22nd April 2022

Our ref: GE20747/FG02/220422

Andy Thompson
Eastleigh Borough Council
Eastleigh House
Upper Market Street
Eastleigh
Hampshire
SO51 9YN

Dear Andy,

RE: Bow Lake Garden - Allotments

Geo-Environmental Services Limited (Geo-Environmental) was instructed by Eastleigh Borough Council (the Client) to undertake ground investigation works in the form of hand pitting, coupled with soil sampling and laboratory chemical testing to determine the chemical and nutritional status of the soils installed within the allotment areas at the Allotment Plots, Bow Lake Gardens, Bishopstoke, Hampshire, SO50 6JH herein referred to as 'the site'.

It was understood that the site had recently been redeveloped as allotments as part of a larger residential development scheme, and it was also understood that Eastleigh Borough Council will be taking on the ownership and management of these allotments.

Eastleigh Borough Council was looking to obtain a better understanding of both the chemical and nutrient status of the soils within these allotments in order to understand the potential risks and liabilities associated with the ownership and management of the allotment site.

1.0 Scope of Works

The scope of the works undertaken at the site to date comprised:

- The excavation, using hand tools, of 12No. hand pits to either the natural underlying soils or to a maximum depth of 1.0m bgl, within the proposed allotment plots.
- Geochemical laboratory testing of recovered soils for a suite of commonly occurring brownfield contaminants.
- Geochemical laboratory testing of recovered soils for a BS3882 Topsoil nutrient suite on selected samples.

2.0 Site Description

The site was accessed via Brick Kiln Road, with the entrance from the road leading to a tarmacked parking area. A dirt track ran from the parking area roughly through the centre of the site with a small brick building located to the south-east of the site entrance. The area designated for allotments sloped away gently to the west and was found to be laid to grass with no clear distinct allotment plots visibly marked at the time of the investigation works. The entire site area was enclosed with a closeboard wooden fence.

3.0 Ground Conditions

As the site has been developed for use as allotments ground conditions were anticipated to comprise a thickness of Topsoil, possibly underlain with subsoil, overlying natural strata.

With reference to British Geological Survey (BGS) mapping, the geology of the site was anticipated to comprise River Terrace Deposits overlying clays of the London Clay Formation.

The ground conditions encountered within the exploratory holes were broadly consistent with those anticipated, i.e. a thickness of Topsoil overlying River Terrace Deposits. A generalised summary of the encountered shallow ground conditions is presented in Table 1.

Top (m bgl)	Base (m bgl)	Geology	Positions
0.00 – 0.25	0.15 – 0.90	**TOPSOIL:** Grass over brown slightly gravelly silty CLAY with frequent rootlets.	All
0.00 – 0.15	0.25 – 1.40	**SUBSOIL:** Brown very silty gravelly CLAY with occasional rootlets and brick fragments.	HP10
0.20 – 1.40	3.00 – 8.30	**RIVER TERRACE DEPOSITS:** Soft to stiff strength CLAY with varying proportions of silt and gravel, colouration brown and brown and orange mottled.	All

Table 1 Ground condition summary

Brick fragments were noted to be present within the natural soils in HP10 and thus, this stratum was not considered representative of previously undisturbed River Terrace Deposits.

The exploratory hole logs are presented within Appendix A, a photo sheet showing the encountered soils in each hand pit is presented within Appendix B and the exploratory hole location plan is presented in Figure 2.

4.0 Analysis of laboratory test results

A Preliminary Quantitative Risk Assessment has been undertaken in order to evaluate any unacceptable risks posed to human health with respect to the proposed use of the site as allotments. It should be noted that this assessment is protective of the chronic long-term effects of contaminants, which is also likely to be protective of any possible immediate acute effects.

A quantitative risk assessment has been undertaken by comparing the results of the laboratory chemical testing of shallow soils against the ATRISKSOIL Soil Screening Values (SSVs) derived by Atkins, or against the Suitable For Use Levels (S4ULs) published by LQM (Copyright Land Quality Management Limited reproduced with permission, Publication Number S4UL3453. All rights Reserved) and Category 4 Screening Levels (C4SLs) published by DEFRA for the proposed end use. Although the C4SLs were released for Part 2A use, the associated policy companion document for the C4SLs indicated that they may also be used for planning. Although the C4SLs represent a marginally higher risk level than the SSACs (low risk rather than minimal risk) it is considered that the risk levels remain very low. Therefore, the final C4SLs are considered to be suitable to assess soils under the planning regime.

The exploratory holes were located to provide general coverage of the site and so as to target the proposed locations of allotments plots. Samples were selected to provide coverage of the site and to specifically target shallow soils that are likely to come into contact with identified receptors. Analysis was undertaken on soil samples collected from these exploratory holes.

In the first instance the results of the sample analysis were compared to the Tier 1 screening criteria, allotments, where available, which are summarised in Table 2 below:

Determinand	Soil Screening Value (mg/kg)	Sample Max. Conc. (mg/kg)	Below Screening Value?
Arsenic	49	7.8	Yes
Beryllium	17.8	<1.0	Yes
Cadmium	3.9	0.40	Yes
Chromium (Total)	12600	23	Yes
Copper	1450	45	Yes
Hexavalent Chromium	171	<0.50	Yes
Lead	79.1	58	Yes
Mercury (inorganic)	94.1	<0.10	Yes
Nickel	67.3	9	Yes
Selenium	143	0.28	Yes
Vanadium	33.2	25	Yes
Zinc	5230	160	Yes
Phenols	331	<0.10	Yes
Benzo(a)pyrene	5.72	8.2	No
Dibenz(a,h)anthracene	0.43	1.0	No
Naphthalene	27.4	0.61	Yes

Table 2 Summary of chemical analyses

The identified exceedances highlighted above were identified within one sample only. This sample was collected from HP10 at 0.55m bgl from the underlying disturbed natural strata, which was noted to contain brick fragments.

In addition, the results of the speciated hydrocarbon analyses were all returned as either below the laboratory detection limits or below their respective human health screening values for an allotment end use.

All samples were submitted for asbestos screening and returned with no asbestos fibres identified.

Exceedances of the allotment screening criteria were only identified within one sample of the disturbed natural underlying strata within HP10. All other samples were found to be below the relevant screening criteria. The geochemical laboratory testing results are presented within Appendix C.

