

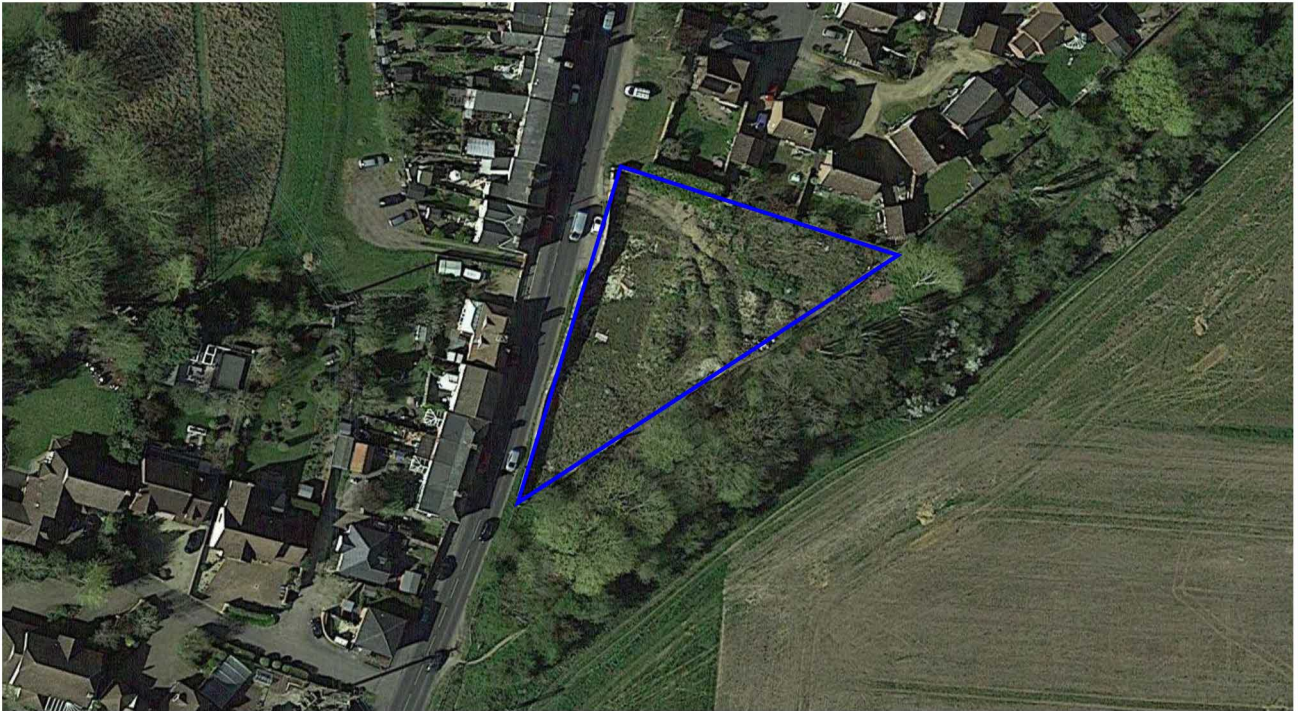
**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

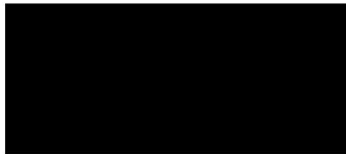
Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

INVESTIGATION AND MONITORING REPORT

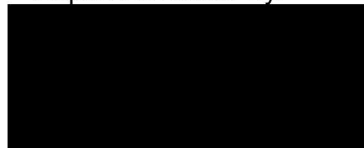


Report Prepared By:



Harriet Sagar

Report Reviewed By:



Steven Partridge

Client: Willowwalk (Thaxted)
Developments Ltd

Subadra Consulting Ltd. Registered in
England No. 4586038
Registered Office 13 Triangle Business
Park, Stoke Mandeville, HP22 5BL

Report	FI03088 CL 022
Date	October 2022
Page	1

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

Contents

1 INTRODUCTION.....	3
1.1 Purpose of Works.....	3
1.2 Scope of Works.....	3
1.3 Previous Reports Relating to the Site.....	4
2 MONITORING WELL INSTALLATION WORKS.....	4
2.1 Well Installation Details.....	5
2.2 Site Geology.....	6
2.3 Visual and Olfactory Signs of Hydrocarbon Contamination.....	6
3 GROUNDWATER MONITORING DATA.....	7
3.1 Groundwater Monitoring.....	7
3.2 Groundwater Monitoring Data.....	7
3.3 Visual and Olfactory Signs of Hydrocarbon Contamination.....	9
4 HAZARDOUS GROUND GASES.....	9
4.1 Monitoring Details.....	9
4.2 Hazardous Ground Gas Monitoring Data.....	10
4.3 Preliminary Gas Screening Assessment.....	10
5 CHEMICAL ANALYSIS RESULTS.....	11
5.1 Chemical Analysis Rationale.....	11
5.2 Soil Results.....	12
5.3 Groundwater Results.....	15
6 GROUNDWATER QUALITY ASSESSMENT.....	17
6.1 Methodology.....	17
6.2 Groundwater Quality Assessment.....	17
7 CONCLUSIONS.....	18
7.1 Ground-gas.....	18
7.2 Groundwater Quality.....	18

Attachment One: Notice to Interested Parties
Attachment Two: Borehole Logs
Attachment Three: Chemical Analysis Certificates

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	2

Development Plot on Southgate Street, Long Melford

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

1 Introduction

1.1 Purpose of Works

The site is located on Southgate Street, in Long Melford and comprises a site that has been cleared for residential development.

We understand that Willowwalk (Thaxted) Developments Ltd (Willowwalk) are proposing to redevelop the site with residential housing (3No. detached houses). We understand that an application for the site's redevelopment has been submitted to, and approved by Babergh District Council (Application Reference: DC/13/00875). Our previous remediation update report, which summarised the historic remediation actions that had already been undertaken at the site, was submitted in support of the application.

As a consultees to the Local Planing Authority, the Environment Agency and the Babergh District Council Senior Environmental Management Officer recommended that contaminated land conditions should be imposed on the Decision Notice.

As part of our on-going environmental assessment of the site, we have been commissioned by Willowwalk (Thaxted) Developments Ltd (Willowwalk) to return to site to provide updated groundwater quality data, specifically within the deeper chalk aquifer, and to screen for the presence of potentially hazardous ground gases in the shallow soils. Our works are intended to assist in the discharge of relevant conditions relating to ground contamination issues.

This report provides the results of our additional environmental works and recommendations for further works (if required).

