

24th February 2016

Our ref: GE15231/CA01/160224



Margaret Smith
B J Smith Builders Limited
193 Havant Road
Hayling Island
PO11 0LG

By email only

Dear Margaret,

RE: 4 Meyrick Road, Havant PO9 1NN

Further to the formal instruction received from B J Smith Builders Limited, we write to present the findings of the geochemical testing of soil and water samples undertaken on the site at 4 Meyrick Road, Havant, PO9 1NN.

Background

The site is understood to be occupied by a former scout hut and is proposed to be redeveloped with houses, private gardens and associated infrastructure.

Published geological records indicate that the ground conditions are likely to comprise Alluvium (generally soft, organic clay), over Head Deposits (gravelly clay), Lambeth Group (interbedded sand and clay) and with Chalk at depth. In addition, given that the site has been developed previously, a mantle of Made Ground is also likely to be present.

From the information supplied to date it would appear that Havant Borough Council have concerns regarding the potential contaminative status of the site, in particular with reference to possible oils and PCBs associated with an electricity substation on adjacent third party land, general contamination in the Made Ground, possible contamination of shallow groundwater which might impact the nearby watercourse and the possibility of hazardous ground gas being associated with the soils beneath the site and/or due to contamination.

A desk study assessment had been completed by others and correspondence from the Environmental Health Officer indicated that, in order to satisfy the requirements of relevant planning conditions, they required an intrusive investigation of the site to clarify the potential for contamination to be present and identify any necessary risk mitigation measures.

Scope of Works

The scope of works comprised:

- Construction of up to 4No. window sampler boreholes to depths of up to 5m bgl, depending on drilling conditions, using a self-propelled track mounted rig.
- Installation of a groundwater monitoring well to facilitate recovery of a groundwater sample and possible return ground gas monitoring.
- Geochemical laboratory testing of soil and water samples for a suite of commonly occurring brownfield contaminants augmented with specific testing for the presence of Volatile Organic Compounds and

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Polychlorinated Biphenyls, both of which have been identified by the Local Authority as potential contaminants on this site.

Methodology

The exploratory holes were located across the site including the area within the vicinity of the electricity sub-station located adjacent to the north-western boundary of the site.

Soil and water samples were collected and placed into tubs and amber jars (appropriate for the testing requirements) and cool boxes on site for transit to the office, where they were stored under controlled conditions (<4°C) prior to final transportation in cool boxes to the laboratory by their in-house courier. Samples were stored in temperature controlled conditions from sampling until receipt at the laboratory from which time sample preparation and storage was determined by testing requirements and in line with laboratory's protocols. The soil and surface water sampling locations are presented on Figure 2.

Ground Conditions

The ground conditions encountered during the investigations was commensurate with the anticipated published sequence of strata and the site history, and comprised Made Ground overlying the Alluvium and Head Deposits with the Lambeth Group in turn. The Chalk Formation was not encountered. A summary of the encountered ground conditions is presented in Table 1.

Stratum	Top (m bgl)	Base (m bgl)	Description	Intrusive Position
Made Ground	0.0	0.2	Concrete.	WS2 & WS3
	0.0	1.1*	Dark brown slightly sandy silty clay with occasional fine to coarse angular flint gravel and frequent rootlets, roots (<40mm dia), brick, ash and glass fragments.	WS1, WS2, WS3 & WS4
Alluvium	0.7	2.9	Soft to firm dark greyish brown slightly sandy silty CLAY with occasional decaying roots and rare medium to coarse angular flint gravel.	WS1 & WS4
Head Deposits	0.7	4.1	Dark greyish brown sandy gravelly CLAY and light yellowish orange sandy clayey fine to coarse angular to very angular flint GRAVEL.	WS2 & WS3
Lambeth Group	2.1	5.0	Stiff dark grey mottled red silty CLAY.	WS1, WS2, WS3 & WS4

NOTE: *The maximum depth of Made Ground (1.10m bgl) was encountered within WS1.

Table 1 Summary of Ground Conditions

There was no visual or olfactory evidence of contamination encountered during the soil or water sampling undertaken. On completion of the works, groundwater monitoring standpipes were installed within WS1 and WS3. For full details of the ground conditions encountered, reference should be made to the borehole logs enclosed.

Groundwater

No evidence of any impact to groundwater was observed during the intrusive investigation. Groundwater was encountered at the time of the investigation within each of the boreholes at depths of between 1.45m bgl (WS1) and 1.80m bgl (WS2). It should be noted that changes in groundwater levels do occur for a number of reasons including effects and variations in drainage. Such fluctuations may only be recorded by the measurement of the groundwater level within a standpipe or piezometer installed within appropriate response zones over a long period of time.

Obstructions

Whilst no obstructions were encountered during the intrusive investigation, their presence in areas remote from exploratory holes cannot be ruled out.

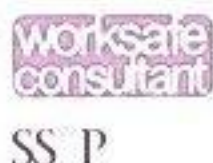
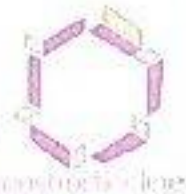
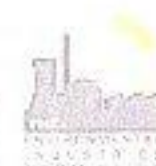
ENVIRONMENTAL ASSEMENT

The site was formerly used as a scout hut and was vacant at the time of the investigation. These land uses are not covered by the National House Building Council (NHBC), Environment Agency (EA) and Chartered Institute of Environmental Health (CIEH) publication 'Guidance for the Safe Development of Housing on Land Affected by Contamination' (2008), which provides a summary of industrial profiles (1995 - 1996) published by the former Department of the Environment (DoE) (now part of the Department for Environment, Food and Rural Affairs [DEFRA]). Thus in lieu of any specific guidance, a suite of commonly occurring brownfield contaminants was selected and augmented with specific potential contaminants associated with adjacent land use.

Potential contaminants associated with the site's former uses include heavy metals, organic pollutants such as poly-aromatic hydrocarbons (PAH), petroleum hydrocarbons/oils and solvents, inorganic compounds, acids, coal tars and polychlorinated bi-phenyls (PCBs). In addition, the former and current buildings on site may have been constructed using asbestos containing materials and therefore the potential presence of this contaminant within the near surface soils cannot be discounted.

Following completion of the testing and review of the analytical report, a quantitative risk assessment has been undertaken by comparing the results of the laboratory chemical testing of shallow soils against Site Specific Assessment Criteria (SSAC) generated using the Contaminated Land Exposure Assessment (CLEA) model v1.06 published by the Environment Agency, or against the Category 4 Screening Levels (C4SLs) published by DEFRA. Whilst the C4SLs were released primarily 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. C4SL values were used for the assessment of lead and benzo(a)pyrene in a residential context with plant uptake.

The results from the testing undertaken as part of site investigation were assessed on a statistical basis as described below. The assumptions made as part of the CLEA v1.06 calculations for a residential end use with plant uptake are presented in Table 2. Copies of the CLEA calculations are enclosed.



	Assumptions			Comments
Land Use	Residential with home grown produce			Commensurate with the most sensitive end use in this portion of the site.
Receptor	Female (res)			A conservative assumption using the most sensitive possible receptor.
Receptor Age	1 to 6			Critical receptor age range.
Building	Residential with homegrown produce			A conservative assumption of the private residence use proposed.
Soil Type	Silty clay	pH 8.7	SOM 0.90%	Based on the values used for the previous assessment ref. GE9523.
Exposure Pathways	Oral	Direct soil & dust ingestion; consumption of home grown produce; soil attached to home grown produce		Default setting for land use.
	Dermal	Indoor & outdoor		Default setting for land use.
	Inhalation	Indoor & outdoor dust & vapour		Default setting for land use.
Occupancy	days/year	hours/day (indoors)	hour/day (outdoors)	Default settings for the critical receptor.
	180 - 365	19 - 23	1	

Table 2 Assumptions for SSAC Calculation (CLEA v1.06 Software)

Statistical analysis of the samples within the dataset was undertaken in accordance with guidance contained in the CIEH/CL:AIRE report 'Comparing Soil Contamination Data with a Critical Concentration' (May 2008). If the contamination status of the soils is considered in a planning context, the null hypothesis tested by the analysis is whether the true mean concentration is equal to or greater than the critical concentration for a given determinant, with the critical concentration being the relevant SSAC or GAC (the soil screening value) for that determinant in the context of the intended end use of the site. If the analysis shows that the true mean concentration is less than the critical concentration the null hypothesis can be rejected. The guidance recommends that for the null hypothesis to be rejected the analysis should show that there is a 95% (or higher) likelihood that the true mean concentration is below the critical concentration. Where this is the case the site is considered to be acceptable for the planned end use without any necessary remedial measures.

The statistical analyses identified that outliers were present for barium and arsenic which related to the samples from WS1 at 0.2m bgl and WS4 at 0.2m, respectively. However, the reported concentration did not exceed the respective assessment criteria and thus were not considered indicative of soil contamination. Following removal of the statistical outlier concentrations, the confidence limit of 95% was exceeded indicating that the null hypothesis could be rejected for all of the determinants. As such, it was considered that the assessment did not indicate the presence of soil contamination in the context of the proposed end use.

In addition, all samples submitted for VOCs and PCBs analysis were recorded either below the laboratory detection limit or the relevant threshold.

Cement sheeting fragments were identified in the Made Ground in WS4. The asbestos screening did not identify the presence of asbestos. Therefore, all samples submitted for asbestos screens were returned as negative for the presence of asbestos fibres.

In view of the results of the above analysis, it is considered that remedial measures are not required areas as part of the proposed development on this site. However, it is recommended that all surface bituminous materials are removed from proposed gardens and soft landscaped areas during site clearance. In the absence of any Topsoil on site, it will be necessary to import chemically and physically suitable Topsoil, which should be placed to a thickness of 300mm in gardens

Waste Acceptance Criteria (WAC)

The Made Ground soils encountered on-site would require WAC testing prior to off-site disposal. It is possible that natural soils free from contamination may be classified as "Inert", under the relevant EWC reference, for off-site disposal to landfill or may be suitable for re-use on-site subject to any necessary consents.