4.0 Topsoil and Subsoil Assessment

A further two Topsoil samples and one sub soil sample were submitted for a physical and nutrient testing suite. The samples were referenced HP03 at 0.4m bgl (Topsoil), HP08 at 0.10m bgl (Topsoil) and HP10 at 0.3m bgl (Subsoil). The results of the soils tested were compared to the Table 1 from BS3882:2015 entitled 'Specification for Topsoil'. The results are summarised in Table 3 below:

Parameters	Limits for Multipurpose Topsoil	Sample Range	Within acceptable Limits?
Maximum Coarse Fragment Content (%) Stones >2mm Stones > 20mm Stones >50mm	 30 10 0	 9.4-28 <0.020-1.6 <0.020-24	No, exceedance of the >50mm stone limit
Mass loss on ignition % Clay 5% to 20%	3 to 20	4-4.4	Yes
Soil pH	5.5 to 8.5	8.1-8.7	No, slight exceedance of the upper pH limit
Plant nutrient content Total nitrogen % Extractable phosphate mg/l Extractable potassium mg/l Extractable magnesium mg/l	 >0.15 16 to 140 121 to 1500 51 to 600	 0.16-0.17 2.4-5.9 110-270 96-130	No, slight shortfall in total phosphate and potassium
Carbon:nitrogen ratio	<20:1	3:1-4:1	Yes
Electrical conductivity µS/cm	<3300	2000-2200	Yes
Potentially Phytotoxic Elements Zn mg/kg Cu mg/kg Ni mg/kg	 <200 <135 <110	 35-150 16-40 13-28	Yes
Visible contaminants % m/m …of which plastics % Sharps n/kg	 <0.5 <0.25 0	 0 0 0	Yes

Table 3 Summary of BS8332 Topsoil Analysis

The results demonstrate that the soils analysed are in accordance with BS3882:2015 Low Fertility Topsoil due to the slight shortfall in phosphate and potassium. It may therefore be necessary to add a fertiliser to the Topsoil to provide a suitable growing medium given the proposed use of the site as allotments. Given the proposed end use as allotments, it is likely that compost, mulch and other nutrient sources will be added to the ground during commissioning and use of the allotments. In addition, one result was found to be slightly above the 'Stones >50mm' limit for Multipurpose Topsoil. BS3882 notes that stone content is an important factor in relation to ultimate land use. For example, high stones content may be unacceptable on a playing field but more tolerable in garden areas. However, given that the site is proposed as allotments and soil is likely to be dug and turned over, the recorded stone content of the Topsoil is considered acceptable. Where large stones are evident at surface level these could be handpicked and removed prior to the use of the site as allotments.

5.0 Recommendations

The only identified exceedances of the relevant screening criteria for an allotment use were identified within the disturbed natural strata within HP10 at 0.55m bgl. The two contaminants found to exceed the screening criteria were Benzo(a)pyrene and Dibenz(a,h)anthracene. Although the material within HP10 was described as a River Terrace Deposits, it was found to contain brick fragments, and therefore differed from natural materials encountered in other exploratory holes. Therefore, it is considered suitable to address this material within HP10 at 0.55m bgl in isolation.

A review of the proposed allotment plot layout shows that HP10 is located within one of the proposed allotment plots. The exceedances were identified within the top 600mm of the soils present on site and are therefore considered to be present within the 'double dig' depth, likely bioturbation zone (e.g. earthworms and ground burrowing insects) and potential root zone. As such, some form of further action is likely to be required.

Below is an outline of several potential options to address the identified exceedances within the soils encountered within HP10 at 0.55m bgl:

- As the allotment plots are yet to be set out on site, relocate the proposed plot in the vicinity of HP10 such that HP10 is located beneath a pathway or area where no soil disturbance or digging is proposed. It is considered that if the disturbed River Terrace Deposits encountered within HP10 are to remain in place at depth, i.e. located beneath a pathway, the contaminants entrained within the soil mass would not pose a risk to end users (due to a lack of exposure pathway) and can remain in-situ without the need for further action.
- Increase the depth of Topsoil installed above the River Terrace Deposits on the Plot in which HP10 is located. If it is necessary to locate an allotment plot in the vicinity of HP10 then increasing the depth of Topsoil such that it forms a suitable cover system. A minimum depth of 600mm of Topsoil would be considered necessary. It may also be necessary to install a geotextile type membrane between the disturbed natural soils and Topsoil to prevent the mixing of the identified impacted disturbed natural soils and the Topsoil above.
- Undertake further intrusive investigation works to delineate the extent of identified impacted material. This further investigation would aim to clarify the extent of the impacted area and enable a detailed remedial approach to be developed, if necessary. It is possible that the resultant solution comprises one of the options described above.

In addition, Topsoil nutrient testing has shown that the Topsoil currently present on site is considered as Low Fertility Topsoil and as such it may be necessary to add a fertiliser or a more nutrient rich Topsoil, to the existing Topsoil to provide a suitable growing medium. It is anticipated that application of mulch, compost and other nutrient sources would occur when individual plots are commissioned and that the nutrient balance on any given plot may be subject to tenant specific requirements to reflect the plants they intend to grow. As such, addition of nutrients at this stage is not considered essential.

6.0 Closure

The inspection of the underlying ground conditions was undertaken by Geo-Environmental via the excavation of a selected number of hand pits. There was no visual surface evidence on the site to indicate that the areas remote from the pits undertaken were likely to differ significantly from the areas where the pits had been undertaken for inspection. However, the confirmation of the composition of Topsoil, subsoil and natural strata has only been assessed by Geo-Environmental within these hand pit locations. It has been assumed that these hand pits are representative of the soils underlying the rest of the site. Geo-Environmental accepts no liability for areas that have not been directly inspected or works that have subsequently been undertaken on the site following our investigation works that may in any way alter or affect the works reported herein.

We trust we have interpreted your request correctly and provided sufficient information for your current requirements.

Should you have any queries please do not hesitate to contact us.

Yours sincerely
For and on Behalf of Geo-Environmental

[redacted]

FIONA GOODE BSc (Hons), MSc, FGS, MIEnvSc, RSoBRA
Senior Consultant Engineer
fiona.goode@gesl.net