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

1.2 Scope of Works

We have completed the following:

- An intrusive site investigation comprising seven boreholes drilled using our Comacchio drilling rig;
- Installation of three groundwater monitoring wells installed into the chalk aquifer, and four gas monitoring wells installed into the shallow soils;
- Logging of soil cores and the collection of soil samples, with screening of samples for the presence of volatile hydrocarbons with a Photo Ionisation Detector, to assist in the scheduling of chemical analysis;
- A site visit to carry out groundwater monitoring and obtain representative groundwater samples from the monitoring wells we installed at the site and from pre-existing wells installed by others;
- As part of our groundwater monitoring visit, complete permeability testing and a survey of borehole elevations to assist us in determining the direction of groundwater flow beneath the site;
- Screening of hazardous ground gases and hydrocarbon vapours using GA5000 series landfill gas monitor and photo-ionisation detector (PID);
- Chemical analysis of representative groundwater water samples;
- Provision of this report, which details the results of our sampling visit, our assessment groundwater quality and ground-gas monitoring data, and provides recommendations for further works (if necessary).

All the activities comprising this assessment were carried out in accordance with the procedures set out in our Quality Manual.

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	3

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA
Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

1.3 Previous Reports Relating to the Site

We have produced the following reports on behalf of Willowwalk over the course of the last three years.

Our Ref.	Report Title	Date of Issue	Report Reference
Ref.1	Remediation Strategy Report	December 2018	FI03088 CL 015
Ref.2	Updated Detailed Quantitative Risk Assessment Report	February 2019	FI03088 CL 016
Ref.3	Groundwater Monitoring Results	November 2019	FI03088 CL 019
Ref.4	Update on Site Remediation	November 2020	FI03088 CL 020

We have used information from these documents, where relevant, in other sections of this report.

Table One: Previous Environmental Reports Relating to the Site

2 Monitoring Well Installation Works

We completed the following works as part of monitoring well installation works at the site:

Drilling	We attended site from 20 th to 23 rd June 2022 to carry out the installation of the required groundwater and gas monitoring wells, using our Comacchio Geo205 (rotary/dynamic sampling) drill rig. A site plan showing borehole locations is provided as Figure One on the following page. Our borehole logs are included as Attachment Two.
Monitoring Well Installations	We drilled and installed four boreholes to a maximum depth of 1.6m and installed wells to facilitate ground-gas monitoring (BH001 to BH003 and BH007). We drilled and installed a further three boreholes to a maximum depth of 15.8m and installed wells to facilitate groundwater monitoring of the deeper chalk aquifer.
Soil Logging	Representative soil samples were recovered from each borehole in sealed liners and logged onsite by a suitably qualified technician. We carried out preliminary (semi-quantitative) screening for hydrocarbon vapour concentrations, to assist in the selection of soil samples for analysis, using a photo-ionisation detector (PID) calibrated with isobutylene gas. The results of our screening are provided on the borehole logs provided as Attachment Two.
Sample Preservation	Sub-samples were preserved in glass jars and stored in cool boxes during transportation to the laboratory for subsequent analysis.

Table Two: Groundwater Monitoring and Sampling Methodologies

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	4

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

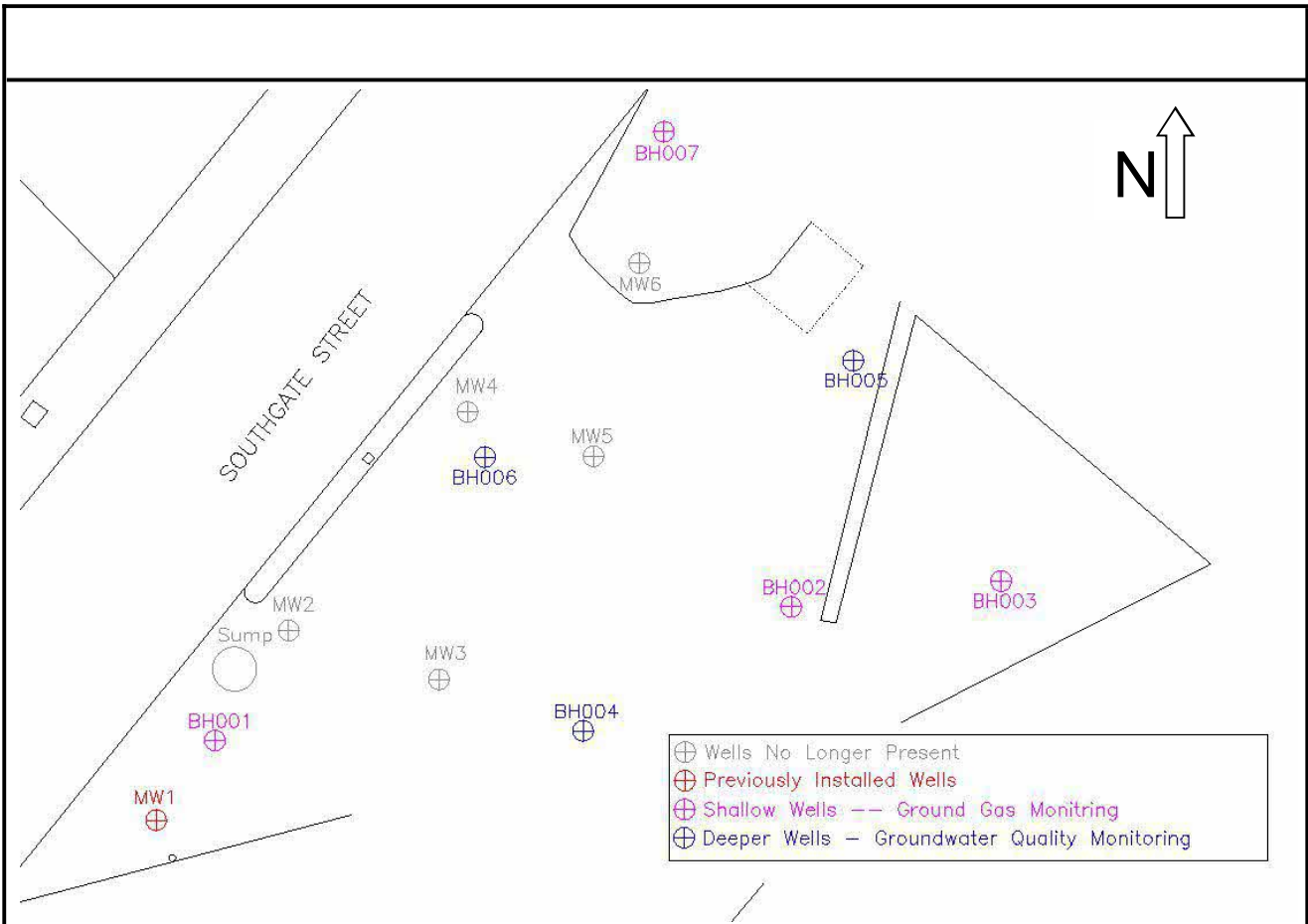


Figure One: Monitoring Well Locations

2.1 Well Installation Details

Monitoring well installation details are included in the following table.

