SUPPLEMTARY SOIL CONTAMINATION ASSESSMENT

Client	Bugler Developments Limited
Works	Hand Excavated Trial Pitting and Soil Contamination Testing
Site	Former Childrens Centre, 113 Charville Lane, Hayes, UB4 8PD

Project	Version	Date
23-267.01	1	31 January 2024

1.0 INTRODUCTION

Aviron Associates Limited (Aviron) was instructed by Bugler Developments Limited [The Client] to attend site and complete a number of hand excavated trial pits to assess shallow ground conditions in previously un-investigated areas of the site to allow the collection of shallow soil samples for chemical analysis and supplement the existing site investigation completed by Card Geotechnics Limited (CGL).

CGL previously completed site investigation can be reviewed within their Geoenvironmental and Geotechnical Interpretative Report, dated September 2023 and referenced CGK/00808.

Pertinent to this assessment the CGL investigation and interpretation is summarised as follows:

- Seven (WS01 to WS07) window sample boreholes were advanced to depths up to 4.45m below ground level (bgl).
- All investigative locations were completed within existing soft landscaping.
- Made Ground are varying descriptions and generally considered to be a re-worked Topsoil was present within all locations, proven to 0.8m bgl. Beneath the overlying unit of Made Ground the brown, grey Clay of the London Clay Formation was encountered.
- Soil samples were collected from the Made Ground and London Clay for chemical (contamination) analysis which recorded all determinant concentrations below the relevant (private gardens) residential with plant uptake end use criteria.
- CGL considered a LOW risk was presented to site end users and remedial measures were not required.
- Notwithstanding a phytotoxic exceedance of Zinc (631mg/kg at 0.2m-0.3m) was encountered within the Made Ground/Re-worked Topsoil sampled in WS02.
- CGL also recommended discovery strategy be enacted in the event previously undiscovered contamination is encountered.

Proposals for supplementary investigation involve:

- Exploratory holes within the north-east corner of the site where tarmac play area is present which shall be re-developed into garden are of the proposed education building and adjacent home.
- Exploratory holes around WS02 where Zinc (phytotoxic) contamination was recorded.

Enclosed within **Appendix I** are:

- **Figure 1** – Existing Site Layout and Exploratory Hole Location Plan.
- **Figure 2** – Proposed Site Layout and Exploratory Hole Location Plan.

Figures 1 and 2 provide CGL locations and also Aviron locations which shall be discussed within section 2.0.

2.0 FIELD WORK

At the time of the investigation works the site was unchanged in appearance from that investigated by CGL in July 2023; comprising parking and soft landscaping to the front, a single storey former children's centre in the centre and tarmac play area with soft landscaping in the rear.

Enclosed within **Appendix I** are:

- **Figure 3** – Site Photograph Location Plan
- **Figure 4** – Site Photographs

An Aviron Team attended site on 15 January 2024 to complete the hand excavation of six trial holes (HP11 to HP15) to depths of up to 1.2m bgl using hand excavation tools. A shallow sample was also collected from the position of BH12.

The objective of the exercise was to visually and chemically assess the shallow soils in the area of the tarmac play area and local to WS02.

Figures 1 and **2** presents Exploratory Hole Location Plans and Table 1 provides a rationale of trial hole locations.

Table 1: Rationale of Hole Locations and Soil Geochemical Testing

Location	Rationale	Strata Sampled	Analysis Scheduled
HP11	Located in the north-west of the site in proposed private gardens and in vicinity to WS02.	RTS/MG. 0.4m	ES-1
HP12	Located in the north-west of the site in proposed private gardens and in vicinity to WS02.	RTS/MG. 0.2m	ES-1
HP13	Located in the north of the site in proposed private gardens and in vicinity to WS02.	RTS/MG. 0.3m	ES-1
HP14	Located in the north of the site in proposed private garden and within existing tarmac play-area	MG. 0.5m	ES-1
HP15	Located in the north-east of the site in amenity space and within existing tarmac play-area	MG. 0.6m MG. 0.8m	ES-1 ES-1
BH12	Located in the north of the site in vicinity to WS02.	RTS/MG. 0.3m	Zinc
RTS = Re-worked Topsoil. MG = Made Ground.			

The **trial hole logs** and **photographs** are presented in **Appendix II** and generally ground conditions are summarised in table 2.

Table 2: Summary of Ground Conditions Encountered

Unit	Description	From (bgl)	To (bgl)
RTS/MG	HP11 to HP13 and BH12. Dark brown dark grey silty sandy slightly gravelly CLAY with brick fragments, ash, timber,	GL	0.4m/ 0.6m
MG	HP14 and HP14. Tarmac upon black light brown very silty clayey gravelly SAND with whole bricks, brick fragments, concrete and ash	GL	0.9m
London Clay Formation	Firm to soft light brown, orange, dark grey dark brown silty sandy gravelly CLAY.	0.4m/ 0.9m	1.2m
Groundwater	Groundwater was encountered as follows: HP11 – seepage around 0.6m with water standing at 0.65m upon completion of hole. HP12 – seepage around 0.7m with water standing at 0.8m upon completion of hole. HP13 – seepage around 0.8m with water standing at 0.8m upon completion of hole. HP14 – Not encountered. HP15 – Not encountered.		

Observations	An oily/hydrocarbon odour was encountered within the MG of HP14 and HP15 at 0.3-0.7m bgl and 0.4-0.9m bgl.
GL = Ground Level	

Re-worked Topsoil (Made Ground) overlies existing soft landscaped area of the site and a granular Made Ground beneath the existing tarmac play-area.

Environmental soil samples were collected within each of the hand pits, which are summarised within table 1. The purpose of the samples was to provide representative chemical analysis of the materials present.

