STATS

10k Raster Mapping

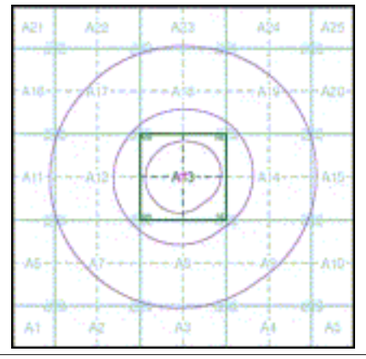
Published 2006

Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

Historical Map - Slice A



Order Details

Order Number:	33075032_1_1
Customer Ref:	241830
National Grid Reference:	527750, 186990
Slice:	A
Site Area (Ha):	0.23
Search Buffer (m):	1000

Site Details

The Water House, Millfield Lane, London, N6 6HQ

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

STATS

10k Raster Mapping

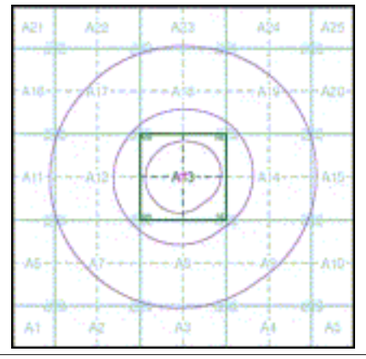
Published 2010

Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

Historical Map - Slice A



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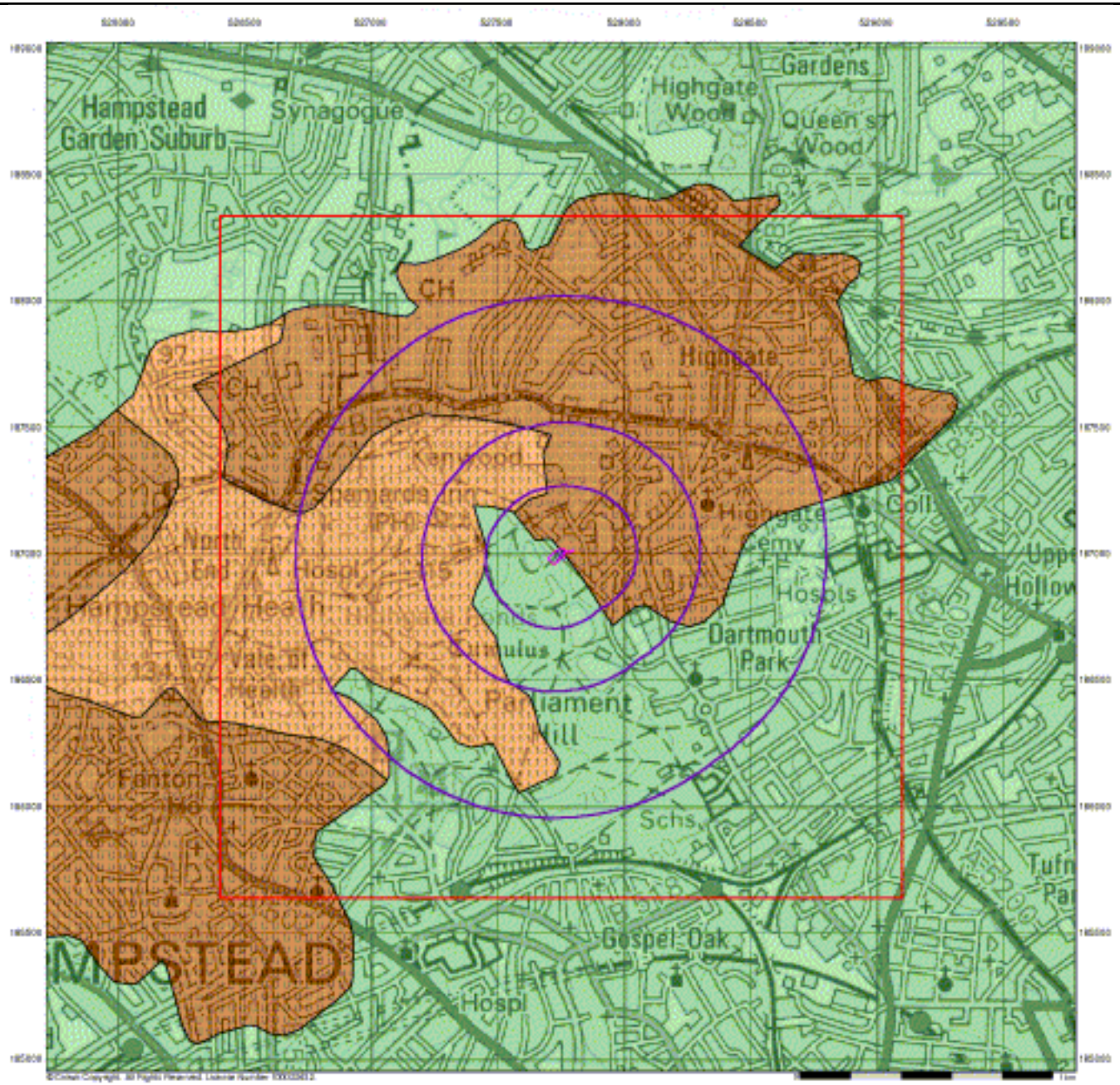


STATS

Groundwater Vulnerability

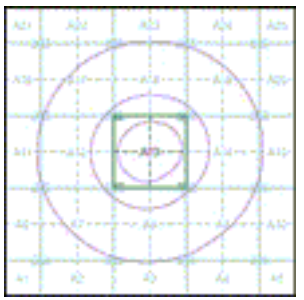
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



Order Details

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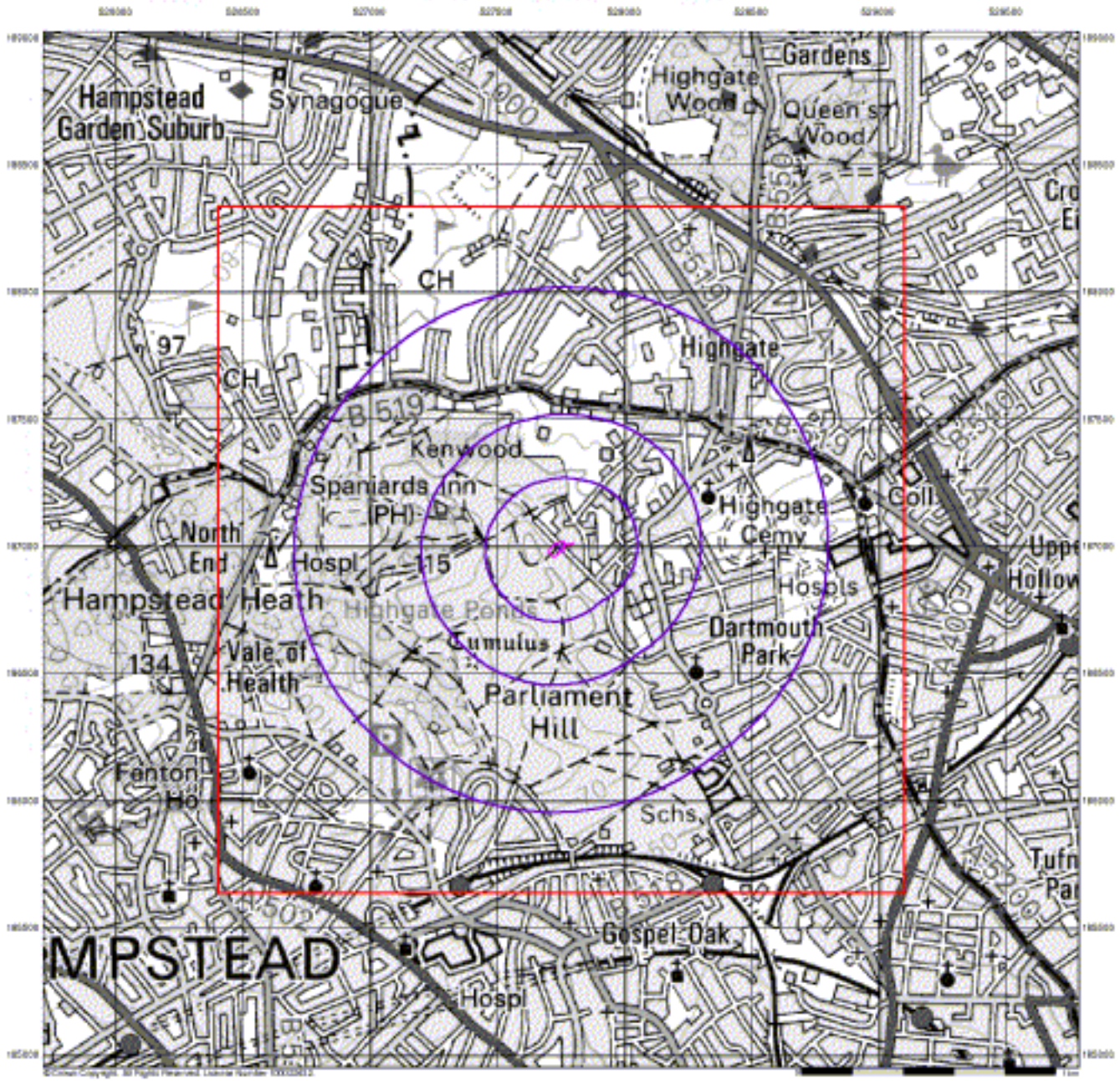


STATS

Source Protection Zones

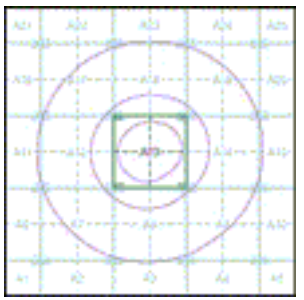
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Source Protection Zone I
Source Protection Zone II
Source Protection Zone III
Zone of Special Interest
Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	33075032_1_1
Customer Ref:	241830
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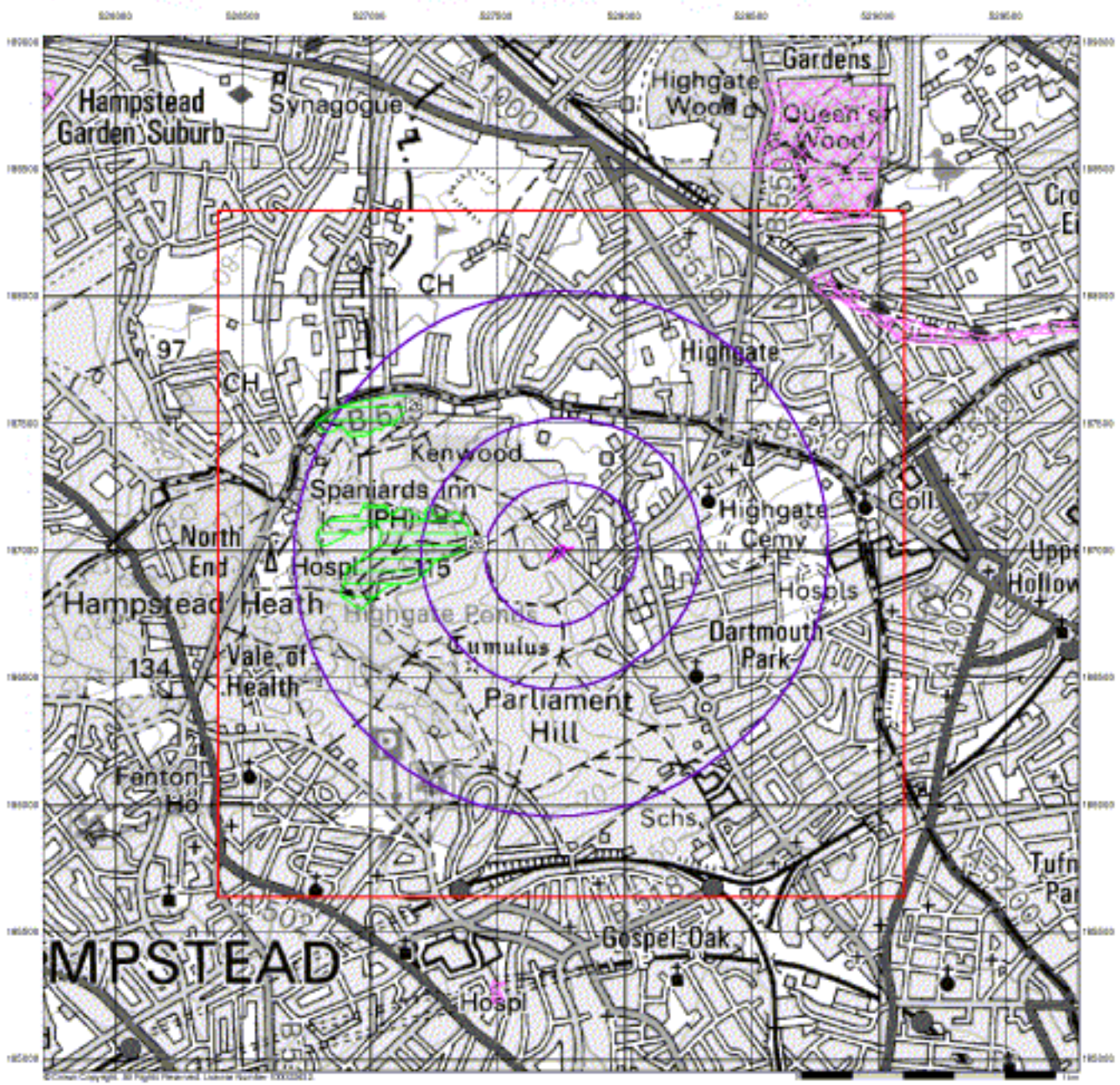


STATS

Sensitive Land Uses

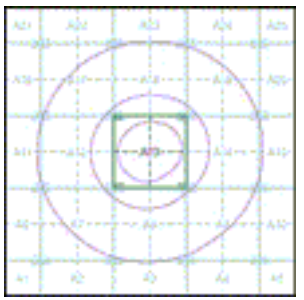
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Sensitive Land Uses

- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area

Site Sensitivity Context Map - Slice A



Order Details

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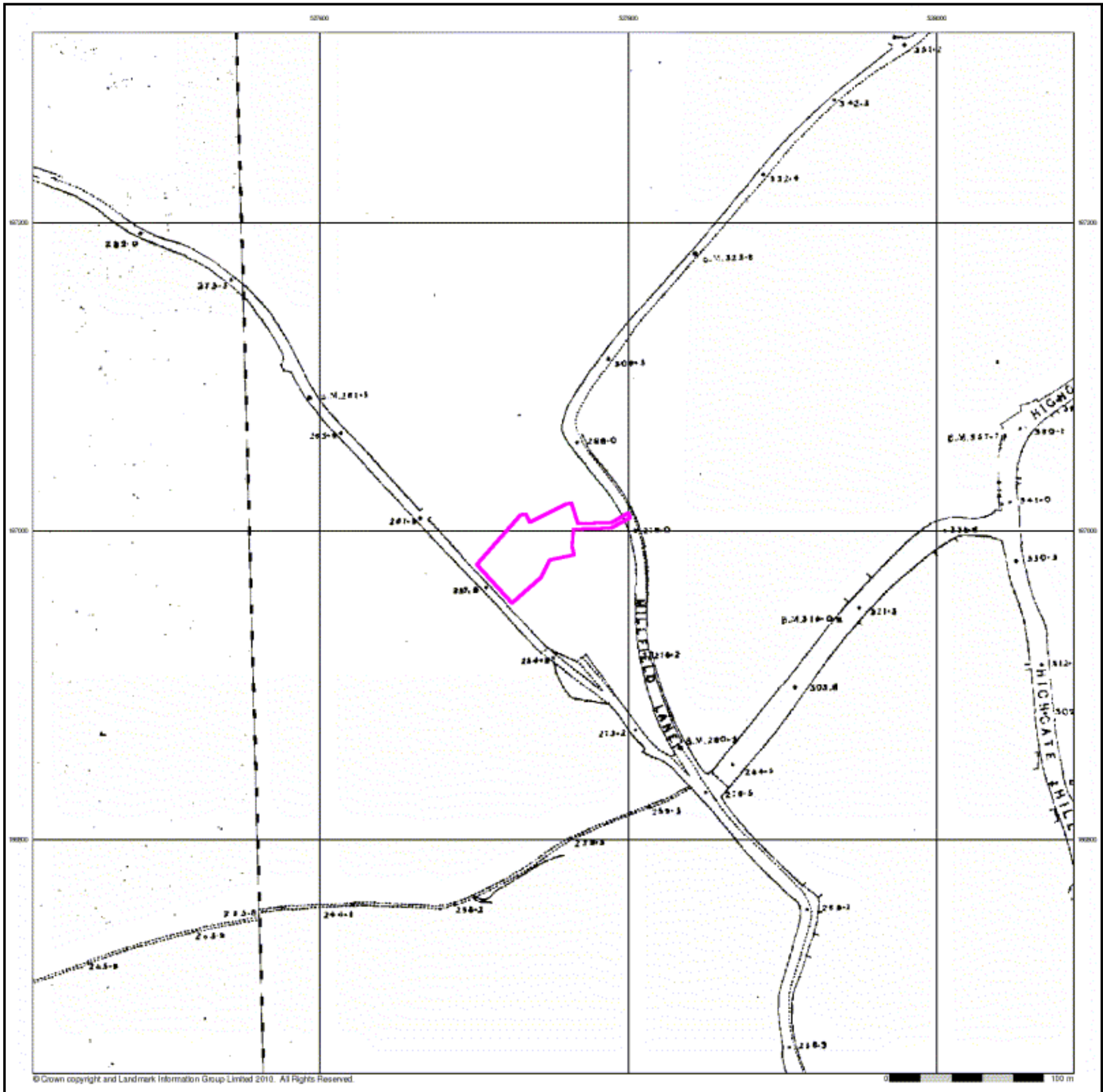


STATS

London

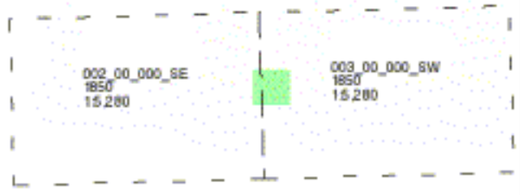
Published 1850

Source map scale - 1:5,280

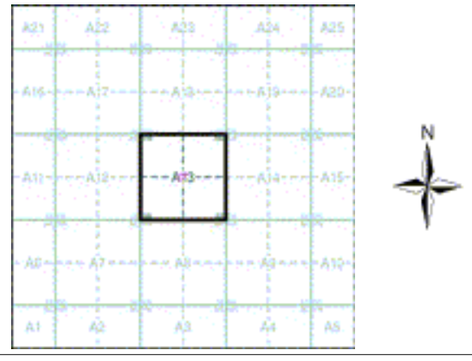
The historical town plans shown derive from Ordnance Survey mapping from the early to mid 1850s. The 1:2640 scale was introduced in the early 1850s, to survey districts covered by the Local Boards of Health and for a map of the Osborne Estate of Queen Victoria. The general style is similar to that of the early 1:2500s published shortly afterwards.
1:5280 scale was surveyed shortly afterwards in the mid 1850s as general purpose mapping with a standard of content similar to the more contemporary 1:10.560 mapping. The scale was also used for a reduction of the 1:1056 'skeleton survey' of London that was undertaken between 1848 and 1850.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)



Historical Town Plan - Segment A13



Order Details

Order Number:	33075032_1_1
Customer Ref:	241830
National Grid Reference:	527750, 186990
Slice:	A
Site Area (Ha):	0.23
Search Buffer (m):	0

Site Details

The Water House, Millfield Lane, London, N6 6HQ

Landmark Information Group

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APPENDIX B

Fieldwork Records

(this appendix contains 15 pages, including this one)

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH1

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 80.46mAOD

Date: 16 Nov 10

Job No: 241830

GROUND WATER | SAMPLES/TESTS | STRATA RECORD | Sheet 1 of 2

Strike	Well	Depth (m)	Depth/Type (m)	SPT 'N' or U Blows	Depth (m)	Level (mAOD)	Key	Description
			0.20 D 1 0.30-0.50 B 2		0.30	80.16	0.30	MADE GROUND: Dark-brown slightly sandy clay with fine roots and occasional fine brick, concrete and ash fragments.
					0.50	79.96	0.20	MADE GROUND: Brown slightly clayey sandy gravel of fine to coarse rounded to angular flint.
		1	0.80-1.10 B 3					Soft, becoming firm, fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
			1.20-1.65 U 4	U30				
			1.65 D 5					…selenite crystals (generally coarse sand size) between 1.65m and 4m
		2	2.20-2.65 SPTLS6 S 2.20-3.10 B 7	N=9 [1,1](2,2,2,3)				
		3	3.10-3.55 U 8	U35			5.30	
			3.55 D 9					
		4	4.00-4.45 SPTLS10 S	N=16 [2,2](3,4,4,5)				…slightly sandy (fine) at 4.0m
		5	5.00-5.45 U 11	U45				
			5.45 D 12					…with occasional very thin laminae of fine sand
					5.80	74.66		
		6	6.00 D 13					Stiff, locally firm, becoming very stiff fissured dark-brownish grey silty CLAY. (LONDON CLAY FORMATION).
			6.50-6.95 SPTLS14 S	N=20 [2,3](3,5,6,6)				
		7						
			7.50 D 15					...slightly sandy (fine) at 7.5m
		8	8.00-8.45 U 16	U55				
			8.45 D 17					
		9	9.00 D 18					
			9.50-9.95 SPTLS19 S	N=21 [2,3](3,5,6,7)				***Continued next sheet***

Remarks and Water Observations
Cased to 1.5m with 150mm casing. No groundwater encountered except minor perched water seepage on 'claystone' band at 11.5m bgl.

