# ARUP

## **Technical Note**

Project title	Triton Square - Longford Place
Job number	246868
File reference	246868/60/01/08/VR/TN
cc	
Prepared by	Tim Morgan
Date	20 September 2024
Subject	Results of further soil verification testing at Longford Place

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#### 1. Aims

This technical note sets out a response to comments from London Borough of Camden (LBC) received by Arup on 22 March 2024, which relate to Condition 12 of planning permission for 1 Triton Square & St Anne's Church (Ref. 2022/0949/P). The LBC comments relate to soil verification testing results presented in the Arup report 'Ground Contamination Verification Report - Longford Place' dated 25 February 2022 (Ref. 264868/LP/REP03).

A previous file note produced by Arup dated 1 December 2023 provided further discussion of the results presented in the 2022 Arup verification report. Following review of that note, LBC confirmed that further soil testing was required. This note presents the results of testing of additional soil samples and assesses the data with consideration of the end use of the site.

#### 2. Background

#### 2.1 Previous soil verification sampling

As set out in the 2022 Arup verification report, the site is a small area, roughly 0.1 hectares (90m x 30m), of formerly hard landscaped public realm, which has been redeveloped as hard and soft landscaping in the form of new lawns, trees and planting.

As part of the verification for the redevelopment of Longford Place, the contractor (Maylim) commissioned Socotec to complete sampling of soil placed in soft landscaped areas. Four samples of topsoil were collected in line with the remediation strategy, which stated that insitu testing of topsoil and subsoil should be completed at a frequency of one sample per 50m<sup>3</sup>. As stated in the verification report, a total of 110m<sup>3</sup> of topsoil was imported and the four samples collected give a frequency of one sample per 27.5m<sup>3</sup>, which is in line with the remediation strategy. No samples of subsoil were obtained, which did not align with the remediation strategy. Based on the photos and records provided by the contractor the subsoil used appeared to be a natural sand.



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#### 2.2 Total petroleum hydrocarbons (TPH) results in topsoil verification samples

The topsoil was obtained from Bourne Amenity and source testing was undertaken by Tim O'Hare Associates (reported by Bourne Amenity). The source testing showed a total TPH (C5 to C35) concentration of 12mg/kg. The total TPH (C8 to C40) concentrations in the topsoil verification samples from the site ranged from 2,210mg/kg to 3,990mg/kg and were therefore unexpectedly higher than the source testing result.

Speciated TPH analysis should have been included in the testing of the topsoil verification samples. However, only the total TPH results for the C8 to C40 range (as described above) and individual results for benzene, toluene, ethylbenzene and xylene (BTEX), which are in the aromatic C6 to C8 range, were available. Concentrations of each of the BTEX compounds in all four samples were found to be below the method detection limit.

#### 3. Further evaluation of TPH results

The contaminant concentrations recorded in the verification samples were compared to criteria for a Public Open Space residential (POS resi) end use based on 1% SOM. These generic criteria (GAC) were considered to be suitably protective of the identified receptors based on the proposed end use.

POS resi GAC are only available for the individual aliphatic and aromatic TPH fractions and a single GAC which applies to all TPH fractions in the C8 to C40 range combined is not available. The 2023 Arup file note presented a discussion which compared the TPH results to the GAC available for individual fractions. This concluded that the reported TPH concentrations were unlikely to pose a risk to receptors.

#### 4. LBC response to Arup evaluation in March 2024

Comments from LBC were received by Arup on 22 March 2024 in relation to the previous submission. These comments stated:

Unfortunately, the total TPH concentrations recorded within the topsoil are not considered suitable. Whilst it is noted that one of the elevated concentrations is below the GAC fractions C15- C21 and C21-C35, the concentrations of TPH recorded within the topsoil is significantly higher than the source certificate provided by Bourne Amenity (where 12mg/kg TPH was reported). As such, one of two thing may have occurred; either something has occurred on site locally to cause this increase in TPH - possible spill etc. (in which case further analysis and testing would be required to determine the extent of potentially impacted soils), or the soils imported were already contaminated with TPH and the Bourne Amenity sample was not representative of the material imported to site.

Given we do not have the speciated TPH results, I do not have the confidence that the placed topsoil is suitable for use, noting the very high concentrations compared to the imported soils certificate. If it is the case that something has occurred on site, then I would require further testing to include speciated TPH to be confident that no unacceptable risk is posed to the site users, noting the POS residential setting and given the concentrations are shallow within the topsoil material (i.e., a plausible pathway exists on site).



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### 5. Results of further soil verification sampling

The origin of the elevated TPH concentrations recorded in the original verification samples is unclear. The results were not consistent with either the original source testing results or observations of the material made onsite and presented in photographs in the verification report.

There was no indication from the contractor at the time of the works that a spill occurred. The TPH results for three of the four samples in the original analysis were marked with an asterisk indicating that the results were not covered by UKAS accreditation. Results for anthracene and acenaphthylene were marked with a letter 'B' indicating that accreditation had been removed as the quality control of the testing had not fully met the requirements.

It was concluded that not only was the original testing insufficient, because it excluded speciated TPH analysis and testing of the subsoil, but also that some of the results may have been erroneous.

As a result, further sampling of both the topsoil and subsoil was undertaken at the site to allow comparison of soil contaminant concentrations to the relevant GAC. A Socotec engineer visited the site on 2 August 2024 and collected a total of eight soil samples, which comprised:

- a topsoil sample from the top 0.2m in each of the four planted areas; and
- a subsoil sample from between 0.4m and 0.6m in each of the four planted areas.