	BH001	BH002	BH003	BH007	BH004	BH005	BH006
Rational	Ground gas monitoring				Groundwater quality monitoring (chalk)		
Well Response Zone	0.6 to 1.6	0.5-1.5	0.1 to 1.0	0.5 to 1.5	9.0 to 12	12.8 to 15.8	10 to 13
Well Diameter (mm)	50	50	50	50	50	50	50
Gas tap fitted?	✓	✓	✓	✓	✓	✓	✓

Dimensions in metres below ground level unless otherwise stated

Table Three: Well Installation Details

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	5

**Development Plot on
Southgate Street, Long
Melford**

2.2 Site Geology

	Unit	Description			
Layer I	Made Ground	Brown clayey SAND with frequent medium gravel inc. red brick fragments, glass, rootlets, chert, organic materials.			
Layer II	River Terrace Deposits	Beige brown sub-rounded to sub-angular fine to medium SAND with occasional medium gravel and occasional soft to firm clay layers			
Layer III	Chalk Formation	STRUCTURELESS creamy white putty CHALK (Grade DC)			
		Depth to Base of Layer			
		BH001	BH002	BH003	BH007
Layer I		>1.5m	>1.5m	>1.5m	>1.5m
Layer II		-	-	-	-
Layer III		-	-	-	-

	Depth to Base of Layer			
	BH004	BH005	BH006	
Layer I	2.2m	0.2m	2.6m	-
Layer II	9.7m	12.0m	9.8m	
Layer III	>13m	>15.8m	>13.0m	

All dimensions in metres below ground level

Table Four: Soil Lithology

2.3 Visual and Olfactory Signs of Hydrocarbon Contamination

No visual and olfactory signs of hydrocarbon contamination was identified during our soil sampling.

We recoded a maximum VOC concentration of 1ppm in the soil samples we screened.

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	6

**Development Plot on
Southgate Street, Long
Melford**

3 Groundwater Monitoring Data

3.1 Groundwater Monitoring

We completed the following works as part of our monitoring of groundwater quality at the site:

Visit Details	We attended site on 14 th July 2022 to complete groundwater monitoring and sampling.
Groundwater Monitoring	We recorded the depth to groundwater, where present, in all monitoring wells on-site using a water dip metre. No groundwater was present in BH001 to BH003 and BH007 (gas wells).
Groundwater Sampling	We purged all groundwater monitoring wells a minimum of three well volumes prior to sampling. We collected a groundwater sample from MW1 using a disposable bailer. We collected groundwater samples from the remaining deeper wells, using low flow techniques, comprised of a bladder pump incorporating a flow through dedicated tubing into a multi-parameter cell which allows for collection of the following field measurements: pH, conductivity, temperature, redox potential, and dissolved oxygen.
Sample Preservation	Sub-samples were preserved in glass bottles and stored in cool boxes during transportation to the laboratory for subsequent analysis.

Table Five: Groundwater Monitoring and Sampling Methodologies

3.2 Groundwater Monitoring Data

Details of the monitoring data are included in the following table.

		BH001	BH002	BH003	BH004	BH005	BH006	BH007	MW1
Well Elevation	m ASD	100.109	100.239	100.634	100.136	100.475	99.957	100.109	100.037
Depth to Base of Well	m bgl	1.5	1.5	1.5	11.9	12.8	12.5	1.5	3.3
Response zone (screen)	m bgl	0.5 to 1.5	0.5 to 1.5	0.5 to 1.5	8.9 to 11.9	9.8 to 12.8	9.5 to 12.5	0.5 to 1.5	1.2 to 3.3
Groundwater Levels	m bgl	Well dry - no data			2.249	2.585	2.074	Well dry - no data	2.189
	m ASD	Well dry - no data			97.887	97.890	97.883		97.848
Calculated Permeability (m/day)		Well dry - no data			Rapid recharge			Well dry - no data	Rapid recharge

Note: m bgl denotes metres below ground level, mASD denotes metres above arbitrary site datum

Table Six: Groundwater Monitoring Data

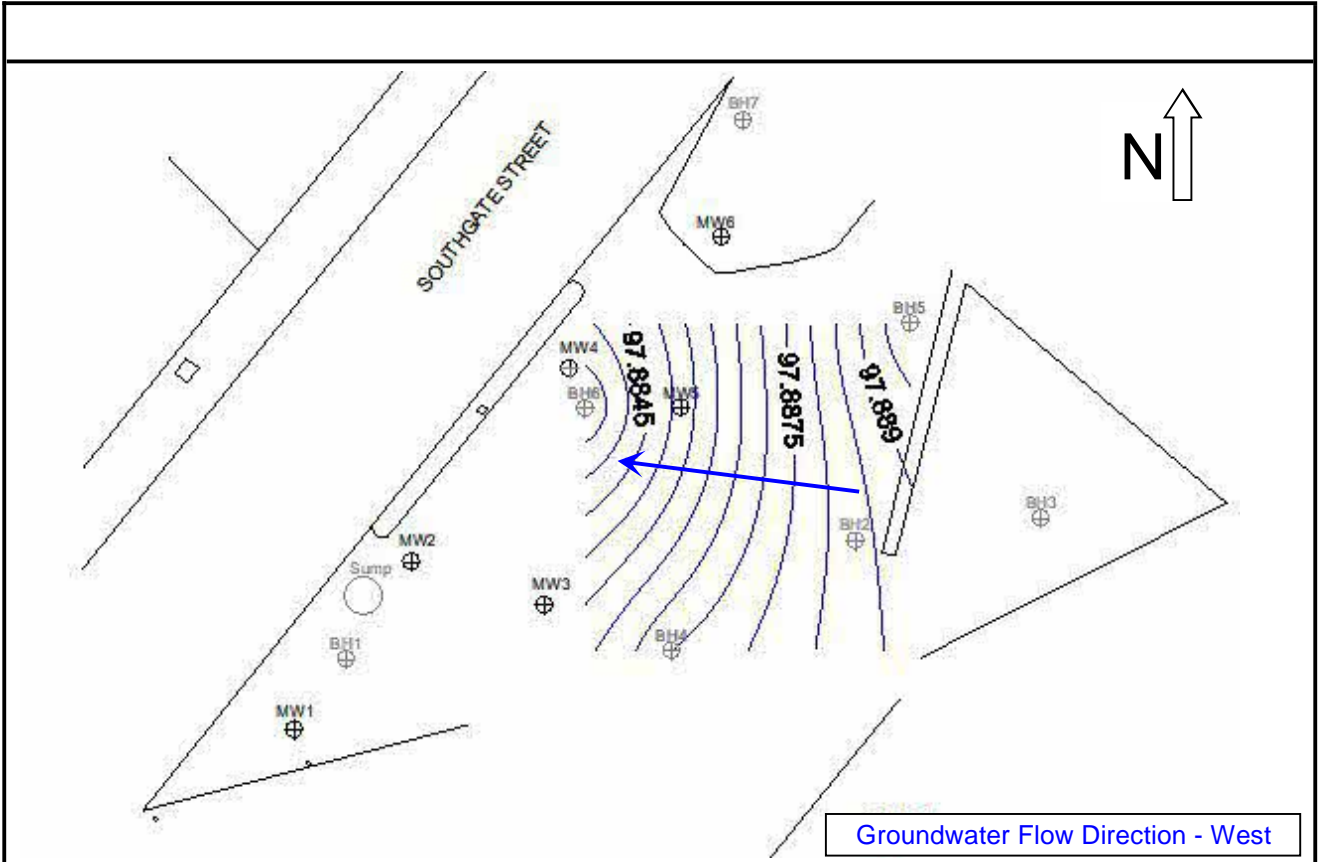
Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	7