Notwithstanding the above, where excess soils are removed from site they will be classified as waste and should be disposed of accordingly. As several classification systems exist, confirmation of disposal costs and classification should be sought from local waste operators. Soils containing ACMs may attract a premium for disposal.

Groundwater

According to the Environment Agency, the site is designated as overlying Secondary (undifferentiated) and Principal Aquifers. Groundwater. The results have been assessed using the 'Water Framework Directive Implementation in England and Wales' for fresh water.

Groundwater samples were retrieved from WS1, the results indicated that no concentrations exceed the relevant WFD or EQS guidelines for fresh water. Therefore, the analytical results are considered not to indicate the presence of gross contamination of either groundwater or surface water but may reflect background, or natural occurrence and variation. Thus further action or remedial intervention is not considered to be necessary.

Conclusions

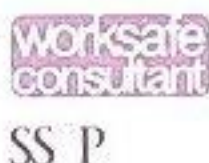
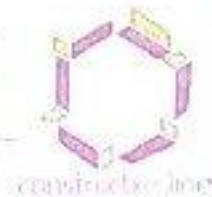
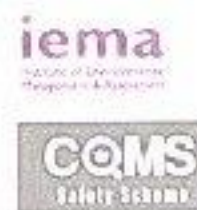
Chemical laboratory analyses were selected to provide the parameters necessary to make an assessment of the potentially contaminated soils and/or waters for the proposed development. The choice of contamination testing was based on the site investigation and observations, in addition to the features highlighted by the proposal.

The investigation and assessment of chemical analyses have not revealed any significant contamination in the near surface the Made Ground and natural soils deposits. Therefore, it is considered that remediation to protect end users of the proposed development will not be required. Should any material suspected of being significantly contaminated be encountered during the redevelopment of the site, Geo-Environmental Services can be contacted to undertake additional investigation and assessment if necessary.

No assessment has been made within this report with regard to the classification of the material for potential off-site disposal. In order to classify materials within the Waste Acceptance Criteria (WAC), further testing may be required prior to dispatch of the waste. Materials to be removed off-site must be classified by carrying out WAC testing and taken to a licensed facility. Further advice and support can be provided if required.

The groundwater testing undertaking has not indicated any groundwater contamination. Therefore, no further action is considered to be warranted to assess or protect controlled waters, i.e. groundwater or surface water.

Given the existence of Made Ground on the site, it is imperative to maintain vigilance during the site clearance and construction, with any unknown or unrecorded contamination being reported and assessed accordingly.



This report is based on the results of the fieldwork, examination of the recovered samples and the laboratory testing carried out. The possibility that different conditions may exist other than at the exploratory hole positions, or at greater depth, should not be ruled out.

Closure

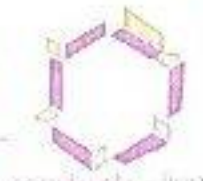
We trust we have interpreted your instructions correctly and provided sufficient information for your current requirements. Should you have any queries please do not hesitate to contact us.

Yours sincerely
For and on Behalf of Geo-Environmental



CESAR AZEVEDO
Consulting Engineer
cesar.azevedo@gei.net

Enc: Figure 1 – Site Location Plan
Figure 2 – Exploratory Hole Location Plan
Figure 3 – Borehole Logs
Figure 4 – Site Specific Assessment Results
Figure 5 – Geochemical Laboratory Results





Project:	4 Meyrick Road, Havant, PO9 1NN			Title	Site Location Plan	
Client:	B J Smith Builders Limited			<div>Geo-Environmental Services Ltd</div> <div>Unit 7 Danworth Farm, Cuckfield Road</div> <div>Hurstpierpoint, West Sussex BN6 9GL</div> <div>+44(0)1273 832972 www.gesi.net</div> <div> Geo-Environmental</div>		
Ref No:	GE15231	Revision:	2			
Drawn:	CA	Date:	03/02/2015			
Figure:	1	Scale:	Not To Scale			



WS - Window sampling **SP** - Standpipe

Project:	4 Meyrick Road, Havant, PO9 1NN			Title	Borehole Location Plan	
Client:	B J Smith Builders Limited			Geo-Environmental Services Ltd Unit 7 Danworth Farm, Cuckfield Road Hurstpierpoint, West Sussex BN6 9GL +44(0)1273 832972 www.gesl.net		
Ref No:	GE15231	Revision:	2			
Drawn:	CA	Date:	03/02/2015			
Figure:	2	Scale:	Not To Scale			
				 Geo-Environmental		

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		<h1>Borehole Log</h1>			Borehole No. WS1 Sheet 1 of 1	
Project Name: 4 Meyrick Road		Project No. GE15231		Co-ords: 470852E - 106470N		Hole Type WS
Location: Havant		Level:		Scale 1:25		Logged By CA
Client: B J Smith Builders Limited		Dates: 01/02/2016				

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.20	ES		0.60		Dark brown slightly sandy silty clay with occasional fine to coarse angular flint gravels and frequent rootlets, roots (<40mm dia), brick and ash fragments. MADE GROUND	1		
		0.50	ES						Dark greyish brown sandy silty clay with occasional fine to coarse angular flint gravels and rare roots (<20mm), ferruginous stain and brick fragments. MADE GROUND	
		1.00	ES				1.10		Soft to firm dark greyish brown slightly sandy silty CLAY with occasional decaying roots and rare medium to coarse angular flint gravels. ALLUVIUM	
		1.50	ES		2.90		1.50	PP	0.8kg/cm ²	2
		2.00	PP	1.0kg/cm ²						
		2.50	PP	1.2kg/cm ²						
		3.00	PP	2.9kg/cm ²						
		3.50	PP	2.8kg/cm ²						
		4.00	PP	3.0kg/cm ²						
		4.50	PP	3.0kg/cm ²	5.00		5.00	PP	3.0kg/cm ²	3
	5.00	PP	3.0kg/cm ²	5.00			End of Borehole at 5.00m	4		
								5		

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Force to	Depth from	Depth to	
		1.45	1.45			Groundwater encountered at 1.45m. A standpipe was installed to 4.00m with a slotted section from 0.30m to 4.00m.





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

Borehole Log

Borehole No.

WS2

Sheet 1 of 1

Project Name: 4 Meyrick Road

Project No.
GE15231

Co-ords: 470868E - 106455N

Hole Type
WS

Location: Havant

Level:

Scale
1:25

Client: B J Smith Builders Limited

Dates: 01/02/2016

Logged By
CA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20			Concrete. MADE GROUND	
		0.30	ES		0.40			Dark reddish brown very sandy clay with frequent fine to coarse angular flint gravels and occasional brick and ash fragments. MADE GROUND	
		0.50	ES		0.70			Dark greyish brown sandy clay with frequent fine to coarse angular flint gravels and occasional brick, mortar and ash fragments. MADE GROUND	
		1.00	ES		1.10			Dark greyish brown sandy gravelly CLAY. Gravels are fine to coarse angular to very angular of flint. HEAD DEPOSITS	1
		1.50	D					Light yellowish orange sandy clayey fine to coarse angular to very angular flint GRAVEL. HEAD DEPOSITS	
		2.00	D						2
		2.50	D						
		3.00	D						3
		3.50	D						
		4.00	D						4
		4.50	D		4.10			Stiff dark grey mottled red silty CLAY. LAMBETH GROUP	
		4.50	PP	3.1kg/cm2					
		5.00	D		5.00				5
		5.00	PP	3.3kg/cm2				End of Borehole at 5.00m	
Casing		Water Strikes (mbgf)		Chiselling (mbgf)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				
		1.80	1.80			Groundwater encountered at 1.80m.			



 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		<h1>Borehole Log</h1>				Borehole No. WS3 Sheet 1 of 1	
Project Name: 4 Meyrick Road		Project No. GE15231		Co-ords: 470877E - 106465N		Hole Type WS	
Location: Havant		Level:		Scale 1:25		Logged By CA	
Client: B J Smith Builders Limited		Dates: 01/02/2016					

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
							Concrete. MADE GROUND	
		0.30	ES		0.20			
					0.40		Dark greyish brown very gravelly sandy clay with frequent ash and mortar fragments. Gravels are fine to coarse angular to very angular of flint.	
		0.50	ES				MADE GROUND	
					0.60		Dark blackish brown slightly sandy silty clay with frequent fine to coarse sub-rounded to angular flint gravels and occasional ash and brick fragments.	
		0.70	ES				MADE GROUND	
					0.90		Dark greyish brown slightly sandy clay with occasional fine to coarse sub-rounded to angular flint gravels and rare ash, brick and glass fragments.	
		1.00	D				MADE GROUND	
		1.00	ES				Dark greyish brown sandy gravelly CLAY. Gravels are fine to coarse angular to very angular of flint.	
							HEAD DEPOSITS	
		1.50	D					
		2.00	D		2.10		Stiff dark grey mottled red silty CLAY. LAMBETH GROUP	
		2.50	D					
		2.50	PP	3.0kg/cm2				
		3.00	D					
	3.00	PP	3.0kg/cm2					
	3.50	D						
	3.50	PP	2.8kg/cm2					
	4.00	D						
	4.00	PP	3.0kg/cm2					
	4.50	D						
	4.50	PP	3.0kg/cm2					
	5.00	D		5.00				
	5.00	PP	3.0kg/cm2			End of Borehole at 5.00m		

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rise to	Depth from	Depth to	
		1.60	1.60			Groundwater encountered at 1.60m. A standpipe was installed to 4.00m with a slotted section from 0.30m to 4.00m.



