



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e trevor.haigh@haighhuddleston.co.uk

Our Ref: E17/7092/MD/001

Date: 6 October 2020

FAO Steve Mitchell

SB Homes Ltd
4 brougham Road
Marsden
Huddersfield
HD7 6BN

Dear Sir,

Re: Proposed development at former fire station, Marsden Lane, Marsden

Further to the initial site investigation, further works were recommended below the base of gas holder 2 and within gas holder 3 which wasn't accessible during the initial investigation works. Please find attached our findings in relation to these additional investigation works.

1. FIELDWORK

- 1.1 The fieldwork comprised of additional trial holes undertaken with an 8 tonne 360 tracked excavator. The locations of the trial pits are indicated on Drawing E17/7092/200B.
- 1.2 Materials encountered within the trial pits were examined and categorised. The trial pit logs are contained within Appendix B at the rear of the report.
- 1.3 Further to the initial investigation, the supplementary works were undertaken to determine the following:
 - 1.3.1 Soil sampling from the underlying natural strata beneath gas holder 2 following the breaking out of the base.
 - 1.3.2 Trial pit to be undertaken within gas holder 3 which wasn't accessible during the original site investigation.

2. RESULTS OF THE INVESTIGATION

2.1 Gas Holder 2

- 2.1.1 During the initial site investigation works, the structure to Gas holder 2 was identified by its circular metal frame with four stanchions (See photo 1). This was infilled with clean type 1 stone and had a concrete/stone flag base. Following the breaking out of the base, the underlying clean hardcore was excavated to prove the underlying natural strata. Trial pits have been undertaken and a sample taken from each.
- 2.1.2 Below the base construction, a soft to firm dark grey sandy clay was encountered. This material is the same as encountered outside the gas holders throughout the site and the trial pit was only excavated to a depth of 0.5m below the hardcore sub-base to allow a sample to be taken.

2.2 Gas Holder 3

- 2.2.1 Gas Holder 3 was not accessible during the initial site investigation works, therefore a trial pit was undertaken central to the gas holder to determine the nature and depth of the fill material present. (See photo 2)
- 2.2.2 The trial pit in Gas Holder 3 proved 2m fill material consisting of dark brown clayey sands and gravels. A hydrocarbon odour was noted within this fill material as it was excavated. The base of the gas holder was not reached.
- 2.2.3 Please note this gas holder is only partly within the site, with the majority lying beneath the adjacent third party land. This restricts the investigation and treatment works that can be undertaken.

3 FURTHER CONTAMINATION TESTING

- 4.1 The samples of natural strata from below gas holder 2 proved free from elevated levels of contaminants and are suitable for re-use on site.
- 4.2 The samples from the upper layer of fill (at 0.6m and 0.9m) in gas holder 3 proved elevated levels of the following:
- Naphthalene (3.7 mg/kg)
 - Sulphide (280 mg/kg)
 - EPH (2100-5800 mg/kg)
 - Phenanthrene (120-280 mg/kg)
 - Fluoranthene (470 mg/kg)
 - Benzo(a)anthracene (63-210 mg/kg)
 - Chrysene (61-210 mg/kg)
 - Benzo(b)fluoranthene (43-160 mg/kg)
 - Benzo(k)fluoranthene (28-100 mg/kg)
 - Benzo(a)pyrene (57-210 mg/kg)
 - Indeno(1, 2, 3-c,d)pyrene (38-150 mg/kg)
 - Dibenzo(a,h)anthracene (7.1-30 mg/kg)
 - PAH Total (830-2600 mg/kg)
- 4.3 The sample from 1.5m depth in gas holder proved elevated levels of:
- Arsenic (65 mg/kg)
 - Sulphide (300 mg/kg)
 - Sulphate (0.37 mg/kg)

- 4.4 In addition to the above, the sample from 0.9m in gas holder 3 proved positive for amosite asbestos.