The locations sampled are shown on the attached plan (Figure 1) and photographs of the sampling locations are also attached (Attachment 1), showing the depth of sampling and the soils encountered. The Socotec engineer did not take a photo of the subsoil sample from location P3 but has advised that the material was similar in appearance to the subsoil shown in photos of the P1 and P4 samples. The certificate of analysis for the eight samples is attached to this note (Attachment 2).

The results were compared to both POS resi GAC and also criteria for a residential end use (without consumption of homegrown produce). The output from the screening spreadsheet used to undertake this comparison is also attached (Attachment 3). This shows that concentrations of metals, Polycyclic aromatic hydrocarbons (PAH), BTEX and TPH in all eight samples are below both POS resi and residential GAC.

These results are consistent with observations of the material quality at the time they were imported to site and the original testing certificate from Tim O'Hare. They are also consistent with observations made of the soils during the additional sampling exercise. It is therefore concluded the previously reported verification sampling results were erroneous either due to laboratory and/or sampling error.



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#### 6. Conclusion

An additional soil sampling exercise has been completed to provide the certainty LBC requires. Eight further verification samples have been collected; four topsoil and four subsoil samples. The results show that the concentrations of TPH (and other contaminants included in the testing suite) are below both POS resi and residential GAC. The testing results demonstrate that the topsoil and subsoil used in all four planters is suitable for use and does not pose a risk to receptors.

#### **DOCUMENT CHECKING**

	Prepared by	Checked by	Approved by
Name	Tim Morgan	Rosie Holden	Tim Morgan
Signature	T.M	Aldoler	T.M



Figure 1 – Sampling locations





## Attachment 1 – Photographs of soil sampling







Socotec STH 4067 PZ-Subsoil 02/08/24 뫎 0.5-0.6m 









## Attachment 2 Laboratory certificate of analysis



## **Certificate of Analysis**

**Client:** SOCOTEC Consultancy South

**Project:** 24080426

Quote: BEC240736178 V1.2

Project Ref: STH4067

Site: 1 Triton Square

Contact: Dave Heasman

Address: Wyvols Court Swallowfield Reading RG7 1WY

E-Mail: Dave.Heasman@socotec.co.uk

Phone: 02475 310700

No. Samples Received: 8

Date Received: 05/08/2024

Analysis Completed: 20/08/2024

Date Issued: 20/08/2024

Report Type: Version 01

This report supersedes any versions previously issued by the laboratory

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Reported by Customer Service Co-Ordinator Julie Dickinson 01283 554670 Julie.Dickinson@socotec.co.uk

SOCOTEC Environmental Chemistry, Bretby Business Park, Ashby Road, Burton-on-Trent, DE15 0YZ



Client:SOCOTEC Consultancy SouthDate Issued:20/08/2024Project Name:STH4067 - 1 Triton Square

#### Samples Analysed

Text ID	Sample Reference	Sampling Date	Sample Type	Sample Description
24080426-001	P1 -TOPSOIL-0-ES-0.15-0.20	02/08/2024 00:00:00	SOLID	Silt Sample
24080426-002	P1 -TOPSOIL-0-ES-0.40-0.45	02/08/2024 00:00:00	SOLID	Silt Sample
24080426-003	P2 -TOPSOIL-0-ES-0.15-0.20	02/08/2024 00:00:00	SOLID	Silt Sample
24080426-004	P2 -TOPSOIL-0-ES-0.50-0.60	02/08/2024 00:00:00	SOLID	Silt Sample
24080426-005	P3 -TOPSOIL-0-ES-0.15-0.20	02/08/2024 00:00:00	SOLID	Silt Sample
24080426-006	P3 -TOPSOIL-0-ES-0.45-0.50	02/08/2024 00:00:00	SOLID	Silt Sample
24080426-007	P4 -TOPSOIL-0-ES-0.15-0.20	02/08/2024 00:00:00	SOLID	Silt Sample
24080426-008	P4 -TOPSOIL-0-ES-0.45-0.55	02/08/2024 00:00:00	SOLID	Sand Sample



Client: Date Issued:

SOCOTEC Consultancy South 20/08/2024 Project Name: STH4067 - 1 Triton Square



		SOCOTEC Sam	ple ID:	24080426-001	24080426-002	24080426-003	24080426-004	24080426-005	
Α	nalysis Results	Samplin	g Date:	02/08/2024 00:00	02/08/2024 00:00	02/08/2024 00:00	02/08/2024 00:00	02/08/2024 00:00	
		Custo	mer ID:	P1 -TOPSOIL-0-ES-	P1 -TOPSOIL-0-ES-	P2 -TOPSOIL-0-ES-	P2 -TOPSOIL-0-ES-	P3 -TOPSOIL-0-ES-	
Method Code	Analysis	MDL A	Accred.	0.15-0.20	0.40-0.45	0.15-0.20	0.50-0.60	0.15-0.20	
	Total Moisture at 35°C	0.1 %	N	13.9	11.9	8.2	6.2	6.1	
	Major Constituents	-	N	SILT	SILT	SILT	SILT	SILT	
CLANDPREP	Minor Constituents	-	N	Gravel	Gravel	Gravel	Gravel	Gravel	
	Miscellaneous Constituents	-	N	Organic Matter					
	Colour of Material	-	N	Brown	Brown	Brown	Brown	Brown	
SUB020	Asbestos Identification	-	N	NAIIS	NAIIS	NAIIS	NAIIS	NAIIS	
PHSOIL	pH (2.5:1 extraction)	1 pH units	M^	7.8	8.2	7.4	7.3	7.3	
WSLM59	Total Organic Carbon	0.02 % m/m	U^	1.31	0.87	5.79	3.25	3.69	
SFAPI	Total Cyanide	0.5 mg/kg	M^	<0.6	<0.6	<0.5	<0.5	<0.5	
SFAPI	Phenol Index	0.5 mg/kg	U^	<0.6	<0.6	<0.5	<0.5	<0.5	
ICPMSS	Antimony as Sb	0.1 mg/kg	U^	0.3	0.3	0.5	0.6	0.5	
ICPMSS	Arsenic as As	0.3 mg/kg	M^	12.0	10.8	7.7	9.4	9.8	
ICPSOIL	Beryllium as Be	0.1 mg/kg	U^	0.31	0.43	0.29	0.27	0.30	
ICPMSS	Cadmium as Cd	0.2 mg/kg	M^	<0.2	<0.2	<0.2	<0.2	0.3	
ICPMSS	Total Chromium as Cr	1.2 mg/kg	M^	14.3	15.3	14.5	15.7	15.5	
KONENS	Chromium (VI) as Cr	0.1 mg/kg	N^	<0.1	<0.1	<0.1	<0.1	<0.1	
ICPMSS	Copper as Cu	1.6 mg/kg	M^	10.9	9.0	22.8	19.4	17.9	
ICPMSS	Lead as Pb	0.7 mg/kg	M^	11.8	9.4	25.6	29.2	30.8	
ICPMSS	Mercury as Hg	0.5 mg/kg	M^	<0.5	<0.5	<0.5	<0.5	<0.5	
ICPMSS	NICKEI AS NI	2 mg/kg	M^	15.4	13.8	11.7	13.4	13.7	
ICPMSS	Selenium as Se	0.5 mg/kg	M^	<0.5	<0.5	<0.5	<0.5	<0.5	
ICPMSS	Vanadium as V	0.6 mg/kg	N^	29.7	31.2	25.7	29.5	32.5	
ICPMSS	Zinc as Zn	16 mg/kg	M^	39.5	32.5	56.1	57.4	57.6	
ICPBOR	Boron as B	0.5 mg/kg	WI^	1.0	0.9	1.7	1.4	1.8	
		10 µg/kg	WI^	<12	<11	<11	<11	<11 c	
	Toluene (Hs_1D_AR)	10 µg/kg	MA	<12	<11	<11	<11	57	
BIEARSA		10 µg/kg	MA	<12	<11	<11 c	<11	57 c	
		20 µg/kg	MA	<12	<11	<22 c	<11	43 c	
		0.2 mg/kg	M^	<0.232	<0.227	<0.218	<0.213	<0.213	
		0.2 mg/kg	M^	<0.232* -	<0.227	<0.218* -	<0.213*	<0.213*	
		0.2 mg/kg	M^	<0.232	<0.227	<0.218	<0.213	<0.213	
GROHSA/BTEXHSA	>C8-C10 Aliphatic (HS 1D 41)	0.2 mg/kg	M^	<0.232	<0.227	<0.218 c	<0.213	<0.213 c	
CRONOADTEXINOA	C5-C7 Aromatic (HS 1D AR)	0.01 mg/kg	M^	<0.202	<0.011	<0.011	<0.011	<0.011 c	
	>C7-C8 Aromatic (HS 10 AR)	0.01 mg/kg	M^	<0.012	<0.011	<0.011	<0.011	<0.011	