 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		<h1>Borehole Log</h1>				Borehole No. WS4 Sheet 1 of 1	
Project Name: 4 Meyrick Road		Project No. GE15231		Co-ords: 470861E - 106479N		Hole Type WS	
Location: Havant				Level:		Scale 1:25	
Client: B J Smith Builders Limited				Dates: 01/02/2016		Logged By CA	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.70		Dark brown slightly sandy silty clay with occasional fine to coarse sub-rounded to angular flint gravels and frequent rootlets, ash, brick and asbestos fragments. MADE GROUND		
		0.50	ES						
		1.00	ES			Soft to firm dark greyish brown slightly sandy silty CLAY with occasional decaying roots and rare medium to coarse angular flint gravels. ALLUVIUM			
		1.00	PP	0.8kg/cm ²					
	▼	1.50	D						
		1.50	PP	1.0kg/cm ²					
		2.00	D						
		2.00	PP	1.0kg/cm ²					
		2.50	D						
		2.50	PP	1.0kg/cm ²					
		3.00	D		2.90		Stiff dark grey mottled red silty CLAY. LAMBETH GROUP		
	3.00	PP	3.0kg/cm ²						
	3.50	D							
	3.50	PP	3.0kg/cm ²						
		4.00	D						
	4.00	PP	3.0kg/cm ²						
	4.50	D							
		4.50	PP	3.2kg/cm ²					
	5.00	D							
		5.00	PP	3.0kg/cm ²	5.00		End of Borehole at 5.00m		

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	
		1.55	1.55			Groundwater encountered at 1.55m.





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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 16-05568

Issue: 1

Date of Issue: 11/02/2016

Contact: Cesar Azevedo

Customer Details: GESL
Unit 7
Danworth Farm
Hurstpierpoint
West Sussex BN6 9GL

Quotation No: Q14-00021

Order No: 410

Customer Reference: GE15231

Date Received: 04/02/2016

Date Approved: 11/02/2016

Details: 4 Meyrick Road, Havant

Approved by: 

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)



Sample Summary

Report No.: 16-05568

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
52866	WS1 -1.00	03/02/2016	04/02/2016		

Results Summary

Report No.: 16-05568

ELAB Reference	52868
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	WS1
Sample Depth (m)	~1.00
Sampling Date	03/02/2016

Determinand	Codes	Units	LOD	
Dissolved Metals				
Arsenic	U	ug/l	5	< 5
Boron	N	ug/l	5	344
Barium	U	ug/l	5	127
Beryllium	U	ug/l	5	< 5
Cadmium	U	ug/l	1	< 1
Chromium	U	ug/l	5	< 5
Copper	U	ug/l	5	< 5
Mercury	U	ug/l	0.1	< 0.1
Nickel	U	ug/l	5	< 5
Lead	U	ug/l	1	< 1
Selenium	U	ug/l	5	< 5
Vanadium	N	ug/l	5	< 5
Zinc	U	ug/l	5	5
Anions				
Chloride	U	mg/l	0.5	45.1
Sulphate	U	mg/l	0.5	17.9
Inorganics				
Elemental Sulphur	N	mg/l	0.1	< 0.1
Hexavalent Chromium	U	ug/l	100	< 100
Sulphide	N	mg/l	0.1	0.3
Miscellaneous				
Dissolved organic carbon	U	mg/l	1.5	7.7
pH	U	pH units	0.1	6.9
Phenols				
Phenol	N	ug/l	1	< 1
M,P-Cresol	N	ug/l	1	< 1
O-Cresol	N	ug/l	1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1
2,3,5-trimethylphenol	N	ug/l	1	< 1
Total Monohydric Phenols	N	ug/l	1	< 1
Polyaromatic hydrocarbons				
Naphthalene GCMS	N	ug/l	0.01	0.05
Acenaphthylene GCMS	N	ug/l	0.01	< 0.01
Acenaphthene GCMS	N	ug/l	0.01	< 0.01
Fluorene GCMS	N	ug/l	0.01	0.01
Phenanthrene GCMS	N	ug/l	0.01	0.06
Anthracene GCMS	N	ug/l	0.01	0.01
Fluoranthene GCMS	N	ug/l	0.01	0.03
Pyrene GCMS	N	ug/l	0.01	0.22
Benzo (a) anthracene GCMS	N	ug/l	0.01	< 0.01
Chrysene GCMS	N	ug/l	0.01	< 0.01
Benzo (b) fluoranthene GCMS	N	ug/l	0.01	< 0.01
Benzo (k) fluoranthene GCMS	N	ug/l	0.01	< 0.01
Benzo (a) pyrene GCMS	N	ug/l	0.01	< 0.01
Indeno (1,2,3-cd) pyrene GCMS	N	ug/l	0.01	< 0.01
Dibenzo(a,h)anthracene GCMS	N	ug/l	0.01	< 0.01
Benzo(ghi)perylene GCMS	N	ug/l	0.01	< 0.01
Total PAH(16) GCMS	N	ug/l	0.01	0.40

Results Summary

Report No.: 16-05568

ELAB Reference	52868
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	WS1
Sample Depth (m)	~1.00
Sampling Date	03/02/2016

Determinand	Codes	Units	LOD	
TPH CWG				
>C5-C6 Aliphatic	N	ug/l	1	< 1.0
>C6-C8 Aliphatic	N	ug/l	1	< 1.0
>C8-C10 Aliphatic	N	ug/l	5	< 5.0
>C10-C12 Aliphatic	N	ug/l	5	< 5.0
>C12-C16 Aliphatic	N	ug/l	5	< 5.0
>C16-C21 Aliphatic	N	ug/l	5	< 5.0
>C21-C35 Aliphatic	N	ug/l	5	84.7
>C35-C40 Aliphatic	N	ug/l	5	< 5.0
Total (>C5-C40) Aliphatic	N	ug/l	5	84.7
>C5-C7 Aromatic	N	ug/l	1	< 1.0
>C7-C8 Aromatic	N	ug/l	1	< 1.0
>C8-C10 Aromatic	N	ug/l	5	< 5.0
>C10-C12 Aromatic	N	ug/l	5	< 5.0
>C12-C16 Aromatic	N	ug/l	5	< 5.0
>C16-C21 Aromatic	N	ug/l	5	< 5.0
>C21-C35 Aromatic	N	ug/l	5	17.9
>C35-C40 Aromatic	N	ug/l	5	< 5.0
Total (>C5-C40) Aromatic	N	ug/l	5	17.9
Total (>C5-C40) Ali/Aro	N	ug/l	5	103

Method Summary

Report No.: 16-05568

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Water					
Aliphatic/Aromatic hydrocarbons in water	N		09/02/2016		GC-FID
Aromatic hydrocarbons in water	N		09/02/2016		GC-FID
Phenols in waters	N		10/02/2016		HPLC
Dissolved metals by ICP in waters	U		10/02/2016	101	ICPMS
Dissolved organic carbon	U		11/02/2016	102	IR
pH of waters	U		10/02/2016	113	Electromeric
Chromium Hexavalent in waters	U		11/02/2016	123	Colorimetry
Anions	U		10/02/2016	131	Ion Chromatography
PAHs and/or PCBs in waters	U		08/02/2016	135	GC-MS
Elemental Sulphur by HPLC in waters	N	As submitted sample	10/02/2016	206	HPLC
Aliphatic hydrocarbons in water	N		08/02/2016	215	GC-FID
Aromatic hydrocarbons in water	N		08/02/2016	215	GC-FID
Low range Aliphatic hydrocarbons water	N		08/02/2016	215	GC-MS
Low range Aromatic hydrocarbons water	N		08/02/2016	215	GC-MS