Scale: 1:50

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH1

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 80.46mAOD

Date: 16 Nov 10

Job No: 241830

GROUND WATER | SAMPLES/TESTS | STRATA RECORD

Strike	Well	Depth (m)	Depth/Type (m)	SPT 'N' or U Blows	Depth (m)	Level (mAOD)	Key	Description
			10.50 D 20					
		11	11.00-11.45 U 21	U80				
			11.50 D 22					...'claystone' band at 11.3m
		12						
			12.50-12.95 D 23	S N=16 [2,3](3,4,4,5)				
		13				14.20		
			13.50 D 24					...slightly sandy (fine) at 13.5m
		14	14.00-14.45 U 25	U60				
		15	15.00 D 26					
			15.50-15.95 D 27	S N=27 [3,5](6,6,7,8)				
		16						
			16.50 D 28					
		17	17.00-17.45 U 29					
		18	18.00 D 30					...slightly sandy (fine) below 18m
			18.50-18.95 D 31	S N=41 [5,7](9,10,10,12)				
		19						
			19.20 D 32					
			19.50-19.95 U 33					

End of Borehole at 20.00 m

Remarks and Water Observations

Cased to 1.5m with 150mm casing. No groundwater encountered except minor perched water seepage on 'claystone' band at 11.5m bgl.

Scale: 1:50

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH2

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 82.22mAOD

Date: 23 Nov 10

Job No: 241830

GROUND WATER | SAMPLES/TESTS | STRATA RECORD | Sheet 1 of 1

Strike	Well	Depth (m)	Depth/Type (m)	SPT 'N' or U Blows	Depth (m)	Level (mAOD)	Key	Description
			0.20 D 1		0.40	81.82		MADE GROUND: Dark-brown slightly sandy clay with fine roots and rare fine brick and flint fragments.
			0.70-0.90 B 2					Soft, becoming firm, fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
		1	1.00-2.00 B 4					
			1.20-1.65 SPTLS3	S N=8 [1,1](1,2,2,3)				…selenite crystals (generally coarse sand size) between 1.2m and 2.5m
		2	2.00-2.45 U 5	U35				
			2.45 D 6					
		3	3.00-4.00 B 7	S				
			3.00-3.45 SPTLS8	N=13 [1,2](3,3,3,4)				…locally slightly sandy (fine) with occasional very thin laminae of fine sand between 3.0m and 4.0m
		4	4.00-4.45 U 9	U40				
			4.45 D 10					
		5	5.00-5.45 SPTLS11	S N=17 [2,2](4,4,4,5)				
					5.50	76.72		Stiff, locally firm, fissured dark-brownish grey silty CLAY. (LONDON CLAY FORMATION).
		6	6.00 D 12					
			6.50-6.95 U 13	U55				…slightly sandy (fine) between 6.0m and 7.5m
		7	6.95 D 14					
			7.50 D 15					
		8	8.00-8.45 SPTLS16	S N=21 [12,5](5,5,5,6)				…'claystone' band at 8m
		9	9.00 D 17					
			9.50-9.95 SPTLS18	S N=19 [5,3](4,4,5,6)				…with occasional very thin laminae of fine sand

0.40

5.10

4.50

End of Borehole at 10.00 m

Remarks and Water Observations
Cased to 1.5m with 150mm casing. No groundwater encountered.

Scale: 1:50

Logged by: CG

Figure:

BOREHOLE RECORD (Windowless Sampler)

Borehole Number: WS1

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 80.53mAOD

Dates: 18 Nov 10

Job No.: 241830

GROUND WATER | SAMPLES/TESTS | STRATA RECORD | Sheet 1 of 1

Strike	Well	Depth (m)	Type/Depth (m)	In-situ Tests	Depth (m)	Level (mAOD)		Key	Description
					0.20	80.33	0.20		MADE GROUND: Flint shingle and geotextile layer over soft dark-brown slightly sandy clay with roots and occasional fragments of flint, brick and ash/clinker.
		1	D1 1.00	S N=8 (1,1)(1,2,2,3)					Soft, becoming firm, fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
									…with abundant selenite crystals (generally coarse sand size) and fine 'claystone' fragments
		2		S N=10 (1,2)(2,2,3,3)					…locally slightly sandy between 2.0m and 3.7m
		3		S N=14 (2,2)(2,3,4,5)					
		4			4.00	76.53	3.80		***End of Borehole at 4.00 m***

Remarks and Water Observations

No groundwater encountered.

Key for Insitu tests

HV-Hand Vane (kN/m2)
PP-Pocket Penotometer (kN/m2)
MP-Mackintosh Probe (N150)

Scale: 1:25

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Windowless Sampler)

Borehole Number: WS2

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 79.85mAOD

Dates: 18 Nov 10

Job No.: 241830

Sheet 1 of 1

GROUND WATER			SAMPLES/TESTS			STRATA RECORD			
Strike	Well	Depth (m)	Type/Depth (m)	In-situ Tests	Depth (m)	Level (mAOD)		Key	Description
					0.45	79.40	0.45		MADE GROUND: Grass over soft dark-brown slightly sandy slightly gravelly clay occasional concrete cobbles and roots. Gravel of fine to coarse concrete and brick with occasional fragments of flint and charcoal.
		1			1.20	78.65	0.75		MADE GROUND: Soft brown mottled silty clay with roots and fine fragments of brick and ash/charcoal. (REWORKED WEATHERED LONDON CLAY).
		2			2.00	77.85	0.80		Orangey-brown and grey silty clay with occasional fine to medium flint gravel and fragments of organic material. Bricks encountered at 1.7m. (POSSIBLE REWORKED GROUND).
		3							***End of Borehole at 5.00 m***
		4							

Remarks and Water Observations

Groundwater strike at 1.7m in association with bricks.

Key for Insitu tests

HV-Hand Vane (kN/m2)
PP-Pocket Penotometer (kN/m2)
MP-Mackintosh Probe (N150)

Scale: 1:25

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Windowless Sampler)

Borehole Number: WS3

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 80.21mAOD

Dates: 17 Nov 10

Job No.: 241830

Sheet 1 of 1

GROUND WATER		SAMPLES/TESTS			STRATA RECORD				
Strike	Well	Depth (m)	Type/Depth (m)	In-situ Tests	Depth (m)	Level (mAOD)		Key	Description
					0.50	79.71	0.50		MADE GROUND: Grass over soft dark-brown very sandy gravelly clay with roots. Gravel of fine to coarse flint, concrete and brick with occasional fragments of coal, slate and pottery.
					0.70	79.51	0.20		MADE GROUND: Brown sandy gravelly clay with roots. Gravel of fine to coarse rounded to subangular flint.
		1							MADE GROUND: Soft brown mottled sandy silty clay with roots and fine fragments of brick. (REWORKED WEATHERED LONDON CLAY).
					1.20	79.01	0.50		Firm fissured brown mottled grey-green silty CLAY with roots, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
		2							…locally slightly sandy with abundant selenite crystals (generally coarse sand size)
		3							… with occasional partings of coarse silt/fine sand
		4							

Remarks and Water Observations

Minor perched water seepage at 1.1m bgl.

End of Borehole at 5.00 m

Key for Insitu tests

HV-Hand Vane (kN/m2)
PP-Pocket Penotometer (kN/m2)
MP-Mackintosh Probe (N150)

Scale: 1:25

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Windowless Sampler)

Borehole Number: WS4

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 81.90mAOD

Dates: 17 Nov 10

Job No.: 241830

Sheet 1 of 1

GROUND WATER		SAMPLES/TESTS			STRATA RECORD			
Strike	Well	Depth (m)	Type/Depth (m)	In-situ Tests	Depth (m)	Level (mAOD)		Key	Description
					0.40	81.50	0.40		MADE GROUND: Flint shingle driveway over soft brown and grey slightly sandy gravelly clay with brick cobbles. Gravel of fine to coarse flint, brick, slate, concrete and occasional fragments of metal, cable, wood and ash/clinker.
		1			1.10	80.80	0.70		MADE GROUND: Black/dark-brown sandy slightly gravelly organic clay with roots and plant fragments. Gravel of fine to coarse flint and brick with fragments of glass, pottery, wood and coal.
				S	1.40	80.50	0.30		MADE GROUND: Soft brown mottled silty clay with fragments of brick and wood. (REWORKED WEATHERED LONDON CLAY).
			D1 1.50	N=7 (1,1)(1,2,2,2)					Firm fissured brown mottled grey-green silty CLAY with roots, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
		2		S N=13 (1,2)(2,3,3,5)					…locally with selenite crystals (generally coarse sand size)
		3		S N=16 (2,3)(3,3,4,6)					…slightly sandy (fine) between 3.5m and 3.8m
		4		S N=18 (3,3)(4,4,5,5)					… with occasional partings of coarse silt/fine sand

Remarks and Water Observations

No groundwater encountered.

End of Borehole at 5.00 m

Scale: 1:25

Logged by: CG

Figure:

Key for Insitu tests

HV-Hand Vane (kN/m2)
PP-Pocket Penotometer (kN/m2)
MP-Mackintosh Probe (N150)

BOREHOLE RECORD (Windowless Sampler)

Borehole Number: WS5

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 79.67mAOD

Dates: 17 Nov 10

Job No.: 241830

GROUND WATER | SAMPLES/TESTS | STRATA RECORD

Strike	Well	Depth (m)	Type/Depth (m)	In-situ Tests	Depth (m)	Level (mAOD)		Key	Description
					0.75	78.92	0.75		MADE GROUND: Dark-brown/black very silty slightly gravelly sand and desiccated clay with roots and occasional fragments of flint, brick and tile.
		1			1.25	78.42	0.50		MADE GROUND: Very stiff dark-grey sandy slightly gravelly clay (desiccated) with fragments of flint, concrete, glass and clay tile.
					1.70	77.97	0.45		MADE GROUND: Dark-brown slightly sandy slightly gravelly clay with roots and fragments of flint, brick and ash.
		2							Firm fissured brown mottled grey-green silty CLAY with roots, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
									…locally with selenite crystals (generally coarse sand size)
		3							…slightly sandy (fine) from 3m
									…parting of coarse silt/fine sand
		4							…slightly sandy (fine) between 4.0m and 4.5m

Remarks and Water Observations

End of Borehole at 5.00 m

Key for Insitu tests
HV-Hand Vane (kN/m2)
PP-Pocket Penotometer (kN/m2)
MP-Mackintosh Probe (N150)

Scale: 1:25

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Windowless Sampler)

Borehole Number: WS6

Site: The Waterhouse

Location: The Waterhouse

Client: Mr and Mrs Munford

Ground Level: 82.28mAOD

Dates: 18 Nov 10

Job No.: 241830

Sheet 1 of 1

GROUND WATER			SAMPLES/TESTS				STRATA RECORD	
Strike	Well	Depth (m)	Type/Depth (m)	In-situ Tests	Depth (m)	Level (mAOD)	Key	Description
					0.55	81.73		MADE GROUND: Grass over dark-brown/black slightly sandy slightly gravelly clay with roots and fragments of brick, pottery, slate and coal. 100mm diameter plastic drainage pipe at 0.3m bgl.
		1						Firm fissured brown mottled grey-green silty CLAY with roots, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
								…locally with selenite crystals (generally coarse sand size)
		2						…locally slightly sandy (fine) between 2m and 3m
		3						…parting of coarse silt/fine sand
		4						…parting of coarse silt/fine sand
								End of Borehole at 5.00 m

Remarks and Water Observations

Key for Insitu tests
HV-Hand Vane (kN/m2)
PP-Pocket Penotometer (kN/m2)
MP-Mackintosh Probe (N150)

Scale: 1:25

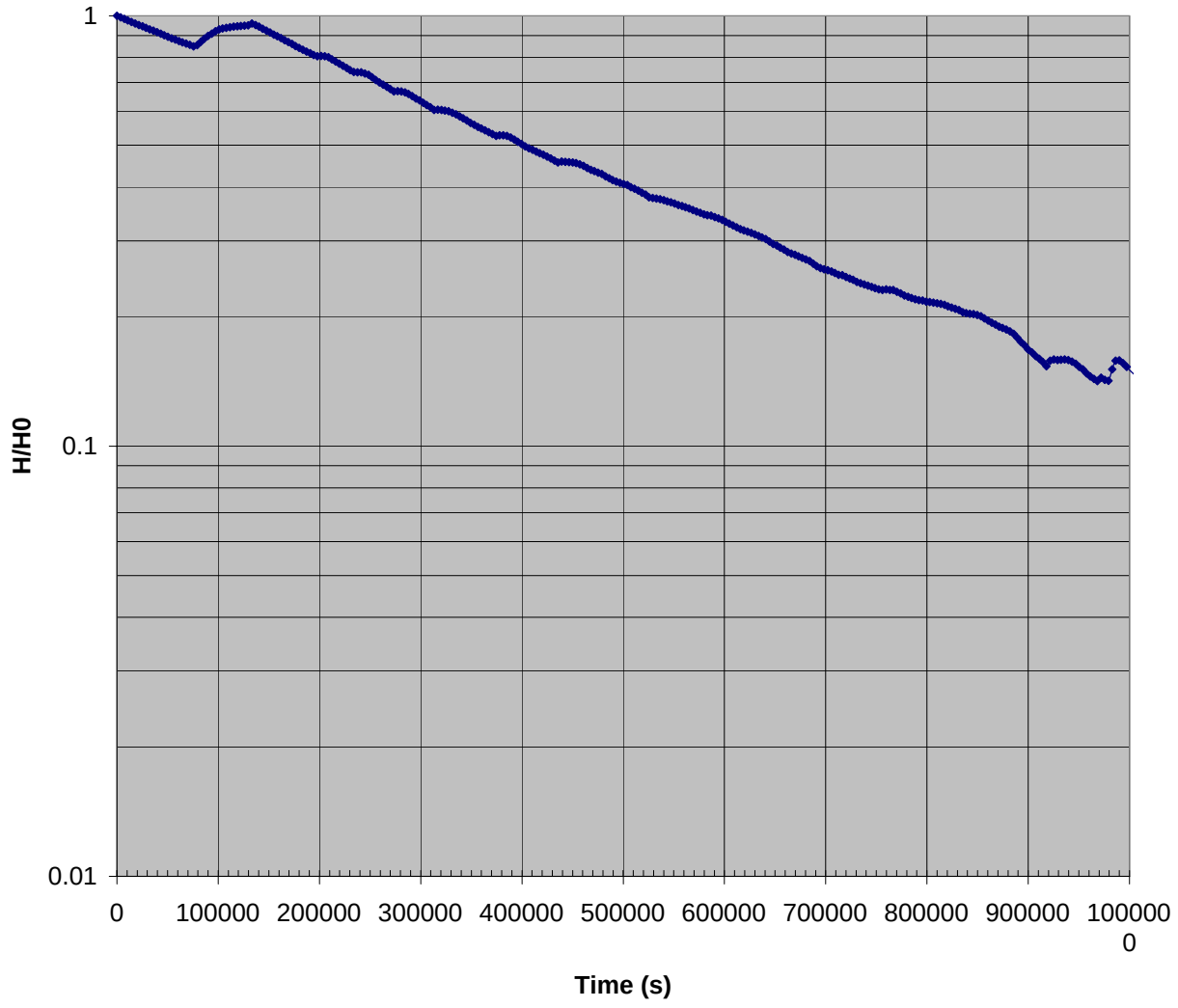
Logged by: CG

Figure:

STATS

RisingHead Permeability Test to BS 5930:1999

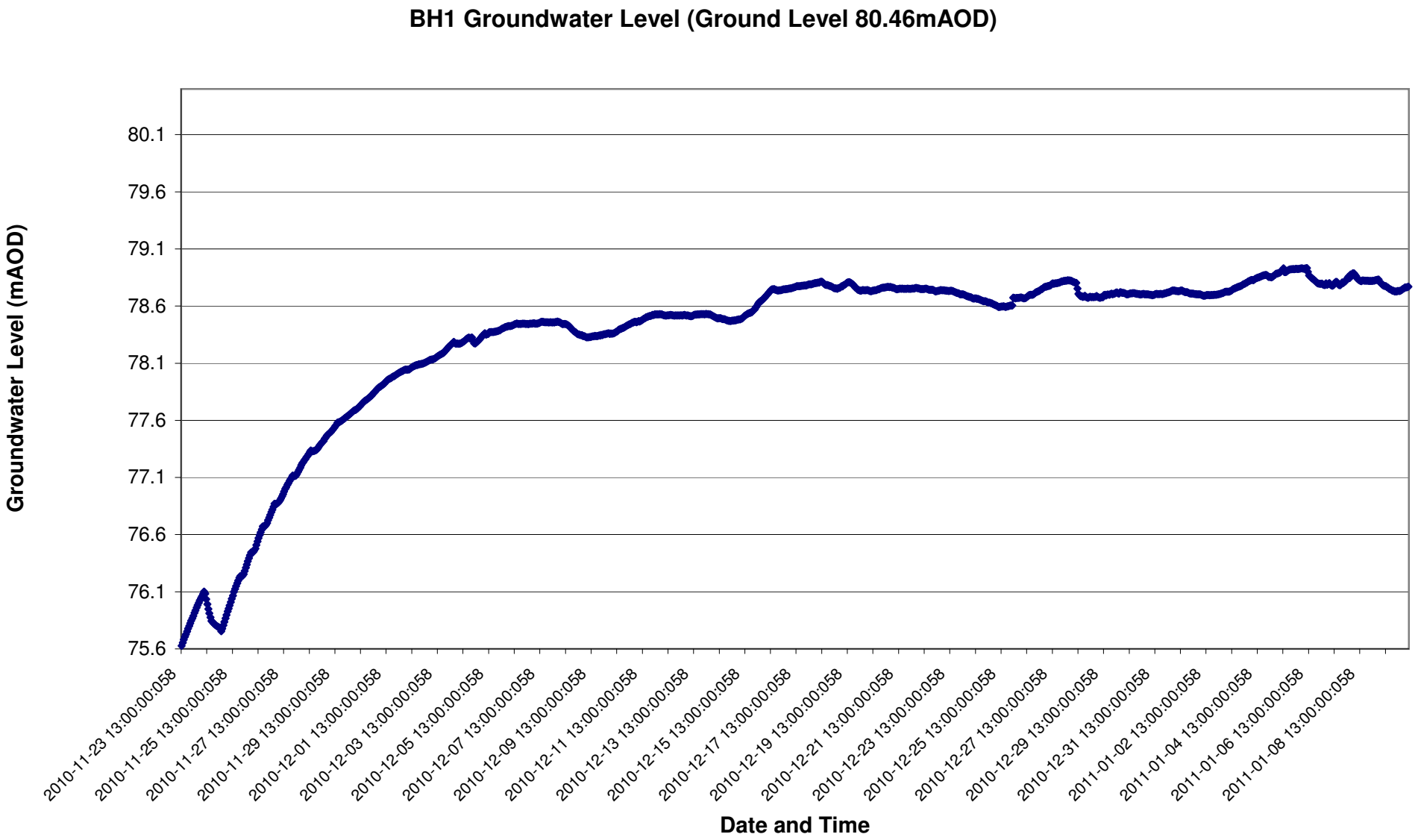
Location	The Waterhouse	**Borehole No**	BH1
Client	Mr and Mrs Munford	**Depth to top response zone (m)**	4.8
Job Number	241830-01 (00)	**Depth to bottom response zone (m)**	5.8
Date	17-Jan-11	**Diameter of Borehole (m)**	0.15
Operator	CG	**Depth to water table (m bgl)**	1.73



Calculations

Area of borehole A (m^2)	0.01767
Intake Factor F	0.804857
Permeability k (m/s)	4.14E-08

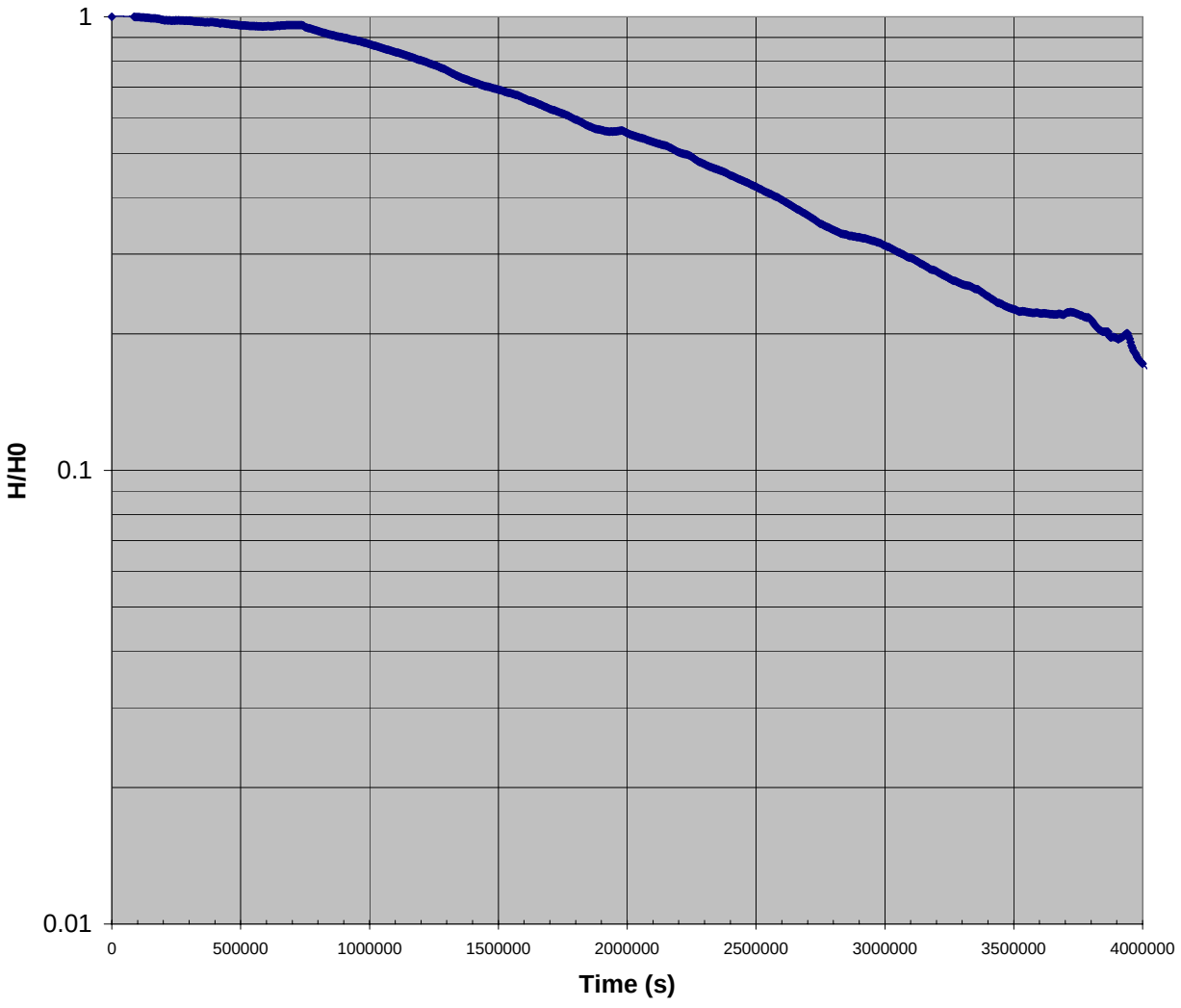
Figure
Appendix B


BH1 Groundwater Level (Ground Level 80.46mAOD)
Groundwater Level (mAOD)
80.1
79.6
79.1
78.6
78.1
77.6
77.1
76.6
76.1
75.6
2010-11-23 13:00:00:058
2010-11-25 13:00:00:058
2010-11-27 13:00:00:058
2010-11-29 13:00:00:058
2010-12-01 13:00:00:058
2010-12-03 13:00:00:058
2010-12-05 13:00:00:058
2010-12-07 13:00:00:058
2010-12-09 13:00:00:058
2010-12-11 13:00:00:058
2010-12-13 13:00:00:058
2010-12-15 13:00:00:058
2010-12-17 13:00:00:058
2010-12-19 13:00:00:058
2010-12-21 13:00:00:058
2010-12-23 13:00:00:058
2010-12-25 13:00:00:058
2010-12-27 13:00:00:058
2010-12-29 13:00:00:058
2010-12-31 13:00:00:058
2011-01-02 13:00:00:058
2011-01-04 13:00:00:058
2011-01-06 13:00:00:058
2011-01-08 13:00:00:058
Date and Time

STATS

RisingHead Permeability Test to BS 5930:1999

Location	The Waterhouse	**Borehole No**	BH2
Client	Mr and Mrs Munford	**Depth to top response zone (m)**	8.8
Job Number	241830-01 (00)	**Depth to bottom response zone (m)**	10
Date	17-Jan-11	**Diameter of Borehole (m)**	0.15
Operator	CG	**Depth to water table (m bgl)**	1.7

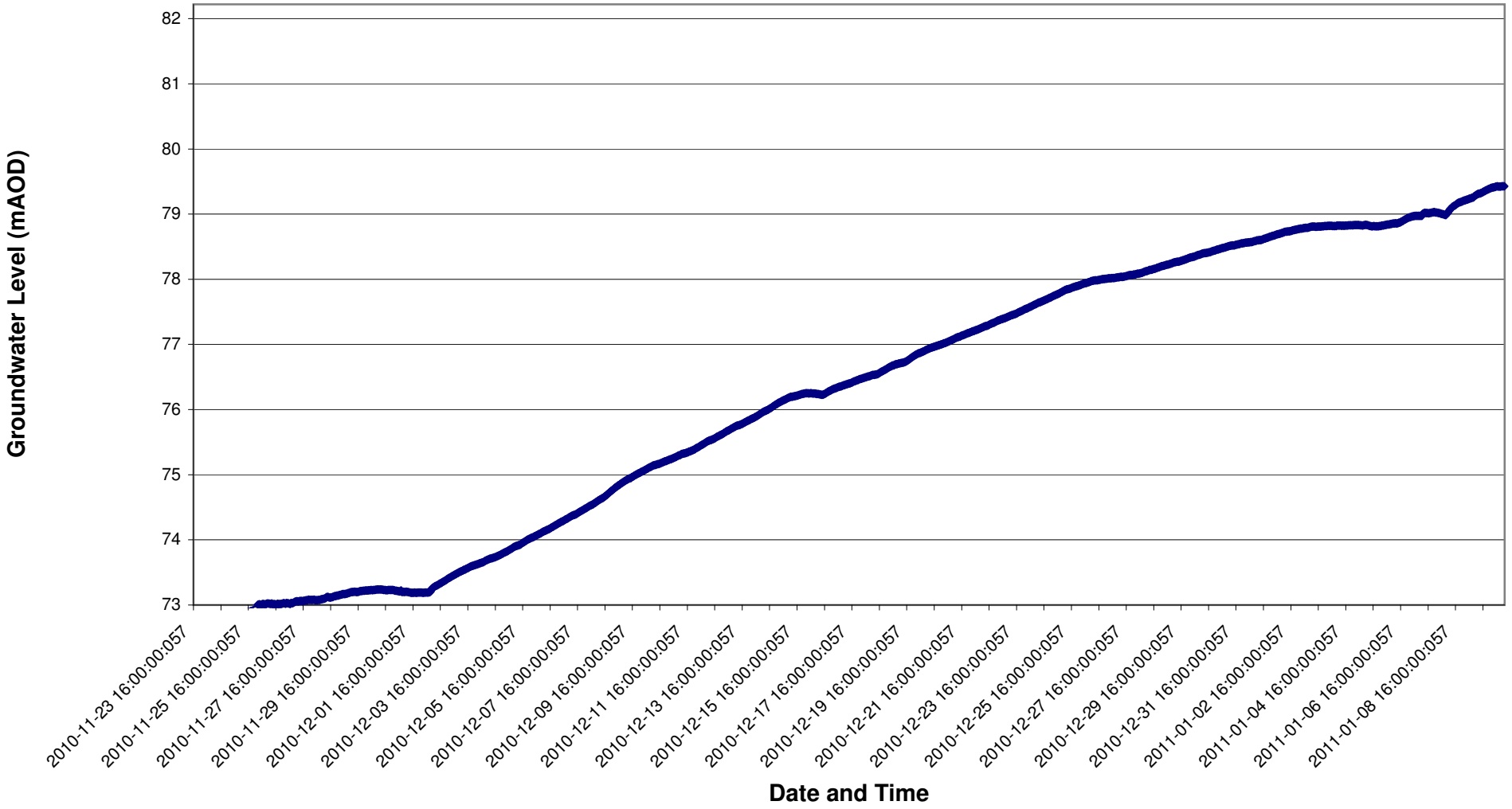


Calculations

Area of borehole A (m^2)	0.01767
Intake Factor F	0.823202
Permeability k (m/s)	8.10E-09

Figure
Appendix B

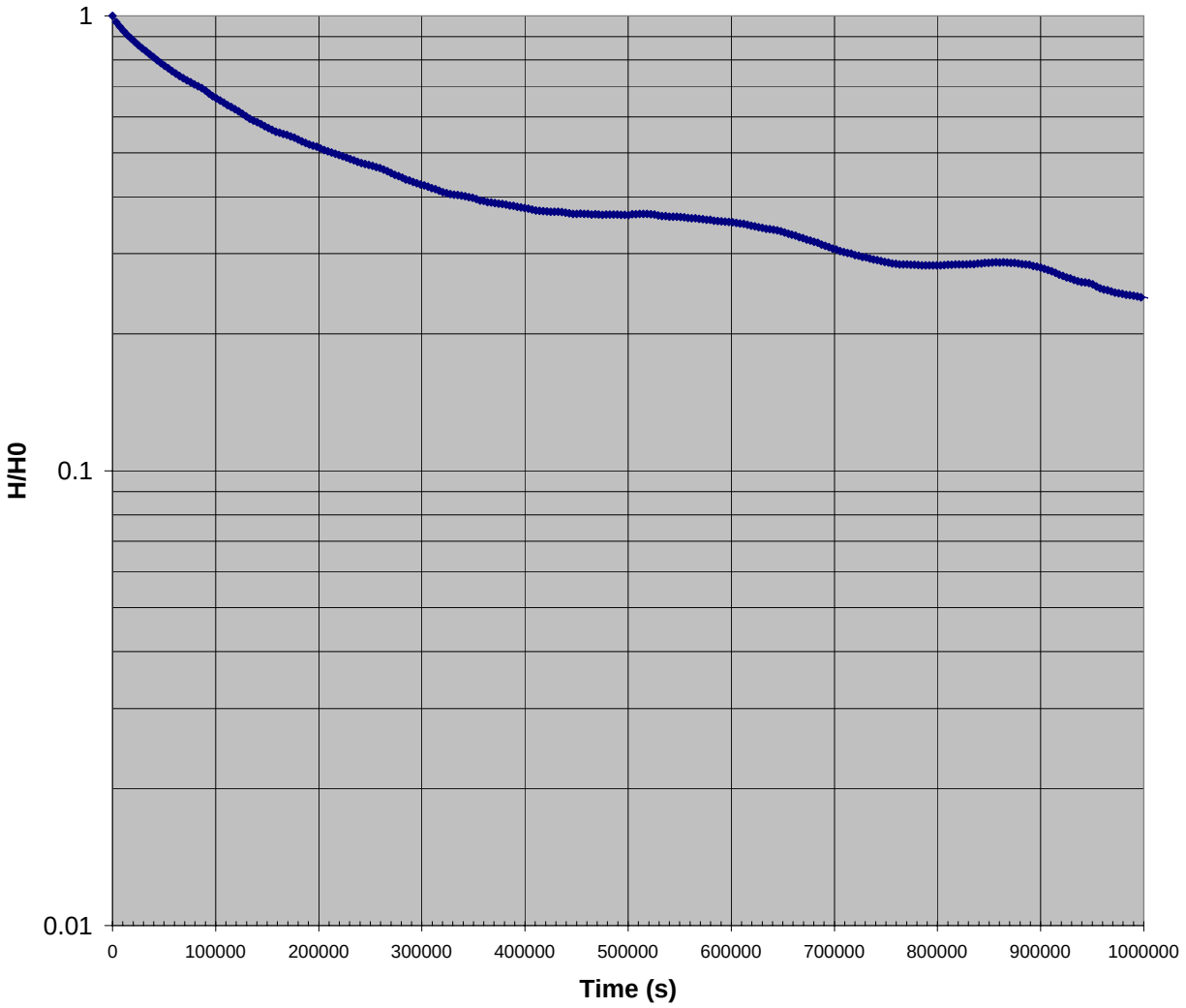
BH2 Groundwater Level (Ground Level 82.22mAOD)



STATS

RisingHead Permeability Test to BS 5930:1999

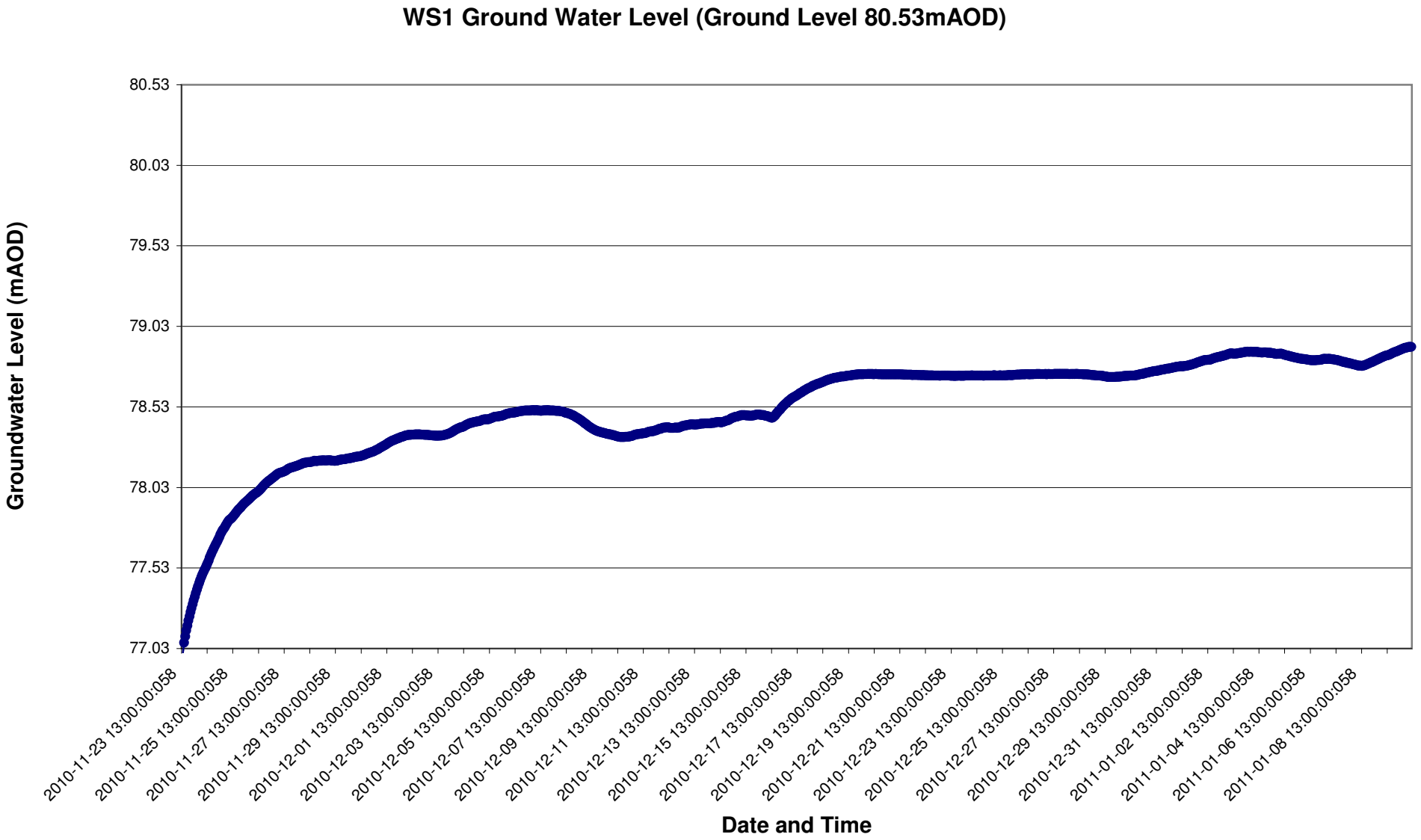
Location	The Waterhouse	**Borehole No**	WS1
Client	Mr and Mrs Munford	**Depth to top response zone (m)**	2.5
Job Number	241830-01 (00)	**Depth to bottom response zone (m)**	4
Date	17-Jan-11	**Diameter of Borehole (m)**	0.075
Operator	CG	**Depth to water table (m bgl)**	1.62



Calculations

Area of borehole A (m^2)	0.00442
Intake Factor F	0.453809
Permeability k (m/s)	2.43E-08

Figure
Appendix B


WS1 Ground Water Level (Ground Level 80.53mAOD)
Groundwater Level (mAOD)
80.53
80.03
79.53
79.03
78.53
78.03
77.53
77.03
2010-11-23 13:00:00:058
2010-11-25 13:00:00:058
2010-11-27 13:00:00:058
2010-11-29 13:00:00:058
2010-12-01 13:00:00:058
2010-12-03 13:00:00:058
2010-12-05 13:00:00:058
2010-12-07 13:00:00:058
2010-12-09 13:00:00:058
2010-12-11 13:00:00:058
2010-12-13 13:00:00:058
2010-12-15 13:00:00:058
2010-12-17 13:00:00:058
2010-12-19 13:00:00:058
2010-12-21 13:00:00:058
2010-12-23 13:00:00:058
2010-12-25 13:00:00:058
2010-12-27 13:00:00:058
2010-12-29 13:00:00:058
2010-12-31 13:00:00:058
2011-01-02 13:00:00:058
2011-01-04 13:00:00:058
2011-01-06 13:00:00:058
2011-01-08 13:00:00:058
Date and Time

APPENDIX C

Geotechnical Laboratory Test Records

(this appendix contains 17 pages, including this one)

UKAS TESTING
No 2652

Clive Gerring
RSK STATS GEOCONSULT LIMITED
18 Frogmore Road
Hemel Hempstead
Herts
HP3 9RT

STRUCTURAL SOILS LTD

SITE INVESTIGATION

SOIL, ROCK & MATERIAL TESTING

GEOTECHNICAL CONSULTANCY

CONTAMINATED LAND ASSESSMENT

11th December 2010

TESTING REPORT

YOUR REF: 241830

SITE: The Waterhouse, Fitzroy Park

CERTIFICATE NUMBER: 581445

DATE SAMPLES RECEIVED: 1st December 2010
DATE TESTING COMMENCED: 1st December 2010

DATE OF SAMPLE DISPOSAL: 11th January 2011

INSTRUCTIONS: Please carry out Moisture Content, Atterberg Limits, Particle Size Distribution and Quick Undrained Triaxial tests on samples provided.

