

APPENDIX F

Groundwater and Gas Monitoring Results

GAS MONITORING RECORD SHEET

JOB DETAILS			
Site:	Arthur Stanley House, Tottenham Street	Job No:	CGL_09198a
Date:	31/01/2018	Engineer:	TJB
Time:	4pm	Client:	1923 Mortimer Estates Limited

METEOROLOGICAL & SITE INFORMATION									
State of ground:	Dry	☐	Moist	☒	Wet	☐			
Wind:	Calm	☐	Light	☒	Moderate	☐	Strong	☐	
Cloud cover:	None	☐	Slight	☐	Cloudy	☐	Overcast	☒	
Precipitation:	None	☒	Slight	☐	Moderate	☐	Heavy	☐	
Barometric pressure (mb):		1002		Local pressure system*:		Air temperature (°C):		5	

Well No.	Time (s)	Flow (l/hr)	dA (PA)	O ₂ (% vol. in air)	CO ₂ (% vol. in air)	CH ₄ (% vol. in air)	PID (ppm)	Depth to Groundwater (mbgl)	Depth to base (mbgl)
BH5	0	< 0.1		20.3	< 0.1	< 0.1	0.1	0 (basement slab lvl)	6.35 (mb basement slab lvl)
	15	< 0.1		20.2	< 0.1	< 0.1	0.2		
	30	< 0.1		20.1	0.1	< 0.1	0.2		
	45	< 0.1		19.8	0.1	< 0.1	0.4		
	60	< 0.1		19.8	0.1	< 0.1	0.4		
	90	< 0.1		19.7	0.1	< 0.1	0.4		
	120	< 0.1		19.7	0.1	< 0.1	0.4		
	150	< 0.1		19.7	0.1	< 0.1	0.4		
	180	< 0.1		19.7	0.1	< 0.1	0.4		
	240	< 0.1		19.7	0.1	< 0.1	0.4		
	300	< 0.1		19.7	0.1	< 0.1	0.4		
BH4	0	< 0.1		20.2	< 0.1	< 0.1	0.2	0 (basement slab level)	6.2 (mb basement slab level)
	15	< 0.1		19.8	0.1	< 0.1	0.1		
	30	< 0.1		19.1	0.2	< 0.1	0.3		
	45	< 0.1		19.1	0.2	< 0.1	0.4		
	60	< 0.1		19.1	0.2	< 0.1	0.4		
	90	< 0.1		19.1	0.2	< 0.1	0.4		
	120	< 0.1		19.1	0.2	< 0.1	0.5		
	150	< 0.1		19.1	0.2	< 0.1	0.5		
	180	< 0.1		19.1	0.2	< 0.1	0.5		
	240	< 0.1		19.1	0.2	< 0.1	0.5		
	300	< 0.1		19.1	0.2	< 0.1	0.5		
BH3	0	< 0.1		20.1	< 0.1	< 0.1	0.1	0.18mb basement slab lvl	4.46mb basement slab lvl
	15	< 0.1		19.8	0.1	< 0.1	0.1		
	30	< 0.1		19.8	0.1	< 0.1	0.2		
	45	< 0.1		19.8	0.1	< 0.1	0.3		
	60	< 0.1		19.8	0.1	< 0.1	0.3		
	90	< 0.1		19.8	0.1	< 0.1	0.3		
	120	< 0.1		19.8	0.1	< 0.1	0.4		
	150	< 0.1		19.8	0.1	< 0.1	0.5		
	180	< 0.1		19.8	0.1	< 0.1	0.6		
	240	< 0.1		19.8	0.1	< 0.1	0.6		
	300	< 0.1		19.8	0.1	< 0.1	0.6		
BH1	0	< 0.1		20.1	< 0.1	< 0.1	< 0.1	0 (basement slab lvl)	3.98mb basement slab lvl
	15	< 0.1		19.9	0.1	< 0.1	0.1		
	30	< 0.1		19.8	0.1	< 0.1	0.1		
	45	< 0.1		19.8	0.1	< 0.1	0.1		
	60	< 0.1		19.8	0.1	< 0.1	0.2		
	90	< 0.1		19.8	0.1	< 0.1	0.2		
	120	< 0.1		19.8	0.1	< 0.1	0.4		
	150	< 0.1		19.8	0.1	< 0.1	0.4		
	180	< 0.1		19.8	0.1	< 0.1	0.4		
	240	< 0.1		19.8	0.1	< 0.1	0.4		
	300	< 0.1		19.8	0.1	< 0.1	0.4		
	0								
	15								
	30								
	45								
	60								
	90								
	120								
	150								
	180								
	240								
	300								

Notes:

The measurement of hydrogen sulphide and hydrocarbon free product is undertaken on a site specific basis, if deemed necessary.

* With reference to the Weather Underground rolling weather archive for Cambridge weather station.

NR= Not recorded

GROUNDWATER MONITORING RECORD SHEET

JOB DETAILS			
Site:	Arthur Stanley House, Tottenham Street	Job No:	CGL_09198a
Date:	31/01/2018	Engineer:	TJB
Time:	1630	Client:	1923 Mortimer Estates Limited
Weather:	Overcast		

MONITORING & SAMPLING DETAILS								
Well / Borehole reference:	BH1	BH3	BH4	BH5				
Monitoring details								
Ground elevation (+mOD) (Basement level)	20.97	21.03	21.02	21.03				
Groundwater depth (mbgl) (Below basement level)	0	0.18	0	0				
Groundwater elevation (+mOD)	20.97	20.85	21.02	21.03				
Depth to base of well (mbgl)	3.98	4.46	6.2	6.35				
Diameter of well (m)	0.05	0.05	0.05	0.05				
Condition of well	good	good	good	good				
Top of response zone (mbgl)	7.7	7	10.7	6.9				
Base of response zone (mbgl)	11.7	9.5	12.5	12.5				
Free product thickness (m)	N/A	N/A	N/A	N/A				
Hydrocarbon sheen noted (Y/N)	N	N	N	N				
Purging details								
Purge method	Bail	Bail	Bail	Bail				
Purged volume (litres)	24	26	36	36				
Recharge (good / poor)								
Sampling details								
Sampling method	Bail	Bail	Bail	Bail				
Volume of water sample taken (litres)	300ml 100 ml	300ml 100 ml	300ml 100 ml	300ml 100 ml				
Volume of free product sample taken (litres)	N/A	N/A	N/A	N/A				
Colour / odours noted*	None	None	None	None				
In-situ measurements								
pH								
Temperature (°C)								
Dissolved oxygen (mg/l)								
Redox potential (mV)								
Electrical conductivity (µS/cm)								
Total dissolved solids (ppt)								
* Respiratory protective equipment to be worn if odours are noted during initial monitoring & on sites which are potentially contaminated								

NOTES

APPENDIX G

Laboratory Testing Results

Analytical Report Number: 18-72438

Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				886305				
Sample Reference				BH2 (ES1)				
Sample Number				None Supplied				
Depth (m)				7.80				
Date Sampled				05/01/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	11				
Total mass of sample received	kg	0.001	NONE	1.4				

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.3				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	410				
Organic Matter	%	0.1	MCERTS	0.1				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Coronene	mg/kg	0.05	NONE	< 0.05				

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9				
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.3				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	17				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.23				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	13				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.5				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	14				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51				

Analytical Report Number: 18-72438

Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				886305				
Sample Reference				BH2 (ES1)				
Sample Number				None Supplied				
Depth (m)				7.80				
Date Sampled				05/01/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	ug/kg	1	MCERTS	< 1.0				
Ethylbenzene	ug/kg	1	MCERTS	< 1.0				
p & m-xylene	ug/kg	1	MCERTS	< 1.0				
o-xylene	ug/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

Analytical Report Number: 18-73201

Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				890847	890848			
Sample Reference				BH4	BH3			
Sample Number				None Supplied	None Supplied			
Depth (m)				8.00	7.50			
Date Sampled				Deviating	Deviating			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	9.6	13			
Total mass of sample received	kg	0.001	NONE	1.3	1.4			

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	8.9			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO ₄	mg/kg	50	MCERTS	270	220			
Organic Matter	%	0.1	MCERTS	0.2	0.2			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05			

