	1.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Methane	0.2	%	0.5	GA5000 SN:G504748	



GAS AND GROUNDWATER MONITORING DATA

Project	Global Centre of Rail Excellence			Project No	G22069	Client	Walters UK Limited	
Exploratory Hole	Pipe Ref.	Date and Time	Reading Type	Reading	Units	Detection Limit	Instrument	Remarks
SOP003.16	1	09/01/2023 13:21	Gas Flow Rate	-6.8	l/hr	0.3	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Peak Methane	0.3	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Carbon Monoxide	2	ppm	2	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Peak Carbon Dioxide	3.7	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Steady Carbon Dioxide	3.6	%	0.5	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:21	Differential Pressure	0.02	mbar	4	GA5000 SN:G504748	
SOP003.16	1	09/01/2023 13:24	Water Level	10.2	m	0.01	Dip Meter	Base dipped at 13.75m. No LNAPL detected.

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Overcast			Surface Conditions	Wet		
Installation Base Depth (m bgl)	9.00			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		3.00	
				Porosity of Filter Pack (ϕ)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) ($L\phi$)/(($\pi df^2/4$)-(($\pi dp^2/4$)))	15.5		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.65	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)			
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) ($\pi dp^2/4$)*10-3		16.4	
Time to Purge (mins)	21	Number of Well Volumes Purged	3.00	Total Well Volume			
Total Volume Purged (litres)	96	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		31.9	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH102		Installation No	1	Date and Time	28.11.22 11:48	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH103	1	50	5.50	08.12.2022	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	2.00	5.50	Dry and cold	
Installation Inspection					
Surface Conditions	Dry	Damage to Headworks?	No		
Check Dip of Base (m bgl)	5.2	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	2.05
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	9.4
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	3.45	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	WASP PUMP	Average Flow Rate (litres/min)	1.9	1.75	
Time to Purge (mins)	15	Number of Well Volumes Purged	3.0	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	8.0
Total Volume Purged (litres)	29.0	Operative	JJ	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	9.6
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	None	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	No		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear		



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH105	1	50	15.00	08.12.22	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	11.00	15.00	Cold/Dry	
Installation Inspection					
Surface Conditions	Dry	Damage to Headworks?	No		
Check Dip of Base (m bgl)	15.63	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	4.00
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	20.1
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	6.45	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp pump.	Average Flow Rate (litres/min)	6.9	8.55	
Time to Purge (mins)	16	Number of Well Volumes Purged	3.0	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	16.8
Total Volume Purged (litres)	110.0	Operative	JJ	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	36.9
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	None	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	No		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear		

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Rain			Surface Conditions	Wet		
Installation Base Depth (m bgl)	15.50			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		2.50	
				Porosity of Filter Pack (ø)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) $(Lø)/((\pi df^2/4)-(\pi dp^2/4))$	12.6		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	1.40	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)		14.10	
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) $(\pi dp^2/4)*10-3$		27.7	
Time to Purge (mins)	14.5	Number of Well Volumes Purged	3.00	Total Well Volume			
Total Volume Purged (litres)	121	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		40.3	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH108		Installation No	1	Date and Time	28.11.22 10:20	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH112	1	50	2.50	21/12/2022 12:26	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	1.00	2.50	Clear	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	3.31	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	0.25
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	1.2
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	2.25	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	10.0	0.25	
Time to Purge (mins)	2	Number of Well Volumes Purged	8.8	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	
Total Volume Purged (litres)	15.0	Operative	JP	0.5	
				Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe	
				1.7	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Grey		

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH112	2	50	15.00	21/12/2022 13:03	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	8.00	15.00	Clear	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	15	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	5.38
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	146
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	26.2
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	9.62	LNAPL/ DNAPL (m bgl)	0.00	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	6.1	5.38	
Time to Purge (mins)	20	Number of Well Volumes Purged	3.3	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	10.6
Total Volume Purged (litres)	120.0	Operative	JP	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)	36.8
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Greyish brown running clear.		

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Clear skies			Surface Conditions	Wet		
Installation Base Depth (m bgl)	5.50			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		2.50	
				Porosity of Filter Pack (ø)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) $(Lø)/((\pi df^2/4)-((\pi dp^2/4)))$	12.6		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.93	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)		4.57	
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) $(\pi dp^2/4)*10-3$		9.0	
Time to Purge (mins)	12	Number of Well Volumes Purged	5.75	Total Well Volume			
Total Volume Purged (litres)	124	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		21.6	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH113		Installation No	1	Date and Time	28.11.22 12:42	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Rajn			Surface Conditions	Wet		
Installation Base Depth (m bgl)	3.50			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		1.50	
				Porosity of Filter Pack (ϕ)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) ($L\phi$)/(($\pi df^2/4$)-(($\pi dp^2/4$))	6.8		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.43	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)		3.07	
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) ($\pi dp^2/4$)*10-3		6.0	
Time to Purge (mins)	15	Number of Well Volumes Purged	3.05	Total Well Volume			
Total Volume Purged (litres)	39	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		12.8	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Dark brown and black with a slight sheen, not a typical oil sheen though.				
Exploratory Hole Number	S1-BH121		Installation No	1	Date and Time	28.11.22 11:08	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						

INSTALLATION INSPECTION, PURGING AND WATER SAMPLING RECORD

Installation Inspection							
Weather Conditions	Overcast			Surface Conditions	Wet		
Installation Base Depth (m bgl)	1.90			Damage to headworks?	No		
Remedial Actions undertaken to well:							
Purging and Well Development							
Guidance Notes				Well Volume Calculation			
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack			
				Saturated length of Filter Pack (dip depth to base of installation) (L) (m)		0.90	
				Porosity of Filter Pack (ø)		0.33	
Approx. Guidance Volumes for Field Calculation of Wet Well Volume							
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	150		
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of the Filter Pack (litres) $(Lø)/((\pi df^2/4)-((\pi dp^2/4)))$	3.3		
Groundwater Prior to Well Development				Volume of the Standpipe			
Groundwater Level (m bgl)	0.19	LNAPL/ DNAPL (m bgl)	N/A	Diameter of Standpipe (mm) (dp)	50		
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)		1.71	
Purge Method/ Device	Wasp pump	Average Flow Rate (litres/min)	10.00	Volume of the Standpipe (litres) $(\pi dp^2/4)*10-3$		3.4	
Time to Purge (mins)	5	Number of Well Volumes Purged	2.71	Total Well Volume			
Total Volume Purged (litres)	18	Operative	JJ	Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe)		6.6	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations			
In-situ Parameter Device Model		Groundwater Odour	No	In-situ parameters not required during well development.			
In-situ Parameter Device SN		Visual Turbidity	Yes				
Confirm Field Calibration Completed		Groundwater Colour	Grey/Black running clear				
Exploratory Hole Number	S1-BH122		Installation No	1	Date and Time	28.11.22 12:08	
Project Number	G22069		Client	Walters UK			
Project Name	GCRE						



INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
SOP003.16	1	50	13.00	14/12/2022 13:07	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	10.00	13.00	Cold and clear	
Installation Inspection					
Surface Conditions	Frozen	Damage to Headworks?	Not concreted in		
Check Dip of Base (m bgl)	13.61	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
Well head concreted in.					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	1.66
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	115
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	3.7
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	11.34	LNAPL/ DNAPL (m bgl)	0.00	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	7.0	1.66	
Time to Purge (mins)	1	Number of Well Volumes Purged	1.0	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	3.3
Total Volume Purged (litres)	7.0	Operative	JP	Total Well Volume	
Observations During Well Development (see Vu-situ output for insitu parameter readings)				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development. Well purged dry with no recharge.	
In-situ Parameter Device SN	N/A	Visual Turbidity	No		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Clear		

INSTALLATION INSPECTION AND WELL DEVELOPMENT RECORD

Project	Global Centre of Rail Excellence	Project No	G22069	Client	Walters UK Limited
Exploratory Hole Number	Installation Reference	Installation Diameter (mm)	Anticipated Well Depth (m bgl)	Date and Time	
S1-BH101	1	50	14.00	21/12/2214:00	
Cover Type	Pipe Cover	Top of Response Zone (m bgl)	Base of Response Zone (m bgl)	Weather	
Box Cover	Pipe Plug	11.00	14.00	Clear	
Installation Inspection					
Surface Conditions	Wet	Damage to Headworks?	No		
Check Dip of Base (m bgl)	13.48	Pipe Cover/Bung Present?	Yes		
Remedial actions undertaken to well:					
N/A					
Purging and Well Development					
Guidance Notes				Well Volume Calculation	
Well development undertaken in accordance with BS10175:2011+A2:2017. Purge volumes to include the annulus of the filter pack. Purging must continue until insitu parameters have stabilised unless agreed with clients representative.				Volume of the Filter Pack	
				Saturated length of Filter Pack (L) (m)	3.00
				Porosity of Filter Pack (ϕ)	0.33
Approx. Guidance Volumes for Field Calculation of Wet Well Volume					
Volume of 50mm diameter plain pipe	2 litres / metre	Volume of 50mm diameter slotted pipe with 200mm diameter gravel filter pack	11 litres / metre	Diameter of Filter Pack (mm) (df)	140
Porosity of 10mm pea gravel	0.33	Volume of 50mm diameter slotted pipe with 150mm diameter gravel filter pack	6 litres / metre	Volume of Filter Pack (litres) $(L\phi)/((\pi df^2/4)-(\pi dp^2/4))$	13.3
Groundwater Prior to Well Development				Volume of the Standpipe	
Groundwater Level (m bgl)	10.54	LNAPL/ DNAPL (m bgl)	0.00	Diameter of Standpipe (mm) (dp)	50
Purging Details				Saturated depth (m) (sd) (installation base - groundwater level)	
Purge Method/ Device	Wasp Pump	Average Flow Rate (litres/min)	6.5	3.46	
Time to Purge (mins)	10	Number of Well Volumes Purged	3.2	Volume of the Standpipe (litres) $(\pi dp^2/4)*10^{-3}$	6.8
Total Volume Purged (litres)	65.0	Operative	JP	Total Well Volume	
				Total Well Volume (litres) Volume of Filter Pack + Volume of Standpipe	20.1
t				Additional Notes and Observations	
In-situ Parameter Device Model	N/A	Groundwater Odour	No	In-situ parameters not required during development.	
In-situ Parameter Device SN	N/A	Visual Turbidity	Yes		
Confirm Field Calibration Completed	N/A	Groundwater Colour	Dark grey/black		

Appendix IV

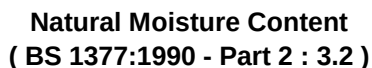
Geotechnical Testing

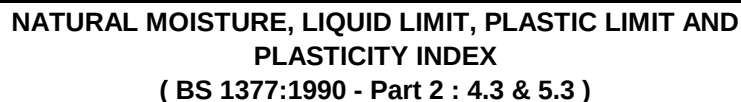
GSTL Lab Report

Interim report 63106

Eurofins Chemtest Lab Report

22-46523, 22-49093 and 23-00130





Contract Number	63106	
Project Name	Global Centre Of Rail Excellence	
Date Tested	19/12/2022	
	DESCRIPTIONS	

[illegible]

Operator

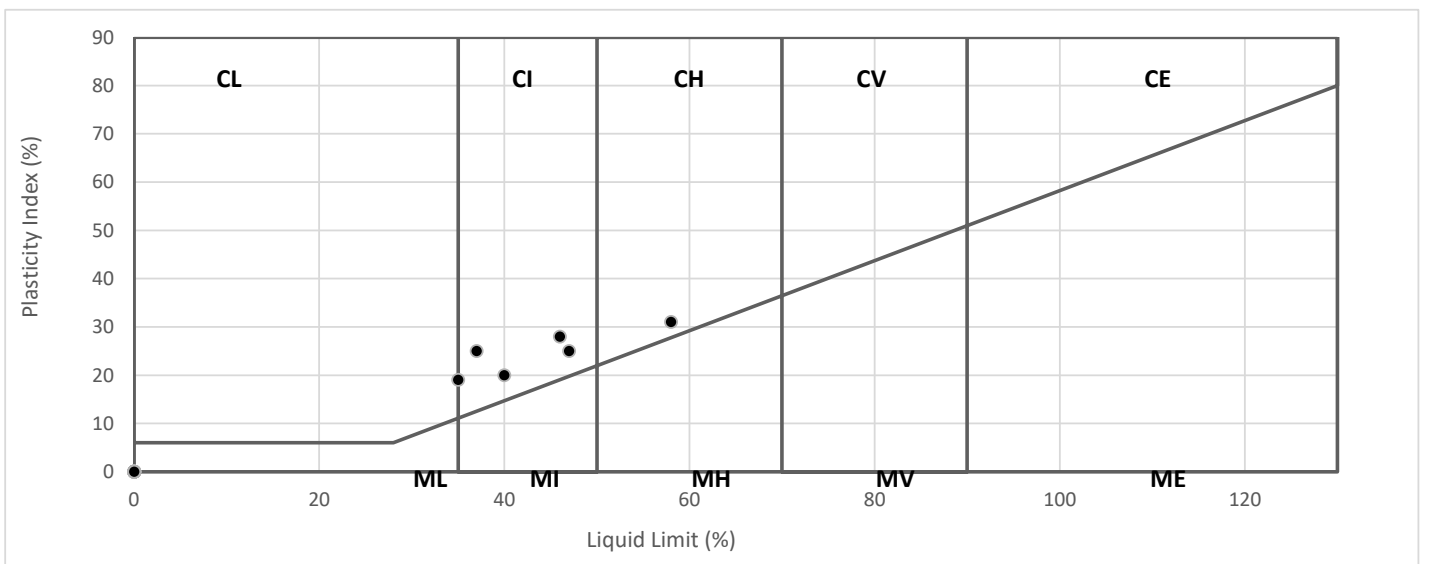
Ethan Harper

Contract Number	63106	
Project Name	Global Centre Of Rail Excellence	
Date Tested	19/12/2022	

[illegible]

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:2015+A1:2020



Operator
Ethan Harper

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-BH102

Project Name Global Centre Of Rail Excellence

Sample No. 3

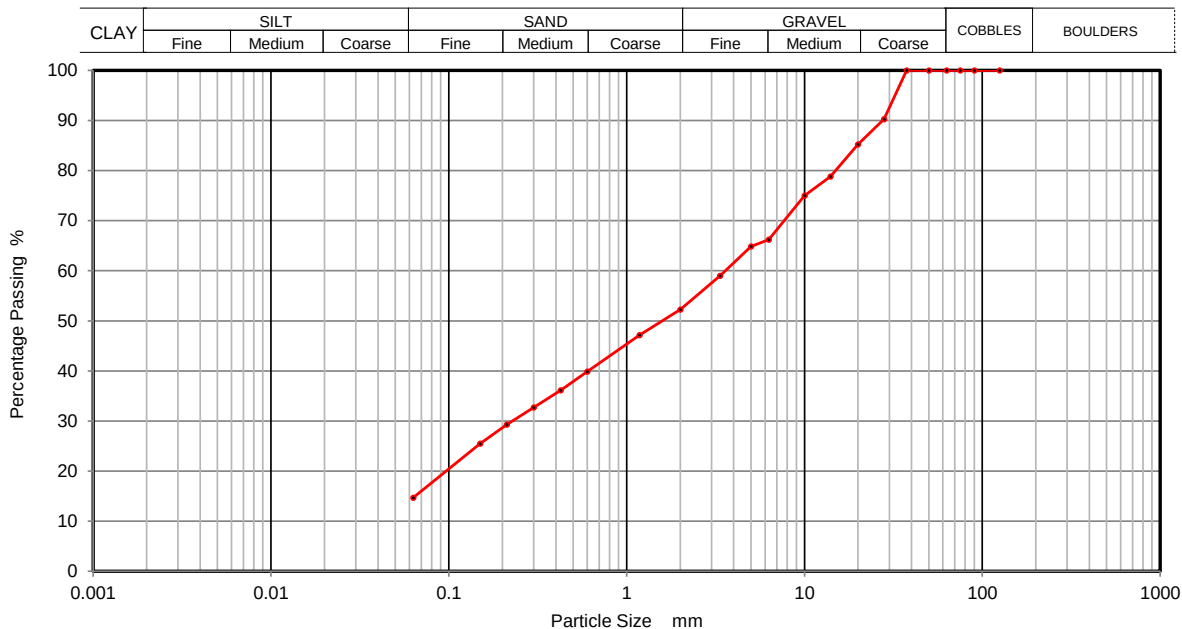
Soil Description Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 0.00

Depth Base 0.60

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	90		
20	85		
14	79		
10	75		
6.3	66		
5	65		
3.35	59		
2	52		
1.18	47		
0.6	40		
0.425	36		
0.3	33		
0.212	29		
0.15	26		
0.063	15		

Sample Proportions	% dry mass
Cobbles	0
Gravel	48
Sand	37
Silt and Clay	15

Remarks

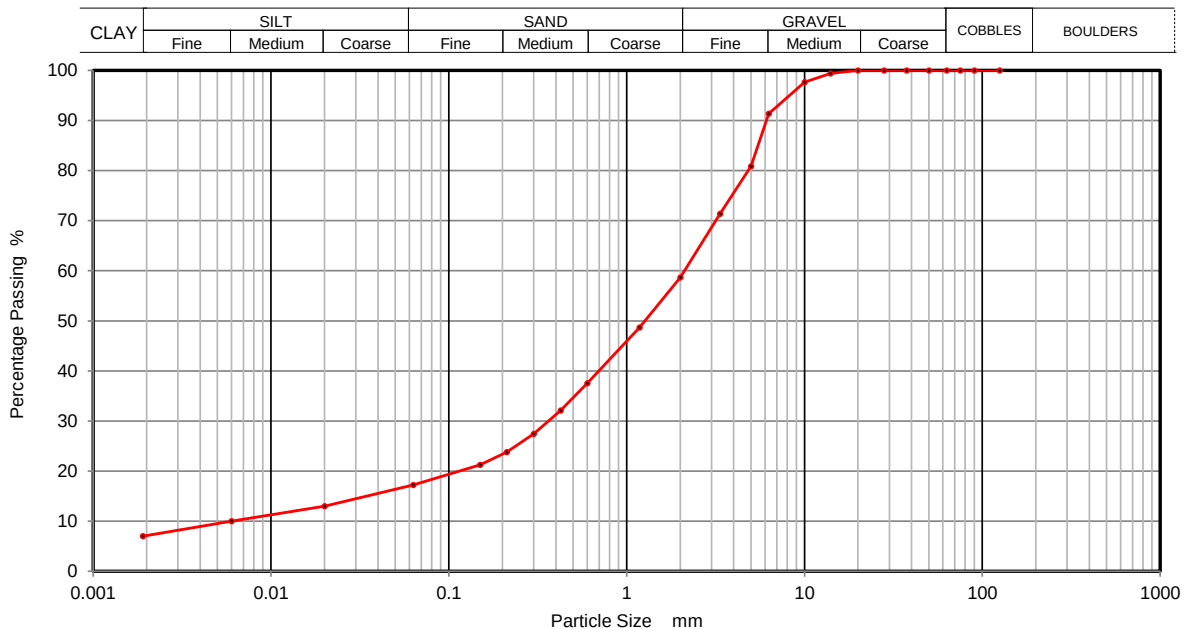
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4**

Contract Number	63106
Borehole/Pit No.	S1-BH102
Sample No.	102
Depth Top	3.50
Depth Base	3.60
Sample Type	D

Project Name	Global Centre Of Rail Excellence
Soil Description	Black fine to medium gravelly PEAT
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	13
90	100	0.0060	10
75	100	0.0020	7
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	91		
5	81		
3.35	71		
2	59		
1.18	49		
0.6	38		
0.425	32		
0.3	27		
0.212	24		
0.15	21		
0.063	17		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	42
Silt	10
Clay	7

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-BH102

Project Name Global Centre Of Rail Excellence

Sample No. 105

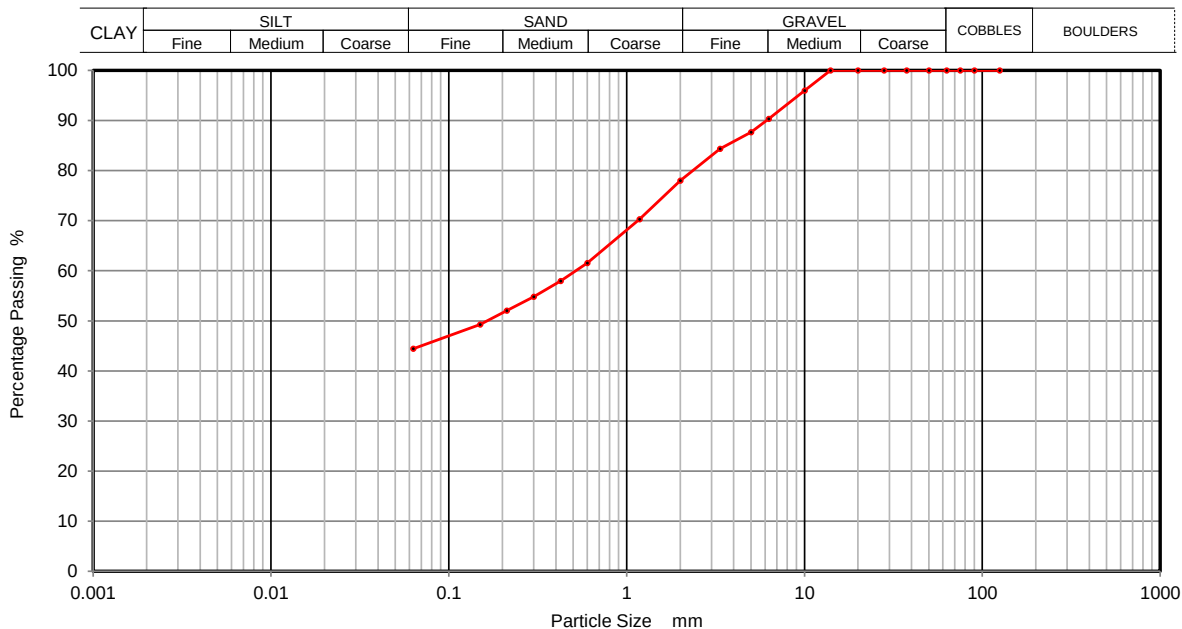
Soil Description Grey fine to medium gravelly fine to coarse sandy SILT/CLAY

Depth Top 4.60

Depth Base 4.70

Date Tested 03/01/2023

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	96		
6.3	90		
5	88		
3.35	84		
2	78		
1.18	70		
0.6	62		
0.425	58		
0.3	55		
0.212	52		
0.15	49		
0.063	44		

Sample Proportions	% dry mass
Cobbles	0
Gravel	22
Sand	34
Silt and Clay	44

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-BH102

Project Name Global Centre Of Rail Excellence

Sample No. 104

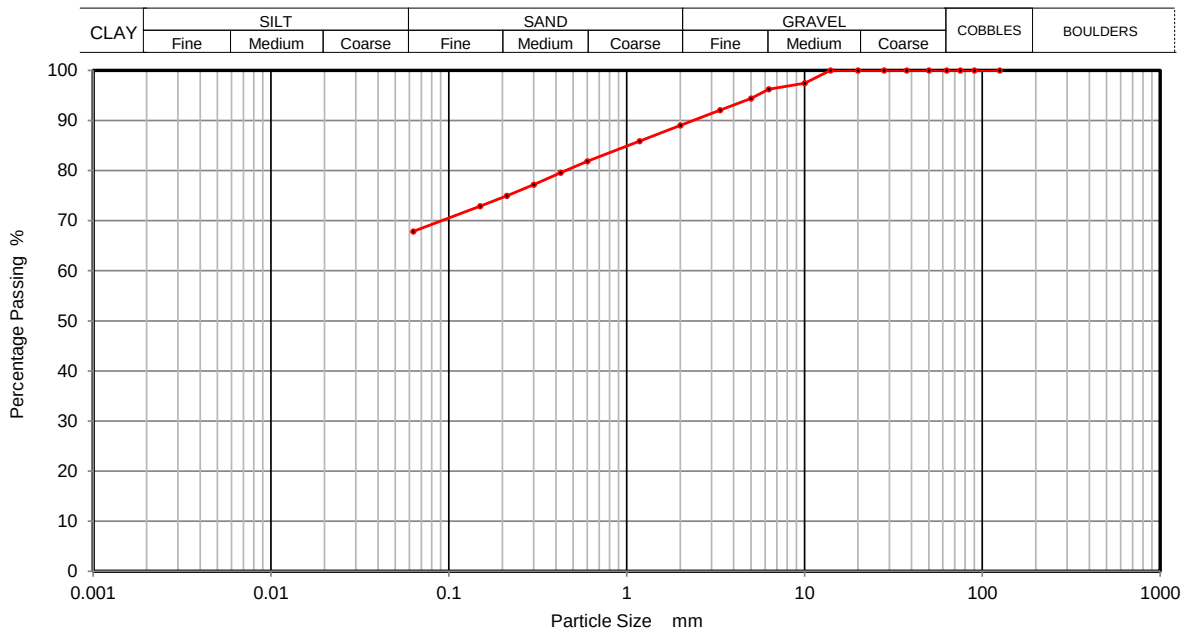
Soil Description Grey fine to medium gravelly fine to coarse sandy SILT/CLAY