	>C8-C10 Aromatic (HS 1D AR)	0.04 mg/kg	M^	<0.047	<0.045	<0.044 c	<0.043	0.144 c	
	Total TPH >C8-C40 (Aliphatic) (EH CU 1D AL)	20 ma/ka	U^	<23.2	<22.7	47.7	38.1	31.9	
	>C10-C12 (Aliphatic) (EH CU 1D AL)	4 mg/kg	U^	<4.65	<4.54	<4.36	<4.26	<4.26	
	>C12-C16 (Aliphatic) (EH CU 1D AL)	4 ma/ka	U^	<4.65	<4.54	<4.36	<4.26	<4.26	
TPHFIDUS (Aliphatic)	>C16-C21 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U^	<4.65	<4.54	<4.36	<4.26	<4.26	
	>C21-C35 (Aliphatic) (EH_CU_1D_AL)	10 mg/kg	U^	<11.6	<11.4	41.0	31.6	24.2	
	>C35-C44 (Aliphatic) (EH_CU_1D_AL)	6 mg/kg	N^	<6.97	<6.81	<6.54	<6.40	<6.39	
	Total TPH >C8-C40 (Aromatic) (EH_CU_1D_AR)	20 mg/kg	U^	<23.2	<22.7	28.6	<21.3	<21.3	
	>C10-C12 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U^	<4.65	<4.54	<4.36	<4.26	<4.26	
	>C12-C16 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U^	<4.65	<4.54	<4.36	<4.26	<4.26	
IPHFIDUS (Aromatic)	>C16-C21 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U^	<4.65	<4.54	<4.36	<4.26	5.83	
	>C21-C35 (Aromatic) (EH_CU_1D_AR)	10 mg/kg	U^	<11.6	<11.4	17.4	<10.7	<10.6	
	>C35-C44 (Aromatic) (EH_CU_1D_AR)	6 mg/kg	N^	<6.97	<6.81	<6.54	<6.40	<6.39	
	Acenaphthene	0.08 mg/kg	M^	<0.09	<0.09	<0.09	<0.09	<0.09	
	Acenaphthylene	0.08 mg/kg	U^	<0.09	<0.09	<0.09	<0.09	<0.09	
	Anthracene	0.08 mg/kg	U^	<0.09	<0.09	<0.09	<0.09	<0.09	
	Benzo[a]anthracene	0.08 mg/kg	M^	<0.09	<0.09	<0.09	0.10	<0.09	
	Benzo[a]pyrene	0.08 mg/kg	M^	<0.09	<0.09	<0.09	0.13	<0.09	
	Benzo[b]fluoranthene	0.08 mg/kg	M^	<0.09	<0.09	0.10	0.18	0.11	
	Benzo[g,n,i]perylene	0.08 mg/kg	M^	<0.09	<0.09	<0.09	0.09	<0.09	
DALIMELLE	Chryson	0.08 mg/kg	WI^	<0.09	<0.09	<0.09	<0.09	<0.09	
PARMSUS	Chrysene Dibenzolo blanthracene	0.08 mg/kg	MA	<0.09	<0.09	<0.09	0.11	<0.09	
	Eluoranthono	0.08 mg/kg	MA	<0.09	<0.09	<0.09	0.09	<0.09	
	Fluorene	0.00 mg/kg	M^	<0.09	<0.09	<0.03	<0.09	<0.09	
	Indeno[1,2,3-cd]pyrene	0.08 mg/kg	 M^	<0.09	<0.09	<0.09	<0.09	<0.09	
	Naphthalene	0.08 mg/kg	M^	<0.09	<0.09	<0.09	<0.09	<0.09	
	Phenanthrene	0.08 ma/ka	M^	<0.09	<0.09	<0.09	<0.09	<0.09	
	Pyrene	0.08 ma/ka	M^	<0.09	<0.09	<0.09	0.13	<0.09	
	Total PAH 16	1.28 ma/ka	U^	<1.49	<1.45	1.40	1.65	1.39	
	PCB 28	5 µa/ka	M^	<5.81	<5.68	<5.45	<5.33	<5.32	
	PCB 52	5 µg/kg	M^	<5.81	<5.68	<5.45	<5.33	<5.32	
	PCB 101	5 µg/kg	M^	<5.81	<5.68	<5.45	<5.33	<5.32	
PCBECD	PCB 118	5 µg/kg	M^	<5.81	<5.68	<5.45	<5.33	<5.32	
	PCB 138	5 µg/kg	M^	<5.81	<5.68	<5.45	<5.33	<5.32	
	PCB 153	5 µg/kg	M^	<5.81	<5.68	<5.45	<5.33	<5.32	
	PCB 180	5 µg/kg	M^	<5.81	<5.68	<5.45	<5.33	<5.32	
-									