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	< 0.9			
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.1	3.8			
Barium (aqua regia extractable)	mg/kg	1	MCERTS	14	8.6			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.23	0.16			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.4			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2			
Chromium (III)	mg/kg	1	NONE	16	10			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	11			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7.8	5.9			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	4.7	3.7			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	12			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	14	12			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	23	18			

Analytical Report Number: 18-73201
Project / Site name: Arthur Stanley House
Your Order No: 24

Lab Sample Number				890847	890848			
Sample Reference				BH4	BH3			
Sample Number				None Supplied	None Supplied			
Depth (m)				8.00	7.50			
Date Sampled				Deviating	Deviating			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

Analytical Report Number: 18-74003

Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				895950	895951	895952	895953	895954
Sample Reference				BH5 (ES1)	BH1	BH1	BH1	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				7.50	9.50	16.50	33.50	8.00
Date Sampled				23/01/2018	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	65
Moisture Content	%	N/A	NONE	28	18	17	11	2.1
Total mass of sample received	kg	0.001	NONE	1.2	0.28	0.30	0.30	0.44

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7	8.5	8.8	9.2	8.9
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	3600	270	860	170	150
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.066	0.42	0.048	0.016
Total Sulphur	mg/kg	50	MCERTS	-	300	7100	180	430
Organic Matter	%	0.1	MCERTS	1.6	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.0	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Coronene	mg/kg	0.05	NONE	< 0.05	-	-	-	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	-	-	-	-
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	-	-	-	-
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	-	-	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	170	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.59	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-	-	-	-
Chromium (III)	mg/kg	1	NONE	14	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	82	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	360	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	61	-	-	-	-

Analytical Report Number: 18-74003
Project / Site name: Arthur Stanley House
Your Order No: 24

Lab Sample Number				895950	895951	895952	895953	895954
Sample Reference				BH5 (ES1)	BH1	BH1	BH1	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				7.50	9.50	16.50	33.50	8.00
Date Sampled				23/01/2018	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	-

Analytical Report Number: 18-74003

Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				895955	895956	895957	895958	895959
Sample Reference				BH3	BH3	BH4	BH4	BH5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				25.50	31.00	8.50	12.50	6.90
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	37	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	14	5.3	18	20
Total mass of sample received	kg	0.001	NONE	0.27	0.31	0.56	0.26	0.35

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	9.3	9.1	8.3	8.1
Total Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1700	160	200	610	1200
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.81	0.027	0.031	0.29	0.24
Total Sulphur	mg/kg	50	MCERTS	35000	130	150	3300	640
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Coronene	mg/kg	0.05	NONE	-	-	-	-	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-	-	-	-	-
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	-	-	-	-	-
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	-	-	-	-
Chromium (III)	mg/kg	1	NONE	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-

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Project / Site name: Arthur Stanley House
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Lab Sample Number				895955	895956	895957	895958	895959
Sample Reference				BH3	BH3	BH4	BH4	BH5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				25.50	31.00	8.50	12.50	6.90
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	ug/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	ug/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	ug/kg	1	MCERTS	-	-	-	-	-
o-xylene	ug/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-

Analytical Report Number: 18-74003

Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				895960				
Sample Reference				BH5				
Sample Number				None Supplied				
Depth (m)				14.00				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	19				
Total mass of sample received	kg	0.001	NONE	0.31				

Asbestos in Soil	Type	N/A	ISO 17025	-				
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5				
Total Cyanide	mg/kg	1	MCERTS	-				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	930				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.43				
Total Sulphur	mg/kg	50	MCERTS	6900				
Organic Matter	%	0.1	MCERTS	-				
Total Organic Carbon (TOC)	%	0.1	MCERTS	-				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-				
Acenaphthylene	mg/kg	0.05	MCERTS	-				
Acenaphthene	mg/kg	0.05	MCERTS	-				
Fluorene	mg/kg	0.05	MCERTS	-				
Phenanthrene	mg/kg	0.05	MCERTS	-				
Anthracene	mg/kg	0.05	MCERTS	-				
Fluoranthene	mg/kg	0.05	MCERTS	-				
Pyrene	mg/kg	0.05	MCERTS	-				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				
Coronene	mg/kg	0.05	NONE	-				

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	-				
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	-				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-				
Boron (water soluble)	mg/kg	0.2	MCERTS	-				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-				
Chromium (III)	mg/kg	1	NONE	-				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-				

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Project / Site name: Arthur Stanley House
Your Order No: 24

Lab Sample Number				895960				
Sample Reference				BH5				
Sample Number				None Supplied				
Depth (m)				14.00				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	ug/kg	1	MCERTS	-				
Toluene	ug/kg	1	MCERTS	-				
Ethylbenzene	ug/kg	1	MCERTS	-				
p & m-xylene	ug/kg	1	MCERTS	-				
o-xylene	ug/kg	1	MCERTS	-				
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	-				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-				

Analytical Report Number: 18-74536
Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				898935	898936	898937	898938	
Sample Reference				BH1 (WS1)	BH3 (WS2)	BH4 (WS3)	BH5 (WS4)	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				31/01/2018	31/01/2018	31/01/2018	31/01/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.3	7.3	7.6	7.8	
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Sulphate as SO ₄	µg/l	45	ISO 17025	84500	123000	79100	81300	
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	14000	3300	120	3800	
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	5.86	3.06	5.00	2.55	
Hardness - Total	mgCaCO ₃ /l	1	ISO 17025	421	357	212	278	

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	2.0	
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	< 0.16	
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	6.4	6.6	3.4	4.1	
Barium (dissolved)	µg/l	0.05	ISO 17025	120	110	51	67	
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.5	0.3	< 0.2	
Boron (dissolved)	µg/l	10	ISO 17025	260	200	61	170	
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	
Calcium (dissolved)	mg/l	0.012	ISO 17025	140	120	70	98	
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	
Chromium (III)	µg/l	1	NONE	< 1.0	6.2	5.0	< 1.0	
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.7	6.2	5.0	0.7	
Copper (dissolved)	µg/l	0.7	ISO 17025	22	3.5	23	13	
Lead (dissolved)	µg/l	1	ISO 17025	4.1	1.2	13	5.6	
Magnesium (dissolved)	mg/l	0.005	ISO 17025	15	12	8.9	8.3	
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	
Nickel (dissolved)	µg/l	0.3	ISO 17025	5.1	8.2	5.7	4.3	
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	5.9	6.7	4.6	
Zinc (dissolved)	µg/l	0.4	ISO 17025	18	4.9	53	10	

Analytical Report Number: 18-74536
Project / Site name: Arthur Stanley House

Your Order No: 24

Lab Sample Number				898935	898936	898937	898938	
Sample Reference				BH1 (WS1)	BH3 (WS2)	BH4 (WS3)	BH5 (WS4)	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				31/01/2018	31/01/2018	31/01/2018	31/01/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	44	
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	110	
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	150	
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	300	

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	

U/S = Unsuitable Sample I/S = Insufficient Sample

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					(%)	(%)	(%)	(%)	(%)	Mg/m³	Mg/m³	kPa	kPa	kPa		(g/L)	(mg/L)	
BH1		8.50	B	Yellow brown very gravelly SAND														Particle Size Distribution
BH1		10.50	U	Stiff fissured dark brown silty CLAY	28.4					2.04	1.59	420	242	121				
BH1		11.00	D	Dark brown CLAY with rare gravel	24.8	73	25	48	98									
BH1		13.00	U	Stiff fissured dark brown silty CLAY	29.0					1.97	1.52	520	146	73				
BH1		15.50	D	Dark brown CLAY	27.8	82	27	55	100									
BH1		16.00	U	Stiff fissured dark brown CLAY	26.9					2.03	1.60	640	574	287				
BH1		19.00	U	Stiff fissured dark brown CLAY with rare pyrite nodules	27.0					2.05	1.61	760	527	263				
BH1		25.00	U	Very stiff fissured dark brown silty CLAY	24.4					2.06	1.65	1000	790	395				
BH1		28.00	U	Stiff fissured multi coloured silty CLAY	15.9					2.13	1.84	1120	1012	506				
BH1		28.50	D	Red brown and light grey silty CLAY	13.7	43	16	27	99									