Depth Top 4.20

Depth Base 4.30

Date Tested 03/01/2023

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	97		
6.3	96		
5	94		
3.35	92		
2	89		
1.18	86		
0.6	82		
0.425	80		
0.3	77		
0.212	75		
0.15	73		
0.063	68		

Sample Proportions	% dry mass
Cobbles	0
Gravel	11
Sand	21
Silt and Clay	68

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator

David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-BH110

Project Name Global Centre Of Rail Excellence

Sample No. 105

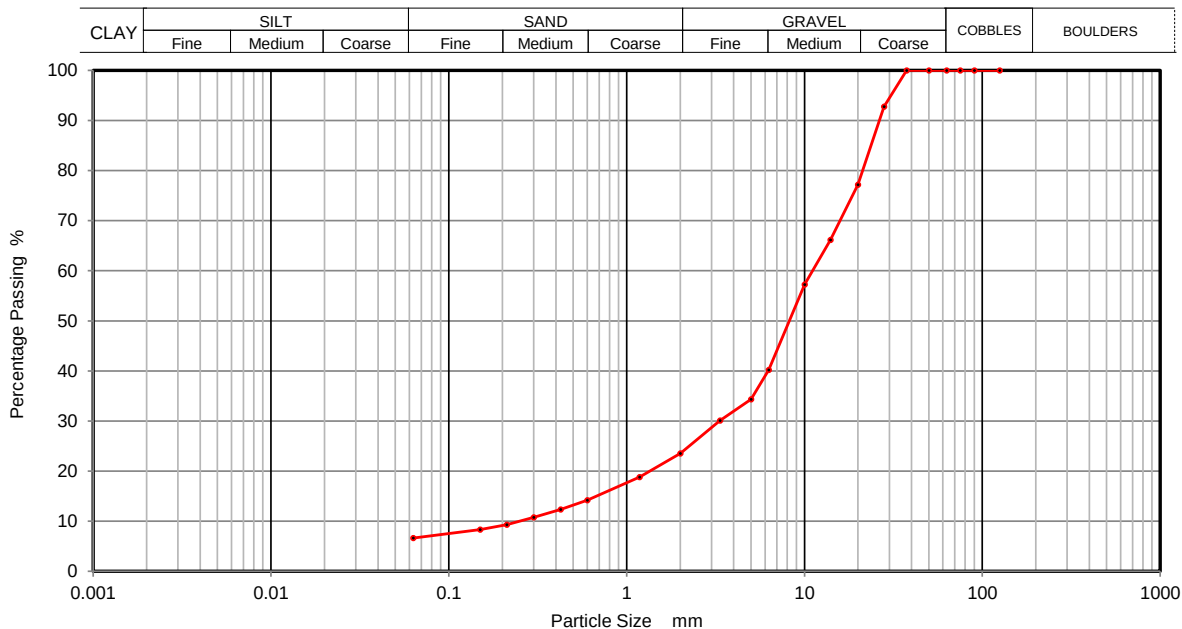
Soil Description Grey silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 1.00

Depth Base 1.30

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	77		
14	66		
10	57		
6.3	40		
5	34		
3.35	30		
2	24		
1.18	19		
0.6	14		
0.425	12		
0.3	11		
0.212	9		
0.15	8		
0.063	7		

Sample Proportions	% dry mass
Cobbles	0
Gravel	76
Sand	17
Silt and Clay	7

Remarks

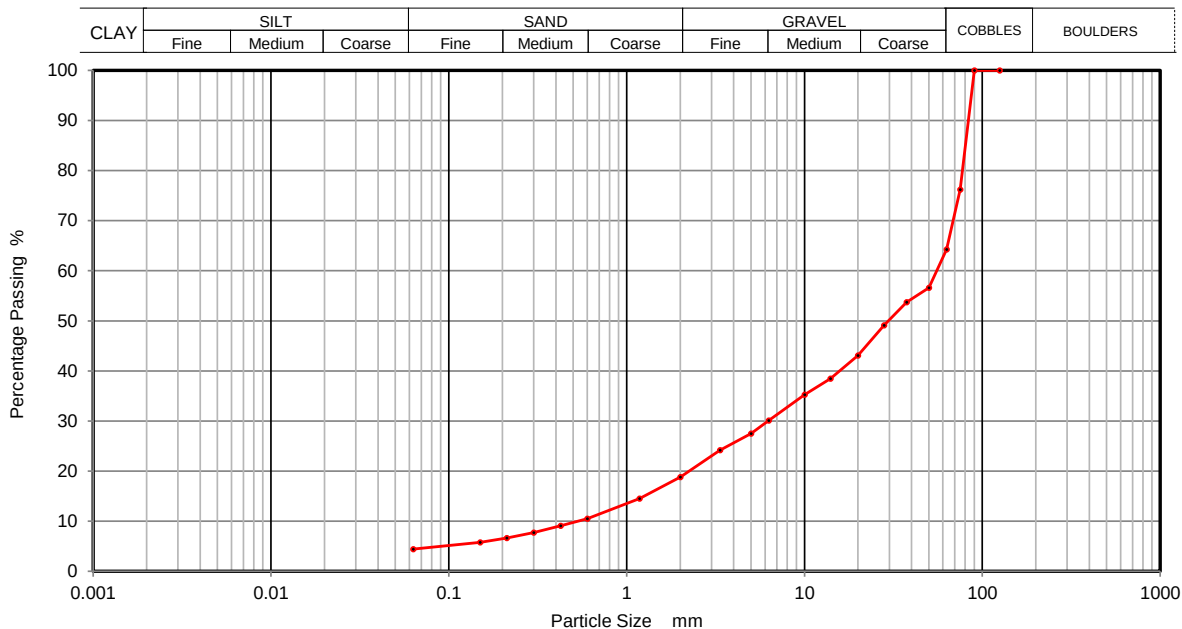
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	63106
Borehole/Pit No.	S1-BH110
Sample No.	108
Depth Top	4.00
Depth Base	4.30
Sample Type	B

Project Name	Global Centre Of Rail Excellence
Soil Description	Black slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	76		
63	64		
50	57		
37.5	54		
28	49		
20	43		
14	38		
10	35		
6.3	30		
5	27		
3.35	24		
2	19		
1.18	15		
0.6	10		
0.425	9		
0.3	8		
0.212	7		
0.15	6		
0.063	4		

Sample Proportions	% dry mass
Cobbles	36
Gravel	45
Sand	15
Silt and Clay	4

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-BH121

Project Name Global Centre Of Rail Excellence

Sample No. 103

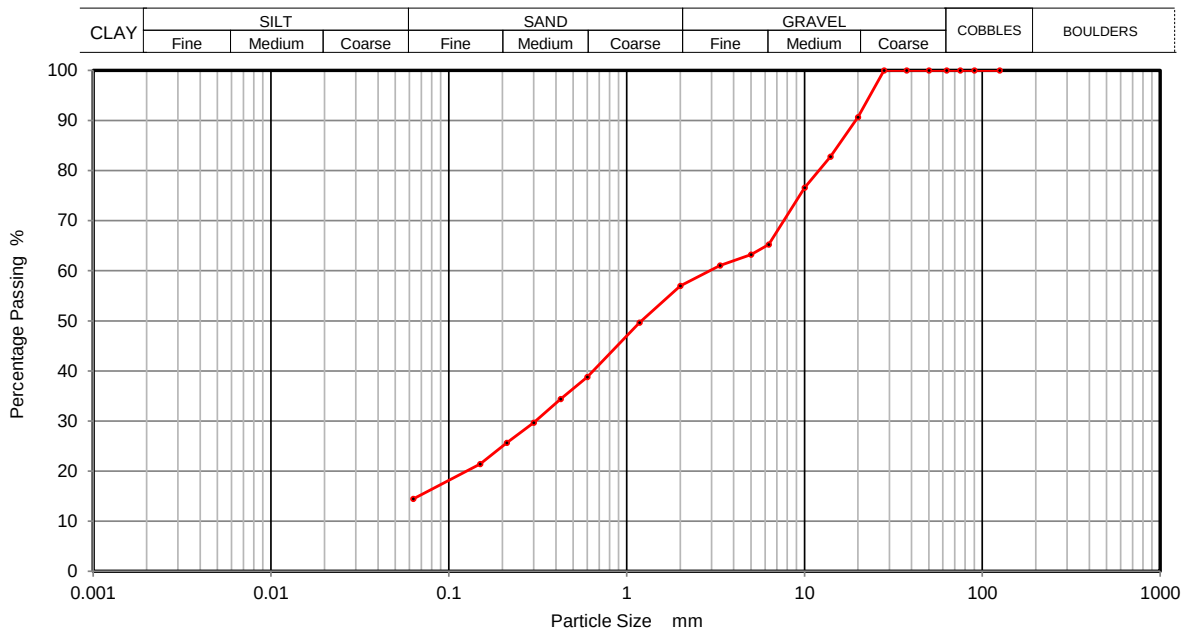
Soil Description Black silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 1.20

Depth Base 1.80

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	91		
14	83		
10	77		
6.3	65		
5	63		
3.35	61		
2	57		
1.18	50		
0.6	39		
0.425	34		
0.3	30		
0.212	26		
0.15	21		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	43
Sand	43
Silt and Clay	14

Remarks

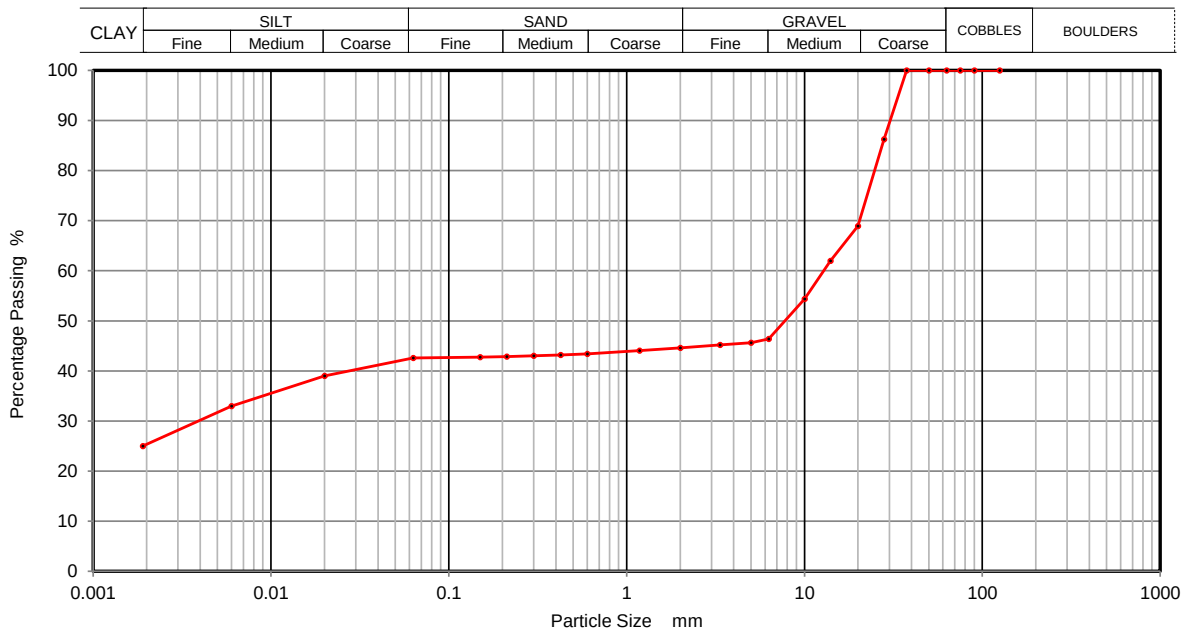
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	63106
Borehole/Pit No.	S1-BH121
Sample No.	106
Depth Top	3.50
Depth Base	3.60
Sample Type	D

Project Name	Global Centre Of Rail Excellence
Soil Description	Black slightly fine to coarse sandy organic silty clayey fine to coarse GRAVEL
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	39
90	100	0.0060	33
75	100	0.0020	25
63	100		
50	100		
37.5	100		
28	86		
20	69		
14	62		
10	54		
6.3	46		
5	46		
3.35	45		
2	45		
1.18	44		
0.6	43		
0.425	43		
0.3	43		
0.212	43		
0.15	43		
0.063	43		

Sample Proportions	% dry mass
Cobbles	0
Gravel	55
Sand	2
Silt	18
Clay	25

Remarks
Preparation and testing in accordance with BS1377 unless noted below

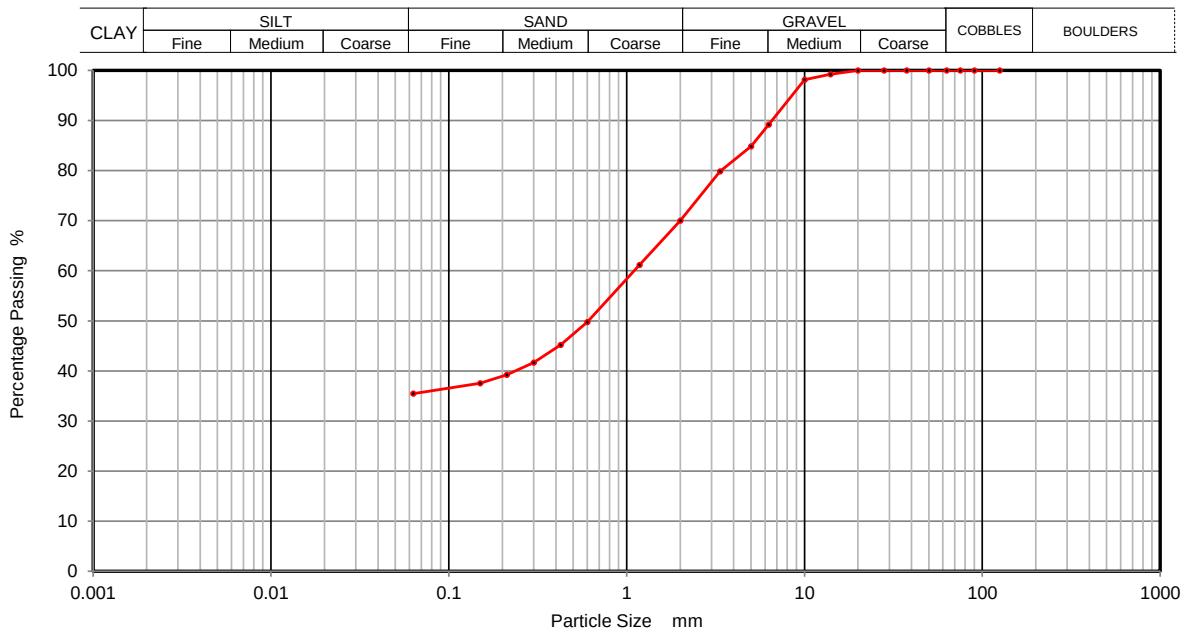
Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	63106
Borehole/Pit No.	S1-BH121
Sample No.	108
Depth Top	3.90
Depth Base	4.00
Sample Type	D

Project Name	Global Centre Of Rail Excellence
Soil Description	Grey fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	89		
5	85		
3.35	80		
2	70		
1.18	61		
0.6	50		
0.425	45		
0.3	42		
0.212	39		
0.15	38		
0.063	35		

Sample Proportions	% dry mass
Cobbles	0
Gravel	30
Sand	35
Silt and Clay	35

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

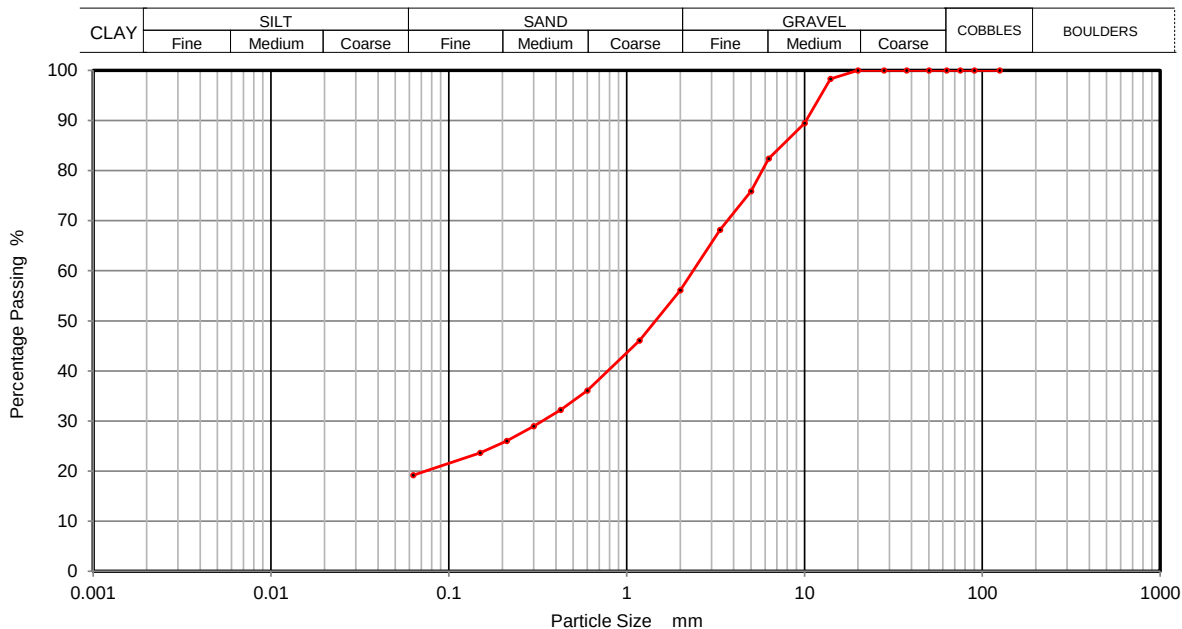




**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	63106
Borehole/Pit No.	S1-BH122
Sample No.	3
Depth Top	1.70
Depth Base	1.90
Sample Type	D

Project Name	Global Centre Of Rail Excellence
Soil Description	Black silty/clayey fine to coarse sandy fine to coarse GRAVEL
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	89		
6.3	82		
5	76		
3.35	68		
2	56		
1.18	46		
0.6	36		
0.425	32		
0.3	29		
0.212	26		
0.15	24		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	44
Sand	37
Silt and Clay	19

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

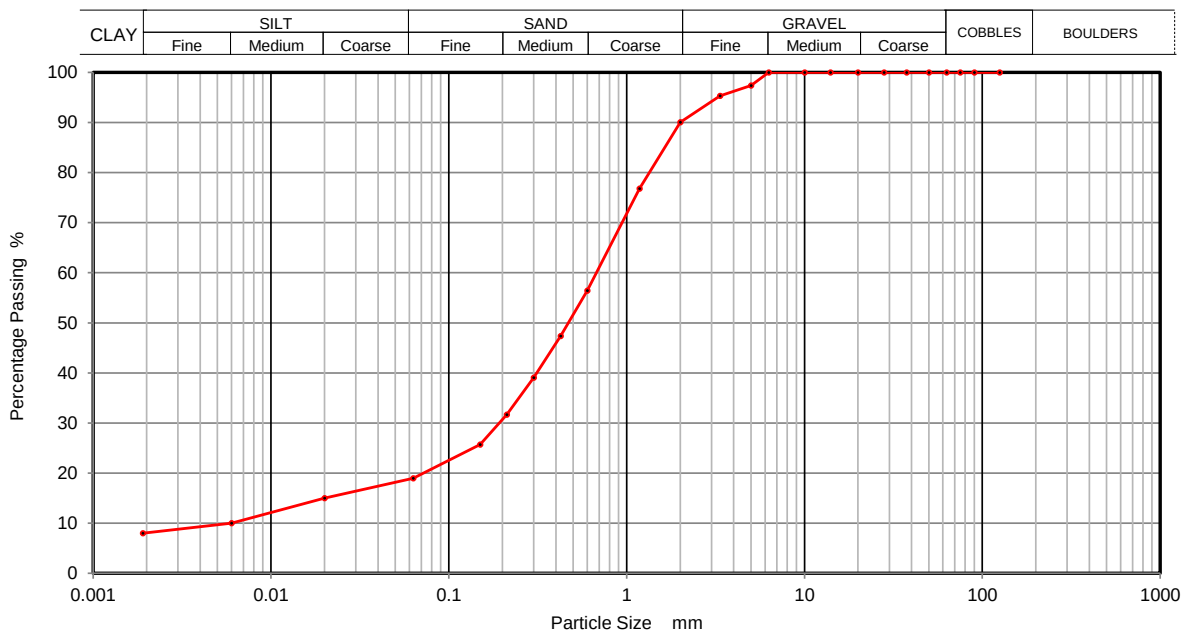


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PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	63106
Borehole/Pit No.	S1-BH122
Sample No.	4
Depth Top	2.00
Depth Base	2.45
Sample Type	D

Project Name	Global Centre Of Rail Excellence
Soil Description	BLACK PEAT
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	15
90	100	0.0060	10
75	100	0.0020	8
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	97		
3.35	95		
2	90		
1.18	77		
0.6	56		
0.425	47		
0.3	39		
0.212	32		
0.15	26		
0.063	19		

Sample Proportions	% dry mass
Cobbles	0
Gravel	10
Sand	71
Silt	11
Clay	8

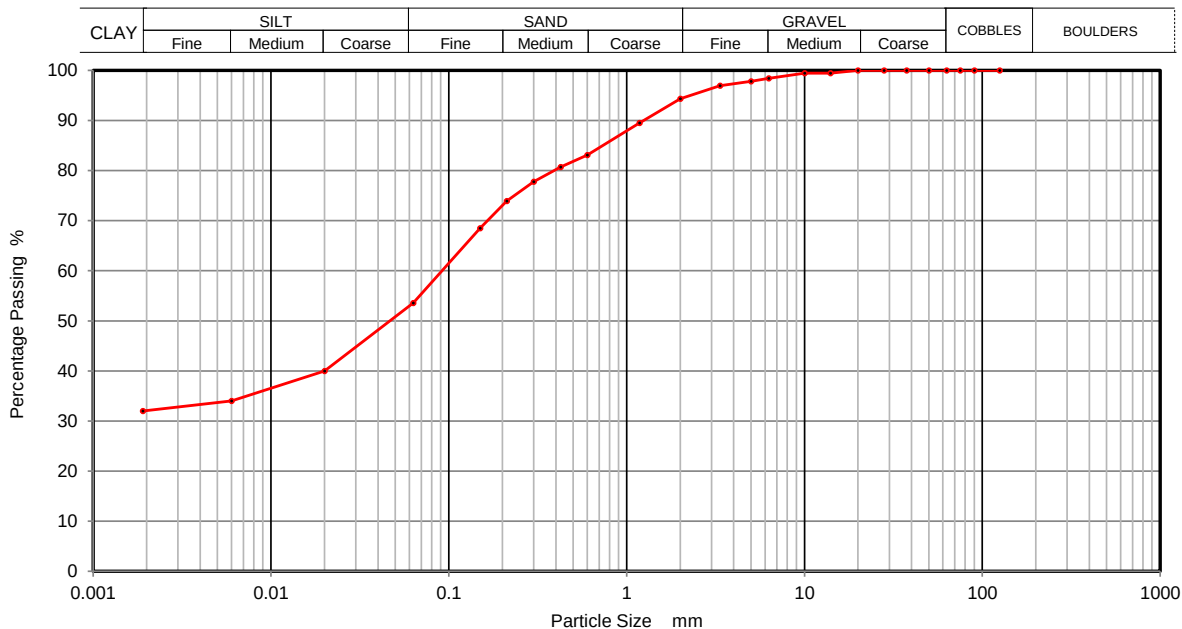
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	63106
Borehole/Pit No.	S1-BH122
Sample No.	104
Depth Top	4.70
Depth Base	4.80
Sample Type	D