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com



Notes: Plot determined using data collected from BH004, BH005 and BH006.

Figure Two: Piezometric Plot - Chalk Aquifer

The stabilised results of the field measurements of various geochemical parameters we recorded during our low flow sampling is provided in the following table.

Analyte	Unit	Sample Details		
		BH004	BH005	BH006
Temperature	(°C)	14.63	16.70	13.80
pH	pH Units	7.12	7.20	6.96
Electrical Conductivity	(mS/cm)	2.542	2.189	2.811
Dissolved Oxygen	(mg/l)	1.84	2.0	2.66
Oxygen Release Potential	(mV)	-56.6	-71.8	+15.7

Table Seven: Geo-Chemical Parameters from Low-Flow Sampling (14th July 2022)

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	8

**Development Plot on
Southgate Street, Long
Melford**

3.3 Visual and Olfactory Signs of Hydrocarbon Contamination

	BH004	BH005	BH006	MW1
Groundwater	White purge water. No hydrocarbon odour or sheen.	White purge water. No hydrocarbon odour or sheen.	White purge water. No hydrocarbon odour or sheen.	Black and grey initial purge water, which became clear. Slight hydrocarbon odour, no sheen noted.

Table Eight: Visual and Olfactory Signs of Hydrocarbon Contamination (14th July 2022)

4 Hazardous Ground Gases

4.1 Monitoring Details

Screening for Hazardous Ground Gases	<p>During our site visit on 14th July 2022 we carried out preliminary screening for hazardous ground gases in the dedicated ground-gas monitoring wells we installed (BH001, BH003, BH007) as well as an existing well that remained present at the site (MW1).</p> <p>Monitoring was completed using a GA5000 series landfill gas monitor, designed to record concentrations of methane, carbon dioxide, carbon monoxide, hydrogen sulphide and oxygen (and flow readings).</p>
Hydrocarbon Vapours	<p>During our site visit on 14th July 2022 we also carried out preliminary (semi-quantitative) screening for hydrocarbon vapour concentrations using a photo-ionisation detector (PID) calibrated with isobutylene gas.</p>
Notes:	<p>Between the installation of monitoring well installations and our monitoring visit, a third party contractor carried out a grading exercise at the site, in preparation for the redevelopment. Due to this, the screened section of monitoring well BH002 was exposed above ground level, rendering this well unsuitable for ground-gas monitoring.</p>

Note: m bgl denotes metres below ground level, mASD denotes metres above arbitrary site datum

Table Nine: Well Installation Details

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	F103088 CL 022
		Date	October 2022
		Page	9

**Development Plot on
Southgate Street, Long
Melford**

4.2 Hazardous Ground Gas Monitoring Data

The result of our monitoring for hazardous ground gases are provided in the following table.

		BH001	BH003	BH007	MW1
Groundwater Rest Level	m bgl	Well dry	Well dry	Well dry	2.189
PID reading (ppm)	Peak	0	0	0	0
	Stable	0	0	0	0
Carbon Monoxide (%)	Peak	0	0	0	0
	Stable	0	0	0	0
Hydrogen Sulphide (%)	Peak	0	0	0	0
	Stable	0	0	0	0
Methane (%)	Peak	0	0	0	0
	Stable	0	0	0	0
Carbon Dioxide (%)	Peak	0.8	0.3	1.5	2.9
	Stable	0.8	0.2	0.8	2.9
Oxygen (%)	Min	20.2	19.0	18.9	17.3
	Stable	20.2	19.8	19.4	17.3
Flow (L/hr)	Peak	0	0.1	0	0
	Stable	0	0	0	0
Time to Stabilise (mins)		5	5	5	5
Weather		Sunny with no precipitation,			
Barometric Pressure		1020hPa and stable			

Table Ten: Ground Gas Monitoring Data

4.3 Preliminary Gas Screening Assessment

To establish whether the concentrations of methane and carbon dioxide are present at potentially hazardous concentrations in shallow soils in the vicinity of the shop building, we have calculated Gas Screening Values (GSV) using our monitoring data. These were calculated using gas concentrations and flow rates, in accordance with the methodologies and guidance presented within BS8485 (2015).

In order to assure conservatism within our assessment we have used maximum gas concentrations and flow rates recorded at each location when calculating GSVs.

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	10

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

		BH001	BH003	BH007	MW1
Gas Screening Value (l/hr)	CH ₄	<0.07	<0.07	<0.07	<0.07
	CO ₂	<0.07	<0.07	<0.07	<0.07
Risk Classification (CIRIA C665)		Very Low Risk	Very Low Risk	Very Low Risk	Very Low Risk
Characteristic Situation (CIRIA 149)		CS1			
NHBC Traffic Light Classification		Green			

Table Eleven: Gas Screening Value for CO₂ and Methane

The results of our preliminary screening indicate ground-gases are likely to be classified as Characteristic Situation One and NHBC Traffic Light Classification Green. This indicates mitigation measures to protect future residents from ground-gases are unlikely to be required, however additional data may be require to fully validate this preliminary assessment.