Client: Date Issued:

SOCOTEC Consultancy South 20/08/2024 Project Name: STH4067 - 1 Triton Square



		SOCOTEC Sam	ple ID:	24080426-006	24080426-007	24080426-008
Α	nalvsis Results	Sampling	Date:	02/08/2024 00:00	02/08/2024 00:00	02/08/2024 00:00
-		Custor	ner ID:	P3 -TOPSOIL-0-ES-	P4 -TOPSOIL-0-ES-	P4 -TOPSOIL-0-ES-
Method Code	Analysis	MDI A	ccred	0.45-0.50	0.15-0.20	0.45-0.55
method code	Total Moisture at 35°C	0.1 %	N N	4.4	21.5	12.6
	Major Constituents	-	N	SILT	SILT	SAND
CLANDPREP	Minor Constituents	-	N	Gravel	Gravel	Gravel
	Miscellaneous Constituents	-	N	Organic Matter	Organic Matter	Organic Matter
	Colour of Material		N	Brown	Brown	Brown
SUB020	Asbestos Identification		N	NAIIS	NAIIS	NAIIS
BHSON	nH (2.5:1 extraction)	1 nH unite	MA	80	8.1	77
WSI M59	Total Organic Carbon	0.02 % m/m	11^	1.08	5.24	0.03
SEADI	Total Cyanido	0.02 /8 ma/ka	M^	<0.5	5.24	<0.6
SEADI	Phonol Index	0.5 mg/kg		<0.5	<0.0	<0.0
	Autiment of Oh	0.5 mg/kg		<0.5	<0.0	<0.0
ICPMSS	Antimony as SD	0.1 mg/kg	0^	0.4	0.7	<0.1
ICPMSS	Arsenic as As	0.3 mg/kg	M^	8.8	8.5	8.8
ICPSOIL	Beryllium as Be	0.1 mg/kg	U^	0.28	0.38	0.28
ICPMSS	Cadmium as Cd	0.2 mg/kg	M^	<0.2	0.3	<0.2
ICPMSS	Total Chromium as Cr	1.2 mg/kg	M^	17.9	16.9	17.0
KONENS	Chromium (VI) as Cr	0.1 mg/kg	N^	<0.1	<0.1	<0.1
ICPMSS	Copper as Cu	1.6 mg/kg	M^	12.7	24.8	8.8
ICPMSS	Lead as Pb	0.7 mg/kg	M^	16.6	52.3	9.5
ICPMSS	Mercury as Hg	0.5 mg/kg	M^	<0.5	<0.5	<0.5
ICPMSS	Nickel as Ni	2 mg/kg	M^	13.0	16.3	14.2
ICPMSS	Selenium as Se	0.5 mg/kg	M^	<0.5	<0.5	<0.5
ICPMSS	Vanadium as V	0.6 ma/ka	N^	27.4	24.9	26.4
ICPMSS	Zinc as Zn	16 mg/kg	M^	44.8	93.1	34.0
ICPBOR	Boron as B	0.5 mg/kg	MA	12	14	10
IOI DOIL		10 uo/ko	MA	∠ ∠11	-10	211
		10 µg/kg	IVI	-11	10	
	TOTUENE (HS_1D_AR)	10 µg/kg	MI^	<11	<13	<11
BTEXHSA	Ethylbenzene (Hs_1D_AR)	10 µg/kg	M^	<11	<13	<11
	m/p-Xylene (HS_1D_AR)	20 µg/kg	M^	<21	<26	<23
	o-Xylene (Hs_1D_AR)	10 µg/kg	M^	<11	<13	<11
	Total GRO C5-C10 (HS_1D_Total)	0.2 mg/kg	M^	<0.209	<0.255	<0.229
	C5-C6 Aliphatic (HS_1D_AL)	0.2 mg/kg	M^	<0.209* в	<0.255* <sub>B</sub>	<0.229* в
	>C6-C8 Aliphatic (HS_1D_AL)	0.2 mg/kg	M^	<0.209	<0.255	<0.229
GROHSA/BTEXHSA	>C8-C10 Aliphatic (Hs_1D_AL)	0.2 mg/kg	M^	<0.209	<0.255	<0.229
	C5-C7 Aromatic (Hs_1D_AR)	0.01 mg/kg	M^	<0.011	< 0.013	<0.011
	>C7-C8 Aromatic (HS_1D_AR)	0.01 mg/kg	M^	<0.011	<0.013	<0.011
	>C8-C10 Aromatic (HS 1D AR)	0.04 mg/kg	M^	< 0.043	< 0.052	<0.046
	Total TPH >C8-C40 (Aliphatic) (EH CU 1D AL)	20 ma/ka	U^	<20.9	33.1	106
	>C10-C12 (Aliphatic) (EH CU 1D AL)	4 ma/ka	U^	<4.18	<5.10	<4.58
	>C12-C16 (Aliphatic) (EH_CU_10_AL)	4 mg/kg	11^	<4.18	<5.10	<4 58
TPHFIDUS (Aliphatic)		4 mg/kg	114	<1.10	5.70	6.29
	>C10-C21 (Aliphatic) (En_C0_10_AL)	4 mg/kg		<10.5	19.0	0.20
		fu nig/kg	NA	< 10.5	10.0	00.0
		6 mg/kg	N <sup></sup>	<0.20	<7.04	70.0
	Total IPH >C8-C40 (Aromatic) (EH_CU_1D_AR)	20 mg/kg	0^	<20.9	<25.5	79.0
	>C10-C12 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U^	<4.18	<5.10	<4.58
TPHFIDUS (Aromatic)	>C12-C16 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U^	<4.18	<5.10	<4.58
	>C16-C21 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U^	<4.18	<5.10	6.01
	>C21-C35 (Aromatic) (EH_CU_1D_AR)	10 mg/kg	U^	<10.5	15.9	55.4
	>C35-C44 (Aromatic) (EH_CU_1D_AR)	6 mg/kg	N^	<6.28	<7.64	12.7
	Acenaphthene	0.08 mg/kg	M^	<0.08	<0.10	<0.09
	Acenaphthylene	0.08 mg/kg	U^	<0.08	<0.10	<0.09
	Anthracene	0.08 mg/kg	U^	<0.08	<0.10	<0.09
	Benzo[a]anthracene	0.08 mg/kg	M^	<0.08	<0.10	0.26
	Benzo[a]pyrene	0.08 mg/kg	M^	<0.08	<0.10	0.29
	Benzo[b]fluoranthene	0.08 ma/ka	M^	<0.08	<0.10	0.36
	Benzola h ilperviene	0.08 mg/kg	M^	<0.08	<0.10	0.17
	Benzo[k]fluoranthene	0.08 mg/kg	M^	<0.08	<0.10	0.16
	Chrysono	0.08 mg/kg	MA	<0.08	<0.10	0.10
FARMSUS		0.08 mg/kg	IVI ···	<0.08	<0.10	0.27
	Eluoranthono	0.00 mg/kg	NAA	~0.00	<0.10	0.09
	-iuoranthene	0.08 mg/kg	MI^	<0.08	<0.10	0.47
	riuorene	0.08 mg/kg	M^	<0.08	<0.10	<0.09
	Indeno[1,2,3-cd]pyrene	0.08 mg/kg	M^	<0.08	<0.10	0.17
	Naphthalene	0.08 mg/kg	M^	<0.08	<0.10	<0.09
	Phenanthrene	0.08 mg/kg	M^	<0.08	<0.10	0.17
	Pyrene	0.08 mg/kg	M^	<0.08	<0.10	0.42
	Total PAH 16	1.28 mg/kg	U^	<1.34	<1.63	3.27
	PCB 28	5 µg/kg	M^	<5.23	<6.37	<5.72
	PCB 52	5 µg/kg	M^	<5.23	<6.37	<5.72
	PCB 101	5 µg/kg	M^	<5.23	<6.37	<5.72
PCBECD	PCB 118	5 µa/ka	M^	<5.23	<6.37	<5.72
	PCB 138	5 µa/ka	M^	<5.23	<6.37	<5.72
	PCB 153	5 µg/kg	M^	<5.20	<6 37	<5.72
	PCB 180	5 µg/kg	MA	<5.23	<6.37	<5.70
	100	5 µg/kg	IMI	~0.20	-0.01	-0.12



## **CERTIFICATE OF ANALYSIS**

#### ANALYSIS REQUESTED BY: SOCOTEC UK Ltd Environmental Chemistry PO Box 100 Burton upon Trent Staffordshire DE15 0XD

**CONTRACT NO:** S42623-3 **DATE OF ISSUE:** 13.08.24

DATE SAMPLES RECEIVED: 06.08.24

DATE ANALYSIS COMPLETED: 13.08.24

**DESCRIPTION:** Eight soil/loose aggregate samples each weighing approximately 0.9-1.4kg.

**ANALYSIS REQUESTED:** Qualitative and quantitative analysis of soil/loose aggregate samples for mass determination of asbestos.

#### **METHODS:**

**Qualitative -** Each sample was analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

**Quantitative -** The analysis was carried out using our documented in-house method based on HSE Contract Research Report No. 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies *et al*, 1996) and HSG 248. Our method includes initial examination of the entire sample, detailed analysis of a representative sub-sample and quantification by hand picking/weighing and/or fibre counting/sizing as appropriate.