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

NP=Non Plastic

Checked and Approved by  S Burke - Senior Technician 01/02/2018	Project Number: GEO / 27018 Project Name: ARTHUR STANLEY HOUSE CGL/09198a	
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SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					(%)	(%)	(%)	(%)	(%)	Mg/m³	Mg/m³	kPa	kPa	kPa		(g/L)	(mg/L)	
BH1		31.00	U	Very stiff fissured brown mottled grey silty CLAY	20.9					2.07	1.71	1240	383	191				
BH3		8.90	D	Yellow brown CLAY with rare fine gravel	25.9	64	22	42	99									
BH3		10.00	U	Stiff fissured dark brown CLAY	26.6					2.08	1.64	400	281	140				
BH3		12.50	U	Stiff fissured dark brown CLAY	26.6					2.06	1.63	500	300	150				
BH3		18.50	U	Very stiff fissured orange brown mottled light grey CLAY	17.0					2.00	1.71	740	1008	504				
BH3		21.50	U	Very stiff fissured multi coloured silty CLAY	20.5					2.03	1.69	860	836	418				
BH3		24.50	U	Stiff fissured dark brown CLAY	24.0					1.98	1.60	980	564	282				
BH3		27.50	U	Stiff fissured dark brown silty CLAY	21.9					2.00	1.64	1100	667	333				
BH3		30.00	D	Yellow brown mottled light grey CLAY	16.3	61	21	40	100									
BH3		30.50	U	Very stiff fissured dark brown silty CLAY with rare siltstone	22.4					2.02	1.65	1220	513	257				

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

NP=Non Plastic

Checked and Approved by

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

**ARTHUR STANLEY HOUSE
CGL/09198a**

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SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					(%)	(%)	(%)	(%)	(%)	Mg/m³	Mg/m³	kPa	kPa	kPa		(g/L)	(mg/L)	
BH4		9.50	U	Stiff fissured dark brown slightly gravelly CLAY	25.7					2.04	1.62	380	250	125				
BH4		12.00	U	Stiff fissured dark brown CLAY	27.6					1.80	1.41	480	263	132				
BH4		14.50	U	Stiff fissured dark brown silty CLAY	24.2					2.01	1.62	580	441	220				
BH4		17.50	U	Stiff fissured dark brown silty CLAY	24.4					2.00	1.61	700	338	169				
BH4		18.00		Dark brown silty CLAY	23.6	71	22	49	99									
BH4		20.50	U	Very stiff fissured dark brown silty CLAY	21.3					2.02	1.66	820	603	301				
BH4		23.50	U	Stiff fissured dark brown CLAY	26.4					2.00	1.58	940	336	168				
BH5		7.50	B	Brown sandy GARVEL	8.0		NP		4									
BH5		8.50	B	Yellow brown slightly sandy GRAVEL														Particle Size Distribution
BH5		10.50	B	Yellow brown GRAVEL with rare sand.														Particle Size Distribution

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

NP=Non Plastic

Checked and Approved by

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

**ARTHUR STANLEY HOUSE
CGL/09198a**

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SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			Chemical Tests			Other tests and comments
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC	LL	PL	PI	<425 µm	Bulk	Dry	Cell Pressure	Deviator Stress	Shear Stress	pH	2:1 W/S SO4	W/S Mg	
					(%)	(%)	(%)	(%)	(%)	Mg/m³	Mg/m³	kPa	kPa	kPa		(g/L)	(mg/L)	
BH5		13.00	U	Stiff dark brown CLAY	27.5					2.00	1.57	20	171	86				
BH5		16.00	U	Very stiff fissured dark brown silty CLAY	23.4					2.05	1.66	640	285	142				
BH5		19.00	U	Stiff fissured dark brown silty CLAY	24.9					1.96	1.57	760	267	134				
BH5		22.00	U	Stiff fissured dark brown silty CLAY	23.4					2.05	1.66	880	612	306				
BH5		23.00	D	Dark brown silty CLAY	20.5	57	20	37	100									

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

NP=Non Plastic

Checked and Approved by  S Burke - Senior Technician 01/02/2018	Project Number:	GEO / 27018
	Project Name:	ARTHUR STANLEY HOUSE CGL/09198a
		

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

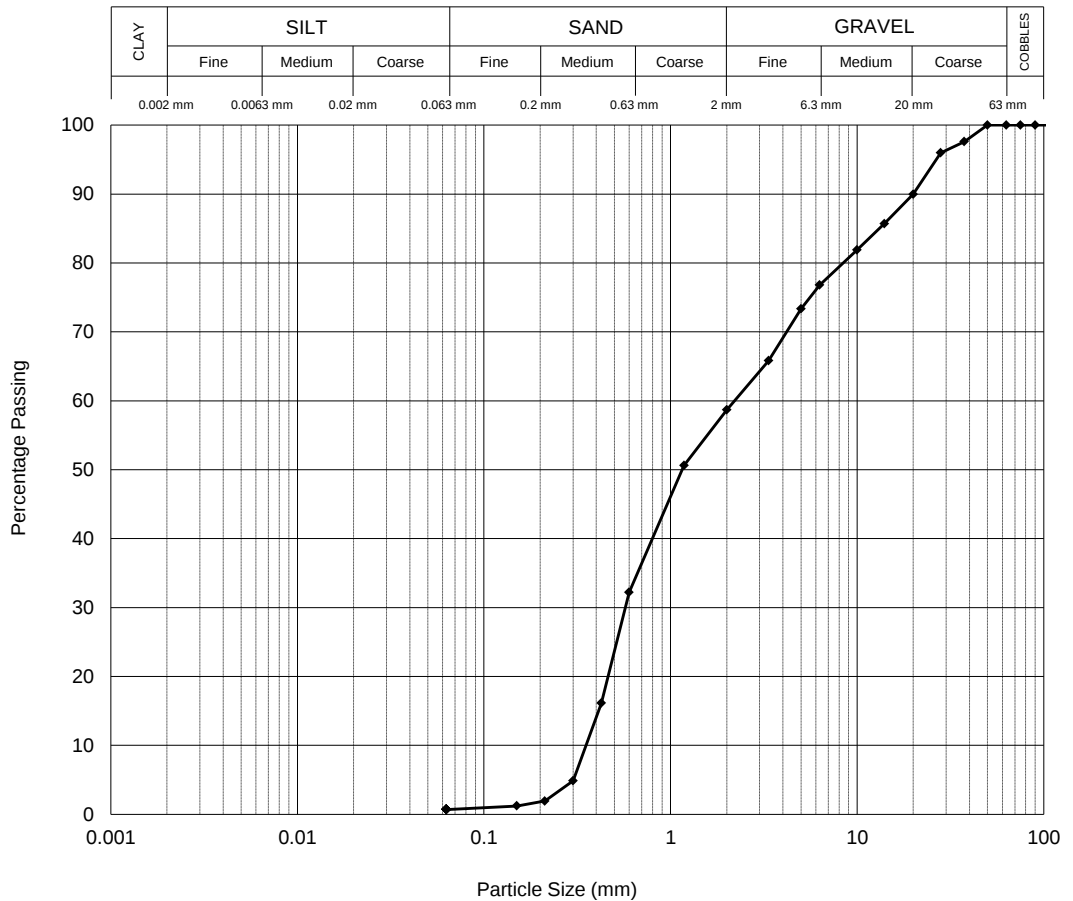
BH1
8.50
B

Description

Yellow brown very gravelly SAND

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Dry Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	98
28.0 mm	96
20.0 mm	90
14.0 mm	86
10.0 mm	82
6.30 mm	77
5.00 mm	73
3.35 mm	66
2.00 mm	59
1.18 mm	51
600 µm	32
425 µm	16
300 µm	5
212 µm	2
150 µm	1
63 µm	1



Particle Proportions	
Cobbles	0
Gravel	41
Sand	58
Silt & Clay	1

Checked and Approved by

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

ARTHUR STANLEY HOUSE
CGL/09198a

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Page 1 of 1

Test Report By GEOLABS Limited Bucknalls Lane, Garston, Watford, Hertfordshire, WD25 9XX

Client : Card Geotechnics, 12 Melcombe Place, London, NW1 6JJ

(Ref 1517501904)

