

4 March 2016

Your ref:
Planning ref:
Our ref: J15109/DB/c02

Grace Palmer
BDW Southampton
Tollbar House
Tollbar Way
Hedge End
Southampton
Hampshire
SO30 2UH

Dear Ms Palmer,

RE: LAND NORTH OF STATION ROAD, HAYLING ISLAND
RESPONSE TO CONTAMINATED LAND OFFICER MEMO IN RELATION TO
CONTAMINATED LAND RELATED PLANNING CONDITION CLEARANCE

In response to the submission of our initial desk study and ground investigation report for the above site by the planning consultants to the Local Authority, the Contaminated Land Officer has provide a memo that outlines a series of queries and requests for additional information. We have discussed the memo directly with the contaminated land officer to resolve initial queries, although this letter is intended to provide a formal response to the queries and encloses the requested additional information.

In summary the Contaminated Land Officer noted the following

- Confirm whether BH8 was finished as a well, and whether any groundwater data is available for this location. If data exist, these should be submitted. If no data is currently available but the well remains serviceable, a further round of groundwater analysis would lend a considerable degree of confidence to the results already submitted.
- Address the inconsistencies in sample matrix / log description for BH8 - lab reports 'rubble' (indicating inclusions, made ground), but the log refers to "silty-fine sand", and geotechnical description "silty clay with rare fine gravel"
- Submit gas monitoring data referred to within the report, and any collected subsequently.
- Submit any available groundwater monitoring data post-dating 17/04/2015
- Confirm whether any further soil sampling or formal / documented soil inspection is to be undertaken within plots 1 & 2 (as marked on Opus Drainage Dwg No. 300), coincident with the previous structure of unknown (likely non-residential) use, and to submit any related documentation if this has been- / is to be- undertaken.

Taking each point in turn;

BH 8

BH 8 and BH 9 have been mistakenly transposed on the site plan. BH 9 was located in the location of BH 8 shown on the plan and was indeed installed with a monitoring standpipe. BH 8 was drilled in the location of BH 9 in the main body of the field where we were not allowed to install monitoring standpipes. The results of an additional round of groundwater analysis to BH 1, BH 3 and BH 9 are enclosed together with an amended site plan. The results of the analyses have not indicated elevated concentrations of groundwater contaminants of concern.

Sample Descriptions

Having discussed this with the laboratories it is considered that the different sample descriptions are a result of sample sizes, where a single fragment of gravel or apparently man-made aggregate may appear proportionately more significant in the small laboratory sample, than in the full volume of soils inspected on site from the borehole. The borehole description carried out by a Chartered Geologist should be referenced as being representative of the ground conditions.

Gas Monitoring Data

Apologies for the apparent omission of these records from the original report. Records are enclosed with this letter.

Supplementary Ground Water Monitoring

The updated results of the monitoring to date are detailed in the table below and indicated as depth below ground level in metres.

Date	Comments	BH No 1	BH No 2	BH No 3	BH No 4	BH No 5	BH No 9
6/10/2016	Following rainfall	1.10	1.13	1.13	1.38	1.40	1.32
3/11/2015	High tide	1.04	1.08	1.09	1.30	1.22	1.10
11/12/2015	High tide and following persistent heavy rainfall	0.69	0.66	0.64	0.93	1.00	0.90
19/01/2015	High tide and following persistent heavy rainfall	0.92	0.76	0.55	0.67	0.59	0.86
8/2/2016	High tide, heavy rain and Storm Isobel	0.62	0.53	0.66	destroyed	0.72	0.75

Further Investigation Within Plot Nos 1 & 2

As noted this area was not investigated due to ecological restrictions.

We note the unknown building that is indicated on selected historical photos but is absent from historical mapping and whilst we agree that this is likely to present a minimal risk of ground contamination, we have agreed to carry out a post construction inspection of the formation level to the gardens of Plot Nos 1 and 2 in order to check for the presence of any obvious visual or olfactory indications of ground contamination. As part of this future site visit we will recover a soil sample from each garden and present the findings of independent soil contamination testing in the form of a validation and verification report in due course.

We trust that this letter and enclosures provide sufficient information and clarification. This letter should be submitted by the planning consultant through the planning system for consideration in relation to discharging the contaminated land conditions at this site. Please do not hesitate to contact me should you have any questions or queries.

Yours sincerely
Wilson Bailey Partnership

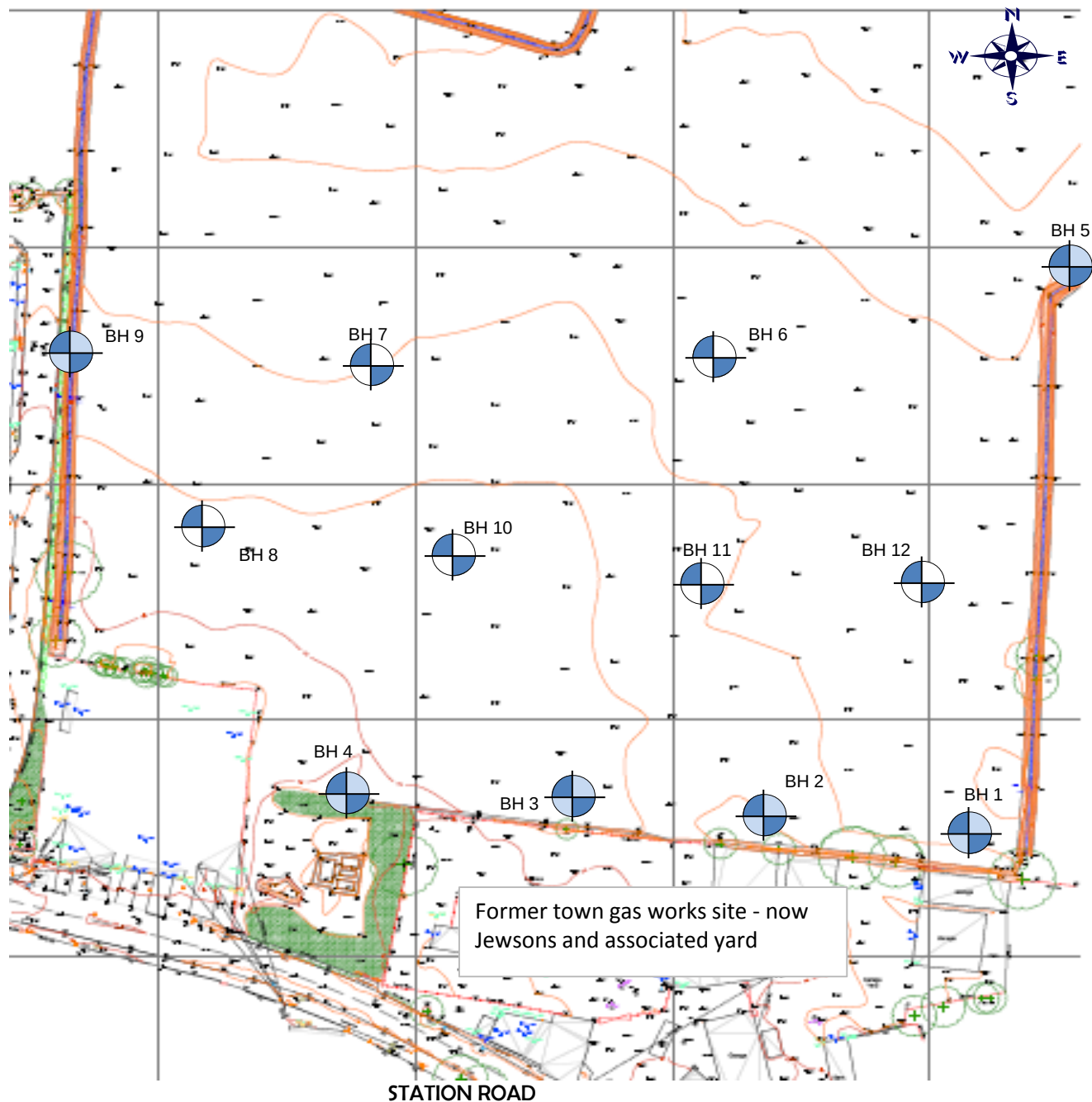


Dominic Brightman
BSc MSc DIC FGS CGeol ARSM
Encs

Cc Jonathon Driver, Environmental Control Officer, Havant Borough Council

Site Land North of Station Road, Hayling Island, Hampshire

Client BDW Southampton



Borehole completed with a monitoring standpipe for soil gas and groundwater



Borehole backfilled with a cementitious grout within clay soils to match existing ground permeabilities

Revision Note;
Corrected locations of BH 8 and BH 9 that were transposed



Approximate Scale in metres



Dominic Brightman
Wilson Bailey Geotechnical & Environmental Ltd
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Sherrington
Wiltshire
BA12 0SN

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t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 16-40560

Site Reference: Hayling Island

Project / Job Ref: None Supplied

Order No: None Supplied

Sample Receipt Date: 10/02/2016

Sample Scheduled Date: 11/02/2016

Report Issue Number: 2

Reporting Date: 04/03/2016

Authorised by:

Russell Jarvis
Associate Director of Client Services
On behalf of QTS Environmental Ltd

A handwritten signature in black ink, appearing to read 'R Jarvis', written over the printed name.

Authorised by:

Kevin Old
Associate Director of Laboratory
On behalf of QTS Environmental Ltd

A handwritten signature in black ink, appearing to read 'K Old', written over the printed name.



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Water Analysis Certificate						
QTS Environmental Report No: 16-40560	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Hayling Island	TP / BH No	BH1	BH3	BH9		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 04/03/2016	QTSE Sample No	191522	191523	191524		

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	ISO17025	6.8	6.8	6.9		
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	3.1	2.8	2.4		
Arsenic (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Boron (dissolved)	ug/l	< 5	ISO17025	12	7	5		
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	2.1	2.2	2.1		
Chromium (dissolved)	ug/l	< 5	ISO17025	7	8	8		
Chromium (hexavalent)	ug/l	< 20	NONE	< 20	< 20	< 20		
Copper (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Lead (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Mercury (dissolved)	ug/l	< 0.05	ISO17025	< 0.05	< 0.05	< 0.05		
Nickel (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Selenium (dissolved)	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Zinc (dissolved)	ug/l	< 2	ISO17025	4280	4450	4260		
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10	< 10	< 10		

Subcontracted analysis ^(S)
Insufficient sample ^{I/S}
Unsuitable Sample ^{U/S}



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Water Analysis Certificate - Speciated PAH						
QTS Environmental Report No: 16-40560	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental L	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Hayling Island	TP / BH No	BH1	BH3	BH9		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 04/03/2016	QTSE Sample No	191522	191523	191524		

Determinand	Unit	RL	Accreditation					
Naphthalene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluorene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Phenanthrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Chrysene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Total EPA-16 PAHs	ug/l	< 0.01	NONE	< 0.01	< 0.01	< 0.01		



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Water Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 16-40560	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Hayling Island	TP / BH No	BH1	BH3	BH9		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 04/03/2016	QTSE Sample No	191522	191523	191524		

Determinand	Unit	RL	Accreditation						
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10	< 10	< 10			
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10	< 10	< 10			
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10			
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	< 10			
Aliphatic >C12 - C16	ug/l	< 10	NONE	< 10	< 10	< 10			
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10	< 10	< 10			
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10	< 10	< 10			
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70	< 70	< 70			
Aromatic >C5 - C7	ug/l	< 10	NONE	< 10	< 10	< 10			
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10	< 10	< 10			
Aromatic >C8 - C10	ug/l	< 10	NONE	< 10	< 10	< 10			
Aromatic >C10 - C12	ug/l	< 10	NONE	< 10	< 10	< 10			
Aromatic >C12 - C16	ug/l	< 10	NONE	< 10	< 10	< 10			
Aromatic >C16 - C21	ug/l	< 10	NONE	< 10	< 10	< 10			
Aromatic >C21 - C35	ug/l	< 10	NONE	< 10	< 10	< 10			
Aromatic (C5 - C35)	ug/l	< 70	NONE	< 70	< 70	< 70			
Total >C5 - C35	ug/l	< 140	NONE	< 140	< 140	< 140			