All soil samples were collected from excavated arisings using latex gloves and a clean stainless-steel trowel. Samples were placed into pre-labeled amber jars. All soil samples were collected in accordance with Aviron's standard sampling protocols. Environmental soil samples were submitted for the following analysis:

- Aviron's 'ES-1' includes the following parameters; arsenic, barium, cadmium, total chromium, copper, nickel, zinc, lead, mercury, selenium, water soluble boron, total cyanide, total sulphate, water soluble sulphate (SO4), total sulphur, speciated PAH, total phenols, pH, TPH CWG (Total Petrol Hydrocarbon Criteria Working Group), Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), Methyl Tert-Butyl Ether (MTBE), asbestos and organic matter.
- Only Zinc was tested within BH12 to enable delineation of the phytotoxic contaminant of concentration.

Aviron's ES-1 Suite was developed to provide a broad suite of analysis for commonly encountered soil contaminants and testing depths were selected of those where dermal contact may exist to future site users.

Samples were submitted to i2 Analytical Limited on 15 January 2024, being placed within ice-packed cool boxes during transit.

3.0 CHEMICAL LABORATORY RESULTS

3.1 Human Health Assessment

Laboratory certificates of analysis are presented in **Appendix III** along with an appraisal of the human health guidance criteria applied by Aviron for soil chemical appraisal. The chemical results have been appraised for the proposed residential end use with homegrown produce in areas of proposed private gardens (allow locations bar HP15) and the homegrown without produce in areas of communal gardens (HP15). The 2.5% SOM guidance shall be selected on the basis of the laboratory SOM results.

The results of the laboratory are summarised in Table 3, presenting results where determinant exceedances have been reported when compared to the above criteria.

Table 3: Summary of Exceedances

Location	Strata	Determinant	Measured Conc. (mg/kg)	Guidance Conc. (mg/kg)
HP11 (0.4m)	All	Determinants	Human Health	Acceptable
HP12 (0.2m)	All	Determinants	Human Health	Acceptable
HP13 (0.3m)	All	Determinants	Human Health	Acceptable
HP14 (0.5m)	Made Ground	Asbestos – chrysotile fibres and debris	0.005%	Detected
HP15 (0.6m)	All	Determinants	Human Health	Acceptable
HP15 (0.8m)	Made Ground	Asbestos – chrysotile fibres	<0.001%	Detected
BH12 (0.3m)	All	Determinants	Human Health	Acceptable

Detections of chrysotile asbestos have been recorded within HP14 and HP15 within the Made Ground sub-base beneath the tarmac Play-Area, which shall form new private and communal gardens.

The presence of asbestos fibre a likely a result of asbestos contamination within re-purposed fill material/agreement which was used to form the sub-base to the Play-Area. Accordingly remedial shall be required which will involve:

- **Private Graden (HP14).** Removal of the Made Ground sub-base to a depth of 0.6m below final levels. At 0.6m the formation should be covered with a high-viz geotextile membrane prior to laying with 0.6m (600mm) of 'clean cover' of sub-soils and topsoil.
- **Communal Graden (HP15).** Removal of the Made Ground sub-base to a depth of 0.3m below final levels. At 0.6m the formation should be covered with a high-viz geotextile membrane prior to laying with 0.6m (600mm) of 'clean cover' of sub-soils and topsoil. Should vegetable/produce planting be proposed in parts of this communal/education garden the removal/cover thickness/depth should be increased to 600mm.

Enclosed within **Appendix I** is **Figure 5** which pr

A formal Remediation Action Plan may be necessary.

3.2 Phytotoxic Assessment

CGL reported a zinc concentration 631mg/kg in WS02 within the overlying Made Ground/Re-worked Topsoil at 0.2m-0.3m. The BS3882 guidance for Zinc where pH is greater than 7 is 300mg/kg.

As part of the Aviron assessment zinc was considered in terms of phytotoxicity and the impact on new planting.

Targeted to WS02 a sample of re-worked Topsoil was collected from HP12 and surrounding WS02 samples of re-worked topsoil were collected from HP11, BH12 and HP13 to determine Zinc concentrations.

Zinc concentrations were recorded as follows:

- HP11 at 0.4m to west of WS02 of 110mg/kg
- HP12 at 0.2m upon WS02 of 290mg/kg
- HP13 at 0.3m to east of WS02 of 120mg/kg
- BH12 at 0.3m to south of WS02 of 140mg/kg

The average Zinc concentration from the Aviron dataset which is local to WS02 and from the re-worked Topsoil (Made Ground) is 165mg/kg, below the BS3882 guidance of 300mg/kg.

Taking account of the CGL Zinc concentrations from the re-worked Topsoil local to WS02 and inclusive of WS01 and WS03 an average Zinc concentration of 268mg/kg has been determined.

Combining the results of the CGL and Aviron assessment an average Zinc concentration for the re-worked Topsoil in rear gardens to the north-west of the site of 216mg/kg has been determined.

It is not considered the existing and overlying unit of re-worked Topsoil shall present a phytotoxic risk to new plant life on the basis the *en mass* Zinc dataset for pH >7 is below 300mg/kg and during landscaping is it expected the re-worked Topsoil shall be cultivated and turned to prepare for new planting and as such homogenise the material to be representative of the average Zinc concentrations indicated above.

4 RECOMMENDATIONS

To remove the risk from asbestos contaminated Made Ground in areas of new gardens/soft landscaping the following can be completed:

1. Cover the area in permanent hardstand (pavers/tarmac) to create a hard-landscaped encapsulated surfacing.
2. Construct a 600mm/300mm thick cover system to soft landscaped/gardens areas with at least 600mm/300mmm of 'clean Topsoil' (and sub-soil) placed upon a geotextile membrane. The 600mm thickness applied to private gardens or area of vegetable/produce planting and the lesser 300mm thickness to communal gardens where produce shall not be grown.

