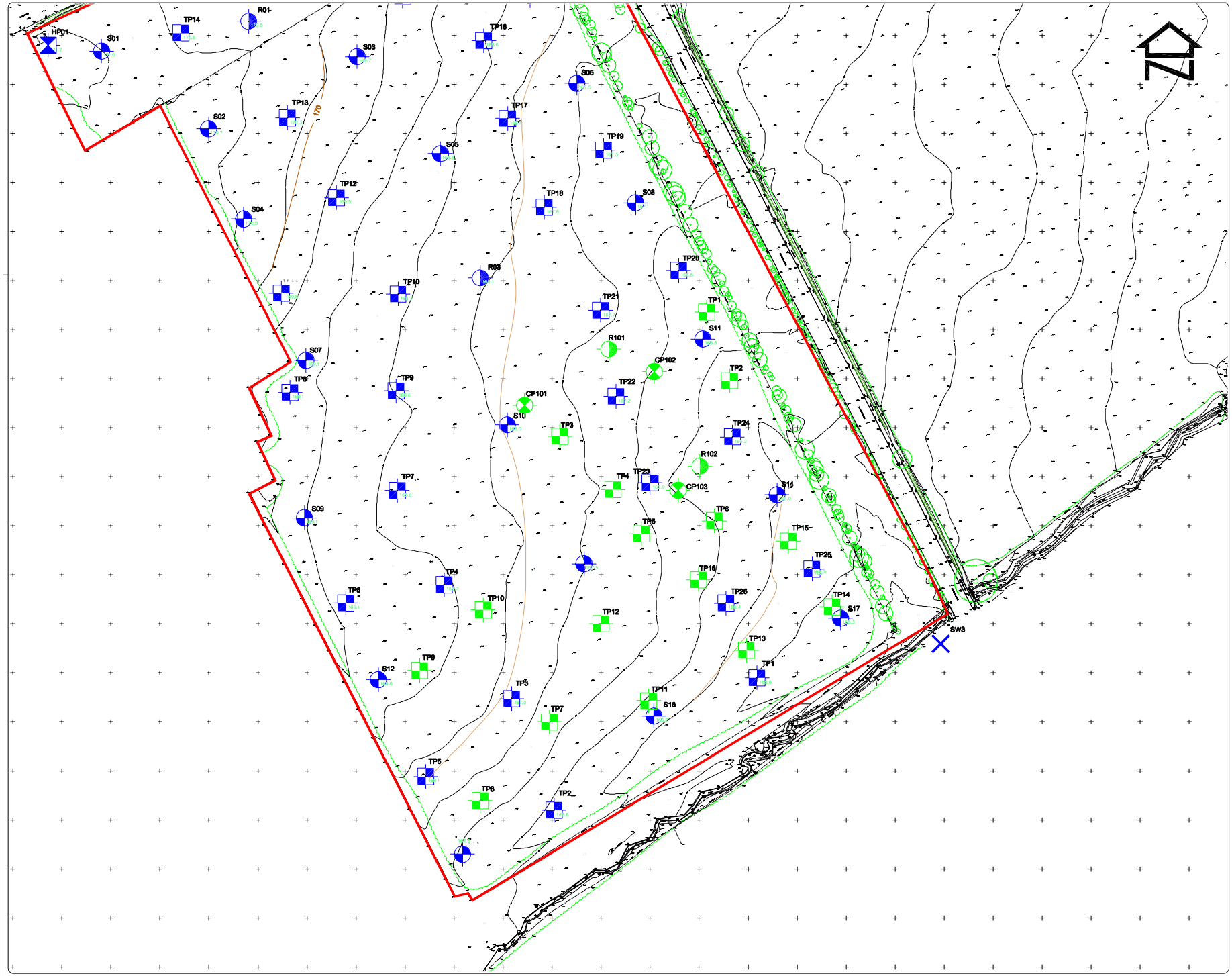
Appendix 1

JOHNSON POOLE & BLOOMER CONSULTANTS GEO-ENVIRONMENTAL & MINERALS 50 SPEIRS WHARF GLASGOW G49TH TEL: 0141 331 1456



REPRESENTS LOCATION OF TRIAL PITS CARRIED OUT BY JOHNSON POOLE & BLOOMER MAY 2022

REPRESENTS LOCATION OF SOIL BOREHOLE CARRIED OUT BY KIRKS LABORATORIES LTD MAY 2022

REPRESENTS LOCATION OF SURFACE BOREHOLES CARRIED OUT BY ROCKSOFT LTD MAY 2022

REPRESENTS LOCATION OF HAND PIT CARRIED OUT BY JOHNSON POOLE & BLOOMER MAY 2022

REPRESENTS LOCATION OF SURFACE WATER SAMPLES OBTAINED BY JOHNSON POOLE & BLOOMER

REPRESENTS LOCATION OF ADDITIONAL TRIAL PITS PROPOSED BY JOHNSON POOLE & BLOOMER - JUNE 2024

PROPOSED LOCATION OF ADDITIONAL CPT PROBE BOREHOLES

REPRESENTS LOCATION OF ADDITIONAL PROPOSED BOREHOLES BY KIRKS LABORATORIES - JUNE 2024

THE COPYRIGHT IN THIS DRAWING IS OWNED BY JOHNSON POOLE & BLOOMER LIMITED AND MAY NOT BE REPRODUCED, PUBLISHED OR OTHERWISE MADE AVAILABLE, WHOLLY OR IN PART, TO ANY PERSON OR COMPANY EXCEPT AS EXPRESSLY AGREED BY JOHNSON POOLE & BLOOMER LTD. ANY ALTERATIONS TO DRAWINGS MUST BE MADE ONLY BY JOHNSON POOLE & BLOOMER LTD. DRAWINGS MUST NOT BE SCALED. DIMENSIONS MUST BE CHECKED ON SITE BY THE CLIENT'S APPROPRIATE PERSONNEL WITH ANY QUERIES DIRECTLY RELATED TO ITS CONSTRUCTION.

Johnson Poole & Bloomer Consultants
GEO-ENVIRONMENTAL & MINERALS

Midlothian

BEESLACK,
PENICUIK

PROPOSED LOCATIONS OF ADDITIONAL SITE INVESTIGATION

FF	ARB
1:1,000	A2
JUN 2024	WG684-45/R/F/03

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP101

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 3.00m			P427

Location	Dates	Engineer	Sheet
	23/08/2024	JOHNSON POOLE & BLOOMER	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.10	TOPSOIL		
0.20	E1						Dense brown clayey fine to coarse SAND and fine to coarse GRAVEL with cobbles		
0.50	E2								
1.00	E3								
1.20-1.65	SPT N=35			4,8/8,9,8,10					
1.20-1.65	B1								
						(3.30)			
3.00-3.20	SPT 50/50			9,18/50					
				23/08/2024:DRY		3.40	#OBSTRUCTION (Boulder)		
3.40-3.40	SPT 50*/0			50/			Complete at 3.40m		

Remarks
CP101 terminated on an obstruction at a depth of 3.40m. CP101A was put down at an adjacent location
# Denotes driller's description
Chiselling from 1.80m to 2.60m for 1.00 hour. Chiselling from 3.20m to 3.40m for 1.00 hour. Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)	Logged By
1:50	SM

Figure No. P427.CP101

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP101A

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 7.00m			P427
	Location	**Dates**	**Engineer**	**Sheet**
		23/08/2024-26/08/2024	JOHNSON POOLE & BLOOMER	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.10	TOPSOIL		
						(2.90)	Dense brown clayey fine to coarse SAND and fine to coarse GRAVEL with cobbles		
				23/08/2024:DRY		3.00	Medium strength firm, locally stiff consistency grey sandy gravelly CLAY with cobbles. Gravel content is fine to coarse		
3.00-3.45	U1			26/08/2024:DRY 36 blows					
3.50	B2								
4.00-4.45	SPT N=24			5,5/6,7,6,5					
4.00-4.45	B3								
5.00-5.45	U4			39 blows					
5.50	B5								
6.50-6.95	SPT N=25			6,6/8,6,5,6					
6.50-6.95	B6								
						(9.35)			
8.00-8.42	U7			42 blows					
8.50	B8								
9.50-9.95	SPT N=28			5,6/6,8,6,8					
9.50-9.95	B9								

Remarks
# Denotes driller's description
Chiselling from 1.30m to 1.80m for 1.00 hour. Chiselling from 7.10m to 7.60m for 1.00 hour. Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)	Logged By
1:50	SJ/PM

Figure No. P427.CP101A

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP101A

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 7.00m			P427

Location	Dates	Engineer	Sheet
	23/08/2024-26/08/2024	JOHNSON POOLE & BLOOMER	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.00-11.45	U10			46 blows					
12.30-12.35	SPT 50*/50			50/ 26/08/2024:DRY		12.35	#OBSTRUCTION (Bedrock or boulder) Complete at 12.35m		

Remarks
# Denotes driller's description
Chiselling from 11.80m to 12.30m for 1.00 hour.

Scale (approx)	Logged By
1:50	SJ/PM

Figure No. P427.CP101A

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP101B

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 8.00m			P427

Location	Dates	Engineer	Sheet
	27/08/2024-28/08/2024	JOHNSON POOLE & BLOOMER	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.10	TOPSOIL		
						(2.90)	Dense brown clayey fine to coarse SAND and fine to coarse GRAVEL with cobbles		
				Water strike(1) at 3.00m.		3.00	Medium strength firm, locally stiff consistency grey sandy gravelly CLAY with cobbles. Gravel content is fine to coarse		▽1
				27/08/2024:DRY 28/08/2024:DRY					

Remarks
# Denotes driller's description
Chiselling from 4.80m to 5.10m for 1.00 hour. Chiselling from 8.70m to 9.30m for 1.00 hour. Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)	Logged By
1:50	SF

Figure No. P427.CP101B

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP101B

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 8.00m			P427
	Location	**Dates**	**Engineer**	**Sheet**
		27/08/2024-28/08/2024	JOHNSON POOLE & BLOOMER	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(15.60)			
12.50-12.95 12.50-12.95	SPT N=38 B1			6,8/10,9,11,8					
14.00-14.45	U2			72 blows					
15.50-15.95 15.50-15.95	SPT N=36 B3			9,10/10,8,9,9					
17.00-17.45	U4			79 blows					
				28/08/2024:DRY		18.60	#OBSTRUCTION (Bedrock or boulder)		
18.60-18.60	SPT 50*/0			50/			Complete at 18.60m		

Remarks
# Denotes driller's description
Chiselling from 13.20m to 13.60m for 1.00 hour. Chiselling from 18.30m to 18.60m for 1.00 hour.

Scale (approx)	Logged By
1:50	SF

Figure No. P427.CP101B

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP102

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 7.00m			P427

Location	Dates	Engineer	Sheet
	30/08/2024-02/09/2024	JOHNSON POOLE & BLOOMER	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.10	TOPSOIL		
0.20	E1						Medium dense brown clayey gravelly fine to coarse SAND with rootlets and cobbles. Gravel content is fine to coarse		
0.50	E2								
1.00	E3								
1.20-1.65 1.20-1.65	SPT N=26 B1			5,6/6,8,6,6		(2.50)			
2.00-2.45 2.00-2.45	SPT N=27 B2			6,8/6,6,8,7					
						2.60	Stiff consistency brownish grey sandy gravelly CLAY with cobbles. Gravel content is fine to coarse		
3.00-3.45	U3			48 blows					
4.00-4.45 4.00-4.45	SPT N=29 B4			5,6/6,7,7,9					
5.00-5.45	U5			52 blows					
6.50-6.95 6.50-6.95	SPT N=29 B6			8,6/6,8,9,6					
8.00-8.45	U7			51 blows			...at 8.00m, medium strength firm consistency		
						(11.40)			
9.50-9.95 9.50-9.95	SPT N=27 B8			7,6/6,8,7,6 30/08/2024:DRY					
				03/09/2024:6.00m					

Remarks
# Denotes driller's description
Chiselling from 5.80m to 6.10m for 1.00 hour. Chiselling from 7.20m to 7.40m for 1.00 hour. Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)	Logged By
1:50	PM

Figure No. P427.CP102

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP102

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 7.00m			P427
	Location	**Dates**	**Engineer**	**Sheet**
		30/08/2024-02/09/2024	JOHNSON POOLE & BLOOMER	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.00-11.45	B9			UNSUCCESSFUL U100					
11.00-11.45	U			28 blows					
12.50-12.95	SPT N=17			3,3/5,3,4,5			...below 12.50m, firm consistency		
12.50-12.95	B10								
						14.00	Firm consistency grey sandy gravelly CLAY with cobbles. Gravel content is fine to coarse		
14.00-14.45	SPT N=11			3,2/2,3,4,2					
14.00-14.45	B11								
15.50-15.95	SPT N=13			4,3/3,4,3,3		(3.10)			
15.50-15.95	B12								
				03/09/2024:15.10m		17.10	#OBSTRUCTION (Bedrock or boulder)		
17.10-17.10	SPT 50*/0			50/			Complete at 17.10m		

Remarks
# Denotes driller's description
Chiselling from 16.80m to 17.10m for 1.00 hour.

Scale (approx)	Logged By
1:50	PM

Figure No. P427.CP102

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP103

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 7.00m			P427

Location	Dates	Engineer	Sheet
	03/09/2024-05/09/2024	JOHNSON POOLE & BLOOMER	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.55)	TOPSOIL		
0.20	E1								
0.20	E1								
0.50	E2					0.55	Medium dense brown slightly clayey gravelly fine to coarse SAND with cobbles. Gravel content is fine to coarse		
0.50	E2								
1.00	E3								
1.00	E3								
1.20-1.65	SPT N=24			4,6/6,8,6,4					
1.20-1.65	B1								
2.00-2.10	SPT 69*/100			19,50/		(2.85)			
						3.40	Very low strength soft consistency brownish grey sandy slightly gravelly CLAY with cobbles. Gravel content is fine to coarse		
4.00-4.45	U2			22 blows					
5.00-5.45	SPT N=15			3,3/4,3,4,4			...below 5.00m, firm consistency		
5.00-5.45	B3								
				03/09/2024:DRY					
				04/09/2024:					
6.50-6.95	B4			UNSUCCESSFUL					
				U100					
6.50-6.95	U			30 blows					
8.00-8.45	SPT N=16			4,4/5,4,3,4					
8.00-8.45	B5					(9.60)			
9.50-9.95	U6			29 blows					

Remarks
# Denotes driller's description
Chiselling from 2.10m to 3.30m for 1.00 hour. Chiselling from 5.50m to 6.00m for 1.00 hour. Chiselling from 7.10m to 7.70m for 1.00 hour.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)	Logged By
1:50	PM

Figure No. P427.CP103

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Site	Borehole Number
BEESLACK HIGH SCHOOL, PENICUIK	CP103

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
Cable Percussion	150mm cased to 7.00m			P427
	Location	**Dates**	**Engineer**	**Sheet**
		03/09/2024-05/09/2024	JOHNSON POOLE & BLOOMER	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
11.00-11.45 11.00-11.45	SPT N=17 B7			5,4/4,3,5,5					
				04/09/2024: 05/09/2024:10.00m UNSUCCESSFUL U100 32 blows					
12.50-12.95	U								
13.00-13.45 13.00-13.45	SPT N=19 B8			4,4/3,5,5,6		13.00	Stiff consistency grey sandy gravelly CLAY with cobbles. Gravel content is fine to coarse		
14.50-14.95 14.50-14.95	SPT N=22 B9			5,3/6,5,5,6		(3.00)			
				05/09/2024:		16.00	#OBSTRUCTION (Bedrock or boulder)		
16.00-16.00	SPT 50*/0			50/			Complete at 16.00m		

Remarks
# Denotes driller's description
Chiselling from 11.80m to 12.00m for 1.00 hour. Chiselling from 15.40m to 16.00m for 1.50 hours.

Scale (approx)	Logged By
1:50	PM

Figure No. P427.CP103

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

Appendix 2

Laboratory Testing References

Laboratory Test	**Standard Specification in Accordance with**
Moisture Content	BS 1377: Part 2 1990: Clause 3.2
Liquid Limit	BS 1377: Part 2 1990: Clause 4.3
Plastic Limit	BS 1377: Part 2 1990: Clause 5.3
Plasticity Index and Liquidity Index	BS 1377: Part 2 1990: Clause 5.4
Density Measurement	BS 1377: Part 2 1990: Clause 7.2
Particle Size Distribution	BS 1377: Part 2 1990: Clause 9.2
Particle Size Distribution	BS 1377: Part 2 1990: Clause 9.3
Particle Size Distribution	BS 1377: Part 2 1990: Clause 9.5
Sulphate Content of Soil and Groundwater *	BS 1377: Part 3 1990: Clause 5.6
pH *	BS 1377: Part 3 1990: Clause 9
California Bearing Ratio	BS 1377: Part 2 1990: Clause 7
One Dimension Consolidation Properties	BS 1377: Part 5 1990: Clause 3
Undrained Shear Strength, Triaxial Compression	BS 1377: Part 7 1990: Clause 8
Undrained Shear Strength, Triaxial Compression (Multi-stage)	BS 1377: Part 7 1990: Clause 9
Dry Density/Moisture Content Relationship (2.5kg Rammer)	BS1377: Part 4 1990: Clause 3.3.3.4
Dry Density/Moisture Content Relationship (4.5kg Rammer)	BS1377: Part 4 1990: Clause 3.5.3.6

***Tests marked with asterisk are not UKAS Accredited.**

AITKEN LABORATORIES LTD

Site : BEESLACK HIGH SCHOOL

Job no. P427

Client : -

Table no. 1

Geotechnical Test Results

Engineer : JOHNSON POOLE & BLOOMER

Sample Identification													
Exp. Point no.	Sample Type/no.	Depth (m)	Moisture Content (%)	Natural Wet Density (Mg/m^3)	Natural Dry Density (Mg/m^3)	<425 (µm)	LL (%)	PL (%)	PI (%)	Average Shear Strength (kPa)	Apparent Cohesion (kPa)	Angle of Shearing Resistance (degrees)	Other Testing and Remarks
CP101A	U	3.00	14	2.29	2.01					59	42	3	Consolidation
CP101B	U	14.00	24	2.14	1.73					53	28	5	Consolidation
CP102	U	3.00	15			58.2	26	14	12				Compaction
CP102	U	8.00	16	2.22	1.92	43.2	30	18	12	60	49	2	
CP103	U	4.00	17	2.14	1.84					19	11	2	Compaction

Originator	Approved
LK	AD

Notes :

1. **Tested in accordance with BS1377**
2.
3.

Page 1 of 1

AITKEN LABORATORIES LTD

Laboratory Test Results

Site : BEESLACK HIGH SCHOOL, PENICUIK

Client :

Engineer : JOHNSON POOLE & BLOOMER

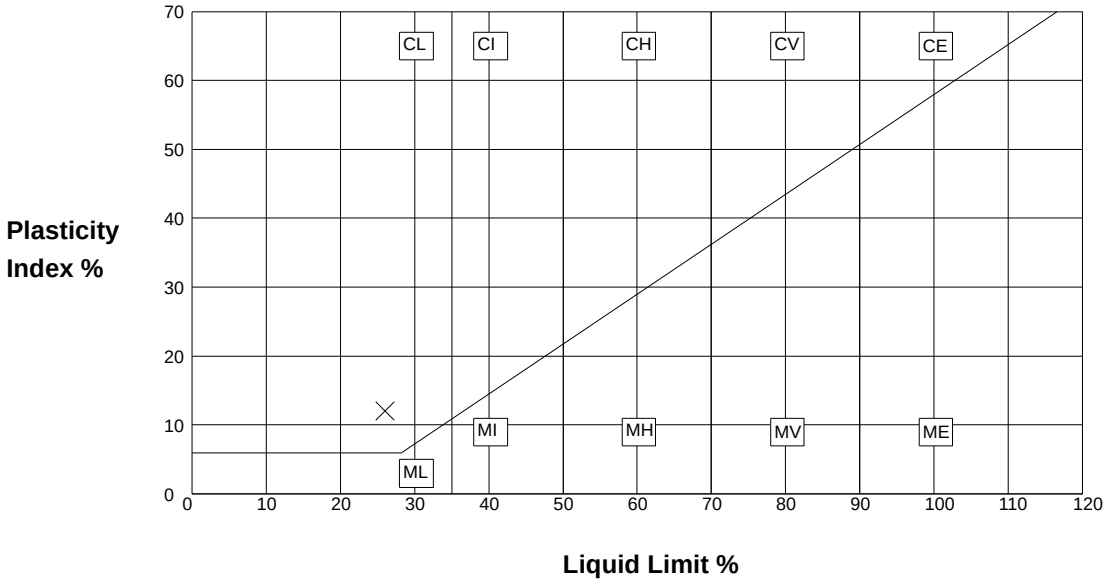
Job Number P427

Sheet 1 / 2

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX

Borehole / Trial Pit	Depth (m)	Sample	Laboratory Description
CP102	3.00	U	

Casagrande Plasticity Chart



Liquid Limit	26 %	**Plastic Limit**	14 %
Liquidity Index	0.98	**Plasticity Index**	12 %
Natural Moisture Content	15 %	**Group Symbol**	CL

Material Passing 425µm sieve			
Percentage passing	58 %	**Corrected Moisture Content**	26 %

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index

Remarks :

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Laboratory Test Results

Site : BEESLACK HIGH SCHOOL, PENICUIK

Client :

Engineer : JOHNSON POOLE & BLOOMER

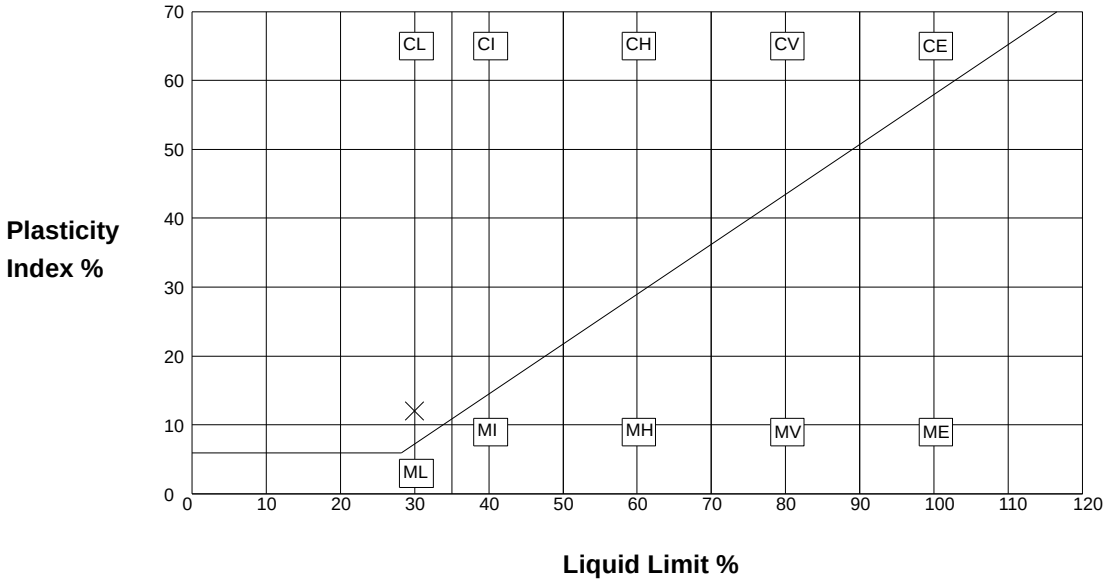
Job Number P427

Sheet 2 / 2

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX

Borehole / Trial Pit	Depth (m)	Sample	Laboratory Description
CP102	8.00	U	

Casagrande Plasticity Chart



Liquid Limit	30 %	**Plastic Limit**	18 %
Liquidity Index	1.58	**Plasticity Index**	12 %
Natural Moisture Content	16 %	**Group Symbol**	CL

Material Passing 425µm sieve			
Percentage passing	43 %	**Corrected Moisture Content**	37 %

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index

Remarks :

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure No. P427.CP101A.3.U.TXL

Site : BEESLACK HIGH SCHOOL

Client : -

Engineer : JOHNSON POOLE & BLOOMER

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

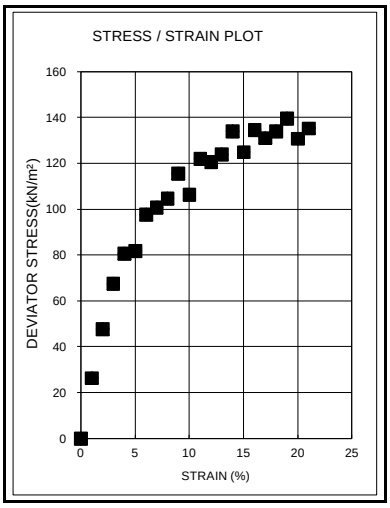
Exp. Point	Depth (m)	Sample Type / Ref	Non-Engineering Description
CP101A	3.00	U	Brown gravelly sandy clay

READ No	AREA cm²	STRAIN %	STRAIN mm	PROVING RING DIAL Divs.	APPLIED LOAD kN	DEVIATOR STRESS kN/m²
0	80.87	0.0	0		0.00 0.00 0.00	0 0 0
1	81.68	1.0	2	35	0.21	26
2	82.52	2.0	4	55	0.39	48
3	83.37	3.0	6	74	0.56	67
4	84.24	4.0	8	87	0.68	81
5	85.13	5.0	10	89	0.70	82
6	86.03	6.0	12	105	0.84	98
7	86.96	7.0	14	109	0.88	101
8	87.90	8.0	16	121	0.92	105
9	88.87	9.0	18	133	1.03	116
10	89.86	10.0	20	134	0.96	106
11	90.87	11.0	22	151	1.11	122
12	91.90	12.0	24	151	1.11	120
13	92.96	13.0	26	156	1.15	124
14	94.04	14.0	28	168	1.26	134
15	95.15	15.0	30	160	1.19	125
16	96.28	16.0	32	172	1.29	134
17	97.44	17.0	34	170	1.28	131
18	98.63	18.0	36	175	1.32	134
19	99.85	19.0	38	183	1.39	140
20	101.10	20.0	40	175	1.32	131
21	102.38	21.0	42	182	1.38	135

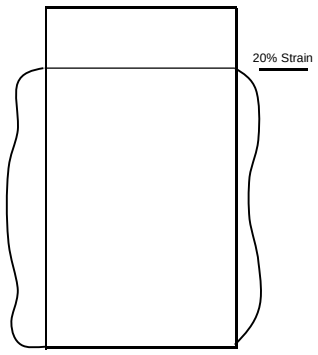
Specimen/Stage No :	1	2	3	
Cell Pressures :	100	200	400	kN/m²
Weight of Specimen :	3698.4			gms.
Diameter of Specimen :	101.47			m.m.
Height of Specimen :	199.84			m.m.
Weight of Wet Sample & Tin :	689			gms.
Weight of Dry Sample & Tin :	609.2			gms.
Weight of Tin :	34.6			gms.
Moisture Content :	13.9			% dry weight
Bulk Density :	2.29			Mg/m³
Dry Density :	2.01			Mg/m³
Load Factor :	8.93			N/Div.
Pressure Zero :	11	18	27	Div.
Shear Strength :	50	58	70	kN/m²
Strain at Failure :	7	9	19	%
Rate of Strain :	2	2	2	%/min.

Average Shear Strength :	59	kN/m²
Apparent Cohesion :	42	kN/m²
Angle of Shear Resistance :	3	Degrees

101mm Diameter Multi-stage test - (one specimen)



Failure Diagram



Type of Failure : Plastic

Notes :

Tested in accordance with BS1377 : Part 7 : 1990 cluases 8 and 9.

Membrane Type : Standard Latex - 0.60mm. thick.