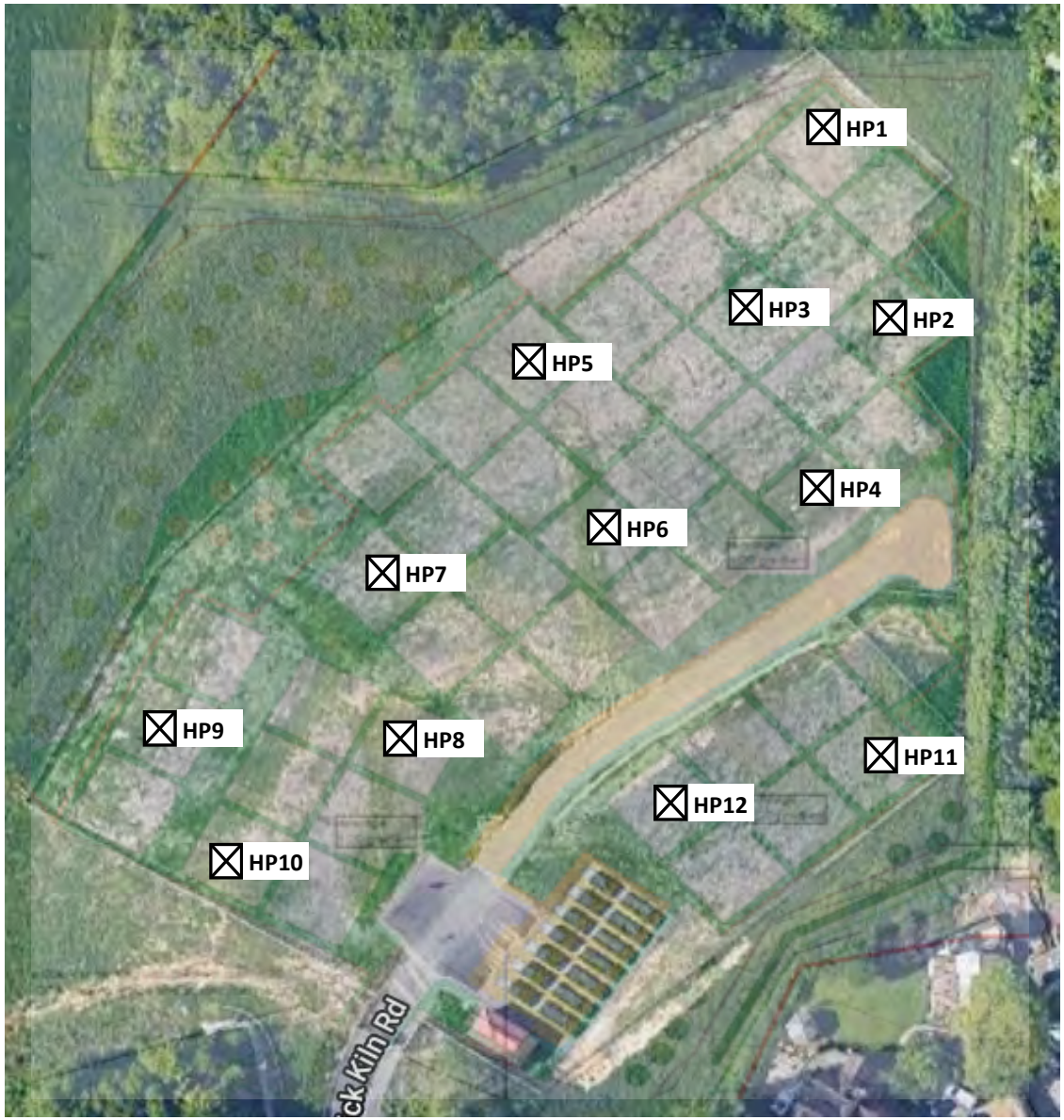
Enc Figure 1 - Site Location Plan
Figure 2 – Hand Pit Locations
Appendix A – Exploratory Hole Logs
Appendix B – Photo Sheet of Hand Pits
Appendix C – Geochemical Laboratory Test Results

FIGURES





Project:	Bow Lake Gardens - Allotments, Bishopstoke, SO50 6JH			**Title**	Site Location Plan
Client:	Eastleigh Borough Council			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE20747	**Revision:**	0		
Drawn:	FG	**Date:**	04/04/2022		
Figure:	1	**Scale:**	Not To Scale		



Project:	Bow Lake Gardens - Allotments, Bishopstoke, SO50 6JH			**Title**	Proposed Exploratory Hole Location Plan
Client:	Eastleigh Borough Council			**Geo-Environmental Services Ltd** **Unit 7 Danworth Farm, Cuckfield Road** **Hurstpierpoint, West Sussex BN6 9GL** **+44(0)1273 832972 www.gesl.net**	Geo-Environmental
Ref No:	GE20747	**Revision:**	0		
Drawn:	FG	**Date:**	04/04/2022		
Figure:	2	**Scale:**	Not To Scale		

APPENDIX A

Exploratory Hole Logs



Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
HP01
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.33 Level:
Location:	Bishopstoke	Dimensions (m): Depth 0.80	Date 08/04/2022 Scale 1:25
Client:	Eastleigh Borough Council		Logged TU

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.25	ES		0.40			Turf over brown slightly gravelly silty CLAY. Gravels are fine to medium subrounded. Frequent rootlets. TOPSOIL
	0.50	PP	PP=0.75kg/cm2				Soft to firm orangey brown slightly silty slightly gravelly CLAY. Gravels are fine subrounded. RIVER TERRACE DEPOSITS
	0.60	ES		0.80			End of Pit at 0.80m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
HP02
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.33 Level:
Location:	Bishopstoke	Dimensions (m):	Date 08/04/2022
Client:	Eastleigh Borough Council	Depth 0.70	Scale 1:25 Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30	ES		0.40			Turf over brown slightly silty slightly gravelly CLAY. Gravels are fine to coarse subrounded to angular. Abundant rootlets 1mm. TOPSOIL
	0.60	PP	PP=1.5kg/cm2	0.70			Firm to stiff light brown slightly silty slightly gravelly CLAY. Gravels are fine subrounded to subangular. RIVER TERRACE DEPOSITS
							End of Pit at 0.70m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No: HP03
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No.: GE20747	Co-ords: 50.98 - 1.33 Level:	Date: 08/04/2022
Location:	Bishopstoke	Dimensions (m): Depth 0.90		Scale: 1:25
Client:	Eastleigh Borough Council			Logged: TU

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.40	ES		0.50			Turf over brown slightly silty gravelly CLAY. Gravels are fine to medium subrounded. Frequent rootlets 1mm-3mm. TOPSOIL
	0.80	PP	PP=0.5kg/cm2	0.90			Soft brown motteled orange slightly silty slightly gravelly CLAY. Gravels are fine to medium subrounded to angular. RIVER TERRACE DEPOSITS
							End of Pit at 0.90m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
Geo-Environmental www.gesl.net