Tests marked N are not UKAS accredited

Report Information

Report No.: 16-05568

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage

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Report generated 15-Feb-15

Report title

Created by Cesar Azevedo at Geo-Environmental Services Ltd



RESULTS

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		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.6m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.6m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg ⁻¹	mg m ⁻³	mg kg ⁻¹	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg kg ⁻¹ RW	mg kg ⁻¹ RW	mg kg ⁻¹ RW	mg kg ⁻¹ RW	mg kg ⁻¹ RW	mg kg ⁻¹ RW
1	Al-EC5-EC7	38.5	59.8	1.6	100.0	8.37E+01	1.20E+04	4.69E+01	3.69E-08	0.00E+00	7.25E-02	1.59E-04	0.00E+00	1.38E+02	4.86E+02	1.91E+02	0.00E+00	0.00E+00	2.37E+02
2	Al-EC7-EC9	65.4	33.7	0.9	100.0	1.44E+02	7.03E+04	7.20E+01	8.12E-08	0.00E+00	6.39E-02	1.72E-04	0.00E+00	2.11E+02	4.40E+02	8.43E+01	0.00E+00	0.00E+00	2.12E+02
3	Al-EC8-EC10	93.4	6.2	0.4	100.0	4.63E+01	1.34E+03	2.32E+01	1.67E-08	0.00E+00	6.67E-03	3.93E-06	0.00E+00	2.74E+01	3.90E+01	9.92E+00	0.00E+00	0.00E+00	7.36E+00
4	Al-EC10-EC12	95.9	4.0	0.1	100.0	7.06E+01	3.77E+02	3.53E+01	3.00E-08	0.00E+00	2.71E-03	2.72E+06	0.00E+00	3.03E+01	4.19E+01	1.17E+01	0.00E+00	0.00E+00	5.70E+00
5	Al-EC12-EC16	97.9	2.1	0.0	100.0	1.28E+02	6.01E+01	8.30E+01	6.37E-08	0.00E+00	7.06E-04	1.89E+06	0.00E+00	3.93E+01	4.20E+01	1.56E+01	0.00E+00	0.00E+00	3.32E+00
6	Al-EC16-EC21	99.5	0.7	0.0	100.0	2.29E+02	2.14E+00	1.13E+02	8.64E-08	0.00E+00	1.37E-04	1.47E+06	0.00E+00	1.86E+01	2.92E+01	1.74E+01	0.00E+00	0.00E+00	8.15E+01
7	Al-EC21-EC35	99.9	0.1	0.0	100.0	8.55E+02	3.28E+02	4.27E+02	3.64E+07	0.00E+00	4.19E+06	1.82E+06	0.00E+00	3.33E+00	1.30E+01	1.94E+01	0.00E+00	0.00E+00	2.97E+02
8	Al-EC35-EC44	99.9	0.1	0.0	100.0	6.60E+02	3.26E+02	4.27E+02	3.64E+07	0.00E+00	4.19E+06	1.82E+06	0.00E+00	3.33E+00	1.30E+01	1.94E+01	0.00E+00	0.00E+00	2.97E+02
9																			
10	Al-EC5-EC8	56.6	7.3	36.1	100.0	1.57E+02	4.53E+06	7.64E+01	6.51E-08	0.00E+00	2.68E+00	1.25E+03	0.00E+00	1.29E+02	1.96E+02	3.14E+01	0.00E+00	0.00E+00	3.66E+01
11	Al-EC6-EC8	83.0	2.3	14.7	100.0	3.75E+02	4.53E+06	1.89E+02	1.60E+07	0.00E+00	2.68E+00	1.97E+03	0.00E+00	1.15E+02	1.58E+02	4.49E+01	0.00E+00	0.00E+00	1.37E+01
12	Al-EC8-EC9	98.4	0.3	3.3	100.0	8.98E+01	2.48E+04	4.84E+01	4.12E+08	0.00E+00	1.54E+01	2.39E+04	0.00E+00	3.09E+00	6.92E+00	5.10E+00	0.00E+00	0.00E+00	8.06E+02
13	Al-EC10-EC12	98.3	0.0	0.7	100.0	4.71E+02	2.43E+04	2.56E+02	2.01E+07	0.00E+00	1.51E+01	5.22E+04	0.00E+00	5.97E+01	3.79E+00	6.49E+00	0.00E+00	0.00E+00	3.08E+03
14	Al-EC12-EC16	99.9	0.0	0.1	100.0	2.92E+03	1.74E+04	1.41E+03	1.20E+06	0.00E+00	1.08E+01	1.08E+03	0.00E+00	4.42E+01	1.02E+00	2.14E+00	0.00E+00	0.00E+00	1.21E+06
15	Al-EC16-EC25	100.0	0.0	0.0	100.0	8.84E+04	3.18E+04	4.42E+04	3.78E+06	0.00E+00	1.97E+01	8.17E+03	0.00E+00	1.01E+07	2.98E+01	6.34E+01	0.00E+00	0.00E+00	5.89E+14
16	Al-EC35-EC44	100.0	0.0	0.0	100.0	8.84E+04	3.18E+04	4.42E+04	3.78E+06	0.00E+00	1.97E+01	8.17E+03	0.00E+00	1.01E+07	2.98E+01	6.34E+01	0.00E+00	0.00E+00	5.89E+14
17																			
18																			
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Report generated 18/02/2016

Report title

Created by Cesar Azevedo at Geo-Environmental Services Ltd



BASIC SETTINGS

Land Use Residential with homegrown produce

Building Small terraced house

Receptor Female (res)

Start age class 1

End age class 6

Exposure Duration 6 years

Soil Silty clay

Exposure Pathways

Direct soil and dust ingestion	☒
Consumption of homegrown produce	☒
Soil attached to homegrown produce	☒

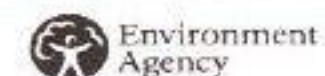
Dermal contact with indoor dust	☒
Dermal contact with soil	☒

Inhalation of indoor dust	☒
Inhalation of soil dust	☒
Inhalation of indoor vapour	☒
Inhalation of outdoor vapour	☒



Land Use Residential with homegrown produce

Age Class	Exposure Frequencies (days yr ⁻¹)						Occupation Periods (hr day ⁻¹)		Soil to skin adherence factors (mg cm ⁻²)		Direct soil ingestion rate (g day ⁻¹)
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor	
1	180	180	180	180	365	365	23.0	1.0	0.06	1.00	0.10
2	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
3	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
4	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
5	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10
6	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00



Receptor Female (res)

Age Class	Body weight (kg)	Body height (m)	Inhalation rate (m ³ day ⁻¹)	Max exposed skin factor			Consumption rates (g FW kg ⁻¹ BW day ⁻¹)					
				Indoor (m ² m ⁻²)	Outdoor (m ² m ⁻²)	Total skin area (m ²)	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	5.60	0.7	8.5	0.32	0.26	3.43E-01	7.12	10.69	16.03	1.83	2.23	3.82
2	9.80	0.8	13.3	0.33	0.26	4.84E-01	6.85	3.30	5.46	3.96	0.54	11.96
3	12.70	0.9	12.7	0.32	0.25	5.82E-01	6.85	3.30	5.46	3.96	0.54	11.96
4	15.10	0.9	12.2	0.35	0.28	6.36E-01	6.85	3.30	5.46	3.96	0.54	11.96
5	16.90	1.0	12.2	0.35	0.28	7.04E-01	3.74	1.77	3.38	1.85	0.16	4.26
6	19.70	1.1	12.2	0.33	0.26	7.94E-01	3.74	1.77	3.38	1.85	0.16	4.26
7	22.10	1.2	12.4	0.22	0.15	8.73E-01	3.74	1.77	3.38	1.85	0.16	4.26
8	25.30	1.2	12.4	0.22	0.15	9.36E-01	3.74	1.77	3.38	1.85	0.16	4.26
9	27.50	1.3	12.4	0.22	0.15	1.01E+00	3.74	1.77	3.38	1.85	0.16	4.26
10	31.40	1.3	12.4	0.22	0.15	1.08E+00	3.74	1.77	3.38	1.85	0.16	4.26
11	35.70	1.4	12.4	0.22	0.14	1.19E+00	3.74	1.77	3.38	1.85	0.16	4.26
12	41.30	1.4	13.4	0.22	0.14	1.29E+00	3.74	1.77	3.38	1.85	0.16	4.26
13	47.20	1.5	13.4	0.22	0.14	1.42E+00	3.74	1.77	3.38	1.85	0.16	4.26
14	51.20	1.6	13.4	0.22	0.14	1.52E+00	3.74	1.77	3.38	1.85	0.16	4.26
15	56.70	1.6	13.4	0.21	0.14	1.60E+00	3.74	1.77	3.38	1.85	0.16	4.26
16	59.00	1.6	13.4	0.21	0.14	1.63E+00	3.74	1.77	3.38	1.85	0.16	4.26
17	70.00	1.6	14.8	0.33	0.27	1.78E+00	2.94	1.40	1.79	1.61	0.22	2.97
18	70.90	1.6	12.0	0.33	0.27	1.80E+00	2.94	1.40	1.79	1.61	0.22	2.97

**Building** Small terraced house

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

Soil Silty clay

Porosity, Total ($cm^3\ cm^{-3}$)	6.30E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	1.20E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	5.10E-01
Residual soil water content ($cm^3\ cm^{-3}$)	2.60E-01
Saturated hydraulic conductivity ($cm\ s^{-1}$)	1.17E-03
van Genuchten shape parameter m (dimensionless)	3.16E-01
Bulk density ($g\ cm^{-3}$)	9.40E-01
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_d) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	8.70E+00
Soil Organic Matter content (%)	8.90E-01
Fraction of organic carbon ($g\ g^{-1}$)	5.16E-03
Effective total fluid saturation (unitless)	6.76E-01
Intrinsic soil permeability (cm^2)	1.56E-08
Relative soil air permeability (unitless)	4.59E-01
Effective air permeability (cm^2)	7.18E-09

**Soil - Vapour Model**

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

Air Dispersion Model

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

* Air dispersion factor in $\text{g m}^{-2} \text{s}^{-1}$ per kg m^{-2} **Soil - Plant Model**

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

Gardener type Average

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Report generated 18-Feb-16

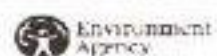
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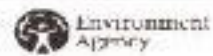
Environment
Agency

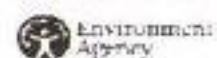
Created by Cesar Azevedo at Geo-Environmental

RESULTS



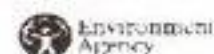
		Assessment Criterion (mg kg ⁻¹)			Ratio of ADE to HCV			Saturation Limit (mg kg ⁻¹)	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
1	Arsenic	3.24E+01	8.50E+01	NR	1.00	0.38	NR	NR	No	No
2	Cadmium	5.45E+00	2.97E+01	5.17E+00	0.91	0.10	1.00	NR	Yes	Yes
3	Chromium III	1.95E+04	3.55E+03	3.01E+03	0.15	0.85	1.00	NR	No	No
4	Mercury, inorganic	1.81E+02	2.55E+03	1.69E+02	0.93	0.07	1.00	NR	No	No
5	Nickel	5.31E+02	1.27E+02	NR	0.14	1.00	NR	NR	Yes	Yes
6	Copper	7.81E+03	1.04E+04	5.20E+03	0.50	0.50	1.00	NR	Yes	No
7	Zinc	1.94E+04	2.55E+07	1.94E+04	1.00	0.00	1.00	NR	Yes	No
8	Selenium	3.50E+02	NR	NR	1.00	NR	NR	NR	Yes	No
9	Chromium VI	4.89E+01	NR	NR	1.00	NR	NR	NR	Yes	No
10	Barium	1.33E+03	NR	NR	1.00	NR	NR	NR	Yes	No
11	Beryllium	1.48E+02	5.10E+01	4.12E+01	0.18	0.81	1.00	NR	Yes	No
12	Vanadium	1.18E+02	6.08E+02	1.07E+02	0.90	0.10	1.00	NR	Yes	Yes
13	Phenol	5.11E+02	4.09E+02	2.27E+02	0.44	0.56	1.00	5.35E+04 (vap)	No	No
14	Acenaphthylene	1.61E+02	2.87E+03	1.53E+02	0.95	0.05	1.00	7.90E+01 (sol)	No	No
15	Acenaphthene	1.98E+02	3.25E+03	1.86E+02	0.94	0.06	1.00	5.20E+01 (sol)	No	No
16	Fluorene	1.54E+02	3.55E+03	1.47E+02	0.96	0.04	1.00	2.81E+01 (sol)	No	No
17	Phenanthrene	8.45E+01	4.20E+03	8.28E+01	0.98	0.02	1.00	3.24E+01 (sol)	No	No
18	Anthracene	2.08E+03	8.70E+04	2.04E+03	0.98	0.02	1.00	1.05E+00 (vap)	No	No
19	Fluoranthene	2.38E+02	2.57E+04	2.36E+02	0.99	0.01	1.00	1.69E+01 (vap)	No	No
20	Pyrene	5.20E+02	6.05E+04	5.16E+02	0.99	0.01	1.00	1.96E+00 (vap)	No	No