Preparation Method : Vertical Extrusion

Originator	Checked & Approved
JA	JA

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure No. P427.CP101B.14.U.TXL

Site : BEESLACK HIGH SCHOOL

Client : -

Engineer : JOHNSON POOLE & BLOOMER

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

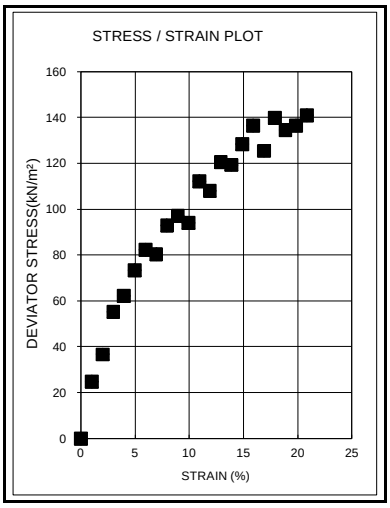
Exp. Point	Depth (m)	Sample Type / Ref	Non-Engineering Description
CP101B	14.00	U	Brown gravelly sandy clay

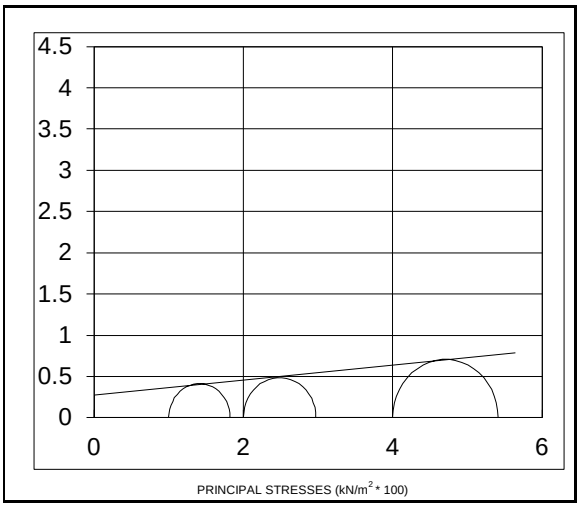
READ No	AREA cm²	STRAIN %	STRAIN mm	PROVING RING DIAL Divs.	APPLIED LOAD kN	DEVIATOR STRESS kN/m²
0	78.71	0.0	0		0.00 0.00 0.00	0 0 0
1	79.50	1.0	2	32	0.20	25
2	80.31	2.0	4	43	0.29	37
3	81.13	3.0	6	60	0.45	55
4	81.97	4.0	8	67	0.51	62
5	82.82	5.0	10	78	0.61	73
6	83.70	6.0	12	87	0.69	82
7	84.59	6.9	14	86	0.68	80
8	85.50	7.9	16	104	0.79	93
9	86.43	8.9	18	109	0.84	97
10	87.39	9.9	20	113	0.82	94
11	88.36	10.9	22	132	0.99	112
12	89.35	11.9	24	129	0.96	108
13	90.37	12.9	26	143	1.09	121
14	91.41	13.9	28	143	1.09	119
15	92.48	14.9	30	154	1.19	128
16	93.57	15.9	32	164	1.28	136
17	94.69	16.9	34	154	1.19	125
18	95.83	17.9	36	171	1.34	140
19	97.01	18.9	38	167	1.30	134
20	98.21	19.9	40	171	1.34	136
21	99.44	20.8	42	178	1.40	141

Specimen/Stage No :	1	2	3	
Cell Pressures :	100	200	400	kN/m²
Weight of Specimen :	3399			gms.
Diameter of Specimen :	100.11			m.m.
Height of Specimen :	201.51			m.m.
Weight of Wet Sample & Tin :	686.9			gms.
Weight of Dry Sample & Tin :	562.3			gms.
Weight of Tin :	34.5			gms.
Moisture Content :	23.6			% dry weight
Bulk Density :	2.14			Mg/m³
Dry Density :	1.73			Mg/m³
Load Factor :	8.93			N/Div.
Pressure Zero :	10	15	21	Div.
Shear Strength :	41	49	70	kN/m²
Strain at Failure :	6	9	21	%
Rate of Strain :	2	2	2	%/min.

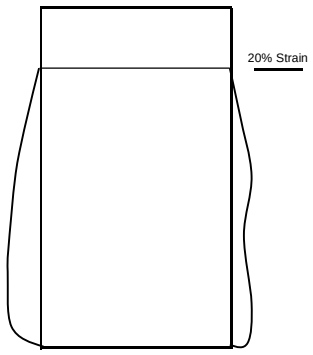
Average Shear Strength :	53	kN/m²
Apparent Cohesion :	28	kN/m²
Angle of Shear Resistance :	5	Degrees

100mm Diameter Multi-stage test - (one specimen)





Failure Diagram



Type of Failure : Plastic

Notes :

Tested in accordance with BS1377 : Part 7 : 1990 cluases 8 and 9.

Membrane Type : Standard Latex - 0.60mm. thick.

Preparation Method : Vertical Extrusion

Originator	Checked & Approved
JA	JA

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

08/10/2024 14:56:40

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure No. P427.CP102.8.U.TXL

Site : BEESLACK HIGH SCHOOL

Client : -

Engineer : JOHNSON POOLE & BLOOMER

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

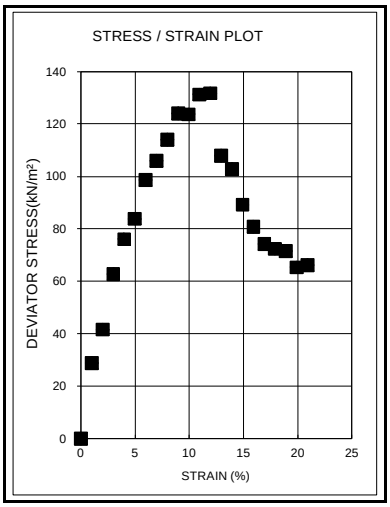
Exp. Point	Depth (m)	Sample Type / Ref	Non-Engineering Description
CP102	8.00	U	Brown gravelly very sandy clay

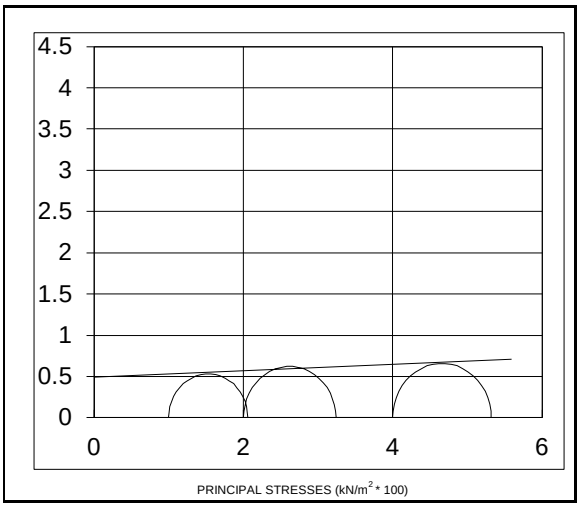
READ No	AREA cm²	STRAIN %	STRAIN mm	PROVING RING DIAL Divs.	APPLIED LOAD kN	DEVIATOR STRESS kN/m²
0	80.01	0.0	0		0.00 0.00 0.00	0 0 0
1	80.81	1.0	2	34	0.23	29
2	81.63	2.0	4	46	0.34	42
3	82.47	3.0	6	66	0.52	63
4	83.32	4.0	8	79	0.63	76
5	84.20	5.0	10	87	0.71	84
6	85.09	6.0	12	102	0.84	99
7	86.00	7.0	14	110	0.91	106
8	86.92	8.0	16	122	0.99	114
9	87.87	9.0	18	133	1.09	124
10	88.85	9.9	20	134	1.10	124
11	89.84	10.9	22	149	1.18	131
12	90.85	11.9	24	151	1.20	132
13	91.89	12.9	26	128	0.99	108
14	92.95	13.9	28	124	0.96	103
15	94.04	14.9	30	111	0.84	89
16	95.15	15.9	32	103	0.77	81
17	96.29	16.9	34	97	0.71	74
18	97.46	17.9	36	96	0.71	72
19	98.65	18.9	38	96	0.71	72
20	99.88	19.9	40	90	0.65	65
21	101.13	20.9	42	92	0.67	66

Specimen/Stage No :	1	2	3	
Cell Pressures :	100	200	400	kN/m²
Weight of Specimen :	3568.4			gms.
Diameter of Specimen :	100.93			m.m.
Height of Specimen :	201.06			m.m.
Weight of Wet Sample & Tin :	626.3			gms.
Weight of Dry Sample & Tin :	545.7			gms.
Weight of Tin :	35.9			gms.
Moisture Content :	15.8			% dry weight
Bulk Density :	2.22			Mg/m³
Dry Density :	1.92			Mg/m³
Load Factor :	8.93			N/Div.
Pressure Zero :	8	11	17	Div.
Shear Strength :	53	62	66	kN/m²
Strain at Failure :	7	9	12	%
Rate of Strain :	2	2	2	%/min.

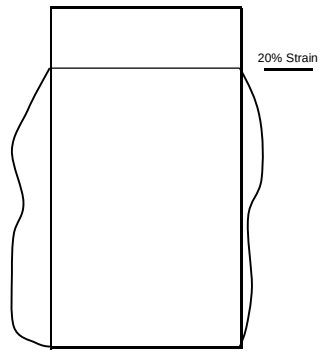
Average Shear Strength :	60	kN/m²
Apparent Cohesion :	49	kN/m²
Angle of Shear Resistance :	2	Degrees

101mm Diameter Multi-stage test - (one specimen)





Failure Diagram



Type of Failure : Plastic

Notes :

Tested in accordance with BS1377 : Part 7 : 1990 cluases 8 and 9.

Membrane Type : Standard Latex - 0.60mm. thick.

Preparation Method : Vertical Extrusion

Originator	Checked & Approved
JA	JA

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure No. P427.CP103.4.U.TXL

Site : BEESLACK HIGH SCHOOL

Client : -

Engineer : JOHNSON POOLE & BLOOMER

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

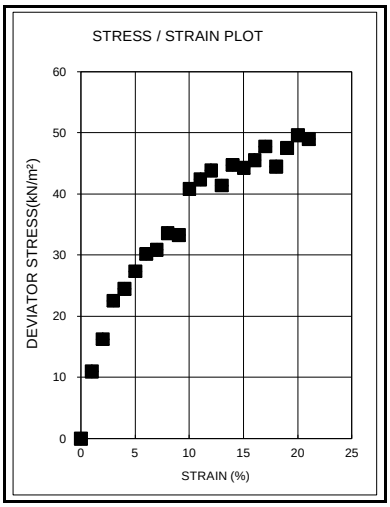
Exp. Point	Depth (m)	Sample Type / Ref	Non-Engineering Description
CP103	4.00	U	Brown gravelly very sandy clay

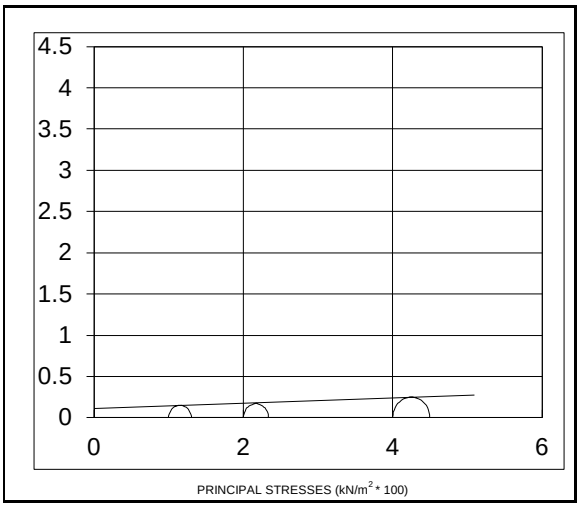
READ No	AREA cm²	STRAIN %	STRAIN mm	PROVING RING DIAL Divs.	APPLIED LOAD kN			DEVIATOR STRESS kN/m²		
0	80.71	0.0	0		0.00	0.00	0.00	0	0	0
1	81.52	1.0	2	13	0.09			11		
2	82.36	2.0	4	18	0.13			16		
3	83.20	3.0	6	24	0.19			23		
4	84.07	4.0	8	26	0.21			24		
5	84.96	5.0	10	29	0.23			27		
6	85.86	6.0	12	32	0.26			30		
7	86.79	7.0	14	37		0.27			31	
8	87.73	8.0	16	40		0.29			34	
9	88.70	9.0	18	40		0.29			33	
10	89.68	10.0	20	53			0.37			41
11	90.69	11.0	22	55			0.38			42
12	91.72	12.0	24	57			0.40			44
13	92.78	13.0	26	55			0.38			41
14	93.86	14.0	28	59			0.42			45
15	94.96	15.0	30	59			0.42			44
16	96.09	16.0	32	61			0.44			46
17	97.25	17.0	34	64			0.46			48
18	98.44	18.0	36	61			0.44			44
19	99.66	19.0	38	65			0.47			47
20	100.90	20.0	40	68			0.50			50
21	102.18	21.0	42	68			0.50			49

Specimen/Stage No :	1	2	3	
Cell Pressures :	100	200	400	kN/m²
Weight of Specimen :	3456.7			gms.
Diameter of Specimen :	101.37			m.m.
Height of Specimen :	199.83			m.m.
Weight of Wet Sample & Tin :	436.3			gms.
Weight of Dry Sample & Tin :	379.4			gms.
Weight of Tin :	35.7			gms.
Moisture Content :	16.6			% dry weight
Bulk Density :	2.14			Mg/m³
Dry Density :	1.84			Mg/m³
Load Factor :	8.93			N/Div.
Pressure Zero :	3	7	12	Div.
Shear Strength :	15	17	25	kN/m²
Strain at Failure :	6	8	20	%
Rate of Strain :	2	2	2	%/min.

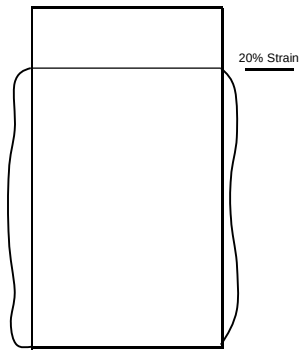
Average Shear Strength :	19	kN/m²
Apparent Cohesion :	11	kN/m²
Angle of Shear Resistance :	2	Degrees

101mm Diameter Multi-stage test - (one specimen)





Failure Diagram



Type of Failure : Plastic

Notes :

Tested in accordance with BS1377 : Part 7 : 1990 cluases 8 and 9.

Membrane Type : Standard Latex - 0.60mm. thick.

Preparation Method : Vertical Extrusion

Originator	Checked & Approved
JA	JA

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure P427.CP101A.3.U.CON

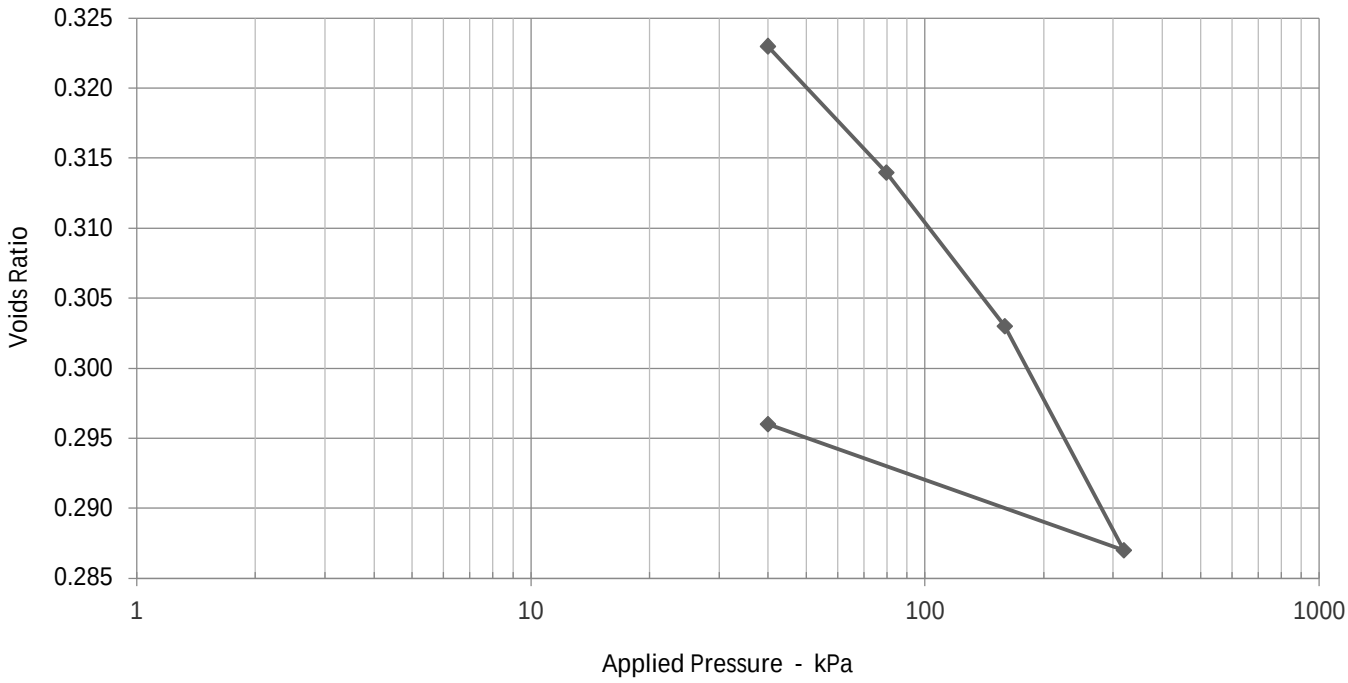
Site : BEESLACK HIGH SCHOOL

Client : -

Engineer : JOHNSON POOLE & BLOOMER

ONE DIMENSIONAL CONSOLIDATION TEST

Exp. Point	Depth (m)	Sample	Description
CP101A	3.00	U	Brown very sandy gravelly clay



Specimem Height	20.26	mm
Specimem Diameter	75.10	mm
Initial Water Content	13.3	%
Initial Bulk Density	2.25	Mg/m^3
Initial Dry Density	1.99	Mg/m^3
Initial Voids Ratio	0.334	
Degree of Saturation	106	%
Specific Gravity	2.65	(assumed)
Final Water Content	11.9	%
Final Bulk Density	2.29	Mg/m^3
Final Dry Density	2.04	Mg/m^3
Final Voids Ratio	0.297	

Pressure Range (kN/m^2)	M_v (m^2/MN)	C_v (t90) (m^2/year)	Voids Ratio
0 - 40	0.240	1.39	0.323
40 - 80	0.170	1.73	0.314
80 - 160	0.100	3.93	0.303
160 - 319	0.080	5.67	0.287
319 - 40	0.030	unloading	0.296

Tested in Accordance with : BS 1377 : 1990 : Part 5 Clause 3

Remarks : Specimen taken 50mm below top of U(100) tube by vertical extrusion with horizontal orientation.

: Temperature maintained at 20 deg.C during test.(+/-2deg.C)

: Root time curve fitting method.

:

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Stirlingshire FK1 3EZ.

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure P427.CP101B.14.U.CON

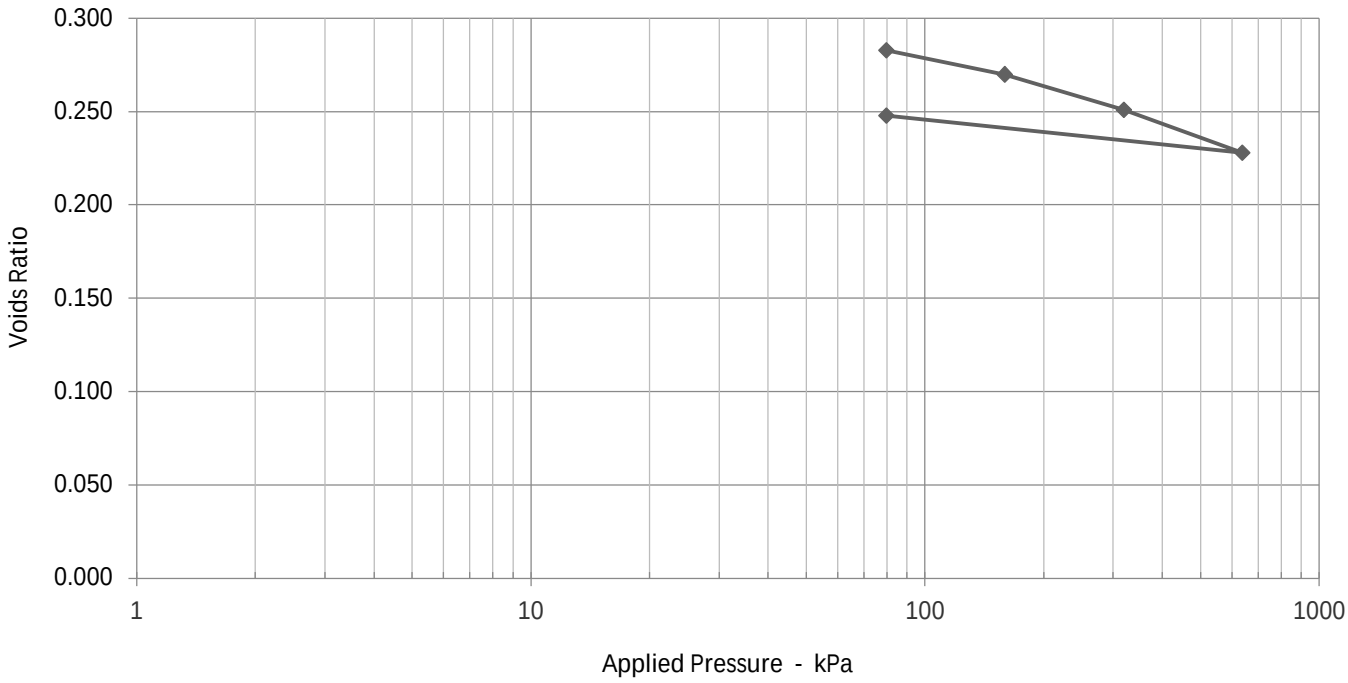
Site : BEESLACK HIGH SCHOOL

Client : -

Engineer : JOHNSON POOLE & BLOOMER

ONE DIMENSIONAL CONSOLIDATION TEST

Exp. Point	Depth (m)	Sample	Description
CP101B	14.00	U	Brown sandy gravelly clay



Specimem Height	20.14	mm
Specimem Diameter	75.08	mm
Initial Water Content	12.5	%
Initial Bulk Density	2.29	Mg/m^3
Initial Dry Density	2.04	Mg/m^3
Initial Voids Ratio	0.301	
Degree of Saturation	110	%
Specific Gravity	2.65	(assumed)
Final Water Content	11.7	%
Final Bulk Density	2.37	Mg/m^3
Final Dry Density	2.12	Mg/m^3
Final Voids Ratio	0.248	

Pressure Range (kN/m^2)	M_v (m^2/MN)	C_v (t90) (m^2/year)	Voids Ratio
0 - 80	0.180	11.59	0.283
80 - 160	0.130	4.04	0.270
160 - 319	0.090	6.90	0.251
319 - 638	0.060	7.46	0.228
638 - 80	0.030	unloading	0.248

Tested in Accordance with : BS 1377 : 1990 : Part 5 Clause 3

Remarks : Specimen taken 50mm below top of U(100) tube by vertical extrusion with horizontal orientation.

: Temperature maintained at 20 deg.C during test.(+/-2deg.C)

: Root time curve fitting method.

:

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Stirlingshire FK1 3EZ.

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure No. P427.CP102.U.DD/MC

Site : BEESLACK HIGH SCHOOL

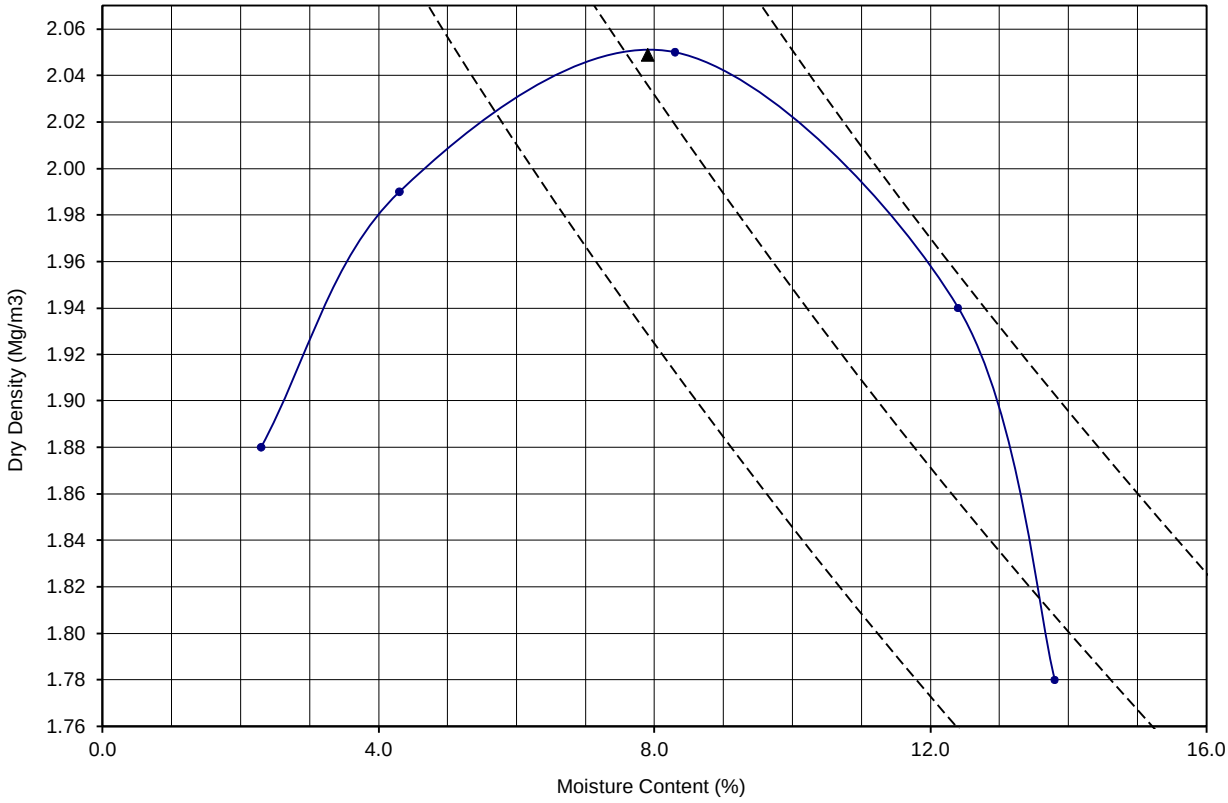
Client : -

Engineer : JOHNSON POOLE & BLOOMER

Dry Density / Moisture Content Relationship

Exp. Point	Depth (m)	Sample Type / Ref	Non-Engineering Description
CP102	3.00	U	Brown sandy gravelly clay

10%, 5%, 0% air voids lines for Particle Density quoted



Preparation		Oven Dried
Test Method		4.5kg Rammer for Soils with Some Coarse-Gravel Size
Samples Used		Single
Retained on 37.5 mm Sieve	%	0
Retained on 20.0 mm Sieve	%	2
Particle Density	Mg/m^3	2.58
Natural Moisture Content	%	15
Maximum Dry Density	Mg/m^3	2.05
Optimum Moisture Content	%	7.9

Remarks

Tested in accordance with BS1377 : Part 4 : 1990

Originator: JA

Checked & Approved: JA

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

AITKEN LABORATORIES LTD

Laboratory Test Results

Job Number P427

Sheet 1 of 1

Figure No. P427.CP103.U.DD/MC

Site : BEESLACK HIGH SCHOOL

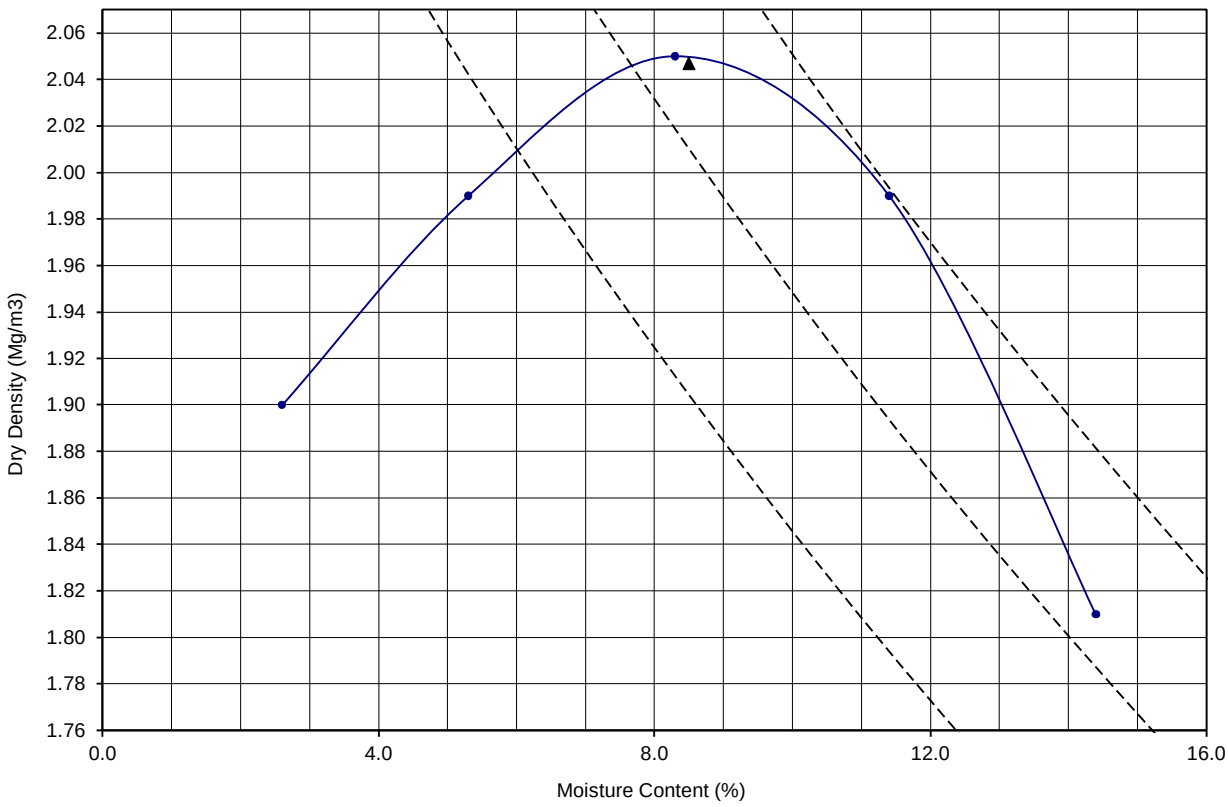
Client : -

Engineer : JOHNSON POOLE & BLOOMER

Dry Density / Moisture Content Relationship

Exp. Point	Depth (m)	Sample Type / Ref	Non-Engineering Description
CP103	4.00	U	Brown very sandy gravelly clay

10%, 5%, 0% air voids lines for Particle Density quoted



Preparation		Oven Dried
Test Method		4.5kg Rammer for Soils with Particles up to Medium-Gravel Size
Samples Used		Single
Retained on 37.5 mm Sieve	%	0
Retained on 20.0 mm Sieve	%	2
Particle Density	Mg/m^3	2.58
Natural Moisture Content	%	15
Maximum Dry Density	Mg/m^3	2.05
Optimum Moisture Content	%	8.5

Remarks

Tested in accordance with BS1377 : Part 4 : 1990

Originator: JA

Checked & Approved: JA

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

AITKEN LABORATORIES LTD

In-Situ Test Results

Job Number: P480

Sheet: 1 of 2

Figure No.:

Site : BEESLACK HIGH SCHOOL, PENICUIK

Client : -

Engineer : JOHNSON POOLE & BLOOMER

Plate Load Test

Exp. Point	Depth (mm)	Location	Ground Level (mAOD)	Description
PLT1	500.00			Brown slighty silty F/C sand & F/C gravel with occassional cobbles

Test Date : 22/10/2024
Weather Conditions : Sunny
Loading Sequence (kN/m²) : 34/68/103
Plate Diameter (mm) : 610

Time from Start of Stage (minutes)	Temperature (o°)	Stress (kN/m²)	Deflection Guage Readings (mm) A	B	C	Deflection Increment (mm)	Total Deflection (mm)
0	10	0	0.00	0.00	0.00	0.000	0.000
1		34	-0.29	-0.33	-0.23	-0.283	-0.283
2		34	-0.29	-0.33	-0.23	0.000	-0.283
3		34	-0.29	-0.33	-0.24	-0.003	-0.287
4		68	-0.62	-0.67	-0.41	-0.280	-0.567
5		68	-0.62	-0.67	-0.41	0.000	-0.567
6		68	-0.62	-0.67	-0.41	0.000	-0.567
7		103	-1.10	-1.15	-0.73	-0.427	-0.993
8		103	-1.14	-1.17	-0.77	-0.033	-1.027
9		103	-1.14	-1.18	-0.77	-0.003	-1.030
10		0	-0.47	-0.39	-0.37	0.620	-0.410
11		0	-0.44	-0.36	-0.32	0.037	-0.373

Remarks

Tested in accordance with BS1377 : Part 9 : 1990

Originator: PM

Checked & Approved: PM

AITKEN LABORATORIES LTD

In-situ Test Results

Job Number: P480

Sheet: 2 of 2

Figure No.