Project Name	Global Centre Of Rail Excellence
Soil Description	Brown fine to medium gravelly fine to coarse sandy silty CLAY
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	40
90	100	0.0060	34
75	100	0.0020	32
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	98		
5	98		
3.35	97		
2	94		
1.18	89		
0.6	83		
0.425	81		
0.3	78		
0.212	74		
0.15	68		
0.063	54		

Sample Proportions	% dry mass
Cobbles	0
Gravel	6
Sand	40
Silt	22
Clay	32

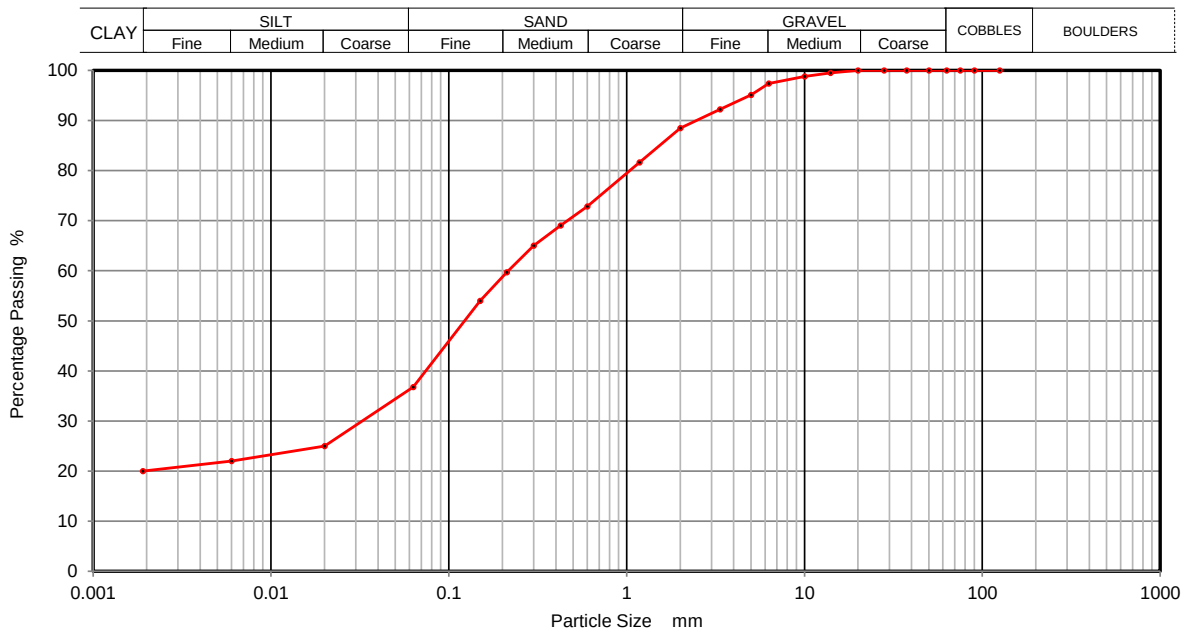
Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	63106
Borehole/Pit No.	S1-BH122
Sample No.	17
Depth Top	5.00
Depth Base	5.45
Sample Type	D

Project Name	Global Centre Of Rail Excellence
Soil Description	Brown fine to medium gravelly fine to coarse sandy silty CLAY
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	25
90	100	0.0060	22
75	100	0.0020	20
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	97		
5	95		
3.35	92		
2	88		
1.18	82		
0.6	73		
0.425	69		
0.3	65		
0.212	60		
0.15	54		
0.063	37		

Sample Proportions	% dry mass
Cobbles	0
Gravel	12
Sand	51
Silt	17
Clay	20

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-BH122

Project Name Global Centre Of Rail Excellence

Sample No. 12

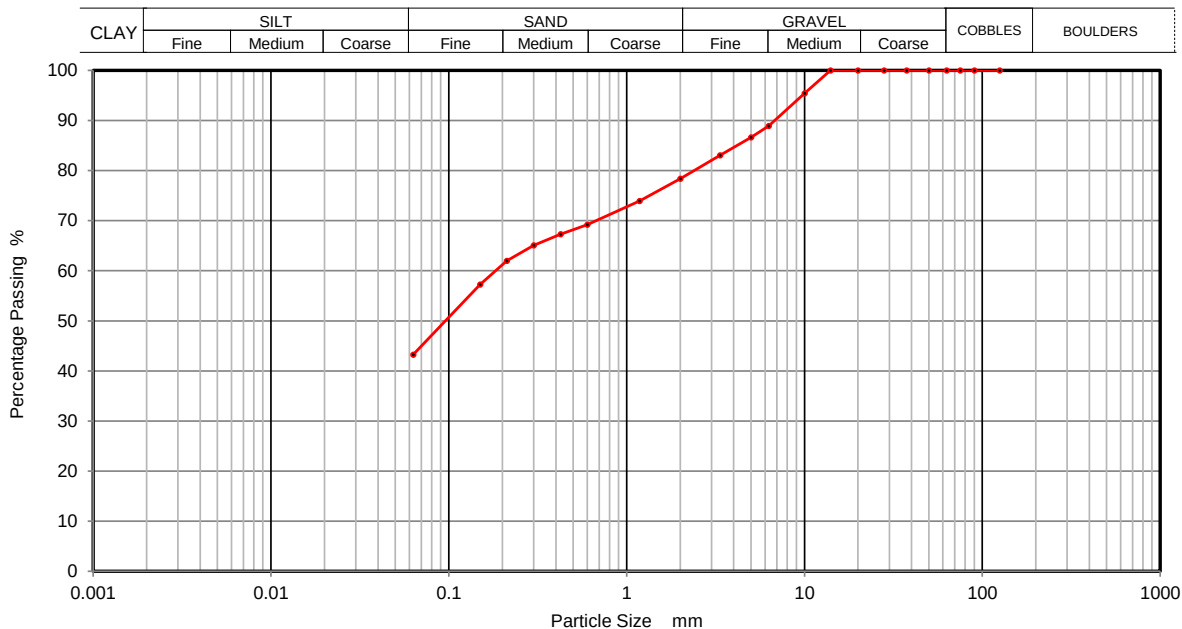
Soil Description Brown grey fine to medium gravelly fine to coarse sandy SILT/CLAY

Depth Top 6.00

Depth Base 6.45

Date Tested 03/01/2023

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	95		
6.3	89		
5	87		
3.35	83		
2	78		
1.18	74		
0.6	69		
0.425	67		
0.3	65		
0.212	62		
0.15	57		
0.063	43		

Sample Proportions	% dry mass
Cobbles	0
Gravel	22
Sand	35
Silt and Clay	43

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP111

Project Name Global Centre Of Rail Excellence

Sample No. 3

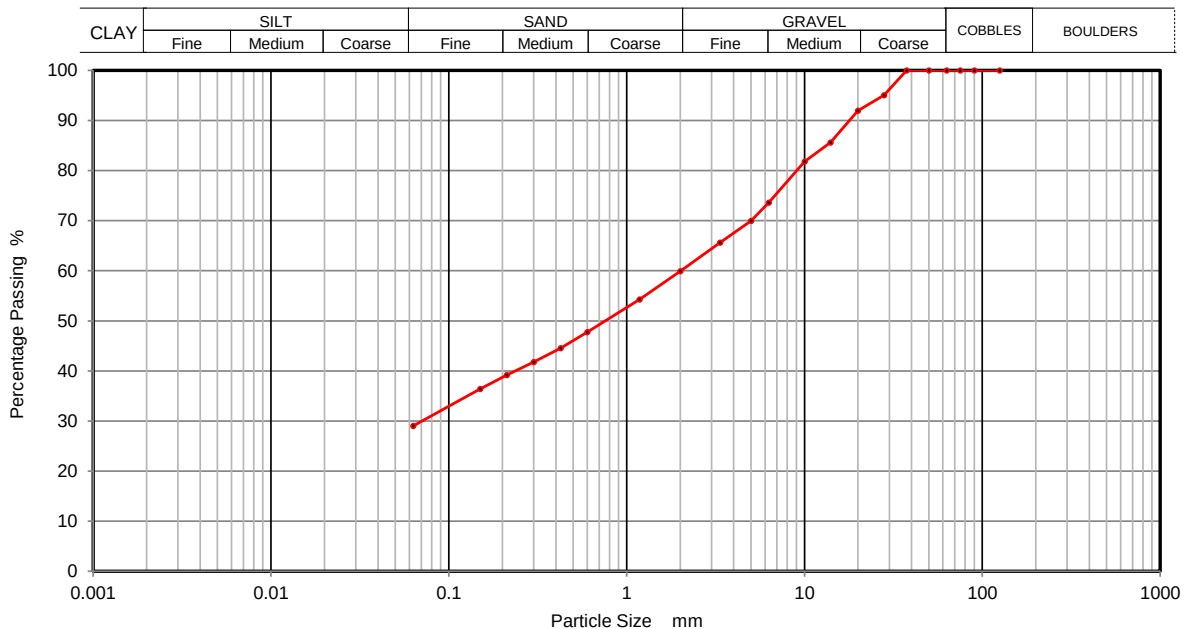
Soil Description Black brown silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 0.10

Depth Base 0.30

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	92		
14	86		
10	82		
6.3	74		
5	70		
3.35	66		
2	60		
1.18	54		
0.6	48		
0.425	45		
0.3	42		
0.212	39		
0.15	36		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	40
Sand	31
Silt and Clay	29

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP111

Project Name Global Centre Of Rail Excellence

Sample No. 4

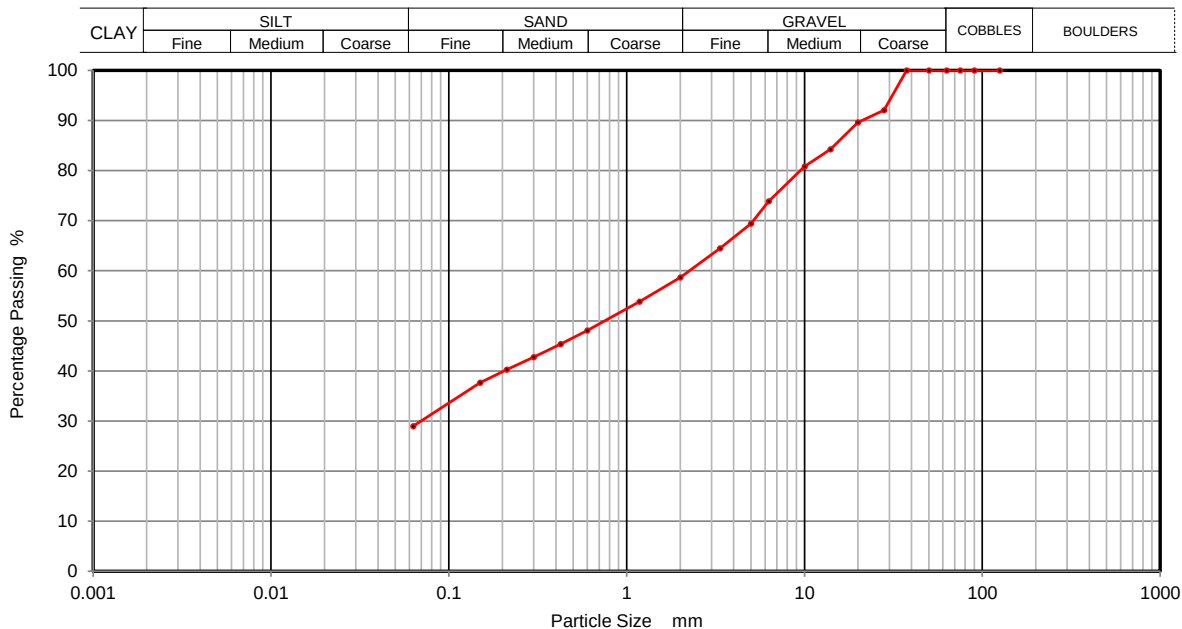
Soil Description Black brown silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 0.30

Depth Base 0.35

Date Tested 03/01/2023

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	90		
14	84		
10	81		
6.3	74		
5	69		
3.35	64		
2	59		
1.18	54		
0.6	48		
0.425	45		
0.3	43		
0.212	40		
0.15	38		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	30
Silt and Clay	29

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP111

Project Name Global Centre Of Rail Excellence

Sample No. 7

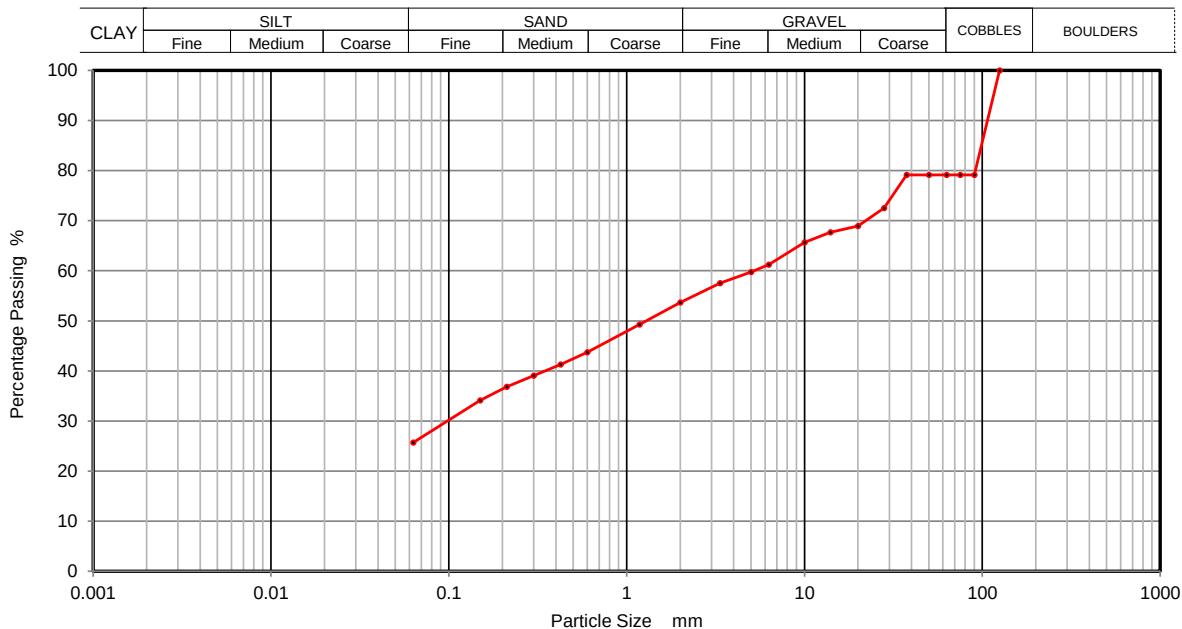
Soil Description Grey brown silty/clayey fine to coarse gravelly fine to coarse SAND
(with cobbles)

Depth Top 0.70

Depth Base 1.00

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	79		
75	79		
63	79		
50	79		
37.5	79		
28	72		
20	69		
14	68		
10	66		
6.3	61		
5	60		
3.35	58		
2	54		
1.18	49		
0.6	44		
0.425	41		
0.3	39		
0.212	37		
0.15	34		
0.063	26		

Sample Proportions	% dry mass
Cobbles	21
Gravel	25
Sand	28
Silt and Clay	26

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP111

Project Name Global Centre Of Rail Excellence

Sample No. 10

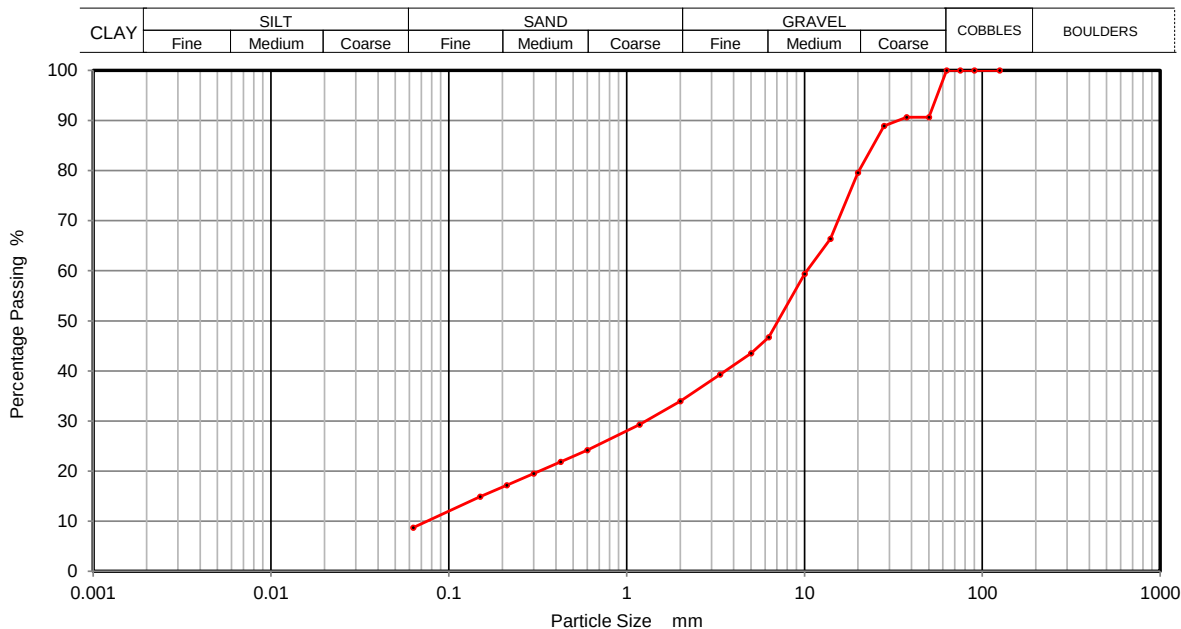
Soil Description Dark grey silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 2.00

Depth Base 2.30

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	91		
37.5	91		
28	89		
20	80		
14	66		
10	59		
6.3	47		
5	43		
3.35	39		
2	34		
1.18	29		
0.6	24		
0.425	22		
0.3	19		
0.212	17		
0.15	15		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	66
Sand	25
Silt and Clay	9

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP112

Project Name Global Centre Of Rail Excellence

Sample No. 9

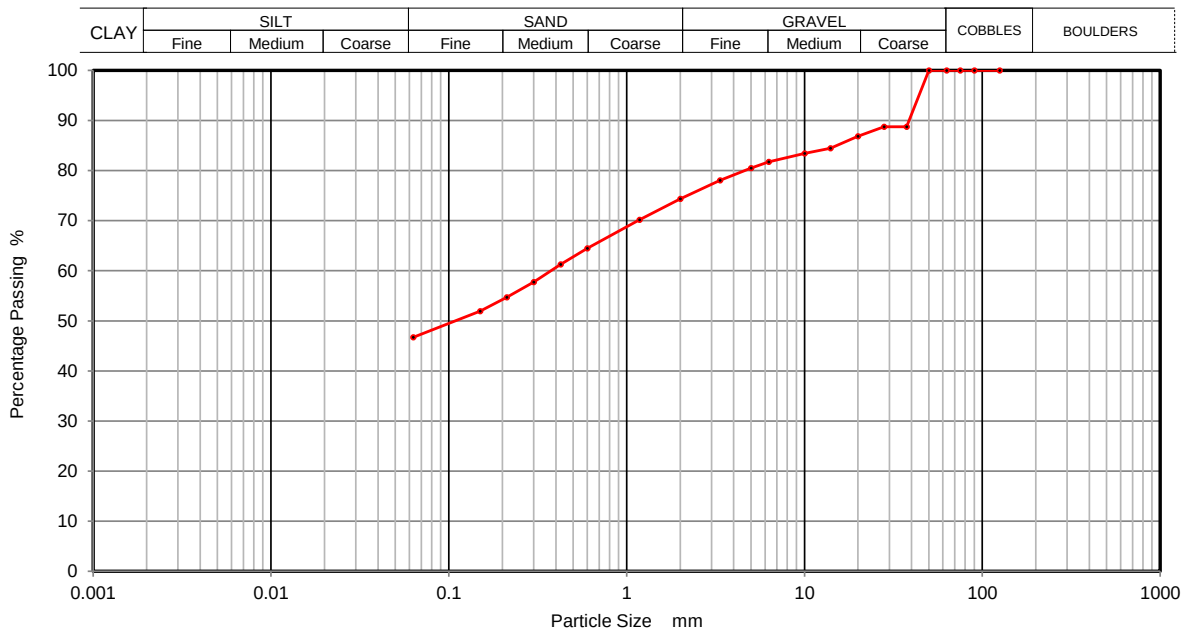
Soil Description Black fine to coarse gravelly fine to coarse sandy SILT/CLAY

Depth Top 0.90

Depth Base 1.00

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	89		
20	87		
14	84		
10	83		
6.3	82		
5	80		
3.35	78		
2	74		
1.18	70		
0.6	64		
0.425	61		
0.3	58		
0.212	55		
0.15	52		
0.063	47		

Sample Proportions	% dry mass
Cobbles	0
Gravel	26
Sand	27
Silt and Clay	47

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP113

Project Name Global Centre Of Rail Excellence

Sample No. 4

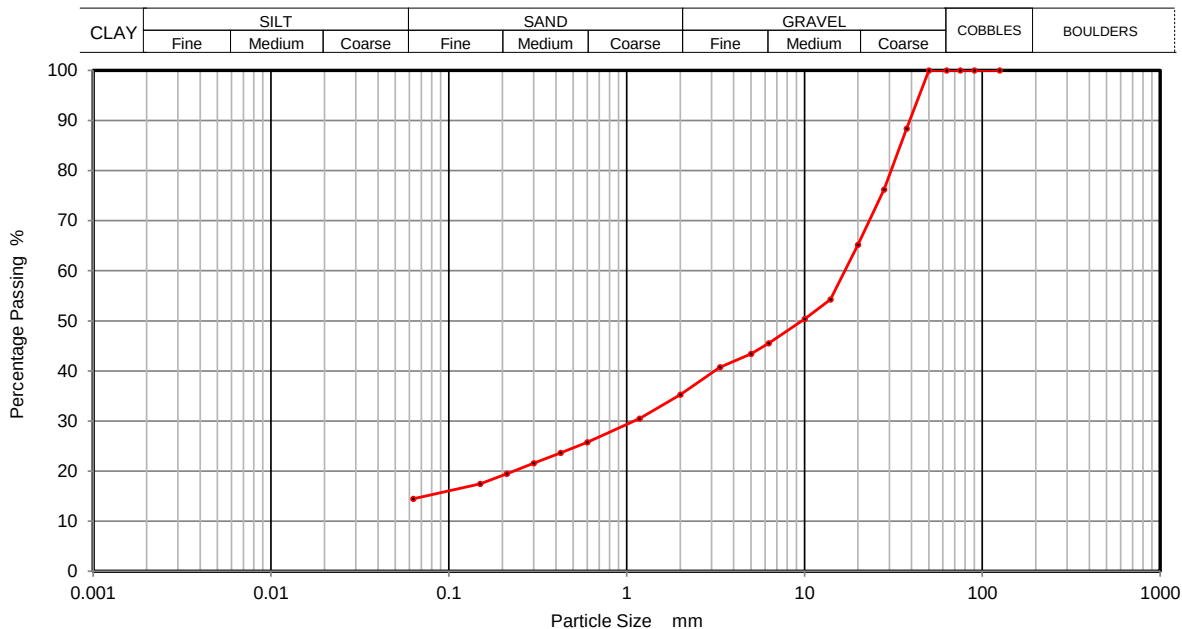
Soil Description Black clayey/silty fine to coarse sandy fine to coarse GRAVEL

