

PHOTOGRAPHIC LOG

Site Location: West End Nursery, Angmering

Photo No.
43

Date:
25/07/2016

NEB V2
dug to a
depth of
0.70m.

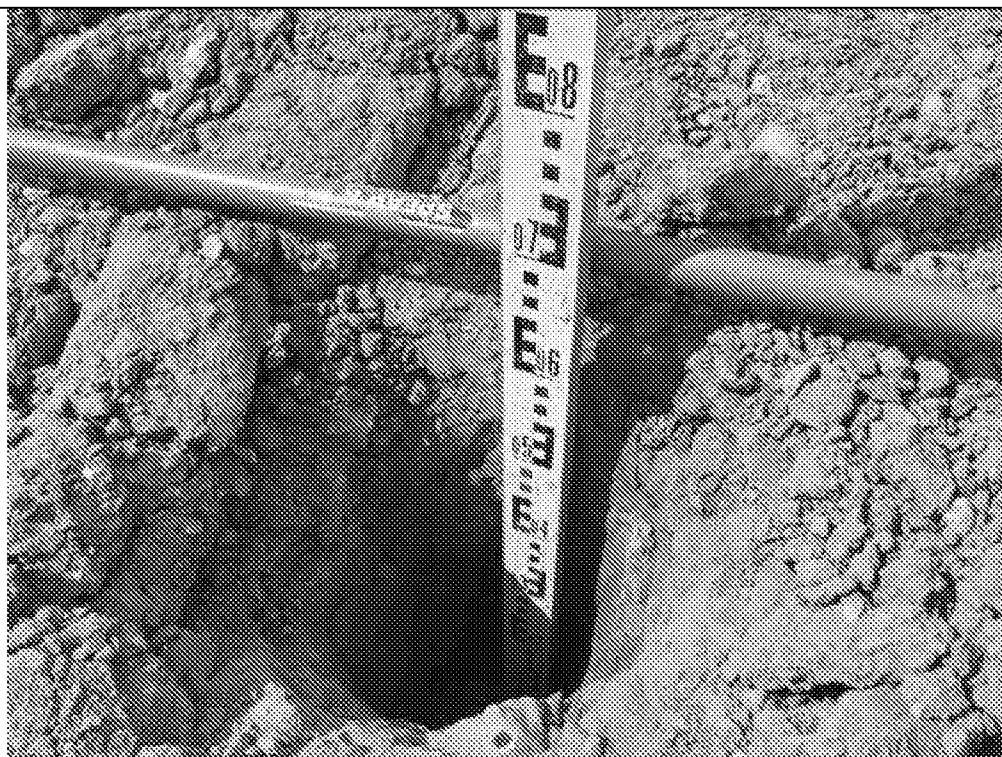
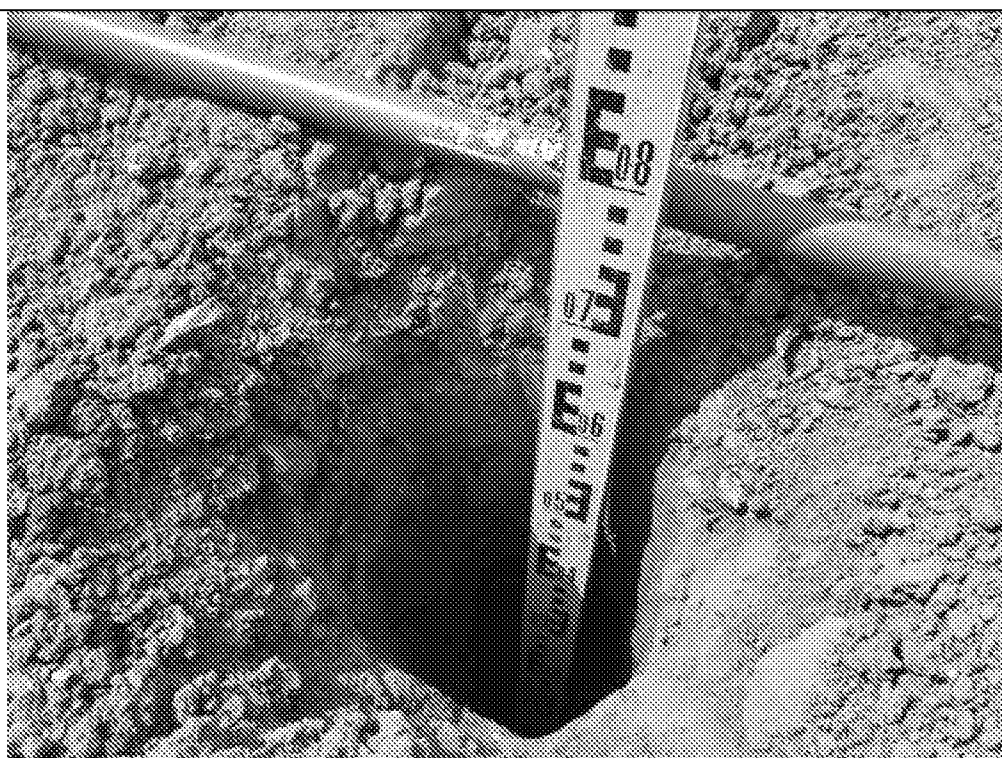


Photo No.
44

Date:
25/07/2016

NEB V3
dug to a
depth of
0.75m.



PHOTOGRAPHIC LOG

Site Location: West End Nursery, Angmering

Photo No.
45

Date:
25/07/2016

NEB V4
dug to a
depth of
0.80m.

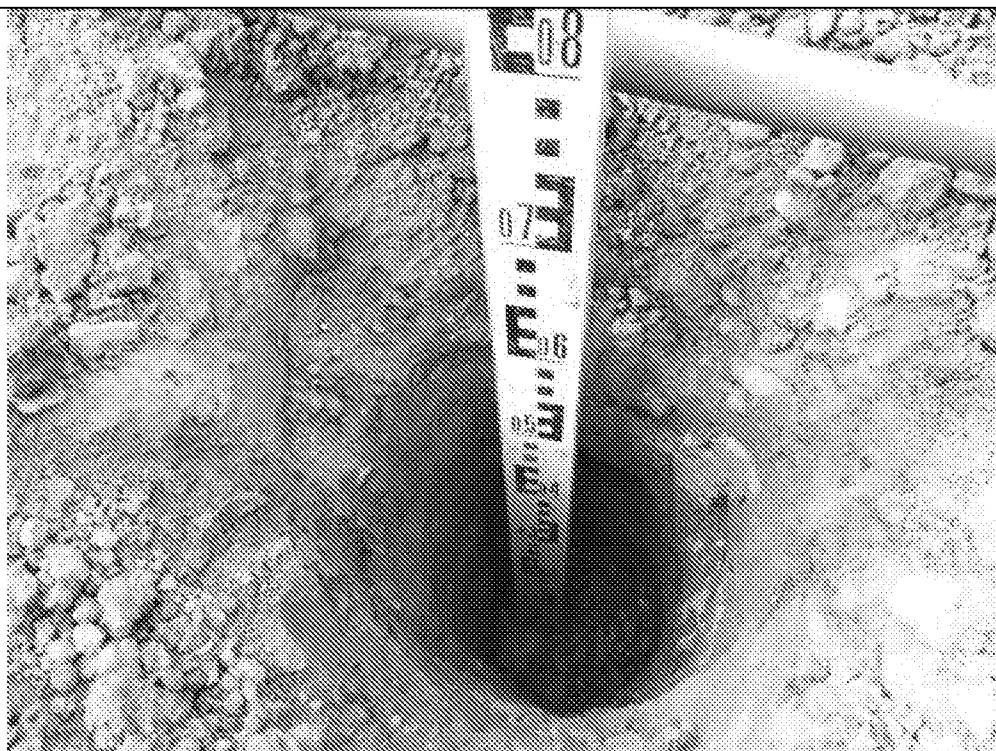


Photo No.
46

Date:
22/08/2016

View
looking
east
across
POS area



PHOTOGRAPHIC LOG

Site Location: West End Nursery, Angmering

Photo No.
47

Date:
22/08/2016

POS V13
(capping
layer
0.65m)

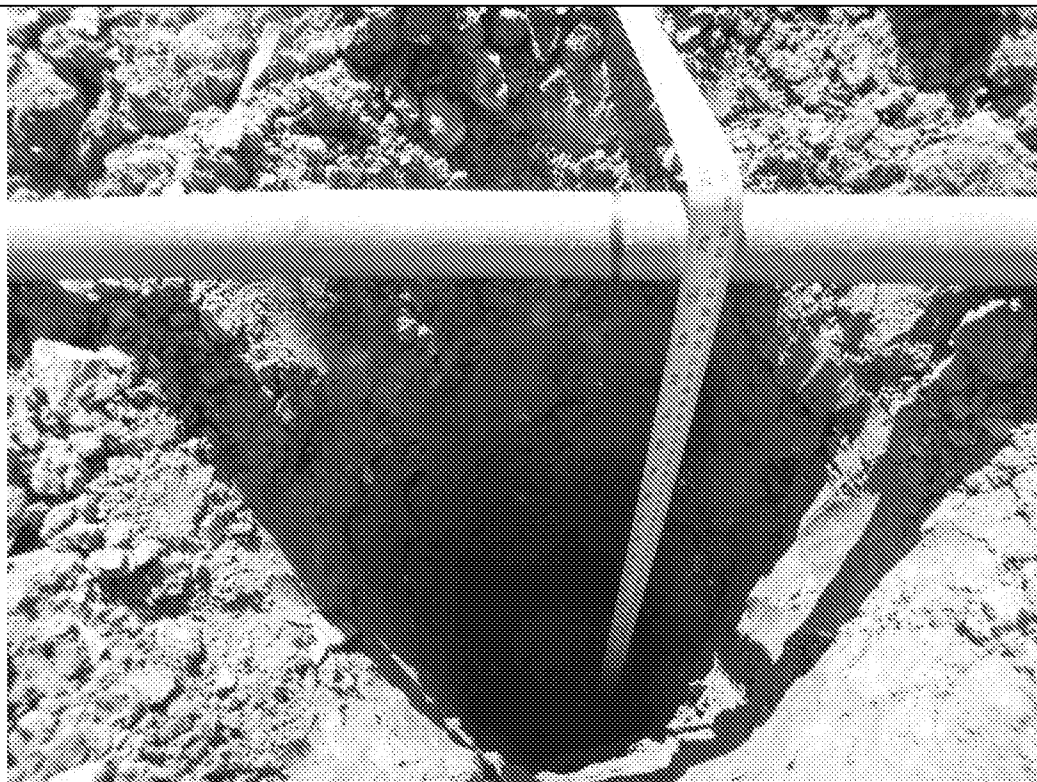


Photo No.
48

Date:
22/08/2016

POS V14
(capping
layer
0.75m)



PHOTOGRAPHIC LOG

Site Location: West End Nursery, Angmering

Photo No.
49

Date:
22/08/2016

POS V15
(capping
layer
0.65m)



Photo No.
50

Date:
22/08/2016

POS V16
(capping
layer
0.85m)





APPENDIX C TRIAL PIT LOGS

RECORD OF TRIAL PITS

Date of Investigation: 09 June 2016

NWBV1

Ground level- 0.50m Light brown slightly gravelly, silty CLAY / clayey SILT with rare fragments of fine brick, charcoal, glass, concrete and chalk.

0.50m Orange marker layer

END OF TRIAL PIT

Remarks

Disturbed sample at 0.20-0.40m

NWBV2

Ground level- 0.70m Light brown slightly gravelly, silty CLAY / clayey SILT with rare fragments of charcoal, glass, concrete and chalk.

END OF TRIAL PIT

Remarks

Side of bund

Disturbed sample at 0.20-0.40m

Orange marker layer not seen in trial pit, but was seen placed during construction.

NWBV3

Ground level- 0.30m Light brown slightly gravelly, silty CLAY / clayey SILT with rare fragments of fine brick, charcoal, glass, concrete, chalk, black plastic sacking and a fragment of clay pipe.

0.30m Orange marker layer

END OF TRIAL PIT

Remarks

Disturbed sample at 0.10-0.30m

NWBV4

Ground level- 0.4m	Light brown slightly gravelly, silty CLAY / clayey SILT with rare fragments of fine brick, charcoal, glass, concrete and chalk.
0.40m	Orange marker layer
	END OF TRIAL PIT

Remarks

Disturbed sample at 0.20-0.4m

NWBV5

Ground level- 0.75m	Light brown slightly gravelly, silty CLAY / clayey SILT with rare fragments of fine brick, charcoal, glass, concrete and chalk.
	END OF TRIAL PIT

Remarks

Disturbed sample at 0.20-0.4m

Orange membrane was not seen but is known to have been placed during construction.

NWBV6

Ground level- 0.55m	Light brown slightly gravelly, silty CLAY / clayey SILT with rare fragments of fine brick, charcoal, glass, concrete and chalk.
0.55m	Orange marker layer
	END OF TRIAL PIT

Remarks

Disturbed sample at 0.20-0.4m

NWBV7

Ground level- 0.55m Light brown slightly gravelly, silty CLAY / clayey SILT with occasional fragments of charcoal and rare fragments of fine brick, glass, concrete and chalk.

0.55m Orange marker layer

END OF TRIAL PIT

Remarks

Disturbed sample at 0.30-0.50m

NWBV8

Ground level- 0.38m Light brown slightly gravelly, silty CLAY / clayey SILT with rare fragments of fine brick, charcoal, glass, concrete and chalk.

0.38m Orange marker layer

END OF TRIAL PIT

Remarks

Disturbed sample at 0.30m

General Notes:

- A piece of ACM was visible in the shallow soils at the northern boundary toward the top/end of the bund. Recommendation is to thoroughly hand pick the exposed faces around the boundary.
- Possible fragment of ACM (approx. 5cm length) seen at the surface half way between NWBV7 and NWBV8. Bulk sample NWBB1 obtained.



FINAL TRIAL PIT LOG

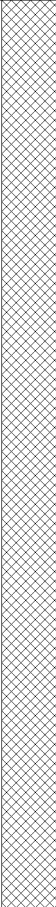
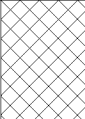
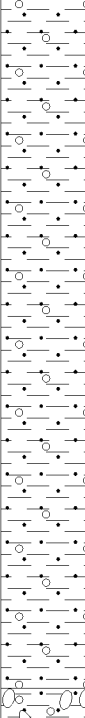
Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Trial Pit: TPPoS1
Contract Ref: 27621	Start: 27.04.16 End: 27.04.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
0.00-0.50	1	ES	T+J+V			MADE GROUND: Very stiff reddish brown to greyish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to medium flint. Occasional asphalt fragments. Rare brick fragments.	(0.75)	
						MADE GROUND: Black asphalt.	0.75	
						Stiff brown slightly sandy CLAY. Sand is fine to coarse.	1.00	
1.50-1.80	2	ES	T+J+V				(1.00)	
2.00-2.20	3	ES	T+J+V			Stiff orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine flint.	2.00	
						Stiff orangish brown slightly sandy very gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Cobble is subangular to subrounded flint up to 70mm in size.	2.20	
2.50-3.00	3	ES	T+J+V				(0.90)	
							3.10	

Plan (Not to Scale)		General Remarks		
		3 fragments of suspected asbestos cement found at surface level within a 5.00m radius - maximum size 100 x 40 x 5mm, average 40 x 40 x 5mm. - Trial pit terminated at 3.10m depth. - Trial pit remained dry and stable during excavation. - Backfilled with arisings.		
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: EHughes	Checked By:	

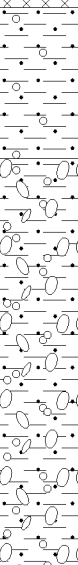
[illegible]ARUN DISTRICT COUNCIL

Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Trial Pit: TPPoS3
Contract Ref: 27621	Start: 27.04.16 End: 27.04.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results					
1.80-2.20	1	ES	T+J+V			MADE GROUND: Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint. Rare brick and glass fragments.	(0.40)	
							0.40	
						MADE GROUND: Light grey and brownish yellow CONCRETE.	0.50	
						MADE GROUND: Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint. Rare brick and glass fragments.	0.60	
						Stiff orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine flint.		
						2.90-3.00m : becoming very gravelly with a low cobble content (10%); gravel is subangular to rounded fine to coarse flint, cobble is subangular to subrounded flint upto 150mm in size	3.00	

Plan (Not to Scale)		General Remarks		
		16 fragments of suspected asbestos cement found at surface level within a 5.00m radius - maximum size 40 x 80 x 5mm, average 40 x 40 x 5mm. - Trial pit terminated at 3.00m depth. - Trial pit remained dry and stable during excavation. - Backfilled with arisings.		
		All dimensions in metres	Scale:	1:25
Method Used:	Plant Used:	Logged By:	Checked By:	
Machine dug	Tracked excavator	EHughes		



Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
1.30-1.70	1	ES	T+J+V			MADE GROUND: Firm greyish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to medium flint. Occasional asphalt fragments. Rare brick fragments.	(1.25)	
						Stiff orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine flint.	(0.50)	
						Stiff orangish brown slightly sandy very gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Cobble is subangular to subrounded flint up to 100mm in size.	(1.75)	
2.00-2.50	2	ES	T+J+V			Stiff orangish brown slightly sandy very gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Cobble is subangular to subrounded flint up to 100mm in size.	(1.35)	
2.20-2.40	3	ES	T+J+V					
							3.10	

ARUN DISTRICT COUNCIL

Contract: Land at West End Nursery, Angmering		Client: Cala Homes (South Home Counties) Ltd		Trial Pit: TPPoS5
Contract Ref: 27621	Start: 27.04.16 End: 27.04.16	Ground Level: ---	Co-ordinates: ---	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results					
1.00-1.50	1	ES	T+J+V			MADE GROUND: Very stiff dark brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Occasional asphalt fragments and organic matter. Rare brick fragments.	(0.50) 0.50	
						Stiff dark orangish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint.	(1.20) 1.70	
2.00-2.50	2	ES	T+J+V			Firm orangish brown occasionally mottled dark grey sandy gravelly CLAY with a low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Cobble is subrounded flint up to 110mm diameter. Occasional organic remains.	(1.20) 2.90	
						2.50-2.90m : becoming stiff	3.00	
2.90-3.00	3	D				Orangish brown clayey sandy GRAVEL with a medium cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. Cobble is subrounded flint up to 80mm diameter.		