5 Chemical Analysis Results

5.1 Chemical Analysis Rationale

Analysis	Rationale	Number of Samples Analysed	
		Soil	Ground water
Total Petroleum Hydrocarbons (TPHCWG) - reported by carbon range and with aromatic and aliphatic speciation	Representative of compounds present in petrol, diesel and lube oils but with additional information regarding composition of contaminant source	9	1
Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and volatile TPH fractions	Representative of compounds present in petrol	9	1
Polycyclic Aromatic Hydrocarbons	Representative of compounds present in diesel and lube oil	5	4
Total Organic Content	Used as part of the risk assessment process	5	-
Drinking Water Screen - analysis of water sample for TPH and BTEX	TPH and BTEX testing with lower detection limits		3

The results of our analysis are summarised in the following tables. Certificates for all chemical analysis are included in Attachment Three.

Table Twelve: Schedule of Analysis

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	11

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

5.2 Soil Results

Analyte	Unit	Sample Details				
		BH002	BH004	BH004	BH005	BH005
		1.4m	3.2m	10.8m	7.8m	10.2m
C ₆₋₈ Aliphatic TPH	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5
>C ₈₋₁₀ Aliphatic TPH	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5
>C ₁₀₋₁₂ Aliphatic TPH	mg/kg	<5	<5	<5	<5	<5
>C ₁₂₋₁₆ Aliphatic TPH	mg/kg	<5	<5	<5	<5	<5
>C ₁₆₋₂₁ Aliphatic TPH	mg/kg	<5	<5	<5	<5	<5
>C ₂₁₋₃₅ Aliphatic TPH	mg/kg	<20	<20	<20	<20	<20
C ₆₋₈ Aromatic TPH	mg/kg	<2.5	134	<2.5	<2.5	<2.5
>C ₈₋₁₀ Aromatic TPH	mg/kg	<2.5	<2.5	<2.5	<2.5	<2.5
>C ₁₀₋₁₂ Aromatic TPH	mg/kg	<5	<5	<5	<5	<5
>C ₁₂₋₁₆ Aromatic TPH	mg/kg	<5	<5	<5	<5	<5
>C ₁₆₋₂₁ Aromatic TPH	mg/kg	<5	<5	<5	<5	<5
>C ₂₁₋₃₅ Aromatic TPH	mg/kg	<20	<20	<20	<20	<20

Analyte	Unit	Sample Details			
		BH005	BH006	BH006	BH006
		11.8m	2.3m	9.8m	11.0m
C ₆₋₈ Aliphatic TPH	mg/kg	<2.5	7.34	<2.5	<2.5
>C ₈₋₁₀ Aliphatic TPH	mg/kg	<2.5	<2.5	<2.5	<2.5
>C ₁₀₋₁₂ Aliphatic TPH	mg/kg	<5	<5	<5	<5
>C ₁₂₋₁₆ Aliphatic TPH	mg/kg	<5	<5	<5	<5
>C ₁₆₋₂₁ Aliphatic TPH	mg/kg	<5	<5	<5	<5
>C ₂₁₋₃₅ Aliphatic TPH	mg/kg	<20	<20	<20	<20
C ₆₋₈ Aromatic TPH	mg/kg	<2.5	<2.5	<2.5	<2.5
>C ₈₋₁₀ Aromatic TPH	mg/kg	<2.5	5.63	<2.5	<2.5
>C ₁₀₋₁₂ Aromatic TPH	mg/kg	<5	<5	<5	<5
>C ₁₂₋₁₆ Aromatic TPH	mg/kg	<5	<5	<5	<5
>C ₁₆₋₂₁ Aromatic TPH	mg/kg	<5	<5	<5	<5
>C ₂₁₋₃₅ Aromatic TPH	mg/kg	<20	<20	<20	<20

Table Thirteen: Speciated TPH Analysis Results - Soils

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	12

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

Analyte	Unit	Sample Details				
		BH002	BH004	BH004	BH005	BH005
		1.4m	3.2m	10.8m	7.8m	10.2m
MTBE	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p+m Xylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o Xylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Analyte	Unit	Sample Details			
		BH005	BH006	BH006	BH006
		11.8m	2.3m	9.8m	11.0m
MTBE	mg/kg	<0.5	2.94	<0.5	<0.5
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	0.149	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	0.377	<0.1	<0.1
p+m Xylene	mg/kg	<0.1	1.52	<0.1	<0.1
o Xylene	mg/kg	<0.1	0.342	<0.1	<0.1

Table Fourteen: BTEX Analysis Results - Soils

Analyte	Unit	Sample Details			
		BH003	BH004	BH005	BH006
		1.2m	8.2m	1.9m	4.6m
Total Organic Carbon	%	0.7	3.0	0.4	0.4

Table Fifteen: TOC Analysis Results - Soils

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	13

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

Analyte	Unit	Sample Details				
		BH001	BH004	BH005	BH006	BH006
		1.4m	2.0m	1.2m	1.5m	10.5m
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.17	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.62	<0.1	<0.1	0.34	<0.1
Pyrene	mg/kg	0.65	<0.1	<0.1	0.35	<0.1
Benzo(a)anthracene	mg/kg	0.42	<0.1	<0.1	0.20	<0.1
Chrysene	mg/kg	0.36	<0.1	<0.1	0.19	<0.1
Benzo(b)fluoranthene	mg/kg	0.47	<0.1	<0.1	0.23	<0.1
Benzo(k)fluoranthene	mg/kg	0.15	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.42	<0.1	<0.1	0.22	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.30	<0.1	<0.1	0.14	<0.1
Dibenzo(ah)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.23	<0.1	<0.1	0.13	<0.1
Total PAHs (EPA16)	mg/kg	3.6	<0.1	<0.1	1.8	<0.1

Table Sixteen: PAHs Analysis Results - Soils

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	14

**Development Plot on
Southgate Street, Long
Melford**

SUBADRA

Environmental - Geotechnical - Laboratory - Foundations

13 Triangle Business Park, Stoke Mandeville, HP22 5BL
Tel: 01296 739400 Email: consultants@subadra.com

5.3 Groundwater Results

Analyte	Unit	Sample Details		
		BH4	BH5	BH6
C ₆₋₈ TPH Band	ug/l	<10	<10	<10
>C ₈₋₁₀ TPH Band	ug/l	<10	<10	<10
>C ₁₀₋₁₂ TPH Band	ug/l	<10	<10	<10
>C ₁₂₋₁₆ TPH Band	ug/l	<10	<10	<10
>C ₁₆₋₂₁ TPH Band	ug/l	<10	<10	<10
>C ₂₁₋₃₅ TPH Band	ug/l	<10	<10	<10