Depth Top 0.50

Depth Base 0.70

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	76		
20	65		
14	54		
10	50		
6.3	46		
5	43		
3.35	41		
2	35		
1.18	30		
0.6	26		
0.425	24		
0.3	22		
0.212	19		
0.15	17		
0.063	14		

Sample Proportions	% dry mass
Cobbles	0
Gravel	65
Sand	21
Silt and Clay	14

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator

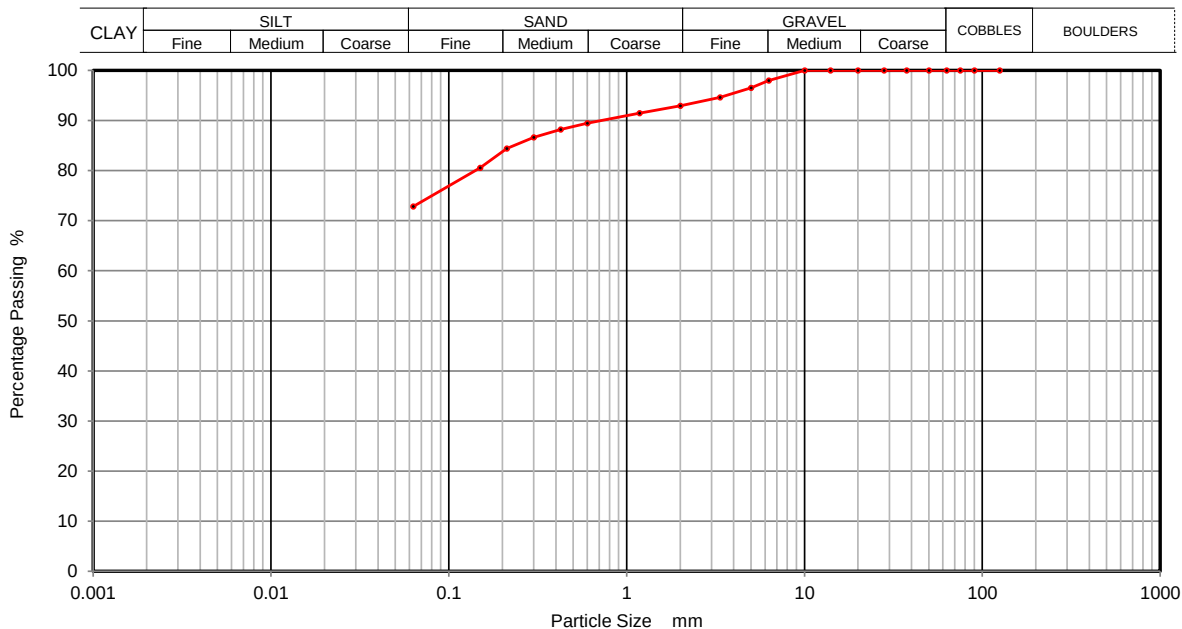
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	63106
Borehole/Pit No.	S1-TP113
Sample No.	7
Depth Top	1.00
Depth Base	1.10
Sample Type	B

Project Name	Global Centre Of Rail Excellence
Soil Description	Brown fine to medium gravelly fine to coarse sandy SILT/CLAY
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	98		
5	97		
3.35	95		
2	93		
1.18	91		
0.6	89		
0.425	88		
0.3	87		
0.212	84		
0.15	81		
0.063	73		

Sample Proportions	% dry mass
Cobbles	0
Gravel	7
Sand	20
Silt and Clay	73

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



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**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP113

Project Name Global Centre Of Rail Excellence

Sample No. 11

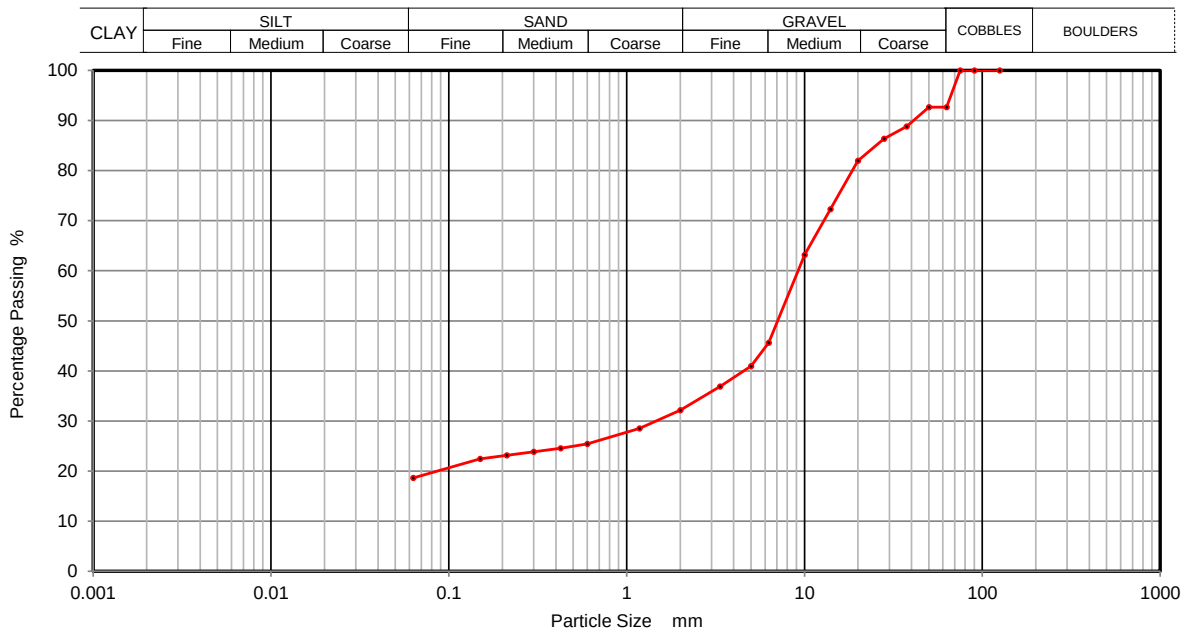
Soil Description Brown fine to coarse sandy silty/clayey fine to coarse GRAVEL (with cobbles)

Depth Top 3.00

Depth Base 3.10

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	93		
37.5	89		
28	86		
20	82		
14	72		
10	63		
6.3	46		
5	41		
3.35	37		
2	32		
1.18	29		
0.6	25		
0.425	25		
0.3	24		
0.212	23		
0.15	22		
0.063	19		

Sample Proportions	% dry mass
Cobbles	7
Gravel	61
Sand	13
Silt and Clay	19

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP114

Project Name Global Centre Of Rail Excellence

Sample No. 5

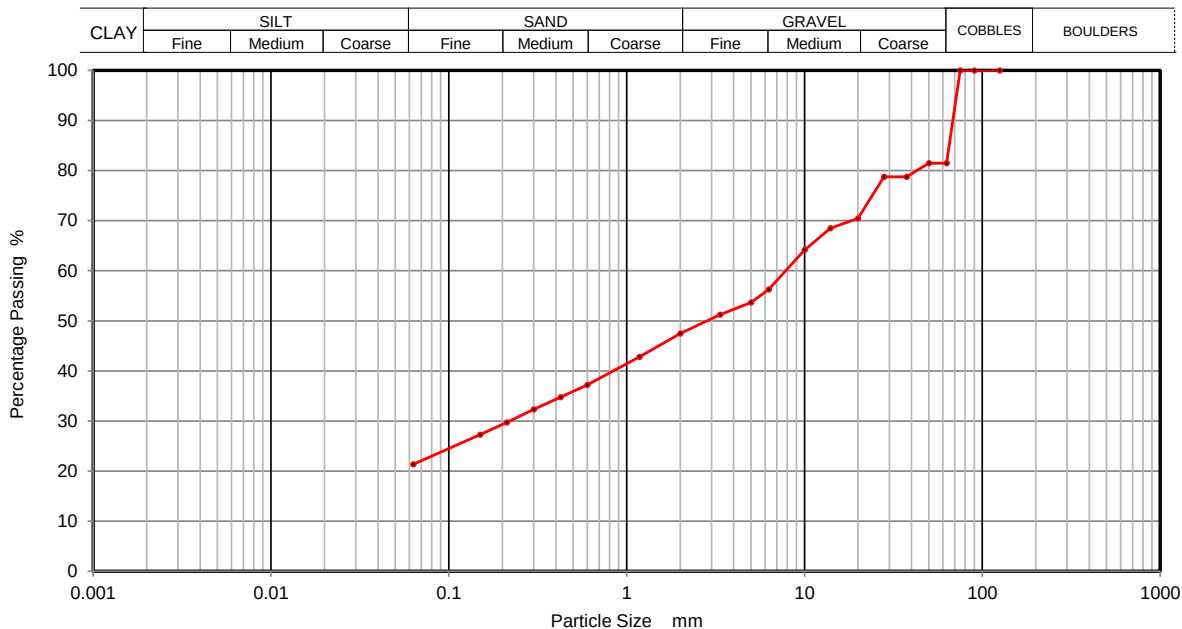
Soil Description Grey brown silty/clayey fine to coarse sandy fine to coarse GRAVEL
(with cobbles)

Depth Top 0.30

Depth Base 0.40

Date Tested 03/01/2023

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	81		
50	81		
37.5	79		
28	79		
20	70		
14	68		
10	64		
6.3	56		
5	54		
3.35	51		
2	47		
1.18	43		
0.6	37		
0.425	35		
0.3	32		
0.212	30		
0.15	27		
0.063	21		

Sample Proportions	% dry mass
Cobbles	19
Gravel	34
Sand	26
Silt and Clay	21

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards

**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number 63106

Borehole/Pit No. S1-TP114

Project Name Global Centre Of Rail Excellence

Sample No. 10

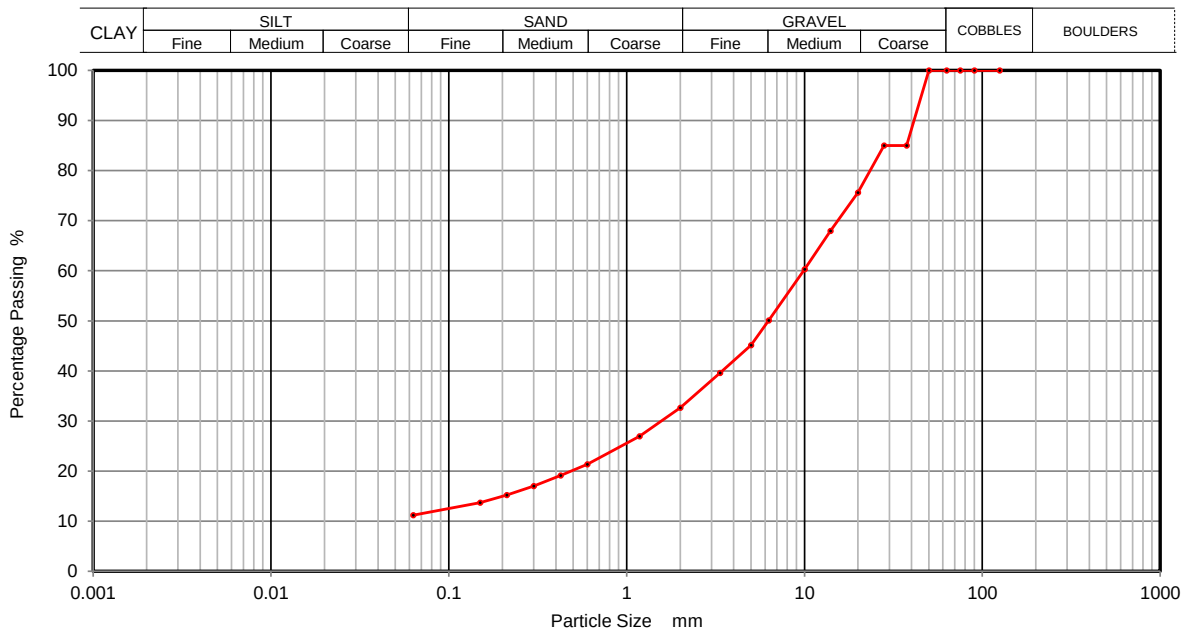
Soil Description Black silty/clayey fine to coarse sandy fine to coarse GRAVEL

Depth Top 2.10

Depth Base 2.20

Date Tested 03/01/2023

Sample Type D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	85		
28	85		
20	76		
14	68		
10	60		
6.3	50		
5	45		
3.35	40		
2	33		
1.18	27		
0.6	21		
0.425	19		
0.3	17		
0.212	15		
0.15	14		
0.063	11		

Sample Proportions	% dry mass
Cobbles	0
Gravel	67
Sand	22
Silt and Clay	11

Remarks
Preparation and testing in accordance with BS1377 unless noted below

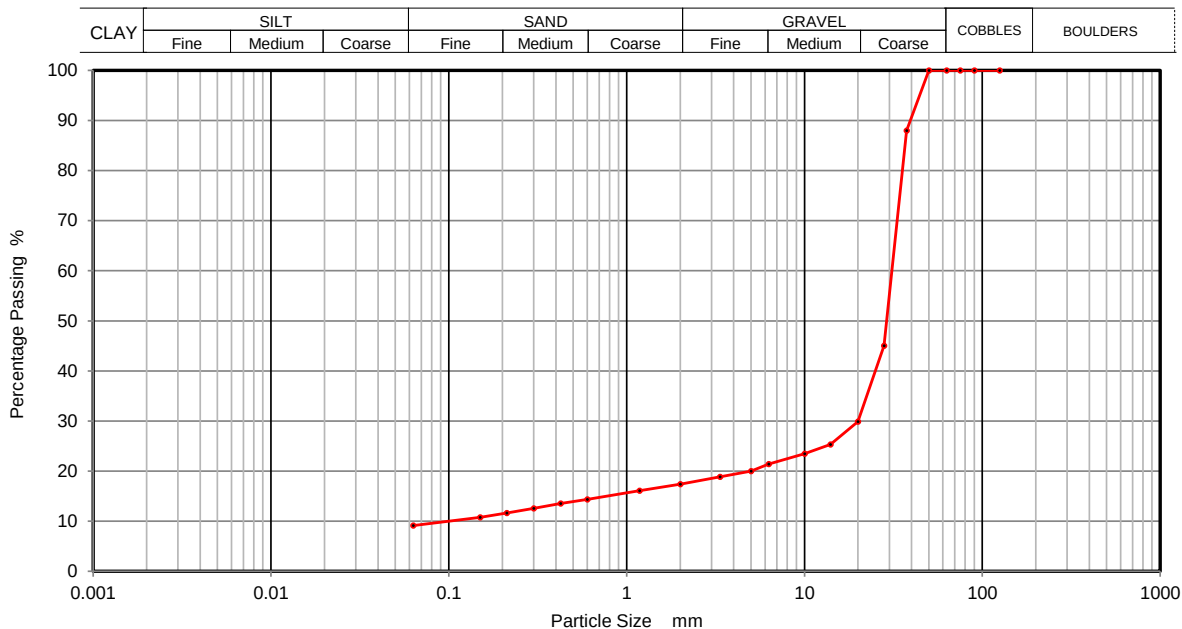
Operator
David Edwards



**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number	63106
Borehole/Pit No.	S1-TP115
Sample No.	4
Depth Top	0.50
Depth Base	0.70
Sample Type	B

Project Name	Global Centre Of Rail Excellence
Soil Description	Black fine to coarse sandy silty/clayey fine to coarse GRAVEL
Date Tested	03/01/2023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	45		
20	30		
14	25		
10	23		
6.3	21		
5	20		
3.35	19		
2	17		
1.18	16		
0.6	14		
0.425	14		
0.3	13		
0.212	12		
0.15	11		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	83
Sand	8
Silt and Clay	9

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator
David Edwards



**Dry Density / Moisture Content Relationship
BS 1377:Part 4:1990**

Contract Number 63106

Borehole / Pit No S1-TP114

Project Name Global Centre Of Rail Excellence

Sample No 1

Date Tested 05/01/2023

Depth Top 0.10

Compaction Method 4.5 Kg Rammer

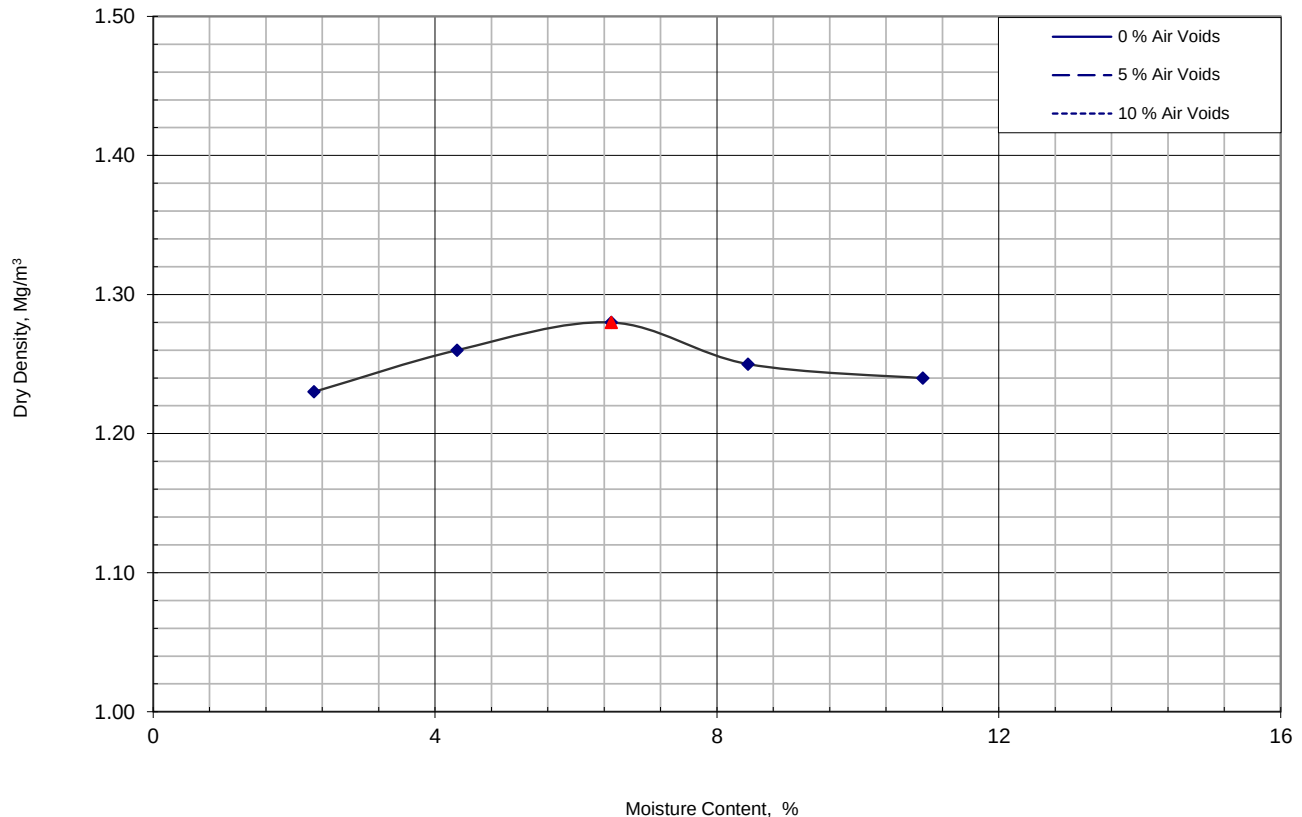
Depth Base 0.20

Compaction Clause BS1377:Part 4:1990, Clause 3.5

Sample Type B

Sample Description Black silty/clayey fine to coarse GRAVEL

Single or Separate
Sample Used Single

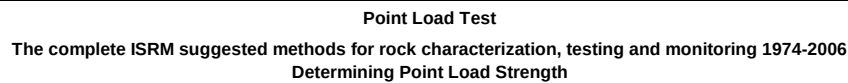


Compaction Point	1	2	3	4	5							
Moisture Content	2.3	4.3	6.5	8.4	11							
Bulk Density	1.26	1.31	1.36	1.36	1.38							
Dry Density	1.23	1.26	1.28	1.25	1.24							

Initial Moisture Content	11	%
Maximum Dry Density	1.28	Mg/m ³
Optimum Moisture Content	6.5	%
Particle Density	2.65 Assumed	Mg/m ³
Material Retained 37.5mm	11	%
Material Retained 20mm	9	%

Operator

Conal



Contract Number	63106
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Project Name	Global Centre Of Rail Excellence
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Sample Type	Core
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Date Tested	13/12/2022
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*Please note that GSTL is not accredited for the water content of rock

[illegible]

<u>Key</u>	<u>Reported As</u>
Width	(W) mm
Platen Separation	(D) mm
Failure Load	(P) kN
Equivalent Diameter	(De) mm
Point Load	(Is) MPa
Size Factor	(F)
Point Load Index	(Is(50)) MPa
Moisture Content	%
Description	SC

Operator

Julian Jones



2788

ANALYTICAL TEST REPORT

Contract no: 117101

Contract name: Globel Centre of Rail Excellence

Client reference: G22069

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 19 December 2022

Analysis started: 19 December 2022

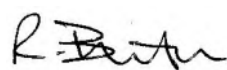
Analysis completed: 23 December 2022

Report issued: 23 December 2022

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:



Rachael Burton
Reporting Manager

Chemtech Environmental Limited

SOILS

Lab number			117101-1	117101-2	117101-3	117101-4	117101-5	117101-6
Sample id			S1-BH102	S1-BH110	S1-BH121	S1-BH122	S1-BH122	S1-BH122
Depth (m)			3.00-3.45	4.75-4.80	3.20-3.30	2.60-2.70	4.20-4.30	5.00-5.45
Sample Type			D8	D109	D105	D102	D103	D10
Date sampled			-	-	-	-	-	-
Test	Method	Units						
Total Organic Carbon (TOC)	CE197	% w/w C	33.6	36.8	33.3	30.9	5.3	2.3
Estimate of OMC (calculated from TOC)	CE197	% w/w	57.9	63.5	57.4	53.3	9.1	4.0

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
117101-1	S1-BH102	3.00-3.45	Y	All (NSD)
117101-2	S1-BH110	4.75-4.80	Y	All (NSD)
117101-3	S1-BH121	3.20-3.30	Y	All (NSD)
117101-4	S1-BH122	2.60-2.70	Y	All (NSD)
117101-5	S1-BH122	4.20-4.30	Y	All (NSD)
117101-6	S1-BH122	5.00-5.45	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

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

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.