#### **RESULTS**:

#### **Initial Screening**

No asbestos was detected in any of the soil samples by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

#### Page 1 of 2



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IOM CONSULTING LIMITED, registered in Scotland No. SC205670



## **CONTRACT NO:** S42623-3 **DATE OF ISSUE:** 13.08.24

#### **RESULTS: (cont.)**

#### Table 1: Qualitative Results

**SOCOTEC Job I.D:** 24080426

IOM sample	SOCOTEC	Client Sample ID	ACM type	PLM result
number	Sample ID		detected	
S42623-7	24080426-001	P1-TOPSOIL-0-ES-0.15-0.20	-	No Asbestos Detected
S42623-8	24080426-002	P1-TOPSOIL-0-ES-0.40-0.45	-	No Asbestos Detected
S42623-9	24080426-003	P2-TOPSOIL-0-ES-0.15-0.20	-	No Asbestos Detected
S42623-10	24080426-004	P2-TOPSOIL-0-ES-0.50-0.60	-	No Asbestos Detected
S42623-11	24080426-005	P3-TOPSOIL-0-ES-0.15-0.20	-	No Asbestos Detected
S42623-12	24080426-006	P3-TOPSOIL-0-ES-0.45-0.50	-	No Asbestos Detected
S42623-13	24080426-007	P4-TOPSOIL-0-ES-0.15-0.20	-	No Asbestos Detected
S42623-14	24080426-008	P4-TOPSOIL-0-ES-0.45-0.55	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

#### COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are out with the scope of our UKAS accreditation.

20 ger

AUTHORISED BY: .....

**D Third** Laboratory Analyst



Client:SOCOTEC Consultancy SouthDate Issued:20/08/2024Project Name:STH4067 - 1 Triton Square

#### **Deviating Sample Report**

Sample Reference	<u>Text ID</u>	<u>Method Code</u>	Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time
P1 -TOPSOIL-0-ES-0.15-0.20	24080426-001	BTEXHSA						✓
P1 -TOPSOIL-0-ES-0.15-0.20	24080426-001	GROHSA/BTEXHSA						✓
P1 -TOPSOIL-0-ES-0.40-0.45	24080426-002	BTEXHSA						~
P1 -TOPSOIL-0-ES-0.40-0.45	24080426-002	GROHSA/BTEXHSA						✓
P2 -TOPSOIL-0-ES-0.15-0.20	24080426-003	BTEXHSA						~
P2 -TOPSOIL-0-ES-0.15-0.20	24080426-003	GROHSA/BTEXHSA						~
P2 -TOPSOIL-0-ES-0.50-0.60	24080426-004	BTEXHSA						~
P2 -TOPSOIL-0-ES-0.50-0.60	24080426-004	GROHSA/BTEXHSA						~
P3 -TOPSOIL-0-ES-0.15-0.20	24080426-005	BTEXHSA						~
P3 -TOPSOIL-0-ES-0.15-0.20	24080426-005	GROHSA/BTEXHSA						~
P3 -TOPSOIL-0-ES-0.45-0.50	24080426-006	BTEXHSA						✓
P3 -TOPSOIL-0-ES-0.45-0.50	24080426-006	GROHSA/BTEXHSA						~
P4 -TOPSOIL-0-ES-0.15-0.20	24080426-007	BTEXHSA						✓
P4 -TOPSOIL-0-ES-0.15-0.20	24080426-007	GROHSA/BTEXHSA						✓
P4 -TOPSOIL-0-ES-0.45-0.55	24080426-008	BTEXHSA						✓
P4 -TOPSOIL-0-ES-0.45-0.55	24080426-008	GROHSA/BTEXHSA						✓

#### **Analysis Method**

Method Code	Method Description	Analysis Method
BTEXHSA	BTEX by GCFID	As Received
CLANDPREP	CLand Prep and Dry Weight Correction to 35°C	As Received
CLANDPREP	Solid Material Description	As Received
GROHSA/BTEXHSA	GRO CWG UK (C5-C10) Ali/Aro Split	As Received
ICPBOR	Boron (Water Soluble) by ICPOES	Air Dried & Ground
ICPMSS	Antimony in Solids by ICPMS	Air Dried & Ground
ICPMSS	Arsenic in Solids by ICPMS	Air Dried & Ground
ICPMSS	Cadmium in Solids by ICPMS	Air Dried & Ground
ICPMSS	Chromium in Solids by ICPMS	Air Dried & Ground
ICPMSS	Copper in Solids by ICPMS	Air Dried & Ground
ICPMSS	Lead in Solids by ICPMS	Air Dried & Ground
ICPMSS	Mercury in Solids by ICPMS	Air Dried & Ground
ICPMSS	Nickel in Solids by ICPMS	Air Dried & Ground
ICPMSS	Selenium in Solids by ICPMS	Air Dried & Ground
ICPMSS	Vanadium in Solids by ICPMS	Air Dried & Ground
ICPMSS	Zinc in Solids by ICPMS	Air Dried & Ground
ICPSOIL	Beryllium in Solids by ICPOES	Air Dried & Ground
KONENS	Chromium VI (Hexavalent) by Colorimetry	Air Dried & Ground
PAHMSUS	16 PAHs by GCMS	As Received
PCBECD	PCBs, ICES 7 Congeners	As Received
PHSOIL	pH (2.5:1)	As Received
SFAPI	Cyanide (Total) by SFA	As Received
SFAPI	Phenol Index (Total) by SFA	As Received



Client:SOCOTEC Consultancy SouthDate Issued:20/08/2024Project Name:STH4067 - 1 Triton Square

SUB020 TRHEIDUS (Aliphatic)	Asbestos Stage 1 (with Stage 2+3 Trigger)	As Received
	Banding	As Necelled
TPHFIDUS (Aromatic)	TPH (CWG UK) Aromatic Split with Carbon	As Received
	Banding	
WSLM59	TOC: Total Organic Carbon	Air Dried & Ground

#### Result Report Notes

Letters alongside results signify that the result has associated report notes. The report notes are as follows:

#### Letter Note

- A Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
- B The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
- C Due to matrix interference, the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
- D A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
- E Due to the parameter value being beyond our calibration range (and following the maximum size of dilution allowed, where applicable), the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
- F Based on the sample history, appearance and smell a dilution was applied prior to testing. Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
- G The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.