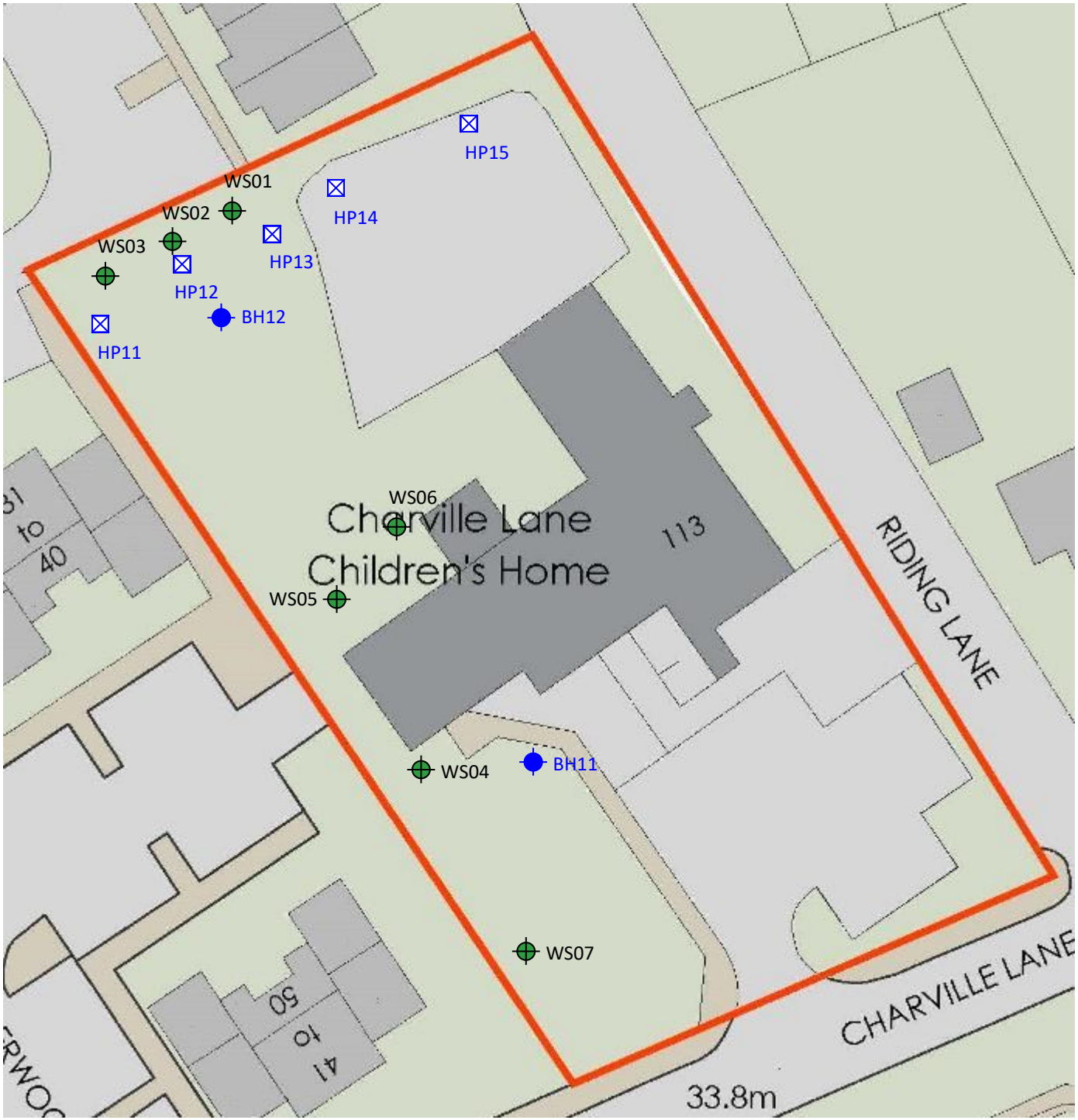
We trust this meets your approval. Any questions please contact the undersigned.

Prepared by

James Burkitt BEng (Hons) CEnv MRICS
Managing Director
Aviron Associates Limited

Appendix I

Figure 1 – Exploratory Hole and Existing Site Layout Plan
Figure 2 – Exploratory Hole and Proposed Site Layout Plan
Figure 3 – Site Photograph Location Plan
Figure 4 – Site Photographs



Legend

- CGL Window Sample
- Aviron Hand Pit
- Aviron Cable Percussion Borehole

Notes

Figure 1

Drawing Title	Exploratory Hole and Existing Site Layout Plan
Project Number	23-267.01
Project Title	113 Charville Lane, Hayes, UB4 8PD
Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk

Legend

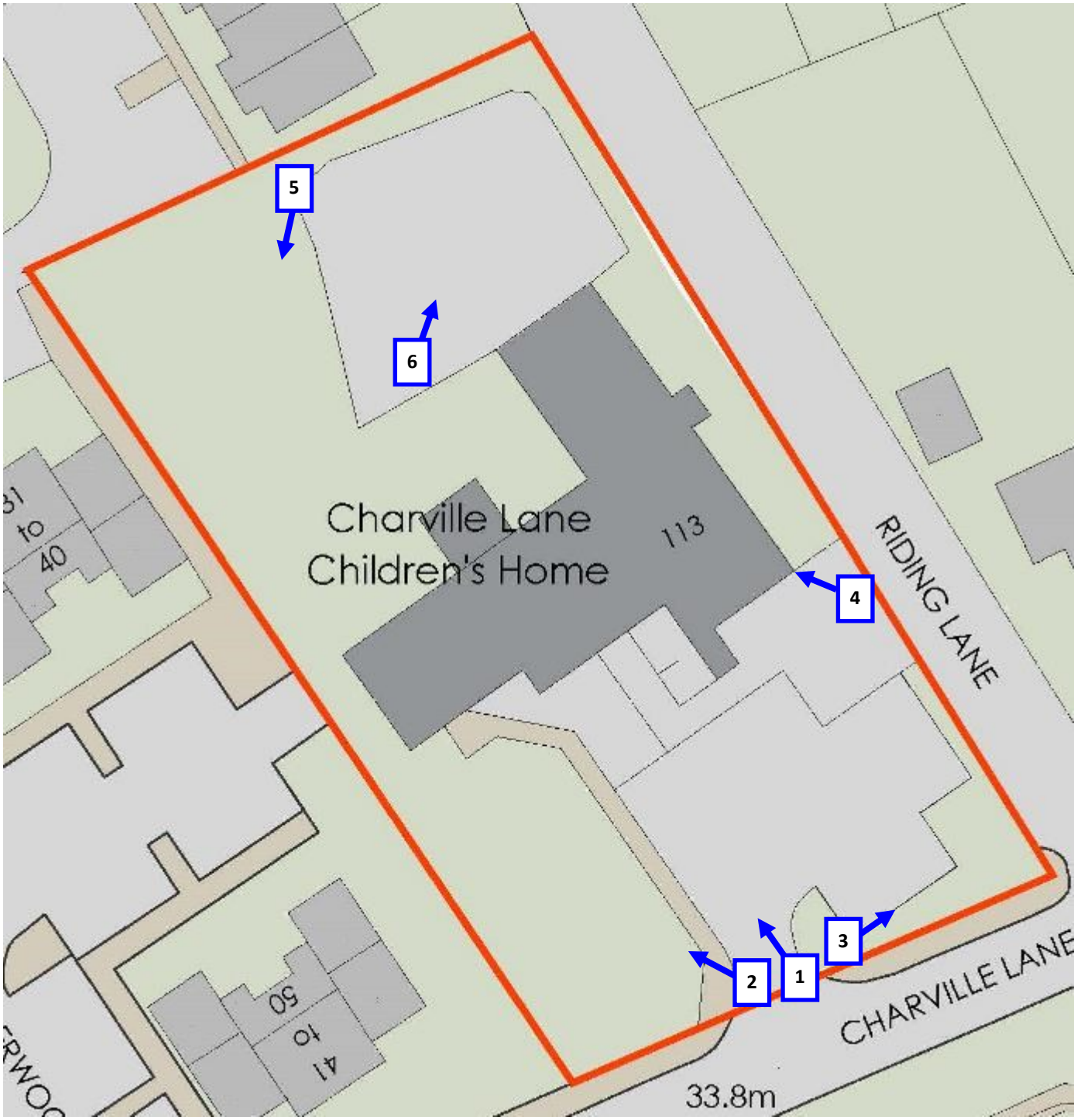
- CGL Window Sample
- Aviron Hand Pit
- Aviron Cable Percussion Borehole

Notes

Figure 2

Drawing Title	Exploratory Hole and Proposed Site Layout Plan
Project Number	23-267.01
Project Title	113 Charville Lane, Hayes, UB4 8PD
Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk



Legend

Photo Direction

Notes

Figure 3

Drawing Title

Site Photograph Location Plan

Project Number	23-267.01
Project Title	113 Charville Lane, Hayes, UB4 8PD
Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk

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Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Legend

Notes

Taken

Figure 4

Drawing Title

Site Photographs

Project Number	23-267.01

Project Title

113 Charville Lane, Hayes, UB4 8PD

Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk

Legend

- CGL Window Sample
- Aviron Hand Pit
- Aviron Cable Percussion Borehole
- Approx. extent of Tarmac Play-Area (Remediation Area)
- 'Contaminated' Location
- 'Un-Contaminated' Location

Notes

Figure 5

Drawing Title	Human Health Soil Contamination Location Plan
Project Number	23-267.01
Project Title	113 Charville Lane, Hayes, UB4 8PD
Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk

Appendix II
Trial Hole Logs and Photographs

HAND PIT LOG

Project:		Project No.	Trial Pit:
113 Charville Lane, Hayes, UB4 8PD		23-267.01	HP11
Client:	Start:	End:	Sheet:
Bugler Developments Limited	15/01/2024	15/01/2024	1 of 1
Method/Plant Used:	Co-ordinates:	Ground Level:	
Hand Dig tools	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	Laboratory Test Details
Dark brown dark grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded of flint. Occasional medium size fragments of waste timber. Rare sub-angular fine gravel size fragments of brick. (REWORKED TOPSOIL/MADE GROUND)		(0.6) 0.6		0.4	1	ES1	
Firm orange light brown locally mottled light grey silty sandy rarely gravelly CLAY. Gravel is fine to coarse sub-angular to rounded of flint. (LONDON CLAY FORMATION)		(0.6) 1.2					

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
0.30	0.30	1.20	15/01/2024	0.6	0.8	Seepage	0.65	

Remarks		By
No roots present in trial pit. Groundwater seepage encountered from 0.6m bgl. No visual or olfactory evidence of contamination. Trial pit backfilled with arisings.	Logged	AC
	Checked	JB
		Scale 01:25

Aviron Associates Limited - Badgemore House - Greys Road - Henley on Thames - RG9 4NR - T:01491 413 722 - M: 07787771686 - E:james@aviron.co.uk

HAND PIT LOG

Project:		Project No.	Trial Pit:
113 Charville Lane, Hayes, UB4 8PD		23-267.01	HP12
Client:	Start:	End:	Sheet:
Bugler Developments Limited	15/01/2024	15/01/2024	1 of 1
Method/Plant Used:	Co-ordinates:	Ground Level:	
Hand Dig tools	NT	NT	