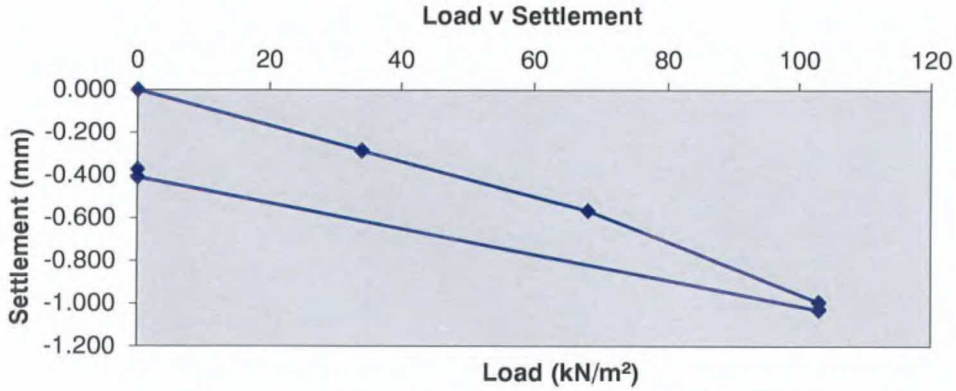
Site : BEESLACK HIGH SCHOOL, PENICUIK

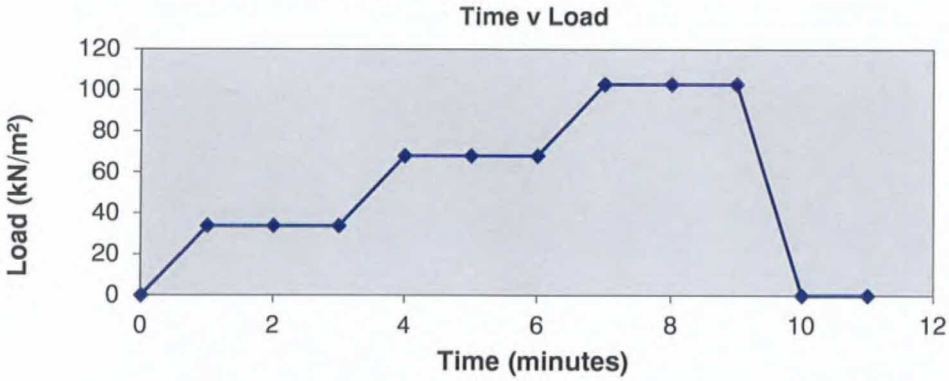
Client : -

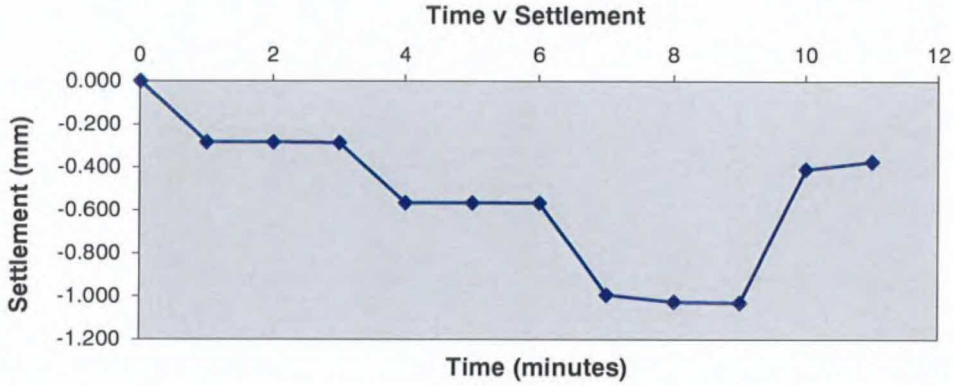
Engineer : JOHNSON POOLE & BLOOMER

Plate Load Test

Exp. Point	Depth (mm)	Location	Ground Level (mAOD)	Description
PLT1	500.00			Brown slighty silty F/C sand & F/C gravel with occassional cobbles







Remarks

Tested in accordance with BS1377 : Part 9 : 1990

Originator	Checked & Approved
PM	PM

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

23/10/2024 14:00:45

AITKEN LABORATORIES LTD

In-Situ Test Results

Job Number: P480

Sheet: 1 of 2

Figure No.:

Site : BEESLACK HIGH SCHOOL, PENICUIK

Client : -

Engineer : JOHNSON POOLE & BLOOMER

Plate Load Test

Exp. Point	Depth (mm)	Location	Ground Level (mAOD)	Description
PLT2	450.00			Brown slightly silty F/C sand & F/C gravel with occassional cobbles

Test Date : 22/10/2024
Weather Conditions : Sunny
Loading Sequence (kN/m²) : 34/68/103
Plate Diameter (mm) : 610

Time from Start of Stage (minutes)	Temperature (o°)	Stress (kN/m²)	Deflection Guage Readings (mm) A	B	C	Deflection Increment (mm)	Total Deflection (mm)
0	10	0	0.00	0.00	0.00	0.000	0.000
1		34	-0.21	-0.29	-0.15	-0.217	-0.217
2		34	-0.21	-0.29	-0.15	0.000	-0.217
3		34	-0.21	-0.29	-0.15	0.000	-0.217
4		68	-0.83	-1.10	-1.36	-0.880	-1.097
5		68	-0.86	-1.12	-1.39	-0.027	-1.123
6		68	-0.86	-1.13	-1.39	-0.003	-1.127
7		103	-1.70	-1.88	-2.30	-0.833	-1.960
8		103	-1.81	-1.93	-2.31	-0.057	-2.017
9		103	-1.83	-1.95	-2.35	-0.027	-2.043
10		103	-1.84	-1.96	-2.35	-0.007	-2.050
11		0	-1.40	-1.45	-2.35	0.317	-1.733
12		0	-1.37	-1.43	-2.35	0.017	-1.717

Remarks

Tested in accordance with BS1377 : Part 9 : 1990

Originator: PM

Checked & Approved: PM

Aitken Laboratories Ltd. Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

AITKEN LABORATORIES LTD

In-situ Test Results

Job Number: P480

Sheet: 2 of 2

Figure No.

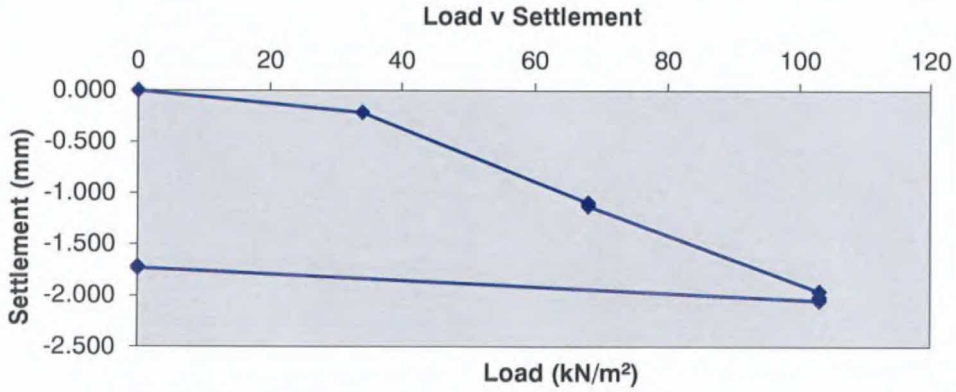
Site : BEESLACK HIGH SCHOOL, PENICUIK

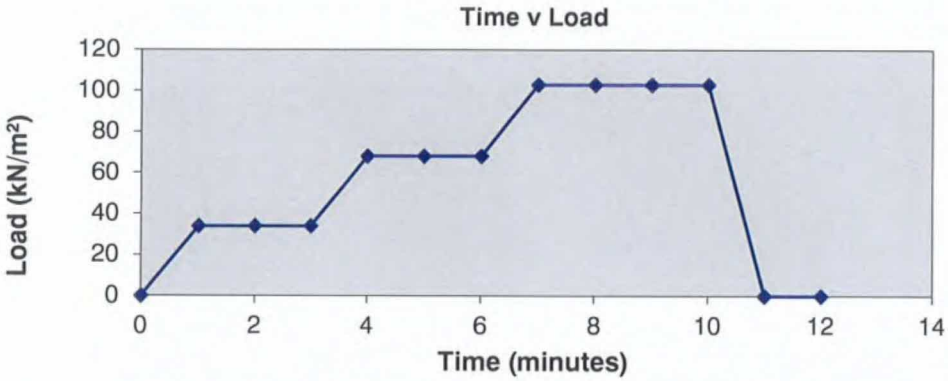
Client : -

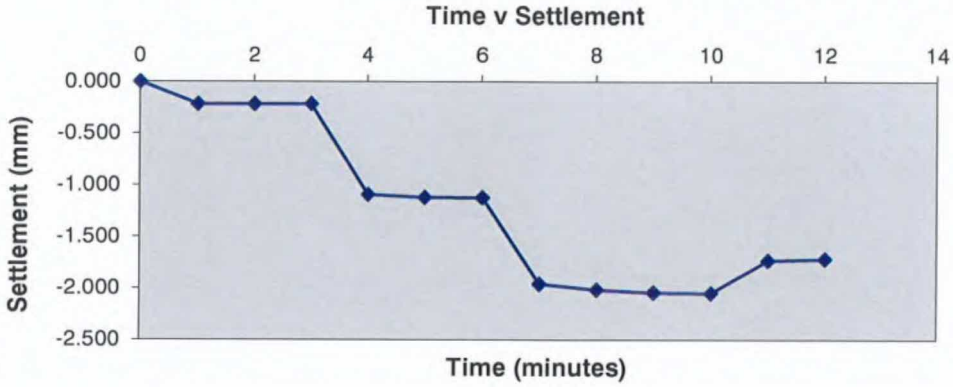
Engineer : JOHNSON POOLE & BLOOMER

Plate Load Test

Exp. Point	Depth (mm)	Location	Ground Level (mAOD)	Description
PLT2	450.00			Brown slightly silty F/C sand & F/C gravel with occassional cobbles







Remarks

Tested in accordance with BS1377 : Part 9 : 1990

Originator: PM

Checked & Approved: PM

Aitken Laboratories Ltd, Castlehill House, Bank Street, Slamannan, Falkirk, FK1 3EZ.

23/10/2024 14:01:52

Appendix 9 Rotary Drilling Logs – Hydracrat – May 2022 and Borehole Correlation and June 2024

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R1
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 22.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 1/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(6.00)	0.00 - 6.00m - CLAY, SAND and GRAVEL (Drillers Description)		
							6.00 (3.00)	6.00 - 9.00m - CLAY (Drillers Description)		
							9.00 (1.00)	9.00 - 22.00m - BOULDER CLAY (Drillers Description)		

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 30.00m, 30.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx)	Logged By
1:50	

Figure No. 10058.R1

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R1
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 22.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 2/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							10.00	9.00 - 22.00m - BOULDER CLAY (Drillers Description)		
							(10.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 30.00m, 30.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx)	Logged By
1:50	

Figure No. 10058.R1

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R1
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 22.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 3/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							20.00	9.00 - 22.00m - BOULDER CLAY (Drillers Description)		
							(2.00)			
					5" Casing to 22.00m		22.00	22.00 - 23.00m - MUDSTONE (Drillers Description)		
							(1.00)			
							23.00	23.00 - 24.00m - SANDSTONE (Drillers Description)		
							(1.00)			
							24.00	24.00 - 36.20m - MUDSTONE (Drillers Description)		
							(6.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 30.00m, 30.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx)	Logged By
1:50	

Figure No. 10058.R1

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R1
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 22.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 4/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							30.00	24.00 - 36.20m - MUDSTONE (Drillers Description)		
							(6.20)			
							36.20	36.20 - 37.00m - SANDSTONE (Drillers Description)		
							(0.80)			
							37.00	37.00 - 42.00m - MUDSTONE (Drillers Description)		
							(3.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 30.00m, 30.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx)	Logged By
1:50	

Figure No. 10058.R1

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R1
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 22.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 5/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							40.00	37.00 - 42.00m - MUDSTONE (Drillers Description)		
							(2.00)			
					Borehole Dry(1) at 42.00m.		42.00	Complete at 42.00m		∇1

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 30.00m, 30.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx)	Logged By
1:50	

Figure No. 10058.R1

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R2
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 18.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 13/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 1/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(9.00)	0.00 - 9.00m - CLAY,SAND and GRAVEL (Drillers Description)		
							9.00 (1.00)	9.00 - 18.00m - BOULDER CLAY (Drillers Description)		

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 22.00m, 22.00m to 19.00m slotted pipe with gravel surround, 19.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx)	Logged By
1:50	

Figure No. 10058.R2

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R2
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 18.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 13/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 2/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							10.00	9.00 - 18.00m - BOULDER CLAY (Drillers Description)		
							(8.00)			
					5" Casing to 18.00m		18.00	18.00 - 31.20m - MUDSTONE (Drillers Description)		
							(2.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 22.00m, 22.00m to 19.00m slotted pipe with gravel surround, 19.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx)	Logged By
1:50	

Figure No. 10058.R2

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R2
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 18.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 13/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 3/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							20.00	18.00 - 31.20m - MUDSTONE (Drillers Description)		
							(10.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 22.00m, 22.00m to 19.00m slotted pipe with gravel surround, 19.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx) 1:50

Logged By

Figure No. 10058.R2

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R2
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 18.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 13/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 4/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							30.00	18.00 - 31.20m - MUDSTONE (Drillers Description)		
							(1.20)			
							31.20	31.20 - 33.00m - SANDSTONE (Drillers Description)		
							(1.80)			
							33.00	33.00 - 40.00m - MUDSTONE (Drillers Description)		
							(7.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
50mm dia standpipe installed to 22.00m, 22.00m to 19.00m slotted pipe with gravel surround, 19.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.

Scale (approx) 1:50

Logged By

Figure No. 10058.R2

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R2
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 18.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 13/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 5/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							40.00	Complete at 40.00m		∇1

Remarks

Scale (approx)	Logged By
1:50	

Figure No. 10058.R2

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R3
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 24.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 1/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(8.00)	0.00 - 8.00m - CLAY, SAND and GRAVEL (Drillers Description)		
							8.00 (2.00)	8.00 - 13.00m - CLAY (Drillers Description)		

Remarks
50mm dia standpipe installed to 27.00m, 27.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.
0.00 - 1.20m - Hand dug inspection pit
No gas recorded

Scale (approx)	Logged By
1:50	

Figure No. 10058.R3

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R3
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 24.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 2/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							10.00	8.00 - 13.00m - CLAY (Drillers Description)		
							(3.00)			
							13.00	13.00 - 24.00m - BOULDER CLAY (Drillers Description)		
							(7.00)			

Remarks
50mm dia standpipe installed to 27.00m, 27.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.
0.00 - 1.20m - Hand dug inspection pit
No gas recorded

Scale (approx)	Logged By
1:50	

Figure No. 10058.R3

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R3
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 24.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 3/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							20.00	13.00 - 24.00m - BOULDER CLAY (Drillers Description)		
							(4.00)			
					5" Casing to 24.00m		24.00	24.00 - 35.20m - MUDSTONE (Drillers Description)		
							(6.00)			

Remarks
50mm dia standpipe installed to 27.00m, 27.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.
0.00 - 1.20m - Hand dug inspection pit
No gas recorded

Scale (approx)	Logged By
1:50	

Figure No. 10058.R3

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R3
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 24.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 4/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							30.00	24.00 - 35.20m - MUDSTONE (Drillers Description)		
							(5.20)			
							35.20	35.20 - 37.00m - SANDSTONE (Drillers Description)		
							(1.80)			
							37.00	37.00 - 40.00m - MUDSTONE (Drillers Description)		
							(3.00)			

Remarks
50mm dia standpipe installed to 27.00m, 27.00m to 24.00m slotted pipe with gravel surround, 24.00m to 0.00m plain pipe with bentonite surround to 0.50m, 0.50m to 0.00m concrete with raised protective cover at top with gas valve.
0.00 - 1.20m - Hand dug inspection pit
No gas recorded

Scale (approx)	Logged By
1:50	

Figure No. 10058.R3

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R3
Machine : D17 **Flush :** Air Flush **Core Dia:** 120 mm **Method :** Rotary Openhole	**Casing Diameter** 140mm to 24.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10058
	Location Penicuik	**Dates** 12/05/2022	**Engineer** Johnson Poole & Bloomer	**Sheet** 5/5

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							40.00	Complete at 40.00m		∇1

Remarks

Scale (approx)	Logged By
1:50	

Figure No. 10058.R3

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R101
Machine : D17 **Flush :** Air Flush **Core Dia:** 75 mm **Method :** Rotary Cored	**Casing Diameter** 140mm to 20.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10227
	Location Penicuik	**Dates** 26/06/2024	**Engineer** Johnson Poole & Bloomer	**Sheet** 1/3

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(6.00)	0.00 - 6.00m - CLAY and GRAVEL (Drillers Description)		
							6.00 (4.00)	6.00 - 10.00m - SILTY CLAY (Drillers Description)		

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
Borehole plugged and backfilled

Scale (approx)	Logged By
1:50	RB

Figure No. 10227.R101

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R101
Machine : D17 **Flush :** Air Flush **Core Dia:** 75 mm **Method :** Rotary Cored	**Casing Diameter** 140mm to 20.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10227
	Location Penicuik	**Dates** 26/06/2024	**Engineer** Johnson Poole & Bloomer	**Sheet** 2/3

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							10.00	10.00 - 22.00m - BOULDER CLAY (Drillers Description)		
							(10.00)			
					5" Casing to 20.00m					

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
Borehole plugged and backfilled

Scale (approx)	Logged By
1:50	RB

Figure No. 10227.R101

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R101
Machine : D17 **Flush :** Air Flush **Core Dia:** 75 mm **Method :** Rotary Cored	**Casing Diameter** 140mm to 20.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10227
	Location Penicuik	**Dates** 26/06/2024	**Engineer** Johnson Poole & Bloomer	**Sheet** 3/3

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							20.00	10.00 - 22.00m - BOULDER CLAY (Drillers Description)		
							(2.00)			
							22.00	22.50 - 23.74m - Weak, very thin bedded, grey SILTSTONE, slightly weathered, very closely spaced rough to smooth undular tight bedding at 48 degrees, closely spaced rough undular tight fractures at 46 degrees opposite to bedding, medium spaced rough irregular tight fractures at 84 degrees		
22.50							(1.74)			
	90%	13%	0%	14			23.74 (0.21) 23.95	23.74 - 23.95m - Weak, poorly bedded, grey SILTSTONE with ironstone nodules, slightly weathered		
							(1.01)	23.95 - 24.96m - Very weak, very thin bedded, black MUDSTONE, slightly ironstained, very closely spaced smooth planar tight bedding at 46 degrees, closely spaced rough undular tight to slightly open fractures at 76 to 84 degrees		
25.00							24.96	24.96 - 27.50m - Weak, very thin bedded, dark grey MUDSTONE, fresh, very closely spaced smooth undular tight bedding at 48 degrees, closely spaced rough undular tight fractures at 42 degrees, widely spaced rough undular tight fractures at 84 degrees		
	96%	32%	5%	15			(2.54)			
27.50							27.50	Complete at 27.50m		

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
Borehole plugged and backfilled

Scale (approx)	Logged By
1:50	RB

Figure No. 10227.R101

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R102
Machine : D17 **Flush :** Air Flush **Core Dia:** 75 mm **Method :** Rotary Cored	**Casing Diameter** 140mm to 21.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10227
	Location Penicuik	**Dates** 27/06/2024	**Engineer** Johnson Poole & Bloomer	**Sheet** 1/3

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(5.00)	0.00 - 5.00m - CLAY and GRAVEL (Drillers Description)		
							5.00	5.00 - 7.00m - SILTY CLAY (Drillers Description)		
							(2.00)			
							7.00	7.00 - 22.00m - BOULDER CLAY (Drillers Description)		
							(3.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
Borehole plugged and backfilled

Scale (approx)	Logged By
1:50	RB

Figure No. 10227.R102

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R102
Machine : D17 **Flush :** Air Flush **Core Dia:** 75 mm **Method :** Rotary Cored	**Casing Diameter** 140mm to 21.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10227
	Location Penicuik	**Dates** 27/06/2024	**Engineer** Johnson Poole & Bloomer	**Sheet** 2/3

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							10.00	7.00 - 22.00m - BOULDER CLAY (Drillers Description)		
							(10.00)			

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
Borehole plugged and backfilled

Scale (approx)	Logged By
1:50	RB

Figure No. 10227.R102

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

HYDRACRAT
GROUND INVESTIGATION CONTRACTORS

Site Beeslack High School, Penicuik			**Borehole Number** R102
Machine : D17 **Flush :** Air Flush **Core Dia:** 75 mm **Method :** Rotary Cored	**Casing Diameter** 140mm to 21.00m	**Ground Level (mOD)**	**Client** Johnson Poole & Bloomer	**Job Number** 10227
	Location Penicuik	**Dates** 27/06/2024	**Engineer** Johnson Poole & Bloomer	**Sheet** 3/3

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					5" Casing to 21.00m		20.00 (2.00) 22.00 (0.50) 22.50	7.00 - 22.00m - BOULDER CLAY (Drillers Description)		
								22.00 - 22.50m - MUDSTONE (Drillers Description)		
22.50	92%	26%	23%	13			(0.48) 22.98	22.50 - 22.98m - Very weak, disturbed dark grey MUDSTONE, very weathered, disorientated fragments in fine mudstone matrix		
23.50	97%	31%	14%	17			(1.48) 24.46	22.98 - 24.46m - Weak, thin bedded, dark grey MUDSTONE, faintly weathered, closely spaced smooth undular to planar tight bedding at 52 degrees, closely spaced smooth undular tight fractures at 42 degrees, generally opposite to bedding		
24.50	100%	25%	4%	14			(2.72) 27.18	24.46 - 27.18m - Weak, very thin bedded, dark grey MUDSTONE, 0.03 ironstone band at top, fresh, very closely spaced smooth to semi polished planar tight bedding at 52 to 62 degrees, closely spaced rough to semi-polished undular tight fractures at 42 degrees, generally opposite to bedding		
27.50	100%	57%	16%	9			(1.32) 28.50	27.18 -28.50m - Medium strong, occasional thin weak bands, thin poorly bedded, grey calcareous MUDSTONE with impure limestone bands, fresh, closely spaced rough undular tight bedding at 58 degrees, closely spaced rough undular tight fractures at 23 degrees, widely spaced rough irregular tight fractures at 84 degrees		
28.50								Complete at 28.50m		

Remarks
0.00 - 1.20m - Hand dug inspection pit
No gas recorded
Borehole plugged and backfilled

Scale (approx)	Logged By
1:50	RB

Figure No. 10227.R102

Produced by the GEOtechnical DAtabase SYstem (GEODASY) (C) all rights reserved

Appendix 10 Chemical Test Results – i2 - May 2022

M Keir
Johnson Poole & Bloomer
50 Speirs Wharf
Glasgow
G4 9TB

e: martin.keir@jpbscotland.co.uk

i2 Analytical Ltd.
40 Carron Pl,
East Kilbride,
Glasgow
G75 0YL

t: 01355202915
f: 01923237404
e: scotland@i2analytical.com

Analytical Report Number : 22-58382

Project / Site name:	Beeslack, Penicuik	**Samples received on:**	13/05/2022
Your job number:	WG684	**Samples instructed on/ Analysis started on:**	13/05/2022
Your order number:	3744	**Analysis completed by:**	27/05/2022
Report Issue Number:	1	**Report issued on:**	31/05/2022
Samples Analysed:	27 soil samples		

Signed: [redacted]

Ashleigh Cunningham
Senior Customer Service Adviser
For & on behalf of i2 Analytical Ltd.