[illegible]



	Soil Distribution				Media Concentrations														
	Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.0m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.0m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit	
	%	%	%	%	mg kg ⁻¹	mg m ⁻³	mg kg ⁻¹	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	
1 Arsenic	99.9	0.1	0.0	100.0	3.24E+01	NR	1.82E+01	1.38E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+02	1.30E+02	7.45E+03	1.07E+02	8.48E+03	3.58E+02	
2 Cadmium	99.5	0.5	0.0	100.0	5.17E+00	NR	2.59E+00	2.20E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.69E+01	1.50E+01	1.60E+01	8.28E+02	1.60E+02	7.24E+03	
3 Chromium III	100.0	0.0	0.0	100.0	3.01E+03	NR	1.50E+03	1.28E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.66E+03	9.29E+03	1.89E+02	5.23E+03	1.50E+02	1.42E+02	
4 Mercury, inorganic	99.9	0.1	0.0	100.0	1.89E+02	NR	8.43E+01	7.18E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.41E+01	1.16E+00	7.25E+01	1.69E+01	1.86E+01	1.89E+01	
5 Nickel	99.9	0.1	0.0	100.0	1.27E+02	NR	5.37E+01	5.42E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.84E+01	5.48E+01	2.41E+01	3.19E+01	3.19E+01	4.33E+01	
6 Copper	99.5	0.5	0.0	100.0	5.20E+03	NR	2.80E+03	2.21E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+01	1.10E+01	2.25E+01	7.03E+00	1.78E+01	1.69E+01	
7 Zinc	99.5	1.4	0.0	100.0	1.94E+04	NR	9.89E+03	8.25E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E+02	1.09E+02	2.20E+02	1.61E+02	1.74E+02	1.84E+02	
8 Selenium	99.9	1.1	0.0	100.0	3.50E+02	NR	1.75E+02	1.49E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E+00	1.27E+00	2.81E+01	8.49E+01	1.05E+00	1.05E+00	
9 Chromium VI	97.0	3.0	0.0	100.0	4.86E+01	NR	2.45E+01	2.08E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.36E+04	9.04E+04	1.03E+03	2.56E+01	2.44E+03	5.91E+01	
10 Barium	99.99	0.01	0.0	100.0	1.30E+03	NR	6.64E+02	5.68E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
11 Beryllium	100.0	0.0	0.0	100.0	4.12E+01	NR	2.06E+01	1.75E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E+02	5.09E+03	1.04E+02	2.87E+03	8.21E+03	7.76E+03	
12 Vanadium	95.7	4.3	0.0	100.0	1.07E+02	NR	5.34E+01	4.55E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E+00	1.43E+00	2.92E+01	8.08E+02	2.31E+01	2.18E+01	
13 Phenol	44.2	55.8	0.0	100.0	2.27E+02	1.86E+00	1.14E+02	9.57E+06	0.00E+00	1.73E+03	8.97E+05	0.00E+00	1.85E+02	6.13E+02	2.00E+02	0.00E+00	0.00E+00	3.78E+02	
14 Acenaphthylene	94.5	5.5	0.0	100.0	1.50E+02	9.73E+00	7.84E+01	6.50E+06	0.00E+00	3.44E+03	1.88E+05	0.00E+00	8.64E+01	1.24E+02	3.05E+01	0.00E+00	0.00E+00	1.72E+01	
15 Acenaphthene	95.7	4.3	0.0	100.0	1.88E+02	1.12E+01	9.32E+01	7.80E+06	0.00E+00	3.71E+03	2.02E+05	0.00E+00	8.65E+01	1.23E+02	3.37E+01	0.00E+00	0.00E+00	1.43E+01	
16 Fluorene	95.4	3.6	0.0	100.0	1.47E+02	4.02E+00	7.36E+01	6.27E+06	0.00E+00	1.79E+03	1.40E+05	0.00E+00	8.02E+01	8.35E+01	2.37E+01	0.00E+00	0.00E+00	8.38E+00	
17 Phenanthrene	98.1	1.9	0.0	100.0	8.28E+01	4.10E+01	4.14E+01	3.53E+06	0.00E+00	2.84E+04	5.53E+06	0.00E+00	1.83E+01	2.83E+01	9.28E+00	0.00E+00	0.00E+00	1.46E+00	
18 Anthracene	98.2	1.8	0.0	100.0	2.04E+03	1.25E+01	1.02E+02	8.66E+07	0.00E+00	1.52E+03	1.35E+04	0.00E+00	4.40E+02	6.31E+02	2.23E+02	0.00E+00	0.00E+00	3.51E+01	
19 Fluoranthene	98.4	0.6	0.0	100.0	2.36E+02	1.57E+01	1.18E+02	1.00E+07	0.00E+00	1.17E+04	8.45E+06	0.00E+00	1.32E+01	2.42E+01	1.28E+01	0.00E+00	0.00E+00	4.06E+01	
20 Pyrene	98.4	0.6	0.0	100.0	5.16E+02	3.45E+01	2.58E+02	2.20E+07	0.00E+00	2.83E+04	1.97E+05	0.00E+00	3.32E+01	5.92E+01	3.05E+01	0.00E+00	0.00E+00	1.10E+00	

[illegible]

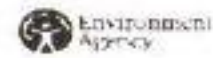


	Average Daily Exposure (mg kg ⁻¹ bw day ⁻¹)							Distribution by Pathway (%)							
	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (total)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (total)	Background (inhalation)
1 Arsenic	2.40E-04	2.27E-05	3.70E-05	7.82E-07	0.00E+00	0.00E+00	0.00E+00	79.80	7.54	12.31	0.25	0.00	0.00	0.00	0.00
2 Cadmium	3.84E-05	1.32E-04	1.97E-07	1.22E-07	0.00E+00	7.54E-04	1.21E-06	11.21	38.70	0.06	0.04	0.00	0.00	48.86	0.04
3 Chromium III	2.27E-02	2.69E-04	0.00E+00	7.06E-05	0.00E+00	3.38E-03	1.94E-05	85.63	1.03	0.00	0.27	0.00	0.00	13.01	0.06
4 Mercury, inorganic	1.25E-03	5.64E-04	0.00E+00	3.97E-06	0.00E+00	5.63E-05	0.00E+00	66.71	30.08	0.00	0.21	0.00	0.00	3.00	0.00
5 Nickel	8.45E-04	4.68E-04	2.43E-05	3.00E-06	0.00E+00	7.31E-03	3.84E-08	52.77	19.18	0.84	0.10	0.00	0.00	48.80	0.10
6 Copper	3.95E-02	1.47E-02	0.00E+00	1.22E-04	0.00E+00	3.94E-01	4.12E-05	36.15	13.78	0.00	0.11	0.00	0.00	49.92	0.04
7 Zinc	1.44E-01	1.59E-01	0.00E+00	4.56E-04	0.00E+00	1.52E+00	1.45E-04	23.85	26.00	0.00	0.08	0.00	0.00	49.85	0.02
8 Selenium	2.60E-03	1.82E-03	0.00E+00	8.24E-06	0.00E+00	1.97E-03	3.84E-06	40.59	28.46	0.00	0.12	0.00	0.00	30.82	0.00
9 Chromium VI	3.83E-04	2.80E-04	0.00E+00	1.15E-06	0.00E+00	3.77E-04	0.00E+00	38.29	28.02	0.00	0.00	0.00	0.00	37.70	0.00
10 Barium	9.86E-03	1.13E-04	0.00E+00	3.13E-05	0.00E+00	4.77E-02	8.06E-02	48.28	0.57	0.00	0.16	0.00	0.00	50.00	0.00
11 Beryllium	3.06E-04	1.61E-05	0.00E+00	8.70E-07	0.00E+00	8.44E-04	0.00E+00	47.42	2.49	0.00	0.15	0.00	0.00	49.92	0.00
12 Vanadium	7.93E-04	7.49E-04	0.00E+00	2.52E-06	0.00E+00	1.28E-03	3.89E-05	27.91	29.36	0.00	0.00	0.00	0.00	45.54	0.09
13 Phenol	1.59E-03	3.01E-01	2.60E-03	5.35E-06	1.60E-03	1.97E-02	2.42E-03	0.51	91.48	0.79	0.00	0.49	0.00	5.96	0.74
14 Acenaphthylene	1.13E-03	5.49E-02	7.67E-04	3.60E-06	3.19E-03	7.88E-06	5.67E-07	1.89	91.52	1.26	0.01	5.31	0.00	0.01	0.00
15 Acenaphthene	1.38E-03	5.42E-02	9.23E-04	4.39E-06	3.43E-03	5.51E-06	1.52E-06	2.30	90.33	1.54	0.01	5.72	0.00	0.00	0.00
16 Fluorene	1.09E-03	3.85E-02	7.29E-04	3.46E-06	1.65E-03	3.32E-06	5.82E-06	2.73	91.21	1.82	0.01	4.13	0.00	0.00	0.01
17 Phenanthrene	6.14E-04	1.11E-02	4.10E-04	1.95E-06	2.44E-04	8.66E-05	3.14E-05	4.80	88.92	3.27	0.02	1.86	0.00	0.69	0.25
18 Anthracene	1.51E-02	2.68E-01	1.01E-02	4.79E-05	6.97E-03	4.50E-05	2.49E-06	5.03	89.26	3.36	0.02	2.02	0.00	0.00	0.00
19 Fluoranthene	1.75E-03	9.45E-03	1.17E-03	5.55E-06	1.09E-04	1.97E-05	5.09E-06	13.97	75.58	9.03	0.04	0.87	0.00	0.16	0.04
20 Pyrene	3.83E-03	2.33E-02	2.58E-03	1.21E-05	2.44E-04	1.97E-05	3.94E-06	12.75	77.80	9.52	0.04	0.81	0.00	0.07	0.01