Plan (Not to Scale)		General Remarks		
		- Single fragment of suspected asbestos cement found at surface level within a 5.00m radius - size 115 x 75 x 5mm. - Trial pit terminated at 3.00m depth. - Trial pit remained dry and stable during excavation. - Backfilled with arisings.		
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: EHughes	Checked By:	



APPENDIX D LABORATORY RESULTS

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/02575
Issue Number: 1

Date: 12 May, 2016

Client: RSK Environment Ltd Hemel
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

Project Manager: Andrew James/Edward Hughes/Nigel Austin
Project Name: Land at West End Nursery, Angmering
Project Ref: 27621
Order No: N/A
Date Samples Received: 03/05/16
Date Instructions Received: 03/05/16
Date Analysis Completed: 12/05/16

Prepared by:

Approved by:

Kate Ellison
Administrative Assistant

Gill Walker
Laboratory Manager

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/1	16/02575/2	16/02575/3	16/02575/4	16/02575/5	16/02575/6	16/02575/7	16/02575/8	Units	Method ref
Client Sample No	2	2	1	2	1	1	1	1		
Client Sample ID	TPPoS1	TPPoS2	TPPoS3	TPPoS4	TPPoS5	SV5	SV6	SV7		
Depth to Top	1.50	2.00	1.80	2.00	1.00	0.20	0.15	0.20		
Depth To Bottom	1.80	3.00	2.20	2.50	1.50		0.20	0.30		
Date Sampled	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - D	Soil - D	Soil - D		
Sample Matrix Code	5	3A	5	3A	3A	1A	1A	1		
% Stones >10mm _A [#]	<0.1	53.9	<0.1	45.0	<0.1	-	-	-	% w/w	A-T-044
pH _D ^{M#}	7.59	6.97	7.03	7.48	7.13	-	-	-	pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.05	0.05	0.05	0.01	0.09	-	-	-	g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	240	<200	<200	<200	370	-	-	-	mg/kg	A-T-028s
Arsenic _D ^{M#}	5	3	5	3	5	-	-	-	mg/kg	A-T-024s
Cadmium _D ^{M#}	0.6	0.6	0.6	<0.5	0.6	-	-	-	mg/kg	A-T-024s
Copper _D ^{M#}	10	8	5	13	10	-	-	-	mg/kg	A-T-024s
Chromium _D ^{M#}	24	10	23	13	28	-	-	-	mg/kg	A-T-024s
Lead _D ^{M#}	11	4	10	6	12	-	-	-	mg/kg	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	-	-	-	mg/kg	A-T-024s
Nickel _D ^{M#}	20	10	16	11	20	-	-	-	mg/kg	A-T-024s
Selenium _D	<1	<1	<1	<1	<1	-	-	-	mg/kg	A-T-024s
Zinc _D ^{M#}	40	18	39	18	40	-	-	-	mg/kg	A-T-024s

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/1	16/02575/2	16/02575/3	16/02575/4	16/02575/5	16/02575/6	16/02575/7	16/02575/8	Units	Method ref
Client Sample No	2	2	1	2	1	1	1	1		
Client Sample ID	TPPoS1	TPPoS2	TPPoS3	TPPoS4	TPPoS5	SV5	SV6	SV7		
Depth to Top	1.50	2.00	1.80	2.00	1.00	0.20	0.15	0.20		
Depth To Bottom	1.80	3.00	2.20	2.50	1.50		0.20	0.30		
Date Sampled	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - D	Soil - D	Soil - D		
Sample Matrix Code	5	3A	5	3A	3A	1A	1A	1		
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Gravimetry

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/1	16/02575/2	16/02575/3	16/02575/4	16/02575/5	16/02575/6	16/02575/7	16/02575/8	Units	Method ref
Client Sample No	2	2	1	2	1	1	1	1		
Client Sample ID	TPPoS1	TPPoS2	TPPoS3	TPPoS4	TPPoS5	SV5	SV6	SV7		
Depth to Top	1.50	2.00	1.80	2.00	1.00	0.20	0.15	0.20		
Depth To Bottom	1.80	3.00	2.20	2.50	1.50		0.20	0.30		
Date Sampled	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - D	Soil - D	Soil - D		
Sample Matrix Code	5	3A	5	3A	3A	1A	1A	1		
PAH 16										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	-	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	-	-	-	mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06	<0.06	<0.06	-	-	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	-	-	-	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08	<0.08	<0.08	-	-	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	-	-	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	-	-	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	-	-	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	-	-	-	mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	<0.08	<0.08	<0.08	<0.08	<0.08	-	-	-	mg/kg	A-T-019s

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/1	16/02575/2	16/02575/3	16/02575/4	16/02575/5	16/02575/6	16/02575/7	16/02575/8	Units	Method ref
Client Sample No	2	2	1	2	1	1	1	1		
Client Sample ID	TPPoS1	TPPoS2	TPPoS3	TPPoS4	TPPoS5	SV5	SV6	SV7		
Depth to Top	1.50	2.00	1.80	2.00	1.00	0.20	0.15	0.20		
Depth To Bottom	1.80	3.00	2.20	2.50	1.50		0.20	0.30		
Date Sampled	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16	27-Apr-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - D	Soil - D	Soil - D		
Sample Matrix Code	5	3A	5	3A	3A	1A	1A	1		
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Total Aliphatics _A	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-023s
Total Aromatics _A	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-022s

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/9	16/02575/10	16/02575/11	16/02575/12	16/02575/13	16/02575/14	16/02575/15	16/02575/16	Units	Method ref
Client Sample No	1	1	1	1	1	1	1	1		
Client Sample ID	SV8	HA5V1	HA5V2	HA5V3	HA5V4	SWV1	SWV2	SWV9		
Depth to Top	0.20	0.50	0.50	0.50	0.50	0.10	0.15	0.10		
Depth To Bottom	0.25	0.60	0.60	0.70	0.60	0.20	0.25	0.30		
Date Sampled	27-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16		
Sample Type	Soil - D	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - D	Soil - D	Soil - D		
Sample Matrix Code	4A	4A	1A	4A	4	6AE	4A	4A		
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Gravimetry

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/9	16/02575/10	16/02575/11	16/02575/12	16/02575/13	16/02575/14	16/02575/15	16/02575/16	Units	Method ref
Client Sample No	1	1	1	1	1	1	1	1		
Client Sample ID	SV8	HA5V1	HA5V2	HA5V3	HA5V4	SWV1	SWV2	SWV9		
Depth to Top	0.20	0.50	0.50	0.50	0.50	0.10	0.15	0.10		
Depth To Bottom	0.25	0.60	0.60	0.70	0.60	0.20	0.25	0.30		
Date Sampled	27-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16		
Sample Type	Soil - D	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - D	Soil - D	Soil - D		
Sample Matrix Code	4A	4A	1A	4A	4	6AE	4A	4A		
Pest-c										
Mevinphos _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Dichlorvos _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH) _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Diazinon _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane) _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Heptachlor _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Aldrin _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
beta-Hexachlorocyclohexane (HCH) _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Methyl Parathion _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Malathion _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Fenitrothion _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Heptachlor Epoxide _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Parathion (Ethyl Parathion) _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
p,p-DDE _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
p,p-DDT _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
p,p-Methoxychlor _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
p,p-TDE (DDD) _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
o,p-DDE _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
o,p-DDT _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
o,p-Methoxychlor _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
o,p-TDE (DDD) _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Endosulphan I _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Endosulphan II _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Endosulphan Sulphate _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Endrin _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Ethion _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Dieldrin _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Azinphos-methyl _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/9	16/02575/10	16/02575/11	16/02575/12	16/02575/13	16/02575/14	16/02575/15	16/02575/16	Units	Method ref
Client Sample No	1	1	1	1	1	1	1	1		
Client Sample ID	SV8	HA5V1	HA5V2	HA5V3	HA5V4	SWV1	SWV2	SWV9		
Depth to Top	0.20	0.50	0.50	0.50	0.50	0.10	0.15	0.10		
Depth To Bottom	0.25	0.60	0.60	0.70	0.60	0.20	0.25	0.30		
Date Sampled	27-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16	28-Apr-16		
Sample Type	Soil - D	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - D	Soil - D	Soil - D		
Sample Matrix Code	4A	4A	1A	4A	4	6AE	4A	4A		
Triazine Herbicides (Nitrogen Pesticides)										
Ametryn _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Atraton _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Atrazine _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Prometon _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Prometryn _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Propazine _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Simazine _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Simetryn _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Terbuthylazine _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon
Terbutryn _A	-	<50	<50	<50	<50	-	-	-	µg/kg	Subcon

Envirolab Job Number: 16/02575

Client Project Name: Land at West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/02575/17	16/02575/18	16/02575/19						Units	Method ref
Client Sample No	1	1	1							
Client Sample ID	SWV10	SWV11	SWV12							
Depth to Top	0.20	0.20	0.25							
Depth To Bottom		0.40								
Date Sampled	28-Apr-16	28-Apr-16	28-Apr-16							
Sample Type	Soil - ES	Soil - D	Soil - D							
Sample Matrix Code	6E	4A	5A							
Asbestos in Soil (inc. matrix)										
Asbestos in soil _A [#]	NAD	NAD	Crocidolite & Chrysotile							A-T-045
Asbestos Matrix (microscope) _A	-	-	Loose Fibres							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							Gravimetry
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) _D	-	-	<0.001						% w/w	A-T-054

REPORT NOTES

Notes - Soil chemical analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supersedes any "D" subscripts.

Superscript "M" indicates method accredited to MCERTS.

If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample. Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/03628
Issue Number: 1

Date: 04 July, 2016

Client: RSK Environment Ltd Tonbridge
Anerley Court, Half Moon Lane, Hildenborough
Tonbridge
Kent
TN11 9HU

Project Manager: Andrew James/Nigel Austin
Project Name: Angmering
Project Ref: 27621
Order No: N/A
Date Samples Received: 14/06/16
Date Instructions Received: 15/06/16
Date Analysis Completed: 04/07/16

Prepared by:

Approved by:

Kate Ellison
Administrative Assistant

Gill Walker
Laboratory Manager

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/1	16/03628/2	16/03628/3	16/03628/4	16/03628/5	16/03628/6	16/03628/7	16/03628/8	Units	Method ref
Client Sample No										
Client Sample ID	NWB B1	NWB V1	NWB V2	NWB V3	NWB V4	NWB V5	NWB V6	NWB V7		
Depth to Top		0.20	0.20	0.10	0.20	0.20	0.20	0.30		
Depth To Bottom		0.40	0.40	0.50	0.40	0.40	0.40	0.50		
Date Sampled	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16		
Sample Type	Solid - Fragment / Tile	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	8	4A	1A	4A	1A	5A	5A	4A		
% Stones >10mm _A [#]	-	<0.1	-	<0.1	2.5	-	3.8	-	% w/w	A-T-044
pH _D ^{M#}	-	7.75	-	7.61	7.62	-	7.64	-	pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	0.10	-	0.10	0.07	-	0.06	-	g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	-	450	-	440	300	-	240	-	mg/kg	A-T-028s
Arsenic _D ^{M#}	-	6	-	7	6	-	7	-	mg/kg	A-T-024s
Cadmium _D ^{M#}	-	1.2	-	1.2	1.3	-	1.3	-	mg/kg	A-T-024s
Copper _D ^{M#}	-	46	-	34	19	-	14	-	mg/kg	A-T-024s
Chromium _D ^{M#}	-	24	-	28	30	-	28	-	mg/kg	A-T-024s
Lead _D ^{M#}	-	49	-	71	49	-	34	-	mg/kg	A-T-024s
Mercury _D	-	<0.17	-	<0.17	<0.17	-	<0.17	-	mg/kg	A-T-024s
Nickel _D ^{M#}	-	17	-	18	22	-	22	-	mg/kg	A-T-024s
Selenium _D	-	1	-	<1	<1	-	<1	-	mg/kg	A-T-024s
Zinc _D ^{M#}	-	84	-	88	67	-	60	-	mg/kg	A-T-024s

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/1	16/03628/2	16/03628/3	16/03628/4	16/03628/5	16/03628/6	16/03628/7	16/03628/8	Units	Method ref
Client Sample No										
Client Sample ID	NWB B1	NWB V1	NWB V2	NWB V3	NWB V4	NWB V5	NWB V6	NWB V7		
Depth to Top		0.20	0.20	0.10	0.20	0.20	0.20	0.30		
Depth To Bottom		0.40	0.40	0.50	0.40	0.40	0.40	0.50		
Date Sampled	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16		
Sample Type	Solid - Fragment / Tile	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	8	4A	1A	4A	1A	5A	5A	4A		
Asbestos in Soil (inc. matrix)										
Asbestos in soil _A [#]	-	NAD	NAD	NAD	NAD	NAD	NAD	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Gravimetry
Bulk Fibre ID (inc. matrix)										
Bulk Fibre Identification _A [#]	Chrysotile	-	-	-	-	-	-	-		A-T-045
Bulk Fibre Identification Matrix (visual) _A	Cement	-	-	-	-	-	-	-		A-T-045
Bulk Fibre Identification - Suitable for Water Absorption Test? _D	Yes	-	-	-	-	-	-	-		Gravimetry

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/1	16/03628/2	16/03628/3	16/03628/4	16/03628/5	16/03628/6	16/03628/7	16/03628/8	Units	Method ref
Client Sample No										
Client Sample ID	NWB B1	NWB V1	NWB V2	NWB V3	NWB V4	NWB V5	NWB V6	NWB V7		
Depth to Top		0.20	0.20	0.10	0.20	0.20	0.20	0.30		
Depth To Bottom		0.40	0.40	0.50	0.40	0.40	0.40	0.50		
Date Sampled	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16		
Sample Type	Solid - Fragment / Tile	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	8	4A	1A	4A	1A	5A	5A	4A		
PAH 16										
Acenaphthene _A ^{M#}	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-019s
Anthracene _A ^{M#}	-	<0.02	-	<0.02	<0.02	-	<0.02	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	<0.04	-	<0.04	<0.04	-	<0.04	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	<0.04	-	<0.04	<0.04	-	<0.04	-	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	<0.05	-	0.07	<0.05	-	<0.05	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	<0.05	-	<0.05	<0.05	-	<0.05	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	<0.07	-	<0.07	<0.07	-	<0.07	-	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	<0.06	-	<0.06	<0.06	-	<0.06	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	-	<0.04	-	<0.04	<0.04	-	<0.04	-	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	<0.08	-	<0.08	<0.08	-	<0.08	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	<0.03	-	0.05	<0.03	-	<0.03	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	<0.03	-	<0.03	<0.03	-	<0.03	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	<0.03	-	<0.03	<0.03	-	<0.03	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	<0.07	-	<0.07	<0.07	-	<0.07	-	mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	-	<0.08	-	0.12	<0.08	-	<0.08	-	mg/kg	A-T-019s

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/1	16/03628/2	16/03628/3	16/03628/4	16/03628/5	16/03628/6	16/03628/7	16/03628/8	Units	Method ref
Client Sample No										
Client Sample ID	NWB B1	NWB V1	NWB V2	NWB V3	NWB V4	NWB V5	NWB V6	NWB V7		
Depth to Top		0.20	0.20	0.10	0.20	0.20	0.20	0.30		
Depth To Bottom		0.40	0.40	0.50	0.40	0.40	0.40	0.50		
Date Sampled	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16	09-Jun-16		
Sample Type	Solid - Fragment / Tile	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	8	4A	1A	4A	1A	5A	5A	4A		
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Total Aliphatics _A	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-023s
Total Aromatics _A	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	-	<0.1	-	<0.1	<0.1	-	<0.1	-	mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s
MTBE _A [#]	-	<0.01	-	<0.01	<0.01	-	<0.01	-	mg/kg	A-T-022s