Description of Strata	Legend	Depth (m bgl) *(thickness)*	Well Cnstr.	Samples/Tests Depth	No	Type	Laboratory Test Details
Black dark grey humic silty sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded of flint. Rare sub-angular fine gravel size fragments of brick. Rare fine fragments of ash. (REWORKED TOPSOIL/MADE GROUND)		*(0.4)* **0.4**		0.2	1	ES1	
Firm to soft light brown locally mottled dark grey silty sandy rarely gravelly CLAY. Gravel is fine to coarse sub-angular to rounded of flint. (LONDON CLAY FORMATION)		*(0.8)* **1.2**					

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
0.30	0.30	1.20	15/01/2024	0.7	0.8	Seepage	0.8	

Remarks		By
No roots present in trial pit. Groundwater seepage encountered from 0.7m bgl. No visual or olfactory evidence of contamination. Trial pit backfilled with arisings.	Logged	AC
	Checked	JB
		Scale 01:25

Aviron Associates Limited - Badgemore House - Greys Road - Henley on Thames - RG9 4NR - T:01491 413 722 - M: 07787771686 - E:james@aviron.co.uk

HAND PIT LOG

Project:		Project No.	Trial Pit:
113 Charville Lane, Hayes, UB4 8PD		23-267.01	HP13
Client:	Start:	End:	Sheet:
Bugler Developments Limited	15/01/2024	15/01/2024	1 of 1
Method/Plant Used:	Co-ordinates:	Ground Level:	
Hand Dig tools	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	Laboratory Test Details
Dark brown dark grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded of flint. Rare sub-angular fine gravel size fragments of brick. Rare fine fragments of ash. (REWORKED TOPSOIL/MADE GROUND)		(0.6) 0.6		0.3	1	ES1	
Firm to soft light brown locally mottled dark grey silty sandy rarely gravelly CLAY. Gravel is fine to coarse sub-angular to rounded of flint. (LONDON CLAY FORMATION)		(0.4) 1.0					

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
0.30	0.30	1.00	15/01/2024	0.8	0.90	Seepage	0.80	

Remarks		By
No roots present in trial pit. Groundwater seepage encountered from 0.8m bgl. No visual or olfactory evidence of contamination. Trial pit backfilled with arisings.	Logged	AC
	Checked	JB
		Scale 01:25

Aviron Associates Limited - Badgemore House - Greys Road - Henley on Thames - RG9 4NR - T:01491 413 722 - M: 07787771686 - E:james@aviron.co.uk

HAND PIT LOG

Project:		Project No.	Trial Pit:
113 Charville Lane, Hayes, UB4 8PD		23-267.01	HP14
Client:	Start:	End:	Sheet:
Bugler Developments Limited	15/01/2024	15/01/2024	1 of 1
Method/Plant Used:	Co-ordinates:	Ground Level:	
Hand Dig tools	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	Laboratory Test Details
Tarmac.		(0.05) 0.05		0.5	1	ES1	
Black light brown silt clayey gravelly SAND. Gravel if fine to medium sub-angular to rounded of flint, type one and shingle. Occasional whole bricks and sub-angular fine to medium gravel size fragments of brick. Concrete rubble. Infrequent fine to coarse gravel size fragments of ash. (MADE GROUND)		(0.85) 0.9					
Firm to soft light brown orange locally mottled dark grey silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded of flint. (LONDON CLAY FORMATION)		(0.2) 1.1					

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
0.25	0.25	1.10	15/01/2024	-	-	-	-	

Remarks		By
No roots present in trial pit. No groundwater encountered in trial pit. Very slight oily/HC odor from between 0.3m bgl to 0.7m bgl. Trial pit backfilled with arisings.	Logged	AC
	Checked	JB
		Scale 01:25

Aviron Associates Limited - Badgemore House - Greys Road - Henley on Thames - RG9 4NR - T:01491 413 722 - M: 07787771686 - E:james@aviron.co.uk

HAND PIT LOG

Project:		Project No.	Trial Pit:
113 Charville Lane, Hayes, UB4 8PD		23-267.01	HP15
Client:	Start:	End:	Sheet:
Bugler Developments Limited	15/01/2024	15/01/2024	1 of 1
Method/Plant Used:	Co-ordinates:	Ground Level:	
Hand Dig tools	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	Laboratory Test Details
Tarmac.		(0.05) 0.05					
Black llight brown silt clayey gravelly SAND. . Gravel if fine to medium sub-angular to rounded of flint, type one and shingle. Occasional whole bricks and sub-angular fine to medium gravel size fragments of brick. Concrete rubble. Infrequent fine to coarse gravel size fragments of ash. (MADE GROUND)		(0.85) 0.9		0.6 0.8	1 2	ES1 ES1	
Firm to soft dark grey dark brown silty sandy gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded of flint. (LONDON CLAY FORMATION)		(0.2) 1.1					

Dimensions (m)			Water level observations (depths in metres below gl)					
Length	Width	Depth	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
0.30	0.30	1.10	15/01/2024	-	-	-	-	

Remarks		By
No roots present in trial pit. No groundwater encountered in trial pit. Very slight oily/HC odor from between 0.4m bgl to 0.9m bgl. Trial pit backfilled with arisings.	Logged	AC
	Checked	JB
		Scale 01:25

Aviron Associates Limited - Badgemore House - Greys Road - Henley on Thames - RG9 4NR - T:01491 413 722 - M: 07787771686 - E:james@aviron.co.uk

Exploratory Hole Photographs

Project Number 23-267.01 **Project Title** 113 Charville Lane, Hayes, UB4 8PD **Taken by** AC **Date** 15/01/2024