[illegible]

Environment Agency		Oral Health Criteria Value ($\mu\text{g kg}^{-1} \text{ BW day}^{-1}$)		Inhalation Health Criteria Value ($\mu\text{g kg}^{-1} \text{ BW day}^{-1}$)		Oral Mean Daily Intake ($\mu\text{g day}^{-1}$)		Inhalation Mean Daily Intake ($\mu\text{g day}^{-1}$)		Air-water partition coefficient (K_{aw}) ($\text{cm}^3 \text{ cm}^{-3}$)		Coefficient of Diffusion in Air (D_a) ($\text{m}^2 \text{ s}^{-1}$)		Coefficient of Diffusion in Water (D_w) ($\text{m}^2 \text{ s}^{-1}$)		$\log K_{ow}$ ($\text{cm}^3 \text{ g}^{-1}$)		$\log K_{oc}$ (dimensionless)		Dermal Absorption Fraction (dimensionless)		Soil to dust transport factor (f_p) ($\text{g}^{-1} \text{ day}^{-1}$)		Sub-surface soil to indoor air correction factor (dimensionless)		Relative bioavailability via soil ingestion (unitless)		Relative bioavailability via dust inhalation (unitless)	
1	Arsenic	ID	0.3	ID	0.002	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.03	0.5	1	1	1	1	1	1	1	1	1	1	1
2	Cadmium	TDI	0.38	TDI	0.0014	13.4	0.02	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.001	0.5	1	1	1	1	1	1	1	1	1	1	1
3	Chromium III	TDI	150	TDI	0.1	60.2	0.27	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
4	Mercury, inorganic	TDI	2	TDI	0.06	1	0	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
5	Nickel	TDI	12	TDI	0.008	120	0.04	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.005	0.5	1	1	1	1	1	1	1	1	1	1	1
6	Copper	TDI	160	TDI	0.285	7000	0.88	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
7	Zinc	TDI	600	TDI	600	27000	2.4	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
8	Selenium	TDI	6.4	NR	0	35	0.06	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
9	Chromium VI	TDI	1	NR	0	5.7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
10	Barium	TDI	20	NR	0	647	1000	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
11	Beryllium	TDI	2	ID	0.0012	15	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
12	Vanadium	TDI	3	TDI	0.0288	23	0.84	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0.5	1	1	1	1	1	1	1	1	1	1	1
13	Phenol	TDI	700	TDI	10	350	40	6.35E-06	7.90E-06	6.36E-10	1.92	1.48	0.3	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	Acenaphthylene	TDI	60	TDI	60	0.14	0.011	5.68E-04	5.97E-06	4.82E-10	3.29	3.91	0.13	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	Acenaphthene	TDI	60	TDI	60	0.88	0.025	7.58E-04	5.85E-06	4.70E-10	3.37	4.03	0.13	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	Fluorene	TDI	40	TDI	40	0.59	0.086	4.12E-04	5.58E-06	4.47E-10	3.45	4.13	0.13	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	Phenanthrene	TDI	12.5	TDI	12.5	1.54	0.518	1.43E-04	5.34E-06	4.32E-10	3.74	4.5	0.13	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	Anthracene	TDI	300	TDI	300	0.08	0.041	1.81E-04	5.36E-06	4.36E-10	3.75	4.5	0.13	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	Fluoranthene	TDI	12.5	TDI	12.5	0.35	0.084	6.29E-05	5.01E-06	4.11E-10	4.28	5.13	0.13	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	Pyrene	TDI	30	TDI	30	0.35	0.065	5.84E-05	5.01E-06	4.15E-10	4.21	5.06	0.13	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1

[illegible]



		Soil-to-water partition coefficient (cm ³ g ⁻¹)	Vapour pressure (Pa)	Water solubility (mg L ⁻¹)	Soil-to-plant concentration factor for green vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for root vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for tree fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)
1	Arsenic	5.00E+02	NR	1.2E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00023 fw	0.0002 fw	0.0011 fw
2	Cadmium	1.00E+02	NR	1.6E+06	0.052 fw	0.029 fw	0.011 fw	0.016 fw	0.0031 fw	0.0014 fw
3	Chromium III	4.60E+03	NR	5.6E+05	0.00003 dw	0.00003 dw	0.00003 dw	0.00003 dw	0.00003 dw	0.00003 dw
4	Mercury inorganic	5.00E+02	NR	7.40E+04	0.0038 fw	0.0068 fw	0.043 fw	0.001 fw	0.0011 fw	0.001 fw
5	Nickel	5.00E+02	NR	2.50E+06	0.0038 fw	0.0043 fw	0.0018 fw	0.0025 fw	0.0025 fw	0.0036 fw
6	Copper	1.00E+02	NR	1.3E+06	0.0208 dw	0.0208 dw	0.0208 dw	0.0233 dw	0.0206 dw	0.0206 dw
7	Zinc	3.80E+01	NR	4.3E+06	0.054 dw	0.054 dw	0.054 dw	0.143 dw	0.054 dw	0.054 dw
8	Selenium	5.00E+01	NR	2.1E+06	0.0106 fw	0.00364 fw	0.00063 fw	0.00271 fw	0.003 fw	0.003 fw
9	Chromium VI	1.80E+01	NR	2.30E+06	0.0002 dw	0.0001 dw	0.0001 dw	0.09 dw	0.0003 dw	0.00 dw
10	Barium	0.00E+00	NR	6.00E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
11	Beryllium	1.70E+03	NR	1.6E+06	0.007 dw	0.0012 dw	0.0012 dw	0.0012 dw	0.0012 dw	0.0012 dw
12	Vanadium	1.2E+01	NR	2.1E+06	0.13 dw	0.13 dw	0.013 dw	0.013 dw	0.013 dw	0.013 dw
13	Phenol	4.2E+01	1.15E+01	8.4E+04	model	model	model	0.00E+00	0.00E+00	model
14	Acenaphthylene	0.3E+00	7.0E-02	7.0E+00	model	model	model	model	model	model
15	Acenaphthene	1.2E+01	7.3E-02	4.1E+00	model	model	model	model	model	model
16	Fluorene	1.4E+01	1.5E-02	1.6E+00	model	model	model	model	model	model
17	Phenanthrene	2.8E+01	2.8E-03	1.1E+00	model	model	model	model	model	model
18	Anthracene	2.9E+01	8.4E-05	5.0E-01	model	model	model	model	model	model
19	Fluoranthene	0.3E+01	1.3E-04	2.0E-01	model	model	model	model	model	model
20	Pyrene	6.3E+01	1.5E-05	1.3E-01	model	model	model	model	model	model

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CLEA Software Version 1.06

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Report generated 18/02/2016

Report title

Created by Cesar Azevedo at Geo-Environmental

Environment
Agency

BASIC SETTINGS

Land Use Residential with homegrown produce

Building Semi-detached house

Receptor Female (res)

Start age class 1

End age class 6

Exposure Duration 6 years

Soil Silty clay

Exposure Pathways

Direct soil and dust ingestion	☒
Consumption of homegrown produce	☒
Soil attached to homegrown produce	☒

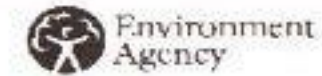
Dermal contact with indoor dust	☒
Dermal contact with soil	☒

Inhalation of indoor dust	☒
Inhalation of soil dust	☒
Inhalation of indoor vapour	☒
Inhalation of outdoor vapour	☒



Land Use Residential with homegrown produce

Age Class	Exposure Frequencies (days yr ⁻¹)						Occupation Periods (hr day ⁻¹)		Soil to skin adherence factors (mg cm ⁻²)		Direct soil ingestion rate (g day ⁻¹)
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor	
1	180	180	180	180	365	365	23.0	1.0	0.06	1.00	0.10
2	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
3	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
4	365	365	365	365	365	365	23.0	1.0	0.06	1.00	0.10
5	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10
6	365	365	365	365	365	365	19.0	1.0	0.06	1.00	0.10
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00



Receptor Female (res)

Age Class	Body weight (kg)	Body height (m)	Inhalation rate (m ³ day ⁻¹)	Max exposed skin factor			Consumption rates (g FW kg ⁻¹ BW day ⁻¹)					
				Indoor (m ² m ⁻²)	Outdoor (m ² m ⁻²)	Total skin area (m ²)	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	5.60	0.7	8.5	0.32	0.26	3.43E-01	7.12	10.69	16.03	1.83	2.23	3.82
2	9.80	0.8	13.3	0.33	0.26	4.84E-01	6.85	3.30	5.46	3.96	0.54	11.96
3	12.70	0.9	12.7	0.32	0.25	5.82E-01	6.85	3.30	5.46	3.96	0.54	11.96
4	15.10	0.9	12.2	0.35	0.28	6.36E-01	6.85	3.30	5.46	3.96	0.54	11.96
5	16.90	1.0	12.2	0.35	0.28	7.04E-01	3.74	1.77	3.38	1.85	0.16	4.26
6	19.70	1.1	12.2	0.33	0.26	7.94E-01	3.74	1.77	3.38	1.85	0.16	4.26
7	22.10	1.2	12.4	0.22	0.15	8.73E-01	3.74	1.77	3.38	1.85	0.16	4.26
8	25.30	1.2	12.4	0.22	0.15	9.36E-01	3.74	1.77	3.38	1.85	0.16	4.26
9	27.50	1.3	12.4	0.22	0.15	1.01E+00	3.74	1.77	3.38	1.85	0.16	4.26
10	31.40	1.3	12.4	0.22	0.15	1.08E+00	3.74	1.77	3.38	1.85	0.16	4.26
11	35.70	1.4	12.4	0.22	0.14	1.19E+00	3.74	1.77	3.38	1.85	0.16	4.26
12	41.30	1.4	13.4	0.22	0.14	1.29E+00	3.74	1.77	3.38	1.85	0.16	4.26
13	47.20	1.5	13.4	0.22	0.14	1.42E+00	3.74	1.77	3.38	1.85	0.16	4.26
14	51.20	1.6	13.4	0.22	0.14	1.52E+00	3.74	1.77	3.38	1.85	0.16	4.26
15	56.70	1.6	13.4	0.21	0.14	1.60E+00	3.74	1.77	3.38	1.85	0.16	4.26
16	59.00	1.6	13.4	0.21	0.14	1.63E+00	3.74	1.77	3.38	1.85	0.16	4.26
17	70.00	1.6	14.8	0.33	0.27	1.78E+00	2.94	1.40	1.79	1.61	0.22	2.97
18	70.90	1.6	12.0	0.33	0.27	1.80E+00	2.94	1.40	1.79	1.61	0.22	2.97