Table Seventeen: Banded TPH Analysis Results - Groundwater

Analyte	Unit	Sample Details
		MW1
C ₆₋₈ Aliphatic TPH	ug/l	<10
>C ₈₋₁₀ Aliphatic TPH	ug/l	<10
>C ₁₀₋₁₂ Aliphatic TPH	ug/l	<50
>C ₁₂₋₁₆ Aliphatic TPH	ug/l	<50
>C ₁₆₋₂₁ Aliphatic TPH	ug/l	<50
>C ₂₁₋₃₅ Aliphatic TPH	ug/l	<50
C ₆₋₈ Aromatic TPH	ug/l	10.2
>C ₈₋₁₀ Aromatic TPH	ug/l	<10
>C ₁₀₋₁₂ Aromatic TPH	ug/l	<50
>C ₁₂₋₁₆ Aromatic TPH	ug/l	<50
>C ₁₆₋₂₁ Aromatic TPH	ug/l	<50
>C ₂₁₋₃₅ Aromatic TPH	ug/l	<50

Table Eighteen: Speciated TPH Analysis Results - Groundwater

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	15

**Development Plot on
Southgate Street, Long
Melford**

Analyte	Unit	Sample Details			
		BH004	BH005	BH006	MW1
MTBE	ug/l	28.4	38	29.6	29.6
Benzene	ug/l	<1	<1	<1	20.5
Toluene	ug/l	<1	<1	<1	<5
Ethylbenzene	ug/l	<1	<1	<1	<5
p+m Xylene	ug/l	<1	<1	<1	<10
o Xylene	ug/l	<1	<1	<1	<5

Table Nineteen: BTEX Analysis Results - Groundwater

Analyte	Unit	Sample Details			
		BH4	BH5	BH6	MW1
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/l	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01	<0.01	<0.01	<0.01
Total PAHs (EPA16)	ug/l	<0.01	<0.01	<0.01	<0.01

Table Twenty: PAHs Analysis Results - Groundwater

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	16

**Development Plot on
Southgate Street, Long
Melford**

6 Groundwater Quality Assessment

6.1 Methodology

To assess if the low contaminant concentrations we have encountered in groundwater poses a risk to environmental receptors associated with the site, specifically the chalk aquifer, we have compared contaminant concentrations recorded in groundwater samples against the Site Specific Target Level derived as part of our previous updated detailed quantitative risk assessment (Ref.2).

6.2 Groundwater Quality Assessment

The results of our assessment of groundwater quality are presented in the following table.

Compound	Solubility Limit (µg/l)	Site-Specific Target(µg/litre)		
		Compliance Point at 50m	Compliance Point at 100m	Pass/Fail
Benzene	20.5 (MW1)	29.5	139	Pass
Ethylbenzene	Not detected	165	1,680	Pass
MTBE	38 (BH005)	145	1,020	Pass
Toluene	Not detected	302,000	Solubility	Pass
Xylenes	Not detected	145	1,020	Pass
TPH Aromatic C ₈₋₁₀	Not detected	242	1,690	Pass
TPH Aromatic C ₁₀₋₁₂	Not detected	350	3,180	Pass
TPH Aromatic C ₁₂₋₁₆	Not detected	484	5,480	Pass
TPH Aromatic C ₁₆₋₂₁	Not detected	110	406	Pass
TPH Aromatic C ₂₁₋₃₅	Not detected	Solubility	Solubility	Pass

Note: Sol – target is greater than solubility limit.: target is removal of free-phase, if present.

Table Twenty-one: Groundwater Targets - Protective of Controlled Water Receptors

None of the samples collected from either the groundwater monitoring wells we have installed into the deep chalk aquifer as part of these works, nor the single remaining shallow groundwater monitoring well installed into the superficial deposits, contained dissolved hydrocarbon concentrations exceeding the Site Specific Target Level derived as part of our previous updated detailed quantitative risk assessment (Ref.2).

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	F103088 CL 022
		Date	October 2022
		Page	17

**Development Plot on
Southgate Street, Long
Melford**

7 Conclusions

7.1 Ground-gas

We have installed dedicated ground-gas monitoring wells at the site and completed a single visit to screen for the presence of potentially hazardous ground-gases in these wells and in a single existing well.

During our visit, we did not encounter detectable concentrations of volatile organic compounds, carbon monoxide, hydrogen sulphide, or methane. Carbon dioxide was present at a maximum of 2.9% and peak flow rates were 0.1l/hr.

The results of our preliminary screening indicate ground-gases are likely to be classified as Characteristic Situation One and NHBC Traffic Light Classification Green. This indicates mitigation measures to protect future residents from ground-gases are unlikely to be required, however additional data may be required to fully validate this preliminary assessment.

We note that our monitoring was complete during static atmospheric conditions. Any future monitoring should be completed at different atmospheric pressures to ensure the data is fully representative of the ground-gas regime beneath the site.

7.2 Groundwater Quality

We have installed monitoring wells, specifically targeting the deeper chalk aquifer beneath the site and completed groundwater monitoring and sampling from these wells, and from a single existing well (MW1, installed to shallow depths).

Our investigation has confirmed that the River Terrace Deposits (sand with gravels and occasional clay layers) extends to at least 9.8m, below which we encountered the underlying chalk Formations (recorded as a structureless creamy white putty chalk). Groundwater flow direction within the chalk aquifer was calculated towards the west.

As part of our assessment, we collected samples of the soils encountered during the drilling process and completed in situ screening for VOC's using a PID, and collected samples for subsequent chemical analysis. During our testing, a maximum VOC reading of 1ppm was detected and our chemical analysis results showed very low hydrocarbon concentrations in shallow Made Ground/River Terrace Deposits and no detectable hydrocarbon concentrations were present below 3.2m depth.

MTBE was detected at very low levels in the groundwater sampled from both the deep wells (BH004 to BH006) in the chalk aquifer and the single remaining shallow well (MW1). Very low Benzene and Total Petroleum Hydrocarbons concentrations were also detected MW1. No detectable Polycyclic Aromatic Hydrocarbons in any of the four wells sampled.

To assess if the low contaminant concentrations we have encountered in groundwater poses a risk to environmental receptors associated with the site, specifically the chalk aquifer, we have compared contaminant concentrations recorded in groundwater samples against the Site Specific Target Level derived as part of our previous updated Detailed Quantitative Risk Assessment (Ref.2). None of the concentrations recorded exceeded the assessment criteria.

Overall, our data indicates that the underlying chalk aquifer has not been significantly impacted with hydrocarbons as a result of the site's historic use as a retail filling station.

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

Client: Willowwalk (Thaxted) Developments Ltd	Groundwater Monitoring Report	Report	FI03088 CL 022
		Date	October 2022
		Page	18

**ATTACHMENT ONE:
NOTICE TO INTERESTED PARTIES**

Client: Willowwalk (Thaxted)
Developments Ltd

Report	FI03088 CL 022
Date	November 2022
Page	Attachment One - 1

Southgate Service Station

NOTICE TO INTERESTED PARTIES

The purpose of our work is to provide general information on the environmental And/OR geotechnical conditions existing at the site And related to soil And/OR groundwater. The Client Or others specified the scope of the investigation And the validity of our conclusions is limited by the scope of work specified. We are Not responsible for any such limitations Or omissions.