HP11

HP12

HP13

HP11 arisings

HP12 arisings

HP13 arisings

Exploratory Hole Photographs

Project Number 23-267.01 **Project Title** 113 Charville Lane, Hayes, UB4 8PD **Taken by** AC **Date** 15/01/2024

HP14

HP15

HP14 arisings

HP15 arisings

Appendix III
Laboratory Certificates of Analysis and Assessment Criteria

Aviron Associates Ltd☐
Badgemore House
Henley
Oxfordshire
RG9 4NR

e: Aviron -

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-000292

Replaces Analytical Report Number: 24-000292, issue no. 1
Additional analysis undertaken.
Missed Metals when booked

Project / Site name:	Former Childrens Centre. 113 Charville Lane, Hayes	**Samples received on:**	15/01/2024
Your job number:	23-267.01	**Samples instructed on/ Analysis started on:**	15/01/2024
Your order number:	23-267.01	**Analysis completed by:**	29/01/2024
Report Issue Number:	2	**Report issued on:**	31/01/2024
Samples Analysed:	7 soil samples		

Signed: A. Czerwińska

Agnieszka Czerwińska
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes
Your Order No: 23-267.01

Lab Sample Number				102840	102841	102842	102843	102844
Sample Reference				HP11	HP12	HP13	HP14	HP15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	0.30	0.50	0.60
Date Sampled				15/01/2024	15/01/2024	15/01/2024	15/01/2024	15/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	20	23	22	14	18
Total mass of sample received	kg	0.1	NONE	0.3	0.6	0.3	0.3	0.3
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	SCA	SCA	SCA
Actinolite detected	Type	N/A	ISO 17025	-	-	-	Not-detected	-
Amosite detected	Type	N/A	ISO 17025	-	-	-	Not-detected	-
Anthophyllite detected	Type	N/A	ISO 17025	-	-	-	Not-detected	-
Chrysotile detected	Type	N/A	ISO 17025	-	-	-	Detected	-
Crocidolite detected	Type	N/A	ISO 17025	-	-	-	Not-detected	-
Tremolite detected	Type	N/A	ISO 17025	-	-	-	Not-detected	-
Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	-	-	0.005	-
Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	-	-	Loose Fibrous Debris	-
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.6	7.3	7.2	8.7	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	340	190	190	3300	390
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	42	45	69	2100	350
Water Soluble SO4 16hr extraction (2:1)	mg/l	1.25	MCERTS	20.9	22.4	34.2	1070	173
Total Sulphur	mg/kg	50	MCERTS	190	270	250	3700	610
Organic Matter (automated)	%	0.1	MCERTS	2.3	4.2	2.8	2.5	1.7
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.24	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.4	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.25	0.09	2.7	0.92
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.57	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.49	0.26	4.1	1
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.43	0.25	3.3	0.78
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.22	0.12	1.3	0.27
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.27	0.15	1.4	0.3
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.32	0.18	1.3	0.24
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.15	0.08	0.74	0.13
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.26	0.15	1	0.19
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.15	0.09	0.55	0.1
Dibenzo(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.16	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.17	0.1	0.6	0.12
Total PAH								

Analytical Report Number: 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes
Your Order No: 23-267.01

Lab Sample Number				102840	102841	102842	102843	102844
Sample Reference				HP11	HP12	HP13	HP14	HP15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	0.30	0.50	0.60
Date Sampled				15/01/2024	15/01/2024	15/01/2024	15/01/2024	15/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	2.72	1.47	18.4	4.09

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Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes
Your Order No: 23-267.01

Lab Sample Number				102840	102841	102842	102843	102844
Sample Reference				HP11	HP12	HP13	HP14	HP15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.20	0.30	0.50	0.60
Date Sampled				15/01/2024	15/01/2024	15/01/2024	15/01/2024	15/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9	11	10	11	14
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.4	0.4	3	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.6	0.7	3.3	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	31	34	34	26	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	24	21	54	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31	75	50	170	73
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	1.8	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	20	19	17	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	290	120	1800	81
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >C5 - C6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C6 - C8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >C8 - C10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL_#1_#2	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.6	< 1.0
TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL_#1_#2	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	91	< 2.0
TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL_#1_#2	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	200	< 8.0
TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL_#1_#2	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	130	< 8.0
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL_#1_#2	mg/kg	10	NONE	< 10	< 10	< 10	420	< 10
TPHCWG - Aliphatic >C6 - C35 EH_CU+HS_1D_AL_#1_#2	mg/kg	10	NONE	< 10	< 10	< 10	420	< 10
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR_#1_#2	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR_#1_#2	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	44	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	< 10	< 10	< 10	96	< 10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	< 10	< 10	< 10	43	< 10
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR_#1_#2	mg/kg	10	NONE	< 10	< 10	< 10	180	< 10
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes
Your Order No: 23-267.01