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

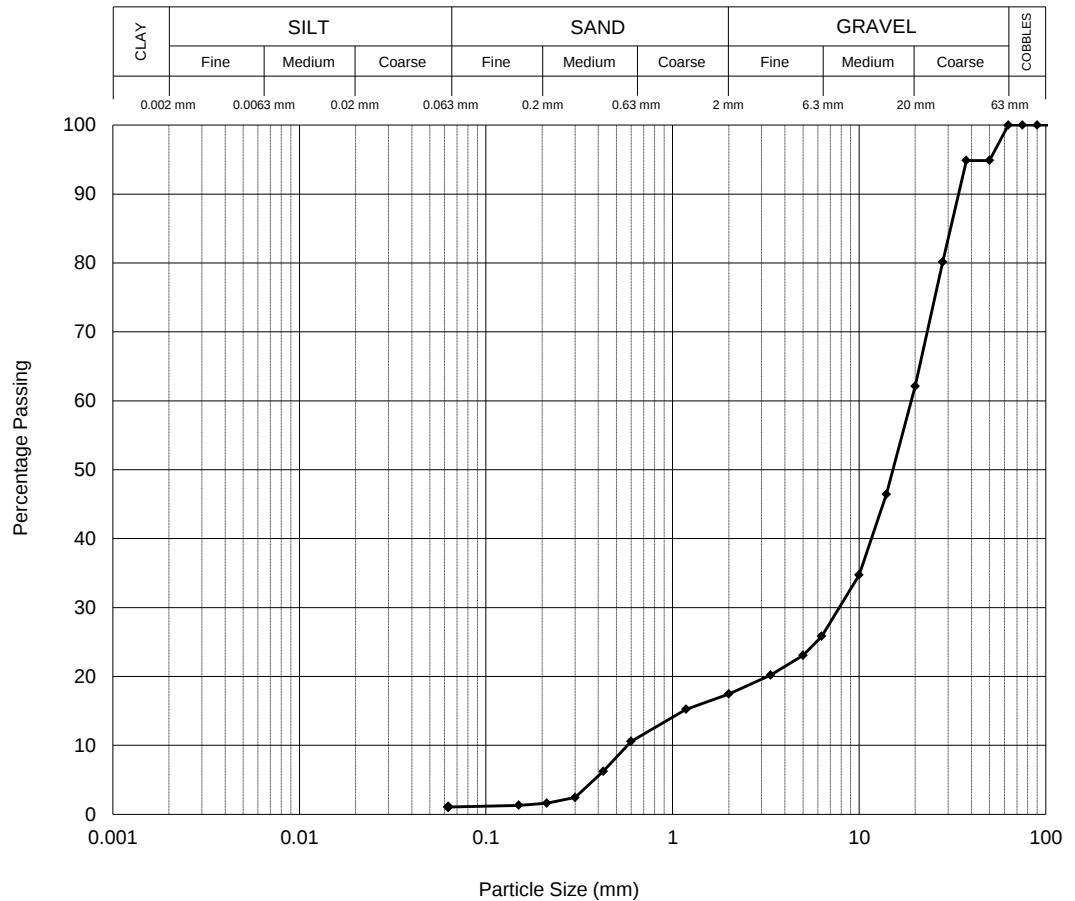
BH5
8.50
B

Description

Yellow brown slightly sandy GRAVEL

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Dry Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	95
37.5 mm	95
28.0 mm	80
20.0 mm	62
14.0 mm	46
10.0 mm	35
6.30 mm	26
5.00 mm	23
3.35 mm	20
2.00 mm	17
1.18 mm	15
600 µm	11
425 µm	6
300 µm	2
212 µm	2
150 µm	1
63 µm	1



Particle Proportions	
Cobbles	0
Gravel	83
Sand	16
Silt & Clay	1

Checked and Approved by

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

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Project Name:

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CGL/09198a**

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PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

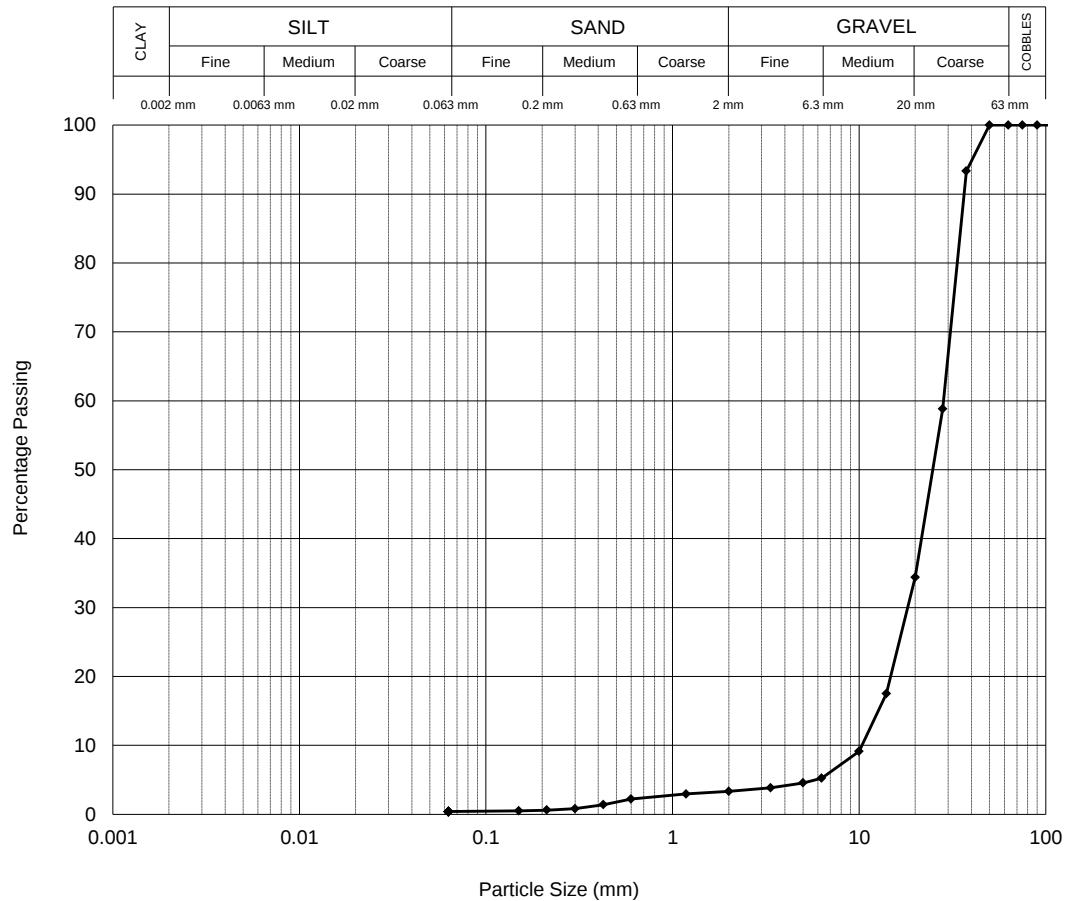
BH5
10.50
B

Description

Yellow brown GRAVEL with rare sand.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Dry Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	93
28.0 mm	59
20.0 mm	34
14.0 mm	18
10.0 mm	9
6.30 mm	5
5.00 mm	5
3.35 mm	4
2.00 mm	3
1.18 mm	3
600 µm	2
425 µm	1
300 µm	1
212 µm	1
150 µm	0
63 µm	0



Particle Proportions	
Cobbles	0
Gravel	97
Sand	3
Silt & Clay	0

Checked and Approved by

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

**ARTHUR STANLEY HOUSE
CGL/09198a**

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH1
 Depth (m) 10.50
 Sample Type U

Description:

Stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	192.8
Diameter	(mm)	103.4
Moisture Content	(%)	28.4
Bulk Density	(Mg/m ³)	2.04
Dry Density	(Mg/m ³)	1.59
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.5
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	420
Strain at failure	(%)	6.7
Maximum Deviator Stress	(kPa)	242
Shear Stress Cu	(kPa)	121

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

50

Checked and Approved by:

S Burke - Senior Technician
 01/02/2018

Project Number:

GEO / 27018

Project Name:

ARTHUR STANLEY HOUSE
CGL/09198a

GEOLABS

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

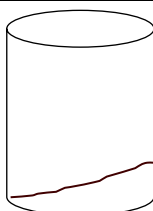
BH/TP No BH1
 Depth (m) 13.00
 Sample Type U

Description:

Stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.6
Diameter	(mm)	104.5
Moisture Content	(%)	29.0
Bulk Density	(Mg/m ³)	1.97
Dry Density	(Mg/m ³)	1.52
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.2
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	520
Strain at failure	(%)	2.0
Maximum Deviator Stress	(kPa)	146
Shear Stress Cu	(kPa)	73

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

40

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

**ARTHUR STANLEY HOUSE
CGL/09198a**

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

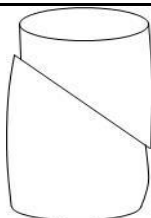
BH/TP No BH1
 Depth (m) 16.00
 Sample Type U

Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.1
Diameter	(mm)	104.5
Moisture Content	(%)	26.9
Bulk Density	(Mg/m ³)	2.03
Dry Density	(Mg/m ³)	1.60
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.4
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	640
Strain at failure	(%)	4.9
Maximum Deviator Stress	(kPa)	574
Shear Stress Cu	(kPa)	287

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

40

Checked and Approved by:

S Burke - Senior Technician
 01/02/2018

Project Number:

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Project Name:

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH1
 Depth (m) 19.00
 Sample Type U

Description:

Stiff fissured dark brown CLAY with rare pyrite nodules

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.1
Diameter	(mm)	103.2
Moisture Content	(%)	27.0
Bulk Density	(Mg/m ³)	2.05
Dry Density	(Mg/m ³)	1.61
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.3
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	760
Strain at failure	(%)	3.7
Maximum Deviator Stress	(kPa)	527
Shear Stress Cu	(kPa)	263

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	90

Checked and Approved by:

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

ARTHUR STANLEY HOUSE
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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH1
 Depth (m) 25.00
 Sample Type U

Description:

Very stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.8
Diameter	(mm)	103.1
Moisture Content	(%)	24.4
Bulk Density	(Mg/m ³)	2.06
Dry Density	(Mg/m ³)	1.65
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	1000
Strain at failure	(%)	9.4
Maximum Deviator Stress	(kPa)	790
Shear Stress Cu	(kPa)	395

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

40

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

**ARTHUR STANLEY HOUSE
CGL/09198a**

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH1
 Depth (m) 28.00
 Sample Type U

Description:

Stiff fissured multi coloured silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.4
Diameter	(mm)	102.9
Moisture Content	(%)	15.9
Bulk Density	(Mg/m ³)	2.13
Dry Density	(Mg/m ³)	1.84
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.7
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	1120
Strain at failure	(%)	10.4
Maximum Deviator Stress	(kPa)	1012
Shear Stress Cu	(kPa)	506

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

30

Checked and Approved by:

S Burke

S Burke - Senior Technician
01/02/2018

Project Number:

GEO / 27018

Project Name:

**ARTHUR STANLEY HOUSE
CGL/09198a**

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

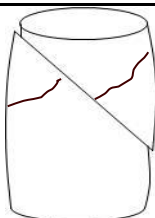
BH/TP No BH1
 Depth (m) 31.00
 Sample Type U

Description:

Very stiff fissured brown mottled grey silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	203.0
Diameter	(mm)	103.6
Moisture Content	(%)	20.9
Bulk Density	(Mg/m ³)	2.07
Dry Density	(Mg/m ³)	1.71
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	1240
Strain at failure	(%)	8.4
Maximum Deviator Stress	(kPa)	383
Shear Stress Cu	(kPa)	191

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	30

Checked and Approved by:

S Burke - Senior Technician
 01/02/2018

Project Number:

GEO / 27018

Project Name:

ARTHUR STANLEY HOUSE
CGL/09198a

GEOLABS

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH3
 Depth (m) 10.00
 Sample Type U

Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	177.3
Diameter	(mm)	101.9
Moisture Content	(%)	26.6
Bulk Density	(Mg/m ³)	2.08
Dry Density	(Mg/m ³)	1.64
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.9
Axial displacement rate	(%/min)	1.1
Cell pressure	(kPa)	400
Strain at failure	(%)	14.7
Maximum Deviator Stress	(kPa)	281
Shear Stress Cu	(kPa)	140

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

60

Checked and Approved by:

S Burke - Senior Technician
 01/02/2018

Project Number:

GEO / 27018

Project Name:

ARTHUR STANLEY HOUSE
CGL/09198a

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

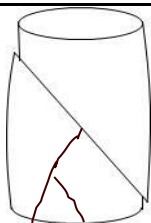
BH/TP No BH3
 Depth (m) 12.50
 Sample Type U

Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	102.2
Moisture Content	(%)	26.6
Bulk Density	(Mg/m ³)	2.06
Dry Density	(Mg/m ³)	1.63
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.7
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	500
Strain at failure	(%)	10.9
Maximum Deviator Stress	(kPa)	300
Shear Stress Cu	(kPa)	150

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

50

Checked and Approved by:

S Burke - Senior Technician
 01/02/2018

Project Number:

GEO / 27018

Project Name:

ARTHUR STANLEY HOUSE
CGL/09198a

GEOLABS

QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

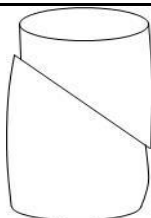
BH/TP No BH3
 Depth (m) 18.50
 Sample Type U

Description:

Very stiff fissured orange brown mottled light grey CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	193.5
Diameter	(mm)	102.5
Moisture Content	(%)	17.0
Bulk Density	(Mg/m ³)	2.00
Dry Density	(Mg/m ³)	1.71
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.5
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	740
Strain at failure	(%)	7.2
Maximum Deviator Stress	(kPa)	1008
Shear Stress Cu	(kPa)	504

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	20

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH3
 Depth (m) 21.50
 Sample Type U

Description:

Very stiff fissured multi coloured silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	177.6
Diameter	(mm)	102.2
Moisture Content	(%)	20.5
Bulk Density	(Mg/m ³)	2.03
Dry Density	(Mg/m ³)	1.69
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	1.1
Cell pressure	(kPa)	860
Strain at failure	(%)	8.4
Maximum Deviator Stress	(kPa)	836
Shear Stress Cu	(kPa)	418

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	120

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

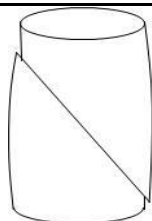
BH/TP No BH3
 Depth (m) 24.50
 Sample Type U

Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.6
Diameter	(mm)	103.1
Moisture Content	(%)	24.0
Bulk Density	(Mg/m ³)	1.98
Dry Density	(Mg/m ³)	1.60
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.3
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	980
Strain at failure	(%)	4.4
Maximum Deviator Stress	(kPa)	564
Shear Stress Cu	(kPa)	282

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

45

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

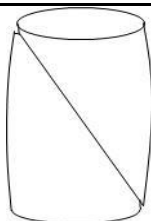
BH/TP No BH3
 Depth (m) 27.50
 Sample Type U

Description:

Stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.1
Diameter	(mm)	102.8
Moisture Content	(%)	21.9
Bulk Density	(Mg/m ³)	2.00
Dry Density	(Mg/m ³)	1.64
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.7
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	1100
Strain at failure	(%)	9.9
Maximum Deviator Stress	(kPa)	667
Shear Stress Cu	(kPa)	333

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

40

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH3
 Depth (m) 30.50
 Sample Type U

Description:

Very stiff fissured dark brown silty CLAY with rare siltstone

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.8
Diameter	(mm)	102.7
Moisture Content	(%)	22.4
Bulk Density	(Mg/m ³)	2.02
Dry Density	(Mg/m ³)	1.65
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	1220
Strain at failure	(%)	8.9
Maximum Deviator Stress	(kPa)	513
Shear Stress Cu	(kPa)	257

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	45

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Project Number:

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

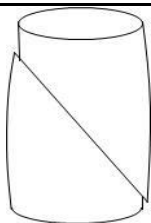
BH/TP No BH4
 Depth (m) 9.50
 Sample Type U

Description:

Stiff fissured dark brown slightly gravelly CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.7
Diameter	(mm)	103.0
Moisture Content	(%)	25.7
Bulk Density	(Mg/m ³)	2.04
Dry Density	(Mg/m ³)	1.62
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.7
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	380
Strain at failure	(%)	9.9
Maximum Deviator Stress	(kPa)	250
Shear Stress Cu	(kPa)	125