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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

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

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275912	2275913	2275914	2275915	2275916
Sample Reference				TP1	TP2	TP3	TP4	TP6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.20	0.60	0.80	0.60
Date Sampled				11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	17	15	14	13
Total mass of sample received	kg	0.001	NONE	0.7	0.7	0.7	1.6	1.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	6.7	6.9	7.6	6.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	130	490	190	170	170
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0063	0.0078	0.014	0.012	0.0099
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	13	16	28	24	20
Sulphide	mg/kg	1	MCERTS	1.1	1.2	5.9	8.1	3.7
Organic Matter (automated)	%	0.1	MCERTS	1.2	3.2	1.4	1	1.1

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.6	7.5	7	6.3	6.9
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.2	< 0.2	0.4	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.4	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	36	35	35	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	26	25	21	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	15	40	18	16	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	34	42	43	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57	88	54	47	40

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275912	2275913	2275914	2275915	2275916
Sample Reference				TP1	TP2	TP3	TP4	TP6
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.20	0.60	0.80	0.60
Date Sampled				11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275917	2275918	2275919	2275920	2275921
Sample Reference				TP7	TP8	TP9	TP10	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.80	0.90	0.20	1.50
Date Sampled				11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	6.9	8.3	13	11
Total mass of sample received	kg	0.001	NONE	1.6	1.5	1.5	1.6	1.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.3	6.9	6.8	6.7	7.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	690	110	140	510	230
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0079	0.0075	0.0036	0.0057	0.0043
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	16	15	7.2	11	8.6
Sulphide	mg/kg	1	MCERTS	2.1	1	3.3	2	1.3
Organic Matter (automated)	%	0.1	MCERTS	6	0.4	1.1	4.7	1.7

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.6	8.4	11	9	7.8
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	< 0.2	< 0.2	0.2	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.4	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	64	40	37	34
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	23	17	21	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	44	19	17	41	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	46	31	30	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	95	130	80	110	82

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275917	2275918	2275919	2275920	2275921
Sample Reference				TP7	TP8	TP9	TP10	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.80	0.90	0.20	1.50
Date Sampled				11/05/2022	11/05/2022	11/05/2022	11/05/2022	11/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275922	2275923	2275924	2275925	2275926
Sample Reference				TP11	TP11	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.90	0.20	0.80	0.60
Date Sampled				12/05/2022	12/05/2022	12/05/2022	12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	13	13	7.6	11
Total mass of sample received	kg	0.001	NONE	1.6	1.6	1.6	1.5	1.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	6.8	6.5	7.9	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	340	230	570	160	63
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.007	0.019	0.0067	0.0035	0.0023
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	14	39	13	7	4.7
Sulphide	mg/kg	1	MCERTS	< 1.0	3.1	3.3	< 1.0	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	2.9	1.2	4.9	0.9	0.6

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7	8.9	7.4	11	9.2
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	0.4	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	46	39	47	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	29	20	17	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	26	45	19	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	40	29	41	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	67	64	100	95	55

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275922	2275923	2275924	2275925	2275926
Sample Reference				TP11	TP11	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.90	0.20	0.80	0.60
Date Sampled				12/05/2022	12/05/2022	12/05/2022	12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275927	2275928	2275929	2275930	2275931
Sample Reference				TP15	TP16	TP17	TP18	TP19
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.60	1.00	0.80	1.20
Date Sampled				12/05/2022	12/05/2022	12/05/2022	12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	6.9	6.6	7.3	6.2
Total mass of sample received	kg	0.001	NONE	1.5	1.6	1.5	1.5	1.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.3	6.6	6.7	8	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	780	130	120	130	160
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.008	0.0049	0.0031	0.0039	0.0032
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	16	9.9	6.1	7.8	6.5
Sulphide	mg/kg	1	MCERTS	5.2	< 1.0	2.9	1.9	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	7.5	0.6	0.8	0.8	1.2

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.5	8.3	9.3	9.3	10
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.3	0.2	0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.3	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	37	29	40	51	48
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	13	19	19	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	43	16	19	18	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	28	36	42	42
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	98	56	92	87	68

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275927	2275928	2275929	2275930	2275931
Sample Reference				TP15	TP16	TP17	TP18	TP19
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.60	1.00	0.80	1.20
Date Sampled				12/05/2022	12/05/2022	12/05/2022	12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275932	2275933	2275934	2275935	2275936
Sample Reference				TP20	TP21	TP23	TP24	TP25
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.80	0.80	0.60	0.20
Date Sampled				12/05/2022	12/05/2022	12/05/2022	12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	7.4	11	16	14
Total mass of sample received	kg	0.001	NONE	1.5	1.5	1.5	1.5	1.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	7.5	7.2	8.1	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	490	97	180	200	490
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0055	0.0027	0.0014	0.003	0.0062
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	11	5.4	2.7	5.9	12
Sulphide	mg/kg	1	MCERTS	10	1.3	3.7	< 1.0	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	5.3	0.5	1.4	1.4	4.4

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.4	11	5.1	12	8.4
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.2	0.2	< 0.2	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	< 0.2	< 0.2	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	41	28	40	38
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	15	13	13	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	41	15	14	16	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	34	20	27	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	79	76	49	67	91

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275932	2275933	2275934	2275935	2275936
Sample Reference				TP20	TP21	TP23	TP24	TP25
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.80	0.80	0.60	0.20
Date Sampled				12/05/2022	12/05/2022	12/05/2022	12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275937	2275938
Sample Reference				TP25	TP26
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.70
Date Sampled				12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)					
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.3	11
Total mass of sample received	kg	0.001	NONE	1.6	1.5

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	7.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	83	190
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.0027	0.004
Water Soluble SO4 (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	5.3	8.1
Sulphide	mg/kg	1	MCERTS	< 1.0	1.2
Organic Matter (automated)	%	0.1	MCERTS	0.7	1.5

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.7	6.8
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	43	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	21
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	92	70

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-58382
Project / Site name: Beeslack, Penicuik
Your Order No: 3744

Lab Sample Number				2275937	2275938
Sample Reference				TP25	TP26
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.70
Date Sampled				12/05/2022	12/05/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)					
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 22-58382
Project / Site name: Beeslack, Penicuik

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2275912	TP1	None Supplied	0.7	Light brown clay and sand with gravel and vegetation.
2275913	TP2	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2275914	TP3	None Supplied	0.6	Light brown clay and sand with gravel and vegetation.
2275915	TP4	None Supplied	0.8	Light brown loam and clay with gravel and vegetation.
2275916	TP6	None Supplied	0.6	Light brown loam and clay with gravel and vegetation.
2275917	TP7	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2275918	TP8	None Supplied	0.8	Brown clay and sand with gravel.
2275919	TP9	None Supplied	0.9	Brown clay and sand with gravel.
2275920	TP10	None Supplied	0.2	Brown loam and clay with gravel.
2275921	TP10	None Supplied	1.5	Brown clay and loam with gravel.
2275922	TP11	None Supplied	0.4	Brown clay and loam with gravel.
2275923	TP11	None Supplied	0.9	Brown clay and sand with gravel.
2275924	TP12	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2275925	TP13	None Supplied	0.8	Brown clay and sand with gravel.
2275926	TP14	None Supplied	0.6	Brown clay and sand with gravel.
2275927	TP15	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2275928	TP16	None Supplied	0.6	Brown clay and sand with gravel.
2275929	TP17	None Supplied	1	Brown clay and sand with gravel.
2275930	TP18	None Supplied	0.8	Brown clay and sand with gravel.
2275931	TP19	None Supplied	1.2	Brown clay and sand with gravel.
2275932	TP20	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2275933	TP21	None Supplied	0.8	Brown sand with gravel.
2275934	TP23	None Supplied	0.8	Brown clay and sand with gravel.
2275935	TP24	None Supplied	0.6	Brown clay and sand with gravel.
2275936	TP25	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2275937	TP25	None Supplied	0.5	Brown clay and sand with gravel.
2275938	TP26	None Supplied	0.7	Brown clay and sand with gravel.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 22-58382
Project / Site name: Beeslack, Penicuik

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPH Chromatogram in Soil	TPH Chromatogram in Soil.	In-house method	L064-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

Analytical Report Number : 22-58382
Project / Site name: Beeslack, Penicuik

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

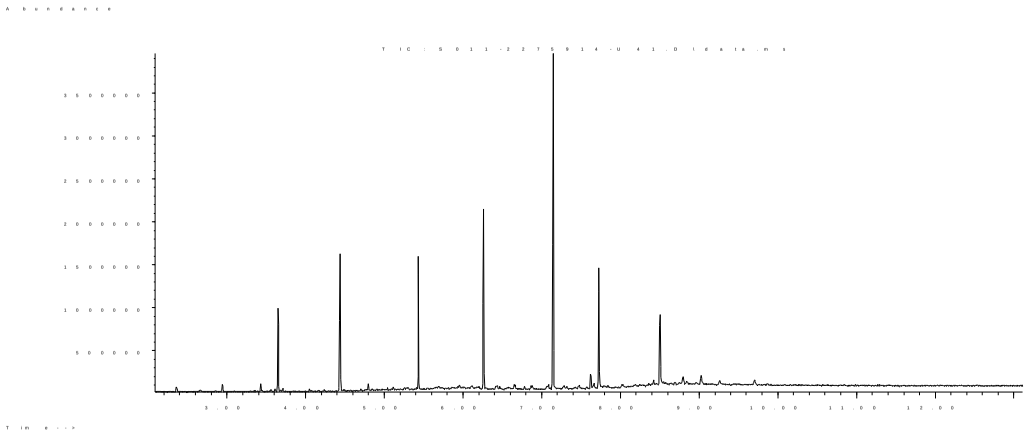
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received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

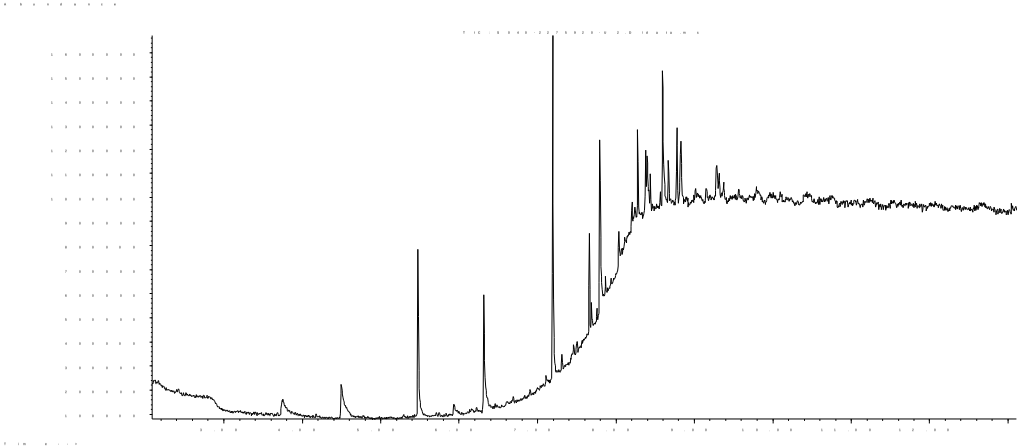
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

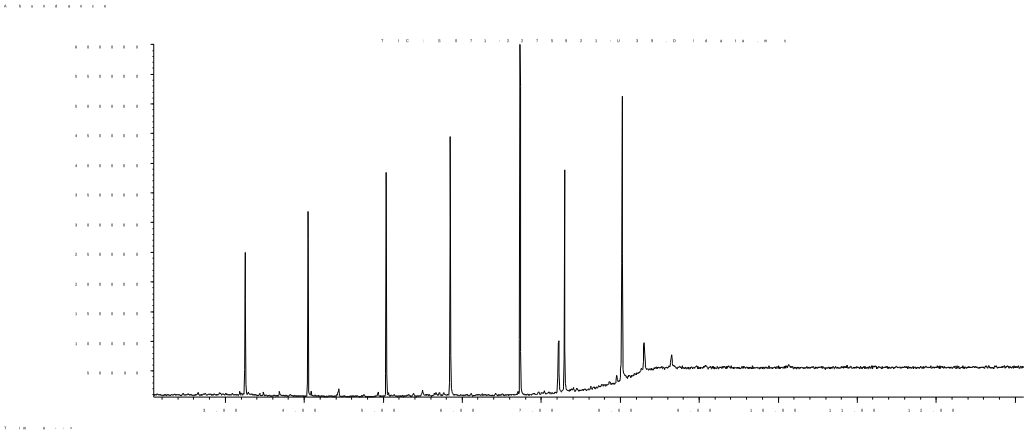
Information in Support of Analytical Results

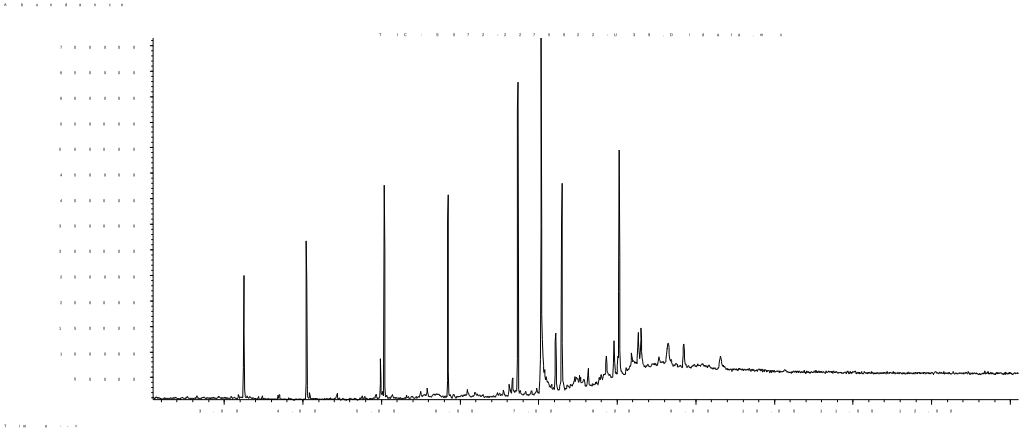
List of HWOL Acronyms and Ope

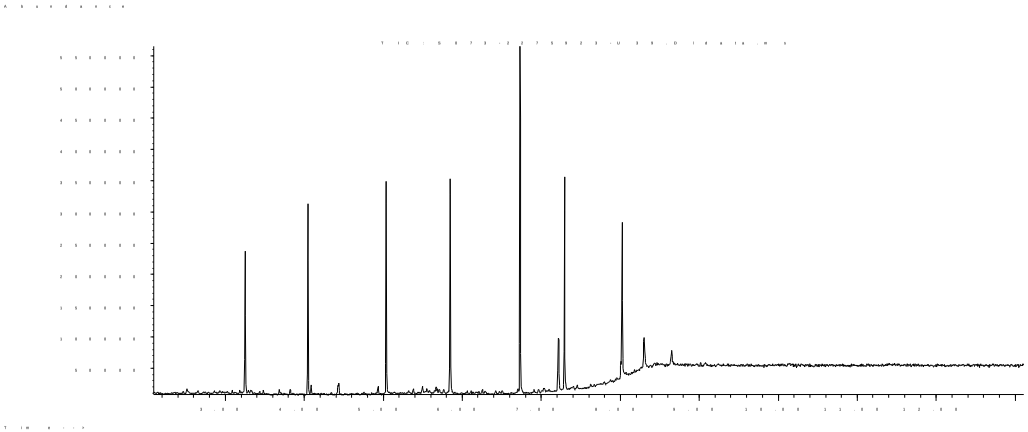
Acronym	Descriptio
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column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

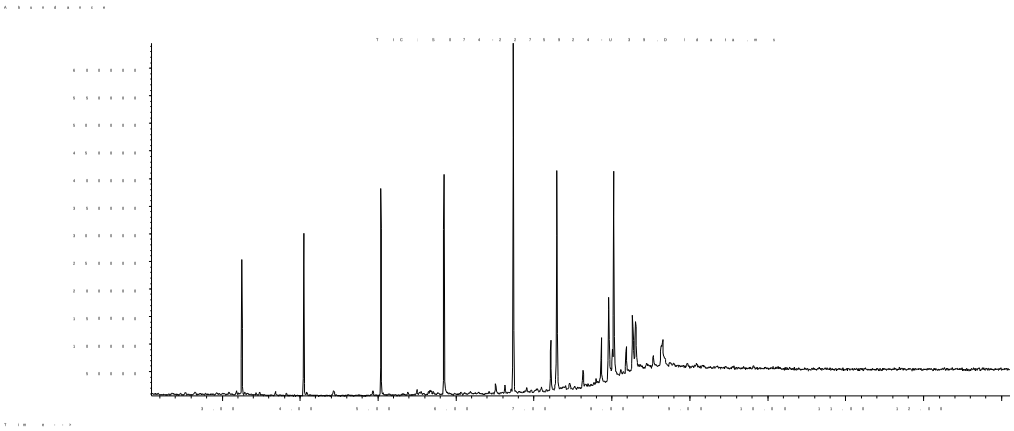

Abundance
TIC: S011-2275914-U41.D (data.ms)
3500000
3000000
2500000
2000000
1500000
1000000
500000
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
Time-->

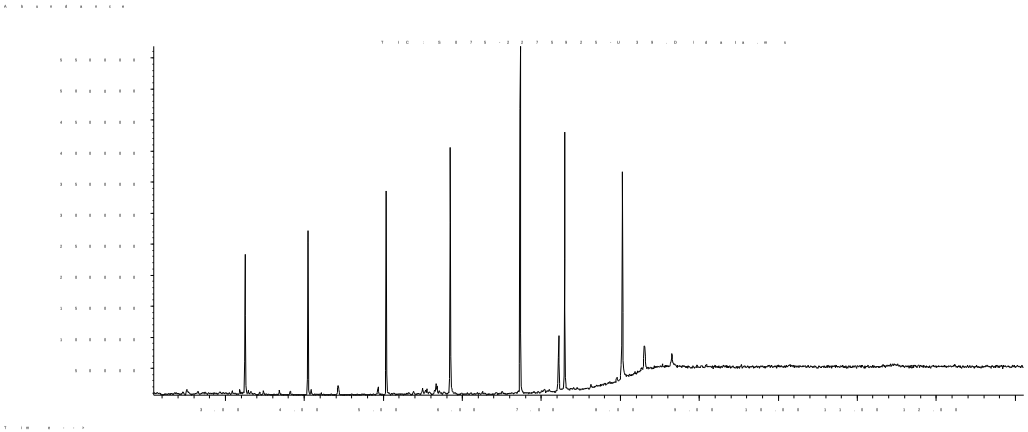


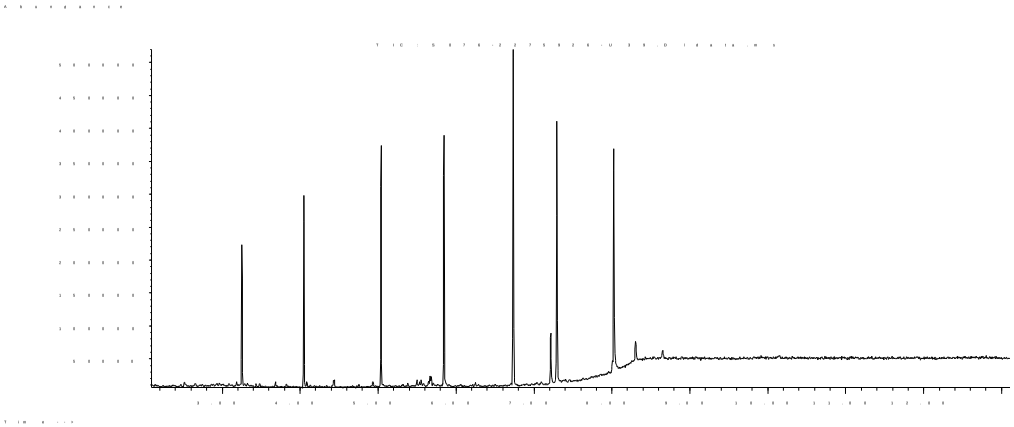


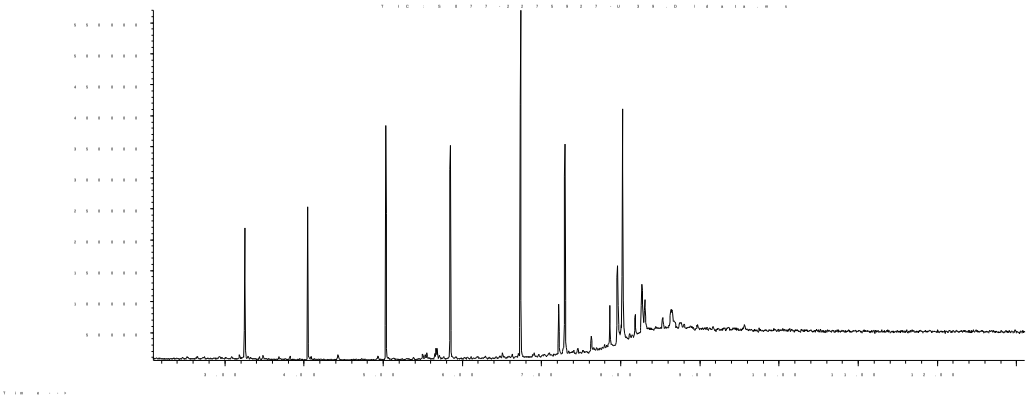


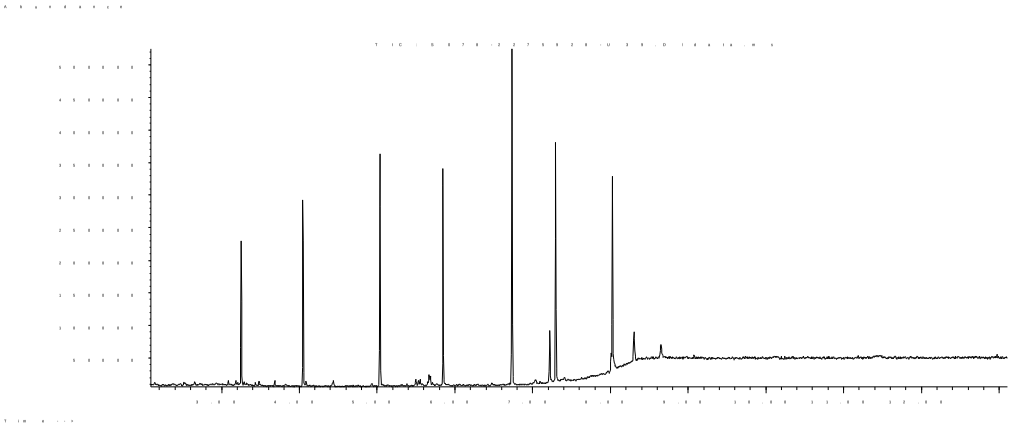


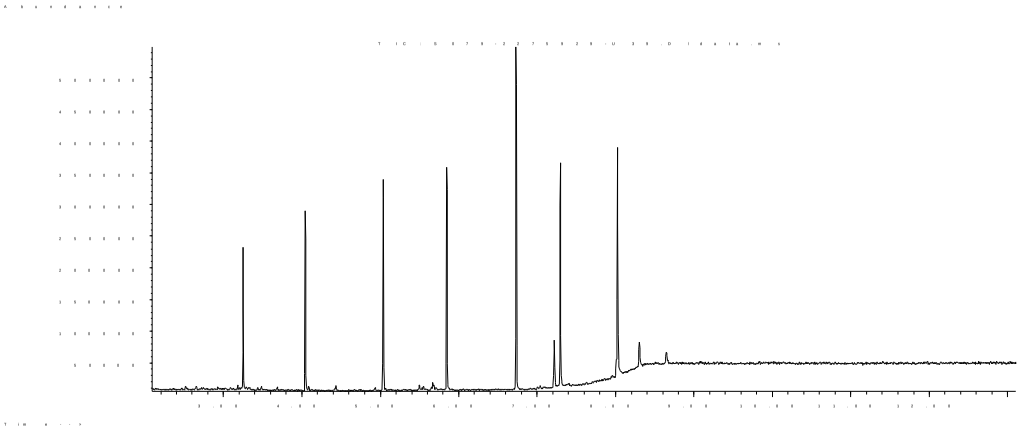


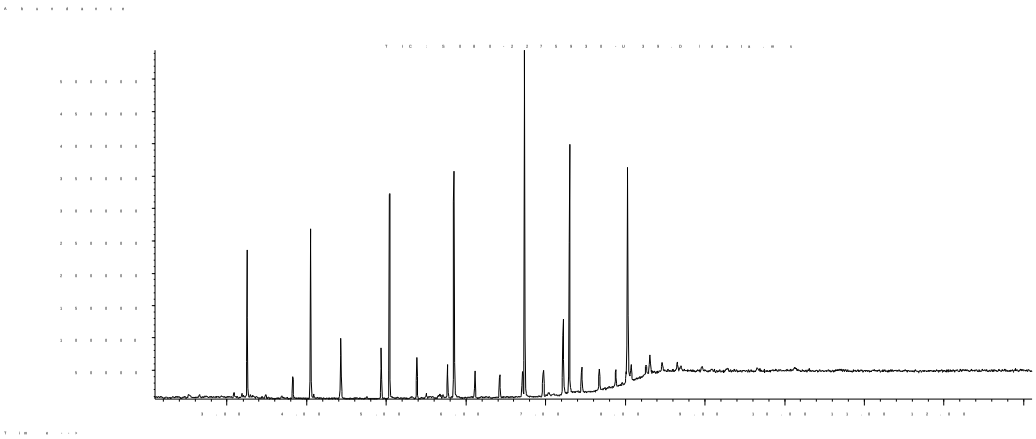


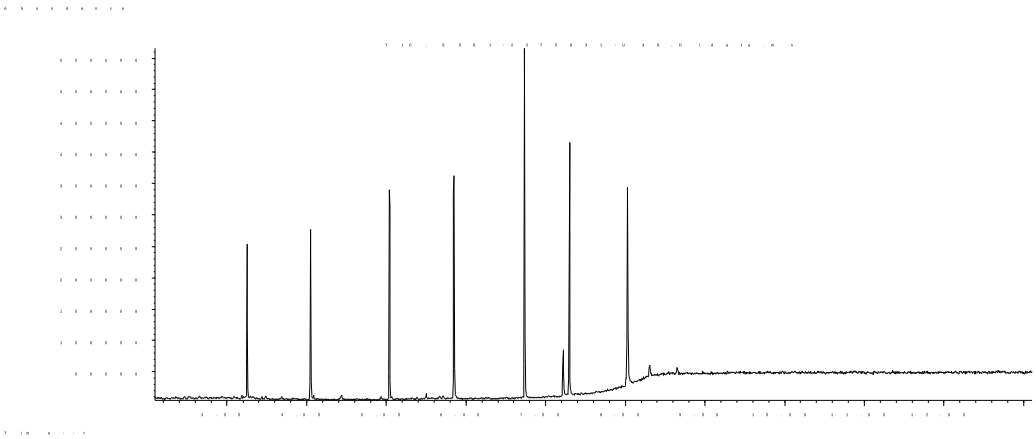


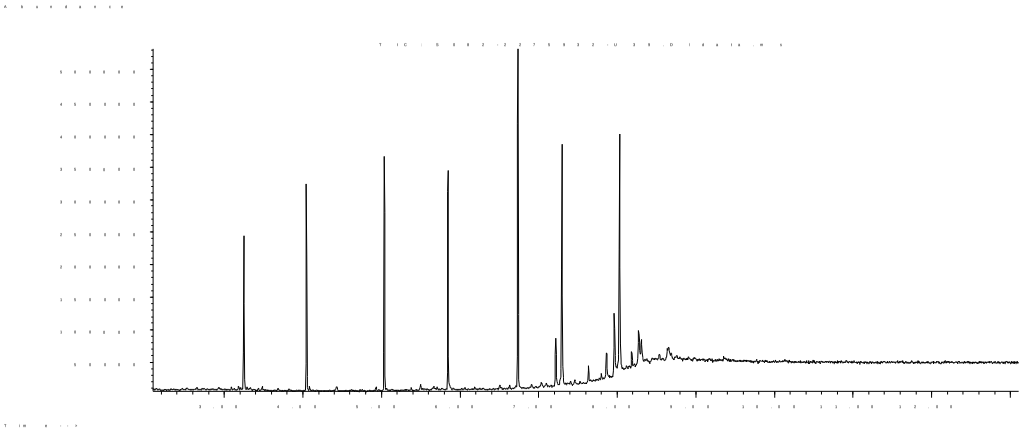


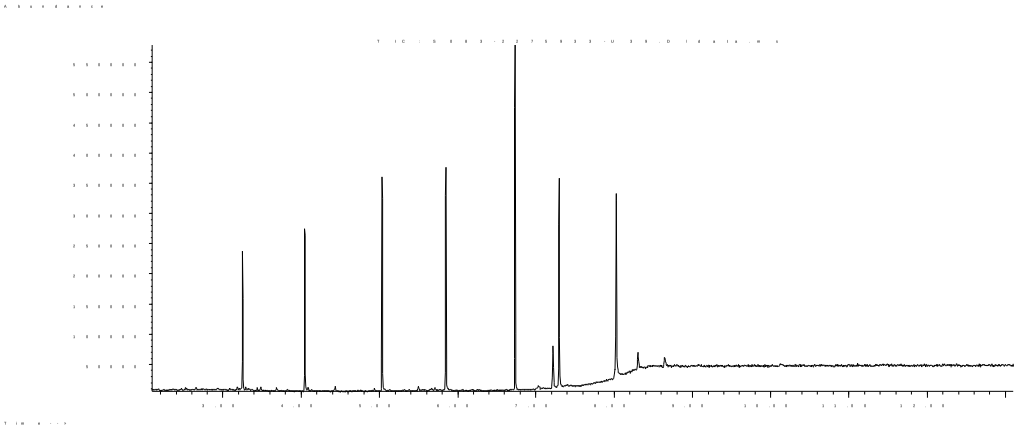


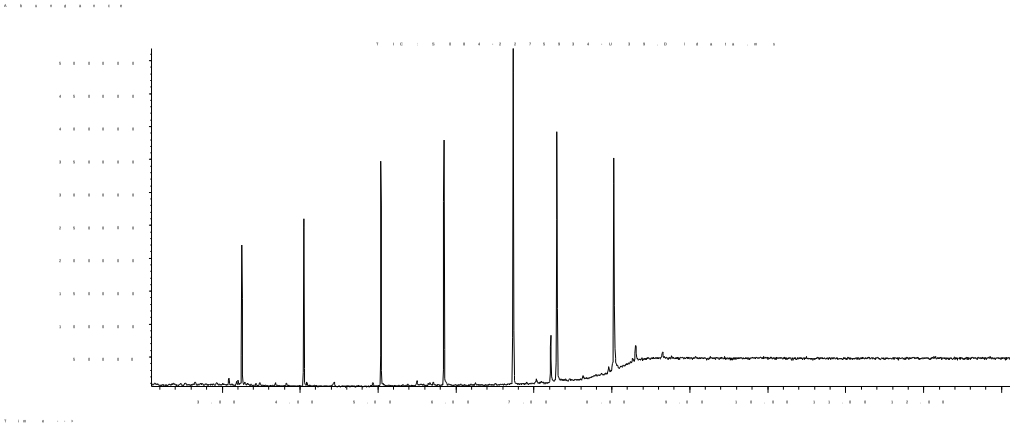


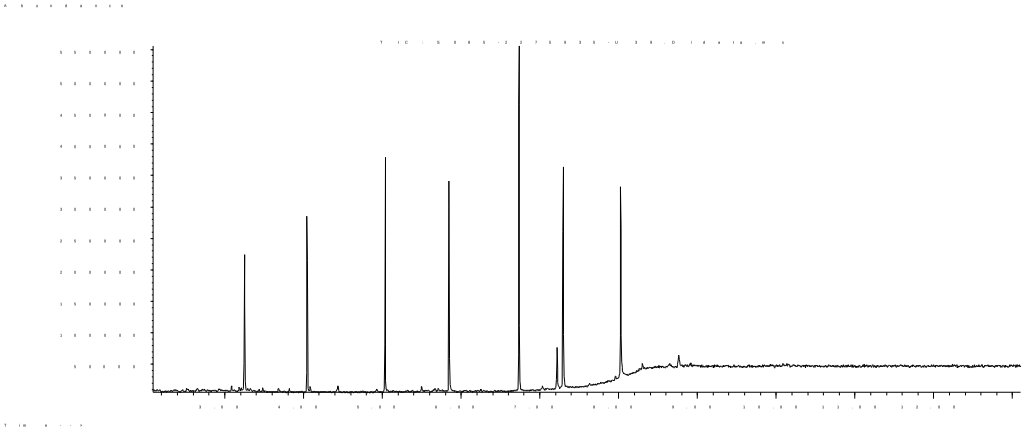


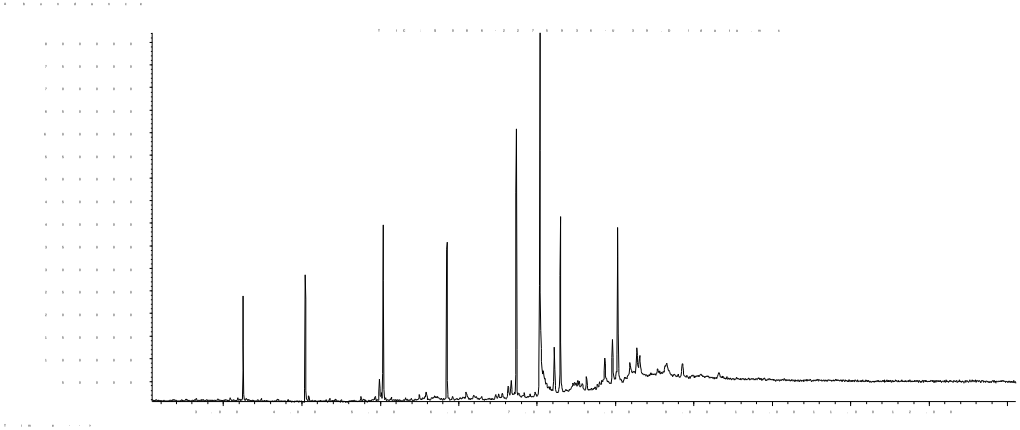


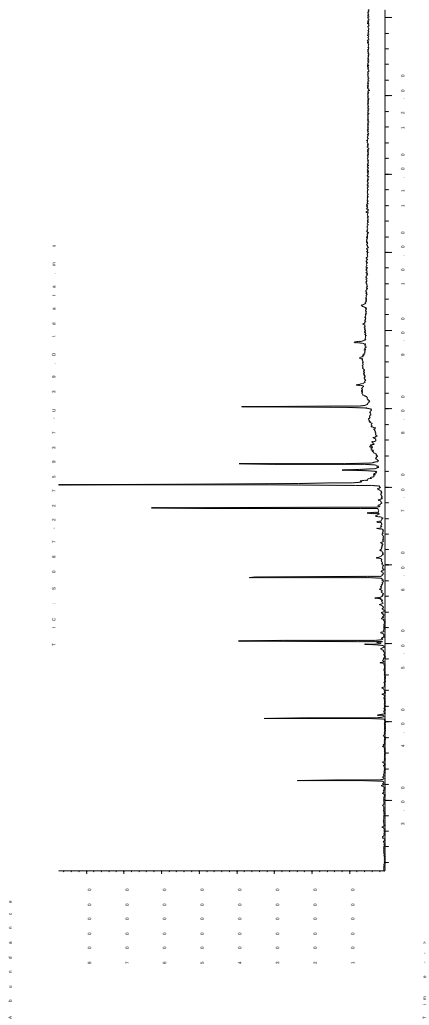


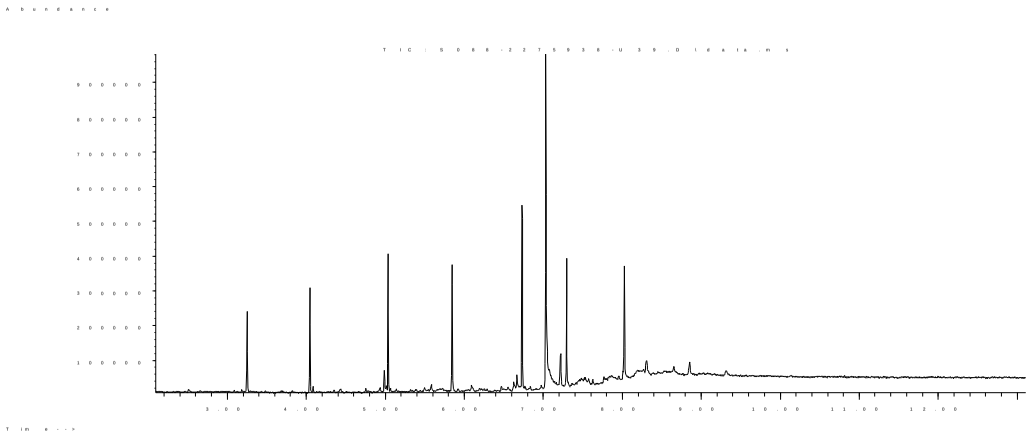


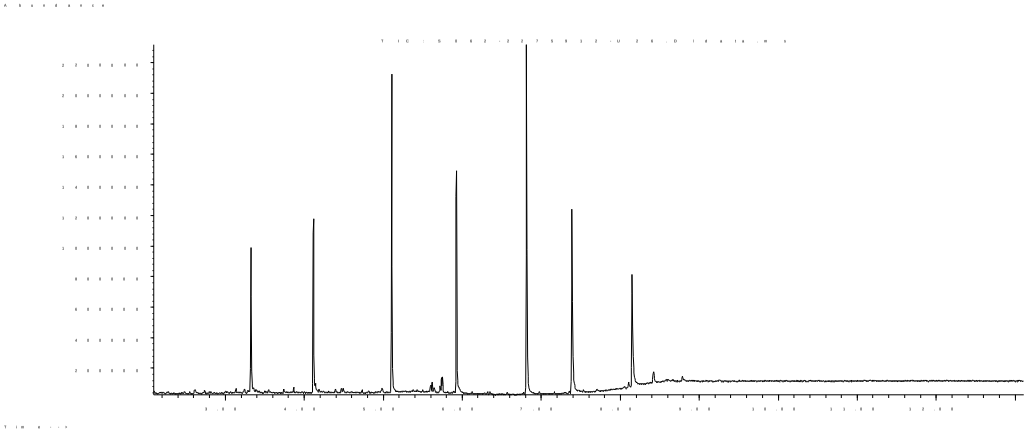


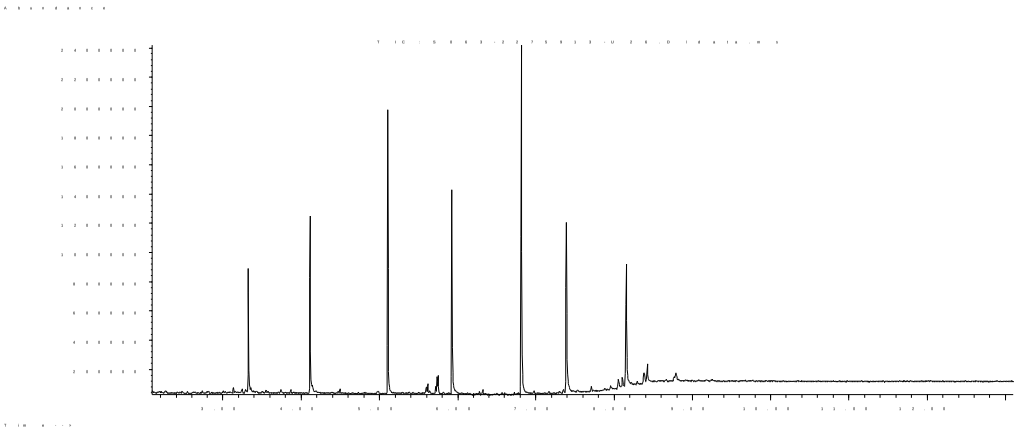


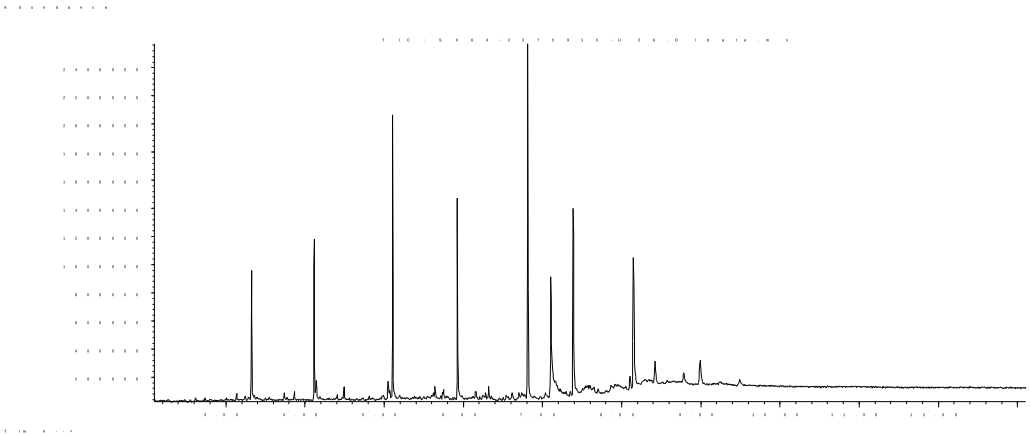


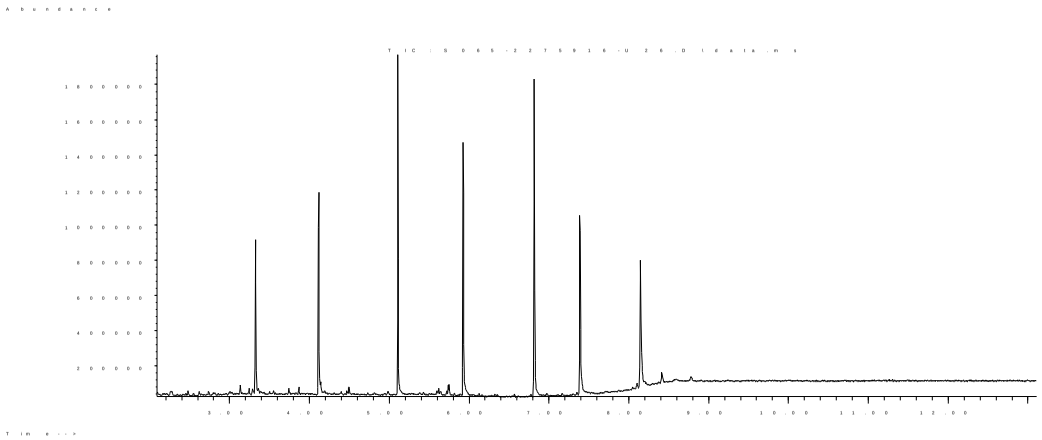


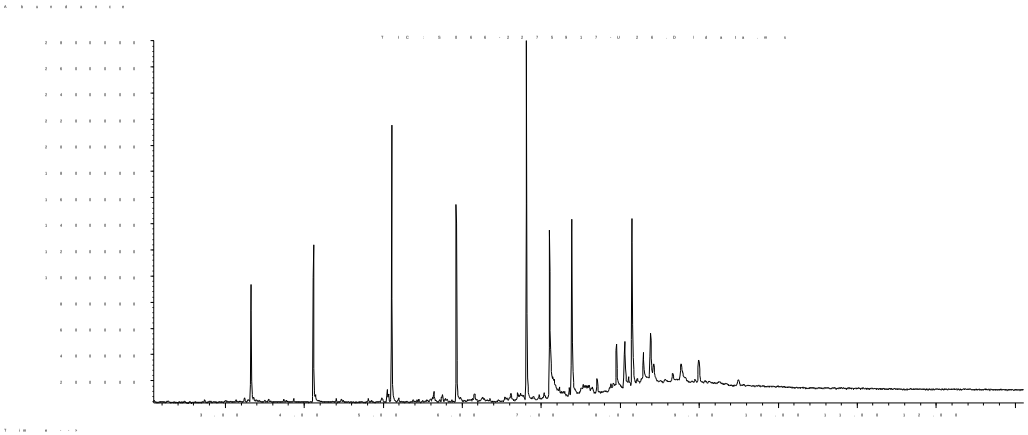

Abundance
TIC: S088-2275936-U39.D (data.ms)
900000
800000
700000
600000
500000
400000
300000
200000
100000
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
Time-->

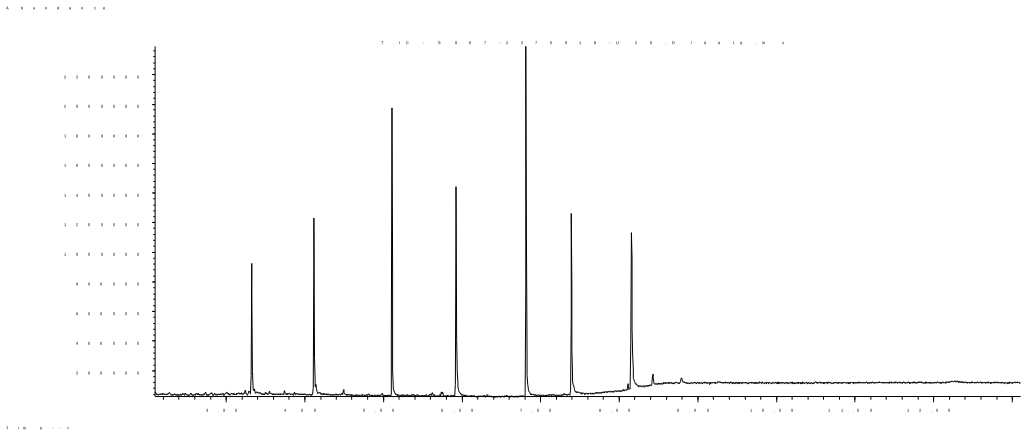


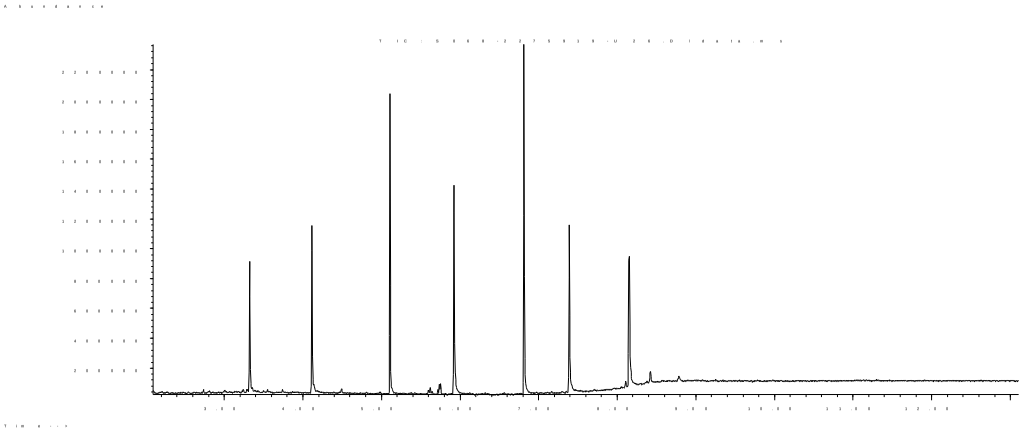





Abundance
TIC: S065-227591 6-U 26.0 (data.ms
1800000
1600000
1400000
1200000
1000000
800000
600000
400000
200000
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
Time-->







Mike Bradley
Johnson Poole & Bloomer
50 Speirs Wharf
Glasgow
G4 9TB

e: mike.bradley@jpbscotland.co.uk

i2 Analytical Ltd.
40 Carron Pl,
East Kilbride,
Glasgow
G75 0YL

t: 01355202915
f: 01923237404
e: scotland@i2analytical.com

Analytical Report Number : 22-62161

Project / Site name:	Beeslack High School, Penicuik	**Samples received on:**	31/05/2022
Your job number:	WG684	**Samples instructed on/ Analysis started on:**	01/06/2022
Your order number:	3822	**Analysis completed by:**	16/06/2022
Report Issue Number:	1	**Report issued on:**	16/06/2022
Samples Analysed:	1 leachate sample - 1 soil sample		

Signed: [redacted]

Ashleigh Cunningham
Senior Customer Service Adviser
For & on behalf of i2 Analytical Ltd.

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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

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

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]	Units	Limit of detection	Accreditation Status	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Accreditation Status	Limit of detection	Units

Accreditation Status	Limit of detection	Units

Accreditation Status	Limit of detection	Units

Analytical Report Number: 23-08505

Project / Site Name: Deerfield High School, Pembroke

Results relate only to the items tested or to the sample(s) as received. Results apply to the sample(s) as received. This report shall not be reproduced except in full, without written approval of Alpha Analytical Laboratories, Inc. Results reported on a dry weight basis unless otherwise noted. Sample results are reported in units of dry weight.

Sample results are reported on a dry weight basis. Analytical results for parameters in the scope of accreditation are identified by an asterisk (*). Reporting limits are reported for all analytes.

Lab Sample Number	Sample Collection Date	Sample Receipt Date	Matrix (W/S)	Sample Description *
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Analytical Results and Methods

Project / Site: [illegible] Sampling Period: [illegible]

Water Sample Analytical:

Sample Water (SW) 1 Points Water (SPW) 1 Groups Water (SGW) 1 Points Water (SPW) 1 Fingerprint and Effluent (FPE) Sediment (SED) Fish (FISH) [illegible]

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Minimum Sample Size	Maximum Holding Time	Analytical Method Failure
Alkalinity in Seawater	Titration Method of Alkalinity in Seawater by Hydrochloric Acid and Bromophenol Blue.	Standard Methods Method 2320 B, 20th Ed. Method Method Method Method Method in Seawater	100 ml	48	Not Stated
Chloride & Other Inorganic Anions in Soil	Ion Chromatography of Chloride & Other Inorganic Anions with Suppressed Conductivity Detection. Chloride is Tested for at Minimum, with Other Ions Tested for Upon Request.	Method Method	100 ml	48	Method
Electrical Conductivity (EC) in Soil	Method Method of Electrical Conductivity (EC) in Soil Extracts. Method and Methods of Electrical Conductivity Tested for by Method Only.	Method Method	100 ml	48	Method
Total Petroleum Hydrocarbons (TPH) Extractable Organics	Method Method. Total Petroleum Hydrocarbons (TPH) Extractable Organics.	Method Method Method Method Method	100 ml	48	None

For a more comprehensive list of analytical methods and their descriptions, please refer to the Method Glossary.

For a more comprehensive list of analytical methods and their descriptions, please refer to the Method Glossary in Table 1.

Analytical results are expressed as a mix of mass units. Water analysis is reported as micrograms per liter (µg/L) or milligrams per liter (mg/L). Soil analysis is reported as milligrams per kilogram (mg/kg) or micrograms per kilogram (µg/kg).

Method detection limits (MDL) are the lowest concentration that can be reliably detected by a method. Reporting limits (RL) are the lowest concentration that can be reliably quantified by a method.

Information in Support of Analytical Results

List of New Glossary and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass Spectrometry
FID	Flame Ionization Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. analytical extracted by the solvent)
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single capillary column gas chromatography
2D	GC-GC - Double capillary column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics

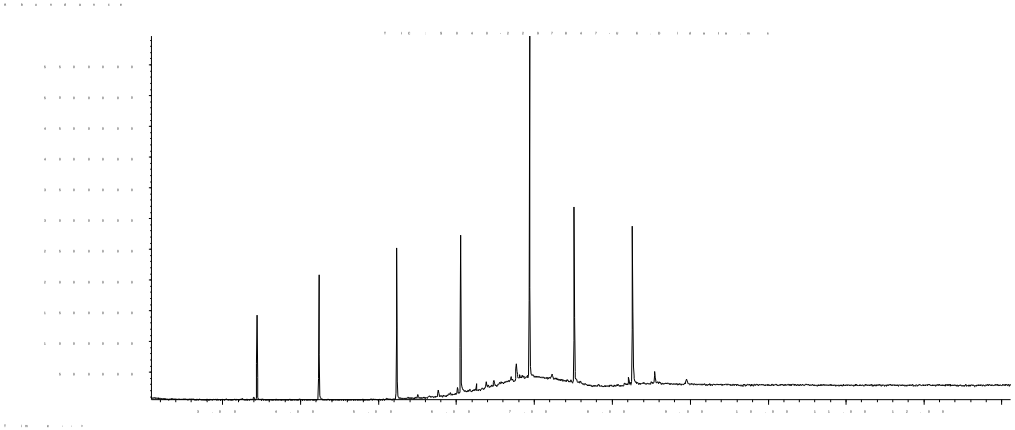
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]				
[illegible]	[illegible]				
[illegible]	[illegible]				
[illegible]	[illegible]				



Mike Bradley
Johnson Poole & Bloomer
50 Speirs Wharf
Glasgow
G4 9TB

e: mike.bradley@jpbscotland.co.uk

i2 Analytical Ltd.
40 Carron Pl,
East Kilbride,
Glasgow
G75 0YL

t: 01355202915
f: 01923237404
e: scotland@i2analytical.com

Analytical Report Number : 22-62166

Project / Site name:	Beeslack High School	**Samples received on:**	31/05/2022
Your job number:	WG684	**Samples instructed on/ Analysis started on:**	01/06/2022
Your order number:	3821	**Analysis completed by:**	13/06/2022
Report Issue Number:	1	**Report issued on:**	13/06/2022
Samples Analysed:	7 water samples		

Signed: [redacted]

Jennifer Fitzpatrick
Customer Services Advisor
For & on behalf of i2 Analytical Ltd.

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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

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

Analytical Report Number: 22-62166
Project / Site name: Beeslack High School

Your Order No: 3821

Lab Sample Number				2297898	2297899	2297900	2297901	2297902
Sample Reference				S02	S04	S14	S17	SW1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				1300	1230	1120	1040	1350
Analytical Parameter (Water Analysis)								
General Inorganics								
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO4	mg/l	0.045	ISO 17025	38.3	23.4	13.5	24.7	17.1
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	81	190	8	9.7	29
Total Phosphate as P	mg/l	0.02	ISO 17025	0.04	0.07	0.07	0.04	0.04
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	180	67	130	28	29
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	4.17	2.16	4.37	5.49	3.06
BOD (Biochemical Oxygen Demand) (Total) - PL	mg/l	1	ISO 17025	3.8	1	2.3	5	< 1.0
Total Phenols								
Total Phenols (monohydric)	µg/l	1	ISO 17025	1.2	1.2	1.2	1.4	1.2
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16
Heavy Metals / Metalloids								
Boron (dissolved)	µg/l	10	ISO 17025	24	40	55	56	33
Calcium (dissolved)	mg/l	0.012	ISO 17025	90	130	55	76	41
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	0.048	0.022	0.12	0.007	0.018
Magnesium (dissolved)	mg/l	0.005	ISO 17025	13	22	8.2	10	7.9
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.29	0.22	0.21	0.68	0.3
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03	0.11	< 0.02	0.05	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.3	< 0.2	0.3
Copper (dissolved)	µg/l	0.5	ISO 17025	9.6	2.9	5.1	4.4	18
Lead (dissolved)	µg/l	0.2	ISO 17025	0.3	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	1600	4200	10	200	2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.2	8.9	1.3	4.1	0.9
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	1.3	0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	9.3	6.8	11	6.1	14

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-62166
Project / Site name: Beeslack High School

Your Order No: 3821

Lab Sample Number				2297898	2297899	2297900	2297901	2297902
Sample Reference				S02	S04	S14	S17	SW1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				31/05/2022	31/05/2022	31/05/2022	31/05/2022	31/05/2022
Time Taken				1300	1230	1120	1040	1350
Analytical Parameter (Water Analysis)								

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-62166
Project / Site name: Beeslack High School

Your Order No: 3821

Lab Sample Number				2297903	2297904
Sample Reference				SW2	SW3
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				31/05/2022	31/05/2022
Time Taken				1410	1440
Analytical Parameter (Water Analysis)					

General Inorganics

Total Cyanide	µg/l	10	ISO 17025	< 10	< 10
Sulphate as SO4	mg/l	0.045	ISO 17025	5.63	22.2
Sulphide	µg/l	5	NONE	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	22	140
Total Phosphate as P	mg/l	0.02	ISO 17025	0.2	0.05
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	920	56
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	6.28	6.15
BOD (Biochemical Oxygen Demand) (Total) - PL	mg/l	1	ISO 17025	1.8	< 1.0

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	2.1	< 1.0

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16

Heavy Metals / Metalloids

Boron (dissolved)	µg/l	10	ISO 17025	24	35
Calcium (dissolved)	mg/l	0.012	ISO 17025	41	80
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	0.2	0.011
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5	13

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.93	0.33
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03	0.04
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.6	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	2.7	23
Lead (dissolved)	µg/l	0.2	ISO 17025	0.3	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	290	4.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.7	1.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	88	8.5

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-62166
Project / Site name: Beeslack High School

Your Order No: 3821

Lab Sample Number				2297903	2297904
Sample Reference				SW2	SW3
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				31/05/2022	31/05/2022
Time Taken				1410	1440
Analytical Parameter (Water Analysis)					

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 $_{EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) $_{HS+EH\_1D\_AL\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 $_{EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH\_1D\_AR\_\#1\_\#2\_MS}$	µg/l	10	NONE	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 22-62166
Project / Site name: Beeslack High School

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Biological oxygen demand (total) of water	Determination of biochemical oxygen demand in water (5 days). Accredited matrices: SW, PW, GW.	In-house method based on standard method 5210B.	L086-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
TPH Chromatogram in Water	TPH Chromatogram in Water.	In-house method	L070-PL	W	NONE
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Total Phosphate as P in water	Determination of ortho phosphate in water by addition of ammonium molybdate, potassium antimonyl tartrate and ascorbic acid followed by colorimetry.Accredited matrices: SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025

Analytical Report Number : 22-62166
Project / Site name: Beeslack High School

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

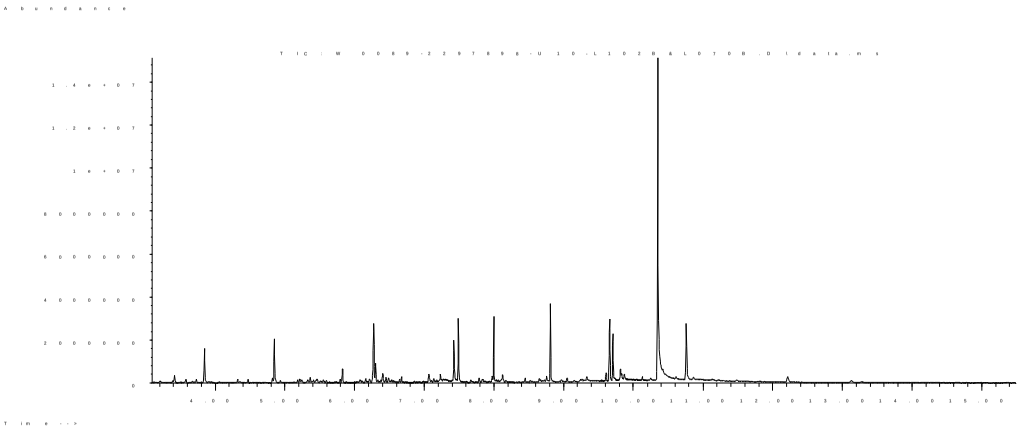
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received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

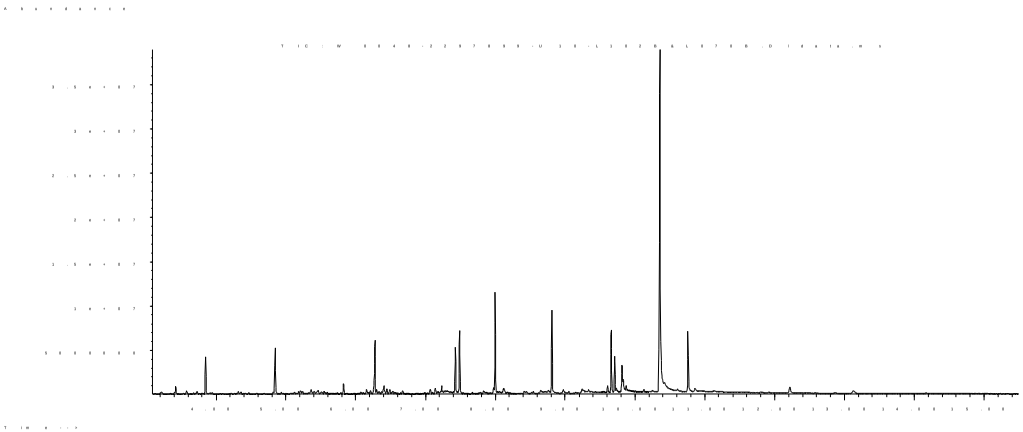
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

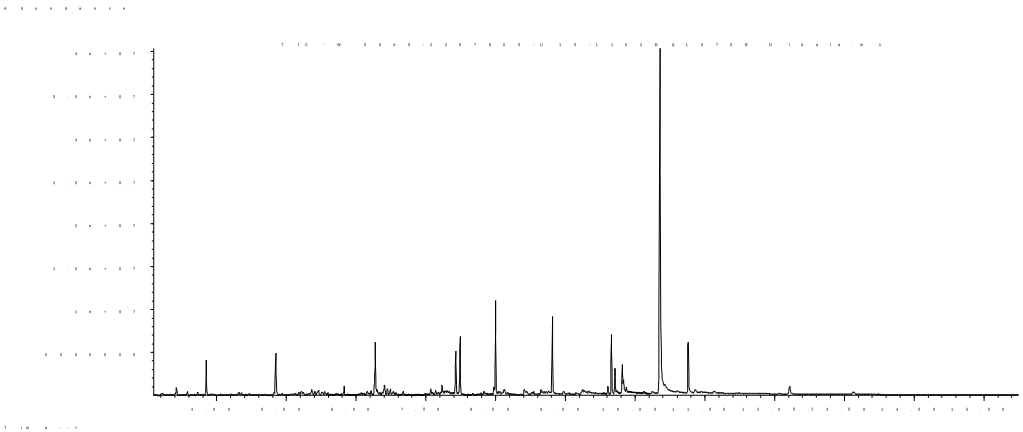
Information in Support of Analytical Results

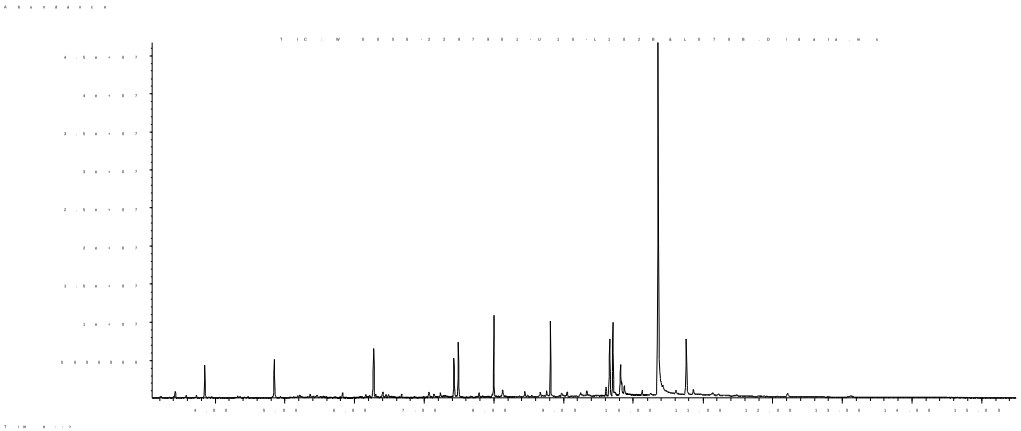
List of HWOL Acronyms and Ope

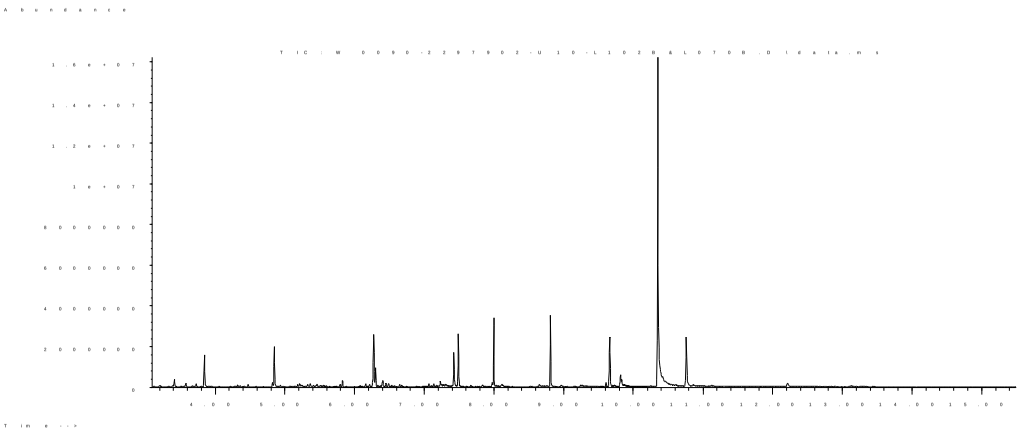
Acronym	Descriptio
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column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

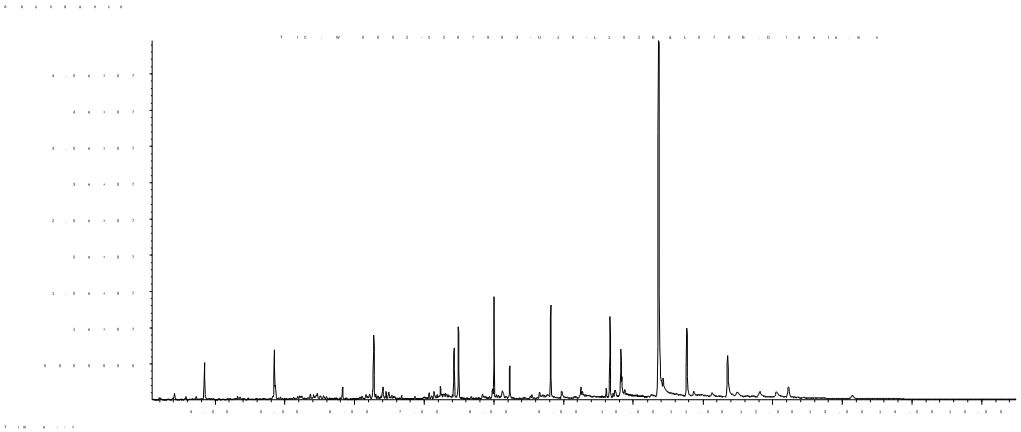

Abundance
TIC: W 0089-2297898-U 10-L102RALOTOR.Ddata.ms
1.4e+07
1.2e+07
1e+07
8000000
6000000
4000000
2000000
0
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
13.00
14.00
15.00
Time-->

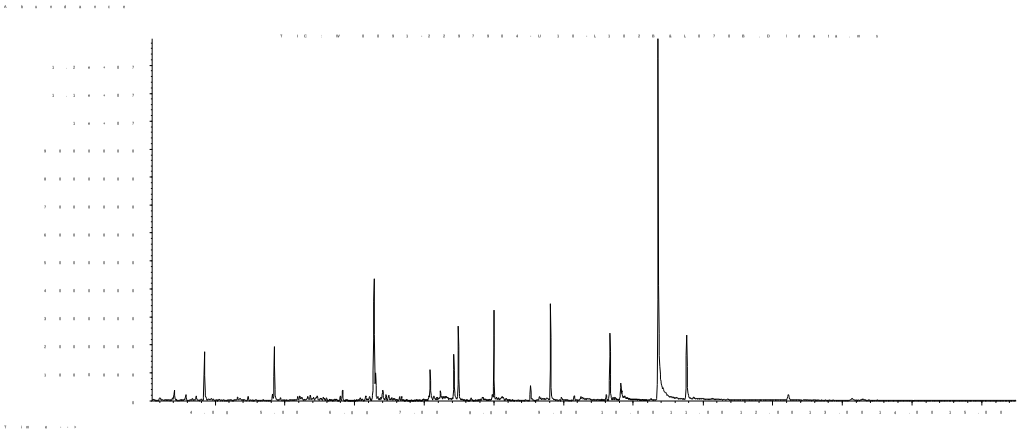







Abundance
TIC: M0090-2297902-U10-L102RAL07OB.D\data.ms
1.6e+07
1.4e+07
1.2e+07
1e+07
8000000
6000000
4000000
2000000
0
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
13.00
14.00
15.00
Time-->





Appendix 11 **Results of On-Site Groundwater and Gas Monitoring and Gas Monitor Calibration Certificate– Johnson Poole & Bloomer – May - August 2022**

Johnson Poole & Bloomer

Project Number	WG684			
Project Name	Beeslack High School, Penicuik			
Client	Midlothian Council			
Date	31/05/2022			
Engineer	MM+SM+AF			
Weather	Overcast, Dry			
Atmospheric Pressure	Start	992	992	993
	Finish	992	992	993
Atmospheric Gas Readings	CH4 % by vol	0	0	0
	CO2 % by vol	0.1	0.1	0.2
	O2 % by vol	20.9	20.5	21.1
	CO ppm	0	0	0
	H2S ppm	0	0	0
Gas monitor Model		GA5000	GA5000	GA5000
Gas Monitor Serial Number		G504849	G505965	G505964
Date of Next Calibration		26/05/2022	22/08/2022	26/06/2022

Borehole Number	Borehole level mAOD	CH_4 %vol		CH_4 %vol		CO_2 % vol		CO_2 % vol		O_2 % vol		O_2 % vol		N_2 % vol		H_2S ppm		H_2S ppm		CO ppm		CO ppm		Atmos Pressure (mb)	Diff Pressure (Pa)	Ave Flow (l/h)		Flow (l/h)	Flow (l/h)	G/water Depth (m)	Depth of BH (m)	Water Level (mAOD)	Water Sampling		
		Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Peak	Steady	Min	Max	Peak	Steady	Min	Max			Peak	Steady	Steady - end of monitoring	Max				Purge 3 x well volume	Recharged	Sample taken
																																	✓	×	×
S01		0	0	0	0	1.6	1.6	0.1	1.6	20.8	19.4	19.4	20.8	79	79	0	0	0	0	1	0	0	1			0	0	0	0	2.09	3.62	-2.09			
S02		0	0	0	0	2.7	2.7	0.1	2.7	20.4	19.3	19.3	20.4	79.5	78	0	0	0	0	0	0	0	0	992	5	0	0	0	0	1.37	2.83	-1.37			
S03		0	0	0	0	1.8	1.8	0.1	1.8	20.9	20.1	20.1	20.9	78.9	78	0	0	0	0	1	1	0	1	992	5	0.1	0.1	0.1	0.1	dry	2.58	#VALUE!			
S04		0	0	0	0	2.2	2.2	0.1	2.2	20.6	19.2	19.1	20.6	79.4	78.6	0	0	0	0	0	0	0	0	992	4	0	0	0	0	1.62	3.5	-1.62			
S05		0	0	0	0	0.1	0.1	0.1	0.1	20.8	20.8	20.8	20.8	79.2	79.2	0	0	0	0	2	1	0	2	992	2	0.2	0.1	0.1	0.2	dry	4	#VALUE!			
S06		0	0	0	0	1.5	1.5	0	1.5	21.3	20.3	20.3	21.3	78.7	78.2	0	0	0	0	0	0	0	0	993	3	0.1	0.1	0.1	0.1	2.17	2.41	-2.17			
S07		0	0	0	0	4.3	4.2	0.1	4.3	20.8	18.1	18.1	20.8	79.1	77.7	0	0	0	0	0	0	0	0	992	4	0	0	0	0	1.61	3.77	-1.61			
S08		0	0	0	0	1.9	1.9	0.1	1.9	21.5	19.9	19.9	21.5	78.4	78.2	0	0	0	0	0	0	0	0	993	5	0.2	0.1	0.1	0.2	1.88	2.3	-1.88			
S09		0	0	0	0	4	4	0.1	4	20.9	18.6	18.6	20.9	79	77.4	0	0	0	0	0	0	0	0	992	4	0	-0.1	-0.1	0	1.43	2.78	-1.43			
S10		0	0	0	0	1.5	1.5	0.1	1.5	20.9	19.9	19.9	20.9	78.9	78.6	0	0	0	0	1	0	0	1	992	15	0.1	0.1	0.1	0.1	dry	2.13	#VALUE!			
S11		0	0	0	0	1.9	1.8	0.1	1.9	21.6	20.3	20.3	21.6	78.3	77.9	0	0	0	0	0	0	0	0	993	2	0	0	0	0	1.77	2.11	-1.77			
S12		0	0	0	0	2.6	2.6	0.1	2.6	20.9	18.7	18.7	20.9	79	78.7	0	0	0	0	0	0	0	0	992	5	0	0	0	0	1.2	3.91	-1.2			
S13		0	0	0	0	1.4	1.4	0.1	1.4	20.8	20	20	20.8	78.9	78.7	0	0	0	0	1	0	0	1	992	3	0.1	0.1	0.1	0.1	1.82	2.85	-1.82			
S14		0	0	0	0	2	2	0.1	2	21.2	20	20	21.2	78.7	78	0	0	0	0	0	0	0	0	993	5	0.1	0.1	0.1	0.1	1.25	2.11	-1.25			
S15		0	0	0	0	0.1	0.1	0.1	0.1	20.6	20.6	20.5	20.6	79.4	79.3	0	0	0	0	0	0	0	0	992	4	0	0	0	0	0.85	3.73	-0.85			
S16		0	0	0	0	5.1	4	0.1	5.1	20.9	18.8	17.9	20.9	79	77.3	0	0	0	0	0	0	0	0	992	-2	0	0	0	0	dry	2.91	#VALUE!			
S17		0	0	0	0	1.5	1.4	0.1	1.5	21.1	19.8	19.7	21.1	78.8	78.8	0	0	0	0	8	5	0	8	993	51	0.4	0.3	0.3	0.4	1.11	2.84	-1.11			
R01		3	3	0	3	0.2	0.2	0	0.2	21.5	14.8	14.8	21.5	82	82	1	1	0	1	92	92	0	92	993	7	0.2	0.2	0.2	0.2	9.38	?	-9.38			
R02		9.7	9.7	0	9.7	0.6	0.6	0.1	0.6	21.5	2.8	2.8	21.5	86.9	86.9	0	0	0	0	27	27	0	27	993	9	0.1	0.1	0.1	0.1	20.92	22.19	-20.92			
R03		0	0	0	0	0.8	0.8	0	0.8	20.7	20.4	20.4	20.7	79.3	78.8	1	0	0	1	0	0	0	0	992	7	0.1	0.1	0.1	0.1	19.23	25.2	-19.23			

Comments	R01 is deeper than the dip meter can go (31.16m)

Project Number	WG684
Client	Midlothian Council
Date	31/05/2022
Engineer	MM+SM+AF
Weather	Overcast, Dry
Instrument Used	
Serial Number	
Calibrated before use	✓

Johnson Poole & Bloomer

Borehole Number	Water Level m	Depth of BH (m)			pH			Temperature °C			Conductivity (uS/cm)	Dissolved Oxygen (mg/7L)
Calibration Check					4.16/7.10						1489@21.1	0.2
S02	1.37	2.83			7.04			14.7			603	6.1
S04	1.62	3.5			6.99			14.7			807	6.6
S14	1.25	2.11			7.08			15.7			308	6.8
S17	1.11	2.84			7.14			15.7			377	6.2
SW1					7.49			14.1			333	7.9
SW2					7.44			12.2			230	4.4
SW3					7.66			12.8			650	8.2
Calibration Check					4.17/7.14						1517@20.5	0.1

Project Number	WG684		
Project Name	Beeslack High School, Penicuik		
Client	Midlothian Council		
Date	15/06/2022		
Engineer	MM+NB		
Weather	Sunny+Cloud		
Instrument Calibration	Start	1000	1000
	Finish	1000	1000
Atmospheric Pressure	CH4 % by vol	0	0
	CO2 % by vol	0.1	0.1
	O2 % by vol	20.9	21.9
	CO ppm	0	0
	H2S ppm	0	0
Gas monitor Model		GA5000	GA5000
Gas Monitor Serial Number		G505964	G503122
Date of Next Calibration		26/06/2022	04/10/2022

Borehole Number	Borehole level mAOD	CH_4 %vol		CH_4 %vol		CO_2 % vol		CO_2 % vol		O_2 % vol		O_2 % vol		N_2 % vol		H_2S ppm		H_2S ppm		CO ppm		CO ppm		Atmos Pressure (mb)	Diff Pressure (Pa)	Ave Flow (l/h)		Flow (l/h)	Flow (l/h)	G/water Depth (m)	Depth of BH (m)	Water Level (mAOD)	Water Sampling		
		Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Peak	Steady	Min	Max	Peak	Steady	Min	Max			Peak	Steady	Steady - end of monitoring	Max				Purge 3 x well volume	Recharged	Sample taken
S01		0	0	0	0	1.6	1.5	0	1.6	21.6	20.2	20.2	21.6	78.4	78.3	0	0	0	0	0	0	0	0	1000	5	0.1	0	0	0.1	2.38	3.88	-2.38			
S02		0	0	0	0	1.4	1.4	0.1	1.4	22.2	21.6	21.6	22.2	77.7	77	0	0	0	0	0	0	0	0	1000	2	0	0	0	0	1.58	2.91	-1.58			
S03		0	0	0	0	1	1	0	1	21.6	20.8	20.8	21.6	78.4	78.2	0	0	0	0	0	0	0	0	1000	5	0.1	0.1	0.1	0.1	2.34	2.69	-2.34			
S04		0	0	0	0	1.8	1.8	0.1	1.8	22	20.7	20.7	22	77.6	77.5	0	0	0	0	0	0	0	0	1000	3	0	-0.1	-0.1	0	1.76	3.51	-1.76			
S05		0	0	0	0	1	1	0	1	21.4	20.7	20.7	21.4	78.6	78.3	0	0	0	0	0	0	0	0	1000	5	0	0	0	0	2.22	3.61	-2.22			
S06		0	0	0	0	1	1	0	1	21.6	20.7	20.7	21.6	78.4	78.3	0	0	0	0	0	0	0	0	1000	2	0.1	0.1	0.1	0.1	1.98	2.37	-1.98			
S07		0	0	0	0	3.4	3.4	0.4	3.4	22	18.3	18.3	22	78.3	78.3	0	0	0	0	0	0	0	0	1000	0	-0.1	-0.1	-0.1	-0.1	1.67	3.77	-1.67			
S08		0	0	0	0	1.1	1.1	0	1.1	21.3	20.4	20.4	21.3	78.7	78.5	0	0	0	0	0	0	0	0	1000	7	0.1	0.1	0.1	0.1	1.78	2.27	-1.78			
S09		0	0	0	0	2.3	2.3	0	2.3	22.2	20.6	20.6	22.2	77.7	77	0	0	0	0	0	0	0	0	1000	-2	0	0	0	0	1.46	2.78	-1.46			
S10		0	0	0	0	1.5	1.4	0.1	1.5	21	20	20	21	78.9	78.6	0	0	0	0	0	0	0	0	1000	3	0.1	0.1	0.1	0.1	1.55	2.54	-1.55			
S11		0	0	0	0	0.9	0.8	0	0.9	21.2	20.6	20.6	21.2	78.8	78.6	0	0	0	0	0	0	0	0	1000	3	0	0	0	0	1.57	2.15	-1.57			
S12		0	0	0	0	0.3	0.1	0	0.3	22.2	22.2	22.2	22.2	77.8	77.8	0	0	0	0	0	0	0	0	1000	-5	0	0	0	0	1.06	3.87	-1.06			
S13		0	0	0	0	1.5	1.5	0.1	1.5	21.7	20.3	20.3	21.7	78.3	78.1	0	0	0	0	0	0	0	0	1000	0	0	-0.1	-0.1	0	1.22	2.86	-1.22			
S14		0	0	0	0	1.2	1.2	0.1	1.2	21	20.1	20.1	21	79	78.7	0	0	0	0	0	0	0	0	1000	5	0.1	0	0	0.1	1.32	2.29	-1.32			
S15		0	0	0	0	0.8	0.4	0.1	0.8	22	21.9	21.9	22	77.9	77.7	0	0	0	0	0	0	0	0	1000	0	0	0	0	0	0.94	4.74	-0.94			
S16		0	0	0	0	1.6	1.6	0.1	1.6	21.7	20.7	20.7	21.7	78.1	77.7	0	0	0	0	0	0	0	0	1000	2	0	0	0	0	1.12	2.9	-1.12			
S17		0	0	0	0	0.3	0.3	0.1	0.3	20.9	20.1	20.1	20.9	79.6	79.6	0	0	0	0	0	0	0	0	1000	3	0	0	0	0	1.24	2.83	-1.24			
R01		0.3	0.2	0	0.3	0	0	0	0	21.4	20	19.9	21.4	79.8	79.7	0	0	0	0	4	2	0	4	1000	7	0.1	0.1	0.1	0.1	9.72	?	-9.72			
R02		0	0	0	0	1.6	1.6	0.1	1.6	21.4	19.3	19.3	21.4	79.1	79.1	0	0	0	0	0	0	0	0	1000	-10	0	0	0	0	21.09	22.18	-21.09			
R03		0	0	0	0	0	0	0	0	21.3	20.9	20.9	21.3	79	79	0	0	0	0	8	6	0	8	1000	9	0.1	0.1	0.1	0.1	19.7	25.14	-19.7			

Comments	

Project Number	WG684		
Project Name	eeslack High School, Penicu		
Client	Midlothian Council		
Date	07/07/2022		
Engineer	MM+AF		
Weather	Sunny		
Time monitoring started/finished	Start	1010	1010
	Finish	1012	1010
Initial readings from gas monitor	CH4 % by vol	0	0
	CO2 % by vol	0.1	0.1
	O2 % by vol	20.8	20.4
	CO ppm	0	0
	H2S ppm	0	0
Gas monitor Model		GA5000	GA5000
Gas Monitor Serial Number		G501911	G505964
Date of Next Calibration		08/12/2022	26/06/2022

Borehole Number	Borehole level mAOD	CH_4 %vol		CH_4 %vol		CO_2 % vol		CO_2 % vol		O_2 % vol		O_2 % vol		N_2 % vol		H_2S ppm		H_2S ppm		CO ppm		CO ppm		Atmos Pressure (mb)	Diff Pressure (Pa)	Ave Flow (l/h)		Flow (l/h)	Flow (l/h)	G/water Depth (m)	Depth of BH (m)	Water Level (mAOD)	Water Sampling		
		Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Peak	Steady	Min	Max	Peak	Steady	Min	Max			Peak	Steady	Steady - end of monitoring	Max				Purge 3 x well volume	Recharged	Sample taken
S01		0	0	0	0	1	1	0	1	21.3	20.5	20.5	21.3	78.8	78.5	0	0	0	0	2	0	0	2	1012	-2	0	0	0	0	2.73	3.61	-2.73			
S02		0	0	0	0	0.7	0.7	0	0.7	21.1	20.8	20.7	21.1	79	78.5	0	0	0	0	1	0	0	1	1012	-4	0	0	0	0	dry	2.89	#VALUE!			
S03		0	0	0	0	0.7	0.7	0.1	0.7	203	19.6	19.6	20.3	79.7	79.7	0	0	0	0	0	0	0	0	1010	2	0	0	0	0	2.42	2.7	-2.42			
S04		0	0	0	0	1.2	1.2	0	1.2	20.8	20	20	20.8	79.2	78.8	0	0	0	0	1	0	0	1	1012	-4	0	0	0	0	dry	3.43	#VALUE!			
S05		0	0	0	0	0.7	0.7	0	0.7	20.1	19.6	19.6	20.1	79.9	79.7	0	0	0	0	0	0	0	0	1010	5	0	0	0	0	2.28	4.27	-2.28			
S06		0	0	0	0	0.6	0.6	0	0.6	21.3	20.7	20.7	21.3	78.8	78.7	0	0	0	0	0	0	0	0	1010	3	0	0	0	0	2.09	2.36	-2.09			
S07		0	0	0	0	2.8	2.8	0	2.8	20.9	18.9	18.9	20.9	79.2	78.2	0	0	0	0	1	1	0	1	1012	2	0	0	0	0	dry	3.73	#VALUE!			
S08		0	0	0	0	0.4	0.4	0	0.4	21.2	20.8	20.8	21.2	78.8	78.8	0	0	0	0	0	0	0	0	1010	3	0.1	0.1	0.1	0.1	1.88	2.28	-1.88			
S09		0	0	0	0	1.9	1.9	0	1.9	20.6	19.5	19.5	20.6	79.4	78.6	0	0	0	0	1	0	0	1	1012	4	0	0	0	0	dry	2.76	#VALUE!			
S10		0	0	0	0	1	1	0	1	20.9	20.1	20.1	20.9	79.1	78.9	0	0	0	0	0	0	0	0	1009	7	0.1	0.1	0.1	0.1	1.66	2.21	-1.66			
S11		0	0	0	0	0.8	0.8	0.1	0.8	21.1	20.4	20.4	21.1	78.9	78.8	0	0	0	0	0	0	0	0	1010	7	0.1	0.1	0.1	0.1	1.7	2.09	-1.7			
S12		0	0	0	0	1.3	1.3	0	1.3	20.3	19.4	19.3	20.3	79.7	79.3	1	0	0	1	1	1	0	1	1012	988	0	-0.1	-0.1	0	dry	3.88	#VALUE!			
S13		0	0	0	0	1	1	0.1	1	20.5	19.6	19.6	20.5	79.5	79.4	1	0	0	1	1	1	0	1	1010	2	0	-0.1	-0.1	0	1.27	2.86	-1.27			
S14		0	0	0	0	0.6	0.6	0	0.6	21	20.5	20.5	21	79	78.9	0	0	0	0	0	0	0	0	1010	5	0.1	0	0	0.1	1.44	2.29	-1.44			
S15		0	0	0	0	0	0	0	0	20.2	20.1	20.1	20.2	79.9	79.9	1	0	0	1	1	1	0	1	1012	2	0	-0.1	-0.1	0	1.09	3.72	-1.09			
S16		0	0	0	0	2.5	2.3	0.1	2.5	20.7	19	18.9	20.7	79.2	78.7	0	0	0	0	1	1	0	1	1010	0	0.1	0.1	0.1	0.1	dry	2.89	#VALUE!			
S17		0	0	0	0	0.1	0	0	0.1	21	21	20.8	21	79.1	79	0	0	0	0	0	0	0	0	1010	0	0	0	0	0	1.37	2.79	-1.37			
R01		0	0	0	0	0	0	0	0	21.3	21.3	21	21.3	79	78.7	0	0	0	0	1	0	0	1	1012	5	0	0	0	0	9.28	?	-9.28			
R02		0	0	0	0	1.3	1.3	0	1.3	21.2	20	20	21.2	78.9	78.7	0	0	0	0	0	0	0	0	1010	-62	0	-0.4	-0.4	0	21.04	22.21	-21.04			
R03		0	0	0	0	0.1	0	0	0.1	20.3	20.3	20.2	20.3	79.7	79.7	0	0	0	0	51	51	0	51	1010	5	0.1	0.1	0.1	0.1	19.92	25.24	-19.92			

Comments	

Project Number	WG684		
Project Name	eeslack High School, Penicu		
Client	Midlothian Council		
Date	25/07/2022		
Engineer	MM+AF		
Weather	Sunny		
Gas Monitoring Parameters	Start	986	985
	Finish	986	985
Gas Detector Range Resolution	CH4 % by vol	0.1	0.1
	CO2 % by vol	0.1	0.1
	O2 % by vol	21.5	20.9
	CO ppm	0	0
	H2S ppm	0	0
Gas monitor Model		GA5000	GA5000
Gas Monitor Serial Number		G501569	G501911
Date of Next Calibration		30/06/2023	08/12/2022