#### HWOL Acronym Key

Description
Headspace Analysis
Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
Clean up - e.g. by florisil, silica gel
GC - Single coil gas chromatography
Aliphatics & Aromatics
Aliphatics only
Aromatics only
Operator to indicate cumulative e.g. EH_CU+HS_1D_Total



Client:SOCOTEC Consultancy SouthDate Issued:20/08/2024Project Name:STH4067 - 1 Triton Square

#### Additional Information

This report refers to samples as received. SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

The accreditation codes are as follows:

U = UKAS accredited analysis M = MCERT accredited analysis N = Unaccredited analysis

Any accreditation marked with ^ signify results are reported on a dry weight basis of 35 ° c.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full, without written approval of the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any results marked with \* are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

IS = Insufficient Sample to complete analysis

NA = Sample is not amenable for the required analysis

ND = Results cannot be determined

Items listed with a 'SUB' method code prefix have been carried out by another SOCOTEC department or by an external subcontracted laboratory.

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the subcontracted lab for information regarding any deviancies for this analysis.

Summaries of analysis methods are available upon request.

### End of Certificate of Analysis



Attachment 3 – Data screening output

		Sampling Date		02/08/2024	02/08/2024	02/08/2024	02/08/2024	02/08/2024	02/08/2024	02/08/2024	02/08/2024		
		Location		P1	P2	P3	P4	P1	P2	P3	P4		
		Depth		0.15	0.15	0.15	0.15	0.4	0.5	0.45	0.45		
Analista	11	Bublic Open Space GAC	Residential without HG	Tenesil	Tenesil	Tanaail	Tanaail	Cubasil	Cubeell	Cubeell	Cubeell	Exceedances of	Exceedances of
Asbestos Identification	-		produce GAC	NAIIS	NAIIS	NAIIS	NAIIS	NAIIS	NAIIS	NAIIS	NAIIS	-	
Total Organic Carbon^	% m/m	-		1.31	5.79	3.69	5.24	0.87	3.25	1.98	0.93	-	-
Total Cyanide <sup>^</sup>	mg/kg	24	24	<0.6	<0.5	<0.5	<0.6	<0.6	<0.5	<0.5	<0.6	0	0
Phenol Index <sup>^</sup>	mg/kg	-		<0.6	<0.5	<0.5	<0.6	<0.6	<0.5	<0.5	<0.6	-	
Antimony as Sb <sup>^</sup>	mg/kg	1070	618	0.3	0.5	0.5	0.7	0.3	0.6	0.4	<0.1	-	-
Arsenic as As^	mg/kg	2.10	40	12	/./	9.8	8.5	10.8	9.4	8.8	8.8	0	0
Cadmium as Cd^	mg/kg	220	85	<0.2	<0.2	0.3	0.38	<0.2	<0.27	<0.2	<0.28	0	0
Total Chromium as Cr^	mg/kg	1539	907	14.3	14.5	15.5	16.9	15.3	15.7	17.9	17	0	0
Chromium (VI) as Cr^	mg/kg	7.7	6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	0
Copper as Cu^	mg/kg	12000	7130	10.9	22.8	17.9	24.8	9	19.4	12.7	8.8	0	0
Lead as Pb^	mg/kg	630	310	11.8	25.6	30.8	52.3	9.4	29.2	16.6	9.5	0	0
Mercury as Hg^	mg/kg	124.4	56	<0.5	< 0.5	< 0.5	<0.5	< 0.5	<0.5	<0.5	<0.5	0	0
Selenium as Se^	mg/kg	1140	430	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0	0
Vanadium as V <sup>*</sup>	mg/kg	1100	651	29.7	25.7	32.5	24.9	31.2	29.5	27.4	26.4	0	0
Zinc as Zn^	mg/kg	80500	40400	39.5	56.1	57.6	93.1	32.5	57.4	44.8	34	0	0
Boron as B^	mg/kg	-	-	1	1.7	1.8	1.4	0.9	1.4	1.2	1	0	0
Benzene*	µg/kg	72	0.38	<12	<11	<11	<13	<11	<11	<11	<11	0	0
Toluene^	µg/kg	55800	880	<12	<11	<11	<13	<11	<11	<11	<11	0	0
eurywenzene" m/n-Xvlene^	µg/kg	23900	82	<23	<11	5/	<13	<23	<21	<21	<23	0	0