Amended Report

Report No.:	22-46523-5		
Initial Date of Issue:	09-Dec-2022	Date of Re-Issue:	12-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	05-Dec-2022
Order No.:	2001	Date Instructed:	05-Dec-2022
No. of Samples:	13		
Turnaround (Wkdays):	5	Results Due:	09-Dec-2022
Date Approved:	09-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:				22-46523	22-46523	22-46523	22-46523	22-46523	22-46523	22-46523	22-46523
Quotation No.: Q22-28967	Chemtest Sample ID.:				1557745	1557746	1557747	1557748	1557749	1557750	1557751	1557752
Order No.: 2001	Client Sample Ref.:				2	8	2	9	6	6	9	2
	Client Sample ID.:				#30483083441 10002	#30483083441 10008	#55573910733 40002	#55573910733 40009	#60844326699 40006	#03114414635 60006	#03114414635 60009	#65479454335 40002
	Sample Location:				S1-TP113	S1-TP113	S1-TP111	S1-TP111	S1-TP112	S1-TP114	S1-TP114	S1-TP115
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.50	1.50	0.20	1.50	0.50	0.80	1.50	0.50
	Bottom Depth (m):				0.60	1.50	0.25	1.55	0.60	0.90	1.60	0.60
Determinand	Accred.	SOP	Units	LOD								
Moisture	N	2030	%	0.020	15	20	12	7.8	17	8.5	7.1	8.6
pH (2.5:1)	N	2010		4.0	[A] 8.1	[A] 6.3	[A] 7.1	[A] 5.5	[A] 8.2	[A] 8.1	[A] 8.1	[A] 8.2
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 0.11	[A] < 0.010	[A] 0.016	[A] < 0.010	[A] < 0.010	[A] 0.071	[A] 0.056	[A] 0.028
Total Sulphur	U	2175	%	0.010	[A] 0.43	[A] 0.018	[A] 0.64	[A] 0.068	[A] 0.016	[A] 0.28	[A] 0.38	[A] 0.46
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.039	[A] < 0.010	[A] 0.11	[A] 0.12	[A] < 0.010	[A] 0.060	[A] 0.044	[A] 0.035

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:				22-46523	22-46523	22-46523	22-46523	22-46523
Quotation No.: Q22-28967	Chemtest Sample ID.:				1557753	1557754	1557755	1557756	1557757
Order No.: 2001	Client Sample Ref.:				3	4	107	5	1
	Client Sample ID.:				#73082598844 90003	#55207899936 90004	#59305388182 00015	#09573952066 50005	#25697923091 00003
	Sample Location:				S1-BH121	S1-BH110	S1-BH110	S1-BH102	S1-BH122
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.10	0.80	2.80	1.00	0.50
	Bottom Depth (m):				0.60	1.25	3.20	1.45	1.20
Determinand	Accred.	SOP	Units	LOD					
Moisture	N	2030	%	0.020	14	2.0	17	22	23
pH (2.5:1)	N	2010		4.0	[A] 8.0	[A] 8.2	[A] 8.1	[A] 7.7	[A] 7.8
Sulphate (2:1 Water Soluble) as SO ₄	U	2120	g/l	0.010	[A] < 0.010	[A] 0.056	[A] 0.040	[A] 0.12	[A] 0.15
Total Sulphur	U	2175	%	0.010	[A] 0.38	[A] 0.044	[A] 0.70	[A] 0.56	[A] 0.75
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.022	[A] 0.015	[A] < 0.010	[A] < 0.010	[A] 0.069

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1557745	2	#3048308344110002	S1-TP113		A	Plastic Tub 500g
1557746	8	#3048308344110008	S1-TP113		A	Plastic Tub 500g
1557747	2	#5557391073340002	S1-TP111		A	Plastic Tub 500g
1557748	9	#5557391073340009	S1-TP111		A	Plastic Tub 500g
1557749	6	#6084432669940006	S1-TP112		A	Plastic Tub 500g
1557750	6	#0311441463560006	S1-TP114		A	Plastic Tub 500g
1557751	9	#0311441463560009	S1-TP114		A	Plastic Tub 500g
1557752	2	#6547945433540002	S1-TP115		A	Plastic Tub 500g
1557753	3	#7308259884490003	S1-BH121		A	Plastic Tub 500g
1557754	4	#5520789993690004	S1-BH110		A	Plastic Tub 500g
1557755	107	#5930538818200015	S1-BH110		A	Plastic Tub 500g
1557756	5	#0957395206650005	S1-BH102		A	Plastic Tub 500g
1557757	1	#2569792309100003	S1-BH122		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

Key

U	UKAS accredited
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N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
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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



Final Report

Report No.:	22-49093-1		
Initial Date of Issue:	05-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	23-Dec-2022
Order No.:	2001	Date Instructed:	23-Dec-2022
No. of Samples:	4		
Turnaround (Wkdays):	5	Results Due:	05-Jan-2023
Date Approved:	05-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:				22-49093	22-49093	22-49093	22-49093
Quotation No.: Q22-28967	Chemtest Sample ID.:				1569154	1569155	1569156	1569157
Order No.: 2001	Client Sample Ref.:				1	109	106	8
	Client Sample ID.:				#97640203310 80002	#61009797668 40020	#21478663534 50017	#25029848527 60014
	Sample Location:				S1-BH114B	S1-BH105	S1-BH103	S1-BH103
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.2	3.2	1.4	6.2
	Bottom Depth (m):				0.4	4.2	2.2	6.65
Determinand	Accred.	SOP	Units	LOD				
Moisture	N	2030	%	0.020	6.6	18	8.5	14
pH (2.5:1)	N	2010		4.0	[A] 8.3	[A] 8.2	[A] 8.2	[A] 8.5
Sulphate (2:1 Water Soluble) as SO ₄	U	2120	g/l	0.010	[A] < 0.010	[A] 0.18	[A] 0.64	[A] 0.047
Total Sulphur	U	2175	%	0.010	[A] 0.24	[A] 1.6	[A] 0.17	[A] 0.86
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.056	[A] 0.080	[A] 0.23	[A] 0.043

Deviations

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Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1569154	1	#9764020331080002	S1-BH114B		A	Plastic Tub 500g
1569155	109	#6100979766840020	S1-BH105		A	Plastic Tub 500g
1569156	106	#2147866353450017	S1-BH103		A	Plastic Tub 500g
1569157	8	#2502984852760014	S1-BH103		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

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<	"less than"
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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

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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



Final Report

Report No.:	23-00130-1		
Initial Date of Issue:	10-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	05-Jan-2023
Order No.:	2001	Date Instructed:	05-Jan-2023
No. of Samples:	6		
Turnaround (Wkdays):	5	Results Due:	11-Jan-2023
Date Approved:	10-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:				23-00130	23-00130	23-00130	23-00130	23-00130	23-00130
Quotation No.: Q22-28967	Chemtest Sample ID.:				1570137	1570138	1570139	1570140	1570141	1570142
Order No.: 2001	Client Sample Ref.:				7	4	101	11	7	10
	Client Sample ID.:				#30800351235 40007	#71121986383 00004	#50674917432 70021	#12591371178 80011	#27201286064 00007	#27201286064 00010
	Sample Location:				S1-BH109	S1-BH116	S1-BH101	S1-BH101	S1-BH106	S1-BH106
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				3.20	0.70	1.20	6.00	2.00	5.00
	Bottom Depth (m):				3.65	1.20	2.00	6.45	2.45	5.45
Determinand	Accred.	SOP	Units	LOD						
Moisture	N	2030	%	0.020	18	5.3	7.7	6.7	13	19
pH (2.5:1)	N	2010		4.0	[A] 8.9	[A] 8.6	[A] 8.4	[A] 7.8	[A] 8.6	[A] 8.1
Sulphate (2:1 Water Soluble) as SO ₄	U	2120	g/l	0.010	[A] 0.062	[A] 0.045	[A] 0.26	[A] 0.17	[A] 0.018	[A] 0.094
Total Sulphur	U	2175	%	0.010	[A] 0.52	[A] 0.30	[A] 0.18	[A] 0.49	[A] 0.32	[A] 0.54
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.043	[A] 0.095	[A] 0.069	[A] 0.069	[A] 0.041	[A] 0.060

Deviations

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Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1570137	7	#3080035123540007	S1-BH109		A	Plastic Tub 500g
1570138	4	#7112198638300004	S1-BH116		A	Plastic Tub 500g
1570139	101	#5067491743270021	S1-BH101		A	Plastic Tub 500g
1570140	11	#1259137117880011	S1-BH101		A	Plastic Tub 500g
1570141	7	#2720128606400007	S1-BH106		A	Plastic Tub 500g
1570142	10	#2720128606400010	S1-BH106		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

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- D - Broken Container
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Appendix V

Geoenvironmental Testing

Eurofins Chemtest Lab Report

22-43217, 22-43423, 22-43443,
22-43598, 22-43782, 22-44170,
22-44357, 22-44359, 22-44618,
22-44869, 22-45031, 22-45069,
22-45196, 22-45200, 22-45716,
22-45966, 22-45971, 22-45973,
22-46262, 22-46488, 22-46649,
22-46652, 22-46681, 22-46901,
22-47278, 22-47318, 22-47321,
22-47450, 22-47806, 22-47960,
22-47963, 22-48189, 22-48361,
22-48913, 22-49095, 23-00082,
23-00084, 23-00188, 23-00189,
23-00268, 23-00268, 23-00270



Final Report

Report No.:	22-43217-1		
Initial Date of Issue:	28-Nov-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	10-Nov-2022
Order No.:		Date Instructed:	10-Nov-2022
No. of Samples:	3		
Turnaround (Wkdays):	10	Results Due:	23-Nov-2022
Date Approved:	28-Nov-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:					22-43217	22-43217
Quotation No.: Q22-28967	Chemtest Sample ID.:					1542829	1542830
Order No.:	Client Sample Ref.:					2	1
	Client Sample ID.:					#73082598844 90002	#65479454335 40001
	Sample Location:					S1-BH121	S1-TP115
	Sample Type:					SOIL	SOIL
	Top Depth (m):					0.50	0.20
	Bottom Depth (m):					0.70	0.30
	Date Sampled:					08-Nov-2022	08-Nov-2022
Determinand	Accred.	SOP	Type	Units	LOD		
pH	U	1010	10:1		N/A	8.8	8.3
Sulphate	U	1220	10:1	mg/l	1.0	2.2	22
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.79	1.4
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.53	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	1.7	1.2
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.1	1.6
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-43217	22-43217	22-43217
Quotation No.: Q22-28967	Chemtest Sample ID.:				1542829	1542830	1542831
Order No.:	Client Sample Ref.:				2	1	2
	Client Sample ID.:				#73082598844 90002	#65479454335 40001	#65479454335 40003
	Sample Location:				S1-BH121	S1-TP115	S1-TP115
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.50	0.20	0.50
	Bottom Depth (m):				0.70	0.30	0.60
	Date Sampled:				08-Nov-2022	08-Nov-2022	08-Nov-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB	NEW-ASB
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
Asbestos by Gravimetry	U	2192	%	0.001	-		-
Total Asbestos	U	2192	%	0.001	-		-
Moisture	N	2030	%	0.020	19	5.6	9.4
pH	U	2010		4.0	8.1	8.1	8.1
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	22	25
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	11	7.6	6.9
Cadmium	U	2455	mg/kg	0.10	0.29	0.17	< 0.10
Chromium	U	2455	mg/kg	0.5	10	4.9	2.5
Copper	U	2455	mg/kg	0.50	48	20	19
Mercury	U	2455	mg/kg	0.05	0.07	0.06	0.05
Nickel	U	2455	mg/kg	0.50	31	14	7.1
Lead	U	2455	mg/kg	0.50	30	24	12
Selenium	U	2455	mg/kg	0.25	1.1	0.69	0.54
Vanadium	U	2455	mg/kg	0.5	12	6.9	2.7
Zinc	U	2455	mg/kg	0.50	73	53	27
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	100	52	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	150	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	150	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-43217	22-43217	22-43217
Quotation No.: Q22-28967	Chemtest Sample ID.:				1542829	1542830	1542831
Order No.:	Client Sample Ref.:				2	1	2
	Client Sample ID.:				#73082598844 90002	#65479454335 40001	#65479454335 40003
	Sample Location:				S1-BH121	S1-TP115	S1-TP115
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.50	0.20	0.50
	Bottom Depth (m):				0.70	0.30	0.60
	Date Sampled:				08-Nov-2022	08-Nov-2022	08-Nov-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD			
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	180	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	180	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	330	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.74	0.68	1.7
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.25
Fluorene	U	2800	mg/kg	0.10	0.29	0.16	0.30
Phenanthrene	U	2800	mg/kg	0.10	2.5	0.79	2.5
Anthracene	U	2800	mg/kg	0.10	0.28	0.17	0.34
Fluoranthene	U	2800	mg/kg	0.10	1.7	0.67	2.5
Pyrene	U	2800	mg/kg	0.10	1.2	0.56	1.7
Benzo[a]anthracene	U	2800	mg/kg	0.10	1.2	0.57	0.90
Chrysene	U	2800	mg/kg	0.10	1.4	0.49	1.3
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	1.7	1.0	1.4
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.77	0.60	0.39
Benzo[a]pyrene	U	2800	mg/kg	0.10	1.3	0.67	0.94
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	1.1	0.76	0.56
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.60	0.43	0.20
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	1.1	0.72	0.49
Total Of 16 PAH's	N	2800	mg/kg	2.0	16	8.3	16
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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.:	22-43423-1		
Initial Date of Issue:	10-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	11-Nov-2022
Order No.:	2001	Date Instructed:	11-Nov-2022
No. of Samples:	6		
Turnaround (Wkdays):	10	Results Due:	24-Nov-2022
Date Approved:	10-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:					22-43423	22-43423
Quotation No.: Q22-28967	Chemtest Sample ID.:					1543718	1543720
Order No.: 2001	Client Sample Ref.:					1	3
	Client Sample ID.:					#39659466193 70001	#30483083441 10003
	Sample Location:					S1-BH122	S1-TP113
	Sample Type:					SOIL	SOIL
	Top Depth (m):					0.20	0.50
	Bottom Depth (m):					0.30	0.60
	Date Sampled:					09-Nov-2022	09-Nov-2022
Determinand	Accred.	SOP	Type	Units	LOD		
pH	U	1010	10:1		N/A	8.5	8.4
Sulphate	U	1220	10:1	mg/l	1.0	1.1	8.5
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	< 0.20	3.2
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	1.4
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	0.96
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	2.4
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	1.9
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:					22-43423	22-43423	22-43423	22-43423	22-43423	22-43423
Quotation No.: Q22-28967	Chemtest Sample ID.:					1543716	1543717	1543718	1543719	1543720	1543721
Order No.: 2001	Client Sample Ref.:					101	102	1	1	3	6
	Client Sample ID.:					#73082598844 90004	#73082598844 90005	#39659466193 70001	#30483083441 10001	#30483083441 10003	#30483083441 10006
	Sample Location:					S1-BH121	S1-BH121	S1-BH122	S1-TP113	S1-TP113	S1-TP113
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					1.20	1.80	0.20	0.20	0.50	0.90
	Bottom Depth (m):					1.40	2.00	0.30	0.30	0.60	1.00
	Date Sampled:					09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022
	Asbestos Lab:					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
Moisture	N	2030	%	0.020	13	70	4.6	11	16	21	
pH	U	2010		4.0	6.8	6.7	7.5	7.8	7.8	5.7	
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.73	< 0.40	< 0.40	< 0.40	< 0.40	
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	95	89	< 10	< 10	17	< 10	
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Arsenic	U	2455	mg/kg	0.5	10	14	6.7	4.6	9.5	3.2	
Cadmium	U	2455	mg/kg	0.10	< 0.10	1.2	< 0.10	< 0.10	0.10	< 0.10	
Chromium	U	2455	mg/kg	0.5	3.9	2.7	4.2	6.7	6.6	11	
Copper	U	2455	mg/kg	0.50	73	29	29	26	51	10	
Mercury	U	2455	mg/kg	0.05	0.18	0.05	< 0.05	< 0.05	0.07	< 0.05	
Nickel	U	2455	mg/kg	0.50	21	9.2	36	7.1	20	6.3	
Lead	U	2455	mg/kg	0.50	46	58	20	17	38	13	
Selenium	U	2455	mg/kg	0.25	2.4	1.3	0.48	0.38	1.1	0.59	
Vanadium	U	2455	mg/kg	0.5	5.8	2.7	6.8	7.0	12	17	
Zinc	U	2455	mg/kg	0.50	52	110	90	62	110	23	
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Organic Matter	U	2625	%	0.40	28	83	11	98	86	1.2	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:					22-43423	22-43423	22-43423	22-43423	22-43423	22-43423
Quotation No.: Q22-28967	Chemtest Sample ID.:					1543716	1543717	1543718	1543719	1543720	1543721
Order No.: 2001	Client Sample Ref.:					101	102	1	1	3	6
	Client Sample ID.:					#73082598844 90004	#73082598844 90005	#39659466193 70001	#30483083441 10001	#30483083441 10003	#30483083441 10006
	Sample Location:					S1-BH121	S1-BH121	S1-BH122	S1-TP113	S1-TP113	S1-TP113
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					1.20	1.80	0.20	0.20	0.50	0.90
	Bottom Depth (m):					1.40	2.00	0.30	0.30	0.60	1.00
	Date Sampled:					09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022	09-Nov-2022
	Asbestos Lab:					DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD							
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	7.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.39	0.50	0.41	1.7	1.3	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.17	0.25	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.28	0.17	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	0.51	< 0.10	2.1	0.95	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.53	0.23	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.27	< 0.10	1.4	0.71	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	0.20	< 0.10	1.0	0.58	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.56	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.0	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	1.2	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.51	0.26	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	11	4.5	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

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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



Final Report

Report No.:	22-43443-1		
Initial Date of Issue:	25-Nov-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	11-Nov-2022
Order No.:		Date Instructed:	11-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	24-Nov-2022
Date Approved:	25-Nov-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

Chemtest Job No: 22-43443							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1543812							Limits			
Sample Ref: 1							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #6547945433540001										
Sample Location: S1-TP115										
Top Depth(m): 0.20										
Bottom Depth(m): 0.30										
Sampling Date: 08-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				28	3	5	6
Loss On Ignition	2610	M	%				8.6	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				3500	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				29	100	--	--
pH	2010	M					7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0008	0.0005	0.0015	0.0057	0.5	2	25	
Barium	1455	U	0.043	0.027	0.086	0.29	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0006	< 0.0005	0.0013	0.0009	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0034	0.0012	0.0067	0.016	0.5	10	30	
Nickel	1455	U	0.0014	< 0.0005	0.0029	0.0020	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0005	< 0.0005	0.0010	0.0007	0.06	0.7	5	
Selenium	1455	U	0.0016	0.0012	0.0031	0.012	0.1	0.5	7	
Zinc	1455	U	< 0.003	0.003	< 0.003	0.022	4	50	200	
Chloride	1220	U	1.4	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.27	0.11	< 1.0	1.3	10	150	500	
Sulphate	1220	U	75	9.4	150	190	1000	20000	50000	
Total Dissolved Solids	1020	N	230	67	460	900	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.7	5.4	< 50	56	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	4.9

Leachate Test Information	
Leachant volume 1st extract/l	0.341
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.248

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
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.
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
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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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

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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

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

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Final Report

Report No.:	22-43598-1		
Initial Date of Issue:	08-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	14-Nov-2022
Order No.:		Date Instructed:	14-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	25-Nov-2022
Date Approved:	08-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:				22-43598
Quotation No.: Q22-28967	Chemtest Sample ID.:				1544565
Order No.:	Client Sample Ref.:				101
	Client Sample ID.:				#25697923091 00008
	Sample Location:				S1-BH122
	Sample Type:				SOIL
	Top Depth (m):				2.00
	Bottom Depth (m):				2.20
	Date Sampled:				10-Nov-2022
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	15
pH	U	2010		4.0	5.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	0.50
Cyanide (Total)	U	2300	mg/kg	0.50	0.90
Arsenic	U	2455	mg/kg	0.5	< 0.5
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	1.4
Copper	U	2455	mg/kg	0.50	3.2
Mercury	U	2455	mg/kg	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	4.5
Lead	U	2455	mg/kg	0.50	0.99
Selenium	U	2455	mg/kg	0.25	0.37
Vanadium	U	2455	mg/kg	0.5	1.0
Zinc	U	2455	mg/kg	0.50	4.8
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	98
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:		22-43598		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1544565		
Order No.:	Client Sample Ref.:		101		
	Client Sample ID.:		#25697923091 00008		
	Sample Location:		S1-BH122		
	Sample Type:		SOIL		
	Top Depth (m):		2.00		
	Bottom Depth (m):		2.20		
	Date Sampled:		10-Nov-2022		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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.

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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

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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

Final Report

Report No.:	22-43782-1		
Initial Date of Issue:	02-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	15-Nov-2022
Order No.:		Date Instructed:	15-Nov-2022
No. of Samples:	2		
Turnaround (Wkdays):	10	Results Due:	28-Nov-2022
Date Approved:	02-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:		22-43782			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1545475			
Order No.:	Client Sample Ref.:		1			
	Sample Location:		S1-BH102			
	Sample Type:		SOIL			
	Top Depth (m):		0.20			
	Bottom Depth (m):		0.30			
	Date Sampled:		11-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.2
Sulphate	U	1220	10:1	mg/l	1.0	15
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.21
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.66
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	4.9
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:				22-43782	22-43782
Quotation No.: Q22-28967	Chemtest Sample ID.:				1545475	1545476
Order No.:	Client Sample Ref.:				1	2
	Sample Location:				S1-BH102	S1-BH102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.50
	Bottom Depth (m):				0.30	0.60
	Date Sampled:				11-Nov-2022	11-Nov-2022
	Asbestos Lab:				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
Moisture	N	2030	%	0.020	9.0	13
pH	U	2010		4.0	8.3	7.7
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.57
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	51	97
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	20	7.1
Cadmium	U	2455	mg/kg	0.10	0.13	0.18
Chromium	U	2455	mg/kg	0.5	19	10
Copper	U	2455	mg/kg	0.50	81	56
Mercury	U	2455	mg/kg	0.05	0.37	0.10
Nickel	U	2455	mg/kg	0.50	21	25
Lead	U	2455	mg/kg	0.50	45	43
Selenium	U	2455	mg/kg	0.25	2.7	0.87
Vanadium	U	2455	mg/kg	0.5	17	14
Zinc	U	2455	mg/kg	0.50	47	60
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	53	81
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence

Client: Jackson Geo Services	Chemtest Job No.:				22-43782	22-43782
Quotation No.: Q22-28967	Chemtest Sample ID.:				1545475	1545476
Order No.:	Client Sample Ref.:				1	2
	Sample Location:				S1-BH102	S1-BH102
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.20	0.50
	Bottom Depth (m):				0.30	0.60
	Date Sampled:				11-Nov-2022	11-Nov-2022
	Asbestos Lab:				DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.8	1.3
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	0.12
Fluorene	U	2800	mg/kg	0.10	< 0.10	0.13
Phenanthrene	U	2800	mg/kg	0.10	0.35	0.52
Anthracene	U	2800	mg/kg	0.10	< 0.10	0.12
Fluoranthene	U	2800	mg/kg	0.10	0.14	0.29
Pyrene	U	2800	mg/kg	0.10	< 0.10	0.23
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	0.13
Chrysene	U	2800	mg/kg	0.10	< 0.10	0.18
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.30
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.11
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	0.12
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	0.17
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.12
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	0.18
Total Of 16 PAH's	N	2800	mg/kg	2.0	2.3	4.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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