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 the underground structures And/OR 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, within the limits imposed by the scope of the investigation.

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. In accepting our recommendations and/or conclusions the Client acknowledges that further, more detailed investigation would allow a more accurate assessment of site conditions to be made and that this would reduce any consequential risk to the Client.

Our 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 (such as asbestos) have been used in the construction of the buildings present on the site. Unless otherwise stated no investigation or assessment has been made of the presence or otherwise of invasive plant species including but not limited to Japanese Knotweed.

Unless specifically stated otherwise, we have not assessed the effect of any proposed future construction activities on existing structures on or near to the site. Nor, unless stated otherwise, have we assessed the likely effect of trees on existing or proposed structures on or near 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 either we or others carry out any remedial works we deem necessary.

This report has been prepared for the Client, as specified on the cover page of this report. In accepting our recommendations and/or conclusions the Client accepts that the terms of our appointment were as detailed in the Proposal, or Proposals, that we provided to the Client before being appointed and that these terms supersede any other terms and/or conditions set out in any contracts agreed between ourselves and the Client, regardless of when such terms and/or conditions were agreed to by us and/or signed by us.

Use of, and reliance on, this report by other third parties will be at such third parties own risk, and we do not accept any liability or responsibility to them.

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. The copyright to this report remains vested in Subadra Consulting Ltd at all times.

Client: Willowwalk (Thaxted) Developments Ltd	Report	FI03088 CL 022
	Date	November 2022
	Page	Attachment One - 2

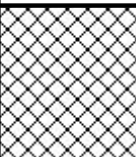

**ATTACHMENT TWO:
BOREHOLE LOGS**


Client: Willowwalk (Thaxted)
Developments Ltd

Report	FI03088 CL 022
Date	November 2022
Page	Attachment Two - 1

Borehole Log BH001

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	20th June 2022	Ground Level	100.11m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio


Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
0.00 - 1.10				S1/0.70 - 0.70		0.0		0.00m - 1.10m Made Ground Brown clayey SAND with frequent medium gravel inc. red brick fragments, glass, rootlets, chert, organic materials (not decomposed).
1.10 - 1.20				S2/1.40 - 1.40	PAH	0.0		1.10m - 1.20m Made Ground Black Tarmac.
1.20 - 1.50								1.20m - 1.50m Made Ground Dark brown very clayey SAND with frequent medium gravel inc. chert and red brick fragments. Borehole terminated at 1.50m
1.50 - 10.00								

	Well Diameter	50mm	Depth of Borehole	1.50m
	Well Casing Length	0.50m	Depth to Groundwater	
	Well Screen Length	1.00m	Page	One of One

Borehole Log BH002

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	20th June 2022	Ground Level	100.24m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio


Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
0.00 - 1.20				S1/1.00 - 1.00		0.0		0.00m - 1.20m Made Ground Brown clayey SAND with frequent medium gravel inc. red brick fragments, glass, rootlets, chert, organic materials and plastic sheeting.
1.20 - 1.50				S2/1.40 - 1.40	BTEX&M/ TPH CWG	0.0		1.20m - 1.50m Made Ground Brown very clayey SAND with occasional fine gravel inc. red brick fragments and glass. Borehole terminated at 1.50m
1.50 - 10.00								

	Well Diameter	50mm	Depth of Borehole	1.50m
	Well Casing Length	0.50m	Depth to Groundwater	
	Well Screen Length	1.00m	Page	One of One

Borehole Log BH003

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	20th June 2022	Ground Level	100.63m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio

Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
0.00 - 0.50								Made Ground Dark brown slightly clayey fine to medium SAND with occasional fine to medium gravel including chert, rootlets, red brick fragments and plastic sheeting.
0.50 - 1.50				S1/0.40 - 0.40 S2/1.20 - 1.20	TOC	0.0 0.0		Made Ground Brown slightly clayey SAND with occasional fine gravel inc. red brick fragments, chert and rootlets. Borehole terminated at 1.50m
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

	Well Diameter	50mm	Depth of Borehole	1.50m
	Well Casing Length	0.50m	Depth to Groundwater	
	Well Screen Length	1.00m	Page	One of One

Borehole Log BH004

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	20th-21st June 2022	Ground Level	100.14m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio


Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description			
		Strike 9.50m		S1/0.50 - 0.50	PAH	0.0	Su = 1.75	0.00m - 0.20m Made Ground Grey sandy GRAVEL including chert and red brick fragments.			
			S2/1.20 - 1.20	Su = 1			0.20m - 2.20m Made Ground SOFT brown CLAY with occasional medium gravel including chert and rootlets.				
			S3/2.00 - 2.00	Su = 0.75				2.20m - 8.10m River Terrace Deposits LOOSE TO MEDIUM DENSE beige brown SAND. Coarser layers of sands with gravels @2.9-3.1,3.3-3.5 and 5.3-5.5, Finer layers of sands with gravel @3.1-3.3 and 5.2-5.3.			
			S4/2.30 - 2.30	Su = 0.75							
			S5/3.20 - 3.20	BTEX&M/ TPH CWG	0.0	S6/3.40 - 3.40	0.0	0.0	0.0		
			S7/4.80 - 4.80			0.0					
			S8/5.80 - 5.80			0.0					
			S9/6.60 - 6.60	TOC	1.0	S10/7.90 - 7.90	1.0	1.0	1.0		
			S11/8.20 - 8.20			1.0					8.10m - 8.40m River Terrace Deposits LOOSE TO MEDIUM DENSE grey SAND. With organic matter.
			S12/9.60 - 9.60			1.0					8.40m - 9.70m River Terrace Deposits LOOSE TO MEDIUM DENSE beige brown sub-rounded to sub-angular fine to medium SAND with occasional medium gravel.
			S13/9.80 - 9.80								

	Well Diameter	50mm	Depth of Borehole	13.00m
	Well Casing Length	10.00m	Depth to Groundwater	
	Well Screen Length	3.00m	Page	One of Two

Borehole Log BH004

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	20th-21st June 2022	Ground Level	100.14m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio


Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
11				S14/10.80 - 10.80	BTEX&M/ TPH CWG	1.0		9.70m - 13.00m Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Culver Chalk Formation (Undifferentiated) - STRUCTURELESS creamy white putty CHALK.
12				S15/11.70 - 11.70				
13				S16/12.80 - 12.80				
14								Borehole terminated at 13.00m
15								
16								
17								
18								
19								
20								