Lab Sample Number				102845	102846
Sample Reference				HP15	BH12
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	0.30
Date Sampled				15/01/2024	15/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	22
Total mass of sample received	kg	0.1	NONE	0.3	0.3
Asbestos					
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Detected	-
Asbestos Analyst ID	N/A	N/A	N/A	SCA	-
Actinolite detected	Type	N/A	ISO 17025	Not-detected	-
Amosite detected	Type	N/A	ISO 17025	Detected	-
Anthophyllite detected	Type	N/A	ISO 17025	Not-detected	-
Chrysotile detected	Type	N/A	ISO 17025	Detected	-
Crocidolite detected	Type	N/A	ISO 17025	Not-detected	-
Tremolite detected	Type	N/A	ISO 17025	Not-detected	-
Asbestos % by hand picking/weighing	%	0.001	ISO 17025	< 0.001	-
Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	Loose Fibres	-
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	9	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-
Total Sulphate as SO4	mg/kg	50	MCERTS	1000	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	330	-
Water Soluble SO4 16hr extraction (2:1)	mg/l	1.25	MCERTS	166	-
Total Sulphur	mg/kg	50	MCERTS	1600	-
Organic Matter (automated)	%	0.1	MCERTS	2.6	-
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	1.3	-
Anthracene	mg/kg	0.05	MCERTS	0.1	-
Fluoranthene	mg/kg	0.05	MCERTS	1.4	-
Pyrene	mg/kg	0.05	MCERTS	1.1	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.41	-
Chrysene	mg/kg	0.05	MCERTS	0.49	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.46	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.23	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.35	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.22	-
Dibenzo(a,h)anthracene	mg/kg	0.05	MCERTS	0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.24	-
Total PAH					

Analytical Report Number: 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes
Your Order No: 23-267.01

Lab Sample Number				102845	102846
Sample Reference				HP15	BH12
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	0.30
Date Sampled				15/01/2024	15/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	6.2	-

Analytical Report Number: 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes
Your Order No: 23-267.01

Lab Sample Number				102845	102846
Sample Reference				HP15	BH12
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	0.30
Date Sampled				15/01/2024	15/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	-
Boron (water soluble)	mg/kg	0.2	MCERTS	2.1	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	220	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	210	140
Petroleum Hydrocarbons					
TPHCWG - Aliphatic >C5 - C6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	-
TPHCWG - Aliphatic >C6 - C8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	-
TPHCWG - Aliphatic >C8 - C10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	-
TPHCWG - Aliphatic >C10 - C12 EH_CU_1D_AL_#1_#2	mg/kg	1	MCERTS	1.1	-
TPHCWG - Aliphatic >C12 - C16 EH_CU_1D_AL_#1_#2	mg/kg	2	MCERTS	14	-
TPHCWG - Aliphatic >C16 - C21 EH_CU_1D_AL_#1_#2	mg/kg	8	MCERTS	26	-
TPHCWG - Aliphatic >C21 - C35 EH_CU_1D_AL_#1_#2	mg/kg	8	MCERTS	12	-
TPHCWG - Aliphatic >C5 - C35 EH_CU+HS_1D_AL_#1_#2	mg/kg	10	NONE	52	-
TPHCWG - Aliphatic >C6 - C35 EH_CU+HS_1D_AL_#1_#2	mg/kg	10	NONE	52	-
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	-
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	-
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR_#1_#2	mg/kg	1	MCERTS	< 1.0	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR_#1_#2	mg/kg	2	MCERTS	< 2.0	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	12	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR_#1_#2	mg/kg	10	MCERTS	< 10	-
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR_#1_#2	mg/kg	10	NONE	12	-
VOCs					
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-
Benzene	µg/kg	5	MCERTS	< 5.0	-
Toluene	µg/kg	5	MCERTS	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes
Your Order No: 23-267.01

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
102843	HP14	0.50	168	Loose Fibrous Debris	**Chrysotile**	0.005	**0.005**
102845	HP15	0.80	169	Loose Fibres	**Amosite & Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
102840	HP11	None Supplied	0.4	Brown clay and sand with gravel and vegetation
102841	HP12	None Supplied	0.2	Brown clay and sand with gravel and vegetation
102842	HP13	None Supplied	0.3	Brown clay and sand with gravel and vegetation
102843	HP14	None Supplied	0.5	Brown clay and sand with gravel and vegetation
102844	HP15	None Supplied	0.6	Brown clay and sand with gravel and vegetation
102845	HP15	None Supplied	0.8	Brown clay and sand with gravel and vegetation
102846	BH12	None Supplied	0.3	Brown clay and sand with metal and vegetation

Analytical Report Number : 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

Analytical Report Number : 24-000292
Project / Site name: Former Childrens Centre. 113 Charville Lane, Hayes

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

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

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Residential with Homegrown Produce
Soil Screening Values
Private Gardens

Determinant	1% SOM (mg/kg)	2.5% SOM (mg/kg)	6% SOM (mg/kg)	Criteria
METALS, SEMI-METALS, INROGANICS + PAH (SUITE 1)				
Arsenic	37	37	37	C4SL/LQM S4UL
Boron	290	290	290	LQM S4UL
Cadmium	11	11	11	LQM S4UL
Chromium III	910	910	910	LQM S4UL
Chromium IV	6	6	6	LQM S4UL
Copper	2,400	2,400	2,400	LQM S4UL
Mercury	1.2	1.2	1.2	LQM S4UL
Nickel	180	180	180	LQM S4UL
Lead	200	200	200	LQM S4UL
Selenium	250	250	250	LQM S4UL
Zinc	3,700	3,700	3,700	LQM S4UL
Free Cyanide	34	34	34	ATRISK
Acenaphthene	210	510	1100	LQM S4UL
Acenaphthylene	170	420	920	LQM S4UL
Anthracene	2,400	5400	11000	LQM S4UL
Benzo(a)anthracene	7.2	11	13	LQM S4UL
Benzo(a)pyrene	2.2	2.7	3	LQM S4UL
Benzo(b)fluoranthene	2.6	3.3	3.7	LQM S4UL
Benzo(ghi)perylene	320	340	350	LQM S4UL
Benzo(k)fluoranthene	77	93	100	LQM S4UL
Chrysene	15	22	27	LQM S4UL
Dibenz(ah)anthracene	0.24	0.28	0.3	LQM S4UL
Fluoranthene	280	560	890	LQM S4UL
Fluorene	170	400	860	LQM S4UL
Indeno(123-cd)pyrene	27	36	41	LQM S4UL
Naphthalene	2.3	5.6	13	LQM S4UL
Phenanthrene	95	220	440	LQM S4UL