Final Report

Report No.:	22-44170-1		
Initial Date of Issue:	20-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	17-Nov-2022
Order No.:	2001	Date Instructed:	18-Nov-2022
No. of Samples:	7		
Turnaround (Wkdays):	10	Results Due:	01-Dec-2022
Date Approved:	20-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:					22-44170	22-44170	22-44170	22-44170
Quotation No.: Q22-28967	Chemtest Sample ID.:					1547516	1547519	1547522	1547523
Order No.: 2001	Client Sample Ref.:					101	8	6	1
	Sample Location:					S1-BH102	S1-TP112	S1-TP111	S1-TP111
	Sample Type:					SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					3.00	0.90	0.90	0.20
	Bottom Depth (m):					3.20	10.00	1.00	0.30
	Date Sampled:					15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022
Determinand	Accred.	SOP	Type	Units	LOD				
pH	U	1010	10:1		N/A	6.3	6.8	6.0	6.7
Sulphate	U	1220	10:1	mg/l	1.0	< 1.0	9.1	16	25
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	3.5	0.49	0.50	4.6
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50	1.9
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.64	< 0.50	5.0	3.3
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	1.3	0.93	1.9	2.6
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50	2.8
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	1.9	< 0.50	0.92
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50	4.2
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	7.3	3.2	5.8	7.1
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-44170	22-44170	22-44170	22-44170	22-44170	22-44170	22-44170
Quotation No.: Q22-28967	Chemtest Sample ID.:				1547516	1547517	1547519	1547520	1547521	1547522	1547523
Order No.: 2001	Client Sample Ref.:				101	3	8	11	5	6	1
	Sample Location:				S1-BH102	S1-TP112	S1-TP112	S1-TP112	S1-TP111	S1-TP111	S1-TP111
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				3.00	0.20	0.90	1.50	0.40	0.90	0.20
	Bottom Depth (m):				3.20	0.30	10.00	1.60	0.50	1.00	0.30
	Date Sampled:				15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022
	Asbestos Lab:					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
Moisture	N	2030	%	0.020	85	21	9.8	29	12	9.8	16
pH	U	2010		4.0	4.7	8.0	7.3	7.7	6.0	5.5	7.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.0	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	34	19	14	39	< 10	58
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	5.4	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	1.0	< 0.50	< 0.50	5.4	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	1.8	18	23	7.5	9.5	6.8	27
Cadmium	U	2455	mg/kg	0.10	< 0.10	0.20	0.13	0.32	0.12	< 0.10	0.27
Chromium	U	2455	mg/kg	0.5	2.8	11	1.5	3.9	9.7	10	8.7
Copper	U	2455	mg/kg	0.50	9.3	120	51	62	29	30	18
Mercury	U	2455	mg/kg	0.05	< 0.05	< 0.05	0.17	0.35	0.07	< 0.05	0.05
Nickel	U	2455	mg/kg	0.50	5.4	43	36	20	19	23	7.4
Lead	U	2455	mg/kg	0.50	6.2	32	36	32	22	19	33
Selenium	U	2455	mg/kg	0.25	0.63	1.6	2.3	1.7	0.93	0.93	1.1
Vanadium	U	2455	mg/kg	0.5	3.7	30	2.8	9.1	12	12	16
Zinc	U	2455	mg/kg	0.50	14	55	45	58	55	64	22
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	88	55	71	100	44	3.1	3.1
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	200	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-44170	22-44170	22-44170	22-44170	22-44170	22-44170	22-44170
Quotation No.: Q22-28967	Chemtest Sample ID.:				1547516	1547517	1547519	1547520	1547521	1547522	1547523
Order No.: 2001	Client Sample Ref.:				101	3	8	11	5	6	1
	Sample Location:				S1-BH102	S1-TP112	S1-TP112	S1-TP112	S1-TP111	S1-TP111	S1-TP111
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				3.00	0.20	0.90	1.50	0.40	0.90	0.20
	Bottom Depth (m):				3.20	0.30	10.00	1.60	0.50	1.00	0.30
	Date Sampled:				15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022	15-Nov-2022
	Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM		DURHAM
Determinand	Accred.	SOP	Units	LOD							
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	200	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	200	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	36	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	180	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	24	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	58	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	35	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.85	1.8	0.99	0.35	0.67	0.47	0.68
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.12	0.24	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	0.13	0.19	0.15	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.32	2.0	1.4	0.42	0.21	< 0.10	0.25
Anthracene	U	2800	mg/kg	0.10	< 0.10	0.42	0.33	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.18	2.8	2.1	0.53	0.12	< 0.10	0.13
Pyrene	U	2800	mg/kg	0.10	0.13	1.9	1.6	0.43	0.12	< 0.10	0.15
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	1.3	0.85	0.19	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	1.8	0.83	0.20	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	2.6	1.2	0.30	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.99	0.44	0.11	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	1.7	0.86	0.15	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	1.1	0.52	0.15	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.18	0.12	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	0.95	0.47	0.16	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	20	12	3.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

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



Amended Report

Report No.:	22-44357-5		
Initial Date of Issue:	14-Dec-2022	Date of Re-Issue:	15-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	18-Nov-2022
Order No.:	2001	Date Instructed:	21-Nov-2022
No. of Samples:	5		
Turnaround (Wkdays):	10	Results Due:	02-Dec-2022
Date Approved:	14-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:					22-44357	22-44357	22-44357
Quotation No.: Q22-28967	Chemtest Sample ID.:					1548421	1548423	1548424
Order No.: 2001	Client Sample Ref.:					2	7	1
	Client Sample ID.:					#03114414635 60002	#03114414635 60007	#42000225764 60001
	Sample Location:					S1-TP114	S1-TP114	S1-BH110
	Sample Type:					SOIL	SOIL	SOIL
	Top Depth (m):					0.1	0.9	0.3
	Bottom Depth (m):					0.15	1.0	0.4
	Date Sampled:					16-Nov-2022	16-Nov-2022	16-Nov-2022
Determinand	Accred.	SOP	Type	Units	LOD			
pH	U	1010	10:1		N/A	7.4	7.9	7.0
Sulphate	U	1220	10:1	mg/l	1.0	7.1	15	9.1
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	0.36	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	0.36	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	< 0.20	0.48	1.1
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.7	< 0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	3.9	0.79	0.81
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	2.5	1.0
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	13	2.6	2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20	< 20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-44357	22-44357	22-44357	22-44357	22-44357
Quotation No.: Q22-28967	Chemtest Sample ID.:				1548421	1548422	1548423	1548424	1548425
Order No.: 2001	Client Sample Ref.:				2	4	7	1	2
	Client Sample ID.:				#03114414635 60002	#03114414635 60004	#03114414635 60007	#42000225764 60001	#42000225764 60002
	Sample Location:				S1-TP114	S1-TP114	S1-TP114	S1-BH110	S1-BH110
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.1	0.3	0.9	0.3	0.6
	Bottom Depth (m):				0.15	0.35	1.0	0.4	0.7
	Date Sampled:				16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022
	Asbestos Lab:				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
Moisture	N	2030	%	0.020	9.0	8.9	6.9	3.3	4.1
pH	M	2010		4.0	4.3	5.9	8.4	7.1	8.2
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	0.44	1.9	1.5	< 0.40	0.41
Sulphate (2:1 Water Soluble) as SO4 mg/l	M	2120	mg/l	10.000	53	140	59	66	100
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	11	11	12	7.0	8.1
Cadmium	M	2455	mg/kg	0.10	< 0.10	0.11	0.21	0.21	0.27
Chromium	M	2455	mg/kg	0.5	1.9	5.7	6.5	6.2	5.0
Copper	M	2455	mg/kg	0.50	17	32	37	37	37
Mercury	M	2455	mg/kg	0.05	< 0.05	0.06	0.12	0.05	0.14
Nickel	M	2455	mg/kg	0.50	3.4	21	25	47	41
Lead	M	2455	mg/kg	0.50	34	36	48	23	23
Selenium	M	2455	mg/kg	0.25	1.5	1.5	2.9	0.83	2.0
Vanadium	U	2455	mg/kg	0.5	4.4	10	8.2	12	7.3
Zinc	M	2455	mg/kg	0.50	11	54	55	120	88
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	26	83	4.4	11	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:					22-44357	22-44357	22-44357	22-44357	22-44357
Quotation No.: Q22-28967	Chemtest Sample ID.:					1548421	1548422	1548423	1548424	1548425
Order No.: 2001	Client Sample Ref.:					2	4	7	1	2
	Client Sample ID.:					#03114414635 60002	#03114414635 60004	#03114414635 60007	#42000225764 60001	#42000225764 60002
	Sample Location:					S1-TP114	S1-TP114	S1-TP114	S1-BH110	S1-BH110
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.1	0.3	0.9	0.3	0.6
	Bottom Depth (m):					0.15	0.35	1.0	0.4	0.7
	Date Sampled:					16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022	16-Nov-2022
	Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD						
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	1.0	0.49	1.2	0.56	0.70	0.70
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	0.43	0.13	< 0.10	< 0.10	< 0.10	0.38
Phenanthrene	M	2800	mg/kg	0.10	1.1	0.30	0.54	0.25	1.7	1.7
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	0.21	< 0.10	0.36	< 0.10	0.13	0.13
Pyrene	M	2800	mg/kg	0.10	0.30	< 0.10	0.30	< 0.10	0.17	0.17
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.24	< 0.10	< 0.10	< 0.10	0.14	0.14
Chrysene	M	2800	mg/kg	0.10	0.33	< 0.10	< 0.10	< 0.10	0.24	0.24
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	0.18	< 0.10	< 0.10	< 0.10	0.19	0.19
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.20	< 0.10	< 0.10	< 0.10	0.15	0.15
Total Of 16 PAH's	N	2800	mg/kg	2.0	4.2	< 2.0	2.5	< 2.0	3.8	3.8
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

Chemtest Job No: 22-44357							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1548422							Limits			
Sample Ref: 4							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #0311441463560004										
Sample Location: S1-TP114										
Top Depth(m): 0.3										
Bottom Depth(m): 0.35										
Sampling Date: 16-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				48	3	5	6
Loss On Ignition	2610	M	%				13	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					5.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.015	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0031	0.0017	0.0062	0.019	0.5	2	25	
Barium	1455	U	0.049	0.022	0.097	0.25	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0015	0.0015	0.0029	0.015	0.5	10	30	
Nickel	1455	U	0.0052	0.0011	0.010	0.017	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0022	0.0013	0.0043	0.014	0.06	0.7	5	
Selenium	1455	U	0.0030	0.0013	0.0060	0.015	0.1	0.5	7	
Zinc	1455	U	0.003	< 0.003	0.006	0.004	4	50	200	
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.21	0.15	< 1.0	1.6	10	150	500	
Sulphate	1220	U	59	8.9	120	160	1000	20000	50000	
Total Dissolved Solids	1020	N	180	56	360	730	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	7.4	4.6	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.9

Leachate Test Information	
Leachant volume 1st extract/l	0.333
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.232

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
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
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane 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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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



Amended Report

Report No.:	22-44359-8		
Initial Date of Issue:	05-Dec-2022	Date of Re-Issue:	06-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	18-Nov-2022
Order No.:	2001	Date Instructed:	18-Nov-2022
No. of Samples:	2		
Turnaround (Wkdays):	7	Results Due:	28-Nov-2022
Date Approved:	05-Dec-2022		
Approved By:			

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

Chemtest Job No: 22-44359							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1548438							Limits			
Sample Ref: 101							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #0138711356620014										
Sample Location: S1-BH102										
Top Depth(m): 3.00										
Bottom Depth(m): 3.20										
Sampling Date: 15-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				60	3	5	6
Loss On Ignition	2610	M	%				11	--	--	10
Total BTEX	2760	M	mg/kg				1.3	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					4.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0080	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.014	0.0038	0.011	0.039	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0010	< 0.0005	0.0008	< 0.0005	0.5	10	70	
Copper	1455	U	0.0043	0.0051	0.0034	0.0020	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0004	< 0.0002	0.0003	< 0.0002	0.5	10	30	
Nickel	1455	U	0.0016	0.0045	0.0013	0.038	0.4	10	40	
Lead	1455	U	0.0011	< 0.0005	0.0009	0.0005	0.5	10	50	
Antimony	1455	U	0.0009	< 0.0005	0.0007	< 0.0005	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	0.021	0.006	0.017	0.057	4	50	200	
Chloride	1220	U	9.1	2.1	< 10	22	800	15000	25000	
Fluoride	1220	U	0.17	0.13	< 1.0	1.2	10	150	500	
Sulphate	1220	U	12	1.0	< 10	14	1000	20000	50000	
Total Dissolved Solids	1020	N	50	16	40	150	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	110	120	90	1100	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	80

Leachate Test Information	
Leachant volume 1st extract/l	0.000
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.084

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

Chemtest Job No: 22-44359							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1548439							Limits			
Sample Ref: 8							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #6084432669940008										
Sample Location: S1-TP112										
Top Depth(m): 0.90										
Bottom Depth(m): 1.00										
Sampling Date: 15-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				39	3	5	6
Loss On Ignition	2610	M	%				17	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					7.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0006	0.0004	0.0011	0.0038	0.5	2	25	
Barium	1455	U	0.040	0.011	0.079	0.15	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0018	0.0024	0.0036	0.023	0.5	10	30	
Nickel	1455	U	0.0007	< 0.0005	0.0014	0.0010	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0006	< 0.0005	0.0012	0.0008	0.06	0.7	5	
Selenium	1455	U	0.0013	< 0.0005	0.0026	0.0018	0.1	0.5	7	
Zinc	1455	U	0.003	< 0.003	0.007	0.005	4	50	200	
Chloride	1220	U	1.8	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.35	0.16	< 1.0	1.9	10	150	500	
Sulphate	1220	U	19	3.4	38	56	1000	20000	50000	
Total Dissolved Solids	1020	N	130	49	270	610	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.3	6.3	< 50	63	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	12

Leachate Test Information	
Leachant volume 1st extract/l	0.327
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.249

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
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.
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
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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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
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<	"less than"
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SOP	Standard operating procedure
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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)

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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

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customerservices@chemtest.com



Amended Report

Report No.:	22-44618-2		
Initial Date of Issue:	12-Dec-2022	Date of Re-Issue:	12-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	21-Nov-2022
Order No.:	2001	Date Instructed:	23-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	06-Dec-2022
Date Approved:	12-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-44618			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1549475			
Order No.: 2001	Client Sample Ref.:		1			
	Client Sample ID.:		#74451491969 70001			
	Sample Location:		S1-BH108			
	Sample Type:		SOIL			
	Top Depth (m):		0.30			
	Bottom Depth (m):		0.40			
	Date Sampled:		17-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	15
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.44
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.7
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.63
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.3
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-44618		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1549475		
Order No.: 2001	Client Sample Ref.:		1		
	Client Sample ID.:		#74451491969 70001		
	Sample Location:		S1-BH108		
	Sample Type:		SOIL		
	Top Depth (m):		0.30		
	Bottom Depth (m):		0.40		
	Date Sampled:		17-Nov-2022		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	8.2
pH	U	2010		4.0	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.71
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	73
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	5.8
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	7.0
Copper	U	2455	mg/kg	0.50	29
Mercury	U	2455	mg/kg	0.05	0.06
Nickel	U	2455	mg/kg	0.50	15
Lead	U	2455	mg/kg	0.50	9.1
Selenium	U	2455	mg/kg	0.25	0.97
Vanadium	U	2455	mg/kg	0.5	3.0
Zinc	U	2455	mg/kg	0.50	28
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-44618		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1549475		
Order No.: 2001	Client Sample Ref.:		1		
	Client Sample ID.:		#74451491969 70001		
	Sample Location:		S1-BH108		
	Sample Type:		SOIL		
	Top Depth (m):		0.30		
	Bottom Depth (m):		0.40		
	Date Sampled:		17-Nov-2022		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	6.5
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.7
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	1.7
Phenanthrene	U	2800	mg/kg	0.10	7.4
Anthracene	U	2800	mg/kg	0.10	0.24
Fluoranthene	U	2800	mg/kg	0.10	1.2
Pyrene	U	2800	mg/kg	0.10	1.3
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.90
Chrysene	U	2800	mg/kg	0.10	1.9
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	1.3
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.28
Benzo[a]pyrene	U	2800	mg/kg	0.10	0.66
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	0.38
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	0.23
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	0.59
Total Of 16 PAH's	N	2800	mg/kg	2.0	20
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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

Final Report

Report No.:	22-44869-1		
Initial Date of Issue:	12-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	22-Nov-2022
Order No.:		Date Instructed:	23-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	06-Dec-2022
Date Approved:	12-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-44869			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1550346			
Order No.:	Client Sample Ref.:		102			
	Sample Location:		S1-BH110			
	Sample Type:		SOIL			
	Top Depth (m):		1.80			
	Bottom Depth (m):		1.90			
	Date Sampled:		18-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	6.6
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	< 0.20
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-44869		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1550346		
Order No.:	Client Sample Ref.:		102		
	Sample Location:		S1-BH110		
	Sample Type:		SOIL		
	Top Depth (m):		1.80		
	Bottom Depth (m):		1.90		
	Date Sampled:		18-Nov-2022		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	1.1
pH	U	2010		4.0	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.87
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	17
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	4.9
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	2.2
Copper	U	2455	mg/kg	0.50	77
Mercury	U	2455	mg/kg	0.05	0.09
Nickel	U	2455	mg/kg	0.50	16
Lead	U	2455	mg/kg	0.50	36
Selenium	U	2455	mg/kg	0.25	1.7
Vanadium	U	2455	mg/kg	0.5	4.7
Zinc	U	2455	mg/kg	0.50	40
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	33
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-44869		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1550346		
Order No.:	Client Sample Ref.:		102		
	Sample Location:		S1-BH110		
	Sample Type:		SOIL		
	Top Depth (m):		1.80		
	Bottom Depth (m):		1.90		
	Date Sampled:		18-Nov-2022		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.13
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.12
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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<	"less than"
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LOD	Limit of detection

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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



Final Report

Report No.:	22-45031-1		
Initial Date of Issue:	02-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	23-Nov-2022
Order No.:	2001	Date Instructed:	23-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	Results Due:	01-Dec-2022
Date Approved:	02-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

Chemtest Job No: 22-45031							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1551055							Limits			
Sample Ref: 102							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #5930538818200010										
Sample Location: S1-BH110										
Top Depth(m): 1.80										
Bottom Depth(m): 1.90										
Sampling Date: 18-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				25	3	5	6
Loss On Ignition	2610	M	%				11	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					7.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.012	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0003	0.0003	0.0005	0.0032	0.5	2	25	
Barium	1455	U	0.031	0.012	0.063	0.15	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0010	< 0.0005	0.0020	0.0015	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0003	0.0002	0.0005	0.0024	0.5	10	30	
Nickel	1455	U	0.0007	< 0.0005	0.0015	0.0011	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0013	0.0007	0.0026	0.0080	0.1	0.5	7	
Zinc	1455	U	0.003	0.003	0.007	0.028	4	50	200	
Chloride	1220	U	1.4	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.36	0.11	< 1.0	1.5	10	150	500	
Sulphate	1220	U	11	2.0	22	33	1000	20000	50000	
Total Dissolved Solids	1020	N	76	47	150	510	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	3.9	2.6	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	1.8

Leachate Test Information	
Leachant volume 1st extract/l	0.347
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.258

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
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.
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
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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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



Amended Report

Report No.:	22-45069-2		
Initial Date of Issue:	04-Dec-2022	Date of Re-Issue:	05-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	23-Nov-2022
Order No.:	2001	Date Instructed:	23-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	Results Due:	01-Dec-2022
Date Approved:	04-Dec-2022		
Approved By:			

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

Chemtest Job No: 22-45069							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1551201							Limits			
Sample Ref: 1							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #7445149196970001										
Sample Location: S1-BH108										
Top Depth(m): 0.30										
Bottom Depth(m): 0.40										
Sampling Date: 17-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				76	3	5	6
Loss On Ignition	2610	M	%				31	--	--	10
Total BTEX	2760	M	mg/kg				0.013	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				90	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				66	100	--	--
pH	2010	M					8.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0008	0.0006	0.0015	0.0063	0.5	2	25	
Barium	1455	U	0.053	0.058	0.10	0.57	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0022	0.0020	0.0043	0.0028	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.012	0.0052	0.024	0.061	0.5	10	30	
Nickel	1455	U	0.0011	0.0005	0.0022	0.0059	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0016	0.0009	0.0033	0.010	0.06	0.7	5	
Selenium	1455	U	0.0040	0.0027	0.0079	0.029	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	1.0	0.33	2.0	4.2	10	150	500	
Sulphate	1220	U	76	18	150	260	1000	20000	50000	
Total Dissolved Solids	1020	N	220	90	430	1100	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	5.7	7.1	< 50	69	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.0

Leachate Test Information	
Leachant volume 1st extract/l	0.337
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.229

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
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2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
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.
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
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

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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



Amended Report

Report No.:	22-45196-2		
Initial Date of Issue:	12-Dec-2022	Date of Re-Issue:	13-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	24-Nov-2022
Order No.:	2001	Date Instructed:	25-Nov-2022
No. of Samples:	1		
Turnaround (Wkdays):	10	Results Due:	08-Dec-2022
Date Approved:	12-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-45196		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1551813		
Order No.: 2001	Client Sample Ref.:		102		
	Client Sample ID.:		#05274161605 70002		
	Sample Location:		S1-BH113		
	Sample Type:		SOIL		
	Top Depth (m):		0.50		
	Bottom Depth (m):		0.60		
	Date Sampled:		21-Nov-2022		
	Asbestos Lab:		NEW-ASB		
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	10
pH	U	2010		4.0	7.6
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	140
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	6.8
Cadmium	U	2455	mg/kg	0.10	0.11
Chromium	U	2455	mg/kg	0.5	4.5
Copper	U	2455	mg/kg	0.50	33
Mercury	U	2455	mg/kg	0.05	0.07
Nickel	U	2455	mg/kg	0.50	38
Lead	U	2455	mg/kg	0.50	20
Selenium	U	2455	mg/kg	0.25	1.2
Vanadium	U	2455	mg/kg	0.5	5.2
Zinc	U	2455	mg/kg	0.50	66
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	32
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-45196		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1551813		
Order No.: 2001	Client Sample Ref.:		102		
	Client Sample ID.:		#05274161605 70002		
	Sample Location:		S1-BH113		
	Sample Type:		SOIL		
	Top Depth (m):		0.50		
	Bottom Depth (m):		0.60		
	Date Sampled:		21-Nov-2022		
	Asbestos Lab:		NEW-ASB		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.39
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Final Report

Report No.:	22-45200-1		
Initial Date of Issue:	12-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	24-Nov-2022
Order No.:		Date Instructed:	25-Nov-2022
No. of Samples:	2		
Turnaround (Wkdays):	10	Results Due:	08-Dec-2022
Date Approved:	12-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-45200			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1551821			
Order No.:	Client Sample Ref.:		103			
	Sample Location:		S1-BH103			
	Sample Type:		SOIL			
	Top Depth (m):		1.00			
	Bottom Depth (m):		1.10			
	Date Sampled:		22-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	7.9
Sulphate	U	1220	10:1	mg/l	1.0	36
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.74
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	4.5
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.4
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-45200	22-45200
Quotation No.: Q22-28967	Chemtest Sample ID.:				1551819	1551821
Order No.:	Client Sample Ref.:				101	103
	Sample Location:				S1-BH103	S1-BH103
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.30	1.00
	Bottom Depth (m):				0.40	1.10
	Date Sampled:				22-Nov-2022	22-Nov-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	9.4	10
pH	U	2010		4.0	8.1	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.42
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	72	240
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	16	11
Cadmium	U	2455	mg/kg	0.10	2.3	0.23
Chromium	U	2455	mg/kg	0.5	8.0	17
Copper	U	2455	mg/kg	0.50	57	40
Mercury	U	2455	mg/kg	0.05	0.59	0.14
Nickel	U	2455	mg/kg	0.50	38	37
Lead	U	2455	mg/kg	0.50	46	150
Selenium	U	2455	mg/kg	0.25	2.0	9.0
Vanadium	U	2455	mg/kg	0.5	9.9	14
Zinc	U	2455	mg/kg	0.50	420	130
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	65	78
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-45200	22-45200
Quotation No.: Q22-28967	Chemtest Sample ID.:				1551819	1551821
Order No.:	Client Sample Ref.:				101	103
	Sample Location:				S1-BH103	S1-BH103
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.30	1.00
	Bottom Depth (m):				0.40	1.10
	Date Sampled:				22-Nov-2022	22-Nov-2022
	Asbestos Lab:				NEW-ASB	NEW-ASB
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.1	1.3
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.45	< 0.10
Fluorene	U	2800	mg/kg	0.10	0.28	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	1.0	1.0
Anthracene	U	2800	mg/kg	0.10	0.30	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.92	0.48
Pyrene	U	2800	mg/kg	0.10	0.67	0.38
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	4.7	3.2
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