Borehole Number	Borehole level mAOD	CH_4 %vol		CH_4 %vol		CO_2 % vol		CO_2 % vol		O_2 % vol		O_2 % vol		N_2 % vol		H_2S ppm		H_2S ppm		CO ppm		CO ppm		Atmos Pressure (mb)	Diff Pressure (Pa)	Ave Flow (l/h)		Flow (l/h)	Flow (l/h)	G/water Depth (m)	Depth of BH (m)	Water Level (mAOD)	Water Sampling		
		Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Peak	Steady	Min	Max	Peak	Steady	Min	Max			Peak	Steady	Steady - end of monitoring	Max				Purge 3 x well volume	Recharged	Sample taken
S01		0	0	0	0	0.8	0.8	0	0.8	21.8	21.4	21.4	21.8	78.4	77.8	0	0	0	0	0	0	0	0	985	-68	0	0	0	0	2.22	3.62	-2.22			
S02		0	0	0	0	0.7	0.7	0.1	0.7	21.1	21	20.9	21.1	78.8	78.3	0	0	0	0	0	0	0	0	985	2	0	-0.1	-0.1	0	1.79	2.89	-1.79			
S03		0.1	0	0	0.1	0.7	0.7	0.1	0.7	21.5	21	21	21.5	78.3	78.3	0	0	0	0	0	0	0	0	986	3	0	0	0	0	2.38	2.7	-2.38			
S04		0	0	0	0	1	1	0.1	1	21	20.5	20.4	21	78.9	78.6	0	0	0	0	0	0	0	0	985	-4	0	-0.1	-0.1	0	1.97	3.42	-1.97			
S05		0	0	0	0	0.7	0.7	0.1	0.7	20.9	20.6	20.6	20.9	79	78.7	0	0	0	0	0	0	0	0	986	7	0.1	0.1	0.1	0.1	2.32	3.63	-2.32			
S06		0	0	0	0	0.6	0.6	0	0.6	21.1	20.6	20.6	21.1	78.9	78.8	0	0	0	0	0	0	0	0	986	3	0.1	0.1	0.1	0.1	2.12	2.33	-2.12			
S07		0	0	0	0	2.2	2.1	0.1	2.2	21.2	19.7	19.7	21.2	78.7	78.1	0	0	0	0	1	0	0	1	985	0	0	-0.1	-0.1	0	1.85	3.74	-1.85			
S08		0	0	0	0	0.4	0.4	0.1	0.4	21.2	20.8	20.8	21.2	78.8	78.8	0	0	0	0	0	0	0	0	986	2	0.1	0.1	0.1	0.1	2.13	2.26	-2.13			
S09		0	0	0	0	1.5	1.5	0.1	1.5	21.3	20.5	20.5	21.3	78.6	78	0	0	0	0	0	0	0	0	985	4	0	-0.1	-0.1	0	1.5	2.75	-1.5			
S10		0	0	0	0	0.9	0.9	0.1	0.9	21.2	20.7	20.6	21.2	78.7	78.4	0	0	0	0	0	0	0	0	986	7	0.1	0	0	0.1	1.71	2.35	-1.71			
S11		0	0	0	0	0.8	0.8	0.1	0.8	21.3	20.5	20.5	21.3	78.8	78.7	0	0	0	0	0	0	0	0	986	2	0.1	0.1	0.1	0.1	1.78	2.11	-1.78			
S12		0	0	0	0	1.2	1.2	0.1	1.2	21.2	20.3	20.3	21.2	78.7	78.4	0	0	0	0	0	0	0	0	985	2	0	0	0	0	1.41	3.88	-1.41			
S13		0.2	0	0	0.2	0.8	0.8	0.2	0.8	20.7	20.5	20.4	20.7	79.3	78.7	0	0	0	0	0	0	0	0	985	7	0	0	0	0	1.5	2.85	-1.5			
S14		0	0	0	0	0.5	0.5	0.1	0.5	21.3	20.9	20.9	21.3	78.6	78.6	0	0	0	0	0	0	0	0	986	9	0.1	0.1	0.1	0.1	1.54	2.27	-1.54			
S15		0	0	0	0	1.2	1.2	0.1	1.2	21.1	20.7	20.7	21.1	78.7	78	0	0	0	0	0	0	0	0	985	-5	0	0	0	0	1.22	3.72	-1.22			
S16		0	0	0	0	2.5	2.3	0.1	2.5	21.1	19.8	19.7	21.1	78.8	77.8	0	0	0	0	0	0	0	0	985	5	0	-0.1	-0.1	0	1.57	2.89	-1.57			
S17		0	0	0	0	0.2	0.2	0.1	0.2	21.3	21.2	21.1	21.3	78.7	78.6	0	0	0	0	0	0	0	0	986	0	0.1	0.1	0.1	0.1	1.47	2.82	-1.47			
R01		0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	21.7	20.4	20.4	21.7	79.4	79.4	0	0	0	0	1	0	0	1	985	4	0.2	0	0	0.2	8.97	?	-8.97			
R02		3.5	3.5	0	3.5	2.3	2.3	0.1	2.3	21.1	0.2	0.2	21.1	94.4	94	3	3	0	3	40	38	0	40	986	60	0.4	0.3	0.3	0.4	21.34	22.23	-21.34			
R03		0	0	0	0	0.1	0.1	0.1	0.1	21.1	20.8	20.8	21.1	79.1	79.1	0	0	0	0	0	0	0	0	986	7	0.2	0.1	0.1	0.2	19.78	25.36	-19.78			

Comments	

Project Number	WG684		
Project Name	eeslack High School, Penicu		
Client	Midlothian Council		
Date	09/08/2022		
Engineer	SM+AF		
Weather	SUNNY		
Time of Atmospheric Pressure	Start	1010	1010
	Finish	1010	1010
Initial Readings Gas Readings	CH4 % by vol	0	0
	CO2 % by vol	0	0.1
	O2 % by vol	20.9	20.9
	CO ppm	0	0
	H2S ppm	0	0
Gas monitor Model		GA5000	GA5000
Gas Monitor Serial Number		G505965	GA501911
Date of Next Calibration		22/08/2022	08/12/2022

Borehole Number	Borehole level mAOD	CH_4 %vol		CH_4 %vol		CO_2 % vol		CO_2 % vol		O_2 % vol		O_2 % vol		N_2 % vol		H_2S ppm		H_2S ppm		CO ppm		CO ppm		Atmos Pressure (mb)	Diff Pressure (Pa)	Ave Flow (l/h)		Flow (l/h)	Flow (l/h)	G/water Depth (m)	Depth of BH (m)	Water Level (mAOD)	Water Sampling		
		Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Peak	Steady	Min	Max	Peak	Steady	Min	Max			Peak	Steady	Steady - end of monitoring	Max				Purge 3 x well volume	Recharged	Sample taken
S01		0	0	0	0	0.5	0.5	0	0.5	21.4	21	21	21.4	78.8	78.4	0	0	0	0	0	0	0	0	1010	7	0	0	0	0	2.31	3.63	-2.31			
S02		0	0	0	0	0.4	0.4	0	0.4	21.5	20.8	20.7	21.5	78.8	78.8	0	0	0	0	0	0	0	0	1010	4	0	0	0	0	1.9	2.87	-1.9			
S03		0	0	0	0	0.6	0.6	0.1	0.6	20.7	19.9	19.9	20.7	79.6	79.6	0	0	0	0	1	0	0	1	1010	9	0.1	0	0	0.1	2.44	2.58	-2.44			
S04		0	0	0	0	0.6	0.6	0	0.6	21.7	20.9	20.8	21.7	78.5	78.5	0	0	0	0	0	0	0	0	1010	2	0	0	0	0	2.21	3.48	-2.21			
S05		0	0	0	0	0.4	0.4	0.1	0.4	20.2	20	20	20.2	79.8	79.6	1	1	0	1	1	1	0	1	1010	7	0	0	0	0	1.81	4	-1.81			
S06		0	0	0	0	0.4	0.4	0	0.4	21	20.7	20.6	21	79.2	78.9	0	0	0	0	1	1	0	1	1011	4	0	0	0	0	DRY	2.18	#VALUE!			
S07		0	0	0	0	1.4	1.4	0	1.4	21.7	20.7	20.7	21.7	78.3	77.9	0	0	0	0	0	0	0	0	1010	5	0	0	0	0	1.93	3.74	-1.93			
S08		0	0	0	0	0	0	0	0	20.9	20.9	20.9	20.9	79.1	79.1	0	0	0	0	1	1	1	1	1011	671	0	0	0	0	1.96	2.07	-1.96			
S09		0	0	0	0	1	1	0	1	21.6	21	20.9	21.6	78.3	78	0	0	0	0	0	0	0	0	1010	7	0	0	0	0	1.56	2.76	-1.56			
S10		0	0	0	0	0.6	0.5	0	0.6	20.3	19.7	19.6	20.3	79.8	79.8	1	0	0	1	1	0	0	0	1011	0	0	0	0	0	1.92	2.03	-1.92			
S11		0	0	0	0	0.5	0.5	0	0.5	21.1	20.5	20.4	21.1	79.1	79	0	0	0	0	1	0	0	1	1011	5	0	0	0	0	DRY	1.84	#VALUE!			
S12		0.1	0	0	0.1	1.9	1.8	0	1.9	21.5	19.8	19.7	21.5	78.6	78.4	0	0	0	0	0	0	0	0	1010	0	0	0	0	0	1.67	3.88	-1.67			
S13		0	0	0	0	0.8	0.8	0	0.8	20.8	19.8	19.8	20.8	79.4	79.4	0	0	0	0	0	0	0	0	1010	4	0	0	0	0	1.84	2.81	-1.84			
S14		0	0	0	0	0.3	0.3	0	0.3	20.9	20.7	20.7	20.9	79.1	78.9	0	0	0	0	1	0	0	1	1011	2	0	0	0	0	1.26	2.05	-1.26			
S15		0	0	0	0	0.8	0.8	0	0.8	20.8	20.4	20.4	20.8	79.2	78.8	0	0	0	0	0	0	0	0	1010	4	0	0	0	0	1.57	3.75	-1.57			
S16		0	0	0	0	1.9	1.8	0	1.9	20.3	19	19	20.3	79.6	79.2	0	0	0	0	0	0	0	0	1010	7	0	0	0	0	1.92	2.89	-1.92			
S17		0	0	0	0	0.3	0.3	0	0.3	20.3	20.3	20.2	20.3	79.7	79.4	0	0	0	0	1	0	0	1	1011	0	0	0	0	0	2.1	2.61	-2.1			
R01		0	0	0	0	0.1	0.1	0	0.1	21.8	17.9	17.9	21.8	82	82	0	0	0	0	0	0	0	0	1010	12	0	0	0	0	8.94	31	-8.94			
R02		0	0	0	0	0	0	0	0	21.1	21.1	20.9	21.1	79.1	78.9	0	0	0	0	1	0	0	1	1011	2	0	0	0	0	21.32	22.44	-21.32			
R03		0	0	0	0	0	0	0	0	20.2	20	20	20.2	79.9	79.9	1	1	0	1	1	0	0	1	1010	2	0.1	0	0	0.1	5.21	25.26	-5.21			

Comments	

Project Number	WG684		
Project Name	eeslack High School, Penicu		
Client	Midlothian Council		
Date	24/08/2022		
Engineer	AF+SM		
Weather	Cloudy		
Gas Monitoring Equipment	Start	992	991
	Finish	992	991
Gas Monitoring Range	CH4 % by vol	0.1	0
	CO2 % by vol	0.1	0.1
	O2 % by vol	21	21.2
	CO ppm	0	0
	H2S ppm	0	0
Gas monitor Model		GA5000	GA5000
Gas Monitor Serial Number		G501911	G504849
Date of Next Calibration		08/12/2022	04/01/2023

Borehole Number	Borehole level mAOD	CH_4 %vol		CH_4 %vol		CO_2 % vol		CO_2 % vol		O_2 % vol		O_2 % vol		N_2 % vol		H_2S ppm		H_2S ppm		CO ppm		CO ppm		Atmos Pressure (mb)	Diff Pressure (Pa)	Ave Flow (l/h)		Flow (l/h)	Flow (l/h	G/water Depth (m)	Depth of BH (m)	Water Level (mAOD)	Water Sampling		
		Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Min	Max	Peak	Steady	Peak	Steady	Min	Max	Peak	Steady	Min	Max			Peak	Steady	Steady - end of monitoring	Max						
S01		0	0	0	0	1	1	0.1	1	21	20.3	20.3	21	78.9	78.7	0	0	0	0	0	0	0	0	991	3	0.1	0.1	0.1	0.1	2.43	3.69	-2.43			
S02		0	0	0	0	1.5	1.5	0.1	1.5	21.1	19.8	19.8	21.1	78.8	78.7	0	0	0	0	0	0	0	0	991	7	0	0	0	0	1.96	2.95	-1.96			
S03		0	0	0	0	0.9	0.9	0.1	0.9	20.9	20	20	20.9	79.1	79	0	0	0	0	1	0	0	1	992	0	0	-0.1	-0.1	0	2.4	2.57	-2.4			
S04		0	0	0	0	1.2	1.2	0.1	1.2	21.2	20.4	20.4	21.2	78.7	78.4	0	0	0	0	0	0	0	0	991	9	0	0	0	0	2.17	3.53	-2.17			
S05		0	0	0	0	0.9	0.9	0.1	0.9	20.8	20.2	20.2	20.8	79.1	78.9	0	0	0	0	1	0	0	1	992	7	0	0	0	0	2.23	3.99	-2.23			
S06		0	0	0	0	0.9	0.9	0	0.9	21.1	20.3	20.3	21.1	78.9	78.8	0	0	0	0	1	0	0	1	992	4	0	0	0	0	1.96	2.19	-1.96			
S07		0	0	0	0	1.4	1.4	0.1	1.4	21.2	20	20	21.2	78.7	78.6	0	0	0	0	0	0	0	0	991	2	0	0	0	0	1.77	3.77	-1.77			
S08		0	0	0	0	0.1	0.1	0.1	0.1	21.1	21.1	21.1	21.1	78.8	78.8	0	0	0	0	0	0	0	0	992	1366	0	0	0	0	1.75	2.04	-1.75			
S09		0	0	0	0	1.3	1.3	0.1	1.3	21.3	20.3	20.3	21.3	78.7	78.4	0	0	0	0	0	0	0	0	991	2	0	0	0	0	1.75	2.8	-1.75			
S10		0	0	0	0	0.9	0.9	0.1	0.9	20.9	20.3	20.3	20.9	79	78.8	0	0	0	0	1	0	0	1	992	9	0	0	0	0	1.61	2.05	-1.61			
S11		0	0	0	0	1	1	0.1	1	21	20.3	20.2	21	78.9	78.8	0	0	0	0	0	0	0	0	992	4	0	0	0	0	1.54	1.87	-1.54			
S12		0	0	0	0	2.4	2.4	0.1	2.4	21.4	19.3	19.3	21.4	78.5	78.3	0	0	0	0	0	0	0	0	991	14	0	0	0	0	1.66	3.89	-1.66			
S13		0	0	0	0	1.3	1.3	0	1.3	21.3	20.1	20.1	21.3	78.7	78.6	0	0	0	0	0	0	0	0	991	5	0	0	0	0	2.43	2.88	-2.43			
S14		0	0	0	0	0.8	0.8	0.1	0.8	20.9	20.4	20.4	20.9	79	78.8	0	0	0	0	1	1	0	1	992	-2	0	-0.1	-0.1	0	1.37	2.03	-1.37			
S15		0	0	0	0	2.2	2.2	0.1	2.2	21.6	19.5	19.5	21.6	78.4	78.3	0	0	0	0	0	0	0	0	991	7	0	0	0	0	1.4	3.75	-1.4			
S16		0	0	0	0	2.3	2.3	0	2.3	21.4	19.1	19.1	21.4	78.7	78.6	0	0	0	0	0	0	0	0	991	5	0	0	0	0	2.17	2.92	-2.17			
S17		0	0	0	0	0.4	0.4	0.1	0.4	20.9	20.5	20.5	20.9	79	79	0	0	0	0	1	0	0	1	992	2	0	0	0	0	1.25	2.59	-1.25			
R01		0	0	0	0	0.1	0.1	0.1	0.1	21.1	20.8	20.8	21.1	79.1	79.1	0	0	0	0	0	0	0	0	991	-2	0	0	0	0	8.71	?	-8.71			
R02		13	13	0	13	2.8	2.8	0.1	2.8	21.1	0.2	0.2	21.1	84	84	0	0	0	0	15	15	0	15	992	14	0.1	0.1	0.1	0.1	19.42	22	-19.42			
R03		0	0	0	0	0.1	0.1	0.1	0.1	20.9	20.9	20.8	20.9	79.1	79	0	0	0	0	1	0	0	1	992	-2	0.1	0	0	0.1	19.54	25.23	-19.54			

Comments	

CERTIFICATION OF CALIBRATION

Date Of Calibration: 22-Feb-2022

Certificate Number: G505965_2/29929

Issued by: QED Environmental Systems Ltd.

Customer: **Johnson Poole & Bloomer Ltd**
50 Speirs Wharf Glasgow Lanarkshire
G4 9TH UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G505965

UKAS Accredited results:

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.9	0.072
14.9	14.8	0.13
59.7	59.5	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.7	0.074
15.1	14.7	0.13
40.3	40.4	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.2	21.3	0.25

All concentrations are molar.

CH_4, CO_2 readings recorded at : 31.8 °C ± 2.5 °C

O2 readings recorded at : 21.5 °C ± 2.5 °C

Barometric Pressure : 1002 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.

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: 22-Feb-2022

Certificate Number: G505965_2/29929

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.

Due to the instrument being in an inoperable condition upon receipt, the as-received gas check results are unavailable for this calibration instance.

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**
1002	1002

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	500	507
H_2S	259	259

Date of Issue : 24-Feb-2022 **Approved by Signatory** [redacted] 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.

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

4533

Date Of Calibration: 08-Jun-2022

Certificate Number: G501911_1/305

Issued by: QED Environmental Systems Ltd.

Customer: **Johnson Poole & Bloomer Ltd**
50 Speirs Wharf Glasgow Lanarkshire
G4 9TH UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G501911

UKAS Accredited results:

Results after adjustment :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	5.0	0.072
15.0	15.0	0.13
60.0	59.7	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.8	0.074
15.0	14.7	0.13
40.0	39.9	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.1	21.2	0.25

The inwards assessment was carried out 10-May-2022.
The maximum adjustment is larger than the specification limit.
Inwards assessment data is available if requested.

All concentrations are molar.

CH_4, CO_2 readings recorded at : 32.5 °C ± 2.5 °C

O2 readings recorded at : 22.9 °C ± 2.5 °C

Barometric Pressure : 0992 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

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: 08-Jun-2022

Certificate Number: G501911_1/30580

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**
992	992

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	499	505
H_2S	259	259

Internal Flow	
Applied (l/hr)	**Instrument Reading (l/hr)**
5.0	5.0
10.0	9.9

Date of Issue : 13-Jun-2022 **Approved by Signatory** [redacted] 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

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: 04-Apr-2022

Certificate Number: G503122_2/30179

Issued by: QED Environmental Systems Ltd.

Customer: **Johnson Poole & Bloomer Ltd**
50 Speirs Wharf Glasgow Lanarkshire
G4 9TH UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G503122

UKAS Accredited results:

Results after adjustment :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.9	0.072
14.9	14.8	0.13
60.0	59.6	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.7	0.074
15.1	14.7	0.13
40.0	40.0	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.1	21.2	0.25

The inwards assessment was carried out 24-Mar-2022.
The maximum adjustment is larger than the specification limit.

All concentrations are molar.

CH_4, CO_2 readings recorded at : 32.1 °C ± 2.5 °C

O2 readings recorded at : 23.3 °C ± 2.5 °C

Barometric Pressure : 1000 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.

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: 04-Apr-2022

Certificate Number: G503122_2/30179

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.

As received gas readings, as recorded on 24-Mar-2022 :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	5.2	0.07
14.9	15.2	0.13
60.0*	61.7	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.8	0.074
15.1	12.4	0.13
40.0*	28.1	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.1	20.7	0.25

All concentrations are molar.

As received gas readings recorded at : 21.8 °C ± 2.5 °C

As received barometric pressure recorded at : 1018.28 mbar ± 4 mbar

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**
1000	1000

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	500	505
H_2S	259	259

Internal Flow	
Applied (l/hr)	**Instrument Reading (l/hr)**
5.0	5.0
10.0	9.8

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.

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: 04-Apr-2022

Certificate Number: G503122_2/30179

Issued by: QED Environmental Systems Ltd.

Date of Issue : 07-Apr-2022 **Approved by Signatory** [redacted] Keeley Knight

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

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

Issued by: QED Environmental Systems Ltd.

CERTIFICATION OF CALIBRATION

4533

Date Of Calibration: 04-Jul-2022

Certificate Number: G504849_1/30752

Issued by: QED Environmental Systems Ltd.

Customer: **Johnson Poole & Bloomer Ltd**
50 Speirs Wharf Glasgow Lanarkshire
G4 9TH UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G504849

UKAS Accredited results:

Results after adjustment :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.9	0.072
15.0	14.9	0.13
60.0	59.7	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.8	0.074
15.0	14.7	0.13
40.0	39.9	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.1	21.2	0.25

The inwards assessment was carried out 21-Jun-2022.
The maximum adjustment was less than the specification limit.
Inwards assessment data is available if requested.

All concentrations are molar.

CH_4, CO_2 readings recorded at : 31.7 °C ± 2.5 °C

O2 readings recorded at : 22.6 °C ± 2.5 °C

Barometric Pressure : 1009 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

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: 04-Jul-2022

Certificate Number: G504849_1/30752

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**
1009	1010

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	499	503
H_2S	260	260

Internal Flow	
Applied (l/hr)	**Instrument Reading (l/hr)**
5	5.1
10	9.9

Date of Issue : 07-Jul-2022 **Approved by Signatory** [redacted] 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

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: 24-Dec-2021

Certificate Number: G505964_1/29566

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**
994	994

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	500	502
H_2S	259	259

Internal Flow	
Applied (l/hr)	**Instrument Reading (l/hr)**
5.0	5.1
10.0	10.0

Date of Issue : 29-Dec-2021 **Approved by Signatory** [redacted] 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

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: 24-Dec-2021

Certificate Number: G505964_1/29566

Issued by: QED Environmental Systems Ltd.

Customer: **Johnson Poole & Bloomer Ltd**
50 Speirs Wharf Glasgow Lanarkshire
G4 9TH UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G505964

UKAS Accredited results:

Results after adjustment :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.9	0.072
14.9	14.8	0.13
59.7	59.4	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.8	0.074
15.1	14.7	0.13
40.3	40.6	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.2	21.3	0.25

The inwards assessment was carried out 20-Dec-2021.
The maximum adjustment is larger than the specification limit.
Inwards assessment data is available if requested.

All concentrations are molar.

CH_4, CO_2 readings recorded at : 31.5 °C ± 2.5 °C

O2 readings recorded at : 21.5 °C ± 2.5 °C

Barometric Pressure : 0994 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

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

Appendix 12 Results of Soakaway Tests – Johnson Poole & Bloomer – May 2022 and June 2024

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365:1991

Client:		**Test Location:**	
Site:	Beeslack High School	**Test Date:**	
JPB Project Ref:	WG684	**Calculation Date:**	11th May 2022

Soil Type

Size of Soakaway:

Length (m)	2.10
Width (m)	0.70
Depth of pit (m)	2.00
Test Depth (m)	0.45
Water level above base (m)	1.55
Effective volume (m^3)	2.28

	input required
	calculated

Test Depths of Soakaway:

Depth of water at start (m)	0.45
Water level above base at start (m)	1.55
Depth of water at end (m)	0.45
Water level above base at end (m)	1.55
Effective range of test (m)	0.00

75% effective depth for full cycle depth	1.163
50% effective depth for full cycle depth	0.775
25% effective depth for full cycle depth	0.388
Effective range required for full cycle test	0.775
FULL CYCLE TEST NOT ACHIEVED. RESULTS ARE INDICATIVE	

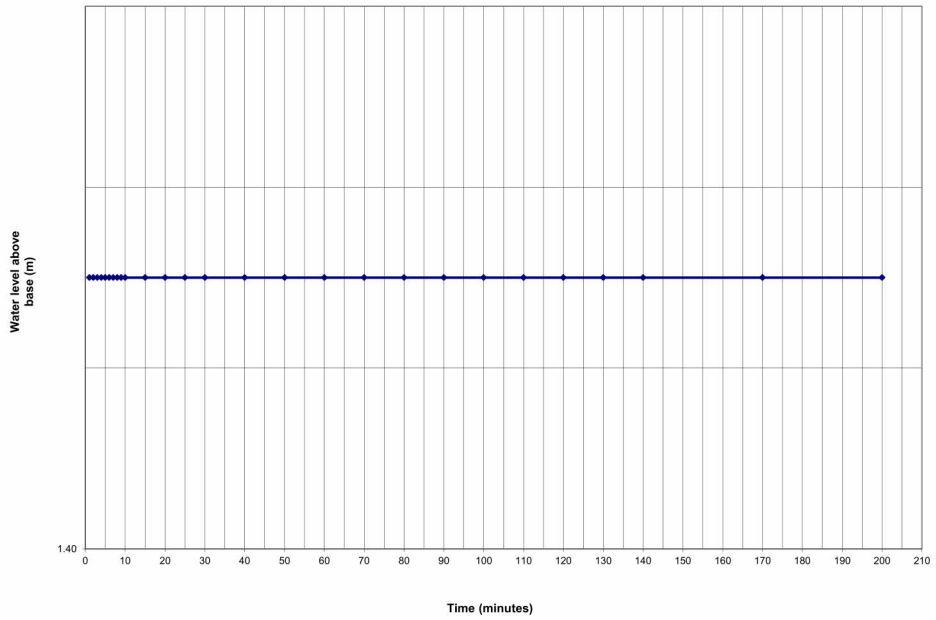
Calculation of Soil Infiltration Rate

Time (minutes)	Depth of water below surface (m)	Water level above base (m)
1	0.45	1.55
2	0.45	1.55
3	0.45	1.55
4	0.45	1.55
5	0.45	1.55
6	0.45	1.55
7	0.45	1.55
8	0.45	1.55
9	0.45	1.55
10	0.45	1.55
15	0.45	1.55
20	0.45	1.55
25	0.45	1.55
30	0.45	1.55
40	0.45	1.55
50	0.45	1.55
60	0.45	1.55
70	0.45	1.55
80	0.45	1.55
90	0.45	1.55
100	0.45	1.55
110	0.45	1.55
120	0.45	1.55
130	0.45	1.55
140	0.45	1.55
170	0.45	1.55
200	0.45	1.55

%	Depth (m)	Water level above base (m)	Time * (minutes)
75%	0.45	1.55	200
50%	0.45	1.55	200
25%	0.45	1.55	200

* estimated from graph

Volume outflow 75%-25% (m^3)	0.00	(V_{p75-25})
Area of pit (50% effective depth) m^2	5.81	(α_{p50})
Time outflow 25%-75% (minutes)	0	(t_{p75-25})



$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

Soil Infiltration (f) = **#DIV/0!** **m/s**

Completed by:	*APB*	*Checked by:*	

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365:1991

Client:		**Test Location:**	TP4
Site:	Beeslack High School	**Test Date:**	
JPB Project Ref:	WG684	**Calculation Date:**	11th May 2022

Soil Type

Size of Soakaway:

Length (m)	2.60
Width (m)	0.70
Depth of pit (m)	2.00
Test Depth (m)	0.43
Water level above base (m)	1.57
Effective volume (m^3)	2.86

	input required
	calculated

Test Depths of Soakaway:

Depth of water at start (m)	0.43
Water level above base at start (m)	1.57
Depth of water at end (m)	0.43
Water level above base at end (m)	1.57
Effective range of test (m)	0.00

75% effective depth for full cycle depth	1.178
50% effective depth for full cycle depth	0.785
25% effective depth for full cycle depth	0.393
Effective range required for full cycle test	0.785
FULL CYCLE TEST NOT ACHIEVED. RESULTS ARE INDICATIVE	