Determinant	1% SOM (mg/kg)	2.5% SOM (mg/kg)	6% SOM (mg/kg)	Criteria
Pyrene	620	1200	2000	LQM S4UL
Phenols	78	0.98	1.1	LQM S4UL
TOTAL PETROLEUM HYDOCARBONS				
Benzene	0.087	0.17	0.37	LQM S4UL
Toluene	130	290	660	LQM S4UL
Ethlybenzene	47	110	260	LQM S4UL
o-xylene	60	140	330	LQM S4UL
m-xylene	59	140	320	LQM S4UL
p-xylene	56	130	310	LQM S4UL
Aliphatic EC 5-6	42	78	160	LQM S4UL
Aliphatic EC >6-8	100	230	530	LQM S4UL
Aliphatic EC >8-10	27	65	150	LQM S4UL
Aliphatic EC >10-12	130	330	760	LQM S4UL
Aliphatic EC >12-16	1,100	2400	4300	LQM S4UL
Aliphatic EC >16-35	65,000	92000	110000	LQM S4UL
Aliphatic EC >35-44	65,000	92000	110000	LQM S4UL
Aromatic EC 5-7 (benzene)	70	140	300	LQM S4UL
Aromatic EC >7-8 (toluene)	130	290	660	LQM S4UL
Aromatic EC >8-10	34	83	190	LQM S4UL
Aromatic EC >10-12	74	180	380	LQM S4UL
Aromatic EC >12-16	140	330	660	LQM S4UL
Aromatic EC >16-21	260	540	930	LQM S4UL
Aromatic EC >21-35	1,100	1500	1700	LQM S4UL
Aromatic EC >35-44	1,100	1500	1700	LQM S4UL
Aromatic EC >44-70	1,600	1800	1900	LQM S4UL
ASBESTOS				
None Detectable			Aviron Adopted Value	

Residential without Homegrown Produce
Soil Screening Values
Communal Gardens

Determinant	1% SOM (mg/kg)	2.5% SOM (mg/kg)	6% SOM (mg/kg)	Criteria
METALS, SEMI-METALS, INROGANICS + PAH (SUITE 1)				
Arsenic	40	40	40	C4SL/LQM S4UL
Boron	11000	11000	11000	LQM S4UL
Cadmium	85	85	85	LQM S4UL
Chromium III	910	910	910	LQM S4UL
Chromium IV	6	6	6	LQM S4UL
Copper	7,100	7,100	7,100	LQM S4UL
Mercury	1.2	1.2	1.2	LQM S4UL
Nickel	180	180	180	LQM S4UL
Lead	310	310	310	LQM S4UL
Selenium	430	430	430	LQM S4UL
Zinc	40000	40000	40000	LQM S4UL
Free Cyanide	34	34	34	ATRISK
Acenaphthene	3000	4700	6000	LQM S4UL
Acenaphthylene	2900	4600	6000	LQM S4UL
Anthracene	31000	35000	37000	LQM S4UL
Benzo(a)anthracene	11	14	15	LQM S4UL
Benzo(a)pyrene	3.2	3.2	3.2	LQM S4UL
Benzo(b)fluoranthene	3.9	4	4	LQM S4UL
Benzo(ghi)perylene	360	360	360	LQM S4UL
Benzo(k)fluoranthene	110	110	110	LQM S4UL
Chrysene	30	31	32	LQM S4UL
Dibenz(ah)anthracene	0.31	0.32	0.32	LQM S4UL
Fluoranthene	1500	1600	1600	LQM S4UL
Fluorene	2800	3800	4500	LQM S4UL
Indeno(123-cd)pyrene	45	46	46	LQM S4UL
Naphthalene	2.3	5.6	13	LQM S4UL
Phenanthrene	1300	1500	1500	LQM S4UL

Determinant	1% SOM (mg/kg)	2.5% SOM (mg/kg)	6% SOM (mg/kg)	Criteria
Pyrene	3700	3800	3800	LQM S4UL
Phenols	750	750	750	LQM S4UL
TOTAL PETROLEUM HYDOCARBONS				
Benzene	0.38	0.7	1.4	LQM S4UL
Toluene	869	1900	3900	LQM S4UL
Ethlybenzene	83	190	440	LQM S4UL
o-xylene	88	210	480	LQM S4UL
m-xylene	82	190	450	LQM S4UL
p-xylene	79	180	430	LQM S4UL
Aliphatic EC 5-6	42	78	160	LQM S4UL
Aliphatic EC >6-8	100	230	530	LQM S4UL
Aliphatic EC >8-10	27	65	150	LQM S4UL
Aliphatic EC >10-12	130	330	770	LQM S4UL
Aliphatic EC >12-16	1,100	2400	4400	LQM S4UL
Aliphatic EC >16-35	65,000	92000	110000	LQM S4UL
Aliphatic EC >35-44	65,000	92000	110000	LQM S4UL
Aromatic EC 5-7 (benzene)	370	690	1400	LQM S4UL
Aromatic EC >7-8 (toluene)	860	1800	3900	LQM S4UL
Aromatic EC >8-10	47	110	270	LQM S4UL
Aromatic EC >10-12	250	590	1200	LQM S4UL
Aromatic EC >12-16	1800	2300	2500	LQM S4UL
Aromatic EC >16-21	1900	1900	1900	LQM S4UL
Aromatic EC >21-35	1900	1900	1900	LQM S4UL
Aromatic EC >35-44	1900	1900	1900	LQM S4UL
Aromatic EC >44-70	1900	1900	1900	LQM S4UL
ASBESTOS				
None Detectable			Aviron Adopted Value	