I have pleasure in enclosing the test report for the above project that you submitted to us for testing.

Yours sincerely

Paul Kent
Laboratory Manager

Enc.

18 FROGMORE ROAD
HEMEL HEMPSTEAD
HERTS
HP3 9RT
TEL: 01442 416660
FAX: 01442 437550
hemel@soils.co.uk
www.soils.co.uk

HEAD OFFICE:
Bristol

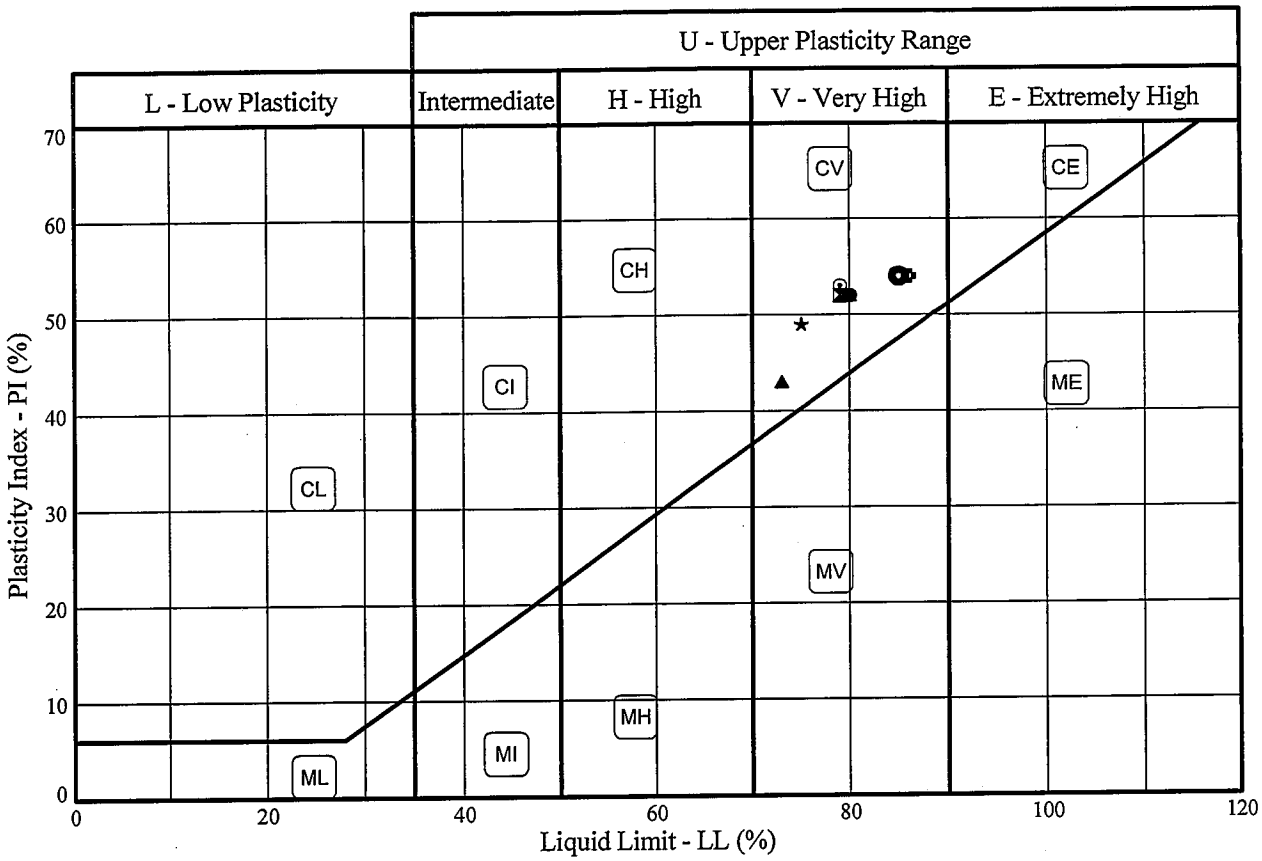
BRANCH OFFICE:
Castleford
West Yorkshire

SUMMARY OF MOISTURE CONTENT TESTING

Exploratory Position ID	Depth (m)	Sample Ref	Sample Type	Moisture Content (%)
BH1	0.80		B	35
BH1	1.20		U	35
BH1	5.00		U	30
BH1	8.00		U	30
BH1	11.00		U	29
BH1	14.00		U	31
BH1	17.00		U	31
BH1	19.50		U	26
BH2	0.70		B	37
BH2	2.00		U	36
BH2	4.00		U	30
BH2	6.50		U	28
WS1	1.00		D	33
WS4	1.50		D	34

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1981
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %
	Exploratory Position ID	Sample	Depth (m)							
●	BH1	B	0.80	3.2/4.4/5.3/5.4	4.2.3	35	80	28	52	100
⊠	BH1	U	1.20	3.2/4.4/5.3/5.4	4.2.3	35	79	27	52	100
▲	BH1	U	5.00	3.2/4.4/5.3/5.4	4.2.3	30	73	30	43	100
★	BH1	U	8.00	3.2/4.4/5.3/5.4	4.2.3	30	75	26	49	100
⊙	BH1	U	11.00	3.2/4.4/5.3/5.4	4.2.3	29	79	26	53	100
✿	BH1	U	14.00	3.2/4.4/5.3/5.4	4.2.3	31	86	32	54	100
◉	BH1	U	17.00	3.2/4.4/5.3/5.4	4.2.3	31	85	31	54	100
△	BH1	U	19.50	3.2/4.4/5.3/5.4	4.2.3	26	80	28	52	100

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non standard test, NP = Non plastic.

Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

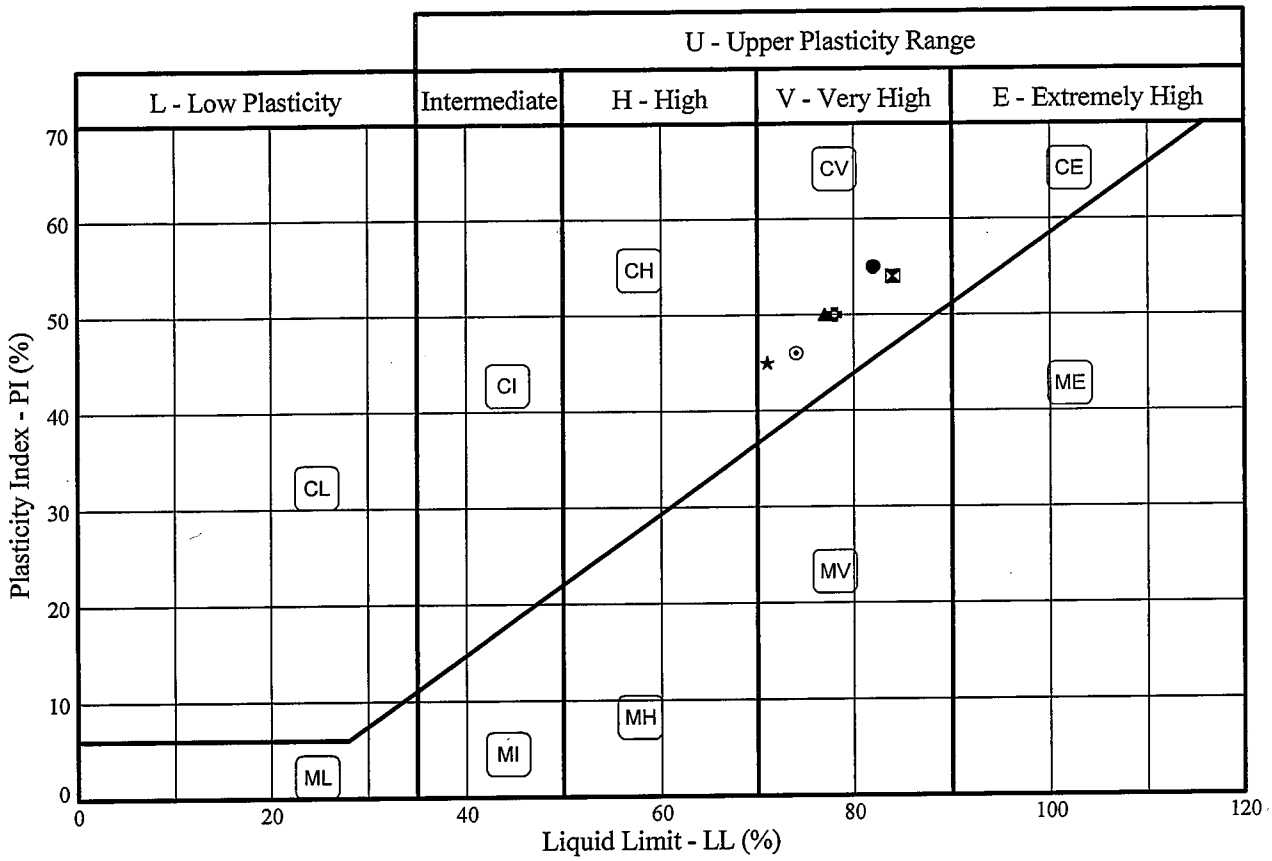
Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1981
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %
Exploratory Position ID		Sample	Depth (m)							
●	BH2	B	0.70	3.2/4.4/5.3/5.4	4.2.3	37	82	27	55	100
⊠	BH2	U	2.00	3.2/4.4/5.3/5.4	4.2.3	36	84	30	54	100
▲	BH2	U	4.00	3.2/4.4/5.3/5.4	4.2.3	30	77	27	50	100
★	BH2	U	6.50	3.2/4.4/5.3/5.4	4.2.3	28	71	26	45	100
⊙	WS1	D	1.00	3.2/4.4/5.3/5.4	4.2.3	33	74	28	46	99
✿	WS4	D	1.50	3.2/4.4/5.3/5.4	4.2.3	34	78	28	50	100

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non standard test, NP = Non plastic.

Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By		Date
	PAUL KENT	10/12/10

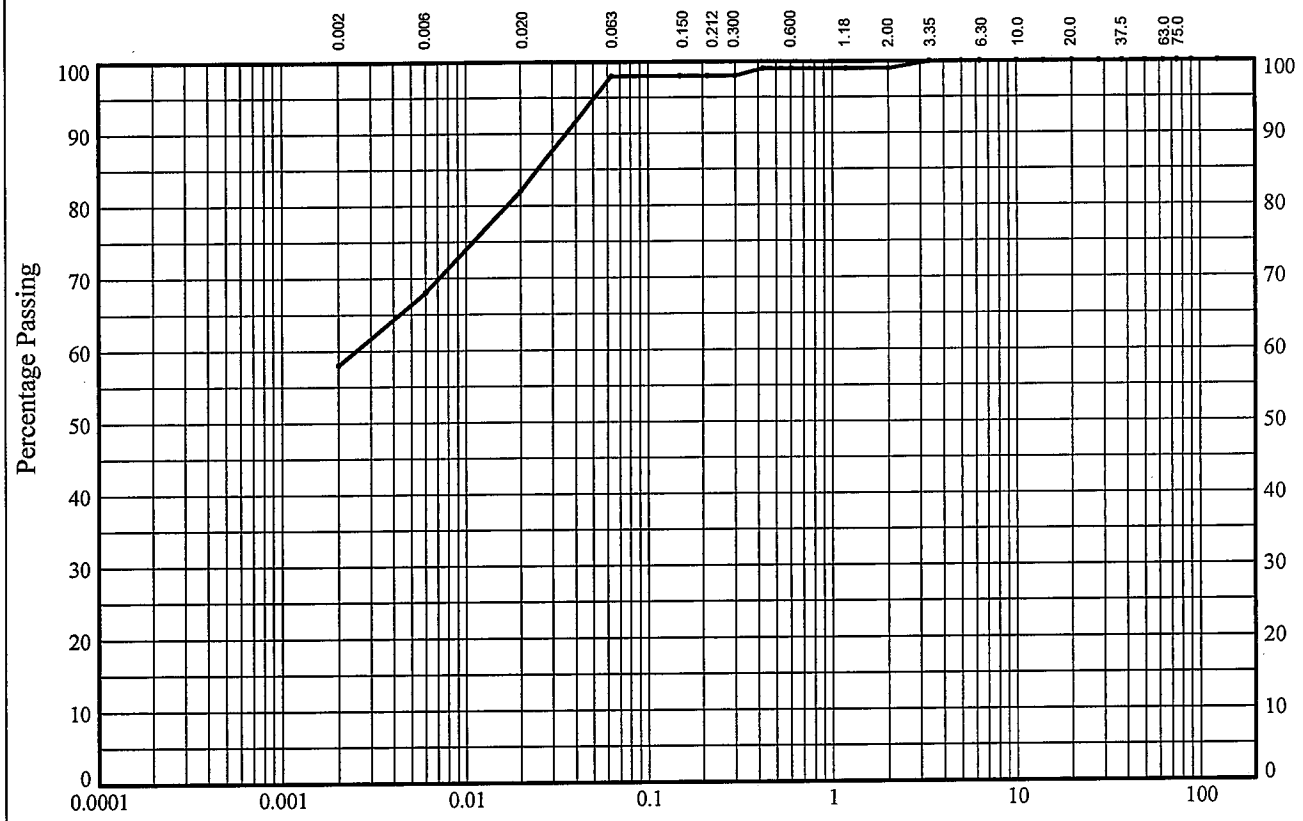
Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.4 of BS1377:Part 2:1990

Borehole : **BH1** Sample Ref: Sample Type: **B** Depth (m): **2.20**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	100
3.35	100
2	99
1.18	99
0.6	99
0.425	99
0.3	98
0.212	98
0.15	98
0.063	98

Particle Diameter	Percentage Passing
0.02	**82**
0.006	**68**
0.002	**58**

Soil Fraction	Sieve Percentage
GRAVEL	**1**
SAND	**1**
SILT	**40**
CLAY	**58**

Soil Description:

Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

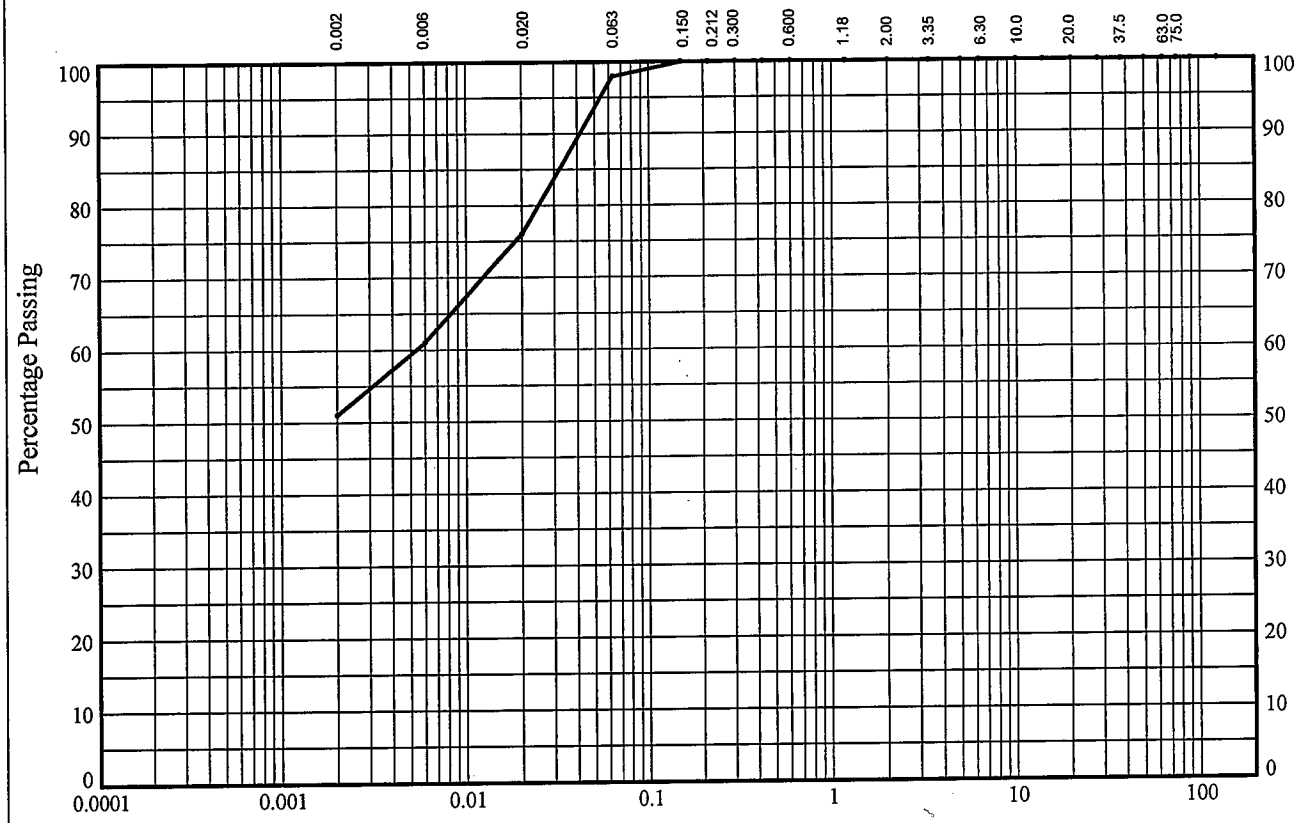
Contract Ref: **581445**

AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2,9.4 of BS1377:Part 2:1990

Borehole : **BH2** Sample Ref: Sample Type: **B** Depth (m): **1.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	100
3.35	100
2	100
1.18	100
0.6	100
0.425	100
0.3	100
0.212	100
0.15	100
0.063	98