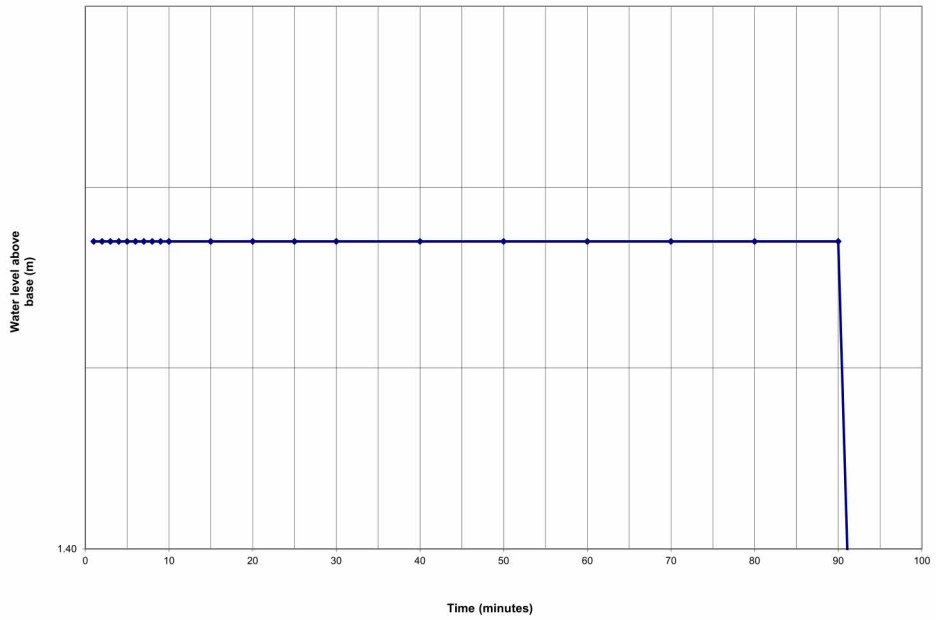
Calculation of Soil Infiltration Rate

Time (minutes)	Depth of water below surface (m)	Water level above base (m)
1	0.43	1.57
2	0.43	1.57
3	0.43	1.57
4	0.43	1.57
5	0.43	1.57
6	0.43	1.57
7	0.43	1.57
8	0.43	1.57
9	0.43	1.57
10	0.43	1.57
15	0.43	1.57
20	0.43	1.57
25	0.43	1.57
30	0.43	1.57
40	0.43	1.57
50	0.43	1.57
60	0.43	1.57
70	0.43	1.57
80	0.43	1.57
90	0.43	1.57
100		
110		
120		
130		
140		
170		
200		

%	Depth (m)	Water level above base (m)	Time * (minutes)
75%	0.43	1.57	90
50%	0.43	1.57	90
25%	0.43	1.57	90

* estimated from graph

Volume outflow 75%-25% (m^3)	0.00	(V_{p75-25})
Area of pit (50% effective depth) m^2	7.00	(α_{p50})
Time outflow 25%-75% (minutes)	0	(t_{p75-25})



$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

Soil Infiltration (f) = **#DIV/0!** **m/s**

Completed by:	*APB*	*Checked by:*	

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365:1991

Client:	Etive Consulting Engineering Limited	**Test Location:**	SA1
Site:	Beeslack High School	**Test Date:**	26.06.2024
JPB Project Ref:	WG684	**Calculation Date:**	16.10.2024

Soil Type Sandy Gravelly Clay

Size of Soakaway:

Length (m)	2.10
Width (m)	0.50
Depth of pit (m)	1.60
Test Depth (m)	0.42
Water level above base (m)	1.18
Effective volume (m^3)	1.24

	input required
	calculated

Test Depths of Soakaway:

Depth of water at start (m)	0.42
Water level above base at start (m)	1.18
Depth of water at end (m)	0.45
Water level above base at end (m)	1.15
Effective range of test (m)	0.03

75% effective depth for full cycle depth	0.885
50% effective depth for full cycle depth	0.590
25% effective depth for full cycle depth	0.295
Effective range required for full cycle test	0.590
FULL CYCLE TEST NOT ACHIEVED. RESULTS ARE INDICATIVE	

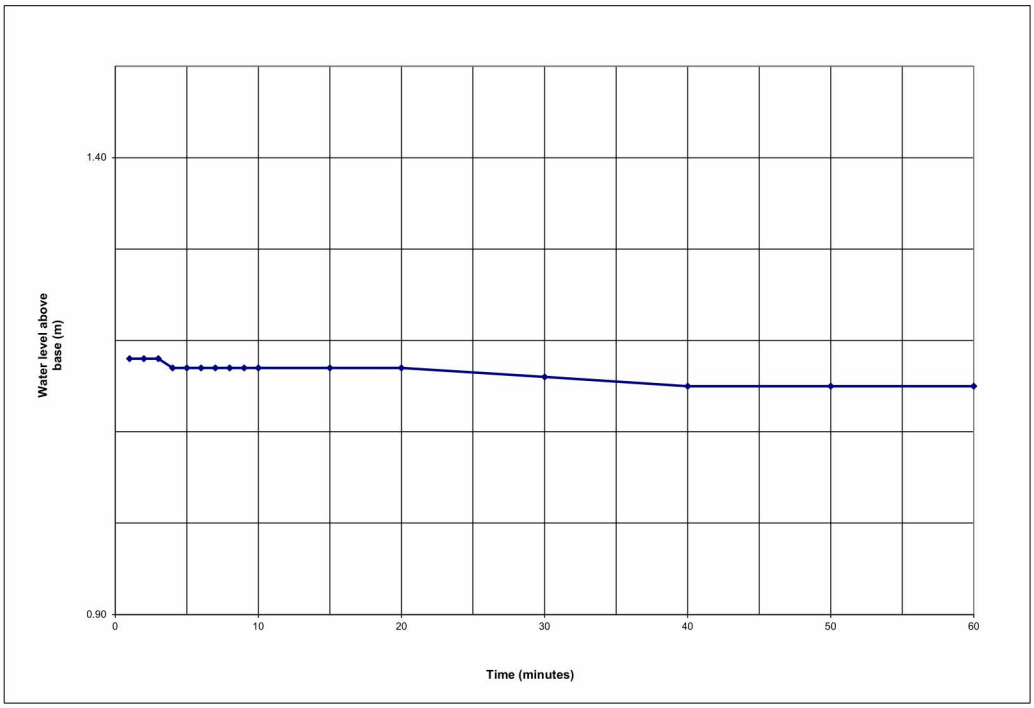
Calculation of Soil Infiltration Rate

Time (minutes)	Depth of water below surface (m)	Water level above base (m)
1	0.42	1.18
2	0.42	1.18
3	0.42	1.18
4	0.43	1.17
5	0.43	1.17
6	0.43	1.17
7	0.43	1.17
8	0.43	1.17
9	0.43	1.17
10	0.43	1.17
15	0.43	1.17
20	0.43	1.17
30	0.44	1.16
40	0.45	1.15
50	0.45	1.15
60	0.45	1.15
90	0.45	1.15
120	0.45	1.15
150	0.45	1.15

%	Depth (m)	Water level above base (m)	Time * (minutes)
75%	0.43	1.17	4
50%	0.44	1.17	4
25%	0.44	1.16	30

* estimated from graph

Volume outflow 75%-25% (m^3)	0.02	(V_{p75-25})
Area of pit (50% effective depth) m^2	4.08	(α_{p50})
Time outflow 25%-75% (minutes)	26	(t_{p75-25})



$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

Soil Infiltration (f) = **2.48E-06** **m/s**

Completed by:	*LR*	*Checked by:*	*KM*

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365:1991

Client:	Etive Consulting Engineering Limited	**Test Location:**	SA2
Site:	Beeslack High School	**Test Date:**	26.06.2024
JPB Project Ref:	WG684	**Calculation Date:**	16.10.2024

Soil Type Sandy Gravelly Clay

Size of Soakaway:

Length (m)	1.70
Width (m)	0.50
Depth of pit (m)	1.50
Test Depth (m)	0.38
Water level above base (m)	1.12
Effective volume (m^3)	0.95

	input required
	calculated

Test Depths of Soakaway:

Depth of water at start (m)	0.38
Water level above base at start (m)	1.12
Depth of water at end (m)	0.38
Water level above base at end (m)	1.12
Effective range of test (m)	0.00

75% effective depth for full cycle depth	0.840
50% effective depth for full cycle depth	0.560
25% effective depth for full cycle depth	0.280
Effective range required for full cycle test	0.560
FULL CYCLE TEST NOT ACHIEVED. RESULTS ARE INDICATIVE	

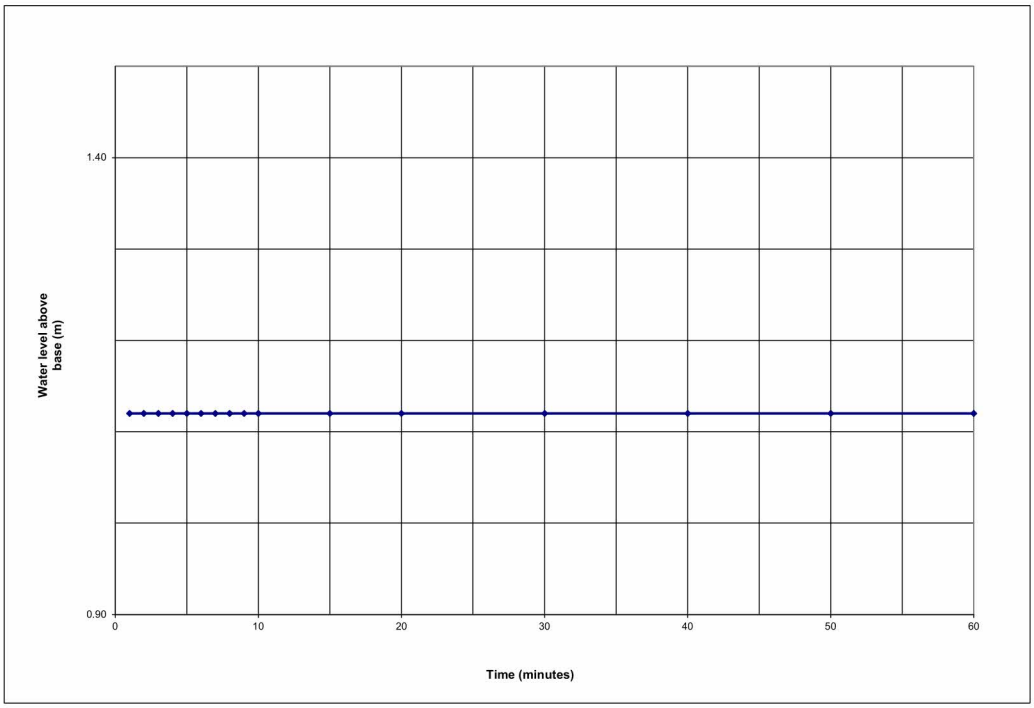
Calculation of Soil Infiltration Rate

Time (minutes)	Depth of water below surface (m)	Water level above base (m)
1	0.38	1.12
2	0.38	1.12
3	0.38	1.12
4	0.38	1.12
5	0.38	1.12
6	0.38	1.12
7	0.38	1.12
8	0.38	1.12
9	0.38	1.12
10	0.38	1.12
15	0.38	1.12
20	0.38	1.12
30	0.38	1.12
40	0.38	1.12
50	0.38	1.12
60	0.38	1.12
90	0.38	1.12
120	0.38	1.12
150	0.38	1.12

%	Depth (m)	Water level above base (m)	Time * (minutes)
75%	0.38	1.12	1
50%	0.38	1.12	1
25%	0.38	1.12	1

* estimated from graph

Volume outflow 75%-25% (m^3)	0.00	(V_{p75-25})
Area of pit (50% effective depth) m^2	3.31	(α_{p50})
Time outflow 25%-75% (minutes)	0	(t_{p75-25})



$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

Soil Infiltration (f) = **#DIV/0!** **m/s**

Completed by:	*LR*	*Checked by:*	*KM*

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365:1991

Client:	Etive Consulting Engineering Limited	**Test Location:**	SA3
Site:	Beeslack High School	**Test Date:**	26.06.2024
JPB Project Ref:	WG684	**Calculation Date:**	16.10.2024

Soil Type Sandy Gravelly Clay

Size of Soakaway:

Length (m)	1.80
Width (m)	0.50
Depth of pit (m)	1.50
Test Depth (m)	0.34
Water level above base (m)	1.16
Effective volume (m^3)	1.04

	input required
	calculated

Test Depths of Soakaway:

Depth of water at start (m)	0.34
Water level above base at start (m)	1.16
Depth of water at end (m)	0.35
Water level above base at end (m)	1.15
Effective range of test (m)	0.01

75% effective depth for full cycle depth	0.870
50% effective depth for full cycle depth	0.580
25% effective depth for full cycle depth	0.290
Effective range required for full cycle test	0.580
FULL CYCLE TEST NOT ACHIEVED. RESULTS ARE INDICATIVE	

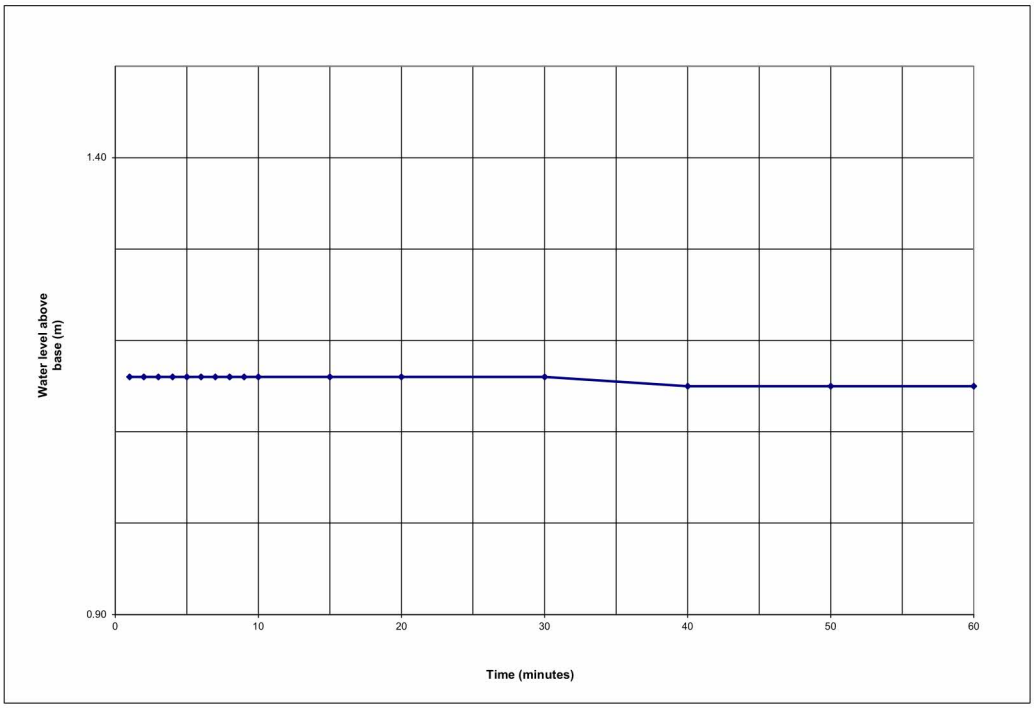
Calculation of Soil Infiltration Rate

Time (minutes)	Depth of water below surface (m)	Water level above base (m)
1	0.34	1.16
2	0.34	1.16
3	0.34	1.16
4	0.34	1.16
5	0.34	1.16
6	0.34	1.16
7	0.34	1.16
8	0.34	1.16
9	0.34	1.16
10	0.34	1.16
15	0.34	1.16
20	0.34	1.16
30	0.34	1.16
40	0.35	1.15
50	0.35	1.15
60	0.35	1.15
90	0.35	1.15
120	0.35	1.15

%	Depth (m)	Water level above base (m)	Time * (minutes)
75%	0.34	1.16	1
50%	0.35	1.16	1
25%	0.35	1.15	40

* estimated from graph

Volume outflow 75%-25% (m^3)	0.00	(V_{p75-25})
Area of pit (50% effective depth) m^2	3.56	(α_{p50})
Time outflow 25%-75% (minutes)	39	(t_{p75-25})



$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

Soil Infiltration (f) = **5.41E-07** **m/s**

Completed by:	*LR*	*Checked by:*	*KM*

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365:1991

Client:	Etive Consulting Engineering Limited	**Test Location:**	SA4
Site:	Beeslack High School	**Test Date:**	26.06.2024
JPB Project Ref:	WG684	**Calculation Date:**	16.10.2024

Soil Type Sandy Gravelly Clay

Size of Soakaway:

Length (m)	1.80
Width (m)	0.50
Depth of pit (m)	1.60
Test Depth (m)	0.36
Water level above base (m)	1.24
Effective volume (m^3)	1.12

	input required
	calculated

Test Depths of Soakaway:

Depth of water at start (m)	0.36
Water level above base at start (m)	1.24
Depth of water at end (m)	0.36
Water level above base at end (m)	1.24
Effective range of test (m)	0.00

75% effective depth for full cycle depth	0.930
50% effective depth for full cycle depth	0.620
25% effective depth for full cycle depth	0.310
Effective range required for full cycle test	0.620
FULL CYCLE TEST NOT ACHIEVED. RESULTS ARE INDICATIVE	

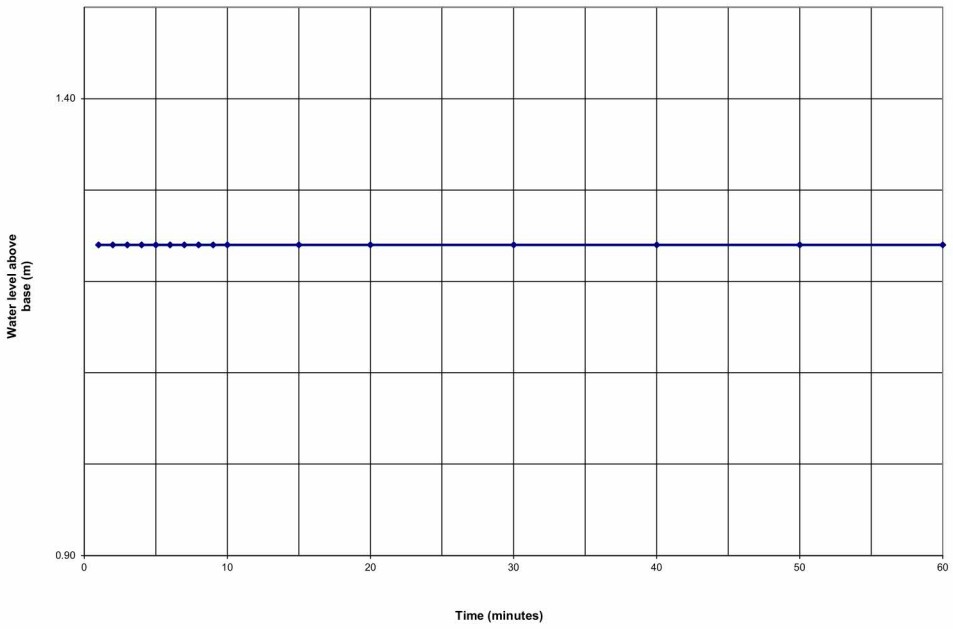
Calculation of Soil Infiltration Rate

Time (minutes)	Depth of water below surface (m)	Water level above base (m)
1	0.36	1.24
2	0.36	1.24
3	0.36	1.24
4	0.36	1.24
5	0.36	1.24
6	0.36	1.24
7	0.36	1.24
8	0.36	1.24
9	0.36	1.24
10	0.36	1.24
15	0.36	1.24
20	0.36	1.24
30	0.36	1.24
40	0.36	1.24
50	0.36	1.24
60	0.36	1.24
90	0.36	1.24
120	0.36	1.24

%	Depth (m)	Water level above base (m)	Time * (minutes)
75%	0.36	1.24	1
50%	0.36	1.24	1
25%	0.36	1.24	1

* estimated from graph

Volume outflow 75%-25% (m^3)	0.00	(V_{p75-25})
Area of pit (50% effective depth) m^2	3.75	(α_{p50})
Time outflow 25%-75% (minutes)	0	(t_{p75-25})



$$f = \frac{V_{p75-25}}{\alpha_{p50} \times t_{p75-25}}$$

Soil Infiltration (f) = **#DIV/0!** **m/s**

Completed by:	*LR*	*Checked by:*	*KM*

Appendix 13 CLEA Model Outputs and Statistical Outputs

CLEA Software Version 1.071

Report generated 19/02/2018

Report title

Created by

BASIC SETTINGS

Land Use	Residential without produce (C4SL)						
Building	Small terraced house						
Receptor	Female (res C4SL)	Start age class	1	End age class	6	Exposure Duration	6 years
Soil	Sandy loam						

Exposure Pathways

Direct soil and dust ingestion	✓	Dermal contact with indoor dust	✓	Inhalation of indoor dust	✓
Consumption of homegrown produce	✗	Dermal contact with soil	✓	Inhalation of soil dust	✓
Soil attached to homegrown produce	✗			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

Land Use Residential without produce (C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1})						Occupation Periods (hr day^{-1})		Soil to skin adherence factors (mg cm^2)		Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Max exposed skin factor		Total skin area (m^2)
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor					Indoor (m^2 m^{-2})	Outdoor (m^2 m^{-2})	
1	180	0	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	0	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	0	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	0	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

Consumption Rates

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1							7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
3							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
4							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
5							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
6							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
7							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
8							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
9							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
10							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
11							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
12							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
13							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
14							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
15							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
16							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
17							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00
18							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00

Top 2 applied? No

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Small terraced house

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Soil Sandy loam

Porosity, Total ($cm^3\ cm^{-3}$)	5.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	2.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	3.30E-01
Residual soil water content ($cm^3\ cm^{-3}$)	1.20E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	3.56E-03
van Genuchten shape parameter *m* (dimensionless)	3.20E-01
Bulk density ($g\ cm^{-3}$)	1.21E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	1.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	5.80E-03
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm^2)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm^2)	3.05E-08

Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate (cm^3 s^{-1})	2.50E+01
Building ventilation rate (cm^3 s^{-1})	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover (m^2 m^{-2})	0.75

* Air dispersion factor in g m^{-2} s^{-1} per kg m^{-3}

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

CLEA Software Version 1.071

Report generated 19-Feb-18

Report title

Created by

RESULTS

Environment Agency

		Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	Aroclor 1254	6.45E-01	3.55E+01	6.34E-01	0.98	0.02	1.00	1.46E+00 (sol)	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Environment Agency

	Assessment Criterion (mg kg^{-1})			Ratio of ADE to HCV			Saturation Limit (mg kg^{-1})	50% rule?		Top Two applied?	Apply Top 2 Approach to Produce Group					
	oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal		Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																

Environment Agency

		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
1	Aroclor 1254	99.9	0.1	0.0	100.0	6.34E-01	1.71E-02	3.17E-01	2.70E-10	0.00E+00	1.44E-06	2.14E-08	0.00E+00	NA	NA	NA	NA	NA	NA
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			

Environment Agency

	Soil Distribution				Media Concentrations													
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
	%	%	%	%	mg kg^{-1}	mg m^{-3}	mg kg^{-1}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg m^{-3}	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW	mg kg^{-1} FW
21																		
22																		
23																		
24																		
25																		
26																		
27																		
28																		
29																		
30																		

Environment Agency

		Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Aroclor 1254	4.70E-06	0.00E+00	2.10E-07	1.05E-08	9.35E-07	0.00E+00	0.00E+00	80.27	0.00	3.58	0.18	15.96	0.01	0.00	0.00
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Environment Agency

	Average Daily Exposure (mg kg^{-1} bw day^{-1})							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															

Environment Agency

		Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)		Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Aroclor 1254	TDI	0.005	TDI	0.053	0	0	1.16E-02	1.56E-06	5.00E-10	4.87	6.79	0.1	0.5	1	1	1
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Environment Agency

	Oral Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)	Inhalation Health Criteria Value ($\mu g\ kg^{-1}\ BW\ day^{-1}$)	Oral Mean Daily Intake ($\mu g\ day^{-1}$)	Inhalation Mean Daily Intake ($\mu g\ day^{-1}$)	Air-water partition coefficient (K_{aw}) ($cm^3\ cm^{-3}$)	Coefficient of Diffusion in Air ($m^2\ s^{-1}$)	Coefficient of Diffusion in Water ($m^2\ s^{-1}$)	log K_{oc} ($cm^3\ g^{-1}$)	log K_{ow} (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor ($g\ g^{-1}$ DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														

Environment Agency

		Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
1	Aroclor 1254	4.30E+02	8.71E-04	3.40E-03	model	model	model	model	model	model
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Environment Agency

	Soil-to-water partition coefficient ($cm^3 g^{-1}$)	Vapour pressure (Pa)	Water solubility (mg L^{-1})	Soil-to-plant concentration factor for green vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for root vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)	Soil-to-plant concentration factor for tree fruit (mg g^{-1} plant DW or FW basis over mg g^{-1} DW soil)
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

Appendix 14 Scottish Water Pipe Materials Assessment Forms

Site Soils Investigation Contamination Checklist

Please refer to Water for Scotland 1st Edition (Parts 2 and 3 section numbers 2.2.2 and 3.2) and to associated documents particularly UK Water Industry Research (UKWIR) document, "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites", UKWIR report reference 10/WM/03/21, 2010.

Please note that all assessments / evaluations regarding soil contamination issues must be carried out by a suitably qualified environmental specialist. These should include comment on the suitability of the pipe material selected, conclusions or recommendations regarding additional protective measures pertaining to the installation of the mains and service pipes and selection of pipe bedding, surround and trench backfill.

For Greenfield sites:

Required:	Included? (tick)
At least 6 historic O.S. land usage maps covering 150 years (1 from 150 years ago and 1 from each period since at approximately 25 to 30 year intervals).	
Walk through survey	

It is recognised that even virgin Greenfield sites can contain naturally occurring contaminants. If an intrusive soils investigation has been carried out with respect to potential contaminants then the results of the survey and the recommendations of the environmental specialist regarding the installation and material of water mains, communication pipes and supply pipes should be included in support of the design.

If Completed:	Included? (tick)
Soil Chemical Analysis	

For Brownfield sites:

Required:	Included? (tick)
History of site and surrounding area giving details of historic and current land usage and any other pertinent information.	✓
Walk through survey	✓
Soil investigation results with risk based evidence to support choice of pipe material with reference to WRAS and UKWIR guidelines.	✓
Plan showing location of all trial pits/boreholes in relation to proposed water main	✓
Evidence from manufacturer that choice of pipe material is suitable for the ground conditions	-
Any Health & Safety considerations due to contaminants	✓

Completed by (name): Andrew R Bussey

Position: Geotechnical Manager

Last Update June 07

RECOMMENDATIONS FOR WATER MAINS SPECIFICATION

Site Name Beeslack, Penicuik
Job Number WG684

SUMMARY OF GROUND CONDITIONS

The following assessment has been undertaken in accordance with Scottish Water guidance and UK Water Industry Research (UKWIR) guidance document, "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites", UKWIR report reference 10/WM/03/21, 2010. Investigations at the site have confirmed the following conditions.

The site currently comprises agricultural land.

Historical OS maps indicate that the site has been greenfield from the earliest available OS map until the present day.

No industrial, commercial or residential land uses are shown on OS maps and the land has been unoccupied.

Soils encountered during previous and recent investigations comprised topsoil or isolated made ground without any significant contamination, overlying natural clay and sand and gravel soils shallow to the surface, further underlain by glacial till deposits.

No evidence of contamination or significant thickness of made ground soils was encountered other than reworked natural soils.

The site has been greenfield throughout its history and according to researches and a site walkover visit no toxic chemicals are stored in the areas of the site under consideration and there is no evidence available that they have been stored on site in the past. Current Scottish Water Guidance - Water Pipe Draft Guidance Version 3.1, indicates that provided desk study information is sufficient, an intrusive investigation including chemical testing will not be required on sites where contaminants are not present such as greenfield sites.

There is, therefore, no restriction on the type of pipe materials which can be used for water supply pipes at the site, other than those imposed by the relevant current Standards and Codes of Practice. On the basis of the above assessment we, therefore, recommend that Polyethylene (PE) plastic pipes are suitable for use as water supply pipes at the site.

It should be noted that the water company may require that a PID survey of the route of water supply pipes is undertaken, extending to 15m either side of the pipe route, in order to confirm that no unexpected chemical contamination is present. Alternatively, this requirement can be satisfied by upgrading pipe materials to PE-Al-PE barrier pipe, which would be protective of water supplies.

It should be noted that these recommendations should be submitted, together with the supporting site investigation information, for approval by Scottish Water before any irrevocable action is taken.

Further recommendations on standards and specifications for water supply pipes and fittings and installation requirements for various pipe materials are given in Part 4 of the UKWIR guidance report reference 10/WM/03/21.

SUITABILITY OF MATERIALS

The above assessment indicates the following pipe materials are suitable for use at the site; polyethylene (PE), polyvinylchloride (PVC)

WATER MAINS: PE is recommended. Trenches must be bedded and back-filled with certified inert material.

SERVICE PIPE-WORK: PE is recommended. Trenches must be bedded and back-filled with certified inert material.

POTENTIAL HAZARDS TO CONTRACTORS LAYING MAINS/SERVICES

Dust: Dust protection measures including dust suppression and where required respiratory protection (such as dust masks) must be used.

Skin Protection: Skin barriers including suitable gloves, clothing and footwear must be used at all times

Excavations: Due care must be paid to stability issues in any excavations.

Where any doubts exist over the selection of suitable PPE or its use advice must be sought from the relevant H&S and Technical advisors. Staff must be vigilant and aware and report any unusual illness, odours, appearance or event. If encountered further sampling/advice must be sought.

Reviewed By: **Validated By:**

[redacted]

[redacted]

Date : 01/08/2022

Established in 1844