Chemtest Job No: 22-45200 Chemtest Sample ID: 1551819 Sample Ref: 101 Sample ID: Sample Location: S1-BH103 Top Depth(m): 0.30 Bottom Depth(m): 0.40 Sampling Date: 22-Nov-2022							Landfill Waste Acceptance Criteria			
			Limits							
			Inert Waste Landfill				Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill		
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				38	3	5	6
Loss On Ignition	2610	U	%				2.0	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				4.9	100	--	--
pH	2010	U					8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				0.015	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0007	0.0004	0.0014	0.0044	0.5	2	25	
Barium	1455	U	0.029	0.031	0.057	0.31	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0005	< 0.0005	0.0010	0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0023	0.0025	0.0046	0.025	0.5	10	30	
Nickel	1455	U	0.0006	< 0.0005	0.0013	0.0007	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0008	< 0.0005	0.0015	0.0008	0.06	0.7	5	
Selenium	1455	U	0.0057	0.0018	0.011	0.022	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	6.7	1.0	13	16	800	15000	25000	
Fluoride	1220	U	0.50	0.29	< 1.0	3.1	10	150	500	
Sulphate	1220	U	240	35	470	560	1000	20000	50000	
Total Dissolved Solids	1020	N	470	130	930	1700	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	3.7	2.6	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	9.4

Leachate Test Information	
Leachant volume 1st extract/l	0.332
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.182

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
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
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane 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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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

Final Report

Report No.:	22-45716-1		
Initial Date of Issue:	04-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	28-Nov-2022
Order No.:		Date Instructed:	05-Dec-2022
No. of Samples:	7		
Turnaround (Wkdays):	5	Results Due:	09-Dec-2022
Date Approved:	04-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-45716			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1554036			
Order No.:	Client Sample Ref.:		107			
	Sample Location:		S1-BH103			
	Sample Type:		SOIL			
	Top Depth (m):		2.20			
	Bottom Depth (m):		2.40			
	Date Sampled:		24-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	35
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.46
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	3.7
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-45716	22-45716	22-45716	22-45716	22-45716	22-45716	22-45716
Quotation No.: Q22-28967	Chemtest Sample ID.:				1554036	1554040	1554041	1554043	1554045	1554049	1554053
Order No.:	Client Sample Ref.:				107	116	2	9	1	11	4
	Sample Location:				S1-BH103	S1-BH103	S1-TP104	S1-TP104	S1-TP103	S1-TP103	S1-TP101
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				2.20	7.00	0.20	0.90	0.20	2.00	0.50
	Bottom Depth (m):				2.40	7.20	0.30	1.00	0.30	2.10	0.60
	Date Sampled:				24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022
	Asbestos Lab:				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
Moisture	N	2030	%	0.020	2.9	64	8.7	15	13	35	6.7
pH	U	2010		4.0	8.2	5.6	7.1	6.8	7.1	6.5	6.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.48	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	0.58
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	7.6	< 0.5	5.3	45	7.9	63	8.0
Cadmium	U	2455	mg/kg	0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.48	< 0.10
Chromium	U	2455	mg/kg	0.5	5.7	0.7	8.7	4.5	14	3.9	7.5
Copper	U	2455	mg/kg	0.50	37	2.3	35	18	27	39	48
Mercury	U	2455	mg/kg	0.05	0.07	< 0.05	< 0.05	0.06	< 0.05	0.07	0.20
Nickel	U	2455	mg/kg	0.50	34	2.0	37	14	26	5.4	23
Lead	U	2455	mg/kg	0.50	20	0.96	19	18	22	100	24
Selenium	U	2455	mg/kg	0.25	1.5	0.38	0.90	2.0	0.89	1.7	1.8
Vanadium	U	2455	mg/kg	0.5	6.1	0.7	9.0	5.9	13	4.9	7.2
Zinc	U	2455	mg/kg	0.50	73	1.6	70	23	67	27	43
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	8.3	54	27	100	41	19	21
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	390	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	67	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	450	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	1100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-45716	22-45716	22-45716	22-45716	22-45716	22-45716	22-45716
Quotation No.: Q22-28967	Chemtest Sample ID.:				1554036	1554040	1554041	1554043	1554045	1554049	1554053
Order No.:	Client Sample Ref.:				107	116	2	9	1	11	4
	Sample Location:				S1-BH103	S1-BH103	S1-TP104	S1-TP104	S1-TP103	S1-TP103	S1-TP101
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				2.20	7.00	0.20	0.90	0.20	2.00	0.50
	Bottom Depth (m):				2.40	7.20	0.30	1.00	0.30	2.10	0.60
	Date Sampled:				24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022	24-Nov-2022
	Asbestos Lab:				DURHAM		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD							
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	1100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	1500	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	0.19	0.16	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

Chemtest Job No: 22-45716							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1554043							Limits			
Sample Ref: 9							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: S1-TP104										
Top Depth(m): 0.90										
Bottom Depth(m): 1.00										
Sampling Date: 24-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				66	3	5	6
Loss On Ignition	2610	U	%				2.6	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					6.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0014	0.0010	0.0028	0.010	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30	
Nickel	1455	U	0.0012	0.0007	0.0024	0.0072	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0008	< 0.0005	0.0015	0.0010	0.06	0.7	5	
Selenium	1455	U	0.0008	0.0006	0.0015	0.0060	0.1	0.5	7	
Zinc	1455	U	0.004	< 0.003	0.008	0.005	4	50	200	
Chloride	1220	U	3.6	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.15	0.11	< 1.0	1.1	10	150	500	
Sulphate	1220	U	4.9	1.1	< 10	16	1000	20000	50000	
Total Dissolved Solids	1020	N	36	15	72	180	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	3.2	5.7	< 50	54	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.223

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

Chemtest Job No: 22-45716							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1554045							Limits			
Sample Ref: 1							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: S1-TP103										
Top Depth(m): 0.20										
Bottom Depth(m): 0.30										
Sampling Date: 24-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				24	3	5	6
Loss On Ignition	2610	U	%				7.3	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					7.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0051	0.0022	0.010	0.023	0.5	2	25	
Barium	1455	U	0.007	< 0.005	0.014	0.0034	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0026	0.0013	0.0051	0.014	0.5	10	70	
Copper	1455	U	0.010	0.0050	0.020	0.0050	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0004	0.0002	0.0008	0.0021	0.5	10	30	
Nickel	1455	U	0.0025	0.0014	0.0049	0.015	0.4	10	40	
Lead	1455	U	0.0074	0.0033	0.015	0.035	0.5	10	50	
Antimony	1455	U	0.0010	< 0.0005	0.0020	< 0.0005	0.06	0.7	5	
Selenium	1455	U	0.0011	0.0007	0.0022	0.0070	0.1	0.5	7	
Zinc	1455	U	0.015	0.007	0.030	0.072	4	50	200	
Chloride	1220	U	2.1	1.9	< 10	19	800	15000	25000	
Fluoride	1220	U	0.26	0.22	< 1.0	2.2	10	150	500	
Sulphate	1220	U	2.1	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	36	17	70	180	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	12	19	< 50	190	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.323
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.087

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence (GCRE)

Chemtest Job No: 22-45716							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1554053							Limits			
Sample Ref: 4							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: S1-TP101										
Top Depth(m): 0.50										
Bottom Depth(m): 0.60										
Sampling Date: 24-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				12	3	5	6
Loss On Ignition	2610	U	%				4.1	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					6.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0002	< 0.0002	0.0004	0.0002	0.5	2	25	
Barium	1455	U	0.029	0.010	0.058	0.12	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0008	< 0.0005	0.0017	0.0009	0.06	0.7	5	
Selenium	1455	U	0.0029	0.0008	0.0058	0.0098	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	1.2	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.21	0.20	< 1.0	2.0	10	150	500	
Sulphate	1220	U	14	2.1	28	34	1000	20000	50000	
Total Dissolved Solids	1020	N	68	30	140	340	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	2.7	11	< 50	100	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	6.7

Leachate Test Information	
Leachant volume 1st extract/l	0.337
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.187

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
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
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane 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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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

Final Report

Report No.:	22-45966-1		
Initial Date of Issue:	06-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 GCRE		
Quotation No.:	Q22-28967	Date Received:	01-Dec-2022
Order No.:	2001	Date Instructed:	05-Dec-2022
No. of Samples:	3		
Turnaround (Wkdays):	5	Results Due:	09-Dec-2022
Date Approved:	06-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:		22-45966			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1555239			
Order No.: 2001	Client Sample Ref.:		1			
	Sample Location:		S1-BH114			
	Sample Type:		SOIL			
	Top Depth (m):		0.20			
	Bottom Depth (m):		0.30			
	Date Sampled:		25-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	7.7
Sulphate	U	1220	10:1	mg/l	1.0	< 1.0
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.41
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.4
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:				22-45966	22-45966	22-45966
Quotation No.: Q22-28967	Chemtest Sample ID.:				1555239	1555241	1555242
Order No.: 2001	Client Sample Ref.:				1	2	6
	Sample Location:				S1-BH114	S1-TP106	S1-TP106
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.20	0.20	0.50
	Bottom Depth (m):				0.30	0.30	0.60
	Date Sampled:				25-Nov-2022	28-Nov-2022	28-Nov-2022
	Asbestos Lab:				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
Moisture	N	2030	%	0.020	13	10	13
pH	U	2010		4.0	8.2	7.9	6.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	66
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	17	7.3	12
Cadmium	U	2455	mg/kg	0.10	0.71	< 0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	13	8.9	14
Copper	U	2455	mg/kg	0.50	130	64	22
Mercury	U	2455	mg/kg	0.05	0.10	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	27	30	22
Lead	U	2455	mg/kg	0.50	67	26	29
Selenium	U	2455	mg/kg	0.25	1.7	0.99	0.71
Vanadium	U	2455	mg/kg	0.5	24	9.4	14
Zinc	U	2455	mg/kg	0.50	96	71	57
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	50	30	3.3
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:				22-45966	22-45966	22-45966
Quotation No.: Q22-28967	Chemtest Sample ID.:				1555239	1555241	1555242
Order No.: 2001	Client Sample Ref.:				1	2	6
	Sample Location:				S1-BH114	S1-TP106	S1-TP106
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.20	0.20	0.50
	Bottom Depth (m):				0.30	0.30	0.60
	Date Sampled:				25-Nov-2022	28-Nov-2022	28-Nov-2022
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.0	< 0.10	0.12
Acenaphthylene	N	2800	mg/kg	0.10	0.15	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.18	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	2.1	< 0.10	< 0.10
Anthracene	U	2800	mg/kg	0.10	0.55	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	3.3	< 0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	2.7	< 0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	1.3	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	2.0	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	2.9	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	0.70	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	1.0	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	0.80	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	0.76	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	19	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 GCRE

Chemtest Job No: 22-45966							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1555242							Limits			
Sample Ref: 6							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: S1-TP106										
Top Depth(m): 0.50										
Bottom Depth(m): 0.60										
Sampling Date: 28-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				1.9	3	5	6
Loss On Ignition	2610	U	%				0.72	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					6.9	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.012	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0005	0.0009	0.0011	0.0088	0.5	2	25	
Barium	1455	U	0.005	< 0.005	0.010	0.0025	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0009	0.0015	0.0019	< 0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	0.0007	< 0.0005	0.0063	0.5	10	50	
Antimony	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.06	0.7	5	
Selenium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.099	0.097	< 1.0	< 1.0	10	150	500	
Sulphate	1220	U	16	6.6	32	70	1000	20000	50000	
Total Dissolved Solids	1020	N	54	19	110	210	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	8.3	17	< 50	170	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.324
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.085

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
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
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane 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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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

Final Report

Report No.:	22-45971-1		
Initial Date of Issue:	09-Jan-2023		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 GCRE		
Quotation No.:	Q22-28967	Date Received:	01-Dec-2022
Order No.:	2001	Date Instructed:	06-Dec-2022
No. of Samples:	4		
Turnaround (Wkdays):	5	Results Due:	12-Dec-2022
Date Approved:	09-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:				22-45971	22-45971	22-45971	22-45971
Quotation No.: Q22-28967	Chemtest Sample ID.:				1555261	1555263	1555264	1555266
Order No.: 2001	Client Sample Ref.:				2	8	2	8
	Sample Location:				S1-TP110	S1-TP110	S1-TP102	S1-TP102
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.10	0.90	0.20	0.90
	Bottom Depth (m):				0.15	1.00	0.30	1.00
	Date Sampled:				29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
	Asbestos Lab:				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
Moisture	N	2030	%	0.020	40	24	11	30
pH	U	2010		4.0	5.9	5.8	6.9	6.5
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.63	< 0.40	< 0.40	0.42
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	< 10	< 10
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	260	7.5	11	8.1
Cadmium	U	2455	mg/kg	0.10	0.17	< 0.10	0.20	< 0.10
Chromium	U	2455	mg/kg	0.5	10	15	17	17
Copper	U	2455	mg/kg	0.50	51	16	38	15
Mercury	U	2455	mg/kg	0.05	0.10	< 0.05	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	7.0	13	39	7.0
Lead	U	2455	mg/kg	0.50	150	16	28	16
Selenium	U	2455	mg/kg	0.25	1.5	0.71	1.5	1.2
Vanadium	U	2455	mg/kg	0.5	21	16	21	19
Zinc	U	2455	mg/kg	0.50	33	31	110	29
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	11	2.7	27	3.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:				22-45971	22-45971	22-45971	22-45971
Quotation No.: Q22-28967	Chemtest Sample ID.:				1555261	1555263	1555264	1555266
Order No.: 2001	Client Sample Ref.:				2	8	2	8
	Sample Location:				S1-TP110	S1-TP110	S1-TP102	S1-TP102
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.10	0.90	0.20	0.90
	Bottom Depth (m):				0.15	1.00	0.30	1.00
	Date Sampled:				29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
	Asbestos Lab:				DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD				
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.13	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	0.29	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.10	< 0.10	0.42	< 0.10
Pyrene	U	2800	mg/kg	0.10	0.11	< 0.10	0.35	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 GCRE

Chemtest Job No: 22-45971							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1555263							Limits			
Sample Ref: 8							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: S1-TP110										
Top Depth(m): 0.90										
Bottom Depth(m): 1.00										
Sampling Date: 29-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	U	%				1.6	3	5	6
Loss On Ignition	2610	U	%				5.5	--	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	U	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	U					5.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0020	0.0029	0.0039	0.029	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0012	0.0019	0.0023	0.019	0.5	10	70	
Copper	1455	U	0.0028	0.0034	0.0054	0.0009	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	< 0.0002	0.0003	< 0.0002	0.0031	0.5	10	30	
Nickel	1455	U	< 0.0005	0.0005	< 0.0005	0.0052	0.4	10	40	
Lead	1455	U	0.0009	0.0014	0.0017	0.014	0.5	10	50	
Antimony	1455	U	0.0009	< 0.0005	0.0017	< 0.0005	0.06	0.7	5	
Selenium	1455	U	< 0.0005	0.0005	< 0.0005	0.0052	0.1	0.5	7	
Zinc	1455	U	< 0.003	0.007	< 0.003	0.067	4	50	200	
Chloride	1220	U	1.3	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.085	0.082	< 1.0	< 1.0	10	150	500	
Sulphate	1220	U	1.0	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	19	6.0	37	64	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	11	21	< 50	210	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	24

Leachate Test Information	
Leachant volume 1st extract/l	0.293
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.059

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 GCRE

Chemtest Job No: 22-45971							Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1555266							Limits		
Sample Ref: 8							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:									
Sample Location: S1-TP102									
Top Depth(m): 0.90									
Bottom Depth(m): 1.00									
Sampling Date: 29-Nov-2022									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%				2.2356		
Loss On Ignition	2610	U	%				6.8--10		
Total BTEX	2760	U	mg/kg				< 0.0106--		
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.101--		
TPH Total WAC	2670	U	mg/kg				< 10500--		
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0100--		
pH	2010	U					6.5-->6		
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020--To evaluateTo evaluate					
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.0067	0.011	0.013	0.11	0.5	2	25
Barium	1455	U	< 0.005	0.006	< 0.0005	0.055	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	0.0053	0.010	0.010	0.099	0.5	10	70
Copper	1455	U	0.0092	0.014	0.017	0.0026	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0007	0.0008	0.0072	0.5	10	30
Nickel	1455	U	0.0011	0.0019	0.0020	0.019	0.4	10	40
Lead	1455	U	0.0042	0.0079	0.0079	0.077	0.5	10	50
Antimony	1455	U	0.0011	0.0008	0.0021	0.0076	0.06	0.7	5
Selenium	1455	U	0.0013	0.0014	0.0024	0.014	0.1	0.5	7
Zinc	1455	U	0.018	0.022	0.034	0.21	4	50	200
Chloride	1220	U	3.2	12	< 10	120	800	15000	25000
Fluoride	1220	U	0.12	0.42	< 1.0	4.1	10	150	500
Sulphate	1220	U	1.3	23	< 10	220	1000	20000	50000
Total Dissolved Solids	1020	N	43	29	81	290	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	21	6.2	< 50	65	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	30

Leachate Test Information	
Leachant volume 1st extract/l	0.274
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.049

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
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
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
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; Dibenzo[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)

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane 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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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



Amended Report

Report No.:	22-45973-2		
Initial Date of Issue:	11-Jan-2023	Date of Re-Issue:	12-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 GCRE		
Quotation No.:	Q22-28967	Date Received:	01-Dec-2022
Order No.:	2001	Date Instructed:	06-Dec-2022
No. of Samples:	6		
Turnaround (Wkdays):	5	Results Due:	12-Dec-2022
Date Approved:	12-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:		22-45973			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1555283			
Order No.: 2001	Client Sample Ref.:		101			
	Sample Location:		S1-BH114			
	Sample Type:		SOIL			
	Top Depth (m):		0.70			
	Bottom Depth (m):		1.00			
	Date Sampled:		29-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.6
Sulphate	U	1220	10:1	mg/l	1.0	3.6
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	1.5
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	0.54
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.5
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	0.72
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	0.52
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	0.97
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:				22-45973	22-45973	22-45973	22-45973	22-45973	22-45973
Quotation No.: Q22-28967	Chemtest Sample ID.:				1555278	1555280	1555283	1555284	1555285	1555286
Order No.: 2001	Client Sample Ref.:				3	9	101	103	2	4
	Sample Location:				S1-TP109	S1-TP109	S1-BH114	S1-BH114	S1-TP105	S1-TP105
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.20	1.00	0.70	1.70	0.20	0.50
	Bottom Depth (m):				0.30	1.10	1.00	1.90	0.30	0.60
	Date Sampled:				28-Nov-2022	28-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
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
Moisture	N	2030	%	0.020	9.9	7.3	13	24	12	7.1
pH	M	2010		4.0	7.2	7.8	7.7	6.7	6.9	6.9
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	0.41	0.56	0.48	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	M	2120	mg/l	10.000	< 10	< 10	< 10	< 10	< 10	12
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	M	2455	mg/kg	0.5	7.1	9.1	13	9.6	18	10
Cadmium	M	2455	mg/kg	0.10	< 0.10	0.50	< 0.10	< 0.10	< 0.10	< 0.10
Chromium	M	2455	mg/kg	0.5	15	13	5.4	9.8	14	16
Copper	M	2455	mg/kg	0.50	33	46	58	7.1	25	50
Mercury	M	2455	mg/kg	0.05	< 0.05	0.09	0.11	< 0.05	0.08	< 0.05
Nickel	M	2455	mg/kg	0.50	29	41	17	7.9	21	26
Lead	M	2455	mg/kg	0.50	21	31	23	13	28	16
Selenium	M	2455	mg/kg	0.25	0.85	0.89	1.1	0.40	1.0	0.90
Vanadium	U	2455	mg/kg	0.5	13	13	9.5	18	15	13
Zinc	M	2455	mg/kg	0.50	71	200	31	14	61	57
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	M	2625	%	0.40	15	22	30	2.0	16	2.4
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:					22-45973	22-45973	22-45973	22-45973	22-45973	22-45973
Quotation No.: Q22-28967	Chemtest Sample ID.:					1555278	1555280	1555283	1555284	1555285	1555286
Order No.: 2001	Client Sample Ref.:					3	9	101	103	2	4
	Sample Location:					S1-TP109	S1-TP109	S1-BH114	S1-BH114	S1-TP105	S1-TP105
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.20	1.00	0.70	1.70	0.20	0.50
	Bottom Depth (m):					0.30	1.10	1.00	1.90	0.30	0.60
	Date Sampled:					28-Nov-2022	28-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022	29-Nov-2022
	Asbestos Lab:					COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD							
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	M	2800	mg/kg	0.10	0.19	0.24	0.45	< 0.10	0.13	0.16	0.16
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	0.42	0.10	0.29	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	0.51	0.11	0.34	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	4.3	0.69	2.2	0.27	0.25	0.25
Anthracene	M	2800	mg/kg	0.10	< 0.10	1.7	0.24	0.93	0.11	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	8.2	0.60	3.8	0.29	0.30	0.30
Pyrene	M	2800	mg/kg	0.10	< 0.10	6.5	0.42	3.0	0.23	0.20	0.20
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	3.0	0.24	1.4	< 0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	< 0.10	2.5	0.29	1.1	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	3.7	0.40	1.7	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	1.3	< 0.10	0.62	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	3.1	0.26	1.3	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	2.1	0.24	0.98	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	0.27	< 0.10	0.14	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	2.1	0.10	0.89	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	40	4.1	19	< 2.0	< 2.0	< 2.0
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - 2 Stage WAC

Project: G22069 GCRE

Chemtest Job No: 22-45973							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1555280							Limits			
Sample Ref: 9							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: S1-TP109										
Top Depth(m): 1.00										
Bottom Depth(m): 1.10										
Sampling Date: 28-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				13	3	5	6
Loss On Ignition	2610	M	%				12	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				45	100	--	--
pH	2010	M					7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0012	0.0008	0.0023	0.0084	0.5	2	25	
Barium	1455	U	0.007	< 0.005	0.013	0.0020	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	0.0007	< 0.0005	0.0063	0.5	10	70	
Copper	1455	U	0.0017	0.0021	0.0033	0.0005	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0005	0.0005	0.0010	0.0045	0.5	10	30	
Nickel	1455	U	0.0012	0.0010	0.0024	0.0096	0.4	10	40	
Lead	1455	U	< 0.0005	0.0006	< 0.0005	0.0058	0.5	10	50	
Antimony	1455	U	0.0017	0.0010	0.0035	0.0099	0.06	0.7	5	
Selenium	1455	U	0.0017	0.0007	0.0033	0.0069	0.1	0.5	7	
Zinc	1455	U	0.004	0.007	0.008	0.067	4	50	200	
Chloride	1220	U	2.1	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.19	0.13	< 1.0	1.3	10	150	500	
Sulphate	1220	U	13	3.9	26	42	1000	20000	50000	
Total Dissolved Solids	1020	N	53	30	110	300	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	47	7.8	94	90	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.3

Leachate Test Information	
Leachant volume 1st extract/l	0.336
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.053

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 GCRE

Chemtest Job No: 22-45973							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1555284							Limits			
Sample Ref: 103							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID:										
Sample Location: S1-BH114										
Top Depth(m): 1.70										
Bottom Depth(m): 1.90										
Sampling Date: 29-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				1.1	3	5	6
Loss On Ignition	2610	M	%				5.0	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				20	100	--	--
pH	2010	M					6.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	< 0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0032	0.0031	0.0062	0.031	0.5	2	25	
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	0.0019	0.0020	0.0037	0.019	0.5	10	70	
Copper	1455	U	0.0046	0.0042	0.0089	0.0066	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30	
Nickel	1455	U	0.0008	< 0.0005	0.0016	0.0012	0.4	10	40	
Lead	1455	U	0.0014	0.0012	0.0026	0.013	0.5	10	50	
Antimony	1455	U	0.0006	< 0.0005	0.0012	0.0009	0.06	0.7	5	
Selenium	1455	U	0.0005	< 0.0005	0.0010	0.0007	0.1	0.5	7	
Zinc	1455	U	0.005	0.008	0.010	0.078	4	50	200	
Chloride	1220	U	2.2	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.11	0.11	< 1.0	1.1	10	150	500	
Sulphate	1220	U	< 1.0	< 1.0	< 10	< 10	1000	20000	50000	
Total Dissolved Solids	1020	N	16	12	30	120	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	23	9.2	< 50	110	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	24

Leachate Test Information	
Leachant volume 1st extract/l	0.294
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.250