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

45

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

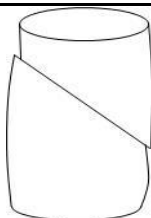
BH/TP No BH4
 Depth (m) 12.00
 Sample Type U

Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	102.4
Moisture Content	(%)	27.6
Bulk Density	(Mg/m ³)	1.80
Dry Density	(Mg/m ³)	1.41
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.7
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	480
Strain at failure	(%)	10.4
Maximum Deviator Stress	(kPa)	263
Shear Stress Cu	(kPa)	132

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

80

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

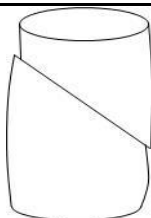
BH/TP No BH4
 Depth (m) 14.50
 Sample Type U

Description:

Stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.4
Diameter	(mm)	103.4
Moisture Content	(%)	24.2
Bulk Density	(Mg/m ³)	2.01
Dry Density	(Mg/m ³)	1.62
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.4
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	580
Strain at failure	(%)	5.4
Maximum Deviator Stress	(kPa)	441
Shear Stress Cu	(kPa)	220

Mode of failure**Orientation of the sample**

Vertical

Distance from top of tube mm

20

Checked and Approved by:

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH4
 Depth (m) 17.50
 Sample Type U

Description:

Stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.8
Diameter	(mm)	103.3
Moisture Content	(%)	24.4
Bulk Density	(Mg/m ³)	2.00
Dry Density	(Mg/m ³)	1.61
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.3
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	700
Strain at failure	(%)	3.5
Maximum Deviator Stress	(kPa)	338
Shear Stress Cu	(kPa)	169

Mode of failure**Orientation of the sample**

Vertical

Distance from top of tube mm

40

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01/02/2018

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH4
 Depth (m) 20.50
 Sample Type U

Description:

Very stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.1
Diameter	(mm)	102.9
Moisture Content	(%)	21.3
Bulk Density	(Mg/m ³)	2.02
Dry Density	(Mg/m ³)	1.66
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.8
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	820
Strain at failure	(%)	12.4
Maximum Deviator Stress	(kPa)	603
Shear Stress Cu	(kPa)	301

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

40

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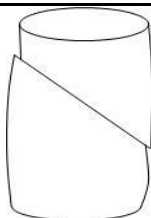
BH/TP No BH4
 Depth (m) 23.50
 Sample Type U

Description:

Stiff fissured dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	192.4
Diameter	(mm)	103.2
Moisture Content	(%)	26.4
Bulk Density	(Mg/m ³)	2.00
Dry Density	(Mg/m ³)	1.58
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.5
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	940
Strain at failure	(%)	7.3
Maximum Deviator Stress	(kPa)	336
Shear Stress Cu	(kPa)	168

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

40

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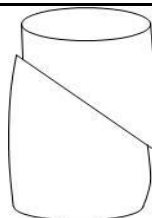
BH/TP No BH5
 Depth (m) 13.00
 Sample Type U

Description:

Stiff dark brown CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.6
Diameter	(mm)	102.9
Moisture Content	(%)	27.5
Bulk Density	(Mg/m ³)	2.00
Dry Density	(Mg/m ³)	1.57
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.2
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	20
Strain at failure	(%)	2.2
Maximum Deviator Stress	(kPa)	171
Shear Stress Cu	(kPa)	86

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

35

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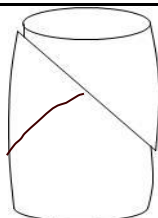
BH/TP No BH5
 Depth (m) 16.00
 Sample Type U

Description:

Very stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.5
Diameter	(mm)	103.2
Moisture Content	(%)	23.4
Bulk Density	(Mg/m ³)	2.05
Dry Density	(Mg/m ³)	1.66
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.6
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	640
Strain at failure	(%)	9.4
Maximum Deviator Stress	(kPa)	285
Shear Stress Cu	(kPa)	142

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	30

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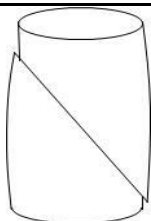
BH/TP No BH5
 Depth (m) 19.00
 Sample Type U

Description:

Stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	103.9
Moisture Content	(%)	24.9
Bulk Density	(Mg/m ³)	1.96
Dry Density	(Mg/m ³)	1.57
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.4
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	760
Strain at failure	(%)	5.4
Maximum Deviator Stress	(kPa)	267
Shear Stress Cu	(kPa)	134

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

80

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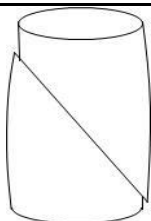
BH/TP No BH5
 Depth (m) 22.00
 Sample Type U

Description:

Stiff fissured dark brown silty CLAY

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	103.3
Moisture Content	(%)	23.4
Bulk Density	(Mg/m ³)	2.05
Dry Density	(Mg/m ³)	1.66
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	0.5
Axial displacement rate	(%/min)	1.0
Cell pressure	(kPa)	880
Strain at failure	(%)	7.4
Maximum Deviator Stress	(kPa)	612
Shear Stress Cu	(kPa)	306

Mode of failure

Orientation of the sample

Vertical

Distance from top of tube mm

30

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APPENDIX H

Generic Assessment Criteria

ASSESSMENT CRITERIA

Table H1 below sets out CGL's rationale for generic assessment criteria (GAC) adoption in order to evaluate risks posed to potential receptors at Arthur Stanley House from identified chemical contamination. Potential receptors have been identified with reference to the Part 2A regime and associated DEFRA guidance. As with the Part 2A regime, under the planning regime all receptors (humans, controlled waters, ecology, crops/livestock and buildings) have been considered if there is the potential for them to be adversely affected by exposure to contamination. The results of the assessment for Arthur Stanley House are then presented in Tables H2 to H5 of this appendix.

Table H1 Rationale for Assessment Criteria Adoption

Source / Media	CGL's Approach & Rationale
<i>Risks to Human Health (long-term chronic risks)</i>	
Soil contaminants	- Laboratory test results have been compared against Generic Assessment Criteria (GACs) derived in-house by CGL using the Contaminated Land Exposure Assessment (CLEA) model and version 1.06 of the CLEA software. Where Soil Guideline Values (SGVs) have been published previously by the Environment Agency, the CGL GACs have updated these based on current exposure parameters (e.g. updated inhalation rates). - The GACs have been generated assuming a sandy loam soil type and a Soil Organic Material of 2.5% for the Made Ground (measured at 1.6% and 1% for the Lynch Hill Gravel Member (measured range <0.1 – 0.2) - In the event impacts are identified on a site above the GAC level for arsenic, cadmium, chromium VI, benzene or benzo(a)pyrene, the results have been compared to the applicable Category 4 Screening Level (C4SL) published by DEFRA to further assess risks. - The exception to the above relates to lead. The SGV for lead has been withdrawn and the C4SL for lead is used by CGL directly as a first tier of assessment. - The CGL GACs represent conservative screening criteria (set at acceptable or minimal risk) and have generally been calculated using the default parameters for the standard land use scenarios set out in the CLEA technical report and toxicological inputs in line with the requirements of Science Report SC050021/SR2 and, in the case of petroleum hydrocarbons, Science Report P5-080/TR3. - Where a CGL GAC has not been derived alternative assessment criteria will be sourced from current commercially-available sources (including international standards where no suitable UK assessment criteria exists). - Concentrations of cyanide above the laboratory reporting limit are assessed against a Soil Screening Value (SSV) developed by Atkins. Atkins have based this assessment criteria on acute exposure to a 0 to 6 year old child. - Where the dataset is of appropriate size, assessment against the applicable GAC or C4SL is carried out at the 95th percentile of the sample mean (designated US₉₅), which is considered to represent a reasonable worst-case scenario. An assessment of the normality of the data has been undertaken. Where datasets are normally distributed the one sample t-test has been applied to calculate the US₉₅. In the case of non-parametric datasets, the Chebychev Theorem has been applied. The Grubbs Test has also been used to identify potential outliers within datasets. - It is noted that the British Geological Survey has published background levels for a number of organic and inorganic constituents. In the event that the C4SL or a GAC is found to be exceeded, the risk may still be considered to be low, unlikely to meet the definition of contaminated land under Part IIA and potentially suitable for use from a development perspective, if the contaminant concentrations are below local background levels, assuming no other contributing factors. - At this time an authoritative GAC is not available for asbestos fibres in soil. A positive identification of asbestos fibres in a soil sample by the laboratory is considered sufficient to warrant additional assessment of risks. Laboratory identification and quantification by microscopy may be required subject to source of material.
Dissolved contaminants	Concentrations of organic constituents detected above the laboratory reporting limit in shallow groundwater or perched water have been assessed against groundwater vapour generic assessment criteria (GAC_{gw vap}) developed by the Society of Brownfield Remediation Risk Assessment (SoBRA). These assess chronic risks to human health via the indoor and outdoor air inhalation pathway only. The values assume a sand soil type, a soil organic matter of 1% and a depth below ground level of 650mm.