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/9								Units	Method ref
Client Sample No										
Client Sample ID	NWB V8									
Depth to Top	0.30									
Depth To Bottom										
Date Sampled	09-Jun-16									
Sample Type	Soil									
Sample Matrix Code	4A									
% Stones >10mm _A [#]	0.8								% w/w	A-T-044
pH _D ^{M#}	7.66								pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.07								g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	370								mg/kg	A-T-028s
Arsenic _D ^{M#}	6								mg/kg	A-T-024s
Cadmium _D ^{M#}	1.2								mg/kg	A-T-024s
Copper _D ^{M#}	30								mg/kg	A-T-024s
Chromium _D ^{M#}	25								mg/kg	A-T-024s
Lead _D ^{M#}	42								mg/kg	A-T-024s
Mercury _D	<0.17								mg/kg	A-T-024s
Nickel _D ^{M#}	18								mg/kg	A-T-024s
Selenium _D	<1								mg/kg	A-T-024s
Zinc _D ^{M#}	70								mg/kg	A-T-024s

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/9								Units	Method ref
Client Sample No										
Client Sample ID	NWB V8									
Depth to Top	0.30									
Depth To Bottom										
Date Sampled	09-Jun-16									
Sample Type	Soil									
Sample Matrix Code	4A									
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD									A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A									Gravimetry

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/9								Units	Method ref
Client Sample No										
Client Sample ID	NWB V8									
Depth to Top	0.30									
Depth To Bottom										
Date Sampled	09-Jun-16									
Sample Type	Soil									
Sample Matrix Code	4A									
PAH 16										
Acenaphthene _A ^{M#}	<0.01								mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01								mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02								mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04								mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05								mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07								mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06								mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04								mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08								mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01								mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03								mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.03								mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07								mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	<0.08								mg/kg	A-T-019s

Envirolab Job Number: 16/03628

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03628/9								Units	Method ref
Client Sample No										
Client Sample ID	NWB V8									
Depth to Top	0.30									
Depth To Bottom										
Date Sampled	09-Jun-16									
Sample Type	Soil									
Sample Matrix Code	4A									
TPH CWG										
Ali >C5-C6 _A [#]	<0.01								mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01								mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01								mg/kg	A-T-022s
Ali >C10-C12 _A [#]	<0.1								mg/kg	A-T-023s
Ali >C12-C16 _A [#]	<0.1								mg/kg	A-T-023s
Ali >C16-C21 _A [#]	<0.1								mg/kg	A-T-023s
Ali >C21-C35 _A [#]	<0.1								mg/kg	A-T-023s
Total Aliphatics _A	<0.1								mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	<0.01								mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01								mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01								mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01								mg/kg	A-T-022s
Aro >C10-C12 _A [#]	<0.1								mg/kg	A-T-023s
Aro >C12-C16 _A [#]	<0.1								mg/kg	A-T-023s
Aro >C16-C21 _A [#]	<0.1								mg/kg	A-T-023s
Aro >C21-C35 _A [#]	<0.1								mg/kg	A-T-023s
Total Aromatics _A	<0.1								mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	<0.1								mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	<0.01								mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01								mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01								mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01								mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01								mg/kg	A-T-022s
MTBE _A [#]	<0.01								mg/kg	A-T-022s

REPORT NOTES

Notes - Soil chemical analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supersedes any "D" subscripts.

Superscript "M" indicates method accredited to MCERTS.

If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample. Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/03957
Issue Number: 1

Date: 06 July, 2016

Client: RSK Environment Ltd Hemel
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

Project Manager: Andrew James/Edward Hughes/Nigel Austin
Project Name: Angmering
Project Ref: 27621
Order No: N/A
Date Samples Received: 28/06/16
Date Instructions Received: 28/06/16
Date Analysis Completed: 06/07/16

Prepared by:

Approved by:

Danielle Brierey
Administrative Assistant

Gill Walker
Laboratory Manager

Envirolab Job Number: 16/03957

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03957/1	16/03957/2	16/03957/3	16/03957/4					Units	Method ref
Client Sample No										
Client Sample ID	SWBV1	SWBV2	SWBV3	SWBV4						
Depth to Top	0.30	0.10	0.20	0.10						
Depth To Bottom	0.50	0.30	0.40	0.30						
Date Sampled	23-Jun-16	23-Jun-16	23-Jun-16	23-Jun-16						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	6	5	3	3						
% Stones >10mm _A [#]	<0.1	<0.1	<0.1	<0.1					% w/w	A-T-044
pH _D ^{M#}	7.72	7.14	6.99	7.28					pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.05	0.05	0.09	0.13					g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	230	220	320	430					mg/kg	A-T-028s
Arsenic _D ^{M#}	7	8	5	9					mg/kg	A-T-024s
Cadmium _D ^{M#}	1.6	3.4	1.6	2.4					mg/kg	A-T-024s
Copper _D ^{M#}	20	14	9	10					mg/kg	A-T-024s
Chromium _D ^{M#}	27	35	31	29					mg/kg	A-T-024s
Lead _D ^{M#}	27	14	12	14					mg/kg	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17					mg/kg	A-T-024s
Nickel _D ^{M#}	19	25	21	21					mg/kg	A-T-024s
Selenium _D	<1	3	<1	2					mg/kg	A-T-024s
Zinc _D ^{M#}	51	47	42	43					mg/kg	A-T-024s

Envirolab Job Number: 16/03957

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03957/1	16/03957/2	16/03957/3	16/03957/4					Units	Method ref
Client Sample No										
Client Sample ID	SWBV1	SWBV2	SWBV3	SWBV4						
Depth to Top	0.30	0.10	0.20	0.10						
Depth To Bottom	0.50	0.30	0.40	0.30						
Date Sampled	23-Jun-16	23-Jun-16	23-Jun-16	23-Jun-16						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	6	5	3	3						
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A						Gravimetry

Envirolab Job Number: 16/03957

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03957/1	16/03957/2	16/03957/3	16/03957/4					Units	Method ref
Client Sample No										
Client Sample ID	SWBV1	SWBV2	SWBV3	SWBV4						
Depth to Top	0.30	0.10	0.20	0.10						
Depth To Bottom	0.50	0.30	0.40	0.30						
Date Sampled	23-Jun-16	23-Jun-16	23-Jun-16	23-Jun-16						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	6	5	3	3						
PAH 16										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	<0.02					mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04					mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	<0.04	<0.04					mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05	<0.05					mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	<0.05					mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07					mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06	<0.06					mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04					mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08	<0.08					mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03					mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03					mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03					mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	<0.07	<0.07					mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	<0.08	<0.08	<0.08	<0.08					mg/kg	A-T-019s

Envirolab Job Number: 16/03957

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/03957/1	16/03957/2	16/03957/3	16/03957/4					Units	Method ref
Client Sample No										
Client Sample ID	SWBV1	SWBV2	SWBV3	SWBV4						
Depth to Top	0.30	0.10	0.20	0.10						
Depth To Bottom	0.50	0.30	0.40	0.30						
Date Sampled	23-Jun-16	23-Jun-16	23-Jun-16	23-Jun-16						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	6	5	3	3						
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Ali >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Ali >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Ali >C16-C21 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Ali >C21-C35 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Total Aliphatics _A	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Aro >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Aro >C16-C21 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Aro >C21-C35 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Total Aromatics _A	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s

REPORT NOTES

Notes - Soil chemical analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

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Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supersedes any "D" subscripts.

Superscript "M" indicates method accredited to MCERTS.

If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample. Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT SUPPLEMENT TO TEST REPORT 16/04244/1

Envirolab Job Number: 16/04244
Issue Number: 2

Date: 27 July, 2016

Client: RSK Environment Ltd Hemel
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

Project Manager: Adam Davidson/Andrew James/Edward Hughes/Nigel

Aus

Project Name: West End Nursery, Angmering
Project Ref: 27621
Order No: N/A
Date Samples Received: 11/07/16
Date Instructions Received: 11/07/16
Date Analysis Completed: 27/07/16

Prepared by:

Approved by:

Danielle Brierley
Administrative Assistant

Iain Haslock
Analytical Consultant

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/1	16/04244/2	16/04244/3	16/04244/4	16/04244/5	16/04244/6	16/04244/7	16/04244/8	Units	Method ref
Client Sample No	SB									
Client Sample ID	SA1	V1	V2	V3	V4	V5	V6	V7		
Depth to Top	0.00	0.30	0.20	0.20	0.20	0.30	0.20	0.20		
Depth To Bottom		0.40	0.30	0.40	0.40	0.50	0.40	0.40		
Date Sampled	28-Jun-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16		
Sample Type	Solid - Fragment / Tile	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	8	3A	5A	3A	4A	5A	3A	3A		
% Stones >10mm _A [#]	-	7.3	-	<0.1	0.9	2.0	9.7	0.5	% w/w	A-T-044
pH _D ^{M#}	-	7.50	-	7.49	7.35	7.50	7.43	7.32	pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	0.05	-	0.10	0.12	0.09	0.07	0.10	g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	-	<200	-	360	450	290	220	330	mg/kg	A-T-028s
Arsenic _D ^{M#}	-	6	-	6	6	7	5	6	mg/kg	A-T-024s
Cadmium _D ^{M#}	-	1.9	-	1.8	1.7	2.1	1.9	1.9	mg/kg	A-T-024s
Copper _D ^{M#}	-	8	-	11	15	11	10	11	mg/kg	A-T-024s
Chromium _D ^{M#}	-	32	-	26	19	31	27	28	mg/kg	A-T-024s
Lead _D ^{M#}	-	13	-	16	18	17	14	15	mg/kg	A-T-024s
Mercury _D	-	<0.17	-	<0.17	<0.17	<0.17	<0.17	<0.17	mg/kg	A-T-024s
Nickel _D ^{M#}	-	23	-	21	14	24	22	22	mg/kg	A-T-024s
Selenium _D	-	<1	-	<1	<1	<1	<1	<1	mg/kg	A-T-024s
Zinc _D ^{M#}	-	46	-	50	48	52	47	48	mg/kg	A-T-024s

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/1	16/04244/2	16/04244/3	16/04244/4	16/04244/5	16/04244/6	16/04244/7	16/04244/8	Units	Method ref
Client Sample No	SB									
Client Sample ID	SA1	V1	V2	V3	V4	V5	V6	V7		
Depth to Top	0.00	0.30	0.20	0.20	0.20	0.30	0.20	0.20		
Depth To Bottom		0.40	0.30	0.40	0.40	0.50	0.40	0.40		
Date Sampled	28-Jun-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16		
Sample Type	Solid - Fragment / Tile	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	8	3A	5A	3A	4A	5A	3A	3A		
Asbestos in Soil (inc. matrix)										
Asbestos in soil _A [#]	-	NAD	NAD	NAD	NAD	NAD	NAD	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Gravimetry
Bulk Fibre ID (inc. matrix)										
Bulk Fibre Identification _A [#]	Chrysotile	-	-	-	-	-	-	-		A-T-045
Bulk Fibre Identification Matrix (visual) _A	Cement	-	-	-	-	-	-	-		A-T-045
Bulk Fibre Identification - Suitable for Water Absorption Test? _D	Yes	-	-	-	-	-	-	-		Gravimetry

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/1	16/04244/2	16/04244/3	16/04244/4	16/04244/5	16/04244/6	16/04244/7	16/04244/8	Units	Method ref
Client Sample No	SB									
Client Sample ID	SA1	V1	V2	V3	V4	V5	V6	V7		
Depth to Top	0.00	0.30	0.20	0.20	0.20	0.30	0.20	0.20		
Depth To Bottom		0.40	0.30	0.40	0.40	0.50	0.40	0.40		
Date Sampled	28-Jun-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16		
Sample Type	Solid - Fragment / Tile	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	8	3A	5A	3A	4A	5A	3A	3A		
PAH 16										
Acenaphthene _A ^{M#}	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-019s
Anthracene _A ^{M#}	-	<0.02	-	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	-	<0.07	-	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	<0.06	-	<0.06	<0.06	<0.06	<0.06	<0.06	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	-	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	<0.08	-	<0.08	<0.08	<0.08	<0.08	<0.08	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	-	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	<0.03	-	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	<0.07	-	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	-	<0.08	-	<0.08	<0.08	<0.08	<0.08	<0.08	mg/kg	A-T-019s

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/1	16/04244/2	16/04244/3	16/04244/4	16/04244/5	16/04244/6	16/04244/7	16/04244/8	Units	Method ref
Client Sample No	SB									
Client Sample ID	SA1	V1	V2	V3	V4	V5	V6	V7		
Depth to Top	0.00	0.30	0.20	0.20	0.20	0.30	0.20	0.20		
Depth To Bottom		0.40	0.30	0.40	0.40	0.50	0.40	0.40		
Date Sampled	28-Jun-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16		
Sample Type	Solid - Fragment / Tile	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	8	3A	5A	3A	4A	5A	3A	3A		
TPH CWG										
Ali >C5-C6 _A [#]	-	<0.04	-	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	A-T-022s
Ali >C6-C8 _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
Ali >C8-C10 _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
Ali >C10-C12 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Ali >C12-C16 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Ali >C16-C21 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Ali >C21-C35 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Total Aliphatics _A	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
Aro >C7-C8 _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
Aro >C8-C9 _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
Aro >C9-C10 _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
Aro >C10-C12 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Aro >C12-C16 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Aro >C16-C21 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Aro >C21-C35 _A [#]	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-023s
Total Aromatics _A	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
BTEX - Toluene _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
BTEX - o Xylene _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s
MTBE _A [#]	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-022s

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/9	16/04244/10	16/04244/11	16/04244/12	16/04244/13	16/04244/14			Units	Method ref
Client Sample No										
Client Sample ID	V8	V9	V10	V11	V12	V2				
Depth to Top	0.20	0.20	0.20	0.20	0.20	0.40				
Depth To Bottom	0.40	0.40	0.40	0.40	0.40					
Date Sampled	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	5A	3A	5A	4A	6A				
% Stones >10mm _A [#]	0.9	9.8	3.0	<0.1	2.7	-			% w/w	A-T-044
pH _D ^{M#}	7.56	7.31	7.60	7.58	7.41	-			pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.11	0.05	0.09	0.08	0.10	-			g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	410	<200	320	300	450	-			mg/kg	A-T-028s
Arsenic _D ^{M#}	6	7	7	7	6	-			mg/kg	A-T-024s
Cadmium _D ^{M#}	1.6	1.8	1.7	2.0	1.8	-			mg/kg	A-T-024s
Copper _D ^{M#}	12	8	11	11	22	-			mg/kg	A-T-024s
Chromium _D ^{M#}	17	20	22	25	19	-			mg/kg	A-T-024s
Lead _D ^{M#}	17	13	23	18	27	-			mg/kg	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	-			mg/kg	A-T-024s
Nickel _D ^{M#}	13	19	19	20	14	-			mg/kg	A-T-024s
Selenium _D	<1	<1	<1	<1	<1	-			mg/kg	A-T-024s
Zinc _D ^{M#}	51	38	46	49	123	-			mg/kg	A-T-024s

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/9	16/04244/10	16/04244/11	16/04244/12	16/04244/13	16/04244/14			Units	Method ref
Client Sample No										
Client Sample ID	V8	V9	V10	V11	V12	V2				
Depth to Top	0.20	0.20	0.20	0.20	0.20	0.40				
Depth To Bottom	0.40	0.40	0.40	0.40	0.40					
Date Sampled	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	5A	3A	5A	4A	6A				
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	Chrysotile	Chrysotile				A-T-045
Asbestos Matrix (visual) _A	-	-	-	-	Cement	-				A-T-045
Asbestos Matrix (microscope) _A	-	-	-	-	-	Loose Fibres				A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	Yes	N/A				Gravimetry

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/9	16/04244/10	16/04244/11	16/04244/12	16/04244/13	16/04244/14			Units	Method ref
Client Sample No										
Client Sample ID	V8	V9	V10	V11	V12	V2				
Depth to Top	0.20	0.20	0.20	0.20	0.20	0.40				
Depth To Bottom	0.40	0.40	0.40	0.40	0.40					
Date Sampled	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	5A	3A	5A	4A	6A				
PAH 16										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	<0.02	<0.02	-			mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.07	<0.04	<0.04	<0.04	<0.04	-			mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.06	<0.04	<0.04	<0.04	<0.04	-			mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	-			mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	-			mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	-			mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06	<0.06	<0.06	-			mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	-			mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.14	<0.08	<0.08	<0.08	<0.08	-			mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.05	<0.03	<0.03	<0.03	<0.03	-			mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	-			mg/kg	A-T-019s
Phenanthrene _A ^{M#}	0.08	<0.03	<0.03	<0.03	<0.03	-			mg/kg	A-T-019s
Pyrene _A ^{M#}	0.11	<0.07	<0.07	<0.07	<0.07	-			mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	0.50	<0.08	<0.08	<0.08	<0.08	-			mg/kg	A-T-019s

Envirolab Job Number: 16/04244

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04244/9	16/04244/10	16/04244/11	16/04244/12	16/04244/13	16/04244/14			Units	Method ref
Client Sample No										
Client Sample ID	V8	V9	V10	V11	V12	V2				
Depth to Top	0.20	0.20	0.20	0.20	0.20	0.40				
Depth To Bottom	0.40	0.40	0.40	0.40	0.40					
Date Sampled	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16	07-Jul-16				
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES				
Sample Matrix Code	4A	5A	3A	5A	4A	6A				
TPH CWG										
Ali >C5-C6 _A [#]	<0.04	<0.04	<0.04	<0.04	<0.04	-			mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
Ali >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-			mg/kg	A-T-023s
Ali >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-			mg/kg	A-T-023s
Ali >C16-C21 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-			mg/kg	A-T-023s
Ali >C21-C35 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-			mg/kg	A-T-023s
Total Aliphatics _A	<0.1	<0.1	<0.1	<0.1	<0.1	-			mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
Aro >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-			mg/kg	A-T-023s
Aro >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1	<0.1	-			mg/kg	A-T-023s
Aro >C16-C21 _A [#]	<0.1	<0.1	<0.1	1.4	0.3	-			mg/kg	A-T-023s
Aro >C21-C35 _A [#]	<0.1	<0.1	<0.1	0.3	<0.1	-			mg/kg	A-T-023s
Total Aromatics _A	<0.1	<0.1	<0.1	1.8	0.3	-			mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	<0.1	<0.1	<0.1	1.8	0.3	-			mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	-			mg/kg	A-T-022s

REPORT NOTES

Notes - Soil chemical analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

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Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supersedes any "D" subscripts.