5. REMEDIATION RECOMMENDATIONS

- 5.1 In the Remediation Method Statement reference E17/70925/RS001 dated May 2019, it was proposed to remove the top 1200-1500mm of made ground from site to accommodate 600mm of clean topsoils and subsoils to soft landscaped areas on site.
- 5.2 The layout proposals for the site have since changed and the site is now primarily to be hard paved to provide pedestrian and parking areas for the residents of the proposed apartments. There is only to be a small area of soft

landscaping in the south east corner of the site adjacent the proposed apartment building, ground levels are being raised here to accommodate the proposed clean capping layer. For the majority of the remainder of the site, it is still proposed to reduce site levels by approximately 500mm throughout.

- 5.3 The entirety of gas holder 1 has been removed, and gas holder 2 will be entirely removed so they do not interfere with the proposed foundations. Gas holder 3 is beneath an area of proposed hard standing, and it will not be able to remove the entirety of the construction as it extends into third party land. We would therefore suggest that 1.0-1.5m of made ground and the buried gas holder wall should be removed from above gas holder 3 to engineer out any soft or hard spots that would affect the hard standing construction. Levels will then be brought back up to proposed final ground levels through the hard paving construction depth.
- 5.4 The hard paved construction will effectively sever the contamination pathways from the future site users.
- 5.5 If any areas of made ground are removed off site, they should be taken to a licensed waste site and full documentation should be obtained. Any material to be taken off-site should be suitably quarantined prior to removal to prevent cross contamination. Any relevant chemical test results should be given to the landfill operator, so that they can determine if this material is suitable to be disposed of in their licensed landfill.
- 5.6 Waste transfer tickets should be retained for inclusion in a remediation validation statement to confirm the removal from site to a suitably licensed waste facility.

We trust that the above is sufficient for your current requirements, however should you need any further information please do not hesitate to contact me direct.

Yours faithfully,



MICHAEL DEAN BSc HND

Enclosure.