Trial Pit Log

TrialPit No
HP04
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.33 Level:
Location:	Bishopstoke	Dimensions (m):	Date 08/04/2022
Client:	Eastleigh Borough Council	Depth 0.70	Scale 1:25 Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES					Turf over brown silty slightly gravelly CLAY. Gravels are fine subrounded to subangular. Abundant rootlets 1mm. TOPSOIL
	0.50	PP	PP=1.75kg/cm2	0.40			Firm to stiff Light brown yellowish slightly silty slightly gravelly CLAY. Gravels are fine to coarse subrounded to angular. RIVER TERRACE DEPOSITS
				0.70			End of Pit at 0.70m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
HP05
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.33 Level:
Location:	Bishopstoke	Dimensions (m): Depth 0.80	Date 08/04/2022
Client:	Eastleigh Borough Council		Scale 1:25 Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.15	ES					Turf over dark brown slightly gravelly silty CLAY. Gravels are fine subrounded. Occasional rootlets 1mm. TOPSOIL
				0.40			
	0.60	PP	PP=1kg/cm2				Light brown Orangey slightly silty slightly gravelly CLAY. Gravels are fine to medium subrounded to subangular. Occasional brick fragments. RIVER TERRACE DEPOSITS
				0.80			End of Pit at 0.80m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
HP06
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.33 Level:
Location:	Bishopstoke	Dimensions (m):	Date 08/04/2022
Client:	Eastleigh Borough Council	Depth 0.90	Scale 1:25 Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES		0.40			Turf over dark brown motteled orange slightly gravelly silty CLAY. Gravels are fine to medium subrounded. Abundant rootlets 1mm TOPSOIL
	0.70	ES					Soft light brown slightly silty gravelly CLAY. Gravels are fine to medium subrounded to subangular. RIVER TERRACE DEPOSITS
	0.80	PP	PP=0.5kg/cm2	0.90			End of Pit at 0.90m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No: HP07
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No.: GE20747	Co-ords: 50.98 - 1.34 Level:
Location:	Bishopstoke	Dimensions (m): Depth 0.75	Date: 08/04/2022 Scale: 1:25
Client:	Eastleigh Borough Council		Logged: TU

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20	ES		0.30			Turf over dark brown slightly gravelly silty CLAY. Gravels are fine to medium subrounded. Frequent rootlets 1mm-2mm. TOPSOIL
	0.60	PP	PP=0.75kg/cm2	0.75			Soft to firm light brown slightly silty gravelly CLAY. Gravels are fine to coarse subrounded to subangular. RIVER TERRACE DEPOSITS
							End of Pit at 0.75m

1
2
3
4
5

Water Strike - Details	
Depth Water	Depth Water Value

Remarks:

Stability: Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
HP08
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.34 Level:
Location:	Bishopstoke	Dimensions (m): Depth 0.80	Date 08/04/2022
Client:	Eastleigh Borough Council		Scale 1:25 Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	ES					Turf over dark brown silty slightly gravelly CLAY. Gravels are fine to medium subrounded. Frequent rootlets 1mm. TOPSOIL
	0.40	PP	PP=0.5kg/cm2	0.30			Soft brown slightly silty gravelly CLAY. Gravels are fine to coarse subrounded to angular. Occasional brick fragments. RIVER TERRACE DEPOSITS
				0.80			End of Pit at 0.80m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
HP09
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.34 Level:
Location:	Bishopstoke	Dimensions (m):	Date 08/04/2022
Client:	Eastleigh Borough Council	Depth 0.90	Scale 1:25 Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES					Turf over dark brown very silty slightly gravelly CLAY. Gravels are fine to medium subrounded. Frequent rootlets 1mm. TOPSOIL
				0.40			Soft light brown slightly silty gravelly CLAY. Gravels are fine to coarse subrounded to subangular. Occasional brick fragments. RIVER TERRACE DEPOSITS
	0.70	PP	PP=0.5kg/cm2				
				0.90			End of Pit at 0.90m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No: HP10
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No.: GE20747	Co-ords: 50.98 - 1.34 Level:	Date: 08/04/2022
Location:	Bishopstoke	Dimensions (m): Depth 0.70		Scale: 1:25
Client:	Eastleigh Borough Council			Logged: TU

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	ES		0.20			Turf over dark brown silty slightly gravelly CLAY. Gravels are medium to coarse subrounded to angular. Frequent rootlets 1-3mm. TOPSOIL
				0.40			Brown very silty gravelly CLAY. Gravels are fine to coarse subrounded to subangular. Occasional rootlets 1mm. SUBSOIL
	0.55 0.60	ES PP	PP=0.5kg/cm2	0.70			Soft light brown slightly silty gravelly CLAY. Gravels are fine to coarse subrounded to angular. Occasional brick fragments. RIVER TERRACE DEPOSITS
							End of Pit at 0.70m

1
2
3
4
5

Water Strike - Details	
Depth Water	Depth Water Value

Remarks:

Stability: Sides Stable

AGS

Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
Geo-Environmental www.gesl.net

Trial Pit Log

TrialPit No
HP11
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.33 Level:	Date 08/04/2022
Location:	Bishopstoke		Dimensions (m): Depth 0.70	Scale 1:25
Client:	Eastleigh Borough Council			Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10	ES					Turf over dark brown silty slightly gravelly CLAY. Gravels are coarse subrounded to angular. Frequent rootlets 1mm-2mm. TOPSOIL
	0.30	ES					
	0.50	PP	PP=1.5kg/cm2	0.40			Firm to stiff light brown motteled orange slightly silty gravelly CLAY. Gravels are fine to medium subrounded to subangular. RIVER TERRACE DEPOSITS
				0.70			End of Pit at 0.70m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental
Unit 7, Danworth Farm
Hurstpierpoint
BN6 9GL
www.gesl.net

Trial Pit Log

TrialPit No
HP12
Sheet 1 of 1

Project Name:	Bow Lake Gardens - Allotments	Project No. GE20747	Co-ords: 50.98 - 1.33 Level:
Location:	Bishopstoke	Dimensions (m): Depth 0.80	Date 08/04/2022
Client:	Eastleigh Borough Council		Scale 1:25 Logged TU

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.40	ES		0.50			Turf over dark brown slightly gravelly CLAY. Gravels are fine to medium subrounded. Occasional rootlets 1mm. TOPSOIL
	0.60	PP	PP=1kg/cm2				Brown to light brown silty gravelly CLAY. Gravels are fine to coarse subrounded to angular. Occasional brick fragment. RIVER TERRACE DEPOSITS
	0.70	ES		0.80			End of Pit at 0.80m

1
2
3
4
5

Water Strike - Details			
Depth Water	Depth Water Value	Remarks	
		Stability	Sides Stable

AGS

Geo-Environmental

APPENDIX B

Photo Sheet of Hand Pits



Name	Bow lake gardens - Allotments, Bishopstoke, SO50 6JH
ID	GE20747
Client	EBC
Engineer	
Travis Underdown	travis.underdown@gesl.net
Location	SO50 6JH
Date	08/04/2022
Geo-Environmental's Project Manager	
Fiona Goode	fiona.goode@gesl.net

Hole

Hole ID	HP1
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP2
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP3

Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP4
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP5
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil

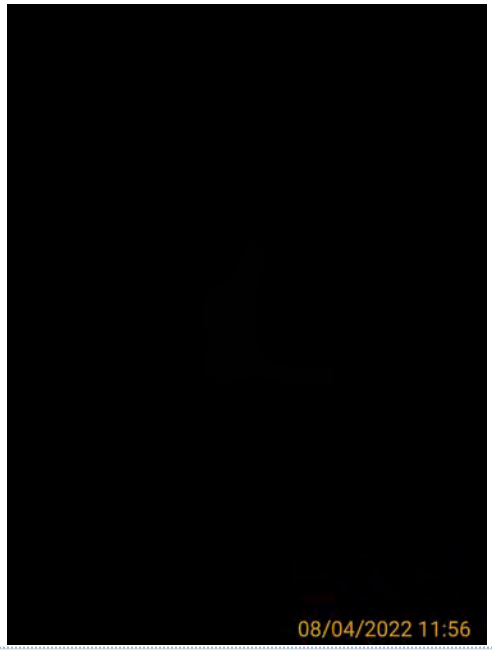


Hole ID	HP6
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP7

Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP8
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP9
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP10
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Additional Photos