Source / Media	CGL's Approach & Rationale
Ground gas	Concentrations and flow rates of carbon dioxide and methane in ground gas are converted to Gas Screening Values (GSVs) in accordance with CIRIA (2007). Potential risks associated with gas chemistry are evaluated in accordance with guidance presented in CIRIA (2007), NHBC (2007), BSI (2007).
Radon	Risks from the radon content of soil gas are evaluated in accordance with BRE (2011).
<i>Risks to Controlled Waters</i>	
Soil contaminants	Results from any eluted liquids have been directly compared to Environmental Quality Standards (EQS) and Drinking Water Values (DWV) as an initial screen of water quality. These are considered to be conservative screening criteria.
Dissolved contaminants	Results have been directly compared to Environmental Quality Standards (EQS) and Drinking Water Values (DWV) as an initial screen of water quality. These are considered to be conservative screening criteria.
<i>Risks to Buildings & Structures</i>	
Water supply pipes	The evaluation of water supply pipe requirements at the site has been undertaken in general accordance with guidance and criteria produced by the UK Water Industry (2011).
Sulfate & pH conditions	The evaluation of risks to buried concrete has followed the guidance and criteria produced by BRE (2005).
<i>Risks to Vegetation & Plants</i>	
Soil contaminants	Risks to plant growth (i.e. phytotoxicity) have been assessed for specific contaminants where the limits for phytotoxic effect proposed (e.g. by BS 3882) are significantly lower than the health GAC.

Table H2. Data assessment summary – potential soil risks to human health (residential land use without homegrown produce consumption) – Made Ground

Determinand	GAC SOM = 2.5%	C4SL (based on 6% SOM) ¹	Note on SSL ²	Concentration (mg/kg)	Concentration > Assessment Criteria? (Y/N)
Antimony	*	*	-	< 1	N
Arsenic	35	40	-	11	N
Barium	*	*	-	170	*
Beryllium	88	*	-	0.59	N
Boron (water soluble)	*	*	-	0.6	*
Cadmium	87	150	-	< 0.2	N
Chromium (III)	3,300	*	-	14	N
Chromium (VI)	6.3	21	-	< 1.2	N
Copper	9,400	*	-	82	N
Lead ³	310	310	-	360	Y
Mercury (inorganic)	250	*	-	0.6	N
Nickel	190	*	-	25	N
Selenium	600	*	-	< 1	N
Vanadium	1,100	*	-	33	N
Zinc	20,000	*	-	61	N
Benzene	1.6	3.3	-	< 1	N
Toluene	1,900	*	(c)	< 1	N
Ethyl benzene	1,200	*	-	< 1	N
m-xylene ⁴	500	*	-	< 1	N
o-xylene	540	*	-	< 1	N
p-xylene	480	*	-	< 1	N
Phenol ⁵	3,500	*	-	< 1	N
Cyanide ⁶	34	*	-	< 1	N
TPH aliphatic EC5-6	130	*	-	< 0.001	N
TPH aliphatic EC>6-8	340	*	-	< 0.001	N
TPH aliphatic EC>8-10	82	*	-	< 0.001	N
TPH aliphatic EC>10-12	5,800	*	(b)	< 1	N
TPH aliphatic EC>12-16	6,400	*	(b)	< 2	N
TPH aliphatic EC>16-35	130,000 [21]	*	(a)	< 16	N
TPH aromatic EC5-7	1.6	*	-	< 0.001	N
TPH aromatic EC>7-8	1,900	*	-	< 0.001	N
TPH aromatic EC>8-10	130	*	-	< 0.001	N
TPH aromatic EC>10-12	670	*	-	< 1	N
TPH aromatic EC>12-16	2,500	*	(b)	< 2	N
TPH aromatic EC>16-21	1,900 [150]	*	(a)	< 10	N
TPH aromatic EC>21-35	1,900 [12]	*	(a)	< 20	N
Naphthalene	15	*	-	< 0.05	N
Acenaphthylene	3,400	*	(b)	< 0.05	N
Acenaphthene	4,100	*	(b)	< 0.05	N
Fluorene	4,000	*	(b)	< 0.05	N
Phenanthrene	130	*	(a)	< 0.05	N
Anthracene	36,000 [19]	*	(a)	< 0.05	N
Fluoranthene	5,000 [47]	*	(a)	< 0.05	N
Pyrene	3,700 [5.5]	*	(a)	< 0.05	N
Benzo(a)anthracene	21 [4.3]	*	(a)	< 0.05	N
Chrysene	230 [1.1]	*	(a)	< 0.05	N
Benzo(b)fluoranthene	23 [3.0]	*	(a)	< 0.05	N
Benzo(k)fluoranthene	23 [1.7]	*	(a)	< 0.05	N
Benzo(a)pyrene	3.6 [2.3]	5.3	(c)	< 0.05	N
Indeno(1,2,3-c,d)pyrene	34 [0.15]	*	(a)	< 0.05	N
Dibenzo(a,h)anthracene	2.3 [0.01]	*	(a)	< 0.05	N
Benzo(g,h,i)perylene	230 [0.05]	*	(a)	< 0.05	N

¹ * = No value currently defined.

² - = green; (a) = amber i.e. GAC set to model output, [SSL provided in square brackets]; (b) = red i.e. SSL exceeded & considered to affect interpretation. GAC calculated in accordance with CLEA Software Handbook; (c) = GAC limited to SSL.

³ Published C4SL.

⁴ Concentrations for total xylenes should be compared against m-xylene for fresh spills and to o-xylene for all other cases.

⁵ GAC relates to phenol (C₆H₅OH) only.

⁶ Assessment criteria for cyanide derived by Atkins based on acute exposure for a 0-6 year old child.

Determinand	GAC SOM = 2.5%	C4SL (based on 6% SOM) ¹	Note on SSL ²	Concentration	Concentration > Assessment Criteria? (Y/N)
				(mg/kg)	
Coronene	*	*	-	< 0.05	N

Table H3. Data assessment summary – potential soil risks to human health (residential land use without homegrown produce consumption) – Lynch Hill Gravel Member