Superscript "M" indicates method accredited to MCERTS.

If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/04624
Issue Number: 1

Date: 09 August, 2016

Client: RSK Environment Ltd Hemel
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

Project Manager: Andrew James/Nigel Austin
Project Name: West End Nursery, Angmering
Project Ref: 27621
Order No: N/A
Date Samples Received: 27/07/16
Date Instructions Received: 27/07/16
Date Analysis Completed: 08/08/16

Prepared by:

Approved by:

Melanie Marshall
Laboratory Coordinator

John Gustafson
Director

Envirolab Job Number: 16/04624

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04624/1	16/04624/2	16/04624/3	16/04624/4					Units	Method ref
Client Sample No										
Client Sample ID	NEBV1	NEBV2	NEBV3	NEBV4						
Depth to Top	0.30	0.30	0.30	0.30						
Depth To Bottom	0.40	0.40	0.40	0.40						
Date Sampled	25-Jul-16	25-Jul-16	25-Jul-16	25-Jul-16						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	5A	5A	3	6A						
% Stones >10mm _A [#]	9.1	<0.1	<0.1	10.4					% w/w	A-T-044
pH _D ^{M#}	7.41	7.45	7.59	7.25					pH	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.09	0.09	0.05	0.09					g/l	A-T-026s
Sulphate (acid soluble) _D ^{M#}	310	340	290	330					mg/kg	A-T-028s
Arsenic _D ^{M#}	5	6	5	5					mg/kg	A-T-024s
Cadmium _D ^{M#}	1.4	1.4	1.2	1.3					mg/kg	A-T-024s
Copper _D ^{M#}	14	13	9	10					mg/kg	A-T-024s
Chromium _D ^{M#}	22	26	19	20					mg/kg	A-T-024s
Lead _D ^{M#}	16	20	19	17					mg/kg	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17					mg/kg	A-T-024s
Nickel _D ^{M#}	18	20	14	15					mg/kg	A-T-024s
Selenium _D	<1	<1	<1	<1					mg/kg	A-T-024s
Zinc _D ^{M#}	43	55	41	43					mg/kg	A-T-024s

Envirolab Job Number: 16/04624

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04624/1	16/04624/2	16/04624/3	16/04624/4					Units	Method ref
Client Sample No										
Client Sample ID	NEBV1	NEBV2	NEBV3	NEBV4						
Depth to Top	0.30	0.30	0.30	0.30						
Depth To Bottom	0.40	0.40	0.40	0.40						
Date Sampled	25-Jul-16	25-Jul-16	25-Jul-16	25-Jul-16						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	5A	5A	3	6A						
Asbestos in Soil (inc. matrix)										
Asbestos in soil _A [#]	NAD	NAD	NAD	NAD						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A						Gravimetry

Envirolab Job Number: 16/04624

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04624/1	16/04624/2	16/04624/3	16/04624/4					Units	Method ref
Client Sample No										
Client Sample ID	NEBV1	NEBV2	NEBV3	NEBV4						
Depth to Top	0.30	0.30	0.30	0.30						
Depth To Bottom	0.40	0.40	0.40	0.40						
Date Sampled	25-Jul-16	25-Jul-16	25-Jul-16	25-Jul-16						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	5A	5A	3	6A						
PAH 16										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	<0.02					mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04					mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	<0.04	<0.04					mg/kg	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05	<0.05					mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	<0.05					mg/kg	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07					mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06	<0.06					mg/kg	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04					mg/kg	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08	<0.08					mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03					mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03					mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03					mg/kg	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	<0.07	<0.07					mg/kg	A-T-019s
PAH (total 16) _A ^{M#}	<0.08	<0.08	<0.08	<0.08					mg/kg	A-T-019s

Envirolab Job Number: 16/04624

Client Project Name: West End Nursery, Angmering

Client Project Ref: 27621

Lab Sample ID	16/04624/1	16/04624/2	16/04624/3	16/04624/4					Units	Method ref
Client Sample No										
Client Sample ID	NEBV1	NEBV2	NEBV3	NEBV4						
Depth to Top	0.30	0.30	0.30	0.30						
Depth To Bottom	0.40	0.40	0.40	0.40						
Date Sampled	25-Jul-16	25-Jul-16	25-Jul-16	25-Jul-16						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	5A	5A	3	6A						
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Ali >C8-C10 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Ali >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Ali >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Ali >C16-C21 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Ali >C21-C35 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Total Aliphatics _A	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-022+23s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C8-C9 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C9-C10 _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
Aro >C10-C12 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Aro >C12-C16 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Aro >C16-C21 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Aro >C21-C35 _A [#]	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-023s
Total Aromatics _A	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-022+23s
TPH (Ali & Aro) _A	<0.1	<0.1	<0.1	<0.1					mg/kg	A-T-022+23s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01					mg/kg	A-T-022s

REPORT NOTES

Notes - Soil chemical analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

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All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supersedes any "D" subscripts.

Superscript "M" indicates method accredited to MCERTS.

If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/05298
Issue Number: 1

Date: 05 September, 2016

Client: RSK Environment Ltd Hemel
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

Project Manager: Andrew James/Edward Hughes/Nigel Austin
Project Name: Angmering
Project Ref: 27621
Order No: N/A
Date Samples Received: 24/08/16
Date Instructions Received: 24/08/16
Date Analysis Completed: 04/09/16

Prepared by:

Approved by:


Danielle Brierley
Administrative Assistant


Iain Haslock
Analytical Consultant

Envirolab Job Number: 16/05298

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/05298/1	16/05298/2	16/05298/3	16/05298/4	16/05298/5	16/05298/6	16/05298/7	16/05298/8	Units	Method ref
Client Sample No										
Client Sample ID	POSV13	POSV14	POSV15	POSV16	POSV2A	POSV2B	POSV2C	POSV2D		
Depth to Top	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30		
Depth To Bottom	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40		
Date Sampled	22-Aug-16	22-Aug-16	22-Aug-16	22-Aug-16	22-Aug-16	22-Aug-16	22-Aug-16	22-Aug-16		
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	3A	3A	3	3A	3A	3A	3	3A		
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		Gravimetry

Envirolab Job Number: 16/05298

Client Project Name: Angmering

Client Project Ref: 27621

Lab Sample ID	16/05298/9	16/05298/10	16/05298/11	16/05298/12					Units	Method ref
Client Sample No										
Client Sample ID	POSV12A	POSV12B	POSV12C	POSV12D						
Depth to Top	0.30	0.30	0.30	0.30						
Depth To Bottom	0.40	0.40	0.40	0.40						
Date Sampled	22-Aug-16	22-Aug-16	22-Aug-16	22-Aug-16						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	3A	3A	3A	3A						
Asbestos in Soil (inc. matrix)										
Asbestos in soil _A [#]	NAD	NAD	NAD	NAD						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A						Gravimetry

REPORT NOTES

Notes - Soil chemical analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

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All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supercedes any "D" subscripts.

Superscript "M" indicates method accredited to MCERTS.

If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

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Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

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APPENDIX E

RSK GENERIC ASSESSMENT CRITERIA

Generic assessment criteria for human health: residential scenario with home-grown produce

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009⁽¹⁾. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009⁽²⁾. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC: 2015

In 2014, the publication of Category 4 Screening Levels (C4SL)^(3,4), as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)⁽⁵⁾ used in the generation of SGVs.

C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010⁽³⁾). Where a C4SL has been published, the RSK GAC duplicates the C4SL published values using all input parameters within the SP1010 final project report⁽³⁾ and associated appendices⁽⁶⁾, and adopts them as GAC for these six substances.

For all other substances the C4SL exposure modifications, with the exception of the "top two" produce type approach taken in the C4SL, have been applied to the current RSK GAC. These include alterations to daily inhalation rates for residential and commercial scenarios, reducing soil adherence factors in children (age classes 1 to 12 only) for residential land use, reducing exposure frequency for dermal contact outdoors for residential land use, and updated produce type consumption rates (90th percentile) based on recent data from the National Diet and Nutrition Survey.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015⁽⁷⁾, where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the Contaminated Land Exposure Assessment (CLEA) tool v1.06, supporting EA guidance^(5,8,9) and revised exposure scenarios published for the C4SL⁽³⁾. Groundwater assessment criteria (GrAC) protective of human health via the inhalation pathway were derived using the RBCA 1.3b model. RSK has updated the inputs within RBCA to reflect EA guidance^(1,5,8,9). The SAC and GrAC collectively are termed GAC.

Conceptual model

In accordance with SR3⁽⁵⁾, the residential with home-grown produce scenario considers risks to a female child between the ages of 0 and 6 years old as the highest risk scenario. In accordance

with Box 3.1 of SR3⁽⁵⁾, the pathways considered for production of the SAC in the residential with home-grown produce scenario are

- direct soil and dust ingestion
- consumption of home-grown produce
- consumption of soil attached to home-grown produce
- dermal contact with soil and indoor dust
- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

In line with guidance in the EA SGV report for cadmium⁽¹⁾, the RSK GAC for cadmium has been derived based on estimates representative of lifetime exposure. Although young children are generally more likely to have higher exposures to soil contaminants, the renal toxicity of cadmium, and the derivation of the TDI_{oral} and TDI_{inh} , are based on considerations of the kidney burden accumulated over 50 years or so. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by residents while indoors. Figure 2 illustrates this linkage. Although the outdoor air inhalation pathway is also valid, this contributes little to the overall risks owing to the dilution in outdoor air. Within RBCA, the solubility limit of the chemical restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. While the same restriction is not built into the CLEA model, the CLEA model output cells are flagged red where the soil saturation limit has been exceeded.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁹⁾. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached⁽⁹⁾. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required⁽⁹⁾:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting

the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook⁽⁹⁾, this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁹⁾, which explains how to calculate an effective assessment criterion manually.

SR3⁽⁵⁾ states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7⁽¹⁰⁾, the EA TOX⁽¹¹⁾ reports, the C4SL SP1010 project report and associated appendices^(3,6) or the 2015 LQM/CIEH report⁽⁷⁾. Where a C4SL has been published, the RSK GAC have duplicated the C4SL published values using all input parameters within the SP1010 final project report⁽³⁾ and associated appendices⁽⁶⁾, and has adopted them as GAC for these six substances. Toxicological and specific chemical parameters for aromatic hydrocarbon C₈–C₉ (styrene), 1,2,4-trimethylbenzene and methyl tertiary-butyl ether (MTBE) were obtained from the CL:AIRE Soil Generic Assessment Criteria report⁽¹¹⁾.

For TPH, aromatic hydrocarbons C₅–C₈ were not modelled, as this range comprises benzene and toluene, which are modelled separately. The aromatic C₈–C₉ hydrocarbon fraction comprises ethylbenzene, xylene and styrene. As ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for aromatic C₈–C₉ have been taken from styrene.

For the GrAC, owing to the lack of UK-specific data, default information in the RBCA model was used to evaluate MTBE. No published UK data was available for 1,3,5-trimethylbenzene, so information was obtained from the RBCA model. RBCA uses toxicity data for the inhalation pathway in different units to the CLEA model and cannot consider separately the mean daily intake (MDI), occupancy periods or breathing rates. Therefore, the HCV in RBCA was amended to take account of

- amendments to the MDI using Table 3.4 of SR2⁽⁸⁾
- a child weighing 13.3kg (average of 0–6 year old female in accordance with Table 4.6 of SR3⁽⁵⁾) and breathing 11.85m³ (average daily inhalation rate for a 0–6-year old female in accordance with Table 4.14 of SR3⁽⁵⁾). Inhalation rates used in the derivation of the GrAC have not been updated in line with the 2011 USEPA published values⁽¹²⁾; these will be updated in subsequent revisions of the RSK GAC. The lower inhalation rates presented by the USEPA in 2011 for ages classes 1 to 11 (values are higher for age classes 12 to 18) are not considered to make a significant difference.
- the 50% rule (for petroleum hydrocarbons, trimethylbenzenes and MTBE)^(8,9) where MDI data is not available but background exposure is considered important in the overall exposure.

Physical parameters

For the residential with home-grown produce scenario, the CLEA default building is a small, two-storey terrace house with a concrete ground-bearing slab. The house is assumed to have a 100m² private garden consisting of lawn and flowerbeds, incorporating a 20m² plot for growing fruit and vegetables consumed by the residents. SR3⁽⁵⁾ notes this residential building type to be the most conservative in terms of potential for vapour intrusion. The building parameters used in the production of the RSK GACs are the default CLEA v1.06 inputs presented in Table 3.3 of SR3⁽³⁾, with a dust loading factor detailed in Section 9.3 of SR3⁽⁵⁾. The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3⁽⁵⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater. The GrAC were produced using the input parameters in Table 4.

Summary of modifications to the default CLEA 1.06/SR3⁽⁵⁾ input parameters for residential with home-grown produce land-use scenario

In summary, the RSK GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3⁽⁵⁾. Modifications to the default SR3⁽⁵⁾ exposure scenarios based on the C4SL exposure scenarios⁽³⁾ are presented in Tables 2 and 3 below.

The final selected GAC are presented by pathway in Table 5 and the combined GAC in Table 6.

Figure 1: Conceptual model for residential scenario with home-grown produce

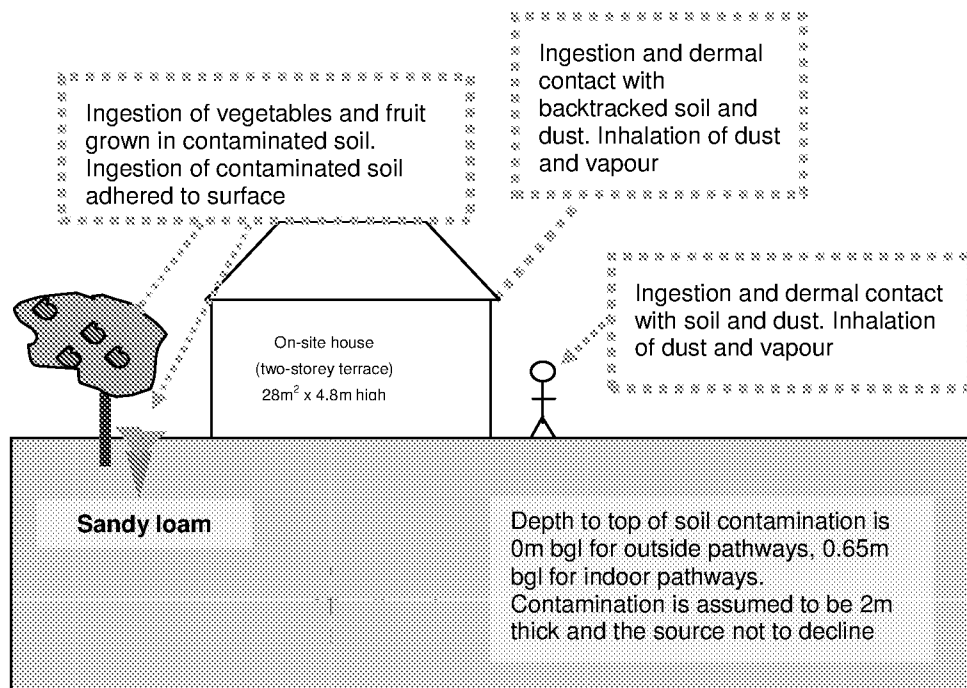


Table 1: Exposure assessment parameters for residential scenario with home-grown produce – inputs for CLEA model

Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, SR3 ⁽⁵⁾
Building	Small terraced house	Key generic assumption given in Box 3.1, SR3. Small, two-storey terraced house chosen, as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3) ⁽⁵⁾
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, from Table 3.1, SR3) ⁽⁵⁾
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged 0–6. From Box 3.1, SR3 ⁽⁵⁾
End AC (age class)	6	
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽¹³⁾
	1	To provide SAC for sites where SOM <6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Residential with home-grown produce – modified home-grown produce data

Name	Consumption rate 90 th percentile (g FW kg ⁻¹ BW day ⁻¹) by age class						Dry weight conversion factor (g DW g ⁻¹ FW)	Home-grown fraction (average)	Home-grown fraction (high end)	Soil loading factor (g g ⁻¹ DW)	Preparation correction factor
	1	2	3	4	5	6					
Green vegetables	7.12	5.87	5.87	5.87	4.53	4.53	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.7	2.83	2.83	2.83	2.14	2.14	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16	6.6	6.6	6.6	4.95	4.95	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.39	3.39	3.39	2.24	2.24	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.46	0.46	0.46	0.19	0.19	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	10.3	10.3	10.3	5.16	5.16	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 3.4, SP1010 ⁽³⁾						Table 6.3, SR3 ⁽⁵⁾	Table 4.19, SR3 ⁽⁵⁾		Table 6.3, SR3 ⁽⁵⁾	

Table 3: Residential with home-grown produce – modified and use and receptor data

Parameter	Unit	Age class					
		1	2	3	4	5	6
EF (soil and dust ingestion)	day yr ⁻¹	180	365	365	365	365	365
EF (consumption of home-grown produce)	day yr ⁻¹	180	365	365	365	365	365
EF (skin contact, indoor)	day yr ⁻¹	180	365	365	365	365	365
EF (skin contact, outdoor)	day yr ⁻¹	170	170	170	170	170	170
EF (inhalation of dust and vapour, indoor)	day yr ⁻¹	365	365	365	365	365	365
EF (inhalation of dust and vapour, outdoor)	day yr ⁻¹	365	365	365	365	365	365
Justification		Table 3.5, SP1010 ⁽³⁾ ; Table 3.1, SR3 ⁽⁵⁾					
Soil to skin adherence factor (outdoor)	mg cm ⁻² day ⁻¹	0.1	0.1	0.1	0.1	0.1	0.1
Justification		Table 3.5, SP1010 ⁽³⁾					
Inhalation rate	m ³ day ⁻¹	5.4	8.0	8.9	10.1	10.1	10.1
Justification		Mean value USEPA, 2011 ⁽¹²⁾ ; Table 3.2, SP1010 ⁽³⁾					
Notes: For cadmium , the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI _{oral} and TDI _{inh} are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not just in childhood but averaged over a longer period. See the Environment Agency Science Report SC05002/ TOX 3 ⁽¹⁾ , Science Report SC050021/Cadmium SGV ⁽¹⁾ and the project report SP1010 ⁽³⁾ for more information.							

Figure 2: GrAC conceptual model for RBCA residential with home-grown produce scenario

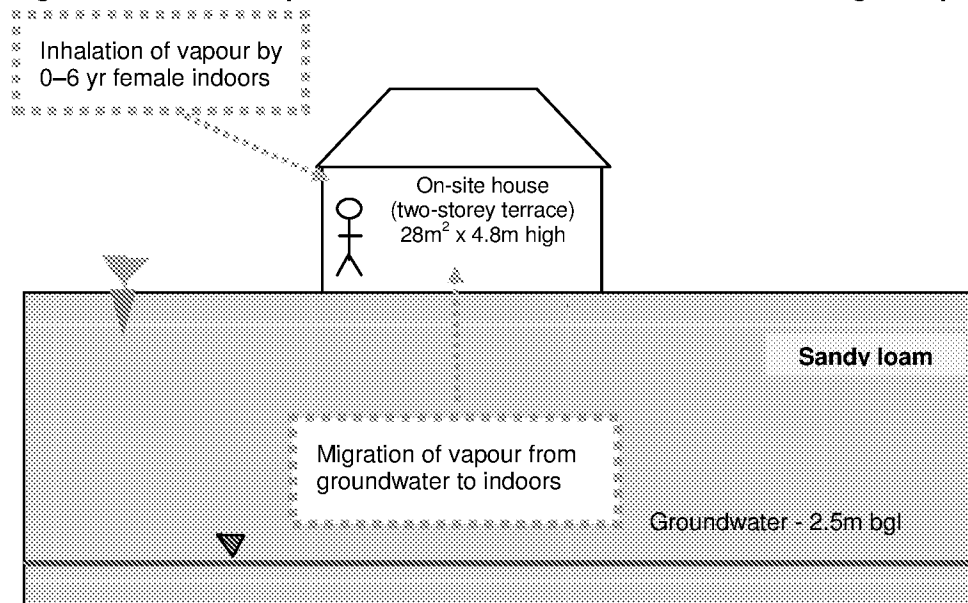


Table 4: Residential with home-grown produce – RBCA inputs

Parameter	Unit	Value	Justification
Receptor			
Averaging time	Years	6	From Box 3.1, SR3 ⁽⁵⁾
Receptor weight	kg	13.3	Average of CLEA 0–6 year old female data, Table 4.6, SR3 ⁽⁵⁾
Exposure duration	Years	6	From Box 3.1, report, SR3 ⁽⁵⁾
Exposure frequency	Days/yr	350	Weighted using occupancy period of 23 hours per day for 365 days of the year
Soil type – sandy loam			
Total porosity	-	0.53	CLEA value for sandy loam. Parameters for sandy loam from Table 4.4, SR3 ⁽⁵⁾
Volumetric water content	-	0.33	
Volumetric air content	-	0.20	
Dry bulk density	g cm ⁻³	1.21	
Vertical hydraulic conductivity	cm s ⁻¹	3.56E-3	CLEA value for saturated conductivity of sandy loam, Table 4.4, SR3 ⁽⁵⁾
Vapour permeability	m ²	3.05E-12	Calculated for sandy loam using equations in Appendix 1, SR3 ⁽⁵⁾
Capillary zone thickness	m	0.1	Professional judgement
Fraction organic carbon	%	0.0348	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽¹³⁾
Building			
Building volume/area ratio	m	4.8	Table 3.3, SR3 ⁽⁵⁾
Foundation area	m ²	28	
Foundation perimeter	m	22	Calculated assuming building measures 7m x 4m to give 28m ² foundation area
Building air exchange rate	d ⁻¹	12	Table 3.3, SR3 ⁽⁵⁾
Depth to bottom of foundation slab	m	0.15	
Foundation thickness	m	0.15	
Foundation crack fraction	-	0.0151	Calculated from floor crack area of 423 cm ² and building footprint of 28m ² in Table 4.21, SR3 ⁽⁵⁾
Volumetric water content of cracks	-	0.33	Assumed equal to underlying soil type in assumption that cracks become filled with soil over time. Parameters for sandy loam from Table 4.4, SR3 ⁽⁵⁾
Volumetric air content of cracks	-	0.2	
Indoor/outdoor differential pressure	Pa	3.1	From Table 3.3, SR3 ⁽⁵⁾

References

1. Environment Agency (2009), 'Science Reports SC050021 - SGV and TOX reports for: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin-like PCBs'; 'Supplementary information for the derivation of SGV for: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin-like PCBs', and 'Contaminants in soil: updated collation of toxicological data and intake values for humans: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel, arsenic, cadmium, phenol, dioxins, furans and dioxin-like PCBs'. Available at: <https://www.gov.uk/government/publications/contaminants-in-soil-updated-collation-of-toxicological-data-and-intake-values-for-humans> and <https://www.gov.uk/government/publications/land-contamination-soil-guideline-values-sgvs> (accessed 4 February 2015)
2. Nathanial, C. P., McCaffrey, C., Ashmore, M., Cheng, Y., Gillet, A. G., Ogden, R. C. and Scott, D. (2009), *LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment*, second edition (Nottingham: Land Quality Press).
3. Contaminated Land: Applications in Real Environment (CL:AIRE) (2014). 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010.
4. Department for Environment, Food and Rural Affairs (Defra) (2014), 'SP1010: Development of Category 4 Screening Levels for assessment of land affected by contamination – Policy Companion Document', Revision 2.
5. Environment Agency (2009), *Science Report – SC050021/SR3. Updated technical background to the CLEA model* (Bristol: Environment Agency).
6. Contaminated Land: Applications in Real Environment (CL:AIRE) (2014). 'Appendices C to H). DEFRA research project SP1010'.
7. Nathanial, C. P., McCaffrey, C., Gillet, A. G., Ogden, R. C. and Nathanial, J. F. (2015), *The LQM/CIEH S4ULs for Human Health Risk Assessment* (Nottingham: Land Quality Press).
8. Environment Agency (2009), *Human health toxicological assessment of contaminants in soil. Science Report – Final SC050021/SR2* (Bristol: Environment Agency).
9. Environment Agency (2009), *Science Report – SC050021/SR4 CLEA Software (version 1.05) Handbook* (Bristol: Environment Agency).
10. Environment Agency (2008), *Science Report SC050021/SR7. Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values* (Bristol: Environment Agency).
11. CL:AIRE (2009), *Soil Generic Assessment Criteria for Human Health Risk Assessment* (London: CL:AIRE).
12. USEPA (2011), *Exposure factors handbook*, EPA/600/R-090/052F (Washington, DC: Office of Research and Development).
13. Environment Agency (2009), 'Changes made to the CLEA framework documents after the three-month evaluation period in 2008', released January 2009.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 5

Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals														
Arsenic	(a,b)	-	3.89E-01	NR	NR	NR	3.89E-01	NR	NR	NR	3.89E-01	NR	NR	NR
Cadmium	(a)	-	NR	NR	2.80E+01	NR	NR	NR	2.80E+01	NR	NR	NR	2.80E+01	NR
Chromium (III) - trivalent	(c)	-	1.84E-04	8.07E-02	8.25E-02	NR	1.84E-04	8.07E-02	8.25E-02	NR	1.84E-04	8.07E-02	8.25E-02	NR
Chromium (VI) - hexavalent	(a,d)	-	NR	2.10E-01	NR	NR	NR	2.10E-01	NR	NR	NR	2.10E-01	NR	NR
Copper	-	-	2.72E-03	1.41E-04	8.47E-03	NR	2.72E-03	1.41E-04	8.47E-03	NR	2.72E-03	1.41E-04	8.47E-03	NR
Lead	(a)	-	NR	NR	2.0E-02	NR	NR	NR	2.0E-02	NR	NR	NR	2.0E-02	NR
Elemental Mercury (Hg ⁰)	(d)	9.40E-03	NR	2.95E-01	NR	4.31E+00	NR	9.89E-01	NR	1.07E+01	NR	1.22E-06	NR	2.58E+01
Inorganic Mercury (Hg ²⁺)	-	-	3.96E-01	3.69E-03	2.31E-01	NR	3.96E-01	3.69E-03	2.31E-01	NR	3.96E-01	3.69E-03	2.31E-01	NR
Methyl Mercury (Hg ⁴⁺)	-	2.00E+01	1.29E-01	1.87E-01	7.33E-06	7.33E+01	1.29E-01	2.62E-01	3.24E-06	1.42E+02	1.29E-01	7.69E-01	1.98E-01	3.04E+02
Nickel	(d)	-	5.47E-02	1.81E-02	1.84E+02	NR	5.47E-02	1.81E+02	1.84E+02	NR	5.47E-02	1.81E+02	1.84E+02	NR
Selenium	(b)	-	2.69E-03	NR	NR	NR	2.69E-02	NR	NR	NR	2.69E-02	NR	NR	NR
Zinc	(b)	-	2.89E-03	3.69E-07	NR	NR	3.89E-03	3.62E-07	NR	NR	3.89E-03	3.69E-07	NR	NR
Cyanide	-	-	3.74E+01	4.09E+00	3.79E+00	NR	2.74E+01	4.09E+00	3.79E+00	NR	2.74E+01	4.09E+00	3.79E+00	NR
Volatile Organic Compounds														
Benzene	(a)	7.20E-00	7.39E-01	1.88E+00	1.94E+00	1.22E+03	7.39E-01	1.88E+00	1.94E+00	2.26E+03	1.16E-06	3.46E+06	8.72E-01	4.71E+03
Toluene	-	8.90E-02	1.63E-02	9.08E-02	1.31E-02	8.69E+02	3.49E-02	2.00E-03	2.97E-02	1.92E+03	7.96E-02	4.55E+03	6.77E-02	4.36E+03
Ethylbenzene	-	1.60E-02	1.10E-02	3.34E-01	4.74E-01	5.18E+02	2.61E-02	1.99E-02	1.12E-02	1.22E+03	9.00E-02	4.59E+02	2.90E-02	2.84E+03
Xylene - m	-	8.40E-01	2.10E-02	8.25E-01	5.92E-01	6.25E+02	5.01E-03	1.46E-02	1.40E-02	1.47E+03	1.12E+02	4.69E+02	3.27E-02	3.46E+03
Xylene - o	-	1.60E-02	1.89E-02	6.67E+03	6.07E-01	4.78E+02	1.58E-02	2.08E-02	1.43E-02	1.12E+03	1.05E-03	4.89E+02	3.12E-02	2.62E+03
Xylene - p	-	8.70E-01	1.89E-02	7.98E-01	6.69E-01	5.76E+02	4.70E-02	1.96E+02	1.38E-02	1.35E+03	1.09E+03	4.94E+02	3.10E-02	3.17E+03
Total xylene	-	8.40E+01	1.92E-02	7.89E-01	5.86E+01	6.25E+02	4.56E-02	1.96E-02	1.39E-02	1.47E+03	1.05E+03	4.96E+02	3.10E-02	3.46E+03
Methyl tertiary-Butyl ether (MTBE)	-	2.20E+03	1.54E-02	1.04E-06	1.84E-02	2.04E+04	2.97E-02	1.69E-03	8.53E-02	3.31E+04	6.69E-02	3.21E+03	3.09E+02	6.27E+04
Trichloroethene	-	1.80E-00	2.83E-01	1.72E-02	1.62E-02	1.54E+03	8.38E-01	3.59E-02	3.40E-02	3.22E+03	1.44E-06	1.96E-02	7.95E-02	7.14E+03
Tetrachloroethene	-	3.60E+00	4.49E-01	1.79E-01	1.79E-01	4.24E+02	1.04E-01	4.02E-01	3.94E-01	9.51E+02	2.39E-01	8.21E-01	8.04E-01	2.18E+03
1,1,1-Trichloroethane	-	2.60E+01	3.39E-02	9.01E-00	8.77E+00	1.43E+03	7.89E-02	1.84E-01	1.89E-01	2.92E+03	1.62E+03	4.94E+01	3.94E-01	6.39E+03
1,1,1,2-Tetrachloroethane	-	1.40E+01	6.29E-00	1.94E-00	1.80E-00	2.60E+03	1.27E-01	3.56E-00	3.79E-00	6.02E+03	2.98E-01	8.29E-00	8.49E-00	1.40E+04
1,1,2,2-Tetrachloroethane	-	1.40E+01	2.81E-00	2.95E-00	1.64E-00	2.67E+03	6.09E-00	3.04E+00	3.47E-00	5.46E+03	1.26E+01	1.79E+01	7.67E+00	1.20E+04
Carbon Tetrachloride	-	5.50E-02	3.19E-04	5.39E-03	2.57E-02	1.52E+03	1.11E-06	5.69E-02	5.69E-02	3.32E+03	1.62E-01	1.89E-01	1.37E-01	7.54E+03
1,2-Dichloroethane	-	3.00E-01	2.13E-02	5.20E-03	7.13E-03	3.41E+03	3.79E-02	1.39E-02	1.98E-02	4.91E+03	1.09E-01	3.39E-02	1.98E-02	8.43E+03
Vinyl Chloride	-	1.90E-02	3.82E-03	7.79E-04	8.43E-04	1.36E+03	6.87E-03	1.06E-03	8.73E-04	1.76E+03	1.25E-02	1.53E-03	1.39E-03	2.69E+03
1,2,4-Trimethylbenzene	-	7.50E-02	NR	1.75E-00	NR	4.74E+02	NR	4.39E+00	NR	1.16E+03	NR	3.72E-06	NR	2.76E+03
1,3,5-Trimethylbenzene	(e)	4.70E-02	NR	NR	NR	2.30E+02	NR	NR	NR	5.52E+02	NR	NR	NR	1.30E+03
Semi-Volatile Organic Compounds														
Acenaphthene	-	3.26E+00	2.27E-02	4.86E-04	2.28E+02	5.70E+01	5.41E-02	1.18E-05	5.38E-02	1.41E+02	1.16E-03	2.88E-05	1.17E+03	3.36E+02
Acenaphthylene	-	4.20E+00	1.85E-02	4.59E-04	1.84E+02	8.61E+01	4.42E-02	1.11E-05	4.40E-02	2.12E+02	9.78E-03	2.53E-05	9.74E-02	5.06E+02
Acridene	-	2.10E-02	2.43E-03	1.59E-05	3.39E+03	1.17E+00	5.53E-02	3.77E-05	5.45E-03	2.91E+00	1.10E-04	8.76E-05	1.09E-04	6.96E+00
Benzo(a)anthracene	-	3.80E-03	1.01E+01	2.47E+01	7.16E+00	1.71E+00	1.42E+01	4.37E+01	1.07E+01	4.28E+00	1.89E+01	6.29E+01	1.39E+01	1.03E+01
Benzo(b)fluoranthene	-	2.00E-03	2.96E-00	1.89E-01	2.56E+00	1.22E+00	3.89E-00	2.13E-01	3.29E-00	3.04E+00	4.45E-06	2.22E-01	2.69E-06	7.29E+00
Benzo(g,h,i)perylene	-	2.80E-04	3.77E-02	1.87E-03	3.14E+02	1.54E-02	4.09E-02	1.94E-03	3.28E-02	3.85E-02	4.23E-02	1.97E-03	2.48E-03	9.23E-02
Benzo(k)fluoranthene	-	9.00E-04	8.92E+01	5.41E+02	7.86E+01	6.87E-01	1.10E+02	9.76E+02	9.22E+01	1.72E+00	1.21E+02	5.91E+02	1.00E+02	4.12E+00
Chrysene	-	2.00E-03	1.66E-01	1.19E-02	1.46E-01	4.40E-01	2.84E-01	1.49E-02	2.17E-01	1.10E+00	3.19E-01	1.66E-02	2.87E-01	2.64E+00
Dibenz(a,h)anthracene	-	8.00E-04	2.90E-01	1.45E-00	2.41E-01	3.93E-03	3.43E-01	1.64E+00	2.84E-01	9.82E-03	5.69E-01	1.74E+00	3.04E-01	2.36E-02
Fluoranthene	-	2.30E-01	2.87E-02	3.89E-04	2.85E-02	1.89E+01	5.63E-02	8.87E-04	5.60E-02	4.73E-01	9.00E-02	1.83E-05	8.96E-02	1.13E-02
Fluorene	-	1.80E+00	1.77E-02	6.20E-03	1.72E-02	3.09E-01	4.13E-02	1.53E-04	4.07E-02	7.65E-01	8.96E-02	3.69E-04	8.78E-02	1.83E+02
Indeno(1,2,3-cd)pyrene	-	2.00E-04	3.09E-01	2.12E-02	2.78E+01	6.13E-02	4.22E-01	2.38E-02	3.99E-01	1.53E-01	4.92E-01	2.50E-02	4.11E-01	3.68E-01
Phenanthrene	-	5.30E-01	8.85E-01	7.17E-03	9.72E-01	3.60E-01	2.24E-02	1.76E-04	2.22E-02	8.96E-01	4.48E-02	4.07E-04	4.43E-02	2.14E-02
Pyrene	-	1.30E-01	6.29E-02	8.79E-04	6.20E-02	2.20E+00	1.25E-02	2.04E-03	1.24E-03	5.49E+00	2.05E-03	4.23E-05	2.04E-03	1.32E-01
Benzo(a)pyrene	(a)	3.80E-03	4.91E+00	3.51E+01	4.30E+00	9.11E-01	4.91E+00	3.77E+01	4.34E+00	2.28E+00	4.91E+00	3.89E+01	4.39E+00	5.46E+00
Naphthalene	-	1.80E+01	2.78E-01	2.39E-01	1.37E-01	7.64E-01	8.89E-01	3.56E-01	3.04E-01	1.83E+02	1.56E-02	1.21E-02	7.96E-01	4.32E-02
Phenol	-	-	1.80E-02	4.96E-02	1.30E-02	2.42E+04	2.98E-02	8.99E-02	8.79E-02	3.81E+04	5.89E-02	1.19E-03	2.89E-02	7.03E+04

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 5

Human Health Generic Assessment Criteria by Pathway for Residential With Home-Grown Produce Scenario

Compound	Notes	GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 2.5% (mg/kg)			Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation Limit (mg/kg)
			Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Total Petroleum Hydrocarbons														
Aliphatic hydrocarbons <EC ₉ -EC ₃		1.00E+01	4.96E+03	4.24E+01	4.23E+01	3.04E+02	1.12E+04	7.79E+01	7.78E+01	5.58E+02	2.41E+04	1.81E+02	1.80E+02	1.15E+03
Aliphatic hydrocarbons >EC ₉ -EC ₅		5.40E+00	1.46E+04	1.04E+02	1.03E+02	1.44E+02	3.27E+04	3.31E+02	3.31E+02	3.22E+02	6.47E+04	3.89E+02	3.88E+02	7.36E+02
Aliphatic hydrocarbons >EC ₉ -EC ₁₀		2.30E+01	1.45E+03	2.66E+03	3.87E+01	7.77E+01	2.42E+03	6.59E+01	6.50E+01	1.90E+02	3.29E+03	1.36E+02	1.34E+02	4.51E+02
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂		3.40E+02	3.47E+03	1.33E+02	1.32E+02	4.75E+01	3.98E+03	3.31E+02	3.24E+02	1.18E+02	4.23E+03	7.93E+02	7.52E+02	2.83E+02
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆		7.60E+04	4.36E+03	1.11E+03	1.03E+03	2.37E+01	4.40E+03	2.78E+03	2.22E+03	5.91E+01	4.41E+03	6.67E+03	3.47E+03	1.42E+02
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	(b)	-	5.28E+04	NR	NR	8.48E+00	6.95E+04	NR	NR	2.12E+01	7.94E+04	NR	NR	5.09E+01
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	(b)	-	5.28E+04	NR	NR	8.48E+00	6.95E+04	NR	NR	2.12E+01	7.94E+04	NR	NR	5.09E+01
Aromatic hydrocarbons >EC ₉ -EC ₉ (styrene)		7.40E+00	1.67E+01	5.22E+02	1.05E+01	6.26E+02	2.51E+01	1.20E+03	2.46E+01	1.44E+03	5.73E+01	3.79E+03	5.80E+01	3.35E+03
Aromatic hydrocarbons >EC ₉ -EC ₁₀		7.40E+00	6.71E+01	4.74E+01	3.44E+01	6.13E+02	1.96E+02	1.16E+02	8.39E+01	1.50E+03	2.81E+02	2.77E+02	1.69E+02	3.58E+02
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂		2.50E+01	8.17E+01	2.59E+02	7.42E+01	3.64E+02	1.90E+02	6.39E+02	1.74E+02	8.99E+02	3.95E+02	1.58E+03	3.67E+02	2.15E+03
Aromatic hydrocarbons >EC ₁₂ -EC ₁₅		5.60E+00	1.42E+02	2.85E+03	1.41E+02	1.69E+02	3.18E+02	7.07E+03	3.14E+02	4.19E+02	6.06E+02	1.68E+04	6.03E+02	1.00E+03
Aromatic hydrocarbons >EC ₁₅ -EC ₂₁	(b)	-	2.46E+02	NR	NR	5.37E+01	4.84E+02	NR	NR	1.34E+02	7.69E+02	NR	NR	3.21E+02
Aromatic hydrocarbons >EC ₂₁ -EC ₂₅	(b)	-	8.72E+02	NR	NR	4.83E+00	1.10E+03	NR	NR	1.21E+01	1.22E+03	NR	NR	2.90E+01
Aromatic hydrocarbons >EC ₂₅ -EC ₄₄	(b)	-	8.72E+02	NR	NR	4.83E+00	1.10E+03	NR	NR	1.21E+01	1.22E+03	NR	NR	2.90E+01

Notes:

EC - equivalent carbon; GrAC - groundwater assessment criteria; SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

	Calculated SAC exceeds soil saturation limit and may significantly effect the interpretation of any exceedances since the contribution of the indoor and outdoor vapour pathway to total exposure is >10%. This shading has also been used for the RSCA output where the theoretical solubility limit has been exceeded. The SAC has been set as the model calculated SAC with the saturation limits shown in brackets.
	Calculated SAC exceeds soil saturation limit but will not effect the SSV significantly since the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.
	Calculated SAC does not exceed the soil saturation limit.

For consistency where the theoretical solubility limit within RSCA has been exceeded in production of the GrAC, these cells have also been hatched red.

The SAC for organic compounds are dependent upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzenes, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the C4SL toxicology data.

(b) SAC for selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposure is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for CrIII should be based on the lower of the oral and inhalation SAC (see LQM/CIEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4 trimethylbenzene may be used.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH HOME-GROWN PRODUCE



Table 6
Human Health Generic Assessment Criteria for Residential with home-grown produce

Compound	GrAC for Groundwater (mg/l)	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals				
Arsenic	-	37	37	37
Cadmium	-	30	30	30
Chromium (III) - trivalent	-	910	910	910
Chromium (VI) - hexavalent	-	21	21	21
Copper	-	2,500	2,500	2,500
Lead	-	200	200	200
Elemental Mercury (Hg ⁰)	0.0094	0.2	0.6	1.2
Inorganic Mercury (Hg ²⁺)	-	39	39	39
Methyl Mercury (Hg ⁴⁺)	20	10	10	10
Nickel	-	180	180	180
Selenium	-	258	258	258
Zinc	-	3,900	3,900	3,900
Cyanide	-	3.8	3.8	3.8
Volatile Organic Compounds				
Benzene	7.2	1.64	1.64	0.87
Toluene	590	130	300	680
Ethylbenzene	180	50	110	260
Xylene - m	84	59	140	327
Xylene - o	100	61	143	332
Xylene - p	87	57	133	310
Total xylene	84	57	133	310
Methyl tertiary-Butyl ether (MTBE)	2200	130	250	510
Trichloroethene	1.8	0.02	0.03	0.08
Tetrachloroethene	3.6	0.2	0.4	0.9
1,1,1-Trichloroethane	26	9	18	39
1,1,1,2-Tetrachloroethane	14	1.2	2.8	6.5
1,1,2,2-Tetrachloroethane	14	1.6	3.5	7.7
Carbon Tetrachloride	0.055	0.026	0.056	0.127
1,2-Dichloroethane	0.3	0.007	0.011	0.019
Vinyl Chloride	0.019	0.0006	0.0009	0.0014
1,2,4-Trimethylbenzene	0.075	1.8	4.3	9.7
1,3,5-Trimethylbenzene	0.047	NR	NR	NR
Semi-Volatile Organic Compounds				
Acenaphthene	3.2	230	540	1,170
Acenaphthylene	4.2	180	440	970
Anthracene	0.021	2,400	5,500	10,900
Benzo(a)anthracene	0.0038	7	11	13
Benzo(b)fluoranthene	0.002	2.6	3.3	3.7
Benzo(g,h,i)perylene	0.00026	310	340	350
Benzo(k)fluoranthene	0.0008	77	92	100
Chrysene	0.002	15	22	27
Dibenzo(a,h)anthracene	0.0006	0.24	0.28	0.30
Fluoranthene	0.23	280	560	900
Fluorene	1.9	170	410	880
Indeno(1,2,3-cd)pyrene	0.0002	27	36	41
Phenanthrene	0.53	100	220	440
Pyrene	0.13	620	1,240	2,040
Benzo(a)pyrene	0.0038	5	5	5
Naphthalene	19	13	30	71
Phenol	-	120	210	390
Total Petroleum Hydrocarbons				
Aliphatic hydrocarbons EC ₅ -EC ₈	10	42	78	160
Aliphatic hydrocarbons >EC ₈ -EC ₈	5.4	100	230	530
Aliphatic hydrocarbons >EC ₈ -EC ₁₀	0.23	27	65	154
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	0.034	130 (48)	320 (118)	750 (283)
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆	0.00076	1,000 (24)	2,200 (59)	3,500 (142)
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	-	53,000 (8)	70,000 (21)	79,000
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	-	53,000 (8)	70,000 (21)	79,000
Aromatic hydrocarbons >EC ₈ -EC ₉ (styrene)	7.4	11	25	56
Aromatic hydrocarbons >EC ₉ -EC ₁₀	7.4	34	83	189
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂	25	74	174	367
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆	5.8	100	300	600
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	-	200	500	800
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	-	900	1,100	1,200
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	-	900	1,100	1,200
Minerals				
Asbestos	-	No asbestos detected with ID or <0.001% dry weight ¹		

Notes:

¹ Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.

NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data, SAC for 1,2,4-trimethylbenzene may be used

EC - equivalent carbon, GrAC - groundwater assessment criteria, SAC - soil assessment criteria.

¹ LOD for weight of asbestos per unit weight of soil calculated on a dry weight basis using PLM, handpicking and gravimetry.

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.

(VALUE IN BRACKETS) The SAC has been set as the model calculated SAC with the saturation limit shown in brackets.
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.

(VALUE IN BRACKETS) For consistency where the GrAC exceeds the solubility limit, GrAC has been set at the solubility limit. The GrAC is conservative since concentrations of the chemical are very unlikely to be at sufficient concentration to result in an exceedance of the health criteria value at the point of exposure (i.e. indoor air) provided free-phase product is absent.

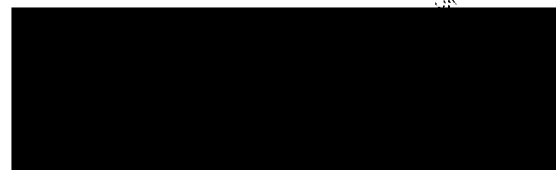


15 Frogmore Road
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Ref: 27621-L08-eh

11th July 2017

Mr Gary Biggs
CALA Homes (South Home Counties) Limited
Tilford House
Farnham Business Park
Weydon Lane
Farnham
Surrey
GU9 8QT



RE: FORMER WEST END NURSERY, ANGMERING – PHASE 1B ASBESTOS DELINEATION WORKS (PLOTS 65 TO 121) AND HISTORIC BOILER HOUSE VALIDATION WORKS

Dear Mr Biggs

1 BACKGROUND

RSK Environment Limited (RSK) was commissioned by CALA Homes (South Home Counties) Limited to carry out delineation of potential asbestos containing materials (ACM) within soils in the gardens of Phase 1B Plots 65 to 121 at the above mentioned site. The site was previously occupied by a garden nursery growing plants and herbs, and also by associated buildings and infrastructure.

Several preceding phases of site investigation and associated risk assessment have been carried out at the site by RSK. These are outlined in the following reports:

- RSK, 27621-R01(02) 'Geo-environmental Site Investigation', West End Nursery, Angmering, September 2015;
- RSK, 27621-R02(00) 'Additional Geo-environmental Site Investigation and Remediation', West End Nursery, Angmering, June 2015;
- RSK, 27621-R03(01) 'Remedial Strategy', West End Nursery, Angmering, January 2016; and
- RSK, 27621-R04(01) 'Supplementary Geo-environmental Site Assessment', West End Nursery, Angmering, June 2016.

Previous onsite buildings and infrastructure have been demolished since the completion of the initial site investigation. Following site clearance, evidence of suspected cement-bound asbestos was identified at the ground surface across much of the site. During subsequent remedial works undertaken by Keltbray, suspected ACMs were also identified with shallow made ground deposits, particularly in the north west of the site within the Phase 1 development area. The site layout is shown on **Figure 1**.

This report is subject to the RSK service constraints given in **Appendix A**.



2 SITE WORKS

To provide further information on the presence of suspected asbestos containing materials across the Phase 1B development area (Plots 65 to 121), RSK carried out intrusive investigation works on 18th to 21st, 24th and 25th April 2017. The objective of the work was to assess made ground deposits and screen for potential ACM within the footprint of each plot. The results are reported in **Section 3** and **Section 4**. Exploratory holes advanced as part of these works were annotated as TPP, followed by the relevant plot number, and are shown on **Figure 2** as blue exploratory locations. Indicative photos of the trial pits are shown in the photographic log (**Appendix B**).

During the excavation of Plot 83 and Plot 84 on the 25th April 2017, elevated levels of volatile organic compounds (VOC) up to 140 ppmV were identified by the hand-held photo-ionisation detector (PID), and weak to moderate hydrocarbon odours were noted. Weak to moderate hydrocarbon odours were also noted during the excavation of Plot 66, although PID readings in this location were low with a maximum reading of 2.5 ppmV recorded. Indicative photos of the trial pits are shown in the photographic log (**Appendix B**). These plots are located in close proximity to the historic boiler house. Therefore on 25th April 2017, RSK carried out further delineation of soils in this area to determine the extent of hydrocarbon impacts. Exploratory holes advanced as part of these works were annotated as TPBOILER, followed by a number, and are shown on **Figure 2** as green exploratory locations.

2.1 Sampling strategy and methods

The techniques adopted for the investigation have been chosen considering the anticipated ground conditions, existing land use and the proposed development. Mechanically excavated trial pits were considered to be the most appropriate method of investigation in order to provide suitable recovery of soils and allow for a thorough visual inspection of the ground.

2.2 Health and safety considerations

Prior to intrusive works, the RSK engineer inspected service plans and undertook service clearance using a cable avoidance tool and signal generator to identify any potential underground utilities. Trial pits were located to avoid any identified positive signals.

2.3 Investigation locations

In the vicinity of each plot, a single trial pit was excavated to target the footprint of the proposed rear garden. It was not possible to investigate the garden areas of Plots 69 to 71, 97 and 100, as access was prevented by immovable building materials.

The exploratory hole records are presented in **Appendix C**.

The locations of the exploratory holes are shown on **Figure 2**. The exploratory holes were positioned via reference to physical on-site features, such as sides of buildings, edges of roads being constructed at the time, and site boundaries.

2.4 Soil sampling and laboratory analysis

Soils were collected for laboratory analysis in a variety of containers appropriate to the anticipated testing suite required. Samples were stored in accordance with the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination.

A total of 71 representative soil samples collected during the works. Of the 71 samples collected, 47 of the samples were scheduled for an asbestos screen (at least one from each plot), to confirm the presence or absence of asbestos fibres and/or asbestos containing materials. In the event that asbestos was detected quantification analysis was undertaken.

Six of the made ground samples collected from the vicinity of the former boiler house (TPBOILER1-3, TPBOILER5, TPP84 and TPP66) were also scheduled for speciated total petroleum hydrocarbons (TPH CWG), polycyclic aromatic hydrocarbon analysis (PAH) and asbestos screen. Due to the absence of visual or olfactory signs of hydrocarbon contamination in natural soils in the vicinity of the former boiler house, supported by low PID readings (<2 ppmV), no natural soil samples were scheduled for TPH and PAH analysis. Suspected asbestos cement was observed at a number of locations across the Phase 1B area as shown on **Figure 2**. Eight samples of the suspected asbestos cement were collected during the works with two representative samples subsequently submitted for analysis by bulk identification.

The laboratory analysis results are summarised in **Section 4** and the laboratory analysis certificates are presented in **Appendix D**.

3 GROUND CONDITIONS

The results of the intrusive investigation and subsequent laboratory analysis undertaken are detailed below. The descriptions of the strata encountered, notes regarding visual evidence of suspected asbestos containing materials, list of samples taken and field observations are included on the exploratory hole records presented in **Appendix C**.

The exploratory holes revealed that the majority of Phase 1B is underlain by a variable thickness of made ground, with some topsoil in the less-disturbed south east corner of Plots 111 to 121. Both of these overlie River Terrace Deposits. For the purpose of discussion, the ground conditions are summarised in **Table 1** and the strata discussed in later subsections.

Table 1: General succession of strata encountered

Strata	Exploratory holes encountered	Depth to top of stratum (mbgl)	Thickness (m)
Made Ground	All locations except Plots 111, 114, 115	Ground level	0.15 to 1.00
Topsoil	Plots 111, 114, 115	Ground level	0.10 to 0.20
River Terrace Deposits	All locations except Plots 65 to 73, 82, 84, and 113.	0.10 to 1.00	0.03 to 0.95

3.1 Made ground

The made ground typically comprised reworked River Terrace Deposits – brown sandy gravelly CLAY with variable proportions of concrete, brick fragments, hard plastic, plastic pipe, plastic sheet, metal, and

glass fragments. Fragments of suspected asbestos cement were also often observed, both on the ground surface and within made ground deposits.

3.2 Topsoil

The topsoil encountered across Plots 111, 114 and 115 typically comprised firm brown slightly sandy slightly gravelly clay, with fine to coarse sand, flint gravel, and occasional rootlets.

3.3 River Terrace Deposits

This stratum typically comprised stiff orangish brown sandy slightly gravelly clay, with fine to medium sand and flint gravel.

3.4 Groundwater

No resting groundwater or groundwater seepages were encountered within the trial pits. A residual water seepage was noted in Plot 83, emanating from a disused grey plastic irrigation pipe.

3.5 Visual evidence of suspected cement bound asbestos

Fragments of suspected cement-bonded asbestos were noted within made ground deposits encountered in Plots 66, 73, 80, 98, 99, 104, 105, 107, 113 and 121.

Fragments of suspected cement-bonded asbestos were also noted on the ground surface on/or adjacent to Plots 66, 80, 84, 93 to 95, 98, 99, 109 and 113.

3.6 Visual and olfactory evidence of hydrocarbon contamination

Weak to moderate hydrocarbon odours were noted in the area around Plots 66, 68, 76, 77, 83, 84 with PID readings of VOCs for Plots 66, 68, 76 and 77 ranging from 0.2 to 2.5 ppmV. Readings for Plots 83 and 84 ranged from 22.8 to 140.0 ppmV together with visual evidence of hydrocarbon impact on the made ground, as shown by photo 8 to photo 12 of the photographic log (**Appendix B**). Visual and olfactory signs of hydrocarbon contamination were noted when RSK returned to excavate TPBOILER1 to TPBOILER5, however PID readings in made ground were all below 6 ppmV and in natural soils were all below 1.0 ppmV.

4 LABORATORY TESTING RESULTS

4.1 Laboratory testing results - asbestos

The majority of the samples submitted for analysis returned negative asbestos screens with the exception of those detailed in **Table 2**:

Table 2: Samples returning positive asbestos screen

Samples of soil where asbestos was identified					
Exploratory Hole	Depth Range	Stratum	Asbestos Type	Presenting As	Quantification Result
Plot 66	0.75	Made ground	Chrysotile	Loose Fibres	<0.001 %
Plot 68	0.50	Made ground	Crocidolite and	Loose Fibres	<0.001 %

Samples of soil where asbestos was identified					
Exploratory Hole	Depth Range	Stratum	Asbestos Type	Presenting As	Quantification Result
			Chrysotile		
Plot 80	0.50 - 0.60	Made ground	Chrysotile	Loose Fibres	0.001 %
Plot 84	0.60	Made ground	Chrysotile	Loose Fibres	0.009 %
Plot 93	0.10	Made ground	Chrysotile	Loose Fibres	<0.001 %
Plot 94	0.20	Made ground	Chrysotile	Loose Fibres	0.006 %
Plot 98	0.20	Made ground	Amosite	Loose Fibres	0.001 %
Plot 105	0.30	Made ground	Amosite	Loose Fibres	0.050 %
Plot 106	0.10	Made ground	Chrysotile	Loose Fibres	<0.001 %
Plot 107	0.10	Made ground	Chrysotile	Loose Fibres	<0.001 %
Suspected asbestos cement sample results					
Exploratory Hole	Depth Range	Stratum	Asbestos Type	Presenting As	Quantification Result
Plot 93	0.10	Made ground	Chrysotile	Cement	15 %
Plot 99	0.10 - 0.30	Made ground	Chrysotile	Cement	15 %

A total of 15 plots were found to contain suspected asbestos cement fragments or asbestos fibres in made ground beneath the surface, as shown on **Figure 2** and in photos 4 and 6 of the photographic log (**Appendix B**). Red shading denotes the plots in which fragments of suspected asbestos cement were observed below the ground surface on-site, or where asbestos fibres were identified by later laboratory analysis.

All 10 soil samples returning positive results for asbestos fibres were submitted for asbestos quantification analysis. The quantification results ranged from <0.001 % to 0.050 %, which is of a similar magnitude to previous asbestos concentrations reported on site. Previous results ranged from <0.001 to 7.214 %, with the highest concentrations reported in the bund materials, RSK report ref: 27621 R04, December 2015.

Plots 95 and 109 were the only plots whereby suspected ACM were observed at the ground surface but not within the underlying soils, and the subsequent soil samples analysed were not found to contain asbestos fibres or ACM.

The representative suspected asbestos cement samples collected from Plots 93 and 99 tested positive for chrysotile cement, with a percentage asbestos within the material at 15 %.

4.2 Laboratory testing results - hydrocarbons

Seven soil samples were collected within the vicinity of Plots 83 to 84, as part of the historic boiler house delineation works. Of these, six samples were submitted for TPHCWG and PAH laboratory analysis. The

analysis results were compared to RSK generic assessment criteria (GAC) for a residential end-use with home grown produce.

Predominately heavy end TPH and PAHs were detected in the soil samples collected from TPBOILER 2-5, TPP84 and TPP66, with a maximum total TPH concentration of 384 mg/kg observed in TPP84. Measured concentrations of benzo(b)fluoranthene (maximum concentration 2.65 mg/kg) and dibenzo(ah)anthracene (maximum concentration 0.31 mg/kg) in TPP84 and TPP66 were marginally (in the same order of magnitude) in excess of the RSK GAC in relation to direct contact pathways.

All other determinants were below the RSK GAC.

5 CONCLUSIONS

A total of 15 plots were found to contain suspected asbestos cement and/or asbestos fibres in made ground, identified by either on-site observation or laboratory analysis. Quantification results of soil samples returning positive results for an asbestos fibres ranged between <0.001 % to 0.05 %.

The representative suspected asbestos cement samples collected from Plots 93 and 99 tested positive for chrysotile cement, with a percentage asbestos within the material at 15 %.

On the basis of the results discussed above, it is recommended that 600 mm of clean cover, underlain by a geo-marker membrane should be placed in the front and back gardens of Plots 66, 68, 73, 80, 84, 93 to 94, 98, 99, 104, 105, 107, 113 and 121, where suspected ACM or asbestos fibres have been found to be present. 600 mm of clean cover underlain by a geo-marker membrane should also be placed in the front and back gardens of Plots 69 to 71, 97 and 100, as these plots were inaccessible at the time of the delineation works. A 450 mm clean cover layer is required across the front and back gardens of all other plots in Phase 1B. The cover layer requirements for Plots 65-121 are presented on **Figure 4**.

It is recommended that handpicking for ACM at the ground surface also be completed across Plots 95 and 106 followed by removal of the upper 200 mm of the existing ground profile through these plots.

A 450 mm thick clean cover layer is also required in all communal soft landscaped areas in Phase 1B (excluding the south west bund A, which required a 600 mm thick clean cover layer underlain by geo-marker membrane and south west bund B, which is proposed to be securely fenced off and planted with prickly vegetation).

A watching brief should be kept in place during groundworks in Phase 1B, as the possibility of further asbestos cannot be discounted.

During the validation works undertaken in the vicinity of the former boiler house (Plots 83 and 84) weak to strong hydrocarbon odours and occasional staining was noted in made ground. In-situ volatiles testing results in the vicinity of the visual and olfactory hydrocarbon observations ranged between 0.6 and 140 ppmV. Despite the RSK engineers on site observing visual and olfactory signs of hydrocarbons the speciated TPH concentrations in the laboratory validation samples collected from the vicinity of the former boiler house did not exceed the RSK GAC for residential end-use with plant uptake. Measured concentrations of benzo(b)fluoranthene and dibenzo(ah)anthracene in TPP84 and TPP66 were marginally (in the same order of magnitude) in excess of the RSK GAC in relation to direct contact pathways. Provision of the 600 mm capping layer underlain by a geo-marker membrane layer within the front and back gardens at these two locations, as required in relation to asbestos impacts, shall break the

identified direct contact pathways. Therefore, no further validation or remediation works are deemed necessary in the vicinity of the former boiler house.

However, any soils excavated in this area observed to contain visual or olfactory signs of hydrocarbon contamination should be segregated and stored on areas of hardstanding or geo-marker membrane to prevent leaching to underlying soils. Any soils observed to contain visual or olfactory signs of hydrocarbon contamination are not permitted to be placed in receptor cells (borrow pits) on-site, until such time that the following has been undertaken:

- In-situ screening for volatiles using a PID;
- Collection and laboratory analysis of soil samples at the discretion of a qualified geo-environmental consultant; and
- Assessment of the PID results and/or laboratory results as deemed necessary indicates that any remaining residual hydrocarbon impacts shall not pose a significant risk to groundwater.

It is understood that Plots 308 to 325 are now intended to fall within Phase 1B. Delineation works have not been conducted across these plots to date. Either additional delineation works shall be required across these plots to determine cover layer requirements, or a 600 mm clean cover layer (in all front and back gardens) underlain by a geo-marker membrane shall be required.

Yours sincerely

For RSK Environment Limited



Edward Hughes

Catherine Latimer

Graduate Geo-environmental Consultant

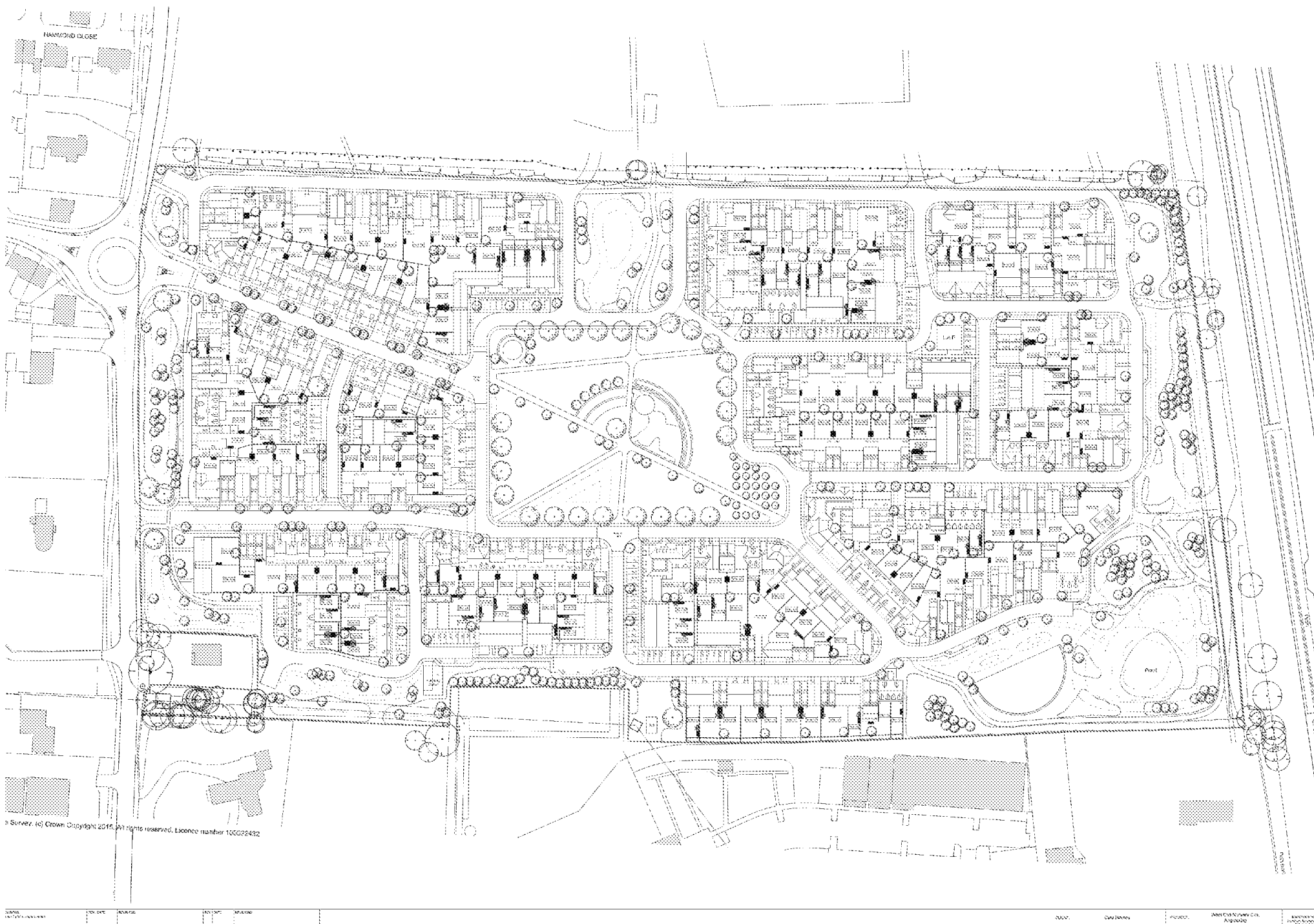
Principal Geo-environmental Consultant

Enc.