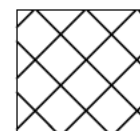
KEY



TRIAL PITS



BOREHOLES



AREAS INACCESSIBLE
DURING SITE INVESTIGATION

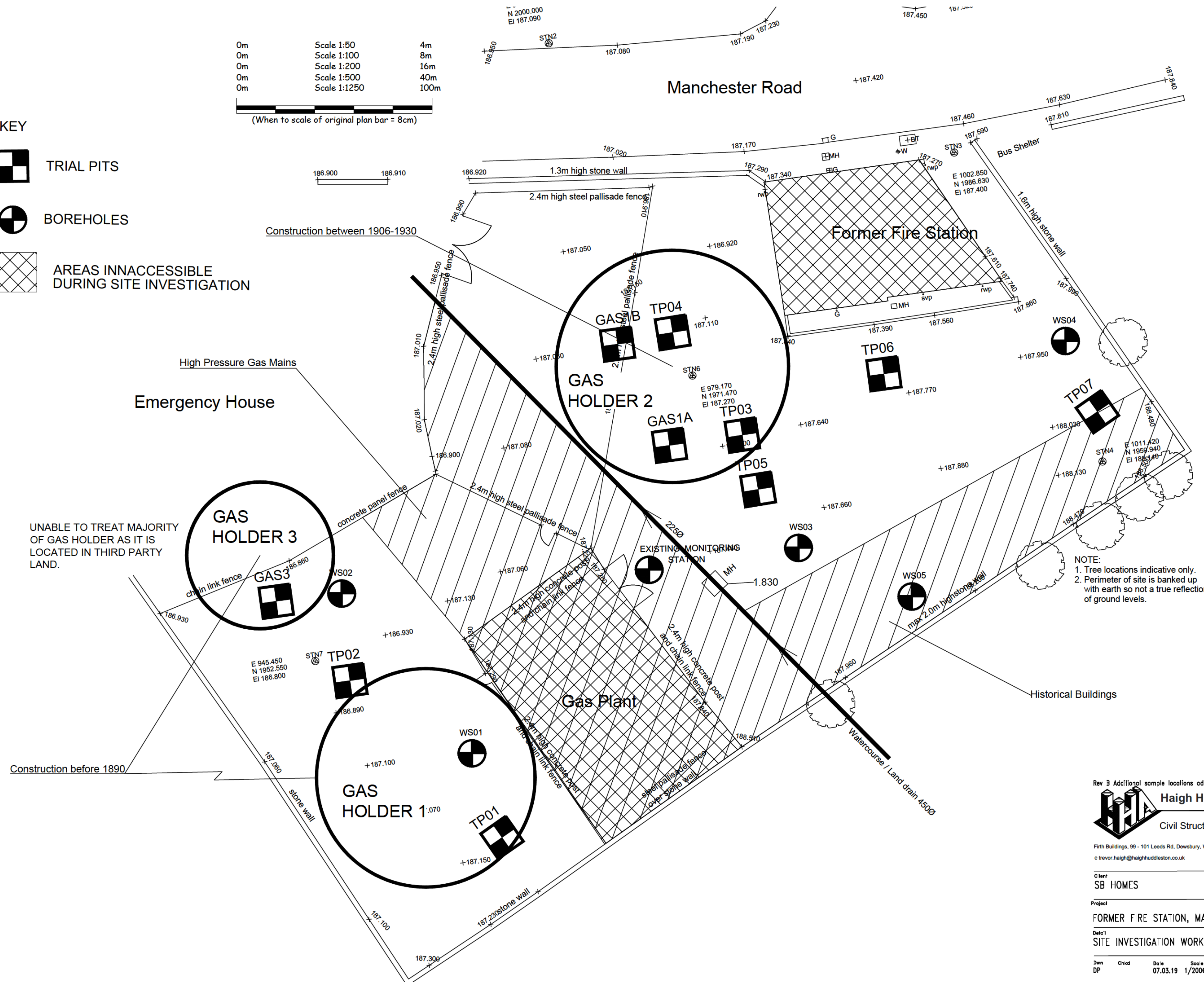
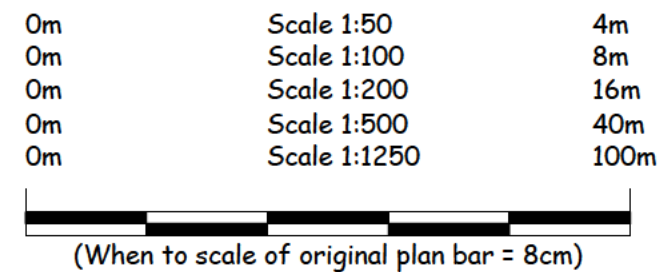




Photo 1 – Gas Holder 2 metal frame and stanchion



Photo 2 – Gas Holder 3 stone frame



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FORM HHA 5

TRIAL HOLE NO. GAS 1A

(BENEATH FORMER BASE SLAB)

Client :	SB HOMES	Job No :	7092
Site :	FORMER MARSDEN FIRE STATION	Date :	24/05/2019

0.0

		Dark Grey Sandy Soft to Firm Clay Sample taken at 0.3m
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.1		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES @ 0.3m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. GAS 1B

(BENEATH FORMER BASE SLAB)

Client :	SB HOMES	Job No :	7092
Site :	FORMER MARSDEN FIRE STATION	Date :	24/05/2019

0.0

		Dark Grey Sandy Soft to Firm Clay
		Sample taken at 0.4m
0.5		
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.1		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES @ 0.4m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



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FORM HHA 5

TRIAL HOLE NO. GAS 3

Client :	SB HOMES	Job No :	7092
Site :	FORMER MARSDEN FIRE STATION	Date :	24/05/2019

0.0

		Loosely compacted dark brown clayey sands and gravels.
		Hydrocarbon odour.
0.5		Sample taken at 0.6m
		Sample taken at 0.9m
1.0		
1.5		Sample taken at 1.5m
2.0		End of trial pit
2.5		
3.0		
3.5		
4.1		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES @ 0.6m, 0.9m and 1.5m

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....
.....