Determinand	GAC SOM = 1%	C4SL (based on 6% SOM) ¹	Note on SSL ²	Measured range	Measured Range > Assessment Criteria? (Y/N)
				(mg/kg)	
Antimony	*	*	-	< 1	N
Arsenic	35	40	-	3.8 to 6.1	N
Barium	*	*	-	8.6 to 17	*
Beryllium	88	*	-	0.16 to 0.23	N
Boron (water soluble)	*	*	-	0.3 to 1.1	*
Cadmium	87	150	-	< 0.2	N
Chromium (III)	3,300	*	-	10 to 16	N
Chromium (VI)	6.3	21	-	< 1.2	N
Copper	9,400	*	-	5.9 to 13	N
Lead ³	310	310	-	3.7 to 9.5	N
Mercury (inorganic)	250	*	-	< 0.3	N
Nickel	190	*	-	12 to 15	N
Selenium	600	*	-	< 1	N
Vanadium	1,100	*	-	12 to 14	N
Zinc	20,000	*	-	18 to 51	N
Benzene	0.88	3.3	-	< 1	N
Toluene	870	*	(c)	< 1	N
Ethyl benzene	520	*	(c)	< 1	N
m-xylene ⁴	220	*	-	< 1	N
o-xylene	230	*	-	< 1	N
p-xylene	210	*	-	< 1	N
Phenol ⁵	2,000	*	-	< 1	N
Cyanide ⁶	34	*	-	< 1	N
TPH aliphatic EC5-6	80	*	-	< 0.001	N
TPH aliphatic EC>6-8	160	*	-	< 0.001	N
TPH aliphatic EC>8-10	34	*	-	< 0.001	N
TPH aliphatic EC>10-12	5,800	*	(b)	< 1	N
TPH aliphatic EC>12-16	6,400	*	(b)	< 2	N
TPH aliphatic EC>16-35	130,000 [8.6]	*	(a)	< 16	N
TPH aromatic EC5-7	0.88	*	-	< 0.001	N
TPH aromatic EC>7-8	870	*	-	< 0.001	N
TPH aromatic EC>8-10	55	*	-	< 0.001	N
TPH aromatic EC>10-12	290	*	-	< 1	N
TPH aromatic EC>12-16	2,500	*	(b)	< 2	N
TPH aromatic EC>16-21	1,900 [60]	*	(a)	< 10	N
TPH aromatic EC>21-35	1,900 [4.8]	*	(a)	< 20	N
Naphthalene	6.3	*	-	< 0.05	N
Acenaphthylene	5,800	*	(c)	< 0.05	N
Acenaphthene	2,500	*	(b)	< 0.05	N
Fluorene	3,000	*	(b)	< 0.05	N
Phenanthrene	1,300 [17]	*	(a)	< 0.05	N
Anthracene	32,000	*	(b)	< 0.05	N
Fluoranthene	4,900 [19]	*	(a)	< 0.05	N
Pyrene	3,700 [2.2]	*	(a)	< 0.05	N
Benzo(a)anthracene	18 [1.7]	*	(a)	< 0.05	N
Chrysene	220 [0.4]	*	(a)	< 0.05	N
Benzo(b)fluoranthene	23 [1.2]	*	(a)	< 0.05	N
Benzo(k)fluoranthene	23 [0.7]	*	(a)	< 0.05	N
Benzo(a)pyrene	3.6 [0.9]	5.3	(c)	< 0.05	N
Indeno(1,2,3-c,d)pyrene	26 [0.06]	*	(a)	< 0.05	N
Dibenzo(a,h)anthracene	2.2 [0.004]	*	(a)	< 0.05	N
Benzo(g,h,i)perylene	230 [0.02]	*	(a)	< 0.05	N

¹ * = No value currently defined.

² - = green; (a) = amber i.e. GAC set to model output, [SSL provided in square brackets]; (b) = red i.e. SSL exceeded & considered to affect interpretation. GAC calculated in accordance with CLEA Software Handbook; (c) = GAC limited to SSL.

³ Published C4SL.

⁴ Concentrations for total xylenes should be compared against m-xylene for fresh spills and to o-xylene for all other cases.

⁵ GAC relates to phenol (C₆H₅OH) only.

⁶ Assessment criteria for cyanide derived by Atkins based on acute exposure for a 0-6 year old child.

Determinand	GAC SOM = 1%	C4SL (based on 6% SOM) ¹	Note on SSL ²	Measured range	Measured Range > Assessment Criteria? (Y/N)
				(mg/kg)	
Coronene	*	*	-	< 0.05	N

Table H4 Data assessment summary – potential groundwater vapour risk to human health (Residential)

Contaminant	Residential GAC _{gwwap} (µg/l)	Measured range (µg/l)	No. of samples exceeding assessment criteria
Benzene	210	< 1	0 of 4
Toluene	230,000	< 1	0 of 4
Ethylbenzene	10,000	< 1	0 of 4
Total Xylene	9,500	< 1	0 of 4
Methyl tertiary butyl ether (MTBE)	83,000	< 1	0 of 4
TPH aromatic >EC5 to EC7 ¹	210,000	< 1	0 of 4
TPH aromatic >EC7 to EC8	220,000	< 1	0 of 4
TPH aromatic >EC8 to EC10	1,900	< 1	0 of 4
TPH aromatic >EC10 to EC12	6,800	< 10	0 of 4
TPH aromatic >EC12 to EC16	39,000	< 10	0 of 4
TPH aliphatic EC5 to EC6	1,900	< 1	0 of 4
TPH aliphatic >EC6 to EC8	1,500	< 1	0 of 4
TPH aliphatic >EC8 to EC10	57	< 1	0 of 4
TPH aliphatic >EC10 to EC12	37	< 10	0 of 4
Acenaphthene	170,000 ¹	< 0.01	0 of 4
Acenaphthylene	220,000 ¹	< 0.01	0 of 4
Fluorene	210,000 ¹	< 0.01	0 of 4
Naphthalene	220	< 0.01	0 of 4

1. Assessment criteria for TPH Aromatic >EC5 to EC7 should also be compared to assessment criteria for benzene to account for genotoxic mutagenic affects.

Table H5. Data assessment summary – potential risk to controlled waters (groundwater and surface water – freshwater)

Contaminant	Freshwater EQS ¹ (µg/l)	EC Drinking Water Value (µg/l)	Measured range (µg/l)	No. of samples exceeding EQS	No. of samples exceeding Drinking Water Value
Arsenic	50	10	3.4 to 6.6	0 of 4	0 of 4
Cadmium	25 ²	5	< 0.08	0 of 4	0 of 4
Chromium VI	3.4	50 ³	< 5	0 of 4	0 of 4
Chromium III	4.7	50 ³	< 1 to 6.2	0 of 4	0 of 4
Lead	1.2	10	1.2 to 13	0 of 4	0 of 4
Mercury	0.07	1	< 0.5	0 of 4	0 of 4
Selenium	* ⁴	10	< 4	*	0 of 4
Boron	*	1,000	61 to 260	*	0 of 4
Copper	1 ⁵	2,000	3.5 to 22	2 of 4	0 of 4
Nickel	4 ⁵	20	4.3 to 8.2	0 of 4	0 of 4
Zinc	12.9 ^{5,6}	(5,000) ⁷	4.9 to 53	1 of 4	0 of 4
Barium	*	(1,000) ⁷	51 to 120	*	0 of 4
Beryllium	(15) ⁸	*	< 0.2 to 0.5	0 of 4	*
Phenols	7.7	(0.5) ⁷	< 1 to 2	0 of 4	1 of 4
Free Cyanide	1	50 ⁹	< 1	0 of 4	0 of 4
Sulphate (mg/l)	*	250	79.1 to 123	*	0 of 4
TPH	*	(10) ⁷	< 16 to 300	*	1 of 4
PAH	*	0.1 ¹⁰	< 0.16	*	0 of 4
Anthracene	0.1	*	< 0.01	0 of 4	*
Benzo(a)pyrene	0.02 [0.00017] ¹¹	0.01	< 0.01	0 of 4	0 of 4
Fluoranthene	0.1 (0.0063)	*	< 0.01	0 of 4	*
Naphthalene	2	*	< 0.01	0 of 4	0 of 4
Benzene	10	1	< 1	0 of 4	0 of 4
Toluene	74	*	< 1	0 of 4	0 of 4
Total ammonia/ ammoniacal nitrogen as NH ₄	*	500	120 to 14000	*	3 of 4
Hardness (mg CaCO ₃ /l)	*	*	212 to 421	*	*
pH	6.0 - 9.0	6.5 - 10.0	7.3 to 7.8	0 of 4	0 of 4

¹ Annual Averages prescribed within The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

² EQS varies with water hardness where range given. Evaluated against appropriate band. (Band 5)

³ This value relates to total chromium.

⁴ * = No values defined or given.

⁵ Screened against the bioavailable fraction of the dissolved concentration of copper, nickel and zinc. "bioavailable" means the fraction of the dissolved concentration of zinc, nickel and copper likely to result in toxic effects as determined using the UKTAG Metal Bioavailability Assessment Tool.

⁶ 10.9 µg/l bioavailable plus ambient background concentration (µg/l) dissolved. Ambient background concentrations for dissolved zinc in freshwaters in England and Wales to be used in conjunction with item 6.

⁷ Concentration formerly prescribed within the Water Supply (Water Quality) Regulations 1989.

⁸ Dutch Indication Level of Serious Contamination.

⁹ Drinking water standard based on total cyanide.

¹⁰ Sum concentration of 4 PAH comprising benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene.

¹¹ The previous published value for benzo(a)pyrene and fluoranthene is given in the table, and the current published value is given in square brackets. The square brackets value must be used if the waters in question could feed into an area where fishery products are produced.