Particle Diameter	Percentage Passing
0.02	**76**
0.006	**61**
0.002	**51**

Soil Fraction	Sieve Percentage
GRAVEL	**0**
SAND	**2**
SILT	**47**
CLAY	**51**

Soil Description:

Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

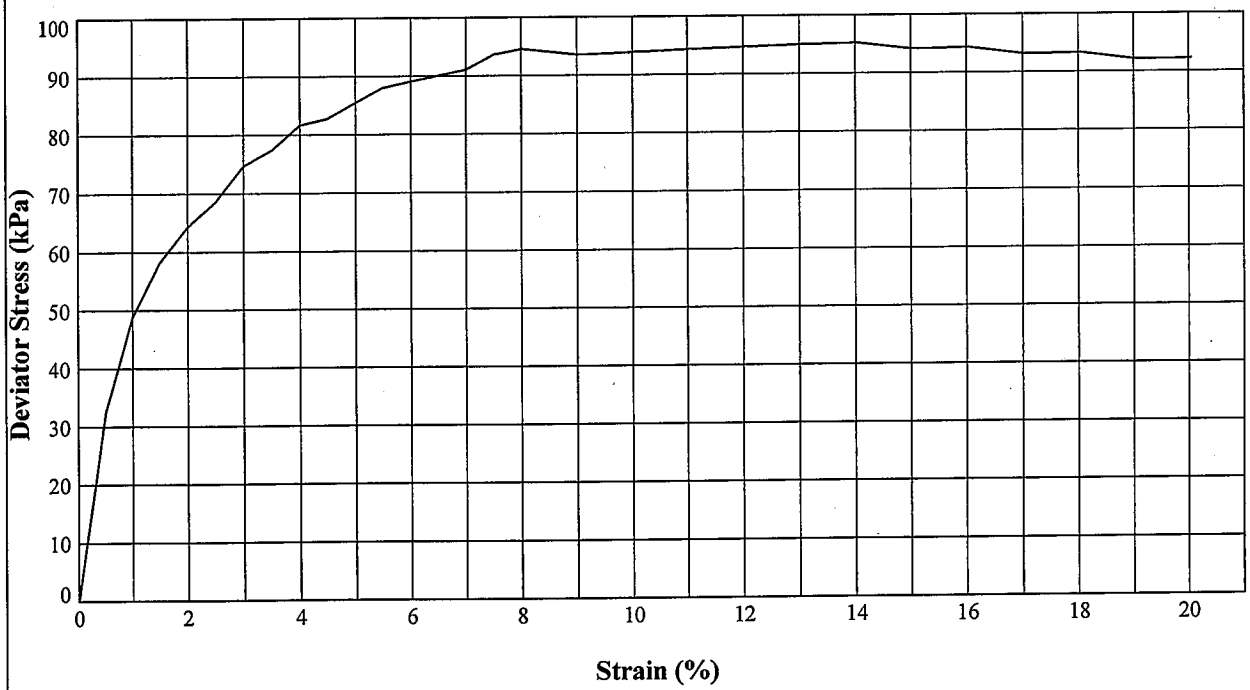
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1** Sample Ref: Sample Type: **U** Depth (m): **1.20**

Description : **Brown CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	101.39		
	Height	(mm)	209.47		
	Moisture Content	(%)	33		
	Bulk Density	(Mg/m^3)	1.90		
	Dry Density	(Mg/m^3)	1.43		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.01		
	Cell Pressure	(kPa)	24		
	Membrane Correction	(kPa)	0.69		
	Corrected Deviator Stress	(kPa)	95		
	Undrained Shear Strength	(kPa)	48		
	Strain at Failure	(%)	14.0		
	Mode of Failure		Compound		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS 18 Frogmore Road Hemel Hempstead Hertfordshire HP3 9RT	Compiled By	Date
	PAUL KENT	10/12/10
	Contract: **The Waterhouse, Fitzroy Park**	Contract Ref: **581445**
		Page 7 of 16

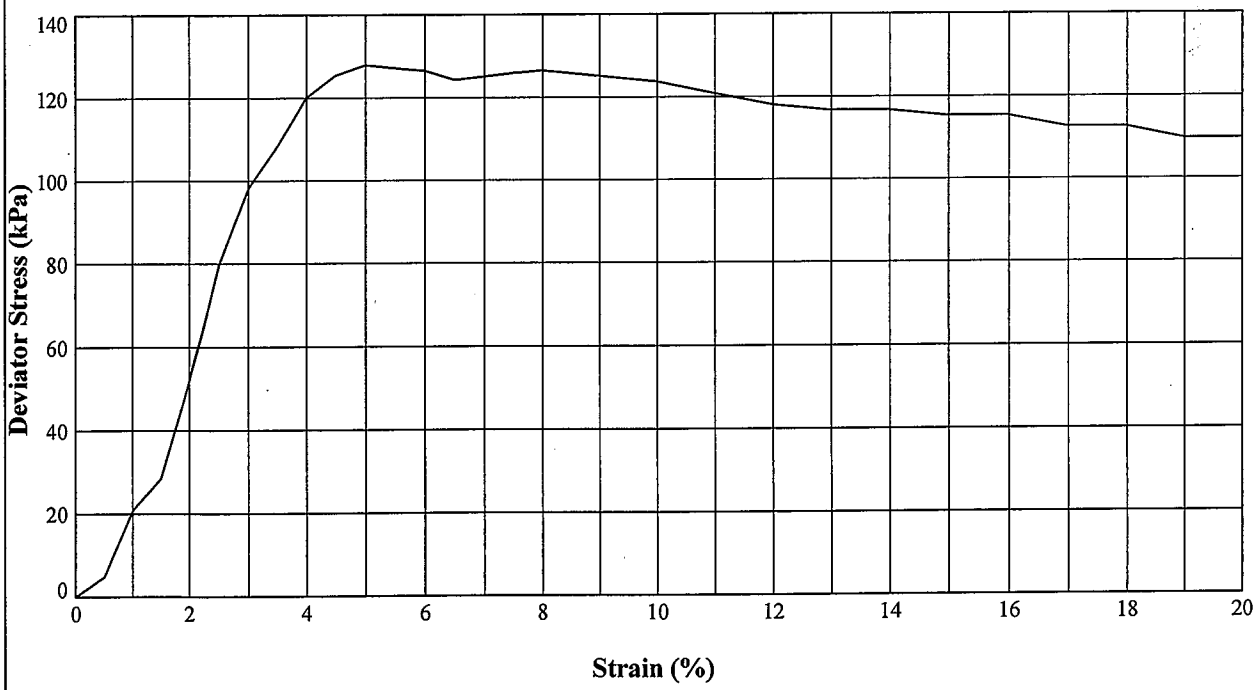
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1** Sample Ref: Sample Type: **U** Depth (m): **5.00**

Description : **Brown CLAY with occasional pockets of grey silty fine sand**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.49		
	Height	(mm)	210.17		
	Moisture Content	(%)	31		
	Bulk Density	(Mg/m^3)	1.89		
	Dry Density	(Mg/m^3)	1.44		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	100		
	Membrane Correction	(kPa)	0.32		
	Corrected Deviator Stress	(kPa)	128		
	Undrained Shear Strength	(kPa)	64		
	Strain at Failure	(%)	5.0		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

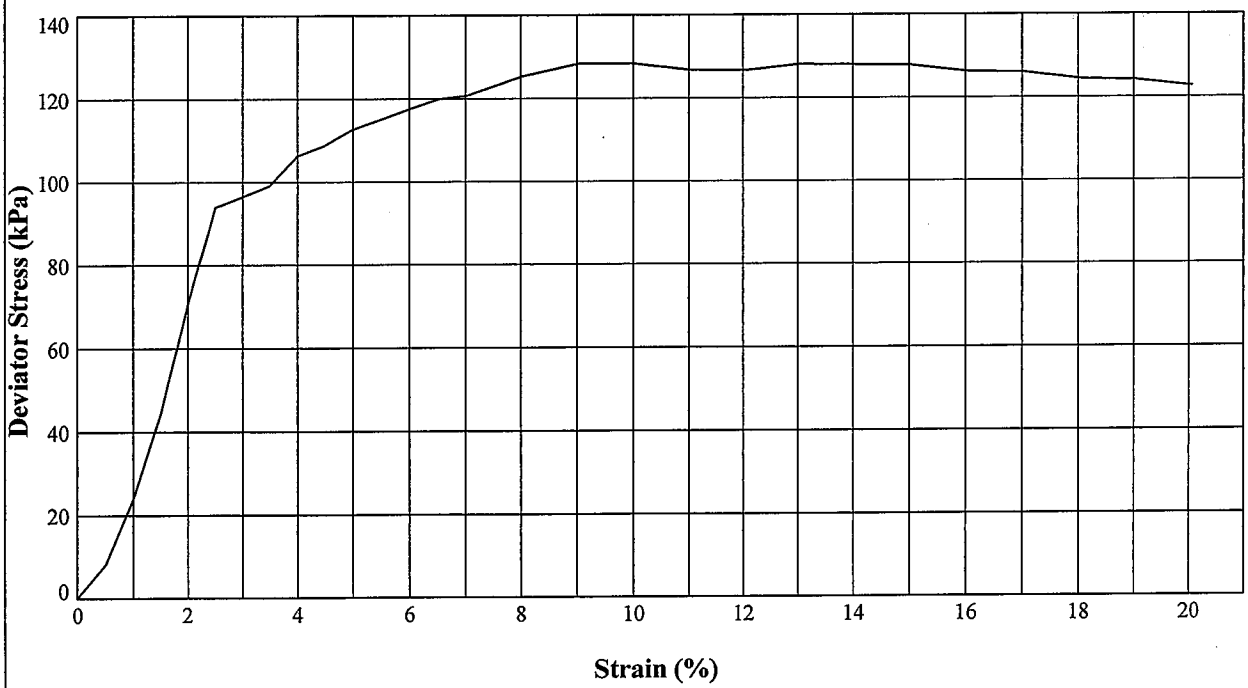
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1** Sample Ref: Sample Type: **U** Depth (m): **8.00**

Description : **Brownish black CLAY with some black staining**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.41		
	Height	(mm)	209.42		
	Moisture Content	(%)	30		
	Bulk Density	(Mg/m^3)	1.95		
	Dry Density	(Mg/m^3)	1.50		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	160		
	Membrane Correction	(kPa)	0.50		
	Corrected Deviator Stress	(kPa)	128		
	Undrained Shear Strength	(kPa)	64		
	Strain at Failure	(%)	9.0		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

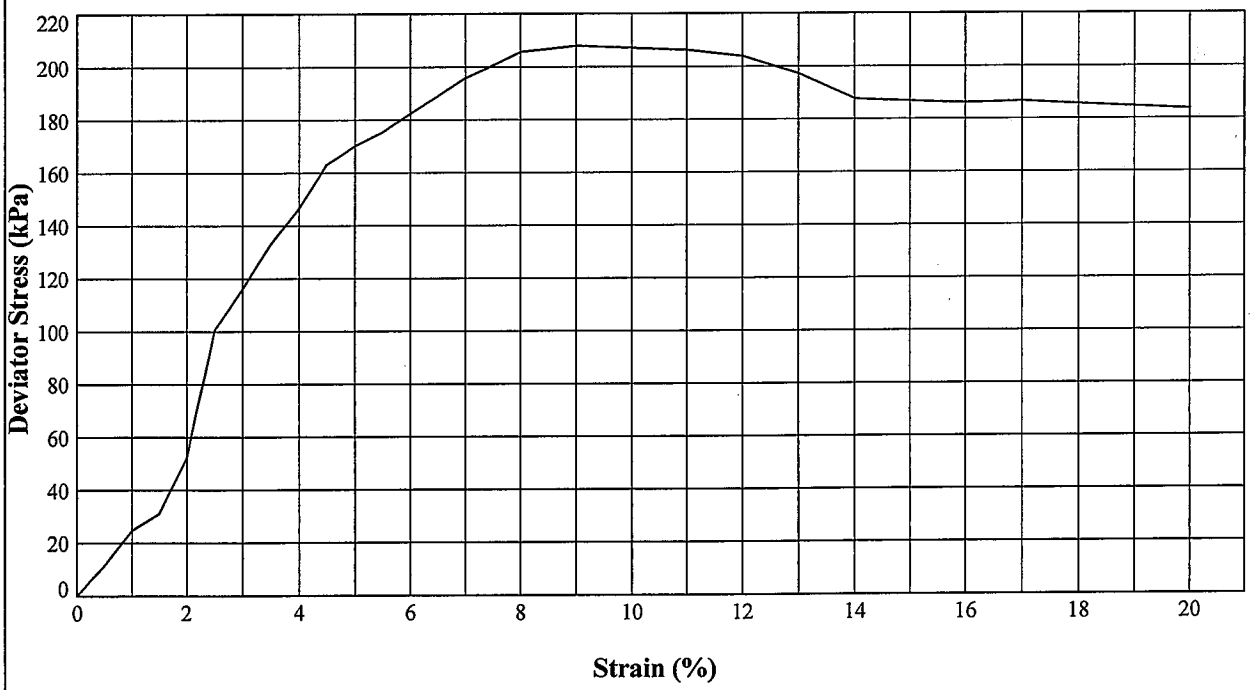
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1** Sample Ref: Sample Type: **U** Depth (m): **11.00**

Description : **Brownish black CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	100.83		
	Height	(mm)	209.86		
	Moisture Content	(%)	30		
	Bulk Density	(Mg/m^3)	1.93		
	Dry Density	(Mg/m^3)	1.48		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	220		
	Membrane Correction	(kPa)	0.50		
	Corrected Deviator Stress	(kPa)	208		
	Undrained Shear Strength	(kPa)	104		
	Strain at Failure	(%)	9.0		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

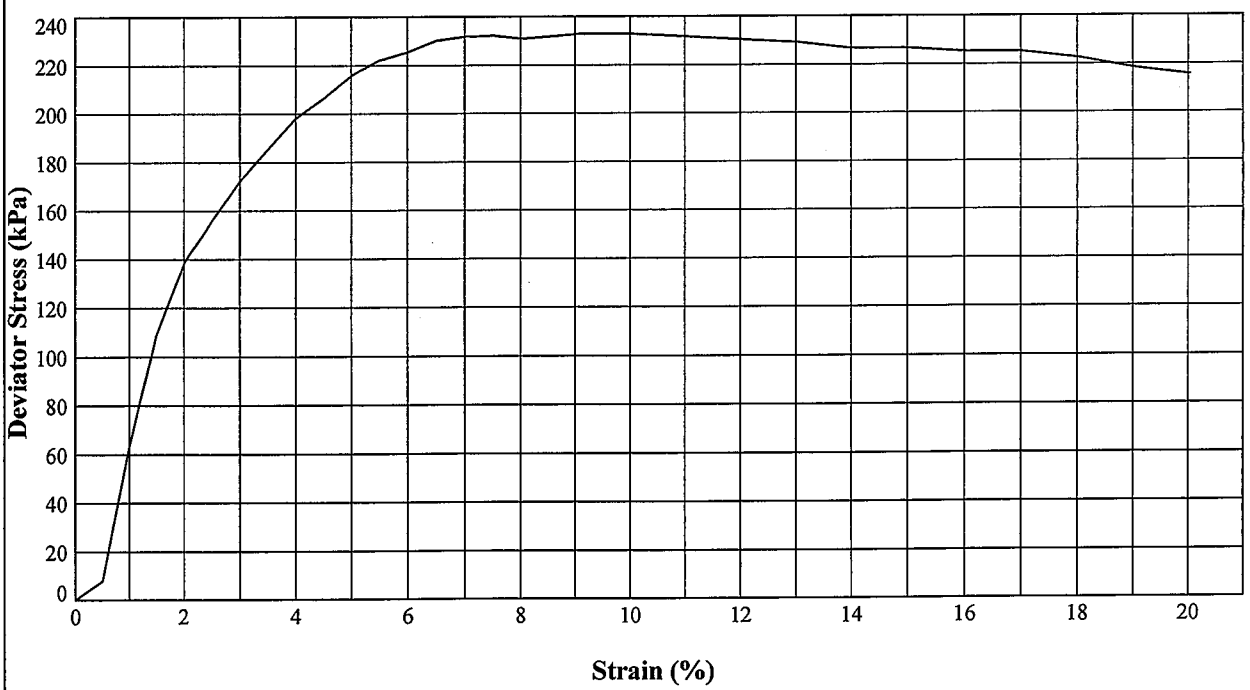
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1** Sample Ref: Sample Type: **U** Depth (m): **14.00**

Description : **Brownish black CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.63		
	Height	(mm)	209.56		
	Moisture Content	(%)	32		
	Bulk Density	(Mg/m^3)	1.91		
	Dry Density	(Mg/m^3)	1.45		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	280		
	Membrane Correction	(kPa)	0.54		
	Corrected Deviator Stress	(kPa)	233		
	Undrained Shear Strength	(kPa)	117		
	Strain at Failure	(%)	10.0		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By		Date
	PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

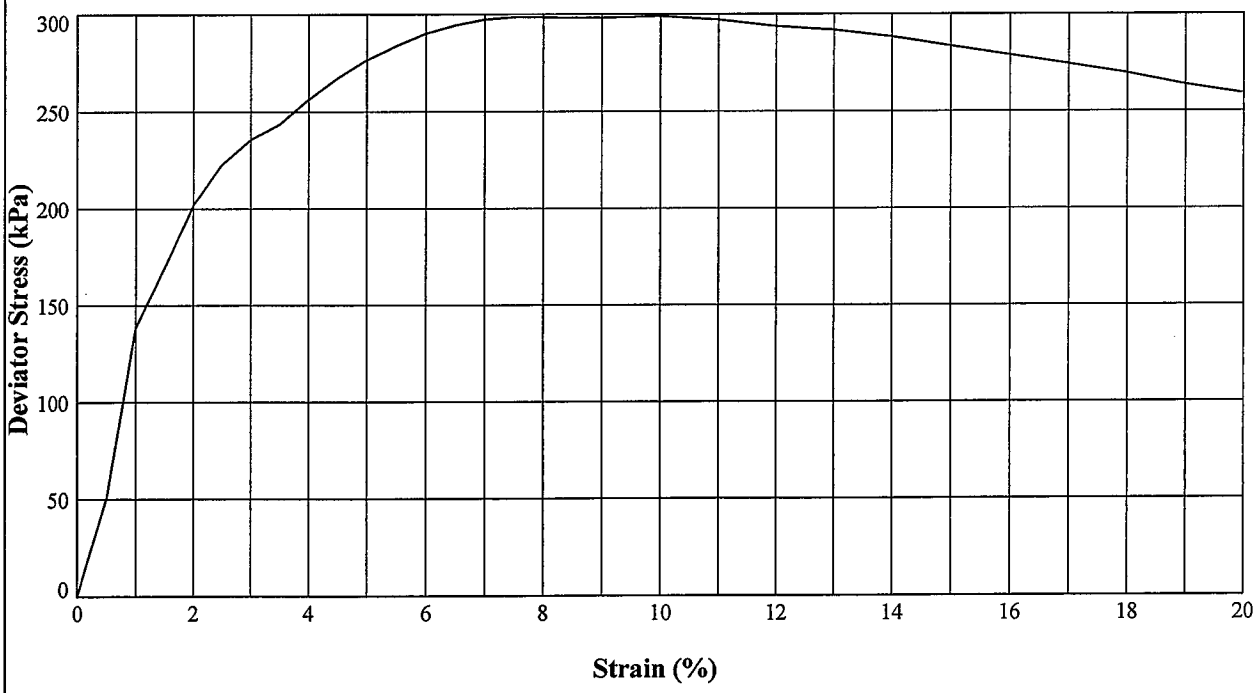
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1** Sample Ref: Sample Type: **U** Depth (m): **17.00**

Description : **Brownish black CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.41		
	Height	(mm)	210.27		
	Moisture Content	(%)	27		
	Bulk Density	(Mg/m^3)	1.90		
	Dry Density	(Mg/m^3)	1.50		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	340		
	Membrane Correction	(kPa)	0.54		
	Corrected Deviator Stress	(kPa)	300		
	Undrained Shear Strength	(kPa)	150		
	Strain at Failure	(%)	10.0		
	Mode of Failure		Brittle		



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Contract Ref: **581445**

AGS

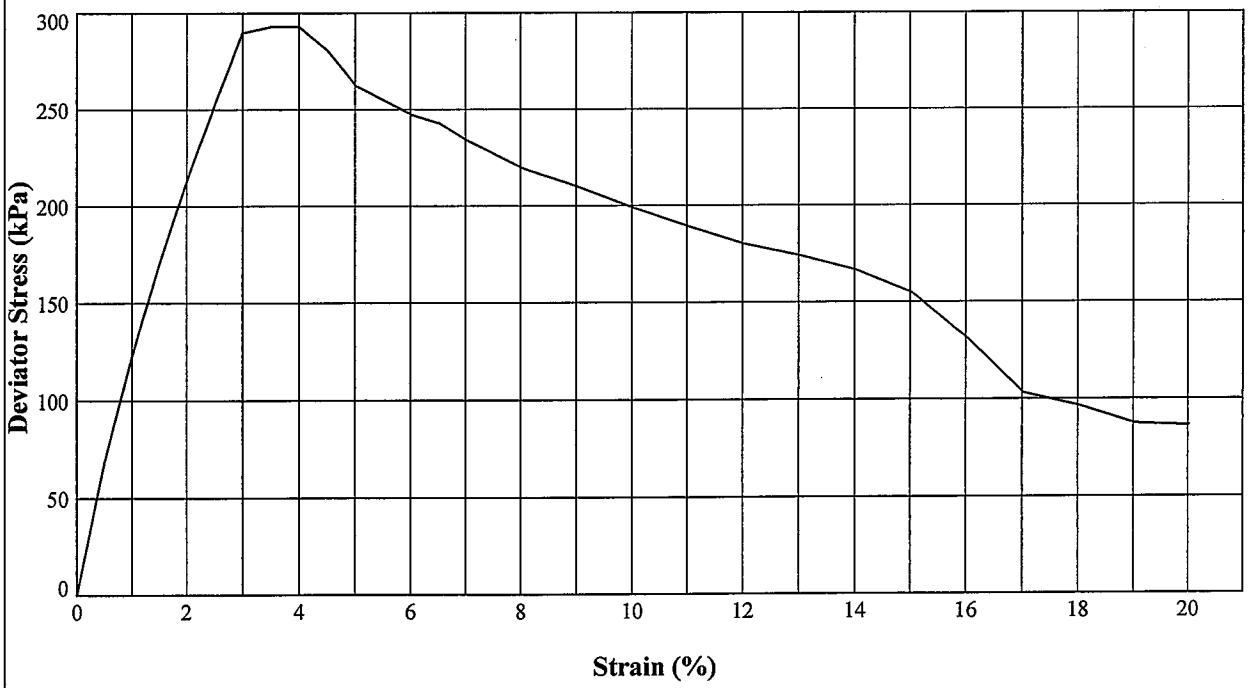
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1** Sample Ref: Sample Type: **U** Depth (m): **19.50**

Description : **Brownish black CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.45		
	Height	(mm)	209.76		
	Moisture Content	(%)	26		
	Bulk Density	(Mg/m^3)	1.94		
	Dry Density	(Mg/m^3)	1.54		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	390		
	Membrane Correction	(kPa)	0.23		
	Corrected Deviator Stress	(kPa)	293		
	Undrained Shear Strength	(kPa)	147		
	Strain at Failure	(%)	3.5		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By		Date
	PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

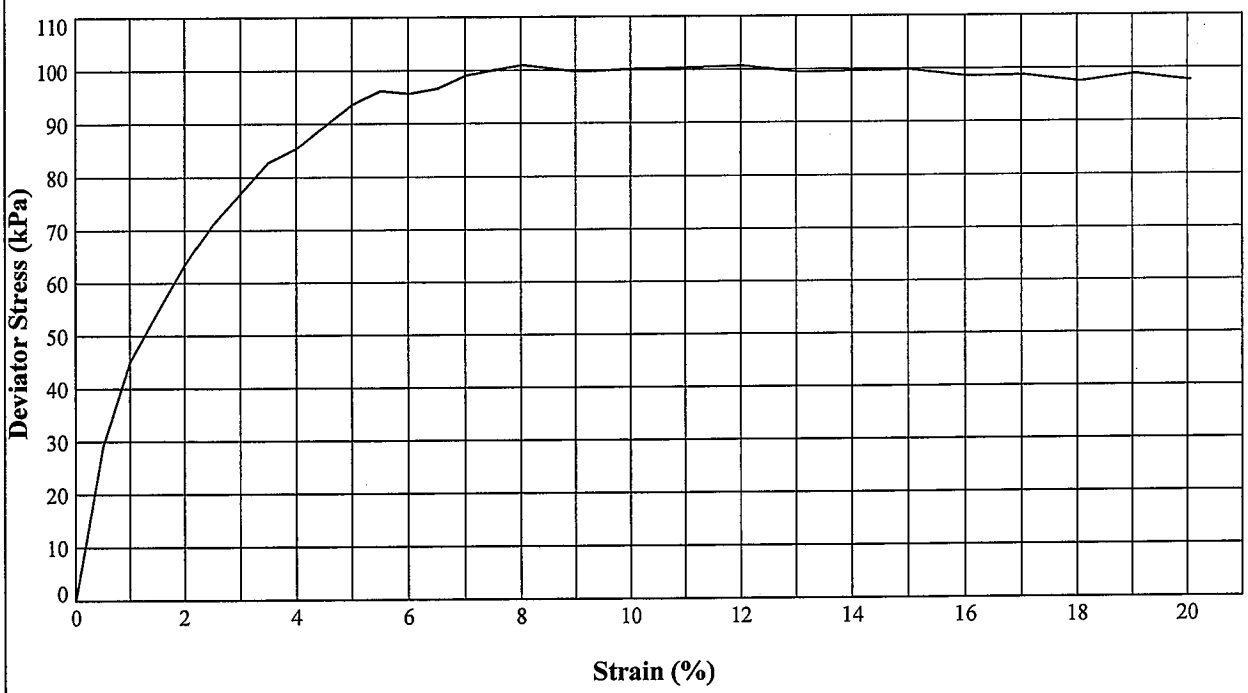
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH2** Sample Ref: Sample Type: **U** Depth (m): **2.00**

Description : **Brown mottled grey CLAY with occasional fine gypsum**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.03		
	Height	(mm)	209.33		
	Moisture Content	(%)	36		
	Bulk Density	(Mg/m^3)	1.91		
	Dry Density	(Mg/m^3)	1.40		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	40		
	Membrane Correction	(kPa)	0.45		
	Corrected Deviator Stress	(kPa)	101		
	Undrained Shear Strength	(kPa)	50		
	Strain at Failure	(%)	8.0		
	Mode of Failure		Compound		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

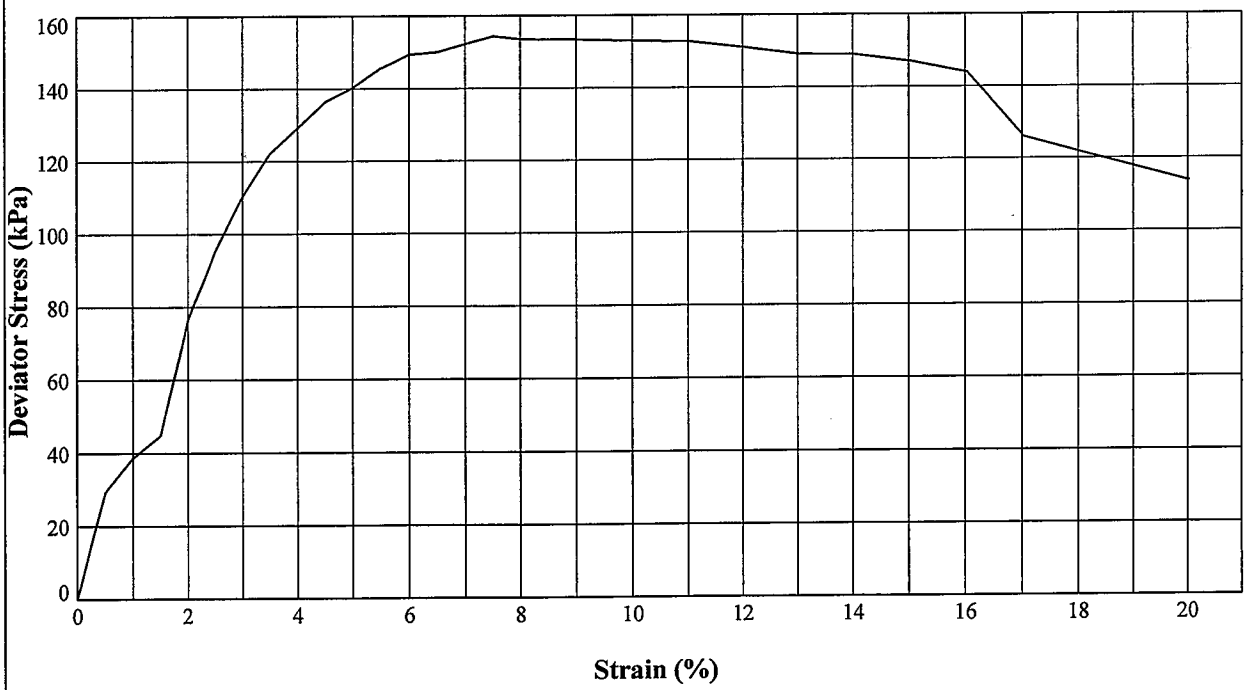
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH2** Sample Ref: Sample Type: **U** Depth (m): **4.00**

Description : **Brown mottled grey CLAY with frequent fine gypsum**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	101.89		
	Height	(mm)	209.67		
	Moisture Content	(%)	31		
	Bulk Density	(Mg/m^3)	1.92		
	Dry Density	(Mg/m^3)	1.46		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	80		
	Membrane Correction	(kPa)	0.43		
	Corrected Deviator Stress	(kPa)	154		
	Undrained Shear Strength	(kPa)	77		
	Strain at Failure	(%)	7.5		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

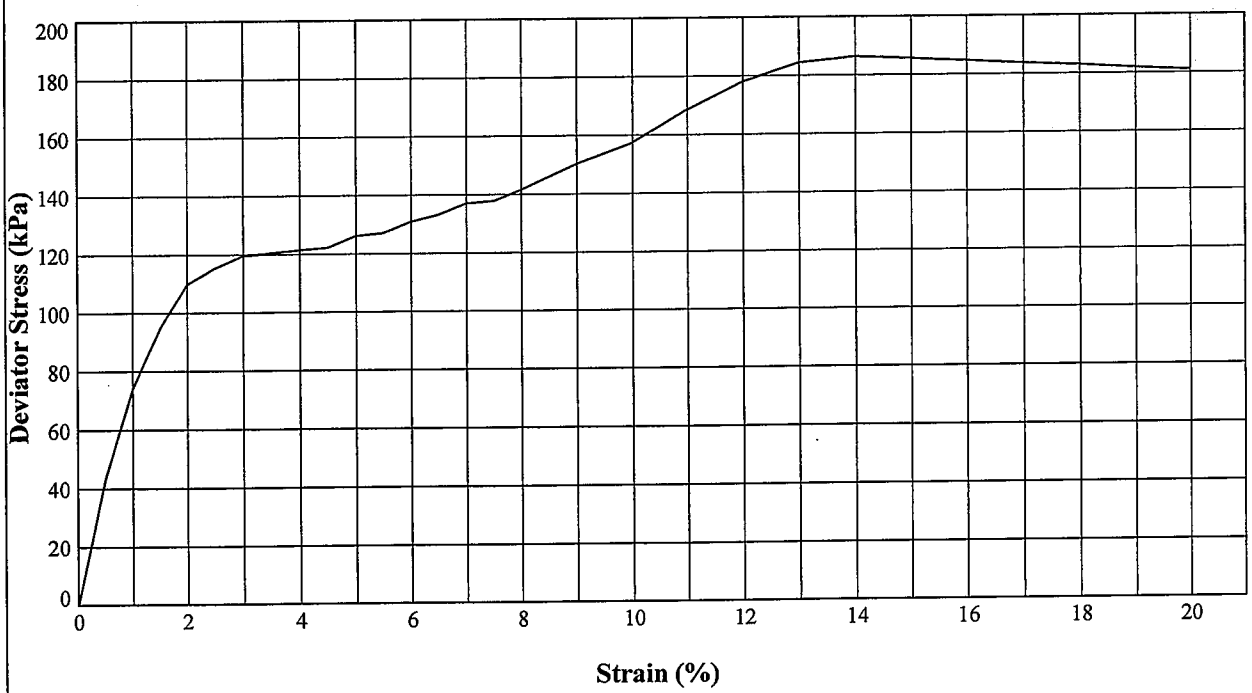
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH2** Sample Ref: Sample Type: **U** Depth (m): **6.50**

Description : **Very dark brownish grey slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	101.92		
	Height	(mm)	209.98		
	Moisture Content	(%)	28		
	Bulk Density	(Mg/m^3)	1.95		
	Dry Density	(Mg/m^3)	1.53		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	130		
	Membrane Correction	(kPa)	0.69		
	Corrected Deviator Stress	(kPa)	187		
	Undrained Shear Strength	(kPa)	93		
	Strain at Failure	(%)	14.0		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	10/12/10

Contract: **The Waterhouse, Fitzroy Park**

Contract Ref: **581445**

AGS

APPENDIX D

Chemical Laboratory Test Records

(This appendix contains 9 pages, including this)

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 10/04186
Issue Number: 1 **Date:** 13 December, 2010

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

Project Manager: Clive Gerring
Project Name: The Waterhouse
Project Ref: 241830
Order No: Not specified
Date Samples Received: 02/12/10
Date Instructions Received: 02/12/10
Date Analysis Completed: 13/12/10

Prepared by:
Melanie Marshall
Laboratory Coordinator

Approved by:
Iain Haslock
Analytical Consultant

Notes - Soil analysis
All results are reported as dry weight (<40°C).
Stones >10mm are removed from the sample prior to analysis and results corrected where appropriate.

Notes - General
For soil samples subscript A indicates analysis performed on the sample as received, D indicates analysis performed on dried & crushed sample.
Superscript M indicates method accredited to MCERTS.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.
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. NDP indicates No Determination Possible. NFI indicates No Fibres Identified.
Superscript # indicates method accredited to ISO 17025.
Accreditation for TPH (C6-C40) applies to the range C6-C36 only.
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.

MCERTS
UKAS TESTING 1247

Envirolab Job Number: 10/04186

Client Project Name: The Waterhouse

Client Project Ref: 241830

Lab Sample ID	10/04186/1	10/04186/2	10/04186/3	10/04186/4	10/04186/5	10/04186/6	10/04186/7	10/04186/8	Units	Method ref
Client Sample No										
Client Sample ID	BH1	BH2	WS1	WS4	BH2	BH2	BH2	BH1		
Depth to Top	0.20	0.20	0.10	0.50	0.70	3.00	6.00	5.45		
Depth To Bottom				0.80	0.90					
Date Sampled										
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	6AE	6AE	6AE	6AE	5	5	5	5		
ACM Screen$_A$	NFI	NFI	NFI	NFI	-	-	-	-		Visual
pH$_D$ M#	7.4	8.0	7.6	8.1	8.0	7.8	8.0	7.8	pH	A-T-031s
Sulphate (water sol 2:1)$_D$ M#	0.24	-	-	-	0.22	1.75	1.34	1.02	g/l	A-T-026s
Organic matter$_D$ M#	12.2	-	8.9	-	-	-	-	-	% w/w	A-T-032 OM
Arsenic$_D$ M#	26	18	20	15	-	-	-	-	mg/kg	A-T-024
Boron (water soluble)$_D$ M#	8.5	2.3	1.6	1.4	-	-	-	-	mg/kg	A-T-027s
Cadmium$_D$ M#	0.6	0.8	0.8	<0.5	-	-	-	-	mg/kg	A-T-024
Copper$_D$ M#	80	58	73	66	-	-	-	-	mg/kg	A-T-024
Chromium$_D$ M#	26	37	32	24	-	-	-	-	mg/kg	A-T-024
Lead$_D$ M#	302	300	431	317	-	-	-	-	mg/kg	A-T-024
Mercury$_D$	0.50	0.39	0.60	0.62	-	-	-	-	mg/kg	A-T-024
Nickel$_D$ M#	23	32	27	19	-	-	-	-	mg/kg	A-T-024
Selenium$_D$ M#	<1	<1	<1	<1	-	-	-	-	mg/kg	A-T-024
Zinc$_D$ M#	204	308	352	195	-	-	-	-	mg/kg	A-T-024
TPH total (C6-C40)$_A$	<10	-	14	-	-	-	-	-	mg/kg	A-T-007s

Envirolab Job Number: 10/04186

Client Project Name: The Waterhouse

Client Project Ref: 241830

Lab Sample ID	10/04186/1	10/04186/2	10/04186/3	10/04186/4	10/04186/5	10/04186/6	10/04186/7	10/04186/8	Units	Method ref
Client Sample No										
Client Sample ID	BH1	BH2	WS1	WS4	BH2	BH2	BH2	BH1		
Depth to Top	0.20	0.20	0.10	0.50	0.70	3.00	6.00	5.45		
Depth To Bottom				0.80	0.90					
Date Sampled										
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	6AE	6AE	6AE	6AE	5	5	5	5		
PAH 16										
Acenapthene$_A^{M\#}$	0.07	0.05	0.14	<0.01	-	-	-	-	mg/kg	A-T-019s
Acenapthylene$_A^{M\#}$	0.09	0.06	0.06	<0.01	-	-	-	-	mg/kg	A-T-019s
Anthracene$_A^{M\#}$	0.73	0.25	0.37	0.04	-	-	-	-	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{\#}$	2.27	0.59	0.92	0.03	-	-	-	-	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	4.41	1.45	2.18	0.15	-	-	-	-	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	2.38	0.62	1.34	0.08	-	-	-	-	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	3.01	1.27	1.64	0.13	-	-	-	-	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A$	2.19	0.72	1.23	0.10	-	-	-	-	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	4.71	1.63	2.20	0.16	-	-	-	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{\#}$	0.88	0.37	0.22	<0.01	-	-	-	-	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	8.10	2.12	3.67	0.18	-	-	-	-	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	0.03	<0.01	0.05	<0.01	-	-	-	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{\#}$	3.18	1.32	1.94	0.06	-	-	-	-	mg/kg	A-T-019s
Napthalene$_A^{M\#}$	0.07	0.07	0.14	0.10	-	-	-	-	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	1.70	0.65	1.17	0.11	-	-	-	-	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	7.78	1.93	3.20	0.15	-	-	-	-	mg/kg	A-T-019s
Total PAH$_A^{\#}$	41.6	13.1	20.5	1.28	-	-	-	-	mg/kg	A-T-019s

Envirolab Job Number: 10/04186

Client Project Name: The Waterhouse

Client Project Ref: 241830

Lab Sample ID	10/04186/9	10/04186/10	10/04186/11						Units	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS4							
Depth to Top	8.45	1.20	2.50							
Depth To Bottom			3.00							
Date Sampled										
Sample Type	Soil	Soil	Soil							
Sample Matrix Code	3	5	3							
$pH_D^{M\#}$	8.3	8.0	8.0						pH	A-T-031s
Sulphate (water sol 2:1)$_D^{M\#}$	0.72	0.41	2.18						g/l	A-T-026s

APPENDIX E

CLEA Software Output Reports

(This appendix contains 13 pages, including this)

Generic Assessment Criteria for Human Health
Residential Scenario – Private Gardens

The human health generic assessment criteria (GAC) have been developed during a period of regulatory review and updating of the Contaminated Land Exposure Assessment (CLEA) project. Hence, the Environment Agency (EA) is in the process of publishing updated reports relating to the CLEA project and the GAC presented in this document may change to reflect these updates. This issue was prepared following the publication of soil guideline value reports and associated publications[(1)] for mercury, selenium, benzene, toluene, ethylbenzene and xylene in March 2009 plus arsenic and nickel in May 2009. Where available, the published soil guideline values (SGV)[(1)] have been used as GAC.

1. Model Selection

Soil assessment criteria (SAC) were calculated for compounds where SGV have not been published using CLEA v1.04. 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 the UK guidance[(2-5)]. The SAC and GrAC collectively are termed GAC.

2. Conceptual Model

In accordance with EA Science Report SC050221/SR3[(3)], the residential with private garden scenario considers risks to a female child between the ages of 0 and 6 years old. In accordance with Box 3.1, SR3[(3)], the pathways considered for production of the SAC in the residential with gardens scenario are:

- Direct soil and dust ingestion;
- Consumption of homegrown produce;
- Consumption of soil attached to homegrown produce;
- Dermal contact with soil and indoor dust, and
- Inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by residents whilst 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 determinant restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. Whilst the same restriction is not built into the CLEA model, the model output cells are flagged red where the soil saturation limit has been exceeded. In accordance with the SGV report for xylene[(1)], where the soil saturation or solubility limit has been exceeded the GAC has been set at this limit. It should be noted this is a highly conservative assumption. Unless free-phase product is present, concentrations of the chemical are unlikely to be present at sufficient concentration to result in an exceedance of the health criteria value (HCV).

3. Input Selection

Chemical data was obtained from EA Report SC050021/SR7[(5)] and the health criteria values (HCV) from the UK TOX reports (published 2002 and 2009) where available.

For total petroleum hydrocarbons (TPH), HCV and chemical specific parameters were taken from the TPH Criteria Working Group (TPHCWG). Until further information is available regarding whether the TPH fractions should be considered cumulatively and/or additional data becomes available regarding background exposure, RSK has taken the conservative view that 50% exposure to TPH fractions is derived from background. Thus, the mean daily intake has been set at 50% of the toxicological data. Aromatic hydrocarbons C_5-C_8 were not modelled since benzene and toluene are being modelled separately. The aromatic C_8-C_9 hydrocarbon fraction comprises ethylbenzene, xylene and styrene. Since ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for this band has been taken from styrene. Owing to the lack of UK-specific data, default information in the RBCA model was used to evaluate methyl tertiary butyl ether (MTBE). No published UK data was available for 1,2,4- and 1,3,5-trimethylbenzene, so information was obtained from the US EPA. Toxicity reports were generated by RSK in line with guidance in CLR9[(7)] for 14 of the 16 USEPA polycyclic aromatic hydrocarbons (PAH). RSK notes that CLR9[(7)] has been withdrawn and these toxicity reports may need to be updated using additional references included within SR2[(2)]. However, the data in these documents is considered to remain valid since it broadly follows the approach outlined in SR2. Therefore, the HCV from these reports was used with the chemical data obtained from SR7[(5)], where available.

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 was amended to take account of:

- Amendments to the MDI using Table 3.4 of SR2[(2)];
- A child weighing 13.3kg (average of 0-6 year old female in accordance with Table 4.6 of SR3[(3)]) and breathing 11.85m^3 (average daily inhalation rate for a 0-6yr old female in accordance with Table 4.14 of SR3[(3)]; and
- The 50% rule (for petroleum hydrocarbons, trimethylbenzenes and MTBE)[(2)] where MDI data is not currently available but background exposure is considered important in the overall exposure.

Physical Parameters

For the residential with private gardens scenario, the CLEA default building is a small two-storey terrace house with concrete ground bearing slab. The house is assumed to have a 100m^2 private garden consisting of lawn, flowerbeds and incorporating a 20m^2 plot for growing fruit and vegetables consumed by the residents. SR3[(3)] notes this residential building type to be the most conservative in terms of protection from vapour intrusion. The building parameters are outlined in Table 5.

The parameters for a sandy loam soil type were used in line with SR3[(3)]. This includes a value of 6% for the percentage 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 this parameter, RSK has produced an additional set of SAC for an SOM of 1%.

For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater.

4. GAC

The SAC were produced using the input parameters in Tables 1 to 5 and the GrAC using input parameters in Table 6. The final selected GAC are presented by pathway in Table 7 and the combined GAC in Table 8.

Figure 1
Conceptual Model for CLEA Residential Scenario – Private Gardens

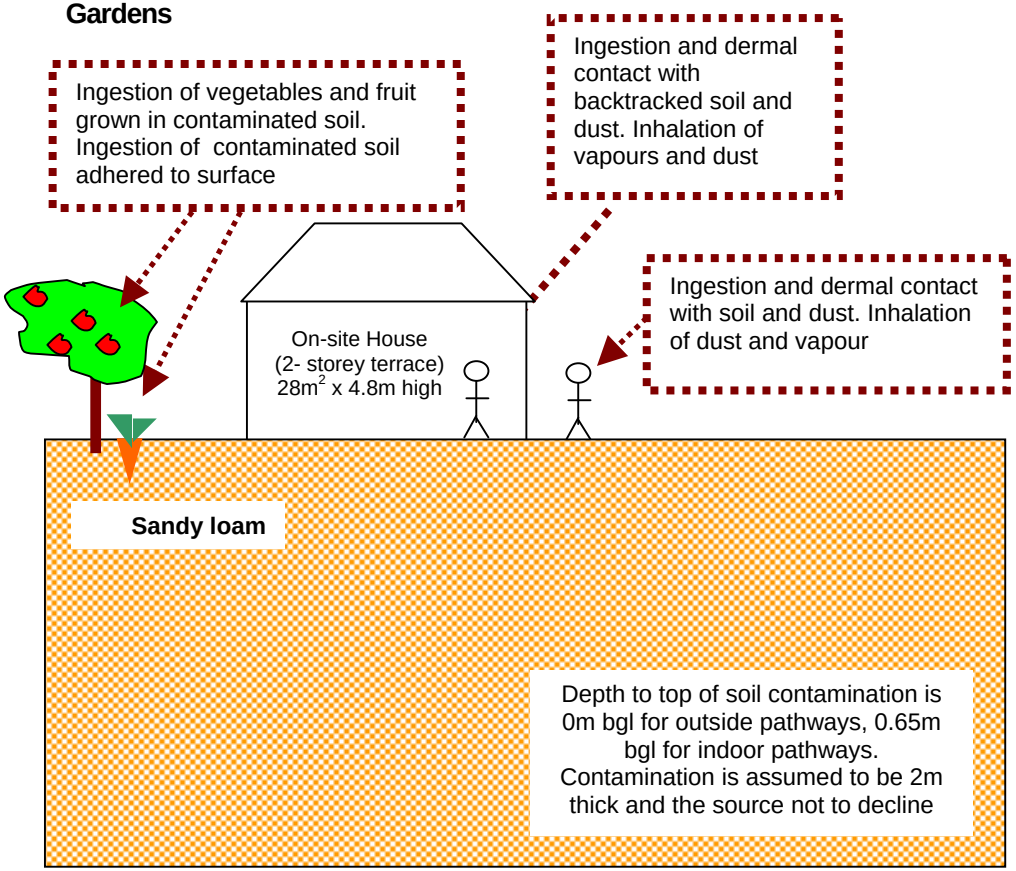


Table 1
Exposure Assessment Parameters for Residential Scenario - Private Gardens – Inputs for RBCA Model

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
Building	Small terraced house	Key generic assumption given in Box 3.1, report SC050021/SR3. Two storey small terraced house chosen as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3)
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, From Table 3.1, SR3)
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged zero to six. From Box 3.1, report SC050021/SR3.
End AC (age class)	6	
SOM (%)	(i) 6	Representative of sandy loamy soil according to EA Guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'
	(ii) 1	To provide SAC for sites where SOM <6% as often observed by RSK
pH	7	Model default

Table 2
Residential with Private Gardens –Homegrown Produce Data for CLEA Model

	Consumption Rate (g FW kg^{-1} BW day^{-1}) by Age Class						Dry Weight Conversion Factor	Homegrown Fraction (average)	Homegrown Fraction (high end)	Soil loading factor	Preparation correction factor
Name	1	2	3	4	5	6	g DW g^{-1} FW	-	-	g g^{-1} DW	-
Green vegetables	7.12	6.85	6.85	6.85	3.74	3.74	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.69	3.30	3.30	3.30	1.77	1.77	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16.03	5.46	5.46	5.46	3.38	3.38	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.96	3.96	3.96	1.85	1.85	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.54	0.54	0.54	0.16	0.16	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	11.96	11.96	11.96	4.26	4.26	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 4.17, SR3						Table 6.3, SR3	Table 4.19, SR3		Table 6.3, SR3	

Table 3
Residential with Private Gardens – Land Use Data for CLEA Model

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 homegrown 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}	180	365	365	365	365	365
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 3.1, SR3					
Occupancy period (indoor)	hr day^{-1}	23	23	23	23	19	19
Occupancy period (outdoor)	hr day^{-1}	1	1	1	1	1	1
Justification		Table 3.2, SR3					
Soil to skin adherence factor (indoor)	mg cm^{-2} day^{-1}	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02
Soil to skin adherence factor (outdoor)	mg cm^{-2} day^{-1}	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Justification		Table 8.1, SR3					
Soil and dust ingestion rate	g day^{-1}	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01
Justification		Table 6.2, SR3					

Table 4
Residential with Private Gardens – Receptor Data for CLEA Model

Parameter	Unit	Age Class						Justification
		1	2	3	4	5	6	
Body weight	kg	5.6	9.8	12.7	15.1	16.9	19.7	Table 4.6, SR3
Body height	m	0.7	0.8	0.9	0.9	1	1.1	
Inhalation rate	m^3 day^{-1}	8.5	13.3	12.7	12.2	12.2	12.2	Table 4.14, SR3
Max exposed skin fraction (indoor)	m^2 m^{-2}	0.32	0.33	0.32	0.35	0.35	0.33	Table 4.8, SR3
Max exposed skin fraction (outdoor)	m^2 m^{-2}	0.26	0.26	0.25	0.28	0.28	0.26	

Table 5
Residential with Private Gardens – Soil and Building Inputs for CLEA Model

Parameter	Unit	Value	Justification
SOIL PROPERTIES for sandy loam			
Porosity, total	$cm^3\ cm^{-3}$	0.53	Default soil type is sandy loam, section 4.3.1, SR3. Parameters for sandy loam from Table 4.4, SR3
Porosity, air filled	$cm^3\ cm^{-3}$	0.20	
Porosity, water filled	$cm^3\ cm^{-3}$	0.33	
Residual soil water content	$cm^3\ cm^{-3}$	0.12	
Saturated hydraulic conductivity	$cm\ s^{-1}$	3.56E-03	
van Genuchten shape parameter (*m*)	-	3.20E-01	
Bulk density	$g\ cm^{-3}$	1.21	
Threshold value of wind speed at 10m	$m\ s^{-1}$	7.20	Default value taken from Section 9.2.2, SR3
Empirical function (F_x) for dust model	-	1.22	Value taken from Section 9.2.2, SR3
Ambient soil temperature	K	283	Annual average soil temperature representative of UK surface soils. Section 4.3.1, SR3
AIR DISPERSION MODEL			
Mean annual wind speed (10 m)	$m\ s^{-1}$	5.00	Default value taken from Section 9.2.2, SR3
Air dispersion factor at height of 0.8 m	$g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$	2400	Values for a 0.01 ha site, appropriate to a residential land use in Newcastle (most representative city for UK). (from Table 9.1, SR3) Assumed child of 6 is not tall enough to reach 1.6m
Air dispersion factor at height of 1.6 m	$g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$	0	
Fraction of site with hard or vegetative cover	$m^2\ m^{-2}$	0.75	Section 3.2.6, SR3 based on residential land use
BUILDING PROPERTIES for small terrace house with ground-bearing floor slab			
Building footprint	m^2	28	From Table 3.3 and 4.21, SR3
Living space air exchange rate	hr^{-1}	0.50	
Living space height (above ground)	m	4.8	
Living space height (below ground)	m	0.0	Assumed no basement
Pressure difference (soil to enclosed space)	Pa	3.1	From Table 3.3, SR3
Foundation thickness	m	0.15	
Floor crack area	cm^2	423	
Dust loading factor	$\mu g\ m^{-3}$	50	Default value for a residential site taken from Section 9.3, SR3
VAPOUR MODEL			
Default soil gas ingress rate	$cm^3\ s^{-1}$	25	Generic flow rate, Section 10.3, SR3
Depth to top of source (beneath building)	cm	50	Section 3.2.6, SR3 states source is 50cm below building or 65cm below ground surface
Depth to top of source (no building)	cm	0	Section 10.2, SR3 assumes impact from 0-1m for outdoor inhalation pathway
Thickness of contaminant layer	cm	200	Model default for indoor air, Section 4.9, SR4
Time average period for surface emissions	years	6	Time period of a 0 to 6 year old, Box 3.5, SR3
User-defined effective air permeability	cm^2	3.05E-08	Calculated for sandy loam using equations in Appendix 1, SR3

Figure 2
GrAC Conceptual Model for RBCA Residential with Gardens Scenario

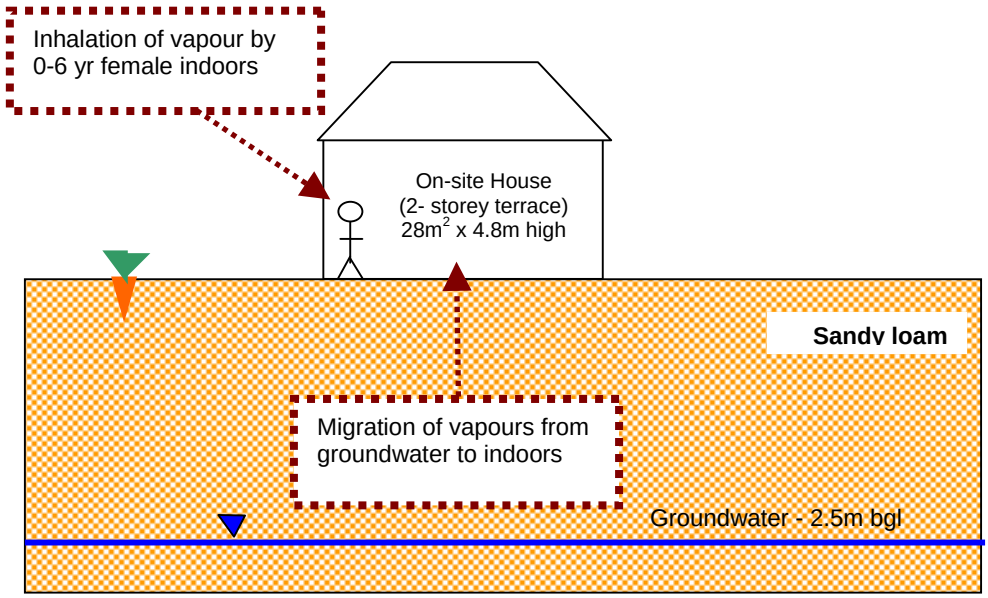


Table 6
Residential with Private Gardens RBCA Inputs

Parameter	Unit	Value	Justification
RECEPTOR			
Averaging time	Years	6	From Box 3.1, SR3
Receptor weight	kg	13.3	Average of CLEA 0-6 year old female data, Table 4.6, SR3
Exposure duration	Years	6	From Box 3.1, report , SR3
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
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
Vapour permeability	m^2	3.05E-12	Calculated for sandy loam using equations in Appendix 1, SR3
Capillary zone thickness	m	0.1	Professional judgement
Fraction organic carbon	%	(i) 0.0348	Representative of sandy loam according to EA Guidance note dated January 2009 entitled Changes We Have Made to the CLEA Framework Documents
		(ii) 0.0058	To provide SAC for site's where SOM < 6% as often observed by RSK
BUILDING			
Building volume/area ratio	m	4.8	Table 3.3, SR3
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
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
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
Volumetric air content of cracks	-	0.2	
Indoor/outdoor differential pressure	Pa	3.1	From Table 3.3, SR3

REFERENCES

1) Environment Agency, 31 March 2009 and May 2009. Science Report SC050021 / benzene SGV, toluene SGV, ethylbenzene SGV, xylene SGV, mercury SGV, selenium SGV, nickel SGV and arsenic SGV. Supplementary information for the derivation of SGV for: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel and arsenic. Contaminants in soil: updated collation of toxicological data and intake values for humans: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel and arsenic.

2) Environment Agency, January 2009. Science Report SC050021/SR2 Human Health Toxicological Assessment of Contaminants in Soil.

3) Environment Agency, January 2009. Science Report SC050021/SR3 Updated Technical Background to the CLEA Model.

4) Environment Agency, January 2009. Science Report SC050021/SR4 CLEA Software (Version 1.04) Handbook.

5) Environment Agency. 2008. Science Report SC050021/SR7. Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values.

6) Environment Agency and DEFRA. Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans. Numbers 1–12, 14, 16–25.