Certificate of Analysis

Certificate Number 19-10276

07-Jun-19

Client Haigh Huddleston & Associates Ltd
Firth Buildings
99-101 Leeds Road
Dewsbury
WF12 7BU

Our Reference 19-10276

Client Reference 7092

Order No (not supplied)

Contract Title Marsden Fire

Description 5 Soil samples.

Date Received 03-Jun-19

Date Started 03-Jun-19

Date Completed 07-Jun-19

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 19-10276

Client Ref 7092

Contract Title Marsden Fire

Sample ID	Depth	Lab No	Completed	Matrix Description
Gasometer 1A		1509852	07/06/2019	Dark grey sandy CLAY
Gasometer 1B		1509853	07/06/2019	Dark grey sandy CLAY
Gasometer 3	1.5	1509854	07/06/2019	U/S (sample matrix outside MCERTS scope of accreditation)
Gasometer 3	0.6	1509855	07/06/2019	Dark brown gravelly, clayey SAND
Gasometer 3	0.9	1509856	07/06/2019	Dark brown gravelly, clayey SAND

Summary of Chemical Analysis

Soil Samples

Our Ref 19-10276

Client Ref 7092

Contract Title Marsden Fire

Lab No	1509852	1509853	1509854	1509855
Sample ID	Gasometer 1A	Gasometer 1B	Gasometer 3	Gasometer 3
Depth			1.50	0.60
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	24/05/19	24/05/19	24/05/19	24/05/19
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	1.6	2.6	65	27
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.1	< 0.1	0.9
Chromium	DETSC 2301#	0.15	mg/kg	24	26	10	39
Copper	DETSC 2301#	0.2	mg/kg	5.8	9.0	42	55
Lead	DETSC 2301#	0.3	mg/kg	15	20	17	190
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.72	0.34
Nickel	DETSC 2301#	1	mg/kg	11	9.9	21	25
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	5.4	0.9
Zinc	DETSC 2301#	1	mg/kg	28	31	26	210
Inorganics							
pH	DETSC 2008#			6.7	5.9	6.3	8.2
Thiocyanate	DETSC 2130#	0.6	mg/kg	< 0.6	0.8	3.6	0.8
Sulphide	DETSC 2024*	10	mg/kg	< 10	20	300	160
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.02	0.04	0.37	0.09
Petroleum Hydrocarbons							
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	< 10	2100
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	1.5
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	3.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	0.2	15
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	22
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.5	120
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2	49
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	1.0	160
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	0.9	140
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	0.6	63
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.6	61
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.4	43
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.3	28
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	0.7	57
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.0	0.7	38
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.2	7.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	0.8	0.5	32
PAH Total	DETSC 3301	1.6	mg/kg	5.5	3.8	6.9	830
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	5.3	0.6

Summary of Chemical Analysis

Soil Samples

Our Ref 19-10276

Client Ref 7092

Contract Title Marsden Fire

Lab No	1509856
	Gasometer
Sample ID	3
Depth	0.90
Other ID	
Sample Type	SOIL
Sampling Date	24/05/19
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	20
Cadmium	DETSC 2301#	0.1	mg/kg	0.3
Chromium	DETSC 2301#	0.15	mg/kg	33
Copper	DETSC 2301#	0.2	mg/kg	42
Lead	DETSC 2301#	0.3	mg/kg	97
Mercury	DETSC 2325#	0.05	mg/kg	0.17
Nickel	DETSC 2301#	1	mg/kg	22
Selenium	DETSC 2301#	0.5	mg/kg	0.9
Zinc	DETSC 2301#	1	mg/kg	110
Inorganics				
pH	DETSC 2008#			9.3
Thiocyanate	DETSC 2130#	0.6	mg/kg	0.9
Sulphide	DETSC 2024*	10	mg/kg	280
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.16
Petroleum Hydrocarbons				
EPH (C10-C40)	DETSC 3311#	10	mg/kg	5800
PAHs				
Naphthalene	DETSC 3301	0.1	mg/kg	3.7
Acenaphthylene	DETSC 3301	0.1	mg/kg	13
Acenaphthene	DETSC 3301	0.1	mg/kg	27
Fluorene	DETSC 3301	0.1	mg/kg	37
Phenanthrene	DETSC 3301	0.1	mg/kg	280
Anthracene	DETSC 3301	0.1	mg/kg	120
Fluoranthene	DETSC 3301	0.1	mg/kg	470
Pyrene	DETSC 3301	0.1	mg/kg	420
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	210
Chrysene	DETSC 3301	0.1	mg/kg	210
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	160
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	100
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	210
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	150
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	30
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	130
PAH Total	DETSC 3301	1.6	mg/kg	2600
Phenols				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5