Figure 1	Site location map
Figure 2	Extent of made ground encountered (Plots 65-121)
Figure 3	Delineation plan of asbestos impacts (Plots 65-121)
Figure 4	Capping layer requirements (Plots 65-121)

Appendix A	Service constraints
Appendix B	Photographic log
Appendix C	Trial pit logs
Appendix D	Laboratory certificates
Appendix E	RSK GAC for residential end-use with home grown produce

FIGURES



LEGEND

----- Site Boundary

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



18 Frogmore Road
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United Kingdom

Tel: +44 (0) 1442 437500
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Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client
CALA HOMES (SOUTH HOME COUNTIES) LTD

Project Title
**FORMER WEST END NURSERY,
ANGMERING**

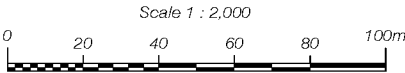
Drawing Title
SITE BOUNDARY PLAN

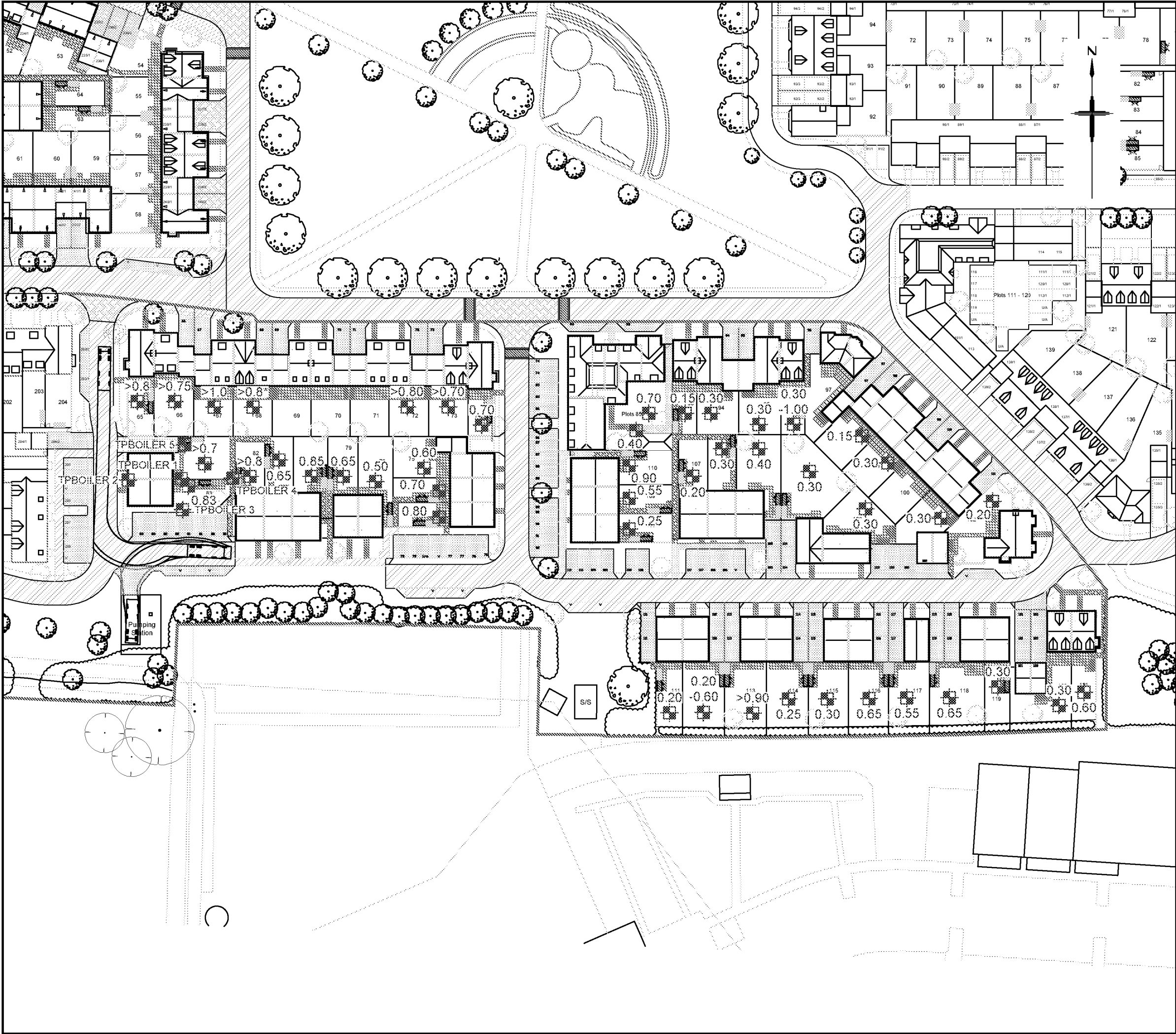
Drawn	Date	Checked	Date	Approved	Date
AP	19.05.17	EH	19.05.17	EH	19.05.17

Scale	Orig Size	Dimensions
1:2000	A3	m

Project No.	Drawing File
27621 - L08	27621 (L08)

Drawing No.	Rev.
FIGURE 1	P1





LEGEND

- Phase 1B Boundary
- Trial Pit Location
- Boiler House Trial Pit Location
- > Base of Made Ground not proven
- 0.1 Denotes depth to base of Made Ground (mbgl)
- 0.30-1.00 Denotes variable depth to base of Made Ground at Location

* Brick wall encountered from 0.60mbgl as well as asphalt surfacing 0.50-0.60mbgl.

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



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Web: www.rsk.co.uk

Client
CALA HOMES (SOUTH HOME COUNTIES) LTD

Project Title
**FORMER WEST END NURSERY,
ANGMERING**

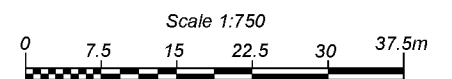
Drawing Title
**EXTENT OF MADE GROUND
ENCOUNTERED IN PHASE 1B
PLOTS 65 TO 121**

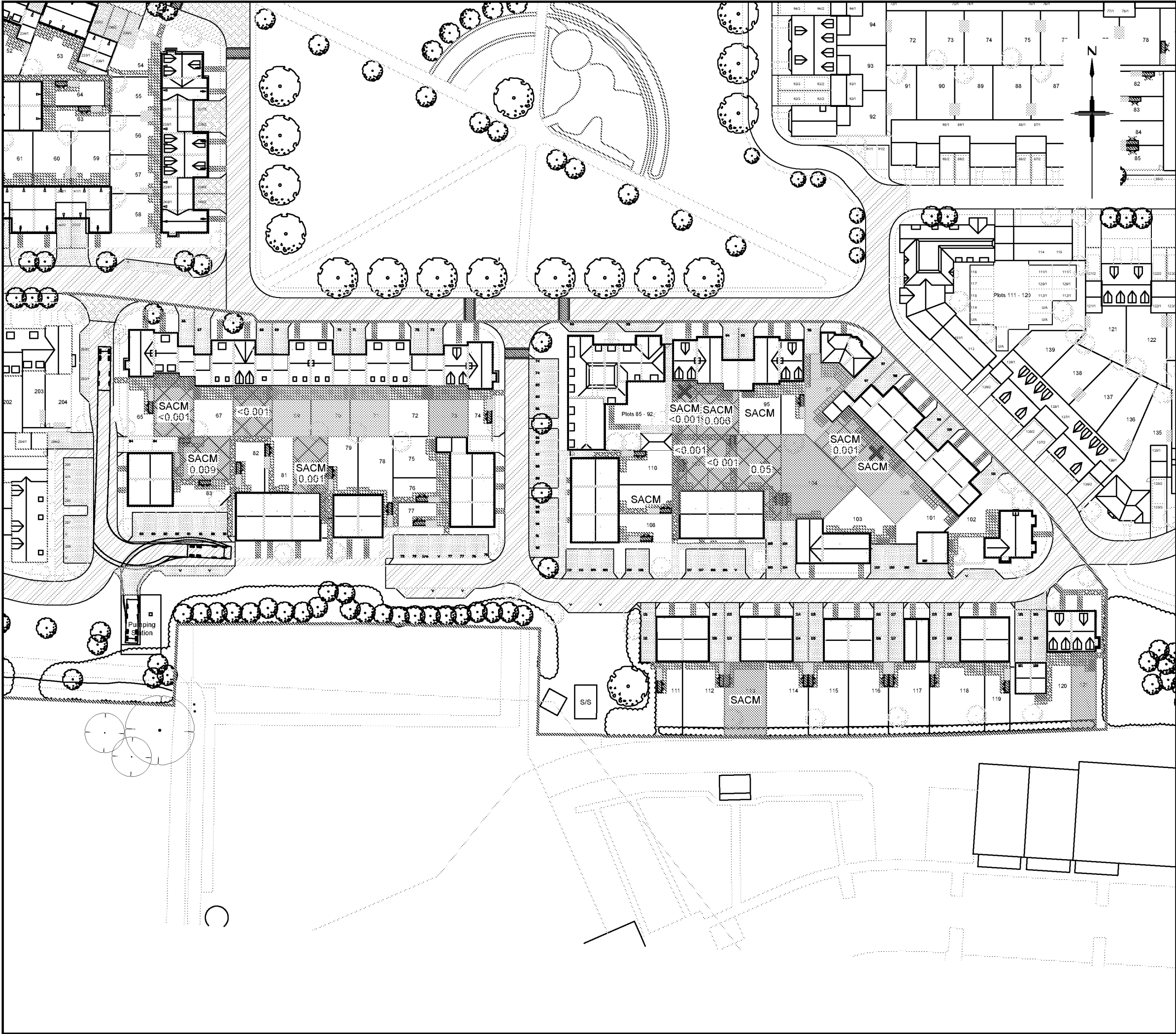
Drawn	Date	Checked	Date	Approved	Date
AP	03.05.17	CL	03.05.17	CL	03.05.17

Scale	Orig Size	Dimensions
1:750	A3	m

Project No.	Drawing File
27621 - L08	27621 (L08)

Drawing No.	Rev.
FIGURE 2	P1





LEGEND

- Phase 1B Boundary
- Suspected ACMs observed on site, or asbestos fibres detected by laboratory analysis
- Plot not inspected due to obstruction
- Representative suspected ACM fragment collected for bulk asbestos ID analysis confirmed as chrysotile asbestos cement
- Loose asbestos fibres detected in soil by laboratory analysis
- SACM** Suspected ACM observed on the ground surface
- <0.001** Asbestos quantification result (%)

Rev.	Date	Amendment	Drawn	Chkd.	Appd.

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Client

CALA HOMES (SOUTH HOME COUNTIES) LTD

Project Title

FORMER WEST END NURSERY, ANGMERING

Drawing Title

DELINEATION OF ASBESTOS IMPACTS IN PHASE 1B PLOTS 65 TO 121

Drawn	Date	Checked	Date	Approved	Date
AP	28.06.17	EH	28.06.17	CML	28.06.17
Scale	Orig Size		Dimensions		
1:750	A3		m		
Project No.			Drawing File		
27621 - L08			27621 (L08)		
Drawing No.					Rev.
FIGURE 3					P1

Scale 1:750



Plot Number	Front Garden		Back Garden	
	Area of Soft landscaping (m ²)	Volume of Soft landscaping (m ³)	Area of Soft landscaping (m ²)	Volume of Soft landscaping (m ³)
65	53.6294	32.17764	64.3598	38.81588
66	15.1892	8.82614	96.2552	42.21484
67	18.3277	10.99662	85.1776	48.10856
68	15.3263	9.19578	78.7855	47.2593
69	15.9895	7.195275	78.7855	35.444475
70	15.9895	7.195275	78.7855	35.444475
71	15.999	7.19955	78.7855	35.444475
72	15.9821	9.58526	85.3032	48.18192
73	21.7963	9.858335	79.8754	35.94393
74	43.6347	26.18682	47.7415	28.6449
75	10.18	6.108	84.8282	50.89572
76	9.874	5.9244	58.0355	33.8213
77	9.64	5.784	50.4051	30.24306
78	16.9583	11.99258	94.3547	58.61282
79	21.2673	12.78638	75.6512	45.38072
80	24.2808	16.92836	84.7363	38.131335
81	19.9998	11.99988	64.736	38.8416
82	20.117	12.0702	32.286	19.3596
83	9.0556	5.43336	57.7691	34.86146
84	8.5181	3.832245	95.4822	42.95799
85-92	159.7244	95.83484	177.1721	106.30326
93	17.4112	7.83504	51.9823	23.388535
94	15.8893	7.189685	80.7328	36.32976
95	16.0173	7.287786	81.0123	36.455635
96	13.5886	8.15195	59.8541	35.91246
97	32.5927	14.868715	90.1233	40.555485
98	18.9177	8.512985	79.797	35.90865
99	19.1745	9.82868	77.2342	34.75539
100	18.3612	8.23564	77.4855	34.868475
101	N/a	N/a	74.1702	44.59212
102	112.5854	67.53924	119.9713	71.98278
103	28.2905	18.9743	98.1672	57.88432
104	16.4365	7.356425	182.4404	82.09618
105	N/a	N/a	120.0562	54.02864
106	N/a	N/a	64.736	29.1312
107	N/a	N/a	34.296	15.4197
108	31.0331	18.61966	63.3774	38.02644
109	4.2494	1.91223	61.7431	27.784395
110	5.0461	3.02768	81.5398	48.92388
111	14.1517	8.49102	81.5917	48.95502
112	14.2137	8.52822	128.9318	78.15908
113	14.2136	8.39612	127.5396	57.39282
114	14.2138	8.52818	137.853	82.5918
115	15.6785	9.4071	121.8011	73.58066
116	15.6785	9.4071	126.8104	72.38824
117	15.625	9.375	121.8267	73.09602
118	14.0327	8.41982	161.424	96.8544
119	16.0459	9.62754	72.8528	43.71188
120	96.2694	57.76104	141.0161	84.80966
121	22.2324	10.09458	77.3341	34.800345

NOTES:

- 450mm capping layer required in all communal soft landscaped areas (excluding bunds falling within the land adjacent to Phase 1B).
- South west Bund B requires 600mm capping layer underlain by geotextile membrane.
- South west Bund B to be fenced and planted with prickly vegetation.

LEGEND

- Phase 1B Boundary
- 600mm Capping Layer Required
- 450mm Capping Layer Required

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
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Client
CALA HOMES (SOUTH HOME COUNTIES) LTD

Project Title
FORMER WEST END NURSERY, ANGMERING

Drawing Title
CAPPING LAYER REQUIRMENTS (PLOTS 65-121)

Drawn	Date	Checked	Date	Approved	Date
AP	28.06.17	EH	28.06.17	CML	28.06.17

Scale	Orig Size	Dimensions
1:750	A3	m

Project No.	Drawing File
27621 - L08	27621 (L08)

Drawing No.	Rev.
FIGURE 4	P1



APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for CALA Homes (South Counties) (the "client") in accordance with the terms of a contract between RSK and the "client", dated October 2016. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.
8. The intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information], and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.



APPENDIX B

PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Site Location: Angmering Phase 1B

Photo No.
1

Date:
19/04/2017

Plot 65,
showing
typical depth
of excavation
of pits in
Phase 1B



Photo No.
2

Date:
19/04/2017

Disused
plastic pipe
and made
ground in
Plot 83



PHOTOGRAPHIC LOG

Site Location: Angmering Phase 1B

Photo No.
3

Date:
20/04/2017

Depth of excavation in Plot 108 and general succession of strata across site: made ground with natural soils at depth

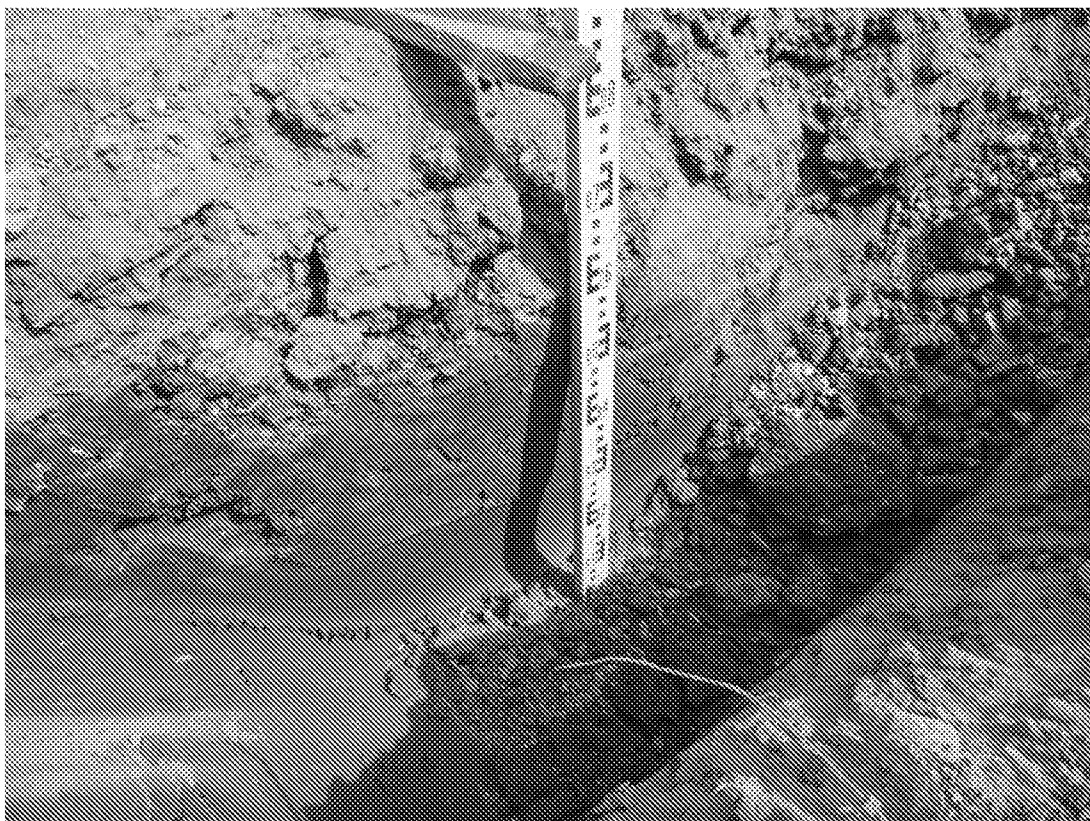


Photo No.
4

Date:
20/04/2017

Plot 107: typical number of suspected asbestos cement fragments found in affected plots in Phase 1B