**Building** Semi-detached house

Building footprint (m ²)	4.30E+01
Living space air exchange rate (hr ⁻¹)	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm ²)	5.25E+02
Dust loading factor (µg m ⁻²)	5.00E+01

Soil Silty clay

Porosity, Total (cm ³ cm ⁻³)	6.30E-01
Porosity, Air-Filled (cm ³ cm ⁻³)	1.20E-01
Porosity, Water-Filled (cm ³ cm ⁻³)	5.10E-01
Residual soil water content (cm ³ cm ⁻³)	2.60E-01
Saturated hydraulic conductivity (cm s ⁻¹)	1.17E-03
van Genuchten shape parameter <i>m</i> (dimensionless)	3.16E-01
Bulk density (g cm ⁻³)	9.40E-01
Threshold value of wind speed at 10m (m s ⁻¹)	7.20E+00
Empirical function (<i>F_s</i>) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	8.70E+00
Soil Organic Matter content (%)	8.90E-01
Fraction of organic carbon (g g ⁻¹)	5.16E-03
Effective total fluid saturation (unitless)	6.76E-01
Intrinsic soil permeability (cm ²)	1.56E-08
Relative soil air permeability (unitless)	4.59E-01
Effective air permeability (cm ²)	7.18E-09

**Soil - Vapour Model**

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($\text{cm}^3 \text{s}^{-1}$)	2.50E+01
Building ventilation rate ($\text{cm}^3 \text{s}^{-1}$)	2.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.6m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($\text{m}^2 \text{m}^{-2}$)	0.75

* Air dispersion factor in $\text{g m}^{-2} \text{s}^{-1}$ per kg m^{-3} **Soil - Plant Model**

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

Gardener type Average

Client/Server ref:
Project ref:
Site ref:
Data description:
Container(s):
Test scenario: Planning
Date: 01 January 1900
User details:

Client/enq ref: Project ref: Site ref: Data description: Contaminant(s): Test scenario: Planning Date: 0 January 1900 User details:	>C5-C6 Aliphatic (mg/kg)	>C6-C8 Aliphatic (mg/kg)	>C8-C10 Aliphatic (mg/kg)	>C10-C12 Aliphatic (mg/kg)	>C12-C16 Aliphatic (mg/kg)	>C16-C21 Aliphatic (mg/kg)	>C21-C35 Aliphatic (mg/kg)	>C35-C40 Aliphatic (mg/kg)	>C5-C7 Aromatic (mg/kg)	>C7-C8 Aromatic (mg/kg)	>C8-C10 Aromatic (mg/kg)	>C10-C12 Aromatic (mg/kg)	>C12-C16 Aromatic (mg/kg)	>C16-C21 Aromatic (mg/kg)	>C21-C35 Aromatic (mg/kg)	>C35-C40 Aromatic (mg/kg)
Critical concentration, C _c	4373.39	12888.96	1349.252	3430.672	4363.553	88386.43	88386.43	88386.43	98.34952	149.3579	50.55218	72.1896	126.7703	226.3884	854.7364	854.7364
Notes																
Full dataset size	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Outliers present?	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No	No	Yes	No	Yes
Number of outliers temporarily excluded	0															
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Sample mean, $\bar{x}$	0.005	0.005	0.5	0.5	0.5	0.7	13.28	9.7	0.005	0.005	0.5	0.5	0.5	1.5	31.44	16.48
Standard deviation, s	0	0	0	0	0	0.4472136	25.122241	20.571825	0	0	0	0	0	2.236068	43.139576	34.679994
Number of non-detects	5	5	5	5	5	4	1	4	5	5	5	5	5	4	2	3
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Single value	Single value	Single value	Single value	Single value	Non-normal	Non-normal	Non-normal	Single value	Single value	Single value	Single value	Single value	Non-normal	Normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t	Auto: Chebychev

Test scenario:	Planning: Is true mean lower than critical concentration ($\mu < C_c$)?	Evidence level required:	95%	Use Normal distribution to reject outliers.
t statistic, t _s (or k _d)	N/A	N/A	N/A	N/A
Upper confidence limit (on true mean concentration, μ)	0.005	0.005	0.5	0.5
Evidence level	100%	100%	100%	100%
Base decision on:	evidence level	evidence level	evidence level	evidence level

Client/client ref:
Project ref:
Site ref:
Data description:
Contaminant(s):
Test scenario: Planning
Date: 0 January 1900
User details:

	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	Benzo (a) pyrene (mg/kg)
Critical concentration, C_c	37	1328.781	148.0899	26	19532.66	7809.698	200	180.636	531.3854	350.2414	118.2839	19395.13	5
Notes													
Full dataset size	5	5	5	5	5	5	5	5	5	5	5	5	5
Outliers present?	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No
Number of outliers temporarily excluded	0												
Number removed by filter	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample size, n	5	5	5	5	5	5	5	5	5	5	5	5	5
Sample mean, $\bar{x}$	7.44	102.86	0.5	0.43	20.46	23.38	100.3	0.25	14.9	0.5	25.98	189.52	1.83
Standard deviation, s	2.3093289	109.4065	0	0.2564176	2.1927152	10.094404	84.017885	0	3.5651087	0	2.1936271	193.07845	2.279693
Number of non-detects	0	0	5	3	0	0	0	5	0	5	0	0	1
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Distribution	Normal	Non-normal	Single value	Normal	Normal	Normal	Normal	Single value	Normal	Single value	Normal	Normal	Normal
Statistical approach	Auto: One-sample t	Auto: Chebyshev	Auto: Chebyshev	Auto: One-sample t	Auto: One-sample t	Auto: One-sample t	Auto: One-sample t	Auto: Chebyshev	Auto: One-sample t	Auto: Chebyshev	Auto: One-sample t	Auto: One-sample t	Auto: One-sample t
Test scenario:	Planning: Is true mean lower than critical concentration ($\mu < C_c$)?												
t statistic, t_0 (or k_0)	-28.62224139	-25.05557415	N/A	-222.9809963	-19897.98583	-1724.790744	-2.65343477	N/A	-323.9442286	N/A	-94.08978235	-222.422752	-3.109337796
Upper confidence limit (on true mean concentration, μ)	9.6416931	316.13254	0.5	0.6744662	22.550515	33.003913	180.40188	0.25	18.298942	0.5	28.071384	373.59923	4.0034384
Evidence level	100%	100%	100%	100%	100%	100%	97%	100%	100%	100%	100%	100%	98%



2683



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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 16-05550

Issue: 1

Date of Issue: 11/02/2016

Contact: Cesar Azevedo

Customer Details: GESL
Unit 7
Danworth Farm
Hurstpierpoint
West Sussex BN6 9GL

Quotation No: Q14-00021

Order No: 400

Customer Reference: GE15231

Date Received: 03/02/2016

Date Approved: 11/02/2016

Details: 4 Meyrick Road, Havant

Approved by: 

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

Sample Summary

Report No.: 16-05550

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
52760	WS1 0.20	01/02/2016	04/02/2016	Silty loam	
52761	WS1 0.50	01/02/2016	04/02/2016	Silty loam	
52762	WS1 1.00	01/02/2016	04/02/2016		
52763	WS1 1.50	01/02/2016	04/02/2016		
52764	WS2 0.30	01/02/2016	04/02/2016	Clay	
52765	WS2 0.50	01/02/2016	04/02/2016	Sandy silty loam	
52766	WS2 1.00	01/02/2016	04/02/2016		
52767	WS2 1.50	01/02/2016	04/02/2016		
52768	WS3 0.30	01/02/2016	04/02/2016	Silty loam	
52769	WS3 0.50	01/02/2016	04/02/2016		
52770	WS3 0.70	01/02/2016	04/02/2016		
52771	WS3 1.00	01/02/2016	04/02/2016		
52772	WS4 0.20	01/02/2016	04/02/2016	Silty loam	
52773	WS4 0.50	01/02/2016	04/02/2016	Silty loam	
52774	WS4 1.00	01/02/2016	04/02/2016		