(1 record)

Photograph	*Description*
	Brick fragments

Hole ID	HP11
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Hole ID	HP12
Additional Photos	[ ] Yes

Photo of Pit



Photo of Spoil



Geo-Environmental

APPENDIX C

Geochemical Laboratory Results



eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	22-13876-1
Initial Date of Issue:	21-Apr-2022
Client	Geo-Environmental Services Ltd
Client Address:	Unit 7, Danworth Farm Cuckfield Road Hurstpierpoint West Sussex BN6 9GL
Contact(s):	Fiona Goode Laura Legate Reporting
Project	GE20747 Bow Lake Gardens - Allotments

Quotation No.:	Q22-27249	**Date Received:**	12-Apr-2022
Order No.:	PO5174	**Date Instructed:**	12-Apr-2022
No. of Samples:	16		
Turnaround (Wkdays):	5	**Results Due:**	20-Apr-2022
Date Approved:	21-Apr-2022		

[redacted]

[redacted]

[redacted]

Stuart Henderson, Technical Manager

Results - Soil

Project: GE20747 Bow Lake Gardens - Allotments

Client: Geo-Environmental Services Ltd		**Chemtest Job No.:**			22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876
Quotation No.: Q22-27249		**Chemtest Sample ID.:**			1410465	1410466	1410467	1410468	1410469	1410470	1410471	1410473
		Sample Location:			HP1	HP1	HP2	HP3	HP4	HP5	HP6	HP6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.25	0.60	0.30	0.40	0.20	0.15	0.20	0.70
		Date Sampled:			08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022
		Asbestos Lab:			DURHAM	DURHAM	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-		-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	18	16	14	24	20	20	21	18
Soil Colour	N	2040		N/A	Brown	Brown	Brown		Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Roots and Stones	Stones and Roots	Roots and Stones		Roots and Stones	Stones and Roots	Stones and Roots	Stones and Roots
Soil Texture	N	2040		N/A	Sand	Sand	Sand		Sand	Sand	Sand	Clay
pH	M	2010		4.0	7.7	7.8	7.3		7.4	7.8	7.7	7.8
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40		< 0.40	< 0.40	0.62	0.90
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	< 0.010	< 0.010		0.015	0.32	0.043	0.12
Sulphur (Elemental)	M	2180	mg/kg	1.0	3.8	< 1.0	< 1.0		1.4	< 1.0	1.1	< 1.0
Chloride (Water Soluble)	M	2220	g/l	0.010	< 0.010	< 0.010	< 0.010		< 0.010	< 0.010	< 0.010	0.010
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	14	0.68	14		15	14	1.0	1.6
Sulphate (Total)	U	2430	mg/kg	100	110	< 100	210		290	280	190	160
Arsenic	M	2450	mg/kg	1.0	1.8	2.4	3.3		2.5	2.7	2.1	2.9
Beryllium	U	2450	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	< 0.10	< 0.10
Chromium	M	2450	mg/kg	1.0	9.0	12	12		8.5	8.0	8.3	11
Copper	M	2450	mg/kg	0.50	3.9	3.9	5.6		5.7	5.9	4.6	4.7
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	3.8	4.8	5.2		3.7	3.5	3.5	6.8
Lead	M	2450	mg/kg	0.50	10	8.6	8.7		17	16	16	4.7
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20	< 0.20		0.21	< 0.20	< 0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	12	16	16		12	12	11	11
Zinc	M	2450	mg/kg	0.50	13	13	17		19	19	16	20
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	0.50	2.0	< 0.20		1.8	0.69	1.3	0.71
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		12	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0		12	< 5.0	< 5.0	< 5.0

Results - Soil

Project: GE20747 Bow Lake Gardens - Allotments

Client: Geo-Environmental Services Ltd			Chemtest Job No.:		22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876
Quotation No.: Q22-27249			Chemtest Sample ID.:		1410465	1410466	1410467	1410468	1410469	1410470	1410471	1410473
			Sample Location:		HP1	HP1	HP2	HP3	HP4	HP5	HP6	HP6
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.25	0.60	0.30	0.40	0.20	0.15	0.20	0.70
			Date Sampled:		08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		24	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0		24	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10		36	< 10	< 10	< 10
Benzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Toluene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Ethylbenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
m & p-Xylene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
o-Xylene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methyl Tert-Butyl Ether	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Naphthalene	N	2800	mg/kg	0.010	0.32	0.35	< 0.010		0.36	0.31	0.29	0.37
Acenaphthylene	N	2800	mg/kg	0.010	0.075	0.091	< 0.010		0.075	0.068	0.063	0.079
Acenaphthene	N	2800	mg/kg	0.010	0.043	0.067	< 0.010		0.047	0.033	0.038	0.039
Fluorene	N	2800	mg/kg	0.010	0.067	0.069	< 0.010		0.048	0.029	0.025	0.042
Phenanthrene	N	2800	mg/kg	0.010	0.095	0.21	0.029		0.066	0.074	0.061	0.082
Anthracene	N	2800	mg/kg	0.010	0.026	0.059	0.020		< 0.010	0.012	0.019	0.017
Fluoranthene	N	2800	mg/kg	0.010	0.10	0.29	0.065		0.10	0.098	0.035	0.12
Pyrene	N	2800	mg/kg	0.010	0.12	0.25	0.082		0.086	0.11	0.040	0.094
Benzo[a]anthracene	N	2800	mg/kg	0.010	0.16	0.11	0.037		< 0.010	0.078	< 0.010	0.074
Chrysene	N	2800	mg/kg	0.010	0.16	0.081	0.038		< 0.010	0.079	< 0.010	0.072
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	0.18	0.16	0.079		< 0.010	0.11	< 0.010	0.095
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	0.060	0.063	0.023		< 0.010	0.036	< 0.010	0.025
Benzo[a]pyrene	N	2800	mg/kg	0.010	0.17	0.095	0.056		< 0.010	0.074	< 0.010	0.046
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	0.099	0.073	< 0.010		< 0.010	< 0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	0.040	0.040	< 0.010		< 0.010	< 0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	0.11	0.059	< 0.010		< 0.010	< 0.010	< 0.010	< 0.010
Total Of 16 PAH's	N	2800	mg/kg	0.20	1.8	2.1	0.43		0.78	1.1	0.57	1.2
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: GE20747 Bow Lake Gardens - Allotments

Client: Geo-Environmental Services Ltd				Chemtest Job No.:	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876
Quotation No.: Q22-27249				Chemtest Sample ID.:	1410474	1410475	1410476	1410477	1410478	1410479	1410481	1410482
				Sample Location:	HP7	HP8	HP9	HP10	HP10	HP11	HP12	HP12
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.20	0.10	0.20	0.30	0.55	0.10	0.40	0.70
				Date Sampled:	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022
				Asbestos Lab:	DURHAM	DURHAM	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-	-		-	-	-	-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	20	20	19	17	19	21	19	17
Soil Colour	N	2040		N/A	Brown	Brown	Brown		Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones and Roots	None		Roots	Stones	Stones and Roots	Stones and Roots
Soil Texture	N	2040		N/A	Sand	Sand	Loam		Clay	Sand	Clay	Clay
pH	M	2010		4.0	8.0	8.1	8.0		8.4	8.0	8.0	8.1
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.9	0.76	< 0.40		0.97	0.50	0.74	0.40
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.28	0.048	0.018		0.28	0.028	0.10	< 0.010
Sulphur (Elemental)	M	2180	mg/kg	1.0	< 1.0	2.8	24		24	1.8	15	17
Chloride (Water Soluble)	M	2220	g/l	0.010	0.033	< 0.010	< 0.010		0.030	< 0.010	< 0.010	0.013
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	14	26	14		14	14	14	14
Sulphate (Total)	U	2430	mg/kg	100	900	490	380		340	410	860	160
Arsenic	M	2450	mg/kg	1.0	3.7	6.1	3.8		1.8	4.1	2.4	< 1.0
Beryllium	U	2450	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M	2450	mg/kg	0.10	0.40	< 0.10	< 0.10		< 0.10	< 0.10	0.29	< 0.10
Chromium	M	2450	mg/kg	1.0	19	23	10		7.9	12	17	5.6
Copper	M	2450	mg/kg	0.50	45	12	8.8		6.8	7.7	40	3.9
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10	0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	8.2	9.0	5.9		3.4	4.5	6.9	2.5
Lead	M	2450	mg/kg	0.50	27	16	22		14	23	58	11
Selenium	M	2450	mg/kg	0.20	< 0.20	0.28	< 0.20		< 0.20	< 0.20	< 0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	13	25	13		9.7	17	12	6.9
Zinc	M	2450	mg/kg	0.50	160	33	30		19	25	140	12
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50
Total Organic Carbon	M	2625	%	0.20	1.2	0.84	0.73		1.2	1.7	2.1	2.0
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0		< 5.0	< 5.0	< 5.0	< 5.0

Results - Soil

Project: GE20747 Bow Lake Gardens - Allotments

Client: Geo-Environmental Services Ltd			Chemtest Job No.:		22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876	22-13876
Quotation No.: Q22-27249			Chemtest Sample ID.:		1410474	1410475	1410476	1410477	1410478	1410479	1410481	1410482
			Sample Location:		HP7	HP8	HP9	HP10	HP10	HP11	HP12	HP12
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.20	0.10	0.20	0.30	0.55	0.10	0.40	0.70
			Date Sampled:		08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022	08-Apr-2022
			Asbestos Lab:		DURHAM	DURHAM	DURHAM		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0	< 5.0		< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10	< 10		< 10	< 10	< 10	< 10
Benzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Toluene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Ethylbenzene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
m & p-Xylene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
o-Xylene	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methyl Tert-Butyl Ether	M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010		< 0.0010	< 0.0010	< 0.0010	< 0.0010
Naphthalene	N	2800	mg/kg	0.010	0.33	0.35	0.14		0.61	0.15	0.27	0.20
Acenaphthylene	N	2800	mg/kg	0.010	0.11	0.11	0.049		0.23	0.049	0.075	0.054
Acenaphthene	N	2800	mg/kg	0.010	0.035	0.11	0.027		2.1	0.033	0.035	0.056
Fluorene	N	2800	mg/kg	0.010	0.043	0.076	0.037		1.8	0.038	0.037	0.060
Phenanthrene	N	2800	mg/kg	0.010	0.10	0.13	0.069		16	0.13	0.18	0.24
Anthracene	N	2800	mg/kg	0.010	0.034	0.083	0.024		4.2	0.041	0.037	0.079
Fluoranthene	N	2800	mg/kg	0.010	0.13	0.23	0.10		26	0.30	0.28	0.39
Pyrene	N	2800	mg/kg	0.010	0.13	0.21	0.094		18	0.24	0.26	0.32
Benzo[a]anthracene	N	2800	mg/kg	0.010	0.069	0.16	0.069		9.7	0.20	0.10	0.18
Chrysene	N	2800	mg/kg	0.010	0.046	0.11	0.063		9.3	0.14	0.13	0.20
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	0.13	0.32	0.089		11	0.27	0.23	0.26
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	0.044	0.12	0.060		4.4	0.10	0.057	0.075
Benzo[a]pyrene	N	2800	mg/kg	0.010	0.098	0.23	0.077		8.2	0.21	0.16	0.13
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	0.10	0.27	< 0.010		6.8	0.32	0.082	0.14
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	0.015	0.18	< 0.010		1.0	0.11	0.018	0.045
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	0.098	0.26	< 0.010		5.0	0.17	0.12	0.13
Total Of 16 PAH's	N	2800	mg/kg	0.20	1.5	3.0	0.90		120	2.5	2.1	2.6
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10	< 0.10	< 0.10	< 0.10

Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 22-13876
Chemtest Sample ID.: 1410468
Client Sample Ref.:
Sample Location: HP3
Client Sample ID.:
Top Depth (m): 0.40
Bottom Depth (m):
Date Sampled: 08-Apr-2022
Time Sampled:

Parameter	Units	Multipurpose Range			Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture							**Acid**	**Low F**	**Calc.**
Clay content	%				6.5				
Silt content	%				35				
Sand content	%				58				
Soil texture class		See Attached Chart			Sandy Loam	YES			
Mass Loss on Ignition									
Clay 5-20%		3.0-20			4.4	YES	YES	YES	YES
Clay 20-35%		5.0-20							
Stone Content	**% m/m**								
>2mm		0-30			9.4	YES			
>20mm		0-10			1.6	YES			
>50mm		0			24	NO			
Soil pH value		5.5-8.5			8.2	YES	NO	YES	YES
Carbonate (Calcareous only)	%				1.2				YES
Electrical Conductivity	µS/cm	If >3300 do ESP			2200	YES			
Available Nutrient Content									
Nitrogen %		>0.15			0.17	YES	YES		YES
Extractable phosphorus	mg/l	16-140			2.4	NO	NO	YES	NO
Extractable potassium	mg/l	121-1500			110	NO	NO		NO
Extractable magnesium	mg/l	51-600			130	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1			15.4/1	YES	YES	YES	YES
Exchangeable sodium	**%**	<15			0.68				
Available Calcium	mg/l				780				
Available Sodium	mg/l				33				
Phytotoxic Contaminants (by soil pH)		**< 6.0**	**6.0-7.0**	**> 7.0**					
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	150	YES			
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	40	YES			
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	15	YES			
Visible Contaminants	**% mm**								
>2mm		<0.5			0.000	YES			
….. of which plastics		<0.25			0.000	YES			
….. man-made sharps		zero in 1kg			0.000	YES			

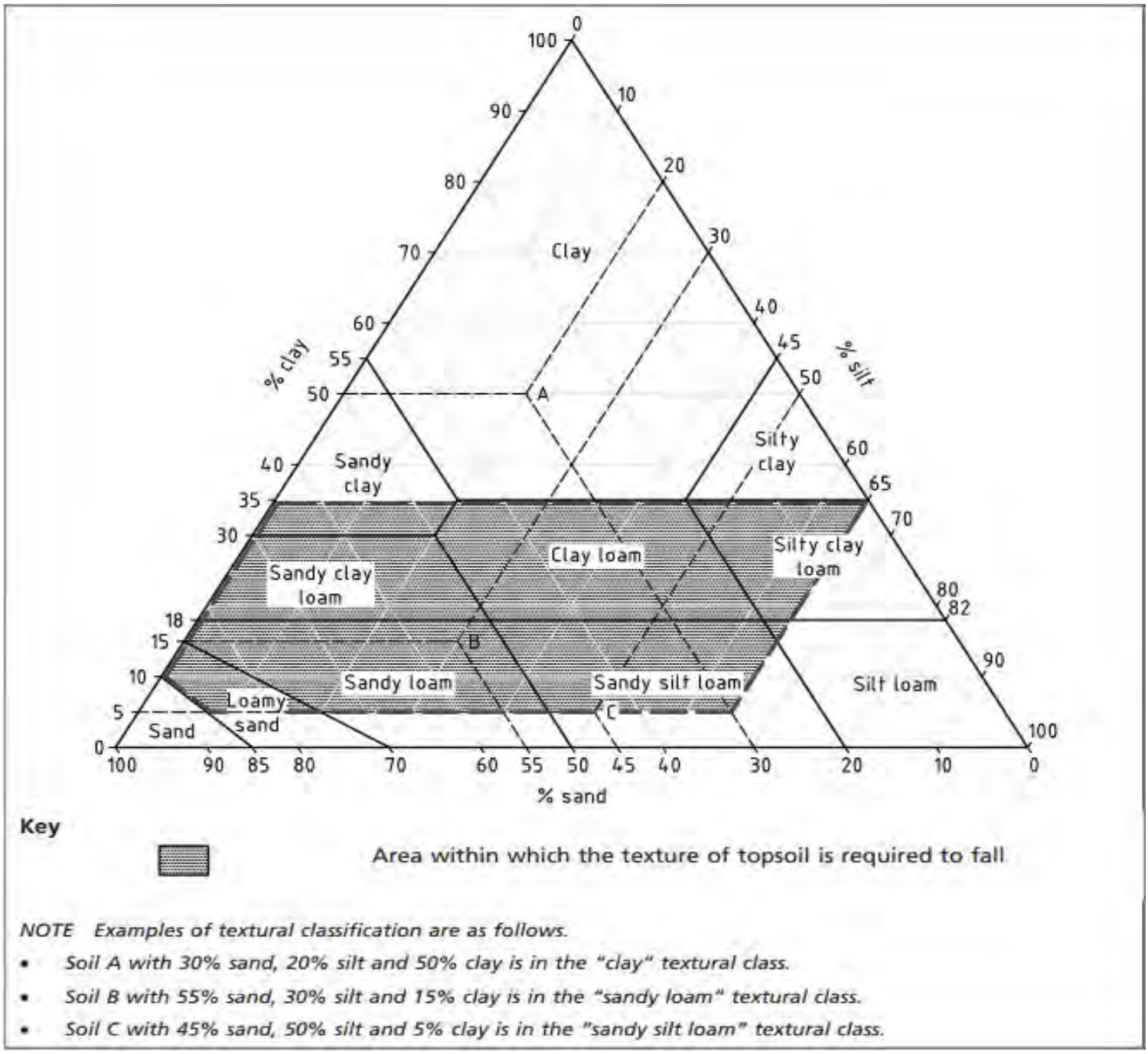
Results - Topsoil Report

BS3882:2015

Chemtest Job No.: 22-13876
Chemtest Sample ID.: 1410475
Client Sample Ref.:
Sample Location: HP8
Client Sample ID.:
Top Depth (m): 0.10
Bottom Depth (m):
Date Sampled: 08-Apr-2022
Time Sampled:

Parameter	Units	Multipurpose Range			Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)		
Texture							**Acid**	**Low F**	**Calc.**
Clay content	%				4.8				
Silt content	%				32				
Sand content	%				63				
Soil texture class		See Attached Chart			Sandy Loam	NO			
Mass Loss on Ignition									
Clay 5-20%		3.0-20			4.4	NO	NO	YES	NO
Clay 20-35%		5.0-20							
Stone Content	**% m/m**								
>2mm		0-30			28	YES			
>20mm		0-10			< 0.020	YES			
>50mm		0			< 0.020	YES			
Soil pH value		5.5-8.5			8.1	YES	NO	YES	YES
Carbonate (Calcareous only)	%				< 0.10				NO
Electrical Conductivity	µS/cm	If >3300 do ESP			2100	YES			
Available Nutrient Content									
Nitrogen %		>0.15			0.16	YES	YES		YES
Extractable phosphorus	mg/l	16-140			5.9	NO	NO	YES	NO
Extractable potassium	mg/l	121-1500			270	YES	YES		YES
Extractable magnesium	mg/l	51-600			96	YES	YES		YES
Carbon : Nitrogen Ratio		<20:1			16.3/1	YES	YES	YES	YES
Exchangeable sodium	**%**	<15			0.85				
Available Calcium	mg/l				810				
Available Sodium	mg/l				43				
Phytotoxic Contaminants (by soil pH)		**< 6.0**	**6.0-7.0**	**> 7.0**					
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	35	YES			
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	38	YES			
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	28	YES			
Visible Contaminants	**% mm**								
>2mm		<0.5			0.000	YES			
….. of which plastics		<0.25			0.000	YES			
….. man-made sharps		zero in 1kg			0.000	YES			

Topsoil:
Texture Classification Chart



Key

Area within which the texture of topsoil is required to fall

NOTE Examples of textural classification are as follows.

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

Permission to reproduce extracts from BS 3882:2015 is granted by BSI.
British Standards can be obtained in PDF or hard copy formats from the BSI online shop: www.bsigroup.com/Shop or by contacting BSI Customer Services for hardcopies only: Tel: +44 (0)20 8996 9001, Email: cservices@bsigroup.com.

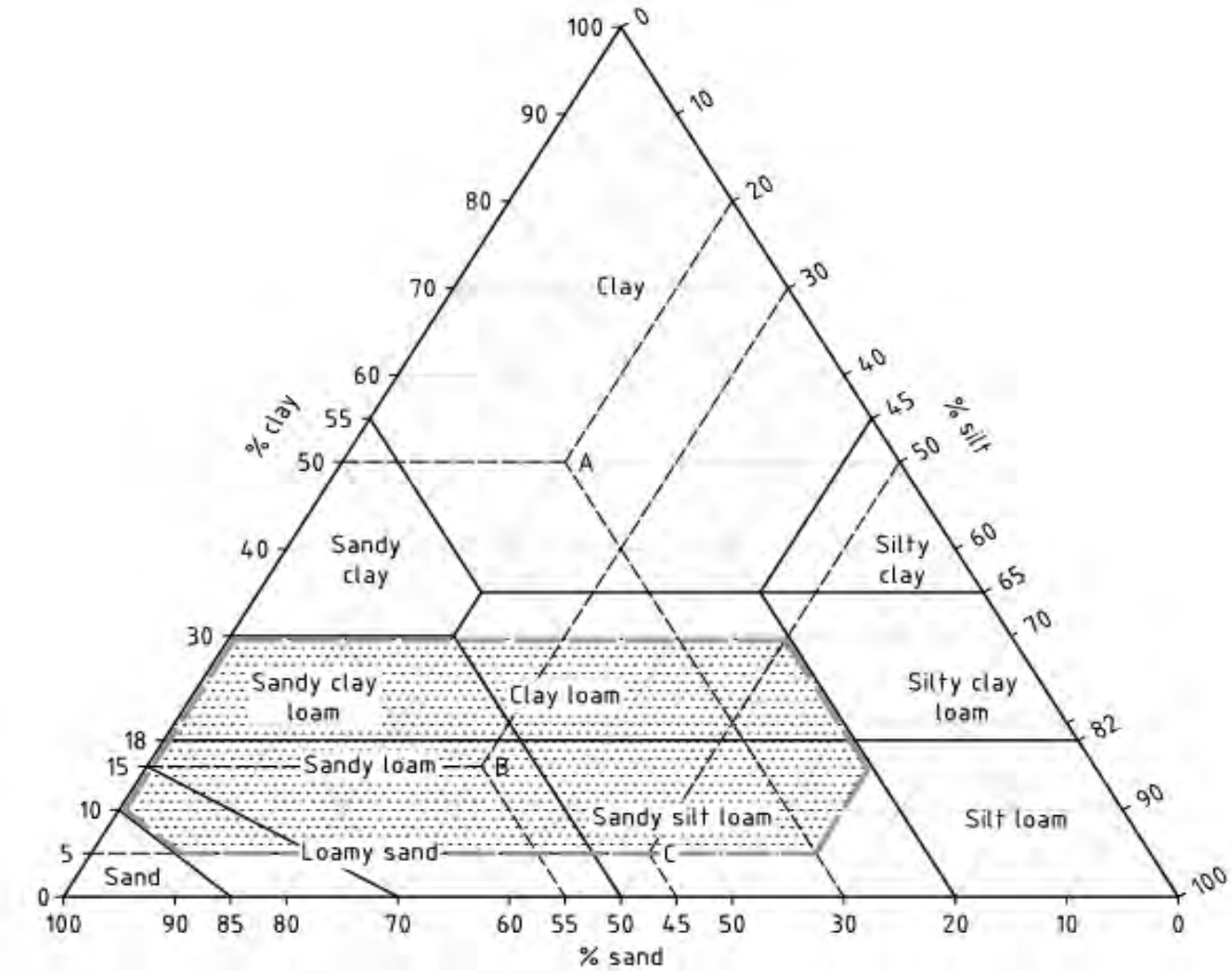
Results - Subsoil Report

BS8601:2013

Chemtest Job No.: 22-13876
Chemtest Sample ID.: 1410477
Client Sample Ref.:
Sample Location: HP10
Client Sample ID.:
Top Depth (m): 0.30
Bottom Depth (m):
Date Sampled: 08-Apr-2022
Time Sampled:

Parameter	Units	Multipurpose Range			Result	Compliant with Multipurpose Range? (Y/N)	Compliant with Specific Purpose Range? (Y/N)	
Texture							**Acid**	**Calc.**
Clay content	%				3.2			
Silt content	%				34			
Sand content	%				63			
Soil texture class		See Attached Chart			Sandy Loam	NO		
Mass Loss on Ignition								
	%	<2			4.0	NO		
Stone Content	**% m/m**							
>2mm		0-40			28	YES		
>20mm		0-20			< 0.020	YES		
>50mm		0			< 0.020	YES		
Soil pH value		5.5-8.5			8.7	NO	NO	NO
Carbonate (Calcareous only)	%				0.50			NO
Electrical Conductivity	µS/cm	If >2800 do ESP			2000	YES		
Exchangeable sodium	**%**	<15			0.46	YES		
Available Calcium	mg/l				800			
Available Sodium	mg/l				22			
Phytotoxic Contaminants (by soil pH)		**< 6.0**	**6.0-7.0**	**> 7.0**				
Zinc (Nitric Acid extract)	mg/kg	<200	<200	<300	39	YES		
Copper (Nitric Acid extract)	mg/kg	<100	<135	<200	16	YES		
Nickel (Nitric Acid extract)	mg/kg	<60	<75	<110	13	YES		
Visible Contaminants	**% mm**							
>2mm		<0.5			0.000	YES		
….. of which plastics		<0.25			0.000	YES		
….. man-made sharps		zero in 1kg			0.000	YES		

Subsoil:
Texture Classification Chart



Key

Area within which the texture of subsoil is required to fall

NOTE Examples of textural classification are as follows.

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

Permission to reproduce extracts from BS 8601:2013 is granted by BSI.
British Standards can be obtained in PDF or hard copy formats from the BSI online shop: www.bsigroup.com/Shop or by contacting BSI Customer Services for hardcopies only: Tel: +44 (0)20 8996 9001, Email: cservices@bsigroup.com.

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2115	Total Nitrogen in Soils	Nitrogen	Determination by elemental analyser
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurememrnt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2260	Carbonate	Carbonate	Titration
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2400	Cations	Cations	ICP-MS
2420	Phosphate	Phosphate	Spectrophotometry - Discrete analyser
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2620	LOI 440	LOI 440 Trommel Fines	Determination of the proportion by mass that is lost from a soil by ignition at 440°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.

Test Methods

SOP	Title	Parameters included	Method summary
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

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

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

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

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

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

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com