7) Environment Agency. March 2002. CLR 9. Contaminants in soil: Collation of Toxicological Data and Intake Values for Humans.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 7
Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens

Compound		GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (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	
Metals										
Arsenic	(b,c)	-	3.24E+01	8.50E+01	2.35E+01	NR	3.24E+01	8.50E+01	2.35E+01	NR
Cadmium		-	6.21E+01	4.25E+01	2.93E+01	NR	6.21E+01	4.25E+01	2.93E+01	NR
Chromium (hexavalent)		-	2.78E+02	4.25E+01	3.76E+01	NR	2.78E+02	4.25E+01	3.76E+01	NR
Copper		-	8.96E+03	6.08E+03	4.74E+03	NR	8.96E+03	6.08E+03	4.74E+03	NR
Lead	(a)	-	4.50E+02	-	-	NR	4.50E+02	-	-	NR
Elemental Mercury (Hg^0)	(b,d)	9.40E-03	-	1.70E-01	-	4.31E+00	-	1.02E+00	-	2.58E+01
Inorganic Mercury (Hg^{2+})	(b)	-	1.81E+02	2.55E+03	1.69E+02	NR	1.81E+02	2.55E+03	1.69E+02	NR
Methyl Mercury (Hg^{4+})	(b)	2.00E+01	1.39E+01	1.59E+01	7.40E+00	7.33E+01	1.39E+01	6.53E+01	1.14E+01	3.04E+02
Nickel	(b,d)	-	5.31E+02	1.27E+02	1.19E+02	NR	5.31E+02	1.27E+02	1.19E+02	NR
Selenium	(b,c)	-	3.51E+02	-	-	NR	3.51E+02	-	-	NR
Zinc	(c)	-	2.53E+04	-	-	NR	2.53E+04	-	-	NR
Cyanide		-	2.66E+01	3.97E+00	3.68E+00	NR	2.66E+01	3.97E+00	3.68E+00	NR
Volatile Organic Compounds										
Benzene	(b)	2.60E+01	1.12E-01	2.69E-01	7.92E-02	1.22E+03	4.89E-01	1.04E+00	3.32E-01	4.71E+03
Toluene	(b)	1.90E+03	1.47E+02	6.26E+02	1.19E+02	8.69E+02	7.59E+02	3.14E+03	6.11E+02	4.36E+03
Ethylbenzene	(b)	2.60E+02	1.06E+02	1.70E+02	6.52E+01	5.18E+02	5.70E+02	9.32E+02	3.54E+02	2.84E+03
Xylene - m	(b)	8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Xylene - o		1.00E+02	1.85E+02	5.98E+01	4.52E+01	4.78E+02	9.96E+02	3.27E+02	2.46E+02	2.62E+03
Xylene - p		8.70E+01	1.91E+02	5.34E+01	4.17E+01	5.76E+02	1.02E+03	2.94E+02	2.28E+02	3.17E+03
Total xylene		8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Methyl t-Butyl ether		2.20E+03	1.75E+00	1.84E+02	1.75E+00	1.66E+04	7.41E+00	3.70E+02	7.37E+00	3.34E+04
Trichloroethene		1.80E+00	2.83E+00	1.10E-01	1.06E-01	1.54E+03	1.40E+01	5.11E-01	4.93E-01	7.14E+03
Tetrachloroethene		3.60E+00	1.06E+01	1.60E+00	1.39E+00	4.24E+02	5.55E+01	8.21E+00	7.15E+00	2.18E+03
1,1,1-Trichloroethane		2.60E+01	3.20E+02	6.33E+00	6.21E+00	1.43E+03	1.55E+03	2.84E+01	2.79E+01	6.39E+03
1,1,1,2Tetrachloroethane		1.40E+01	5.19E+00	1.08E+00	8.93E-01	2.60E+03	2.78E+01	5.83E+00	4.82E+00	1.40E+04
1,1,2,2-Tetrachloroethane		1.40E+01	2.70E+00	2.76E+00	1.37E+00	2.67E+03	1.30E+01	1.24E+01	6.34E+00	1.20E+04
Carbon Tetrachloride		5.50E-02	1.05E+00	1.81E-02	1.79E-02	1.52E+03	5.44E+00	8.99E-02	8.92E-02	7.54E+03
1,2-Dichloroethane		3.00E-01	3.06E-02	6.46E-03	5.34E-03	3.41E+03	1.05E-01	1.60E-02	1.39E-02	8.43E+03
Vinyl Chloride		1.90E-02	3.69E-03	5.43E-04	4.73E-04	1.36E+03	1.21E-02	1.07E-03	9.86E-04	2.69E+03
1,2,4-Trimethylbenzene		7.50E-02	3.39E+01	7.42E-01	7.38E-01	1.03E+02	1.87E+02	4.19E+00	4.17E+00	5.85E+02
1,3,5-Trimethylbenzene		4.70E-02	1.45E+01	4.60E-01	4.56E-01	9.47E+01	7.94E+01	2.59E+00	2.56E+00	5.33E+02
Semi-Volatile Organic Compounds										
Acenaphthene		3.20E+00	2.05E+02	7.34E+00	7.08E+00	1.32E+02	7.49E+02	4.32E+01	4.09E+01	7.89E+02
Acenaphthylene		4.20E+00	1.23E+01	5.45E-01	5.22E-01	3.89E+02	5.32E+01	3.21E+00	3.03E+00	2.31E+03
Anthracene		2.10E-02	4.26E+04	1.39E+03	1.34E+03	3.60E+00	5.15E+04	7.40E+03	6.47E+03	2.16E+01
Benzo(a)anthracene		3.80E-03	1.42E+01	8.09E+00	5.16E+00	1.71E+00	1.57E+01	2.05E+01	8.90E+00	1.03E+01
Benzo(b)fluoranthene		2.00E-03	1.47E+01	2.50E+01	9.25E+00	1.22E+00	1.58E+01	2.87E+01	1.02E+01	7.29E+00
Benzo(g,h,i)perylene		2.60E-04	2.35E+03	5.38E+04	2.25E+03	1.87E-02	2.40E+03	5.63E+04	2.30E+03	1.12E-01
Benzo(k)fluoranthene		8.00E-04	1.50E+01	2.66E+01	9.60E+00	6.87E-01	1.59E+01	2.91E+01	1.03E+01	4.12E+00
Chrysene		2.00E-03	1.37E+02	1.95E+02	8.03E+01	4.40E-01	1.55E+02	2.72E+02	9.90E+01	2.64E+00
Dibenzo(a,h)anthracene		6.00E-04	1.53E+00	2.37E+00	9.28E-01	3.93E-03	1.59E+00	2.85E+00	1.02E+00	2.36E-02
Fluoranthene		2.30E-01	1.12E+02	1.51E+01	1.33E+01	1.89E+01	1.50E+02	7.18E+01	4.85E+01	1.13E+02
Fluorene		1.90E+00	2.35E+03	8.85E+01	8.53E+01	1.53E+02	6.86E+03	5.23E+02	4.86E+02	9.13E+02
Indeno(1,2,3-cd)pyrene		2.00E-04	1.45E+01	2.43E+01	9.08E+00	6.14E-02	1.58E+01	2.86E+01	1.02E+01	3.68E-01
Phenanthrene		5.30E-01	2.39E+03	1.17E+03	7.85E+02	7.06E+01	3.03E+03	6.33E+03	2.05E+03	4.23E+02
Pyrene		1.30E-01	1.08E+03	1.44E+02	1.27E+02	2.20E+00	1.49E+03	6.93E+02	4.73E+02	1.32E+01
Benzo(a)pyrene		3.80E-03	1.49E+00	2.62E+00	9.49E-01	9.11E-01	1.58E+00	2.90E+00	1.02E+00	5.46E+00
Naphthalene		1.90E+01	2.68E+01	1.64E+00	1.54E+00	7.64E+01	1.43E+02	9.27E+00	8.71E+00	4.32E+02
Phenol	(c)	-	4.40E+02	-	-	4.16E+04	1.98E+03	-	-	1.74E+05

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 7
Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens

Compound		GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg) Oral	Inhalation	Combined	Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg) Oral	Inhalation	Combined	Soil Saturation Limit (mg/kg)
Total Petroleum Hydrocarbons										
Aliphatic hydrocarbons EC_5-EC_6		1.00E+01	8.97E+03	2.47E+01	2.47E+01	3.69E+02	4.31E+04	8.04E+01	8.03E+01	1.20E+03
Aliphatic hydrocarbons >EC_6-EC_8		5.40E+00	1.52E+04	5.11E+01	5.10E+01	1.69E+02	6.62E+04	2.39E+02	2.39E+02	7.93E+02
Aliphatic hydrocarbons >EC_8-EC_{10}		2.30E-01	3.14E+03	1.11E+01	1.11E+01	8.46E+01	4.12E+03	6.29E+01	6.27E+01	4.79E+02
Aliphatic hydrocarbons >EC_{10}-EC_{12}		3.40E-02	3.99E+03	5.36E+01	5.35E+01	5.02E+01	4.34E+03	3.18E+02	3.12E+02	2.98E+02
Aliphatic hydrocarbons >EC_{12}-EC_{16}		7.60E-04	4.39E+03	2.48E+02	2.45E+02	2.22E+01	4.41E+03	1.49E+03	1.34E+03	1.33E+02
Aliphatic hydrocarbons >EC_{16}-EC_{21}	(c)	-	8.84E+04	-	-	9.15E+00	8.84E+04	-	-	5.49E+01
Aliphatic hydrocarbons >EC_{21}-EC_{35}	(c)	-	8.84E+04	-	-	6.45E+00	8.84E+04	-	-	3.87E+01
Aromatic hydrocarbons >EC_8-EC_9		6.50E+01	1.66E+02	2.65E+02	1.33E+02	6.20E+02	8.50E+02	1.54E+03	7.02E+02	3.61E+03
Aromatic hydrocarbons >EC_9-EC_{10}		7.40E+00	5.53E+01	1.77E+01	1.60E+01	6.20E+02	2.83E+02	1.03E+02	9.17E+01	3.61E+03
Aromatic hydrocarbons >EC_{10}-EC_{12}		2.50E+01	8.04E+01	9.74E+01	5.84E+01	3.72E+02	3.90E+02	5.74E+02	3.04E+02	2.19E+03
Aromatic hydrocarbons >EC_{12}-EC_{16}		5.80E+00	1.40E+02	5.05E+02	1.29E+02	1.70E+02	6.01E+02	3.00E+03	5.67E+02	1.01E+03
Aromatic hydrocarbons >EC_{16}-EC_{21}	(c)	-	8.84E+04	-	-	5.99E+01	8.84E+04	-	-	3.59E+02
Aromatic hydrocarbons >EC_{21}-EC_{35}	(c)	-	1.11E+03	-	-	4.82E+00	1.29E+03	-	-	2.89E+01

Notes:
-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.
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 RBCA output where the theoretical solubility limit has been exceeded. SAC/GrAC is set at soil saturation/solubility limit.

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 RBCA has been exceeded in production of the GrAC, these cellls have also been hatched red.
The SAC for organic compounds are dependant 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) GAC taken as former Soil Guideline Value owing to uncertainty regarding toxicological approach to be adopted by the Environment Agency.
(b) GAC taken from the Environment Agency SGV reports published March and May 2009.
(c) SAC for selenium, zinc, phenol, aliphatic and aromatic hydrocarbons >EC16 does not include inhalation pathway owing to absence of toxicity data. SAC for arsenic is only based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report.
(d) SAC for elemental mercury and nickel is based on the inhalation pathway only owing to an absence of toxicity for elemental mercury andr in accordance with the SGV report for nickel.

Table 8
Human Health Generic Assessment Criteria for Residential Scenario - Private Gardens

Compound	GrAC for Groundwater (mg/l)	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	-	32	32
Cadmium	-	29	29
Chromium (hexavalent)	-	38	38
Copper	-	4,700	4,700
Lead	-	450	450
Elemental Mercury (Hg^0)	0.009	0.17	1.0
Inorganic Mercury (Hg^{2+})	-	170	170
Methyl Mercury (Hg^{4+})	20	7.4	11
Nickel	-	130	130
Selenium	-	350	350
Zinc	-	25,000	25,000
Cyanide	-	3.7	3.7
Volatile Organic Compounds			
Benzene	26	0.08	0.33
Toluene	1,900	120	610
Ethylbenzene	260	65	350
Xylene - m	84	44	240
Xylene - o	100	45	250
Xylene - p	87	42	230
Total xylene	84	44	240
Methyl t-Butyl ether	2,200	1.8	7.4
Trichloroethene	1.8	0.11	0.49
Tetrachloroethene	3.6	1.4	7.2
1,1,1-Trichloroethane	26	6.2	28
1,1,1,2Tetrachloroethane	14	0.89	4.8
1,1,2,2-Tetrachloroethane	14	1.4	6.3
Carbon Tetrachloride	0.06	0.02	0.09
1,2-Dichloroethane	0.3	0.005	0.01
Vinyl Chloride	0.02	0.0005	0.001
1,2,4-Trimethylbenzene	0.08	0.74	4.2
1,3,5-Trimethylbenzene	0.05	0.46	2.6
Semi-Volatile Organic Compounds			
Acenaphthene	3.2	7.1	41
Acenaphthylene	4.2	0.52	3.0
Anthracene	0.02	1,300	6,500
Benzo(a)anthracene	0.004	5.2	8.9
Benzo(b)fluoranthene	0.002	9.3	10
Benzo(g,h,i)perylene	0.0003	2,300	2,300
Benzo(k)fluoranthene	0.0008	9.6	10
Chrysene	0.002	80	99
Dibenzo(a,h)anthracene	0.0006	0.93	1.0
Fluoranthene	0.23	13	49
Fluorene	1.9	85	490
Indeno(1,2,3-cd)pyrene	0.0002	9.1	10
Phenanthrene	0.53	790	2,100
Pyrene	0.13	130	470
Benzo(a)pyrene	0.004	0.95	1.0
Naphthalene	19	1.5	8.7
Phenol	-	440	2,000
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC_5-EC_6	10	25	80
Aliphatic hydrocarbons >EC_6-EC_8	5.4	51	240
Aliphatic hydrocarbons >EC_8-EC_{10}	0.23	11	63
Aliphatic hydrocarbons >EC_{10}-EC_{12}	0.03	50	300
Aliphatic hydrocarbons >EC_{12}-EC_{16}	0.0008	22	130
Aliphatic hydrocarbons >EC_{16}-EC_{21}	-	88,000	88,000
Aliphatic hydrocarbons >EC_{21}-EC_{35}	-	88,000	88,000
Aromatic hydrocarbons >EC_8-EC_9	65	130	700
Aromatic hydrocarbons >EC_9-EC_{10}	7.4	16	92
Aromatic hydrocarbons >EC_{10}-EC_{12}	25	58	300
Aromatic hydrocarbons >EC_{12}-EC_{16}	5.8	130	570
Aromatic hydrocarbons >EC_{16}-EC_{21}	-	88,000	88,000
Aromatic hydrocarbons >EC_{21}-EC_{35}	-	1,100	1,300

Notes:
'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.
EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

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.
SAC for aliphatic C10-C12 and C12-C16 is taken as soil saturation limit in acordance with CLEA. For consistency with CLEA, the GrAC for aliphatic and aromatic C12-C16 hydrocarbons and all PAH (acenaphthylene) has been set as the theoretical solubility limit.

Calculated SAC exceeds soil saturation limit (SSL), thus SSL taken as SAC in line with recently published SGV. For consistency where the GrAC exceeds the solubility limit, GrAC has been set at the solubility limit. These are highly 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.

APPENDIX F

HASWASTE Assessment

(This appendix contains 2 pages, including this)

As cmpds (AsS), Cd (CdO), CrVI cmpds ($FeCrO_4$), Cu (Cu_2O), Inorg Hg cmpds (HgO), Pb cmpds ($PbSO_4$), Ni ($NiCO_3$), Se cmpds (SeS) and Zn as ZnO. Also Ba ($BaCO_3$), Be cmpds ($BeSO_4$), Co (CoO), Mn (MnO_2) and Mo (MoO_3).

HASWASTE v4. Envirolab's Contaminated Land Soil Hazardous Waste Assessment Tool.

Envirolab, Sandpits Business Park, Mottram Road, Hyde, Cheshire SK14 3AR.

envirolab

Site Code and Name															
TP/WS/BH		BH1	BH2	WS1	WS4										
Depth (m)		0.20	0.20	0.10	0.50										
Envirolab reference															
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic		26	18	20	15										
CrVI or Chromium		26	37	32	24										
Copper		80	58	73	66										
Lead		302	300	431	317										
Nickel		23	32	27	19										
Zinc		204	308	352	195										
Cadmium		0.6	0.8	0.8	0.5										
Mercury		0.5	0.4	0.6	0.6										
Selenium		1	1	1	1										
Barium															
Beryllium															
Cobalt															
Manganese															
Molybdenum															
Total USEPA 16 PAHs															
Acenaphthene		0.07	0.05	0.14	0.01										
Acenaphthylene		0.09	0.06	0.06	0.01										
Anthracene		0.73	0.25	0.37	0.04										
Benzo(a)anthracene		2.27	0.59	0.92	0.03										
Benzo(a)pyrene		4.41	1.45	2.18	0.15										
Benzo(b)fluoranthene		2.38	0.62	1.34	0.08										
Benzo(ghi)perylene		3.01	1.27	1.64	0.13										
Benzo(k)fluoranthene		2.19	0.72	1.23	0.10										
Chrysene		4.71	1.63	2.20	0.16										
Dibenzo(ah)anthracene		0.88	0.37	0.22	0.01										
Fluoranthene		8.10	2.12	3.67	0.18										
Fluorene		0.03	0.01	0.05	0.01										
Indeno(123cd)pyrene		3.18	1.32	1.94	0.06										
Naphthalene		0.07	0.07	0.14	0.10										
Phenanthrene		1.70	0.65	1.17	0.11										
Pyrene		7.78	1.93	3.20	0.15										
Benzo(j)fluoranthene															
Benzene															
Toluene															
Ethylbenzene															
Xylenes															
Trimethylbenzenes															
Chlorobenzene															
1,2-Dichlorobenzene															
1,3-Dichlorobenzene															
1,4-Dichlorobenzene															
1,2,4-Trichlorobenzene															
2-Chlorotoluene															
4-Chlorotoluene															
Trichloroethene (TCE)															
Oil in Waste Carcinogenic H7															
Total TPH	≥1,000mg/kg	10.0		14.0											
Petrol or (C6-C10)	≥1,000mg/kg														
Diesel or (C10-C25) or (conservative C10-C35)	≥10,000mg/kg														
Lube Oil or (C25+) or (conservative C21+)	≥1,000mg/kg														
8 IARC H7 Carcinogenic PAHs marker test (applicable to LRO only)	≥1%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Kerosene															
Kerosene															
Creosote															
Creosote															
pH Corrosive H8 (Irritant H4)															
pH (soil)	≤2 H8 ≥11.5	7.4	8.0	7.6	8.1										
pH (leachate)	≤2 H8 ≥11.5														
Alkali Reserve (gNaOH/100g)															
H4 Alkali Reserve test	≥13	7.4	8.0	7.6	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H8 Alkali Reserve test	≥14.5	7.4	8.0	7.6	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases H12															
Total Sulphide	≥1,400mg/kg														
Free Cyanide	≥1,200mg/kg														
Thiocyanate	≥2,600mg/kg														
Elemental/Free Sulphur															
PCBs Total															
Phenols Total by HPLC															
Phenol															
Cresols															
Xylenols															
1-Naphthol															
Resourcinol															
2,3,5,6-Tetrachlorophenol															
2,4,5-Trichlorophenol															
2,4,6-Trichlorophenol															
2,4-Dichlorophenol															
4-Chloro-3-methylphenol															
Pentachlorophenol															
Bis(2-ethylhexyl)phthalate															
Butylbenzylphthalate															
Di-n-butylphthalate															
Visual Fibre Screen or Asbestos ID (enter Y or N)	H7≥0.1%; H5≥3%; H6≥25%	N	N	N	N										

Hazard Codes	Thresholds	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Irritant H4	≥10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Irritant H4	≥20%	0.005	0.006	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Harmful H5	≥25%	0.059	0.057	0.078	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic H6 (Harmful H5)	≥0.1%H5<7%; H6≥7%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic H6 (Harmful H5)	≥3%H5<25%; H6≥25%	0.009	0.009	0.009	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Carcinogenic H7	≥0.1%	0.009	0.012	0.011	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Carcinogenic H7	≥1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Corrosive H8 (Irritant H4)	≥5%H4<10%; H8≥10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic for Reproduction H10	≥0.5%	0.044	0.044	0.063	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic for Reproduction H10	≥5%	0.044	0.044	0.063	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mutagenic H11	≥0.1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mutagenic H11	≥1%	0.005	0.006	0.005	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ecotoxic H14	≥1.0	0.330	0.385	0.458	0.309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
New Ecotoxic H14 individual substance specific thresholds	≥0.0025%	0.00023	0.00006	0.00009	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
New Ecotoxic H14 individual substance specific thresholds	≥0.025%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consider other individual contaminants on a case by case basis.

Table 3.2 of Annex VI of the CLP Regulation including 1st ATP (sometimes called ATSP1).