o-Xvlene*	ug/kg	40700	88	<12	<11	43	<13	<11	<11	<11	<11	ů 0	0
Total GRO C5-C10 <sup>^</sup>	mg/kg	-	•	<0.232	<0.218	<0.213	<0.255	<0.227	<0.213	< 0.209	< 0.229	-	
C5-C6 Aliphatic <sup>^</sup>	mg/kg	575000	42	<0.232	<0.218	<0.213	<0.255	<0.227	<0.213	<0.209	< 0.229	0	0
>C6-C8 Aliphatic^	mg/kg	597000	104	<0.232	<0.218	<0.213	<0.255	<0.227	<0.213	<0.209	< 0.229	0	0
>C8-C10 Aliphatic^	mg/kg	12500	27	<0.232	<0.218	<0.213	<0.255	<0.227	<0.213	<0.209	< 0.229	0	0
C5-C7 Aromatic^	mg/kg	72	0.38	<0.012	<0.011	<0.011	<0.013	<0.011	<0.011	<0.011	<0.011	0	0
>C8-C10 Aromatic^	mg/kg	5020	47.2	<0.012	<0.011	0.144	<0.013	<0.011	<0.011	<0.011	<0.011	0	0
Total TPH >C8-C40 (Aliphatic)^	mg/kg	-	-	<23.2	47.7	31.9	33.1	<22.7	38.1	<20.9	106	-	-
>C10-C12 (Aliphatic)^	mg/kg	12600	132	<4.65	<4.36	<4.26	<5.10	<4.54	<4.26	<4.18	<4.58	0	0
>C12-C16 (Aliphatic)^	mg/kg	12600	1061	<4.65	<4.36	<4.26	<5.10	<4.54	<4.26	<4.18	<4.58	0	0
>C16-C21 (Aliphatic)^	mg/kg	251000	11925	<4.65	<4.36	<4.26	5.72	<4.54	<4.26	<4.18	6.28	0	0
>C21-C35 (Aliphatic)^	mg/kg	251000	11925	<11.6	41	24.2	18	<11.4	31.6	<10.5	86.5	0	0
Total TPH >C8-C40 (Aromatic)^	mg/kg	251000	11925	<23.2	28.6	<21.3	<25.5	<22.7	<21.3	<20.9	8.51 79	-	-
>C10-C12 (Aromatic)^	mg/kg	5040	252	<4.65	<4.36	<4.26	<5.10	<4.54	<4.26	<4.18	<4.58	0	0
>C12-C16 (Aromatic)^	mg/kg	5050	1800	<4.65	<4.36	<4.26	<5.10	<4.54	<4.26	<4.18	<4.58	0	0
>C16-C21 (Aromatic)^	mg/kg	3770	1400	<4.65	<4.36	5.83	<5.10	<4.54	<4.26	<4.18	6.01	0	0
>C21-C35 (Aromatic)^	mg/kg	3770	1930	<11.6	17.4	<10.6	15.9	<11.4	<10.7	<10.5	55.4	0	0
>C35-C44 (Aromatic)^	mg/kg	3770	1930	<6.97	<6.54	<6.39	<7.64	<6.81	<6.40	<6.28	12.7	0	0
Acenaphthene*	mg/kg mg/kg	14800	2995	<0.09	<0.09	<0.09	<0.10	<0.09	<0.09	<0.08	< 0.09	0	0
Anthracene <sup>*</sup>	mg/kg	74100	30604	<0.09	<0.09	<0.09	<0.10	<0.09	<0.09	<0.08	<0.09	0	0
Benzo[a]anthracene^	mg/kg	28.5	11	<0.09	<0.09	<0.09	<0.10	<0.09	0.1	<0.08	0.26	0	0
Benzo[a]pyrene <sup>^</sup>	mg/kg	5.72	3.17	<0.09	<0.09	<0.09	<0.10	<0.09	0.13	<0.08	0.29	0	0
Benzo[b]fluoranthene*	mg/kg	7.21	3.95	<0.09	0.1	0.11	<0.10	<0.09	0.18	<0.08	0.36	0	0
Benzo[g,h,i]perylene^	mg/kg	636	355	<0.09	<0.09	<0.09	<0.10	<0.09	0.09	<0.08	0.17	0	0
Chrysene*	mg/kg	190	30	<0.09	<0.09	<0.09	<0.10	<0.09	0.09	<0.08	0.16	0	0
Dibenzo[a,h]anthracene*	mg/kg	0.573	0.31	<0.09	<0.09	<0.09	<0.10	<0.09	<0.09	<0.08	< 0.09	0	0
Fluoranthene*	mg/kg	3080	1526	<0.09	<0.09	<0.09	<0.10	<0.09	0.14	<0.08	0.47	0	0
Fluorene*	mg/kg	9870	2795	<0.09	<0.09	<0.09	<0.10	<0.09	<0.09	<0.08	<0.09	0	0
Indeno[1,2,3-cd]pyrene^	mg/kg	81.7	45	<0.09	<0.09	<0.09	<0.10	<0.09	<0.09	<0.08	0.17	0	0
Naphthalene*	mg/kg	4890	2.3	<0.09	<0.09	<0.09	<0.10	<0.09	< 0.09	<0.08	< 0.09	0	0
Prienanthrene" Pyrene^	mg/kg	3070	1292	<0.09	<0.09	<0.09	<0.10	<0.09	<0.09 0.13	<0.08	0.42	0	U 0
Total PAH 16^	mg/kg	7410		<1.49	1.4	1.39	<1.63	<1.45	1.65	<1.34	3.27	-	-
PCB 28 <sup>^</sup>	µg/kg	-	-	<5.81	<5.45	<5.32	<6.37	<5.68	<5.33	<5.23	<5.72	-	-
PCB 52 <sup>^</sup>	µg/kg	-	-	<5.81	<5.45	<5.32	<6.37	<5.68	<5.33	<5.23	<5.72	-	-
PCB 101^	µg/kg	-	-	<5.81	<5.45	<5.32	<6.37	<5.68	<5.33	<5.23	<5.72	-	
PCB 118*	µg/kg	-	-	<5.81	<5.45	<5.32	<6.37	<5.68	<5.33	<5.23	<5.72		-
PCB 156" PCB 153^	µg/kg	-		<5.81	<5.45 <5.45	<5.32 <5.32	<6.37 <6.37	<5.68	<5.33 <5.33	<5.23	<5.72	-	-
PCB 180^	µg/kg		-	<5.81	<5.45	<5.32	<6.37	<5.68	<5.33	<5.23	<5.72	-	-