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Water Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 16-40560	Date Sampled	None Supplied	None Supplied	None Supplied		
Wilson Bailey Geotechnical & Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Hayling Island	TP / BH No	BH1	BH3	BH9		
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied		
Reporting Date: 04/03/2016	QTSE Sample No	191522	191523	191524		

Determinand	Unit	RL	Accreditation					
Benzene	ug/l	< 1	ISO17025	< 1	< 1	< 1		
Toluene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
Ethylbenzene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
p & m-xylene	ug/l	< 10	ISO17025	< 10	< 10	< 10		
o-xylene	ug/l	< 5	ISO17025	< 5	< 5	< 5		
MTBE	ug/l	< 10	ISO17025	< 10	< 10	< 10		



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Soil Analysis Certificate - Methodology & Miscellaneous Information	
QTS Environmental Report No: 16-40560	
Wilson Bailey Geotechnical & Environmental Ltd	
Site Reference: Hayling Island	
Project / Job Ref: None Supplied	
Order No: None Supplied	
Reporting Date: 04/03/2016	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

Site		Land North of Station Road, Hayling Island			Job Number J15109	
Client		BDW Southampton			Sheet 1/3	
Date 23/03/2015 Air Temperature 9 °C Barometric Pressure 1016 mB Visit No 1 of 3						
Borehole No	BH 1	BH 2	BH 3	BH 4		
Condition of Standpipe	good	good	good	good		
Combustible gas (CH4) % LEL	<0.1	<0.1	<0.1	<0.1		
Combustible gas (CH4) % vol	<0.1	<0.1	<0.1	<0.1		
Combustible gas (CH4) ppmv by PID	<0.1	<0.1	<0.1	<0.1		
Carbon Dioxide % vol	0.6	1.1	0.8	1.0		
Oxygen % vol	18.1	17.9	18.2	17.9		
Flow Rate (max) l/hr	<0.01	<0.01	<0.01	<0.01		
Water Level m	1.18	1.00	1.02	0.95		
Remarks						

Site		Land North of Station Road, Hayling Island			Job Number J15109	
Client		BDW Southampton			Sheet 2/3	
Date 01/05/2015 Air Temperature 8 °C Barometric Pressure 1006 mB Visit No 2 of 3						
Borehole No	BH 1	BH 2	BH 3	BH 4		
Condition of Standpipe	good	good	good	good		
Combustible gas (CH4) % LEL	<0.1	<0.1	<0.1	<0.1		
Combustible gas (CH4) % vol	<0.1	<0.1	<0.1	<0.1		
Combustible gas (CH4) ppmv by PID	<0.1	<0.1	<0.1	<0.1		
Carbon Dioxide % vol	0.6	0.2	0.8	0.7		
Oxygen % vol	18.2	18.6	18.7	19.1		
Flow Rate (max) l/hr	<0.01	0.03	<0.01	<0.01		
Water Level m	0.96	0.84	1.00	0.97		
Remarks						

Site		Land North of Station Road, Hayling Island			Job Number		J15109	
Client		BDW Southampton			Sheet		3/3	
Date		02/06/2015						
Air Temperature		15 °C						
Barometric Pressure		1002 mB						
Visit No		3 of 3						
Borehole No	BH 1	BH 2	BH 3	BH 4				
Condition of Standpipe	good	good	good	good				
Combustible gas (CH4) % LEL	<0.1	<0.1	<0.1	<0.1				
Combustible gas (CH4) % vol	<0.1	<0.1	<0.1	<0.1				
Combustible gas (CH4) ppmv by PID	<0.1	<0.1	<0.1	<0.1				
Carbon Dioxide % vol	1.2	0.8	0.6	0.9				
Oxygen % vol	17.3	18.5	18.3	18.1				
Flow Rate (max) l/hr	<0.01	<0.01	<0.2	<0.01				
Water Level m	0.97	0.98	0.95	0.97				
Remarks								