Results Summary

Report No.: 16-05550

2683

ELAB Reference				52760	52761	52764	52768	52772
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				WS1	WS1	WS2	WS3	WS4
Sample Depth (m)				0.20	0.50	0.30	0.30	0.20
Sampling Date				01/02/2016	01/02/2016	01/02/2016	01/02/2016	01/02/2016
Determinand	Codes	Units	LOD					
Metals								
Arsenic	M	mg/kg	1	7.4	6.7	6.0	5.7	11.4
Barium	M	mg/kg	10	294	64.3	38.8	28.3	88.9
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	0.6	0.8
Chromium	M	mg/kg	5	23.8	18.2	20.9	18.8	20.6
Copper	M	mg/kg	5	24.4	20.1	19.9	12.7	39.8
Lead	M	mg/kg	5	205	67.9	35.5	19.1	174
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	14.6	12.5	10.6	19.4	17.4
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	27.0	25.0	26.5	22.8	28.6
Zinc	M	mg/kg	5	226	104	50.9	55.7	511
Anions								
Water Soluble Chloride	M	mg/kg	40	43	< 40	< 40	46	< 40
Water Soluble Sulphate	M	g/l	0.02	0.06	0.03	0.04	0.07	0.13
Inorganics								
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	3	2	2	2	2
Total Cyanide	M	mg/kg	1	2.1	1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO ₄)	U	%SO ₄	0.02	< 0.02	< 0.02	0.04	< 0.02	0.06
Water Soluble Boron	N	mg/kg	0.5	0.6	0.6	1.1	0.5	1.7
Miscellaneous								
pH	M	pH units	0.1	8.0	8.3	9.6	9.4	8.0
Total Organic Carbon	N	%	0.01	1.2	1.0	0.53	0.13	1.6
Phenols								
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	< 0.1	0.3	0.2	< 0.1	0.4
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4
Acenaphthene	M	mg/kg	0.1	< 0.1	0.1	0.9	< 0.1	0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	0.6	< 0.1	0.2
Phenanthrene	M	mg/kg	0.1	0.1	0.8	7.9	< 0.1	3.2
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	1.8	< 0.1	0.8
Fluoranthene	M	mg/kg	0.1	0.5	0.7	8.4	< 0.1	8.3
Pyrene	M	mg/kg	0.1	0.4	0.6	7.1	< 0.1	6.9
Benzo(a)anthracene	M	mg/kg	0.1	0.3	0.4	3.5	< 0.1	4.3
Chrysene	M	mg/kg	0.1	0.3	0.6	3.8	< 0.1	5.7
Benzo (b) fluoranthene	M	mg/kg	0.1	0.3	0.4	3.0	< 0.1	4.7
Benzo(k)fluoranthene	M	mg/kg	0.1	0.3	0.4	2.6	< 0.1	4.7
Benzo (a) pyrene	M	mg/kg	0.1	0.3	0.4	3.2	< 0.1	5.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	0.4	0.3	2.5	< 0.1	3.7
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	0.6	< 0.1	0.9
Benzo(g,h,i)perylene	M	mg/kg	0.1	0.2	0.3	2.1	< 0.1	3.2
Total PAH(16)	M	mg/kg	0.4	3.2	5.7	48.3	< 0.4	52.7

Results Summary

2683

Report No.: 16-05550

ELAB Reference	52760	52761	52764	52768	52772
Customer Reference					
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	WS1	WS1	WS2	WS3	WS4
Sample Depth (m)	0.20	0.50	0.30	0.30	0.20
Sampling Date	01/02/2016	01/02/2016	01/02/2016	01/02/2016	01/02/2016

Determinand	Codes	Units	LOD					
BTEX								
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
TPH CWG								
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.5
>C21-C35 Aliphatic	N	mg/kg	1	58.1	1.4	< 1.0	1.2	5.2
>C35-C40 Aliphatic	N	mg/kg	1	46.5	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	5.5
>C21-C35 Aromatic	N	mg/kg	1	95.4	3.6	< 1.0	< 1.0	57.2
>C35-C40 Aromatic	N	mg/kg	1	78.5	< 1.0	< 1.0	< 1.0	2.4
Total (>C5-C40) Ali/Aro	N	mg/kg	1	279	5.1	< 1.0	1.2	71.8
PCB (ICES 7 congeners)								
PCB 28	M	mg/kg	0.01	< 0.01	n/t	< 0.01	n/t	n/t
PCB 52	M	mg/kg	0.01	< 0.01	n/t	< 0.01	n/t	n/t
PCB 101	M	mg/kg	0.01	< 0.01	n/t	< 0.01	n/t	n/t
PCB 118	M	mg/kg	0.01	< 0.01	n/t	< 0.01	n/t	n/t
PCB 153	M	mg/kg	0.01	< 0.01	n/t	< 0.01	n/t	n/t
PCB 138	M	mg/kg	0.01	< 0.01	n/t	< 0.01	n/t	n/t
PCB 180	M	mg/kg	0.01	< 0.01	n/t	< 0.01	n/t	n/t
PCB (Total of 7 Congeners)	M	mg/kg	0.03	< 0.03	n/t	< 0.03	n/t	n/t

Results Summary

Report No.: 16-05550

ELAB Reference	52765	52773
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS2	WS4
Sample Depth (m)	0.50	0.50
Sampling Date	01/02/2016	01/02/2016

Determinand	Codes	Units	LOD		
VOC					
Heptane	N	ug/kg	10	< 10.0	< 10.0
Octane	N	ug/kg	10	< 10.0	< 10.0
Nonane	N	ug/kg	10	< 10.0	< 10.0
Benzene	M	ug/kg	10	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0
m+p-xylene	M	ug/kg	10	< 10.0	< 10.0
o-xylene	M	ug/kg	10	< 10.0	< 10.0
cis-1,2-dichloroethene	M	ug/kg	10	< 10.0	< 10.0
1,1-Dichloroethane	M	ug/kg	10	< 10.0	< 10.0
Chloroform	M	ug/kg	10	< 10.0	< 10.0
Tetrachloromethane	M	ug/kg	10	< 10.0	< 10.0
1,1,1-Trichloroethane	M	ug/kg	10	< 10.0	< 10.0
Trichloroethylene	M	ug/kg	10	< 10.0	< 10.0
Tetrachloroethylene	M	ug/kg	10	< 10.0	< 10.0
1,1,1,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
1,1,2,2-Tetrachloroethane	M	ug/kg	10	< 10.0	< 10.0
Chlorobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromobenzene	M	ug/kg	10	< 10.0	< 10.0
Bromodichloromethane	M	ug/kg	10	< 10.0	< 10.0
Methylethylbenzene	M	ug/kg	10	< 10.0	< 10.0
1,1-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
Trans - 1-2 -dichloroethylene	N	ug/kg	10	< 10.0	< 10.0
2,2-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
Bromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromomethane	M	ug/kg	10	< 10.0	< 10.0
1,2-Dichloropropane	M	ug/kg	10	< 10.0	< 10.0
cis-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
trans-1,3-Dichloro-1-propene	M	ug/kg	10	< 10.0	< 10.0
1,1,2-Trichloroethane	N	ug/kg	10	< 10.0	< 10.0
Dibromochloromethane	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichloropropane	N	ug/kg	10	< 10.0	< 10.0
1,2-dibromoethane	M	ug/kg	10	< 10.0	< 10.0
Styrene	N	ug/kg	10	< 10.0	< 10.0
Propylbenzene	N	ug/kg	10	< 10.0	< 10.0
2-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
4-Chlorotoluene	N	ug/kg	10	< 10.0	< 10.0
t-butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,3,5-Trimethylbenzene	N	ug/kg	10	< 10.0	< 10.0
1-methylpropylbenzene	N	ug/kg	10	< 10.0	< 10.0
o-cymene	N	ug/kg	10	< 10.0	< 10.0
1,3-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Butylbenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dibromo-3-chloropropane	N	ug/kg	10	< 10.0	< 10.0
Hexachlorobutadiene	N	ug/kg	10	< 10.0	< 10.0
1,2,3-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Naphthalene	N	ug/kg	10	< 10.0	< 10.0
1,2,4-Trichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,4-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
1,2-Dichlorobenzene	N	ug/kg	10	< 10.0	< 10.0
Bromoform	N	ug/kg	10	< 10.0	< 10.0

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The Environmental Laboratory Ltd. Reg. No. 3882193



2683



Results Summary

Report No.: 16-05550

ELAB Reference	52765	52773
Customer Reference		
Sample ID		
Sample Type	SOIL	SOIL
Sample Location	WS2	WS4
Sample Depth (m)	0.50	0.50
Sampling Date	01/02/2016	01/02/2016

Determinand	Codes	Units	LOD		
VOC					
VOC TIC					
Various	N	ug/kg	100	None Detected	None Detected
TIC					



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Results Summary

Report No.: 16-05550

Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
52760	0.20	WS1	Silty loam	No asbestos detected
52761	0.50	WS1	Silty loam	No asbestos detected
52764	0.30	WS2	Clay	No asbestos detected
52768	0.30	WS3	Silty loam	No asbestos detected
52772	0.20	WS4	Silty loam	No asbestos detected

Method Summary

Report No.: 16-05550

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
VOC in solids	M	As submitted sample	05/02/2016		GC-MS
Sulphide	N	As submitted sample	08/02/2016	109	Colorimetry
Hexavalent chromium	N	As submitted sample	05/02/2016	110	Colorimetry
pH	M	Air dried sample	09/02/2016	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	09/02/2016	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	08/02/2016	118	ICPMS
PCB (ICES 7 congeners)	M	Air dried sample	05/02/2016	120	GC-MS
Phenols in solids	M	As submitted sample	05/02/2016	121	HPLC
Elemental Sulphur	N	Air dried sample	08/02/2016	122	HPLC
PAH (GC-FID)	M	As submitted sample	05/02/2016	133	GC-FID
Water soluble anions	M	Air dried sample	08/02/2016	172	Ion Chromatography
VOC in solids	M	As submitted sample	05/02/2016	181	GC-MS
BTEX in solids	M	As submitted sample	08/02/2016	181A	GC-MS
Water soluble boron	N	Air dried sample	08/02/2016	202	Colorimetry
Total cyanide	M	As submitted sample	08/02/2016	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	08/02/2016	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	05/02/2016	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	08/02/2016	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	05/02/2016	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	08/02/2016	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	08/02/2016	214	GC-MS
Asbestos identification	U	As submitted sample	11/02/2016	PMAN	Microscopy

Tests marked N are not UKAS accredited

Report Information

Report No.: 16-05550

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage