

SUBADRA

Consultants in the Earth Sciences

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ADDITIONAL SITE INVESTIGATION REPORT

**Former Units 25c - 25e
Solent Road, Havant, Hampshire**

Report No: In12899 CL 003

April 2013

Client: Hargreaves Properties Ltd

Report Prepared By:

Report Reviewed By:

James Skinner

James Edley

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1 Introduction

1.1 The Purpose of This Assessment

The site is located off Solent Road and Brockhampton Lane in Havant and, until recently, has comprised a series of three industrial units. Hargreaves Properties Ltd (Hargreaves) have purchased the freehold of the site and propose to redevelop the existing units and neighbouring plots to the east for future retail use.

We understand that as part of pre-planning application consultations with Havant Borough Council, the Environmental Health Department raised a number of observations and comments relating to potential historical contamination issues associated with the site based on the historical industrial past of the surrounding area. On the basis of the available evidence, Environmental Health advised that, if planning consent were granted for the development, specific planning conditions requiring contamination assessment should be imposed.

A planning application was made to Havant Borough Council for the proposed retail redevelopment scheme during August 2012 (Planning Application Ref. APP/12/00852). In support of this planning application we were commissioned by Hargreaves to undertake an environmental assessment of the site to investigate potential contamination issues.

 indicated the presence of low concentrations of hydrocarbons in the eastern corner of the site (relating to a historical offsite area). This has been addressed to the satisfaction of the Local Authority and the centre of the site (relating to former above ground fuel tanks). No further action is required.

At the time of writing this report, the final decision regarding this planning application has not yet been made. Initial comments received from Havant Borough Council with regard to our initial environmental assessment indicated that many of the likely requirements of the planning conditions had been addressed. However, concern was raised that the contamination identified in the centre of the site could represent a more significant issue.

The purpose of this additional delineation assessment was, therefore, to determine whether more extensive contamination could be present in the central area of the site, following the demolition of former Unit 25d. This additional data was also designed to determine whether any further detailed risk assessment and/or remedial action would be required at the site and allow the development of a suitable remedial strategy.

All the activities comprising this assessment were carried out in accordance with the procedures set out in our Quality Manual. Your attention is drawn to the Notice to Interested Parties included as Attachment One.

1.2 The Scope of This Assessment

Our additional assessment of the site was carried out in the following parts:

- Construction of an additional six boreholes across the plot of the former Unit 25d, using our Geoprobe direct-push drilling system, all of which were installed as groundwater monitoring wells;
- Chemical analysis of representative soil samples collected from the additional boreholes for hydrocarbon compounds;
- Groundwater monitoring of all additional wells and selected existing wells installed during our 2012 investigation works. Chemical analysis of groundwater samples for hydrocarbon compounds and selected other contaminants / parameters.
- Provision of this report detailing the additional investigation findings and our conclusions.
- Provision of recommendations for the proposed redevelopment.

1.3 Previous Work

As part of our environmental assessment we have reviewed the following investigation.

- Environmental Investigation Report, Units 25c – 25e, Solent Road, Havant, August 2012 – Completed by Subadra on behalf of Hargreaves Properties Ltd, (Our report ref. In12899 CL 001).

This report should be read in conjunction with the above document. We have used information from this document, where relevant, in the various sections of this report.

2 **Results of the Additional Investigation**

2.1 Summary of Previous Investigation Findings

We undertook our investigation works on the 5th and 6th July 2012. We investigated the soil and groundwater quality at the site by constructing eight boreholes, five of which were completed as permanent groundwater monitoring wells. We recovered representative soil and groundwater samples from the site and submitted these for chemical analysis for a range of potential contaminants.

The geology underlying the site was found to comprise Made Ground and/or clay Alluvium, overlying flint gravel River Terrace Deposits and then the Upper Chalk. Groundwater was encountered at shallow depth within the Made Ground and/or River Terrace Deposits, with a resting elevation recorded at approximately 1.0m below ground level. Groundwater flow was calculated to be toward the west.

We recorded olfactory and/or visual evidence of hydrocarbons in samples of the Made Ground taken from a single borehole (Borehole Eight). No other evidence of contamination was encountered during our site investigation or groundwater monitoring works.

Our chemical testing identified low concentrations of hydrocarbon compounds in soil and/or groundwater taken from two locations:

- On the eastern corner of the site (BH8). We understand from a review of previous environmental assessment information provided by Hargreaves for the site to the immediate east, that a hydrocarbon contamination issue was identified and remedial works subsequently undertaken to the satisfaction of Havant Borough Council and the Environment Agency. We concluded the low concentrations of hydrocarbons identified in our BH8 to comprise residual contamination originating from the east.
- In a central location close to former above ground fuel tanks and a flammable materials store located on the eastern edge of Unit 25d (BH4). We concluded that the source of the limited hydrocarbon impact was most likely to comprise the fuel tanks. No hydrocarbon impact of groundwater was recorded in wells located hydraulically down gradient of BH4 on the western boundary of the site.

Our site investigation did not identify significant contamination of underlying soil or groundwater at the site. We also did not identify any current site activities that appear to pose an immediate ongoing risk of contamination. We concluded that, on the basis of our investigation data and subsequent generic risk assessment, we had not identified any contamination issues that we would consider to be a significant constraint to redevelopment for continued commercial use.

A site plan, showing the locations of the various boreholes we constructed is provided overleaf.



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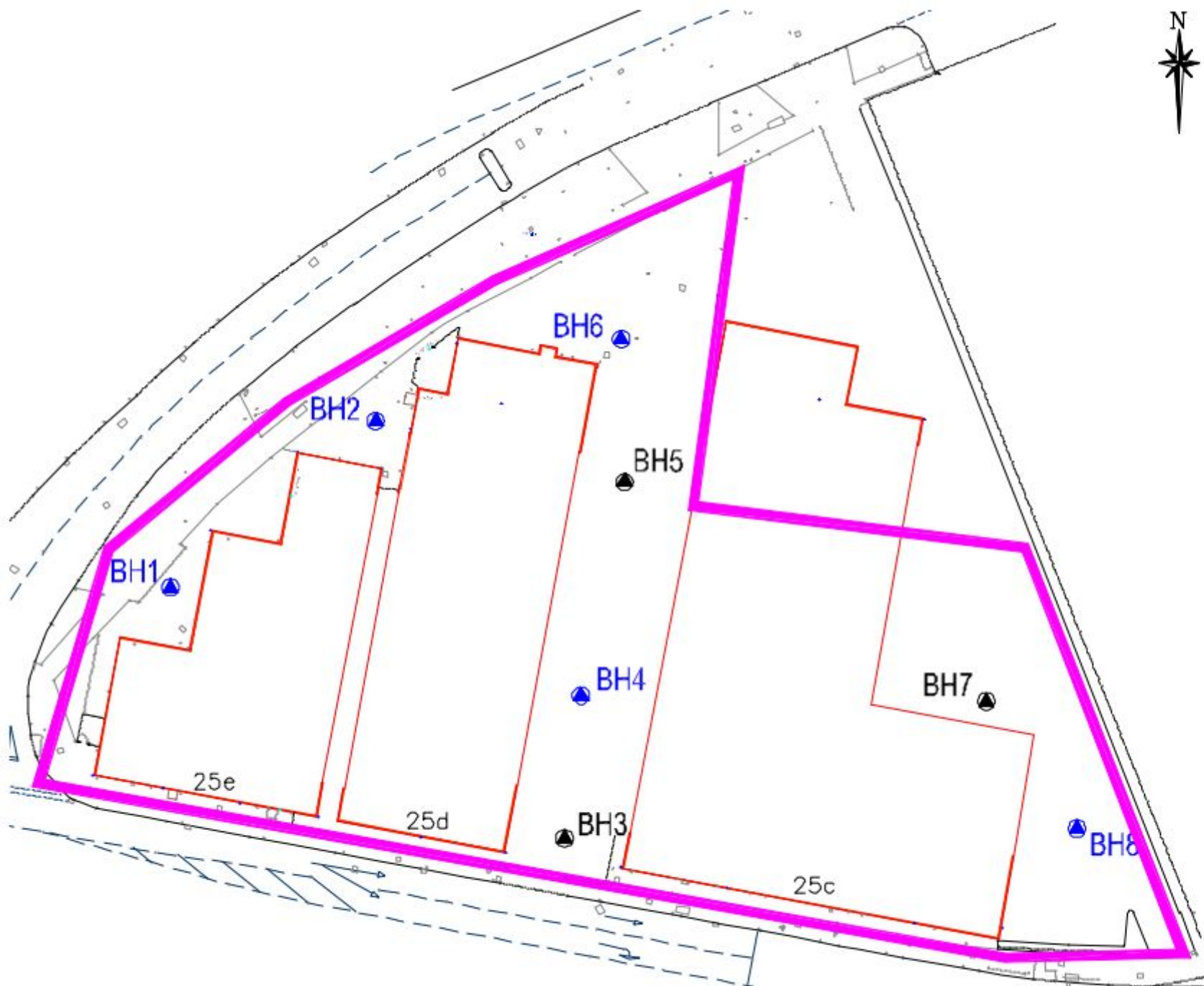
Unit 13, Triangle Business Park
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Tel. 01296 739400 Fax. 01296 739401

Units 25c – 25e
Solent Road, Havant
PO9 1JH

DATE : 17th July 2012
SUBADRA ARCHIVE NO : IN12899 DR 00
DRAWING BY : KM CHECKED BY : JS

KEY

- BUILDING OUTLINE (SUBJECT SITE)
- INVESTIGATION SITE BOUNDARY
- BH1 PERMANENT WELL LOCATION
- BH1 BOREHOLE LOCATION



BOREHOLE LOCATIONS
– JUNE 2012

FIGURE ONE

2.2 Additional Delineation Investigation – May 2012

2.2.1 Description of Works Completed

We undertook the additional delineation investigation at the site on the 13th March 2013, following the demolition and clearance of the building, associated fuel tanks and chemical store at 25d Solent Road.

We constructed an additional six boreholes across the plot of the former Unit 25d using our Geoprobe direct-push sampling system. Representative soil samples were recovered from each borehole in sealed liners and logged onsite by a suitably qualified technician. Sub-samples were preserved in glass jars and stored in cool boxes during transportation to the laboratory for subsequent analysis.

All of the additional boreholes were completed as permanent monitoring wells. We returned to the site on the 20th March 2013 to complete groundwater monitoring. We obtained groundwater samples from all of the additional wells and also from selected existing wells from across the site installed during our 2012 investigation works.

2.2.2 Borehole Locations and Rationale

Boreholes were positioned in order to provide a more detailed assessment of underlying soil and groundwater quality in the vicinity of, and immediately down gradient of, the former fuel tank and chemical storage area located along the eastern boundary of Unit 25d.

A site plan showing the additional borehole locations is shown on the following page.

2.2.3 Soil Stratigraphy

We encountered the same geological strata as previously identified at the site in our additional boreholes. In summary:

Layer I Made Ground – Concrete (floor slab of former building) over MEDIUM DENSE red/grey/brown/black/cream very clayey GRAVEL or FIRM black/brown/grey sandy very gravelly CLAY or MEDIUM DENSE creamy white blocky CHALK (interpreted to comprise an imported layer of chalk rock used to form a founding layer for the building floor). Including red brick fragments, flints and clinker.

Layer IIa Alluvium – SOFT to FIRM grey/black/brown slightly sandy slightly gravelly CLAY.

Layer IIb Head Deposits – MEDIUM DENSE black grey brown very clayey flint GRAVEL or FIRM creamy grey very gravelly CLAY. Occasional chalk fragments.

Layer IIc River Terrace Deposits – LOOSE to MEDIUM DENSE orange/cream/blue/grey/black/brown sandy clayey chalky flint GRAVEL. Occasional very coarse sandy layers.

As before, the shallow drift deposits comprising Alluvium and/or Head Deposits were found inconsistent across the site and detailed differentiation was difficult. However, we encountered the River Terrace Deposits in all of the boreholes from approximately 2.0m depths.

2.2.4 Groundwater

As before, we encountered initial groundwater strike at approximately 1.2m below ground level in the Made Ground or River Terrace Deposits. The depth of groundwater strike varied across the site and we consider the shallow clay geology could be locally confining water contained in underlying River Terrace Deposits. At rest groundwater levels were again recorded at approximately 1.0m below ground level.

A summary of our groundwater monitoring data is summarised in Table One.



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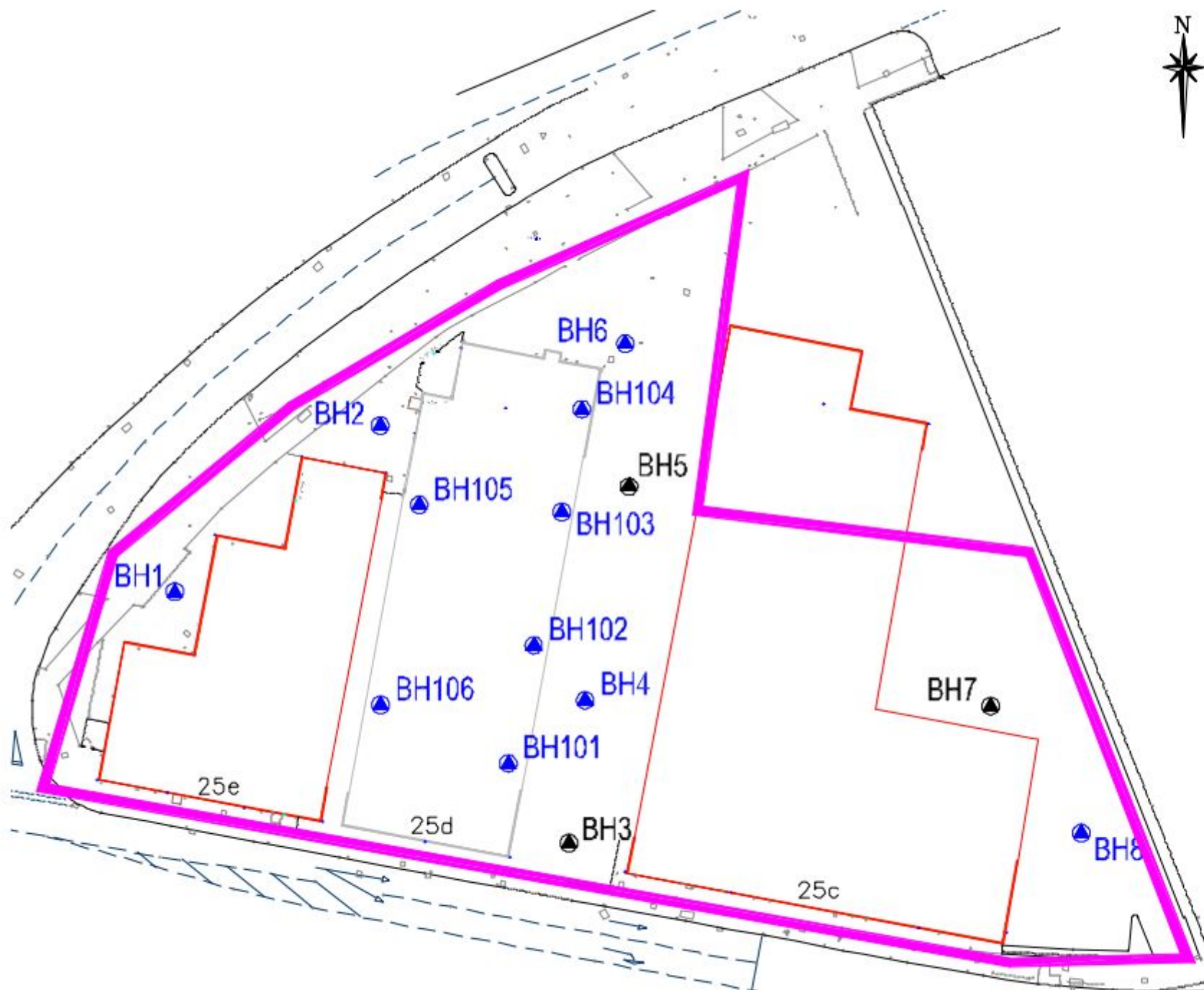
DATE : April 2013

SUBADRA ARCHIVE NO : IN12899 DR 00

DRAWING BY : KM CHECKED BY : JS

KEY

-  BUILDING OUTLINE
(SUBJECT SITE)
-  BUILDING OUTLINE
(SUBJECT SITE)
-  INVESTIGATION SITE BOUNDARY
-  BH1 PERMANENT WELL LOCATION
-  BH1 BOREHOLE LOCATION



BOREHOLE LOCATIONS
- APRIL 2013

FIGURE TWO

Borehole	Groundwater Level – Initial Strike	Groundwater Level – At Rest (20/3/13)	Comment
BH101	~1.5	1.08	No hydrocarbon sheen or odours noted. Groundwater generally light brown or creamy brown in colour. Good levels of recharge recorded in the wells indicating permeable soils.
BH102	~2.2	1.10	
BH103	~1.8	1.045	
BH104	~1.8	1.07	
BH105	~1.7	1.125	
BH106	~1.6	1.18	
BH4	~1.2*	0.98	
BH6	~1.0*	0.89	
BH8	~2.0*	1.18	

All dimensions in metres below ground level

* July 2012 investigation data (Ref.1)

Table One: Summary of Groundwater Data – March 2013

We consider the underlying groundwater regime to be unchanged from our previous investigation data. Based on our 2012 investigation data, taken from the entire site, a clear groundwater flow was calculated toward the west.

2.2.5 Observed Contamination

We did not record olfactory and/or visual evidence of hydrocarbon contamination in shallow soils or groundwater recovered from any of the boreholes we constructed.

Hydrocarbon sheens or odours were also not observed on groundwater samples recovered from the existing BH4 or BH8 (where low concentrations of hydrocarbons were previously recorded) during our March monitoring visit.

2.3 Chemical Analysis Results

Based upon the results of our previous investigation data, we have completed the following analysis on representative soil and groundwater samples collected from the site:

Analysis	Rationale	No of samples	
		Soil	Water
Total petroleum hydrocarbons (TPH) - reported by carbon range	Representative of compounds present in petrol, diesel and lube oils.	8	9
Benzene, toluene, ethylbenzene and xylenes (BTEX) and volatile TPH bands	Representative of compounds present in petrol / hydrocarbon	3	4
Heavy Metals Suite	Possible heavy metal leaching to groundwater highlighted as a potential concern by Havant Council.	0	4

Table Two: Schedule of Analysis – March 2013

The results of the analyses are summarised below. Chemical Analysis Certificates are included in Attachment Three.

2.3.1 Chemical Analysis Results - Soil Samples

Sampling Location	Depth (m)	Total Petroleum Hydrocarbon Concentration (mg/kg)				
		>C ₈ -C ₁₀	>C ₁₀ -C ₁₂	>C ₁₂ -C ₁₆	>C ₁₆ -C ₂₁	>C ₂₁ -C ₃₅
BH101	1.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	1.8	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	2.8	<0.5	<0.5	<0.5	<0.5	<0.5
BH103	1.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH103	1.8	<0.5	<0.5	<0.5	<0.5	<0.5
BH104	2.0	<0.5	<0.5	<0.5	<0.5	<0.5
BH105	2.0	<0.5	<0.5	<0.5	<0.5	<0.5
BH106	1.5	<0.5	<0.5	<0.5	<0.5	<0.5

Table Three: TPH Analysis Results – Soil

Sampling Location	Depth (m)	Concentration (mg/kg)						
		Volatile TPH			Benzene	Toluene	Ethyl-benzene	Total Xylenes
		C ₆ -C ₈	>C ₈ -C ₁₀	>C ₁₀ -C ₁₂				
BH102	1.8	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.2
BH103	1.8	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.2
BH105	2.0	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.2

Table Four: BTEX and Volatile TPH Bands Analysis Results – Soil

2.3.2 Chemical Analysis Results – Groundwater Samples

Sampling Location	Total Petroleum Hydrocarbon Concentration (µg/l)				
	>C ₈ -C ₁₀	>C ₁₀ -C ₁₂	>C ₁₂ -C ₁₆	>C ₁₆ -C ₂₁	>C ₂₁ -C ₃₅
BH101	<10	<10	<10	<10	<10
BH102	<10	<10	<10	<10	<10
BH103	<10	<10	<10	<10	<10
BH104	<10	<10	<10	<10	<10
BH105	<10	<10	<10	<10	<10
BH106	<10	<10	<10	<10	<10
BH4	<10	<10	<10	<10	<10
BH6	<10	<10	<10	<10	<10
BH8	<10	<10	<10	<10	<10

Table Five: TPH Analysis Results – Groundwater

Sampling Location	Concentration (µg/l)						
	Total Petroleum Hydrocarbons			Benzene	Toluene	Ethyl-benzene	Total Xylenes
	C ₆ -C ₈	>C ₈ -C ₁₀	>C ₁₀ -C ₁₂				
BH102	<50	<50	90.1	<10	<10	<10	<20
BH105	<50	<50	<50	<10	<10	<10	<20
BH4	<50	<50	<50	<10	<10	<10	<20
BH8	<50	<50	<50	<10	<10	<10	<20

Table Six: BTEX and Volatile TPH Bands Analysis Results – Groundwater

Sampling Location	Depth (m)	Dissolved Inorganic Element Concentration (µg/l)					
		Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper
BH8	1.18	<10	36	<1	<0.5	5	<10
BH101	1.08	<10	224	<1	<0.5	<5	<10
BH102	1.10	<10	138	<1	<0.5	<5	<10
BH105	1.13	<10	43	<1	<0.5	<5	<10
		Lead	Mercury	Nickel	Selenium	Vanadium	Zinc
BH8	1.18	<5	<0.05	<7	<5	<5	<5
BH101	1.08	<5	<0.05	<7	<5	<5	<5
BH102	1.10	<5	<0.05	<7	<5	<5	<5
BH105	1.13	<5	<0.05	<7	<5	<5	<5

Table Seven: Inorganic Compounds Analysis Results -- Groundwater Samples

3 Conclusions

The results of our additional investigation work have demonstrated that the former fuel tanks and chemical store associated with Unit 25d have not caused significant contamination of underlying soils or groundwater. Our recent monitoring data also indicates that since the demolition of the building and decommissioning of the fuel tank installation, groundwater quality has improved.

We consider this data confirms our previous conclusions that the fuel tanks were the source of the low concentrations of hydrocarbons previously encountered in this area of the site. We do not consider there to be an ongoing potential contaminant source present in the centre of the site.

We have also recorded an improvement in groundwater quality in the eastern corner of the site, with no detectable concentrations of hydrocarbons recorded in groundwater samples taken from BH8 during March 2013 (compared with 256ug/l total petroleum hydrocarbons in June 2012).

Our recent monitoring data has also confirmed that underlying groundwater has not been significantly impacted with heavy metals. Our original investigation had identified limited elevated concentrations of heavy metals in shallow Made Ground samples collected from various boreholes. We did not consider these concentrations to pose a potential risk to site users or underlying groundwater due to the presence of hard standing cover in previous and future site layouts, which will prevent infiltration of surface waters and any potential leaching of heavy metals from shallow Made Ground. This data confirms that significant leaching of heavy metals to underlying groundwater has not occurred.

4 Recommendations

We consider the results of our additional investigation work confirm the conclusions of our 2012 environmental assessment of the site. We do not consider our site investigation works have identified any significant contamination of soils or groundwater at the site, with recent monitoring data suggesting an improvement in conditions following the decommissioning and removal of the former fuel tank installation from Unit 25d.

On the basis of our investigation and generic risk assessment results we would consider the site to be suitable for redevelopment for continued commercial use. We do not consider that further detailed quantitative risk assessment or remedial work action is required.

We have not identified any current site activities that appear to pose an immediate ongoing risk of contamination. However, industrial warehouses have occupied the site for many years and we were not able to complete intrusive investigations of all areas of the site due to the existing buildings present. Whilst we have monitoring data from down gradient locations of all the buildings present at the site, it is possible that additional potential sources of contamination are present (former below ground tanks, oil/water interceptors etc) that we haven't identified.

We would recommend that verification of site conditions is completed during/following the demolition of the remaining site buildings and that any potential contamination is investigated fully at that time. Additional sampling of soils and/or groundwater underlying the buildings may be required and we recommend that we maintain a 'watching brief' during this phase of the redevelopment in order to satisfy the likely final requirements of the planning conditions.

Your attention is drawn to the Notice to Interested Parties included as Attachment One.

ATTACHMENT ONE: NOTICE TO INTERESTED PARTIES

NOTICE TO INTERESTED PARTIES

The purpose of our site assessment is to provide general information on the environmental and/or geotechnical conditions existing at the site and related to soil or groundwater. Where the Client or others specified the scope of the investigation, the validity of our conclusions may be limited by the scope of work completed. We are not responsible for any such limitations imposed by the scope of work.

Where stated in this report, we have used information supplied by third parties. While we have evaluated as far as possible the validity of this information, we cannot guarantee its accuracy in any way whatsoever.

No investigation technique is capable of completely identifying all of the contaminants that might be present in the soil or groundwater under a site. Where specified in our report, we have examined the ground by constructing a number of boreholes and/or trial pits. We recovered samples of soil and/or groundwater from available exposures.

The depth and spacing of our sampling locations were selected to ensure with a reasonable probability that they would be representative of the actual conditions across the whole site. However, safety considerations relating to existing site infrastructure may have restricted our ability to investigate all potential contaminant sources. Specifically, we were unable to investigate the soil and groundwater condition immediately adjacent to buried services. These limitations must be borne in mind when considering the conclusions reached in this report.

Soil is intrinsically variable and the spread of contaminants within the soil is therefore subject to a degree of non-uniformity. For these reasons no sampling technique can completely eliminate the possibility of obtaining samples that are not representative of the actual conditions. Our sampling techniques are intended to reduce the possibility to an acceptable level.

Groundwater levels and soil vapour levels that we report were accurate at the time of the investigation. Groundwater and soil vapour levels are variable. Long term monitoring may be required to ensure that the levels recorded during our investigation are representative of long term and possible 'worst case' conditions.

This investigation was carried out to assess the significance of contamination resulting from use of the site as identified in this report. Unless we have indicated otherwise, no assessment of the potential impact of any other previous uses has been made. No investigation was carried out to determine whether or not any deleterious or hazardous materials have been used in the construction of the buildings present on the site.

We do not accept any responsibility for the cost of remedial works or other costs incurred in whatever way whatsoever as a result of any omissions, errors or other shortcomings in this report unless we have been given reasonable opportunity to verify ourselves that such faults exist and we have been given a reasonable opportunity to carry out works to remedy such faults ourselves using the most practicable means available to us. We do not accept liability for any consequential losses incurred by you while we carry out any remedial works we deem necessary.

This report has been prepared for Hargreaves Properties Ltd. Use of, and reliance on, this report by other third parties will be at such third parties own risk, and we are unable to accept any liability or responsibility to third parties.

Neither the whole nor any part of this report, or any reference to it, may be included in any published document circular or statement or published in any way without our prior written approval.

This report and its contents, together with any supporting correspondence or other documentation, remain the property of Subadra Consulting Limited until paid for in full.

ATTACHMENT TWO: BOREHOLE LOGS

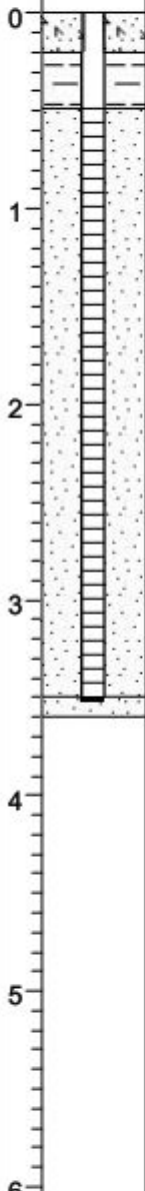
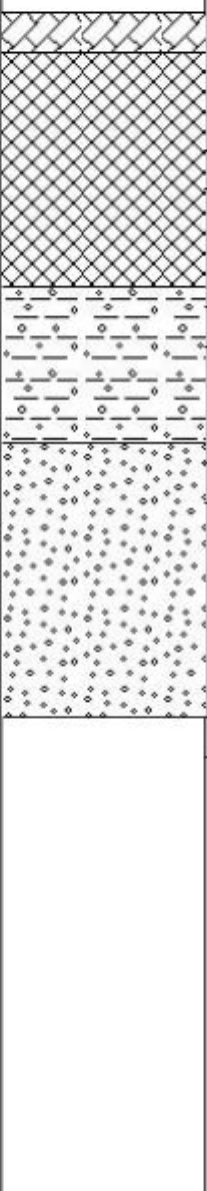
Borehole No. BH101

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Project Name	Retail Park	Date	13th March 2013
Project Code	In12899	Ground Level	~6m AOD
Coordinates	471287 106097	Equipment	Geoprobe 5400 (direct push)

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0		Strike @ ~1.5m Standing @ 1.08m					0.0 to 0.2m Concrete
1				S1			0.2 to 1.4m FIRM brown sandy very gravelly CLAY with frequent flint and brick fragments or layer of MEDIUM DENSE creamy white blocky CHALK (MADE GROUND)
2				S2	TPH		1.4 to 2.2m SOFT to FIRM brown, orange brown or creamy brown sandy gravelly CLAY with frequent flint and chalk fragments (ALLUVIUM / HEAD DEPOSITS)
3				S3			2.2 to 3.6m MEDIUM DENSE creamy brown or grey brown sandy or very sandy clayey flint GRAVEL (RIVER TERRACE DEPOSITS)
4				S4			
5							
6							

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.5m

Groundwater encountered at: ~1.5m

Dwn: TP

Ckd: JS

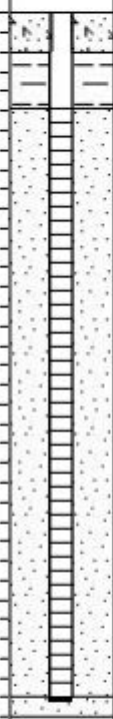
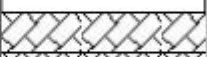
Borehole No. BH102

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Project Name	Retail Park	Date	13th March 2013
Project Code	In12899	Ground Level	~6m AOD
Coordinates	471287 106097	Equipment	Geoprobe 5400 (direct push)

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0		Standing @ 1.1m Strike @ ~2.2m					0.0 to 0.2m Concrete
				S1			0.2 to 1.2m FIRM brown sandy very gravelly CLAY with frequent flint and brick fragments or layer of MEDIUM DENSE creamy white blocky CHALK (MADE GROUND)
1				S2			
				S3	TPH		1.2 to 2.5m SOFT to FIRM brown, orange brown or creamy brown sandy gravelly CLAY with frequent flint (ALLUVIUM / HEAD DEPOSITS)
2				S4	TPH		2.5 to 3.2m MEDIUM DENSE creamy brown or grey brown sandy or very sandy clayey flint GRAVEL (RIVER TERRACE DEPOSITS)
				S5			3.2 to 3.6m FIRM creamy brown or grey very sandy CLAY with frequent flint gravel (RIVER TERRACE DEPOSITS?)
3							
4							
5							
6							

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.5m

Groundwater encountered at: ~2.2m

Dwn: TP

Ckd: JS

Borehole No. BH103

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Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Park	Date	13th March 2013
Project Code	In12899	Ground Level	~6m AOD
Coordinates	471287 106097	Equipment	Geoprobe 5400 (direct push)

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0							0.0 to 0.2m Concrete
				S1			0.2 to 1.3m FIRM brown sandy very gravelly CLAY with frequent flint and brick fragments or layer of MEDIUM DENSE creamy white blocky CHALK. Red brick and crushed concrete layer at 1.0 - 1.3m
1				S2			(MADE GROUND)
				S3	TPH		1.3 to 1.7m SOFT to FIRM brown, orange brown or creamy brown sandy gravelly CLAY with frequent flint
				S4	TPH		(ALLUVIUM / HEAD DEPOSITS)
2				S5			1.7 to 2.0m MEDIUM DENSE creamy brown or grey brown sandy or very sandy clayey flint GRAVEL (wet)
				S6			(RIVER TERRACE DEPOSITS)
3							2.0 to 3.0m FIRM creamy brown or grey very sandy CLAY with frequent flint gravel
							(RIVER TERRACE DEPOSITS?)
4							3.0 to 3.6m MEDIUM DENSE creamy brown or grey brown sandy or very sandy clayey flint GRAVEL (wet)
							(RIVER TERRACE DEPOSITS)
5							
6							

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.5m

Groundwater encountered at: ~1.8m

Dwn: TP

Ckd: JS

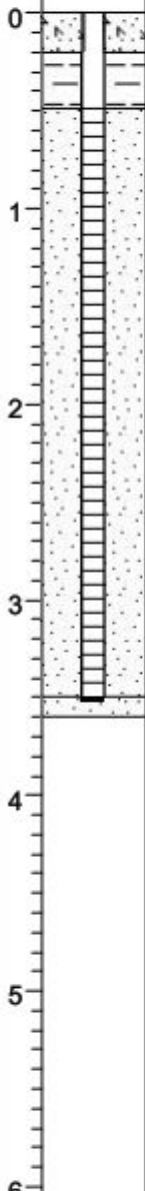
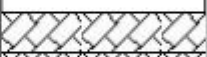
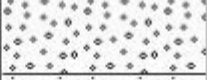
Borehole No. BH104

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Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Park	Date	13th March 2013
Project Code	In12899	Ground Level	~6m AOD
Coordinates	471287 106097	Equipment	Geoprobe 5400 (direct push)

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0		Strike @ ~1.8m Standing @ 1.07m					0.0 to 0.2m Concrete
				S1			0.2 to 1.8m FIRM brown sandy very gravelly CLAY with frequent flint and brick fragments or layer of MEDIUM DENSE creamy white blocky CHALK. (MADE GROUND)
1				S2			
							
2				S3	TPH		1.8 to 2.6m MEDIUM DENSE creamy brown or grey brown sandy or very sandy clayey flint GRAVEL (wet) (RIVER TERRACE DEPOSITS)
							2.6 to 3.6m FIRM creamy brown or grey very sandy very gravelly CLAY with frequent flint gravel (RIVER TERRACE DEPOSITS?)
3				S4			
							
4							
5							
6							

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.5m

Groundwater encountered at: ~1.8m

Dwn: TP

Ckd: JS

Borehole No. BH105

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Park	Date	13th March 2013
Project Code	In12899	Ground Level	~6m AOD
Coordinates	471287 106097	Equipment	Geoprobe 5400 (direct push)

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0		Strike @ ~1.7m Standing @ 1.12m					0.0 to 0.2m Concrete
1				S1			0.2 to 1.8m FIRM brown sandy very gravelly CLAY with frequent flint and brick fragments or layer of MEDIUM DENSE creamy white blocky CHALK. (MADE GROUND)
2				S2	TPH		1.8 to 2.5m MEDIUM DENSE creamy brown or grey brown sandy or very sandy clayey flint GRAVEL (wet) (RIVER TERRACE DEPOSITS)
3				S3			2.5 to 3.6m FIRM creamy brown or grey very sandy very gravelly CLAY with frequent flint gravel (RIVER TERRACE DEPOSITS?)
4							
5							
6							

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.5m

Groundwater encountered at: ~1.7m

Dwn: TP

Ckd: JS

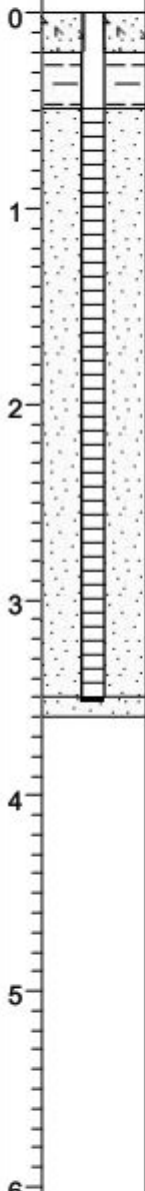
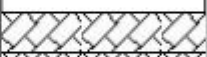
Borehole No. BH106

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park, Stoke Mandeville
Tel. 01296 739400 Fax. 01296 739401.

Project Name	Retail Park	Date	13th March 2013
Project Code	In12899	Ground Level	~6m AOD
Coordinates	471287 106097	Equipment	Geoprobe 5400 (direct push)

Depth (m)	Monitoring Well	Water Level	Log	Sample	Chemical Analysis Scheduled	SPT ('N') or Su (kPa)	Description
0		Strike @ ~1.6m Standing @ 1.18m					0.0 to 0.2m Concrete
				S1			0.2 to 1.2m FIRM brown sandy very gravelly CLAY with frequent flint and brick fragments or layer of MEDIUM DENSE creamy white blocky CHALK. Layer of crushed concrete and brick at 0.7 - 1.2m
				S2			(MADE GROUND)
1				S3	TPH		1.2 to 2.0m FIRM creamy brown or grey very sandy very gravelly CLAY with frequent flint gravel (ALLUVIUM / HEAD DEPOSITS)
2				S4			2.0 to 3.6m LOOSE to MEDIUM DENSE creamy brown or grey brown sandy or very sandy clayey flint GRAVEL (wet) (RIVER TERRACE DEPOSITS)
3							
4							
5							
6							

Borehole terminated at: 3.6m

Hydrocarbon odour/staining: None noted

Groundwater monitoring well installed to: ~3.5m

Groundwater encountered at: ~1.6m

Dwn: TP

Ckd: JS

ATTACHMENT THREE: CHEMICAL ANALYSIS DATA

Laboratory Analysis Report

Report Number 003959

Sampling Date 18th March 2013

Report Date 26th March 2013

Client	Site Name/Address
Hargreaves Properties Ltd Rustington House Worthing Road Rustington West Sussex BN16 3PS	Retail Unit, Havent

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
8	Soil	IH QM:E9.5 based on TNRCC 1005 by GC-FID	RT Corp	Yes	No

QM E9.5: IH TPH Banded method C8 - C35 - Solvent (pentane) extraction then Liquid injection into GC-FID.
Samples were received 18-3-13
Samples were prepared and analysed 20-3-13

Analysis Report Approved By

Katherine Clark

Duty Reporting Manager



Glossary of Terms Used in This Report

Blank - A sample known to contain none of the compounds being analysed, and used to confirm that the analytical instrument is not giving false positives during analysis.

Blind Testing: Name of any blind testing scheme participated in. The laboratory's accuracy is reported as a Z score; the lower the Z score the more accurate the analysis, with a score of less than 2 considered excellent.

CRM - Certified Reference Material. A sample prepared by an accredited source and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Duplicate - A duplicate sample, used to give a measure of the repeatability of a given analysis.

External Calibration - External calibration samples are samples containing a known concentration of the compounds being analysed. They are added to the analysis sequence after every nth sample being analysed and provide confirmation that the instrument remains within its calibration range.

IRM - In house reference material. A sample prepared by our laboratory and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Linearity - The linearity of a given analytical method is the range of concentrations between which the analytical instrument's response is directly proportional to the concentration being analysed, and hence the range of concentrations that the instrument can be said to give quantitative results.

LOD - The lowest response for any given compound generated at the instrument's detector, that can be differentiated from the instrument's baseline noise.

LOQ - Limit of quantification. This is the lowest concentration that a given compound can be both detected and its concentration accurately measured in a sample.

MCERTS - An accreditation scheme created by the Environment Agency for the analysis of soil samples used to determine land quality. The scheme does not apply to analysis of soil samples used for waste classification purposes or to the analysis of water samples.

Method Calibration - The means by which an analytical method is calibrated. Usually this involves analysing a number of external calibration samples, containing different concentrations of the compounds to be analysed.

Precision - A measure of the repeatability of the analysis.

Sample - The material provided by the client to the laboratory for analysis.

Sensitivity - The smallest increment in analytical result that can be reliably quantified.

Spike - Also known as an internal calibration, a spike sample is a sample to be analysed which has a known concentration of another compound added. This provides a check on that the compounds being analysed are being correctly extracted from the sample matrix.

UKAS - The UK's implementation of ISO 17025, the international standard accreditation for laboratory analysis

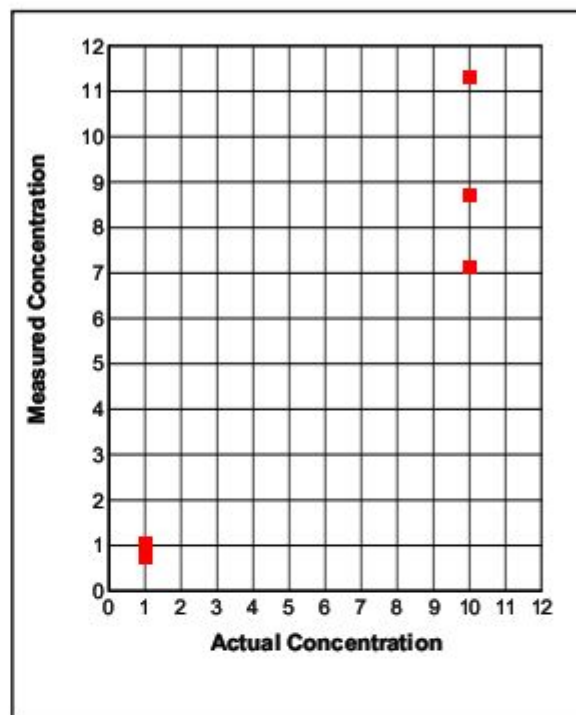
Quality Control/Quality Assurance Information

TPH Banded - Soil

Our laboratory carries out a wide variety of verification analyses in order to ensure the validity of the analysis results we produce.

Samples are analysed in batches, usually according to the sample chain of custody form we receive. However, we also add additional samples into the sample sequence. These additional samples may include blanks, calibration samples, in-house reference material samples and duplicate samples. In addition to this, each sample is 'spiked' with a known concentration of a compound. In the case of this analysis, we use a combination of 2-fluorobiphenyl and 1-chlorooctadecane. The results of the analyses we have carried out on the additional quality assurance samples during the ten days prior to the samples reported here are shown in the accompanying graphs. Results are reported in mg/kg for the C8-C10 band.

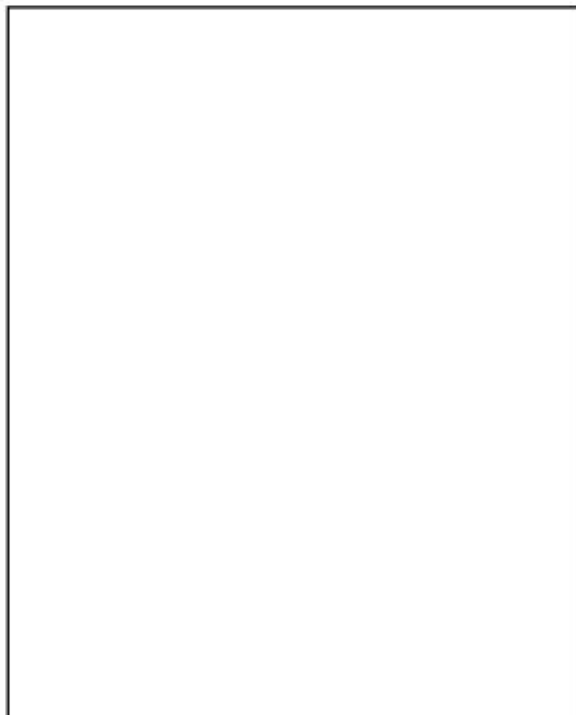
These provide a visual indication of the stability of our laboratory analysis.



Calibration Samples - Previous 10 days



Spike Samples - Previous 10 days



Reference Material - Previous 10 days

Retail Unit, Havent

Summary of Results

TPH Banded - Soil

Accreditation	UKAS	Blind Testing	RT Corp		
Results Reported As	Dry Weight	Last Three Z Scores	-1.18	-1.24	-0.36

Analysis Method Parameters			
Reporting Units	mg/kg	Limit of Detection	0.05mg/kg
Linearity	2,000mg/kg	Limit of Quantification	0.1mg/kg
Sensitivity	0.1mg/kg	Precision	+/-0.1mg/kg

Sample Location	Sample	Depth	Total Petroleum Hydrocarbons				
			C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
BH101/2	sln12899.002001	1.50	<0.5	<0.5	<0.5	<0.5	<0.5
BH102/3	sln12899.002002	1.80	<0.5	<0.5	<0.5	<0.5	<0.5
BH102/4	sln12899.002003	2.80	<0.5	<0.5	<0.5	<0.5	<0.5
BH103/3	sln12899.002004	1.50	<0.5	<0.5	<0.5	<0.5	<0.5
BH103/4	sln12899.002005	1.80	<0.5	<0.5	<0.5	<0.5	<0.5
BH104/3	sln12899.002006	2.00	<0.5	<0.5	<0.5	<0.5	<0.5
BH105/2	sln12899.002007	2.00	<0.5	<0.5	<0.5	<0.5	<0.5
BH106/3	sln12899.002008	1.50	<0.5	<0.5	<0.5	<0.5	<0.5

Retail Unit, Havent

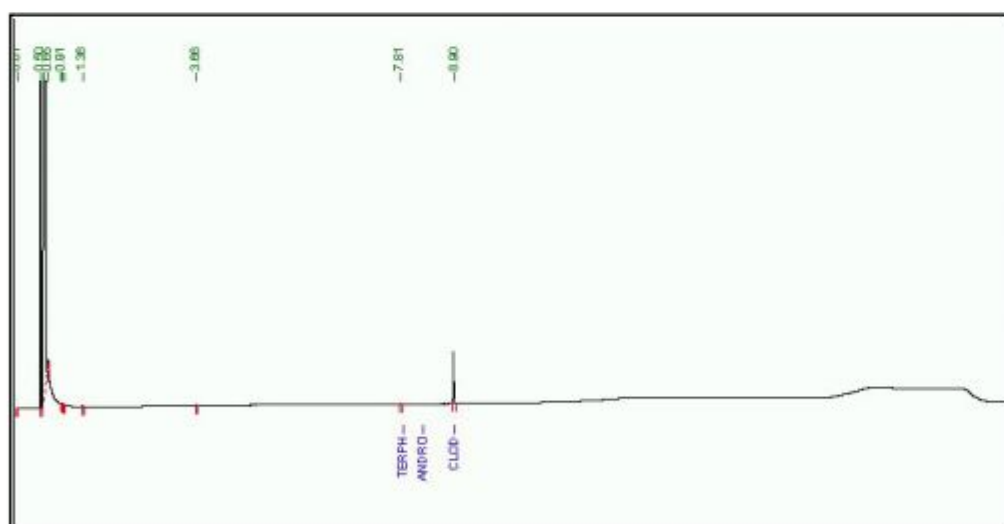
Individual Sample Results

TPH Banded - Soil

Sample Location	BH101/2	Results Reported As	Dry Weight
Sample	sln12899.002001	Reporting Units	mg/kg
Depth(m)	1.50	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	21/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.43	29.69	21.61	10	10.05	1.05	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

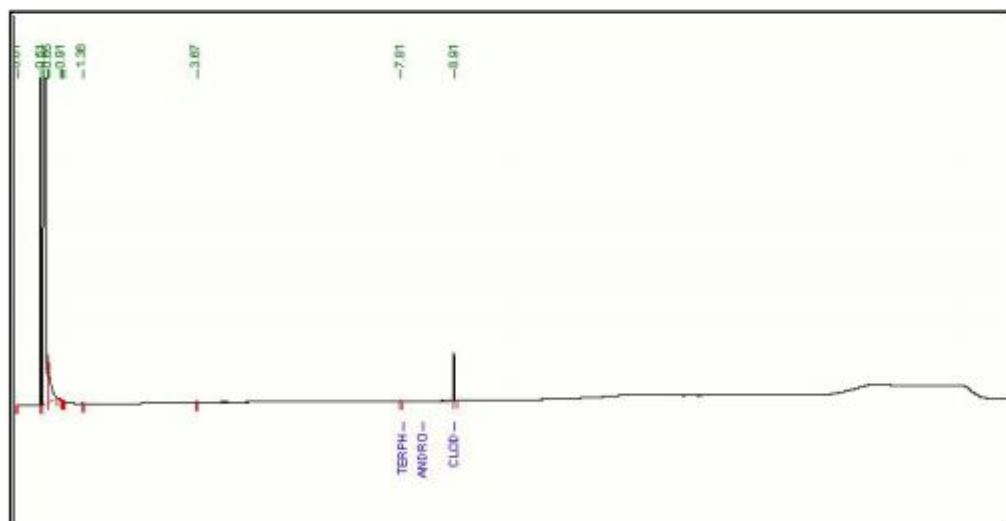
Individual Sample Results

TPH Banded - Soil

Sample Location	BH102/3	Results Reported As	Dry Weight
Sample	sln12899.002002	Reporting Units	mg/kg
Depth(m)	1.80	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	21/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.40	30.28	16.17	10	10.47	0.92	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

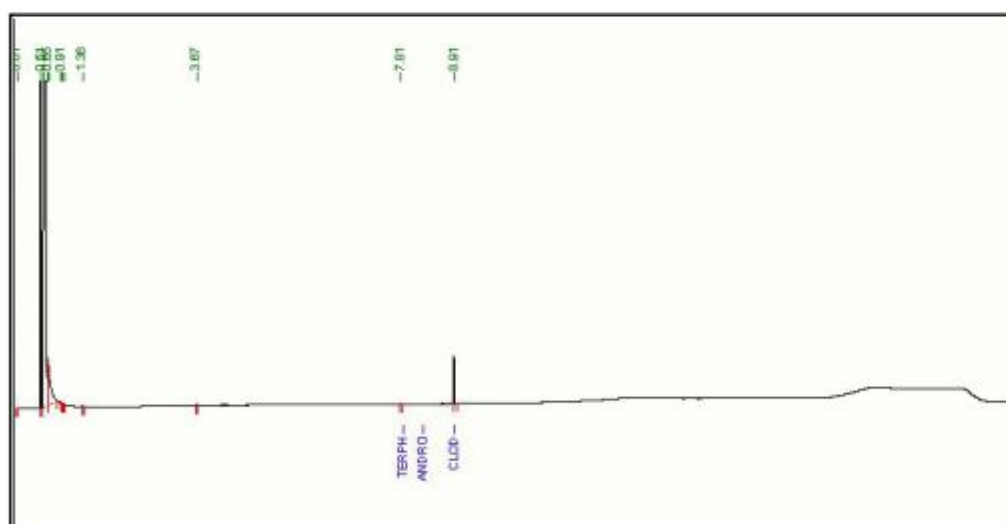
Individual Sample Results

TPH Banded - Soil

Sample Location	BH102/4	Results Reported As	Dry Weight
Sample	sln12899.002003	Reporting Units	mg/kg
Depth(m)	2.80	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	21/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.07	29.69	18.71	10	10.08	0.89	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

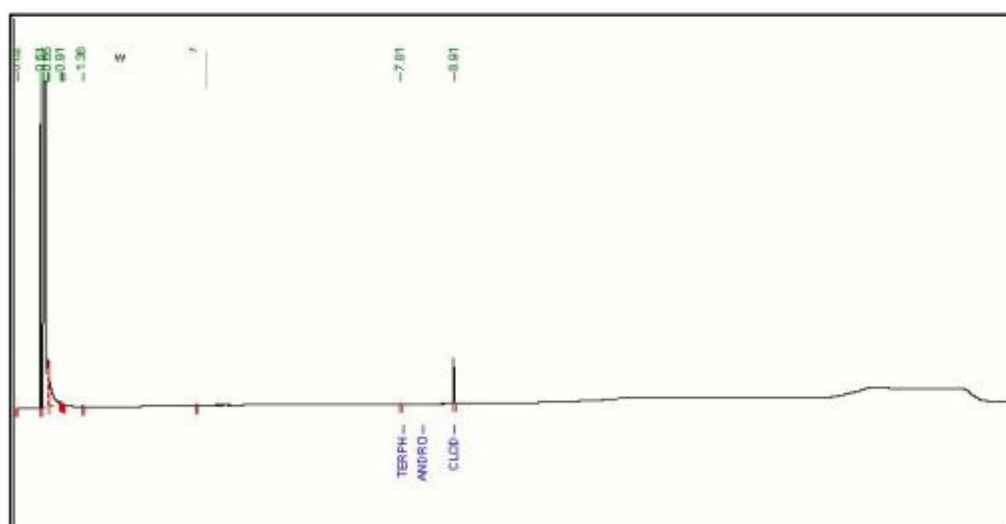
Individual Sample Results

TPH Banded - Soil

Sample Location	BH103/3	Results Reported As	Dry Weight
Sample	sln12899.002004	Reporting Units	mg/kg
Depth(m)	1.50	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	22/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.33	25.65	79.24	10	10.28	0.90	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

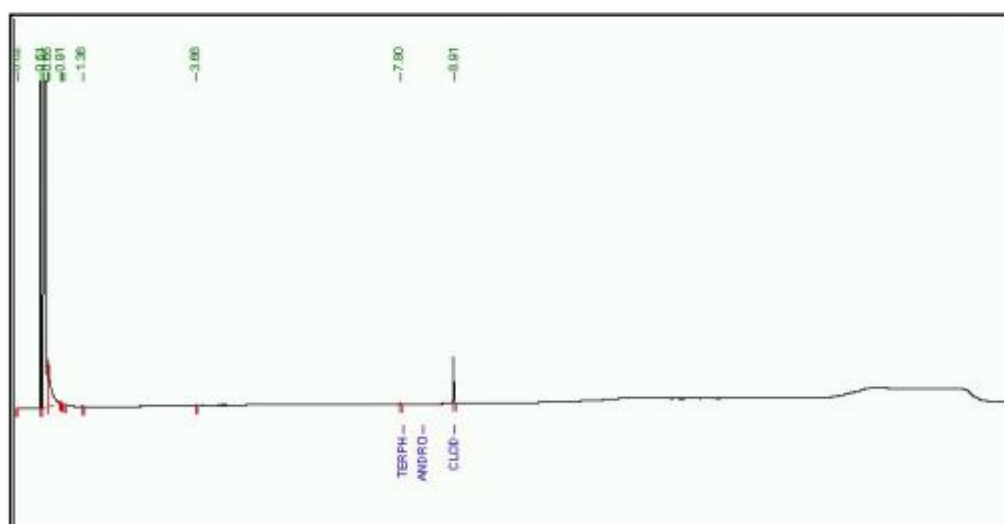
Individual Sample Results

TPH Banded - Soil

Sample Location	BH103/4	Results Reported As	Dry Weight
Sample	sln12899.002005	Reporting Units	mg/kg
Depth(m)	1.80	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	22/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
32.24	29.53	21.73	10	10.3	0.89	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

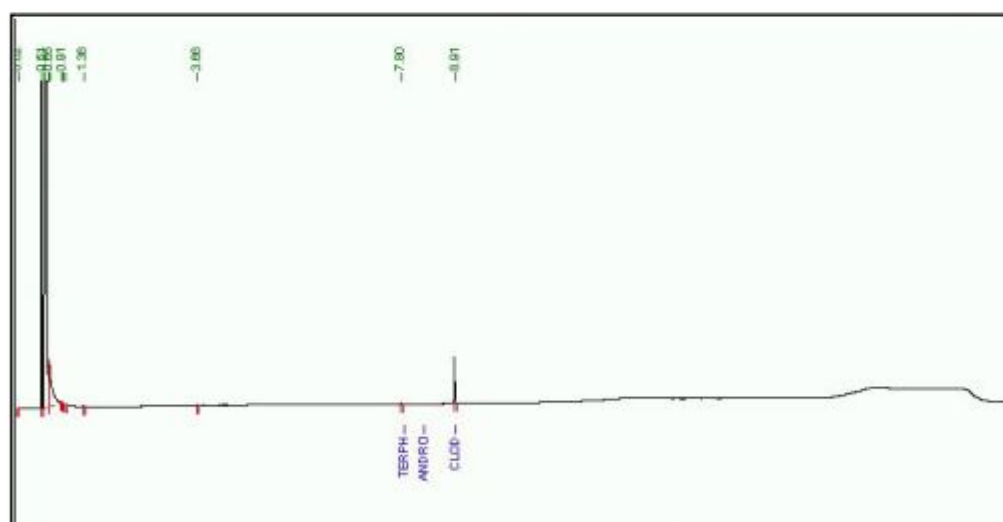
Individual Sample Results

TPH Banded - Soil

Sample Location	BH104/3	Results Reported As	Dry Weight
Sample	sln12899.002006	Reporting Units	mg/kg
Depth(m)	2.00	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	22/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
41.82	39.38	19.14	10	10.35	0.73	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

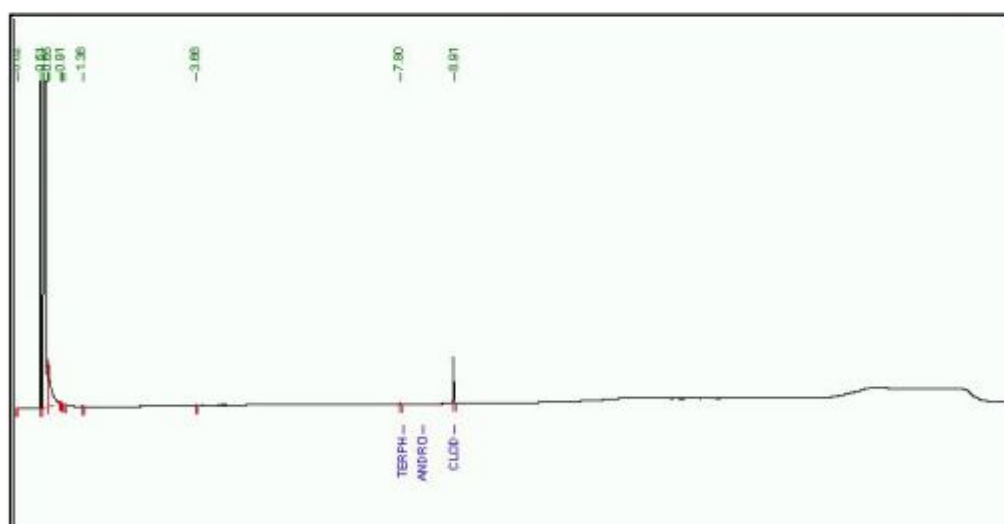
Individual Sample Results

TPH Banded - Soil

Sample Location	BH105/2	Results Reported As	Dry Weight
Sample	sln12899.002007	Reporting Units	mg/kg
Depth(m)	2.00	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	22/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
42.48	40.28	16.62	10	10.41	0.97	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

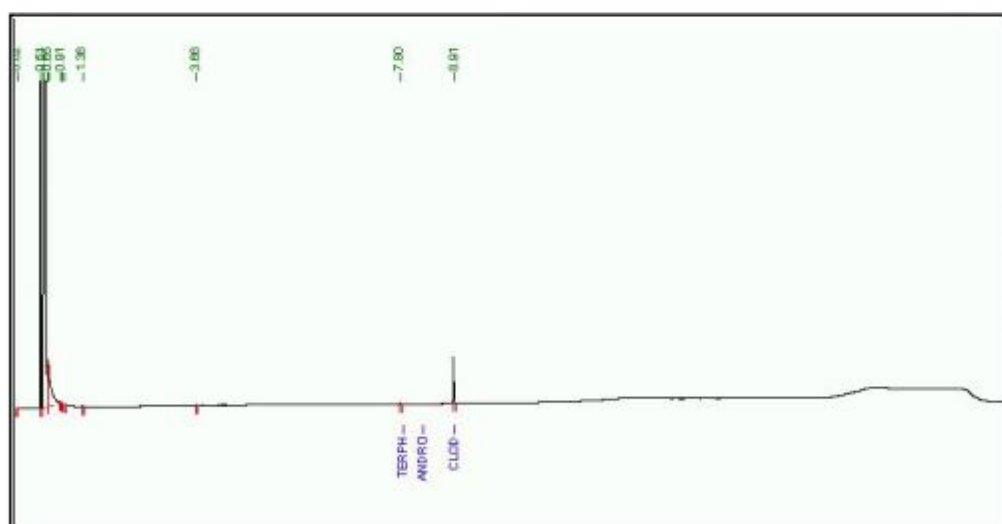
Individual Sample Results

TPH Banded - Soil

Sample Location	BH106/3	Results Reported As	Dry Weight
Sample	sln12899.002008	Reporting Units	mg/kg
Depth(m)	1.50	Date Received	20/03/2013
Chain of Custody No.	6,773	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	22/03/2013

Moisture Content			VES (ml)	ES (g)	CRF	BSV	Results				
WW (g)	DW (g)	MC (%)					C8-C10	>C10- C12	>C12-C16	>C16-C21	>C21-C35
42.03	39.87	16.76	10	10.31	0.95	0.00	<0.5	<0.5	<0.5	<0.5	<0.5

Note: WW denotes wet weight; DW denotes dry weight; MC denotes moisture content; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

End of Report

Laboratory Analysis Report

Report Number 003955

Sampling Date 18th March 2013

Report Date 26th March 2013

Client	Site Name/Address
Hargreaves Properties Ltd Rustington House Worthing Road Rustington West Sussex BN16 3PS	Retail Unit, Havent

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
3	Soil	IH QM:E9.4 based on US EPA 5021 by GC-FID	RT Corp	Yes	No

QM E9.4: In-House BTEX by Headspace method - Liquid-Gas extraction using headspace then Gas injection into GC-FID.

Samples were received 18-3-13

Samples were prepared and analysed 20-3-13

Analysis Report Approved By

Katherine Clark

Duty Reporting Manager



Glossary of Terms Used in This Report

Blank - A sample known to contain none of the compounds being analysed, and used to confirm that the analytical instrument is not giving false positives during analysis.

Blind Testing: Name of any blind testing scheme participated in. The laboratory's accuracy is reported as a Z score; the lower the Z score the more accurate the analysis, with a score of less than 2 considered excellent.

CRM - Certified Reference Material. A sample prepared by an accredited source and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Duplicate - A duplicate sample, used to give a measure of the repeatability of a given analysis.

External Calibration - External calibration samples are samples containing a known concentration of the compounds being analysed. They are added to the analysis sequence after every nth sample being analysed and provide confirmation that the instrument remains within its calibration range.

IRM - In house reference material. A sample prepared by our laboratory and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Linearity - The linearity of a given analytical method is the range of concentrations between which the analytical instrument's response is directly proportional to the concentration being analysed, and hence the range of concentrations that the instrument can be said to give quantitative results.

LOD - The lowest response for any given compound generated at the instrument's detector, that can be differentiated from the instrument's baseline noise.

LOQ - Limit of quantification. This is the lowest concentration that a given compound can be both detected and its concentration accurately measured in a sample.

MCERTS - An accreditation scheme created by the Environment Agency for the analysis of soil samples used to determine land quality. The scheme does not apply to analysis of soil samples used for waste classification purposes or to the analysis of water samples.

Method Calibration - The means by which an analytical method is calibrated. Usually this involves analysing a number of external calibration samples, containing different concentrations of the compounds to be analysed.

Precision - A measure of the repeatability of the analysis.

Sample - The material provided by the client to the laboratory for analysis.

Sensitivity - The smallest increment in analytical result that can be reliably quantified.

Spike - Also known as an internal calibration, a spike sample is a sample to be analysed which has a known concentration of another compound added. This provides a check on that the compounds being analysed are being correctly extracted from the sample matrix.

UKAS - The UK's implementation of ISO 17025, the international standard accreditation for laboratory analysis

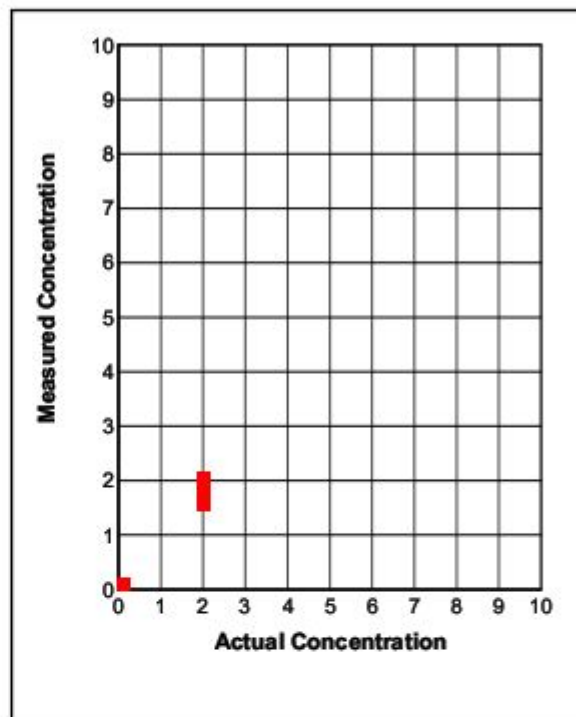
Quality Control/Quality Assurance Information

BTEX by Headspace - Soil

Our laboratory carries out a wide variety of verification analyses in order to ensure the validity of the analysis results we produce.

Samples are analysed in batches, usually according to the sample chain of custody form we receive. However, we also add additional samples into the sample sequence. These additional samples may include blanks, calibration samples, in-house reference material samples and duplicate samples. In addition to this each sample being analysed is 'spiked' with a known concentration of a compound. In the case of BTEX analyses, we use bromobenzene to spike the samples.

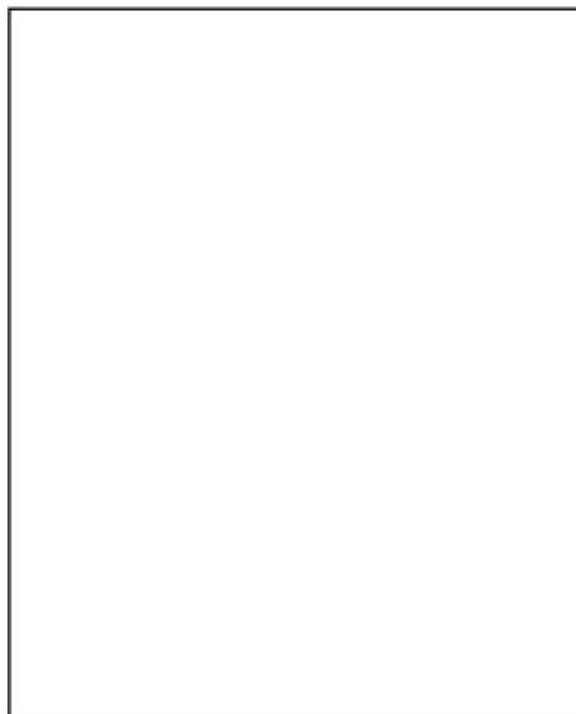
The results of the benzene analyses we have carried out on the additional quality assurance samples during the ten days prior to the samples reported here are shown in the accompanying graphs. Results are reported in mg/kg. These provide a visual indication of the stability of our laboratory analysis.



Calibration Samples - Previous 10 days



Spike Samples - Previous 10 days



Reference Material - Previous 10 days

Retail Unit, Havent

Summary of Results

BTEX by Headspace - Soil

Accreditation	UKAS	Blind Testing	RT Corp		
Results Reported As	Dry Weight	Last Three Z Scores	-0.86	0.01	-2.39

Analysis Method Parameters			
Reporting Units	mg/kg	Limit of Detection	0.01 mg/kg
Linearity	0.02 - 10.0 mg/kg	Limit of Quantification	0.02 mg/kg
Sensitivity	0.1 mg/kg	Precision	+/- 0.1 mg/kg

Sample Location	Sample	Depth	Benzene	Ethyl-Benzene	Toluene	m+p Xylenes	o-Xylene
BH102/3	sln12899.001002	1.80	<0.1	<0.1	<0.1	<0.1	<0.1
BH103/4	sln12899.001005	1.80	<0.1	<0.1	<0.1	<0.1	<0.1
BH105/2	sln12899.001007	2.00	<0.1	<0.1	<0.1	<0.1	<0.1

Sample Location	Sample	Depth	Total Petroleum Hydrocarbons			
			C6-C8	>C8-C10	>C10-C12	>C12-C15
BH102/3	sln12899.001002	1.80	<0.5	<0.5	<0.5	<0.5
BH103/4	sln12899.001005	1.80	<0.5	<0.5	<0.5	<0.5
BH105/2	sln12899.001007	2.00	<0.5	<0.5	<0.5	<0.5

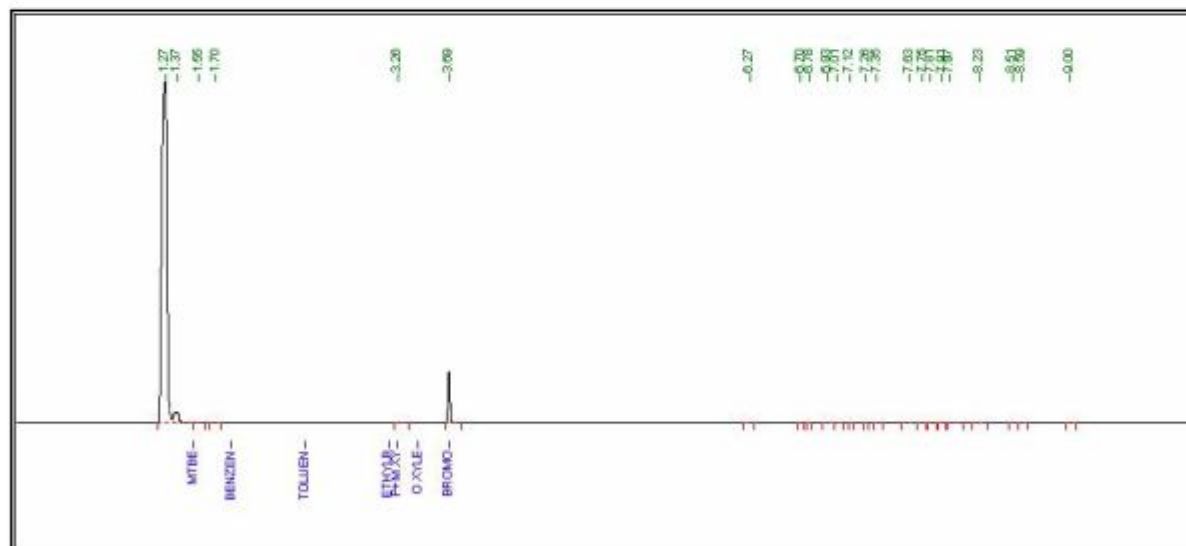
Retail Unit, Havent

Individual Sample Results

BTEX By Headspace - Soil

Sample Location	BH102/3	Results Reported As	Dry Weight
Sample	sln12899.001002	Reporting Units	mg/kg
Depth(m)	1.80	Date Received	20/03/2013
Chain of Custody No.	6772	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	21/03/2013

Moisture Content (%)	Results								
	Benzene	Ethyl-Benzene	Toluene	m+p Xylene	o Xylene	C6-C8	>C8-C10	>C10-C12	>C12-C15
16.17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5



Gas Chromatogram for Sample

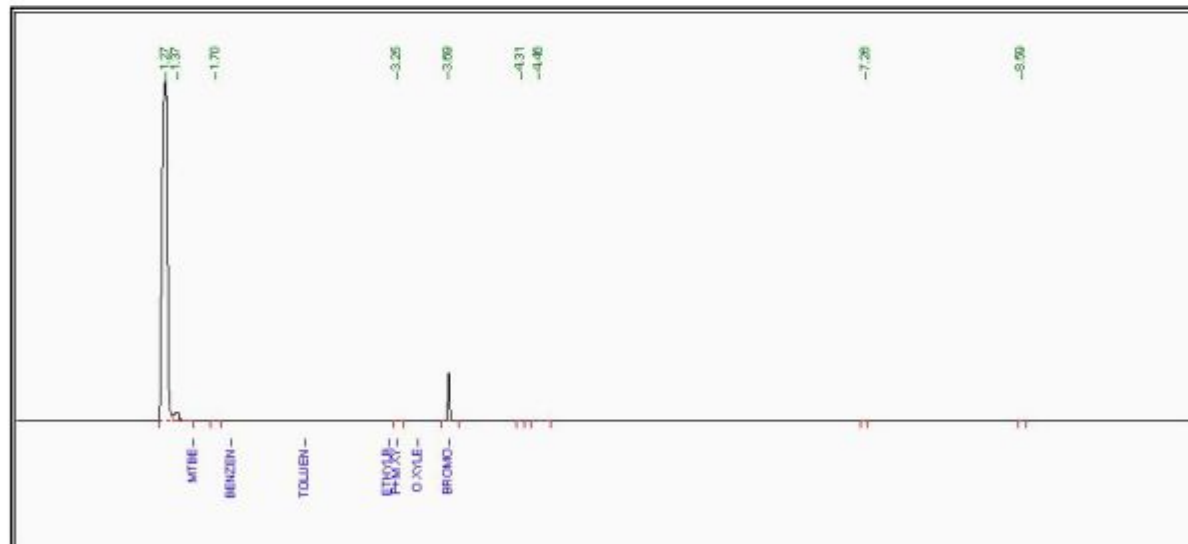
Retail Unit, Havent

Individual Sample Results

BTEX By Headspace - Soil

Sample Location	BH103/4	Results Reported As	Dry Weight
Sample	sln12899.001005	Reporting Units	mg/kg
Depth(m)	1.80	Date Received	20/03/2013
Chain of Custody No.	6772	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	22/03/2013

Moisture Content (%)	Results								
	Benzene	Ethyl-Benzene	Toluene	m+p Xylene	o Xylene	C6-C8	>C8-C10	>C10-C12	>C12-C15
21.73	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5



Gas Chromatogram for Sample

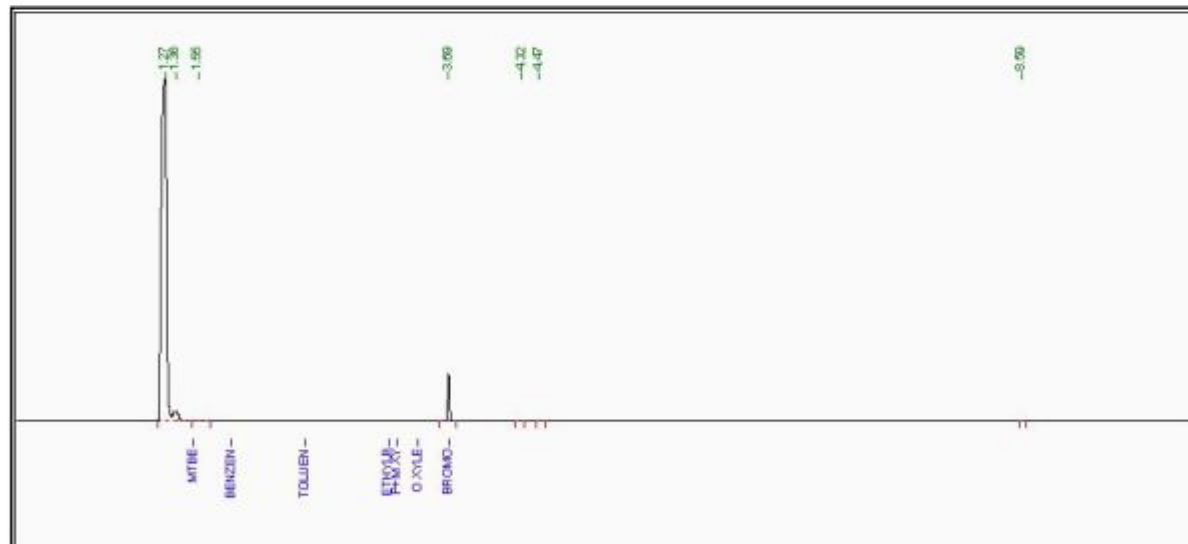
Retail Unit, Havent

Individual Sample Results

BTEX By Headspace - Soil

Sample Location	BH105/2	Results Reported As	Dry Weight
Sample	sln12899.001007	Reporting Units	mg/kg
Depth(m)	2.00	Date Received	20/03/2013
Chain of Custody No.	6772	Date of Sampling	18/03/2013
Accreditation	UKAS	Date of Analysis	21/03/2013

Moisture Content (%)	Results								
	Benzene	Ethyl-Benzene	Toluene	m+p Xylene	o Xylene	C6-C8	>C8-C10	>C10-C12	>C12-C15
16.62	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5



Gas Chromatogram for Sample

Retail Unit, Havent

End of Report

Laboratory Analysis Report

Report Number 003964

Sampling Date 21st March 2013

Report Date 26th March 2013

Client	Site Name/Address
Hargreaves Properties Ltd Rustington House Worthing Road Rustington West Sussex BN16 3PS	Retail Unit, Havent

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
9	Water	IH QM:E9.5 based on TNRCC 1005 by GC-FID	RTCorp	Yes	No

QM E9.5: IH TPH Banded method C8 - C35 - Solvent (pentane) extraction then Liquid injection into GC-FID.
Samples were received 21-3-13
Samples were prepared and analysed 25-3-13

Analysis Report Approved By

Katherine Clark
Duty Reporting Manager



Glossary of Terms Used in This Report

Blank - A sample known to contain none of the compounds being analysed, and used to confirm that the analytical instrument is not giving false positives during analysis.

Blind Testing: Name of any blind testing scheme participated in. The laboratory's accuracy is reported as a Z score; the lower the Z score the more accurate the analysis, with a score of less than 2 considered excellent.

CRM - Certified Reference Material. A sample prepared by an accredited source and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Duplicate - A duplicate sample, used to give a measure of the repeatability of a given analysis.

External Calibration - External calibration samples are samples containing a known concentration of the compounds being analysed. They are added to the analysis sequence after every nth sample being analysed and provide confirmation that the instrument remains within its calibration range.

Field Blank - Similar to a blank sample, except a field blank accompanies the samples throughout their existence (i.e. from the site being sampled to the laboratory) and used to provide a check that the samples aren't being cross-contaminated during the transportation/storage process.

IRM - In house reference material. A sample prepared by our laboratory and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Linearity - The linearity of a given analytical method is the range of concentrations between which the analytical instrument's response is directly proportional to the concentration being analysed, and hence the range of concentrations that the instrument can be said to give quantitative results.

LOD - Limit of detection. This is the lowest response for any given compound generated at the instrument's detector, that can be differentiated from the instrument's baseline noise.

LOQ - Limit of quantification. This is the lowest concentration that a given compound can be both detected and its concentration accurately measured in a sample.

MCERTS - An accreditation scheme created by the Environment Agency for the analysis of soil samples used to determine land quality. The scheme does not apply to analysis of soil samples used for waste classification purposes or to the analysis of water samples.

Method Calibration - The means by which an analytical method is calibrated. Usually this involves analysing a number of external calibration samples, containing different concentrations of the compounds to be analysed.

Precision - A measure of the repeatability of the analysis.

Sample - The material provided by the client to the laboratory for analysis.

Sensitivity - The smallest increment in analytical result that can be reliably quantified.

Spike - Also known as an internal calibration, a spike sample is a sample to be analysed which has a known concentration of another compound added. This provides a check on that the compounds being analysed are being correctly extracted from the sample matrix.

UKAS - The UK's implementation of ISO 17025, the international standard accreditation for laboratory analysis

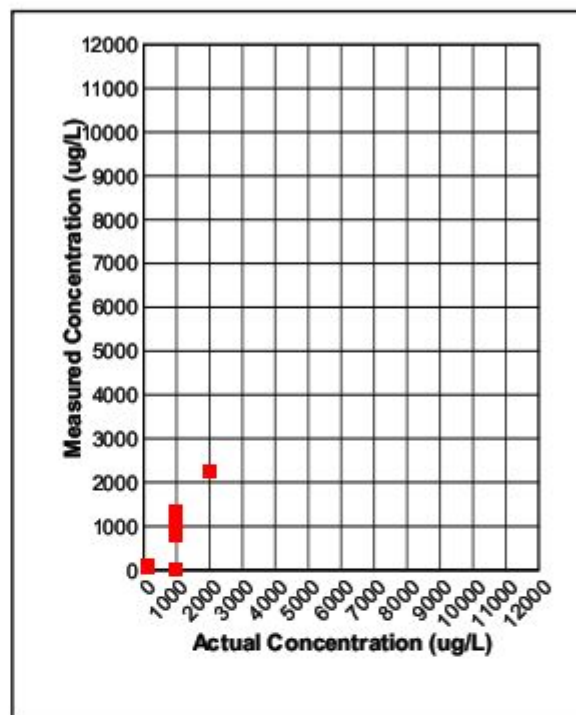
Quality Control/Quality Assurance Information

TPH Banded - Water

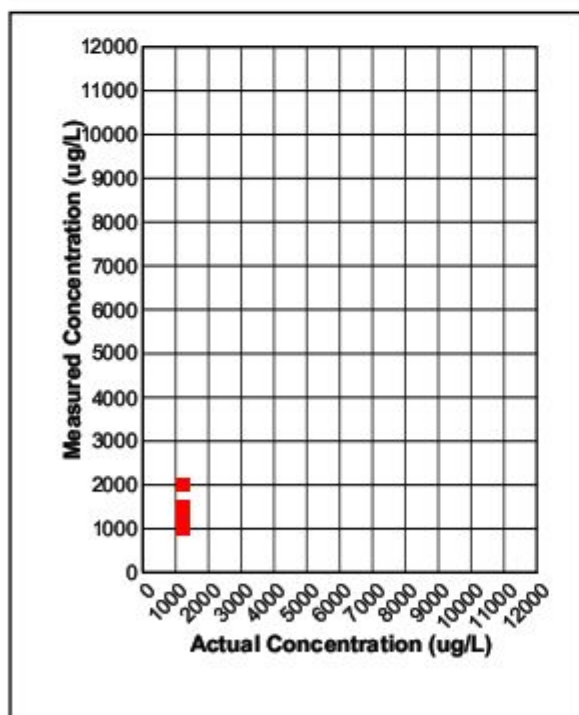
Our laboratory carries out a wide variety of verification analyses in order to ensure the validity of the analysis results we produce.

Samples are analysed in batches, usually according to the sample chain of custody form we receive. However, we also add additional samples into the sample sequence. These additional samples may include blanks, calibration samples, in-house reference material samples and duplicate samples. In addition to this, each sample is 'spiked' with a known concentration of a compound. In the case of this analysis, we use a combination of

2-fluorobiphenyl and 1-chlorooctadecane. The results of the analyses we have carried out on the additional quality assurance samples during the ten days prior to the samples reported here are shown in the accompanying graphs. Results are reported in ug/litre for the C8-C10 band. These provide a visual indication of the stability of our laboratory analysis.



Calibration Samples - Previous 10 days



Spike Samples - Previous 10 days

Retail Unit, Havent

Summary of Results

TPH Banded - Water

Accreditation	UKAS	Blind Testing	RTCorp		
Results Reported As	Not Applicable	Last Three Z Scores	-0.08	-1.06	-0.09

Analysis Method Parameters			
Reporting Units	µg/litre	Limit of Detection	5ug/litre
Linearity	10-10,000 ug/litre	Limit of Quantification	10 ug/litre
Sensitivity	100 ug/litre	Precision	+/-1.0ug/litre

Sample Location	Sample	Depth	Total Petroleum Hydrocarbons				
			C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
BH4	wln12899.002001	0.98	<10	<10	<10	<10	<10
BH6	wln12899.002002	0.89	<10	<10	<10	<10	<10
BH8	wln12899.002003	1.18	<10	<10	<10	<10	<10
BH101	wln12899.002004	1.08	<10	<10	<10	<10	<10
BH102	wln12899.002005	1.10	<10	<10	<10	<10	<10
BH103	wln12899.002006	1.05	<10	<10	<10	<10	<10
BH104	wln12899.002007	1.07	<10	<10	<10	<10	<10
BH105	wln12899.002008	1.13	<10	<10	<10	<10	<10
BH106	wln12899.002009	1.18	<10	<10	<10	<10	<10

Retail Unit, Havent

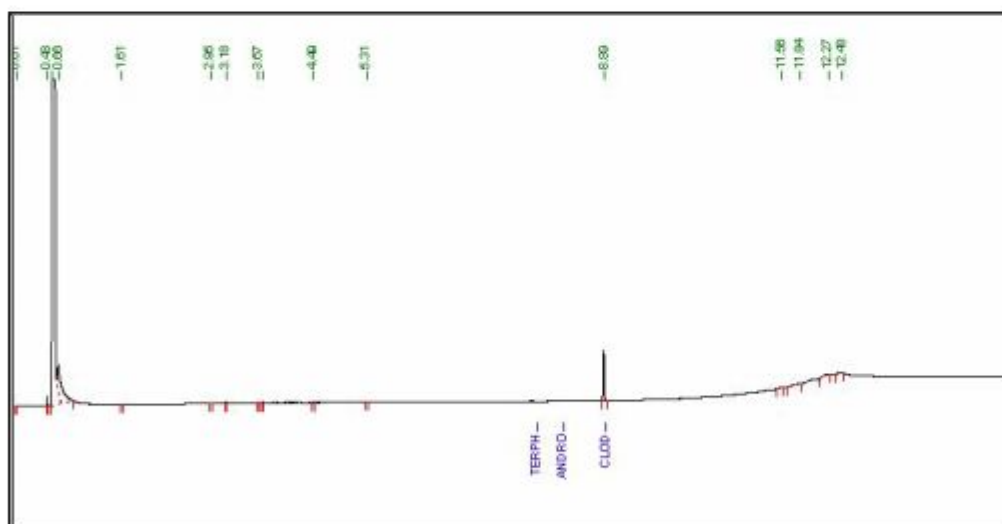
Individual Sample Results

TPH Banded - Water

Sample Location	BH4	Results Reported As	Not Applicable
Sample	wln12899.002001	Reporting Units	ug/litre
Depth(m)	0.98	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	125.05	1.17	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

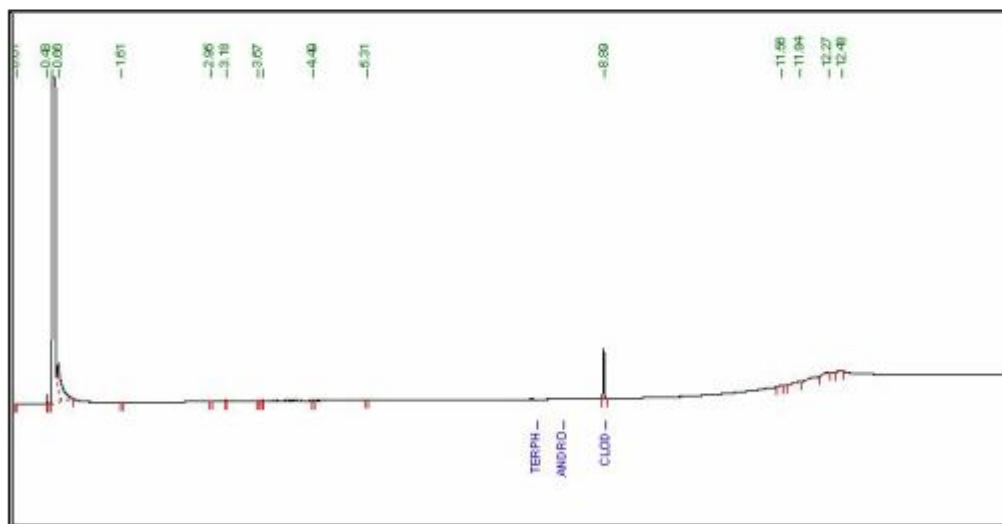
Individual Sample Results

TPH Banded - Water

Sample Location	BH6	Results Reported As	NotApplicable
Sample	win12899.002002	Reporting Units	ug/litre
Depth(m)	0.89	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.81	1.34	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

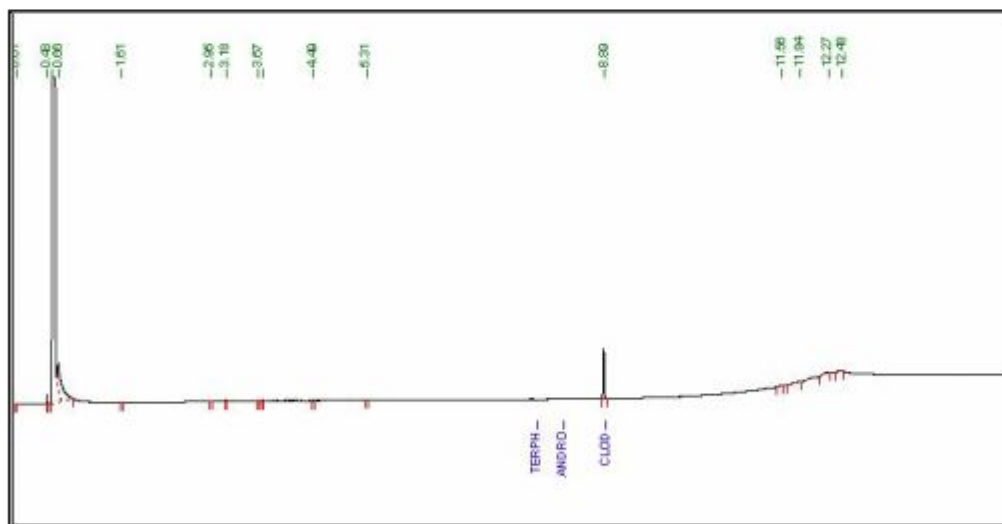
Individual Sample Results

TPH Banded - Water

Sample Location	BH8	Results Reported As	NotApplicable
Sample	win12899.002003	Reporting Units	ug/litre
Depth(m)	1.18	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.86	1.13	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

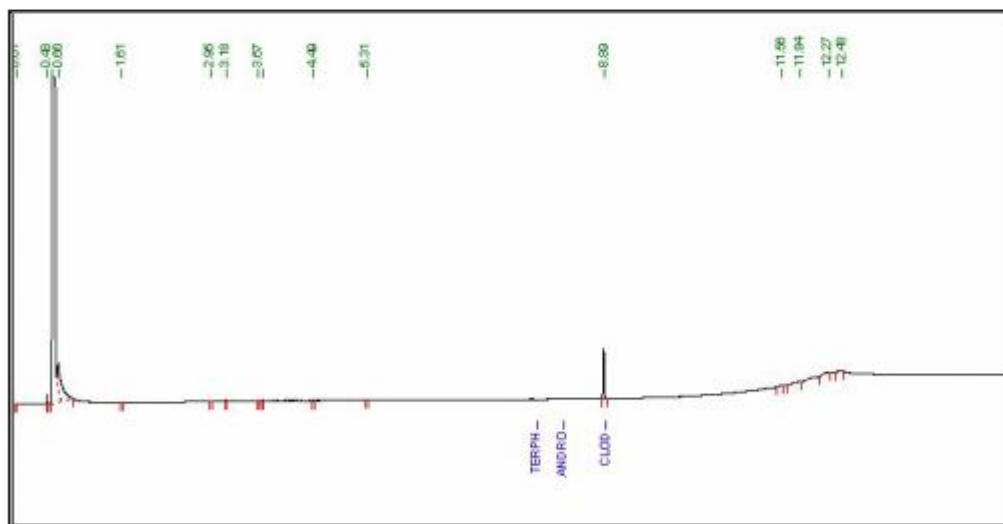
Individual Sample Results

TPH Banded - Water

Sample Location	BH101	Results Reported As	NotApplicable
Sample	win12899.002004	Reporting Units	ug/litre
Depth(m)	1.08	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.98	1.16	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

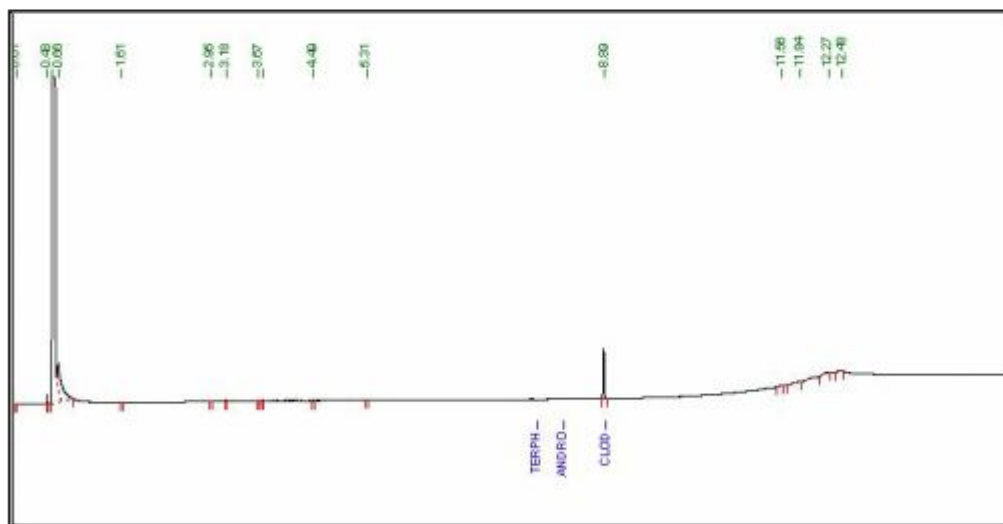
Individual Sample Results

TPH Banded - Water

Sample Location	BH102	Results Reported As	NotApplicable
Sample	win12899.002005	Reporting Units	ug/litre
Depth(m)	1.10	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.16	1.09	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

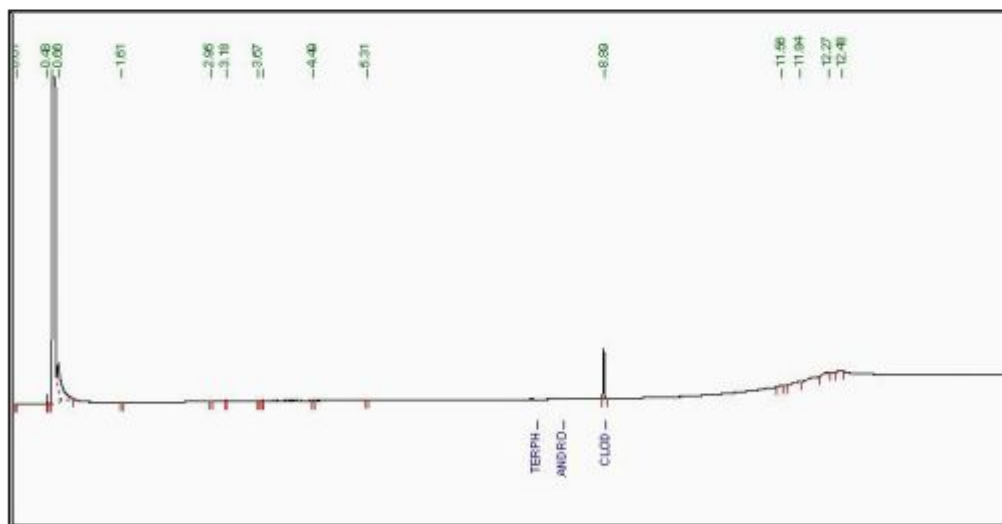
Individual Sample Results

TPH Banded - Water

Sample Location	BH103	Results Reported As	NotApplicable
Sample	win12899.002006	Reporting Units	ug/litre
Depth(m)	1.05	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.1	1.39	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

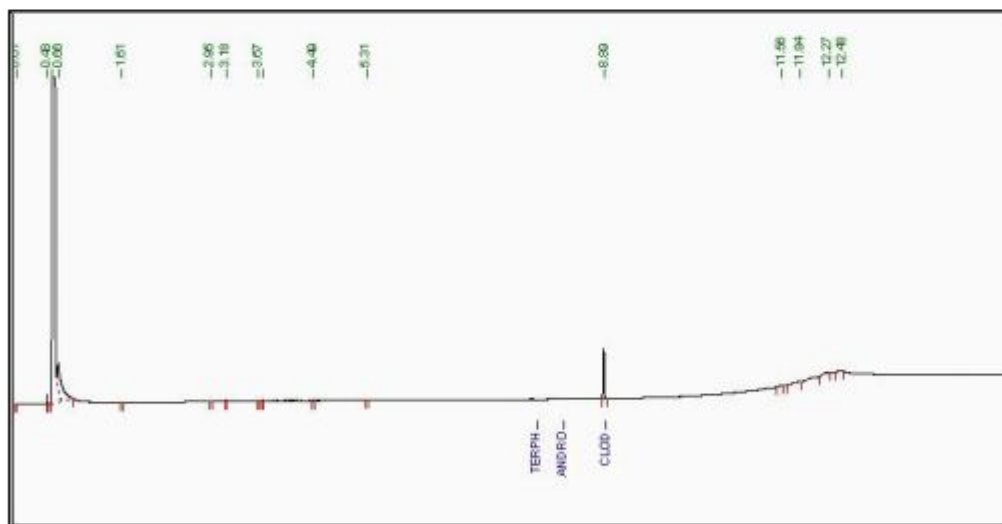
Individual Sample Results

TPH Banded - Water

Sample Location	BH104	Results Reported As	NotApplicable
Sample	win12899.002007	Reporting Units	ug/litre
Depth(m)	1.07	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.31	1.40	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

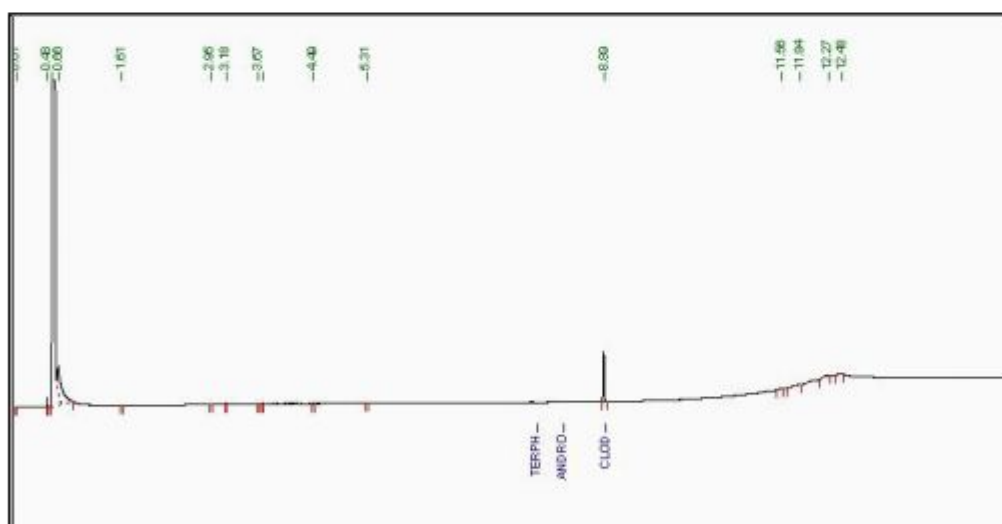
Individual Sample Results

TPH Banded - Water

Sample Location	BH105	Results Reported As	NotApplicable
Sample	win12899.002008	Reporting Units	ug/litre
Depth(m)	1.13	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.18	1.34	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

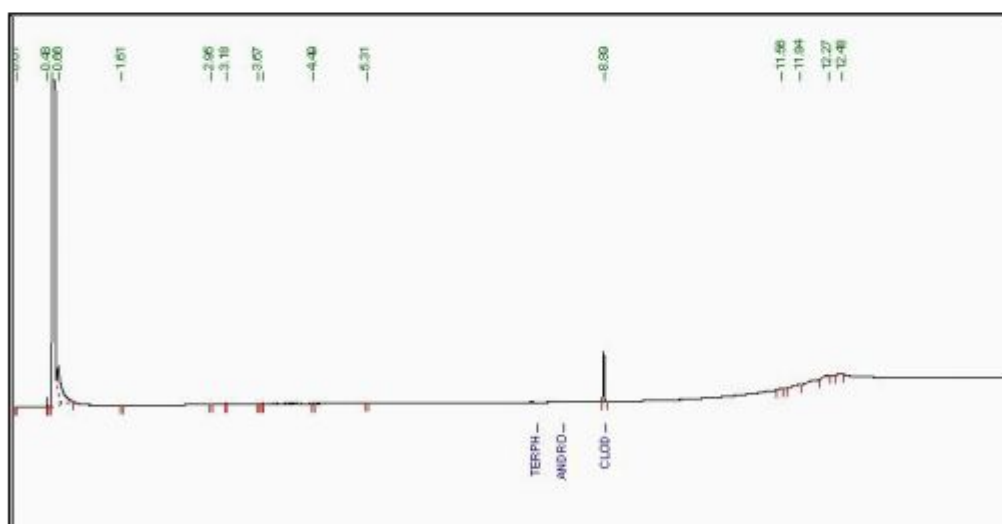
Individual Sample Results

TPH Banded - Water

Sample Location	BH106	Results Reported As	NotApplicable
Sample	wln12899.002009	Reporting Units	ug/litre
Depth(m)	1.18	Date Received	21/03/2013
Chain of Custody No.	6794	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

VES (ml)	MES (g)	CRF	BSV	Results				
				C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
3	124.05	1.14	0.00	<10	<10	<10	<10	<10

Note: VES denotes volume of extraction solvent; MES denotes mass of extracted sample; CRF denotes calibration recovery factor; BSV denotes blank subtraction value



Gas Chromatogram for Sample

Retail Unit, Havent

End of Report

Laboratory Analysis Report

Report Number 003972

Sampling Date 21st March 2013

Report Date 26th March 2013

Client	Site Name/Address
Hargreaves Properties Ltd Rustington House Worthing Road Rustington West Sussex BN16 3PS	Retail Unit, Havent

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
4	Water	IH QM:E9.4 based on US EPA 5021 by GC-FID	RT Corp	Yes	No

QM E9.4: In-House BTEX by Headspace method - Liquid-Gas extraction using headspace then Gas injection into GC-FID.

Samples were received 21-3-13

Samples were prepared and analysed 25-3-13

Analysis Report Approved By

Katherine Clark

Duty Reporting Manager



2628

Glossary of Terms Used in This Report

Blank - A sample known to contain none of the compounds being analysed, and used to confirm that the analytical instrument is not giving false positives during analysis.

Blind Testing: Name of any blind testing scheme participated in. The laboratory's accuracy is reported as a Z score; the lower the Z score the more accurate the analysis, with a score of less than 2 considered excellent.

CRM - Certified Reference Material. A sample prepared by an accredited source and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Duplicate - A duplicate sample, used to give a measure of the repeatability of a given analysis.

External Calibration - External calibration samples are samples containing a known concentration of the compounds being analysed. They are added to the analysis sequence after every nth sample being analysed and provide confirmation that the instrument remains within its calibration range.

Field Blank - Similar to a blank sample, except a field blank accompanies the samples throughout their existence (i.e. from the site being sampled to the laboratory) and used to provide a check that the samples aren't being cross-contaminated during the transportation/storage process.

IRM - In house reference material. A sample prepared by our laboratory and containing a known concentration of a given compound or compounds, which can be used to validate an analysis method.

Linearity - The linearity of a given analytical method is the range of concentrations between which the analytical instrument's response is directly proportional to the concentration being analysed, and hence the range of concentrations that the instrument can be said to give quantitative results.

LOD - Limit of detection. This is the lowest response for any given compound generated at the instrument's detector, that can be differentiated from the instrument's baseline noise.

LOQ - Limit of quantification. This is the lowest concentration that a given compound can be both detected and its concentration accurately measured in a sample.

MCERTS - An accreditation scheme created by the Environment Agency for the analysis of soil samples used to determine land quality. The scheme does not apply to analysis of soil samples used for waste classification purposes or to the analysis of water samples.

Method Calibration - The means by which an analytical method is calibrated. Usually this involves analysing a number of external calibration samples, containing different concentrations of the compounds to be analysed.

Precision - A measure of the repeatability of the analysis.

Sample - The material provided by the client to the laboratory for analysis.

Sensitivity - The smallest increment in analytical result that can be reliably quantified.

Spike - Also known as an internal calibration, a spike sample is a sample to be analysed which has a known concentration of another compound added. This provides a check on that the compounds being analysed are being correctly extracted from the sample matrix.

UKAS - The UK's implementation of ISO 17025, the international standard accreditation for laboratory analysis

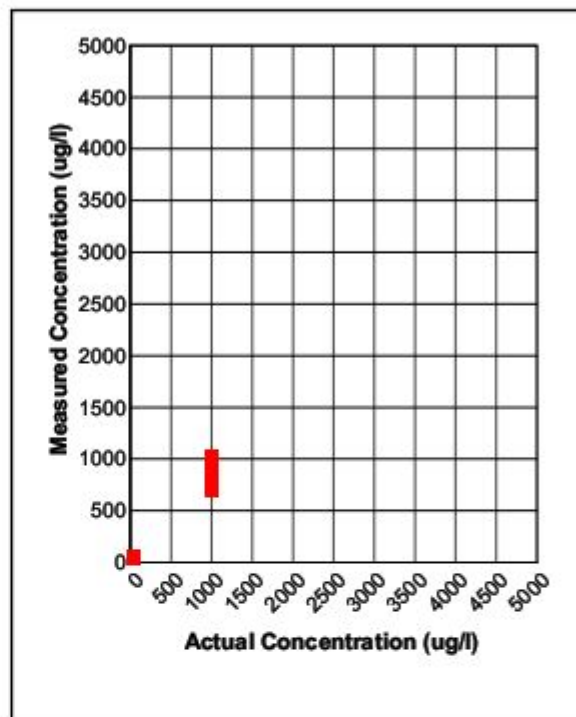
Quality Control/Quality Assurance Information

BTEX by Headspace - Water

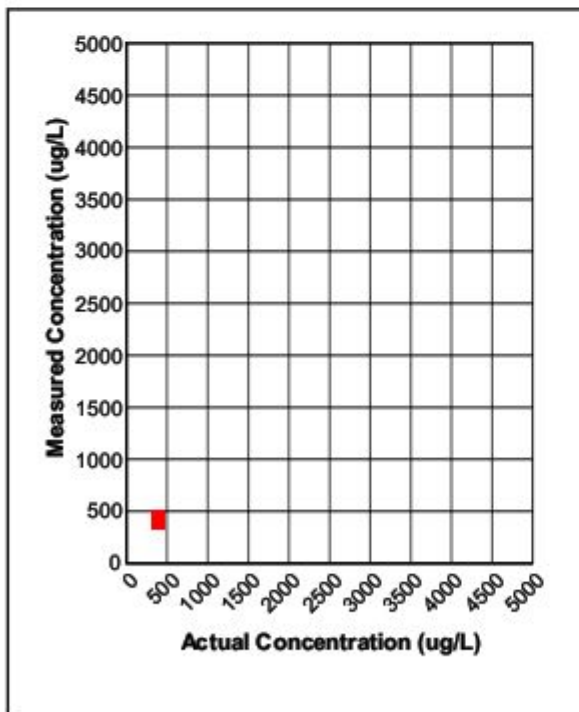
Our laboratory carries out a wide variety of verification analyses in order to ensure the validity of the analysis results we produce.

Samples are analysed in batches, usually according to the sample chain of custody form we receive. However, we also add additional samples into the sample sequence. These additional samples may include blanks, calibration samples, in-house reference material samples and duplicate samples. In addition to this each sample being analysed is 'spiked' with a known concentration of a compound. In the case of BTEX analyses, we use bromobenzene to spike the samples.

The results of the benzene analyses we have carried out on the additional quality assurance samples during the ten days prior to the samples reported here are shown in the accompanying graphs. Results are reported in ug/litre. These provide a visual indication of the stability of our laboratory analysis.



Calibration Samples - Previous 10 days



Spike Samples - Previous 10 days

Retail Unit, Havent

Summary of Results

BTEX by Headspace - Water

Accreditation	UKAS	Blind Testing	RT Corp		
Results Reported As	Not Applicable	Last Three Z Scores	1.80	-1.58	1.18

Analysis Method Parameters			
Reporting Units	ug/litre	Limit of Detection	0.1 ug/litre
Linearity	10-5000 ug/litre	Limit of Quantification	5 ug/litre
Sensitivity	1.0 ug/litre	Precision	+/- 0.5 ug/litre

Sample Location	Sample	Depth	Benzene	Ethyl-Benzene	Toluene	m+p Xylenes	o-Xylene
BH4	wln12899.001001	0.98	<10	<10	<10	<10	<10
BH8	wln12899.001003	1.18	<10	<10	<10	<10	<10
BH102	wln12899.001005	1.10	<10	<10	<10	<10	<10
BH105	wln12899.001008	1.13	<10	<10	<10	<10	<10

Sample Location	Sample	Depth	C6-C8	>C8-C10	>C10-C12	>C12-C15
BH4	wln12899.001001	0.98	<50	<50	90.1	82.0
BH8	wln12899.001003	1.18	<50	<50	<50	<50
BH102	wln12899.001005	1.10	<50	<50	<50	<50
BH105	wln12899.001008	1.13	<50	<50	<50	<50

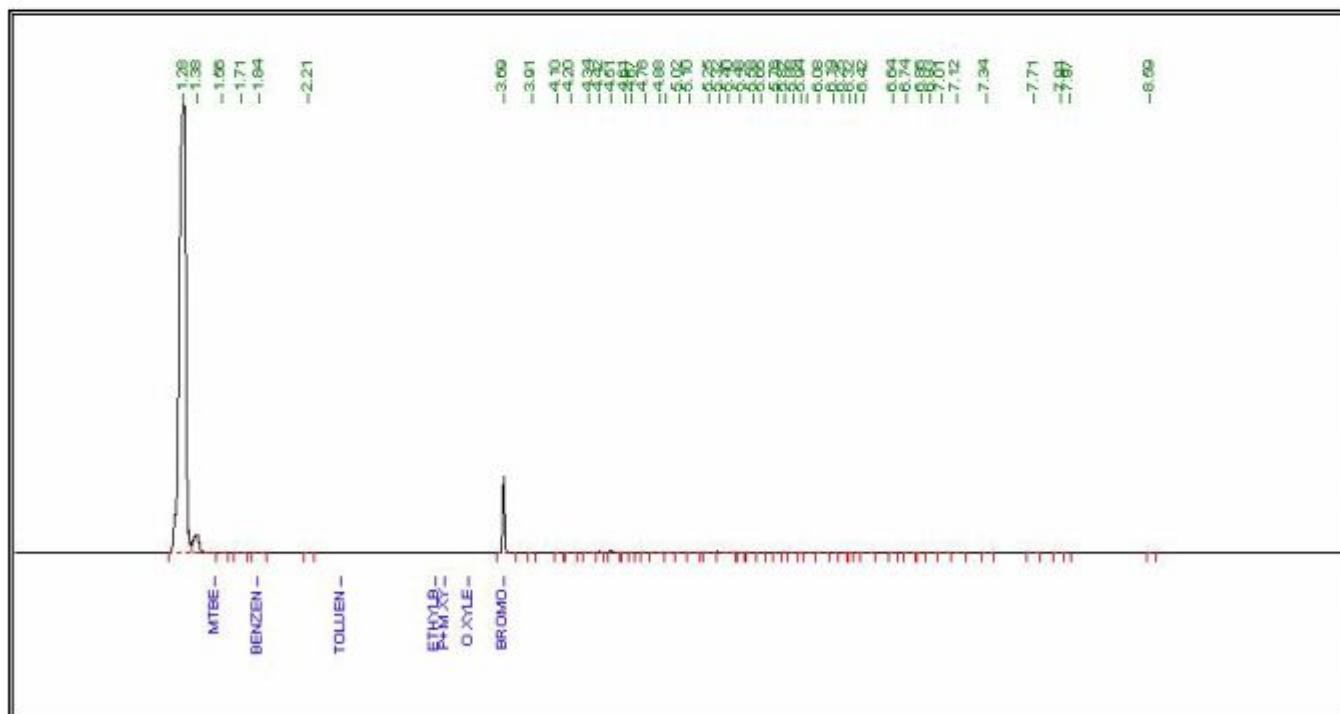
Retail Unit, Havent

Individual Sample Results

BTEX By Headspace - Water

Sample Location	BH4	Results Reported As	Not Applicable
Sample	win12899.001001	Reporting Units	ug/litre
Depth(m)	0.98	Date Received	21/03/2013
Chain of Custody No.	6792	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

Results								
Benzene	Ethyl-Benzene	Toluene	m+p Xylene	o Xylene	C6-C8	>C8-C10	>C10- C12	>C12- C15
<10	<10	<10	<10	<10	<50	<50	90.1	82.0