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: G22069 GCRE

Chemtest Job No: 22-45973							Landfill Waste Acceptance Criteria		
Chemtest Sample ID: 1555286							Limits		
Sample Ref: 4							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:									
Sample Location: S1-TP105									
Top Depth(m): 0.50									
Bottom Depth(m): 0.60									
Sampling Date: 29-Nov-2022									
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	M	%				3		
Loss On Ignition	2610	M	%				5		
Total BTEX	2760	M	mg/kg				6		
Total PCBs (7 Congeners)	2815	M	mg/kg				1		
TPH Total WAC	2670	M	mg/kg				500		
Total (Of 17) PAH's	2700	N	mg/kg				100		
pH	2010	M					6.9		
Acid Neutralisation Capacity	2015	N	mol/kg	0.0040			--	>6	--
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg		
Arsenic	1455	U	0.0007	0.0006	0.0014	0.0063	0.5	2	25
Barium	1455	U	< 0.005	< 0.005	< 0.0005	< 0.0005	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	0.0008	< 0.0005	0.0016	0.0011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0020	0.0015	0.0040	0.015	0.06	0.7	5
Selenium	1455	U	< 0.0005	0.0006	< 0.0005	0.0050	0.1	0.5	7
Zinc	1455	U	0.020	< 0.003	0.040	0.028	4	50	200
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000
Fluoride	1220	U	0.22	0.19	< 1.0	1.9	10	150	500
Sulphate	1220	U	8.3	1.7	17	26	1000	20000	50000
Total Dissolved Solids	1020	N	30	14	59	160	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	4.1	4.9	< 50	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	7.1

Leachate Test Information	
Leachant volume 1st extract/l	0.337
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.250

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
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
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane 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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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



Final Report

Report No.:	22-46262-1		
Initial Date of Issue:	15-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 GCRE		
Quotation No.:	Q22-28967	Date Received:	02-Dec-2022
Order No.:	2001	Date Instructed:	05-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	5	Results Due:	09-Dec-2022
Date Approved:	15-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:		22-46262			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1556573			
Order No.: 2001	Client Sample Ref.:		1			
	Sample Location:		S1-BH105			
	Sample Type:		SOIL			
	Top Depth (m):		0.20			
	Bottom Depth (m):		0.30			
	Date Sampled:		30-Nov-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	7.3
Sulphate	U	1220	10:1	mg/l	1.0	32
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	1.0
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	3.5
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.2
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:		22-46262		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1556573		
Order No.: 2001	Client Sample Ref.:		1		
	Sample Location:		S1-BH105		
	Sample Type:		SOIL		
	Top Depth (m):		0.20		
	Bottom Depth (m):		0.30		
	Date Sampled:		30-Nov-2022		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	4.1
pH	U	2010		4.0	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	190
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	5.0
Cadmium	U	2455	mg/kg	0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	4.6
Copper	U	2455	mg/kg	0.50	30
Mercury	U	2455	mg/kg	0.05	0.05
Nickel	U	2455	mg/kg	0.50	18
Lead	U	2455	mg/kg	0.50	13
Selenium	U	2455	mg/kg	0.25	0.91
Vanadium	U	2455	mg/kg	0.5	6.5
Zinc	U	2455	mg/kg	0.50	29
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 GCRE

Client: Jackson Geo Services	Chemtest Job No.:		22-46262		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1556573		
Order No.: 2001	Client Sample Ref.:		1		
	Sample Location:		S1-BH105		
	Sample Type:		SOIL		
	Top Depth (m):		0.20		
	Bottom Depth (m):		0.30		
	Date Sampled:		30-Nov-2022		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	32
Toluene	U	2760	µg/kg	1.0	15
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.53
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	0.47
Anthracene	U	2800	mg/kg	0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
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.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
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N	Unaccredited
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SOP	Standard operating procedure
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Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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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

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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



Amended Report

Report No.:	22-46488-2		
Initial Date of Issue:	08-Jan-2023	Date of Re-Issue:	09-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	05-Dec-2022
Order No.:		Date Instructed:	09-Dec-2022
No. of Samples:	4		
Turnaround (Wkdays):	5	Results Due:	15-Dec-2022
Date Approved:	08-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-46488			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1557606			
Order No.:	Client Sample Ref.:		104			
	Sample Location:		S1-BH105			
	Sample Type:		SOIL			
	Top Depth (m):		4.70			
	Bottom Depth (m):		4.90			
	Date Sampled:		01-Dec-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.3
Sulphate	U	1220	10:1	mg/l	1.0	9.8
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.28
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	0.61
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.82
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	3.0
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-46488	22-46488	22-46488	22-46488
Quotation No.: Q22-28967	Chemtest Sample ID.:				1557603	1557604	1557606	1557608
Order No.:	Client Sample Ref.:				101	102	104	106
	Sample Location:				S1-BH105	S1-BH105	S1-BH105	S1-BH105
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.70	2.70	4.70	6.70
	Bottom Depth (m):				1.90	2.90	4.90	6.90
	Date Sampled:				01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
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
Moisture	N	2030	%	0.020	14	16	17	17
pH	U	2010		4.0	8.1	8.5	8.2	8.3
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	130	120	90	26
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	4.9	6.7	7.4	1.7
Cadmium	U	2455	mg/kg	0.10	0.10	0.11	0.15	< 0.10
Chromium	U	2455	mg/kg	0.5	1.4	2.4	2.2	1.0
Copper	U	2455	mg/kg	0.50	35	40	46	28
Mercury	U	2455	mg/kg	0.05	0.26	0.32	0.39	0.36
Nickel	U	2455	mg/kg	0.50	8.1	11	13	4.3
Lead	U	2455	mg/kg	0.50	27	37	43	14
Selenium	U	2455	mg/kg	0.25	1.3	1.8	2.1	1.1
Vanadium	U	2455	mg/kg	0.5	2.9	4.2	5.1	2.3
Zinc	U	2455	mg/kg	0.50	22	30	37	19
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	100	95	86	100
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	26	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	26	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	6.8	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	12	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	11	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	2.1	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	12	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-46488	22-46488	22-46488	22-46488
Quotation No.: Q22-28967	Chemtest Sample ID.:				1557603	1557604	1557606	1557608
Order No.:	Client Sample Ref.:				101	102	104	106
	Sample Location:				S1-BH105	S1-BH105	S1-BH105	S1-BH105
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				1.70	2.70	4.70	6.70
	Bottom Depth (m):				1.90	2.90	4.90	6.90
	Date Sampled:				01-Dec-2022	01-Dec-2022	01-Dec-2022	01-Dec-2022
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD				
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	43	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	69	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	2.6
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	2.4
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	1.6	2.8	3.9	0.55
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	0.24	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	0.30	0.49	0.55	0.29
Fluorene	U	2800	mg/kg	0.10	0.25	0.39	0.41	0.16
Phenanthrene	U	2800	mg/kg	0.10	1.1	1.2	1.2	0.45
Anthracene	U	2800	mg/kg	0.10	0.22	0.17	0.18	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	0.65	0.42	0.48	0.13
Pyrene	U	2800	mg/kg	0.10	0.47	0.34	0.36	0.15
Benzo[a]anthracene	U	2800	mg/kg	0.10	0.28	0.19	0.15	< 0.10
Chrysene	U	2800	mg/kg	0.10	0.41	0.28	0.34	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	0.53	0.40	0.34	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	5.8	6.7	8.2	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	1.4	0.48	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

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



Final Report

Report No.:	22-46649-1		
Initial Date of Issue:	19-Dec-2022		
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Rail Centre of Excellence		
Quotation No.:	Q22-28967	Date Received:	06-Dec-2022
Order No.:	2001	Date Instructed:	06-Dec-2022
No. of Samples:	2		
Turnaround (Wkdays):	5	Results Due:	12-Dec-2022
Date Approved:	19-Dec-2022		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Soil

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services	Chemtest Job No.:				22-46649
Quotation No.: Q22-28967	Chemtest Sample ID.:				1558358
Order No.: 2001	Client Sample Ref.:				2
	Client Sample ID.:				#86933226737 50002
	Sample Location:				S1-BH107
	Sample Type:				SOIL
	Top Depth (m):				0.30
	Bottom Depth (m):				0.40
	Date Sampled:				01-Dec-2022
	Time Sampled:				11:35
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected
Moisture	N	2030	%	0.020	6.3
pH	U	2010		4.0	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	41
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	9.0
Cadmium	U	2455	mg/kg	0.10	0.20
Chromium	U	2455	mg/kg	0.5	4.1
Copper	U	2455	mg/kg	0.50	36
Mercury	U	2455	mg/kg	0.05	0.15
Nickel	U	2455	mg/kg	0.50	8.7
Lead	U	2455	mg/kg	0.50	35
Selenium	U	2455	mg/kg	0.25	2.3
Vanadium	U	2455	mg/kg	0.5	7.1
Zinc	U	2455	mg/kg	0.50	32
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
Organic Matter	U	2625	%	0.40	75
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0

Results - Soil

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services	Chemtest Job No.:		22-46649		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1558358		
Order No.: 2001	Client Sample Ref.:		2		
	Client Sample ID.:		#86933226737 50002		
	Sample Location:		S1-BH107		
	Sample Type:		SOIL		
	Top Depth (m):		0.30		
	Bottom Depth (m):		0.40		
	Date Sampled:		01-Dec-2022		
	Time Sampled:		11:35		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	0.20
Acenaphthylene	N	2800	mg/kg	0.10	0.14
Acenaphthene	U	2800	mg/kg	0.10	0.14
Fluorene	U	2800	mg/kg	0.10	0.55
Phenanthrene	U	2800	mg/kg	0.10	2.0
Anthracene	U	2800	mg/kg	0.10	1.8
Fluoranthene	U	2800	mg/kg	0.10	4.1
Pyrene	U	2800	mg/kg	0.10	4.1
Benzo[a]anthracene	U	2800	mg/kg	0.10	4.4
Chrysene	U	2800	mg/kg	0.10	4.5
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	5.0
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	4.7
Benzo[a]pyrene	U	2800	mg/kg	0.10	4.5
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	4.2
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	4.2
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	4.7
Total Of 16 PAH's	N	2800	mg/kg	2.0	49
Total Phenols	U	2920	mg/kg	0.10	< 0.10

Results - Water

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services	Chemtest Job No.:		22-46649		
Quotation No.: Q22-28967	Chemtest Sample ID.:		1558360		
Order No.: 2001	Client Sample Ref.:		1		
	Client Sample ID.:		#60547307348 00001		
	Sample Location:		SOP003.16		
	Sample Type:		WATER		
	Top Depth (m):		11.00		
	Bottom Depth (m):		11.00		
	Date Sampled:		29-Nov-2022		
	Time Sampled:		10:30		
Determinand	Accred.	SOP	Units	LOD	
pH	U	1010		N/A	7.2
Sulphate	U	1220	mg/l	1.0	200
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	mg/l	0.050	< 0.050
Calcium (Dissolved)	U	1455	mg/l	2.00	72
Total Hardness as CaCO3	U	1270	mg/l	15	290
Arsenic (Dissolved)	U	1455	µg/l	0.20	< 0.20
Boron (Dissolved)	U	1455	µg/l	10.0	520
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	1400
Nickel (Dissolved)	U	1455	µg/l	0.50	4.9
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	0.82
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	17
Chromium (Hexavalent)	U	1490	µg/l	20	[B] < 20
Dissolved Organic Carbon	U	1610	mg/l	2.0	< 2.0
Naphthalene	U	1800	µg/l	0.10	0.15
Acenaphthylene	U	1800	µg/l	0.10	< 0.10
Acenaphthene	U	1800	µg/l	0.10	< 0.10
Fluorene	U	1800	µg/l	0.10	< 0.10
Phenanthrene	U	1800	µg/l	0.10	< 0.10
Anthracene	U	1800	µg/l	0.10	< 0.10
Fluoranthene	U	1800	µg/l	0.10	< 0.10
Pyrene	U	1800	µg/l	0.10	< 0.10
Benzo[a]anthracene	U	1800	µg/l	0.10	< 0.10
Chrysene	U	1800	µg/l	0.10	< 0.10
Benzo[b]fluoranthene	U	1800	µg/l	0.10	< 0.10
Benzo[k]fluoranthene	U	1800	µg/l	0.10	< 0.10
Benzo[a]pyrene	U	1800	µg/l	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	µg/l	0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	µg/l	0.10	< 0.10

Results - Water

Project: G22069 Global Rail Centre of Excellence

Client: Jackson Geo Services	Chemtest Job No.:		22-46649	
Quotation No.: Q22-28967	Chemtest Sample ID.:		1558360	
Order No.: 2001	Client Sample Ref.:		1	
	Client Sample ID.:		#60547307348 00001	
	Sample Location:		SOP003.16	
	Sample Type:		WATER	
	Top Depth (m):		11.00	
	Bottom Depth (m):		11.00	
	Date Sampled:		29-Nov-2022	
	Time Sampled:		10:30	
Determinand	Accred.	SOP	Units	LOD
Benzo[g,h,i]perylene	U	1800	µg/l	0.10
Total Of 16 PAH's	U	1800	µg/l	2.0
Total Phenols	U	1920	mg/l	0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1558360	1	#605473073480000 1	SOP003.16	29-Nov-2022	B	Coloured Winchester 1000ml
1558360	1	#605473073480000 1	SOP003.16	29-Nov-2022	B	EPA Vial 40ml
1558360	1	#605473073480000 1	SOP003.16	29-Nov-2022	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters 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	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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-diphenylcarbazine.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection

Test Methods

SOP	Title	Parameters included	Method summary
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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
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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



Amended Report

Report No.:	22-46652-4		
Initial Date of Issue:	15-Dec-2022	Date of Re-Issue:	16-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	05-Dec-2022
Order No.:	2001	Date Instructed:	06-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	Results Due:	14-Dec-2022
Date Approved:	15-Dec-2022		
Approved By:			

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

Chemtest Job No: 22-46652 Chemtest Sample ID: 1558367 Sample Ref: 2 Sample ID: #8693322673750002 Sample Location: S1-BH107 Top Depth(m): 0.30 Bottom Depth(m): 0.40 Sampling Date: 01-Dec-2022							Landfill Waste Acceptance Criteria			
			Limits							
			Inert Waste Landfill				Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill		
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				31	3	5	6
Loss On Ignition	2610	M	%				16	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					9.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0007	0.0005	0.0014	0.0053	0.5	2	25	
Barium	1455	U	0.36	0.23	0.71	2.4	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0057	0.0006	0.011	0.0083	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.011	0.0037	0.022	0.048	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0017	0.0007	0.0033	0.0086	0.06	0.7	5	
Selenium	1455	U	0.0009	0.0006	0.0019	0.0061	0.1	0.5	7	
Zinc	1455	U	0.003	< 0.003	0.006	0.005	4	50	200	
Chloride	1220	U	20	2.8	40	53	800	15000	25000	
Fluoride	1220	U	0.20	0.17	< 1.0	1.7	10	150	500	
Sulphate	1220	U	16	5.6	32	71	1000	20000	50000	
Total Dissolved Solids	1020	N	260	100	510	1300	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	6.0	3.5	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	13

Leachate Test Information	
Leachant volume 1st extract/l	0.323
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.252

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
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.
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
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
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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



Amended Report

Report No.:	22-46681-2		
Initial Date of Issue:	16-Dec-2022	Date of Re-Issue:	16-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	06-Dec-2022
Order No.:	2001	Date Instructed:	06-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	Results Due:	14-Dec-2022
Date Approved:	16-Dec-2022		
Approved By:			

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

Chemtest Job No: 22-46681							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1558633							Limits			
Sample Ref: 107							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #2147866353450018										
Sample Location: S1-BH103										
Top Depth(m): 2.20										
Bottom Depth(m): 2.40										
Sampling Date: 24-Nov-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				1.5	3	5	6
Loss On Ignition	2610	M	%				8.3	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				< 10	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				< 2.0	100	--	--
pH	2010	M					7.7	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg				< 0.0020	--	To evaluate	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0006	0.0003	0.0011	0.0031	0.5	2	25	
Barium	1455	U	0.030	0.028	0.060	0.28	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0007	< 0.0005	0.0014	0.0006	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0044	0.0025	0.0088	0.027	0.5	10	30	
Nickel	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0009	< 0.0005	0.0017	0.0007	0.06	0.7	5	
Selenium	1455	U	0.017	0.0031	0.034	0.043	0.1	0.5	7	
Zinc	1455	U	< 0.003	< 0.003	< 0.003	< 0.003	4	50	200	
Chloride	1220	U	5.1	1.1	10	14	800	15000	25000	
Fluoride	1220	U	0.44	0.27	< 1.0	2.8	10	150	500	
Sulphate	1220	U	160	28	320	390	1000	20000	50000	
Total Dissolved Solids	1020	N	390	120	790	1400	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	4.7	4.1	< 50	< 50	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	2.9

Leachate Test Information	
Leachant volume 1st extract/l	0.345
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.144

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
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.
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
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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



Amended Report

Report No.:	22-46901-2		
Initial Date of Issue:	11-Jan-2023	Date of Re-Issue:	11-Jan-2023
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt James Power		
Project	G22069 Global Centre of Rail Excellence (GCRE)		
Quotation No.:	Q22-28967	Date Received:	07-Dec-2022
Order No.:	2001	Date Instructed:	13-Dec-2022
No. of Samples:	3		
Turnaround (Wkdays):	5	Results Due:	19-Dec-2022
Date Approved:	11-Jan-2023		
Approved By:			
Details:	Stuart Henderson, Technical Manager		

Results - Leachate

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:		22-46901			
Quotation No.: Q22-28967	Chemtest Sample ID.:		1559734			
Order No.: 2001	Client Sample Ref.:		101			
	Sample Location:		S1-BH107			
	Sample Type:		SOIL			
	Top Depth (m):		1.0			
	Bottom Depth (m):		1.1			
	Date Sampled:		06-Dec-2022			
Determinand	Accred.	SOP	Type	Units	LOD	
pH	U	1010	10:1		N/A	8.5
Sulphate	U	1220	10:1	mg/l	1.0	2.5
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	1.9
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	1.1
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	3.9
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	2.2
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	1.6
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	1.1
Vanadium (Dissolved)	U	1455	10:1	µg/l	0.50	1.6
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	6.2
Chromium (Hexavalent)	U	1490	10:1	µg/l	20	< 20
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-46901	22-46901	22-46901
Quotation No.: Q22-28967	Chemtest Sample ID.:				1559733	1559734	1559736
Order No.: 2001	Client Sample Ref.:				116	101	105
	Sample Location:				S1-BH105	S1-BH107	S1-BH107
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				9.6	1.0	5.0
	Bottom Depth (m):				9.7	1.1	5.1
	Date Sampled:				05-Dec-2022	06-Dec-2022	06-Dec-2022
	Asbestos Lab:				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
Moisture	N	2030	%	0.020	14	15	2.8
pH	U	2010		4.0	5.9	8.4	8.2
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.43	< 0.40	1.0
Sulphate (2:1 Water Soluble) as SO4 mg/l	U	2120	mg/l	10.000	< 10	< 10	590
Cyanide (Free)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Arsenic	U	2455	mg/kg	0.5	7.6	11	9.9
Cadmium	U	2455	mg/kg	0.10	< 0.10	0.19	0.15
Chromium	U	2455	mg/kg	0.5	14	8.6	33
Copper	U	2455	mg/kg	0.50	22	35	28
Mercury	U	2455	mg/kg	0.05	< 0.05	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	23	25	37
Lead	U	2455	mg/kg	0.50	18	19	23
Selenium	U	2455	mg/kg	0.25	0.61	0.92	1.1
Vanadium	U	2455	mg/kg	0.5	12	12	41
Zinc	U	2455	mg/kg	0.50	62	76	77
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	10	9.7	7.9
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: G22069 Global Centre of Rail Excellence (GCRE)

Client: Jackson Geo Services	Chemtest Job No.:				22-46901	22-46901	22-46901
Quotation No.: Q22-28967	Chemtest Sample ID.:				1559733	1559734	1559736
Order No.: 2001	Client Sample Ref.:				116	101	105
	Sample Location:				S1-BH105	S1-BH107	S1-BH107
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				9.6	1.0	5.0
	Bottom Depth (m):				9.7	1.1	5.1
	Date Sampled:				05-Dec-2022	06-Dec-2022	06-Dec-2022
	Asbestos Lab:				DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Naphthalene	U	2800	mg/kg	0.10	2.5	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2800	mg/kg	0.10	< 0.10	0.28	< 0.10
Anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2800	mg/kg	0.10	< 0.10	0.25	< 0.10
Pyrene	U	2800	mg/kg	0.10	< 0.10	0.18	< 0.10
Benzo[a]anthracene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	2.5	< 2.0	< 2.0
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
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
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
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.
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.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
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

Test Methods

SOP	Title	Parameters included	Method summary
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and Trimethylphenols Note: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	Compliance Test for Leaching of Granular Waste Material and Sludge

Report Information

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U/S	Unsuitable Sample
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<	"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)

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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

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customerservices@chemtest.com



Amended Report

Report No.:	22-47278-4		
Initial Date of Issue:	20-Dec-2022	Date of Re-Issue:	21-Dec-2022
Client	Jackson Geo Services		
Client Address:	Northwood Farm Coxbridge Road Baltonsborough Somerset BA68 RA		
Contact(s):	Adam Putt		
Project	G22069 Global Centre of Rail Excellence		
Quotation No.:	Q22-28967	Date Received:	09-Dec-2022
Order No.:	2001	Date Instructed:	09-Dec-2022
No. of Samples:	1		
Turnaround (Wkdays):	7	Results Due:	19-Dec-2022
Date Approved:	20-Dec-2022		
Approved By:			

Details: Stuart Henderson, Technical
Manager

Results - 2 Stage WAC

Project: G22069 Global Centre of Rail Excellence

Chemtest Job No: 22-47278							Landfill Waste Acceptance Criteria			
Chemtest Sample ID: 1561595							Limits			
Sample Ref: 101							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID: #3407941713650008										
Sample Location: S1-BH105										
Top Depth(m): 1.70										
Bottom Depth(m): 1.90										
Sampling Date: 01-Dec-2022										
Determinand	SOP	Accred.	Units							
Total Organic Carbon	2625	M	%				62	3	5	6
Loss On Ignition	2610	M	%				19	--	--	10
Total BTEX	2760	M	mg/kg				< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg				< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg				140	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg				6.5	100	--	--
pH	2010	M					8.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0020	--	To evaluate	To evaluate			
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg			
Arsenic	1455	U	0.0007	0.0004	0.0014	0.0044	0.5	2	25	
Barium	1455	U	0.024	0.023	0.046	0.23	20	100	300	
Cadmium	1455	U	< 0.00011	< 0.00011	< 0.00011	< 0.00011	0.04	1	5	
Chromium	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	70	
Copper	1455	U	0.0012	0.0009	0.0024	0.0016	2	50	100	
Mercury	1455	U	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	1455	U	0.0004	0.0003	0.0007	0.0029	0.5	10	30	
Nickel	1455	U	0.0021	< 0.0005	0.0041	0.0028	0.4	10	40	
Lead	1455	U	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.5	10	50	
Antimony	1455	U	0.0013	0.0007	0.0025	0.0075	0.06	0.7	5	
Selenium	1455	U	0.0090	0.0013	0.018	0.023	0.1	0.5	7	
Zinc	1455	U	0.007	0.003	0.013	0.035	4	50	200	
Chloride	1220	U	< 1.0	< 1.0	< 10	< 10	800	15000	25000	
Fluoride	1220	U	0.26	0.16	< 1.0	1.7	10	150	500	
Sulphate	1220	U	110	15	210	270	1000	20000	50000	
Total Dissolved Solids	1020	N	240	66	460	880	4000	60000	100000	
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-	
Dissolved Organic Carbon	1610	U	4.9	6.1	< 50	60	500	800	1000	

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	15

Leachate Test Information	
Leachant volume 1st extract/l	0.319
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.231

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
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
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.
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
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; Dibenzo[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)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge
650	Characterisation of Waste (Leaching WAC)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

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