Summary of Asbestos Analysis Soil Samples

Our Ref 19-10276

Client Ref 7092

Contract Title Marsden Fire

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1509852	Gasometer 1A	SOIL	NAD	none	Rebekah Sayer
1509853	Gasometer 1B	SOIL	NAD	none	Rebekah Sayer
1509854	Gasometer 3 1.50	SOIL	NAD	none	Rebekah Sayer
1509855	Gasometer 3 0.60	SOIL	NAD	none	Rebekah Sayer
1509856	Gasometer 3 0.90	SOIL	Amosite	Amosite present in bundles	Rebekah Sayer

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 19-10276
 Client Ref 7092
 Contract Marsden Fire

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1509852	Gasometer 1A SOIL	24/05/19	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1509853	Gasometer 1B SOIL	24/05/19	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1509854	Gasometer 3 1.50 SOIL	24/05/19	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1509855	Gasometer 3 0.60 SOIL	24/05/19	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1509856	Gasometer 3 0.90 SOIL	24/05/19	GJ 250ml, PT 1L	pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/- 2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS
(WITH PLANT UPTAKE)

<u>CONTAMINANT</u>	<u>ICRCL – TTV / DEFRA – SGV</u> <u>MG/KG</u>
Arsenic	37 (4)
Cadmium	22 (4)
Chromium	130 (2)
Lead	200 (4)
Mercury	1.2 (1)
Selenium	250 (1)
Copper	2400 (1)
Nickel	180 (1)
Zinc	3700 (1)
Cyanide (total)	25
Sulphate	0.24% (3)
Sulphide	250
Thiocyanate	50
PAH (Total)	40
TPH (Total)	250
Phenols	280 (1)
PH	6-8
Asbestos	No fibres present

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- (2) DEFRA CLR SGV's withdrawn used for initial comparison
- (3) BS 8110 1985 Table 6.1
- (4) Category 4 Screening Level

TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS WITH
PLANT UPTAKE
(SPECIATED PAH)

<u>CONTAMINANT</u>	<u>SCREENING</u> <u>CRITERIA</u> <u>FOR PAH</u> <u>(mg/kg)</u>
Acenaphthlene	210 (1)
Acenaphthylene	170 (1)
Anthracene	2400 (1)
Benz[a]anthracene	7.2 (1)
Benzo(a)pyrene	5 (2)
Benzo[b]fluoranthene	2.6 (1)
Benzo[ghi]perylene	320 (1)
Benzo[k]fluoranthene	77 (1)
Chrysene	15 (1)
Dibenzo[ah]anthracene	0.24 (1)
Fluoranthene	280 (1)
Fluorene	170 (1)
Indeno[123-cd]pyrene	27 (1)
Naphthalene	2.3 (1)
Phenanthrene	95 (1)
Pyrene	620 (1)

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- (2) Category 4 Screening Level

LQM S4UL SCREENING VALUES FOR SPECIATED TOTAL TPH
(RESIDENTIAL WITH PLANT UPTAKE 1% SOM)

Petroleum Hydrocarbons	LQM S4UL Screening Values (mg/kg)
Aliphatics	
C5-C6	42
C6-C8	100
C8-C10	27
C10-C12	130 (38)
C12-C16	1100 (24)
C16-C35	65000 (8.48)
Aromatics	
C5-C7	70
C7-C8	130
C8-C10	34
C10-C12	74
C12-C16	140
C16-C21	260
C21-C35	1100