Gas Chromatogram for Sample

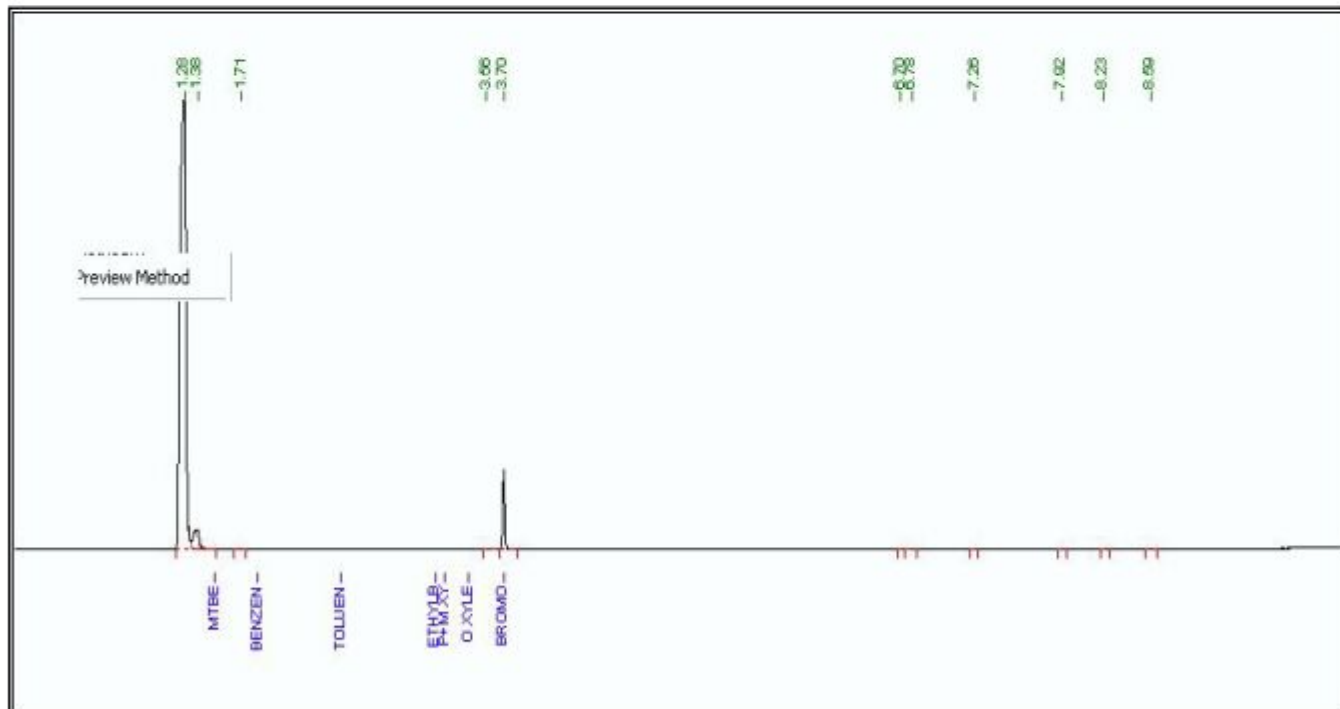
Retail Unit, Havent

Individual Sample Results

BTEX By Headspace - Water

Sample Location	BH8	Results Reported As	Not Applicable
Sample	wln12899.001003	Reporting Units	ug/litre
Depth(m)	1.18	Date Received	21/03/2013
Chain of Custody No.	6792	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

Results								
Benzene	Ethyl-Benzene	Toluene	m+p Xylene	o Xylene	C6-C8	>C8-C10	>C10- C12	>C12- C15
<10	<10	<10	<10	<10	<50	<50	<50	<50



Gas Chromatogram for Sample

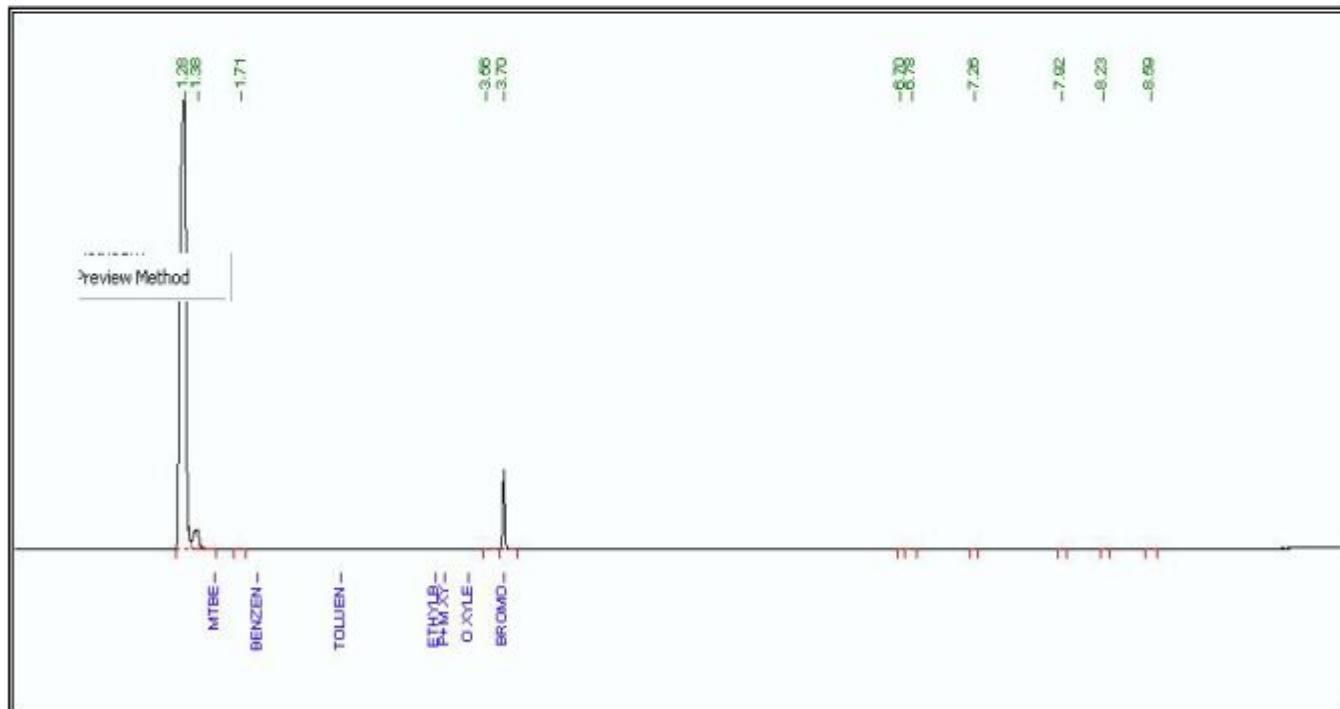
Retail Unit, Havent

Individual Sample Results

BTEX By Headspace - Water

Sample Location	BH102	Results Reported As	Not Applicable
Sample	wln12899.001005	Reporting Units	ug/litre
Depth(m)	1.10	Date Received	21/03/2013
Chain of Custody No.	6792	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

Results								
Benzene	Ethyl-Benzene	Toluene	m+p Xylene	o Xylene	C6-C8	>C8-C10	>C10- C12	>C12- C15
<10	<10	<10	<10	<10	<50	<50	<50	<50



Gas Chromatogram for Sample

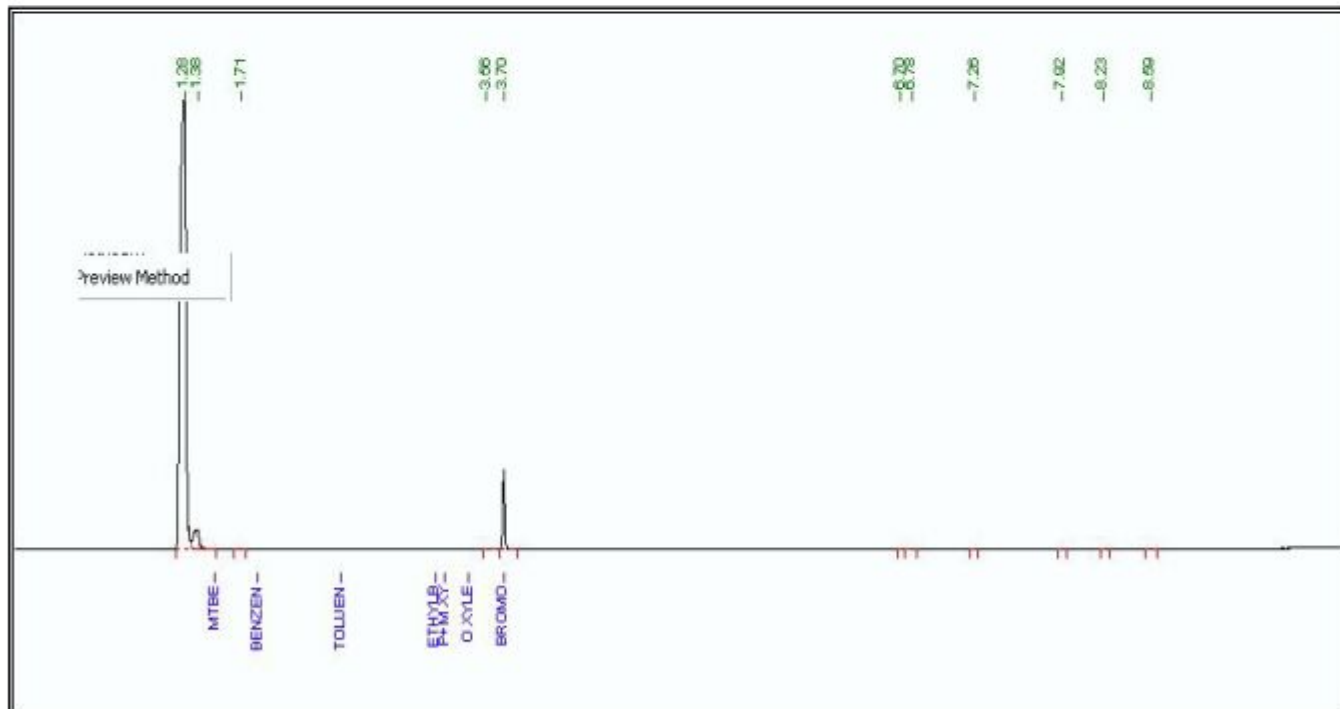
Retail Unit, Havent

Individual Sample Results

BTEX By Headspace - Water

Sample Location	BH105	Results Reported As	Not Applicable
Sample	wln12899.001008	Reporting Units	ug/litre
Depth(m)	1.13	Date Received	21/03/2013
Chain of Custody No.	6792	Date of Sampling	21/03/2013
Accreditation	UKAS	Date of Analysis	26/03/2013

Results								
Benzene	Ethyl-Benzene	Toluene	m+p Xylene	o Xylene	C6-C8	>C8-C10	>C10- C12	>C12- C15
<10	<10	<10	<10	<10	<50	<50	<50	<50



Gas Chromatogram for Sample

Retail Unit, Havent

End of Report



James Skinner
Subadra Consulting Ltd
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HP22 5BL

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 851105
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 13-13649

Site Reference: Retail Units Havant

Project / Job Ref: In12899

Order No: 11887

Sample Receipt Date: 22/03/2013

Sample Scheduled Date: 22/03/2013

Report Issue Number: 1

Reporting Date: 04/04/2013

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Director
On behalf of QTS Environmental Ltd



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 851105



Water Analysis Certificate

QTS Environmental Report No: 13-13649	Date Sampled	20/03/13	20/03/13	20/03/13	20/03/13	20/03/13
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Retail Units Havant	TP / BH No	BH8	BH4	BH101	BH102	BH103
Project / Job Ref: In12899	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11887	Depth (m)	1.18	0.98	1.08	1.10	1.05
Reporting Date: 04/04/2013	QTSE Sample No	64597	64598	64599	64600	64601

Determinand	Unit	MDL	Accreditation					
Sulphate as SO ₄	mg/l	< 1	NONE	19	27	183	69	340
Sulphide	mg/l	< 0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia as NH ₄	ug/l	< 50	NONE	71	2730	1290	877	573
Chloride	mg/l	< 10	NONE	37	76	74	56	147
Nitrate as NO ₃	mg/l	< 0.5	NONE	31	1	2.6	0.5	0.9
Nitrite as NO ₂ ^(S)	mg/l	< 0.003	ISO17025	< 0.003	< 0.003	0.262	< 0.003	0.193
Arsenic (dissolved)	ug/l	< 10	NONE	< 10		< 10	< 10	
Barium (dissolved)	ug/l	< 20	NONE	36		224	138	
Beryllium (dissolved)	ug/l	< 1	NONE	< 1		< 1	< 1	
Boron (dissolved)	ug/l	< 50	NONE	< 50		< 50	< 50	
Cadmium (dissolved)	ug/l	< 0.5	NONE	< 0.5		< 0.5	< 0.5	
Chromium (dissolved)	ug/l	< 5	NONE	5		< 5	< 5	
Copper (dissolved)	ug/l	< 10	NONE	< 10		< 10	< 10	
Iron Species (Fe ²⁺) ^(S)	mg/l	< 0.02	NONE	0.10	0.10	< 0.02	0.10	< 0.02
Iron Species (Fe ³⁺) ^(S)	mg/l	< 0.02	NONE	2.01	8.35	21.20	49.10	67.00
Lead (dissolved)	ug/l	< 5	NONE	< 5		< 5	< 5	
Manganese (dissolved)	ug/l	< 10	NONE	20	256	614	628	128
Mercury (dissolved)	ug/l	< 0.05	NONE	< 0.05		< 0.05	< 0.05	
Nickel (dissolved)	ug/l	< 7	NONE	< 7		< 7	< 7	
Selenium (dissolved)	ug/l	< 5	NONE	< 5		< 5	< 5	
Vanadium (dissolved)	ug/l	< 5	NONE	< 5		< 5	< 5	
Zinc (dissolved)	ug/l	< 5	NONE	< 5		< 5	< 5	

Subcontracted analysis ^(S)



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Water Analysis Certificate

QTS Environmental Report No: 13-13649	Date Sampled	20/03/13	20/03/13			
Subadra Consulting Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Retail Units Havant	TP / BH No	BH105	BH106			
Project / Job Ref: In12899	Additional Refs	None Supplied	None Supplied			
Order No: 11887	Depth (m)	1.13	1.18			
Reporting Date: 04/04/2013	QTSE Sample No	64602	64603			

Determinand	Unit	MDL	Accreditation				
Sulphate as SO ₄	mg/l	< 1	NONE	35	18		
Sulphide	mg/l	< 0.1	NONE	< 0.1	< 0.1		
Ammonia as NH ₄	ug/l	< 50	NONE	149	140		
Chloride	mg/l	< 10	NONE	34	25		
Nitrate as NO ₃	mg/l	< 0.5	NONE	30.1	24.9		
Nitrite as NO ₂ ^(S)	mg/l	< 0.003	ISO17025	0.027	0.043		
Arsenic (dissolved)	ug/l	< 10	NONE	< 10			
Barium (dissolved)	ug/l	< 20	NONE	43			
Beryllium (dissolved)	ug/l	< 1	NONE	< 1			
Boron (dissolved)	ug/l	< 50	NONE	< 50			
Cadmium (dissolved)	ug/l	< 0.5	NONE	< 0.5			
Chromium (dissolved)	ug/l	< 5	NONE	< 5			
Copper (dissolved)	ug/l	< 10	NONE	< 10			
Iron Species (Fe ²⁺) ^(S)	mg/l	< 0.02	NONE	0.10	< 0.02		
Iron Species (Fe ³⁺) ^(S)	mg/l	< 0.02	NONE	172.00	14.60		
Lead (dissolved)	ug/l	< 5	NONE	< 5			
Manganese (dissolved)	ug/l	< 10	NONE	36	< 10		
Mercury (dissolved)	ug/l	< 0.05	NONE	< 0.05			
Nickel (dissolved)	ug/l	< 7	NONE	< 7			
Selenium (dissolved)	ug/l	< 5	NONE	< 5			
Vanadium (dissolved)	ug/l	< 5	NONE	< 5			
Zinc (dissolved)	ug/l	< 5	NONE	< 5			

Subcontracted analysis ^(S)