	Well Diameter	50mm	Depth of Borehole	13.00m
	Well Casing Length	10.00m	Depth to Groundwater	
	Well Screen Length	3.00m	Page	Two of Two

Borehole Log BH005

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	21st-22nd June 2022	Ground Level	100.48m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio


Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description			
1 2 3 4 5 6 7 8 9 10				S1/0.10 - 0.10	PAH		Su = 2.5	0.00m - 0.20m Made Ground LOOSE brown SAND with frequent fine to coarse gravels with organic matter and roots.			
				S2/0.40 - 0.40				0.20m - 0.30m River Terrace Deposits LOOSE grey SAND with occasional fine gravel.			
				S3/1.20 - 1.20				0.30m - 2.00m River Terrace Deposits FIRM TO STIFF brown CLAY with occasional fine gravel. Fine to medium gravels including cherts.			
							S4/1.90 - 1.90 S5/2.10 - 2.10	TOC		Su = 1.5 Su = 1.75 Su = 0.75	2.00m - 8.50m River Terrace Deposits LOOSE light brown SAND with frequent fine gravel. Light brown CLAY @ 2.6-3.0, brown clay @ 5.2-5.4 and grey CLAY @6.2 to 6.7.
							S6/2.80 - 2.80				
							S7/3.70 - 3.70				
							S8/4.60 - 4.60	TOC	0.0		
							S9/5.30 - 5.30				
							S10/6.00 - 6.00				
							S11/6.50 - 6.50		1.0		
							S12/7.80 - 7.80	BTEX&M/ TPH CWG			
							S13/8.90 - 8.90				
							S14/9.50 - 9.50				
										8.50m - 10.10m River Terrace Deposits FIRM light brown CLAY.	

	Well Diameter	50mm	Depth of Borehole	15.80m
	Well Casing Length	12.80m	Depth to Groundwater	
	Well Screen Length	3.00m	Page	One of Two

Borehole Log BH005

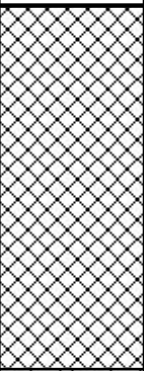
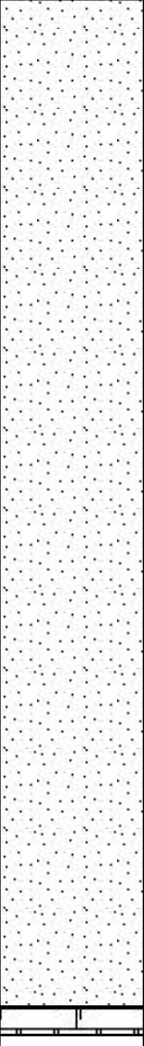
Project Name	FI03088 Southgate Service Station	Coordinates	
Date	21st-22nd June 2022	Ground Level	100.48m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio


Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
11				S15/10.20 - 10.20	BTEX&M/ TPH CWG			8.50m - 10.10m River Terrace Deposits FIRM light brown CLAY.
				S16/10.90 - 10.90				10.10m - 10.40m River Terrace Deposits FIRM grey CLAY.
				S17/11.20 - 11.20				10.40m - 12.00m River Terrace Deposits SOFT light brown CLAY.
12				S18/11.80 - 11.80	BTEX&M/ TPH CWG			12.00m - 15.80m Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Culver Chalk Formation (Undifferentiated) (DC) - STRUCTURELESS putty CHALK. No recovery - description based on drillers notes.
13								
14								
15								
16								Borehole terminated at 15.80m
17								
18								
19								
20								

	Well Diameter	50mm	Depth of Borehole	15.80m
	Well Casing Length	12.80m	Depth to Groundwater	
	Well Screen Length	3.00m	Page	Two of Two

Borehole Log BH006

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	23rd June 2022	Ground Level	99.96m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio

Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
1				S1/0.50 - 0.50		1.0		0.00m - 2.60m Made Ground LOOSE brown gravelly SAND with red brick fragments, glass, tarmac and wood. Brown gravelly CLAY @ 1.4-1.7m.
2		S2/1.50 - 1.50		PAH				
3		S3/2.30 - 2.30		BTEX&M/ TPH CWG				
4				S4/3.00 - 3.00				2.60m - 9.80m River Terrace Deposits LOOSE brown SAND with frequent medium gravel. Gravels. Brown very gravelly CLAY @ 8.0-8.1 and 8.3-8.4.
5		S5/3.90 - 3.90						
6		S6/4.70 - 4.70						
7		S7/6.20 - 6.20						
8		S8/7.80 - 7.80						
9		S9/8.30 - 8.30						
9		S10/9.20 - 9.20		TOC				
10		S11/9.80 - 9.80		BTEX&M/ TPH CWG				

	Well Diameter	50mm	Depth of Borehole	13.00m
	Well Casing Length	10.00m	Depth to Groundwater	
	Well Screen Length	3.00m	Page	One of Two

Borehole Log BH006

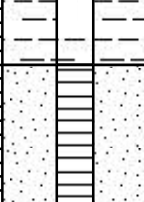
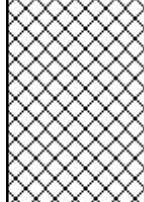
Project Name	FI03088 Southgate Service Station	Coordinates	
Date	23rd June 2022	Ground Level	99.96m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio


Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">11</div> <div style="margin-bottom: 10px;">12</div> <div style="margin-bottom: 10px;">13</div> <div style="margin-bottom: 10px;">14</div> <div style="margin-bottom: 10px;">15</div> <div style="margin-bottom: 10px;">16</div> <div style="margin-bottom: 10px;">17</div> <div style="margin-bottom: 10px;">18</div> <div style="margin-bottom: 10px;">19</div> <div style="margin-bottom: 10px;">20</div> </div>				S12/10.50 - 10.50 S13/11.00 - 11.00	PAH BTEX&M/ TPH CWG			9.80m - 13.00m Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation And Culver Chalk Formation (Undifferentiated) (DC) - STRUCTURELESS creamy white CHALK. Borehole terminated at 13.00m

<p>Prism.NET www.prismerp.co.uk</p>	Well Diameter	50mm	Depth of Borehole	13.00m
	Well Casing Length	10.00m	Depth to Groundwater	
	Well Screen Length	3.00m	Page	Two of Two

Borehole Log BH007

Project Name	FI03088 Southgate Service Station	Coordinates	
Date	23rd June 2022	Ground Level	100.11m AOD
Site Engineer	Harriet Sagar	Drilling Method	Comacchio

Depth (m)	Well	Water Level	Log	Sample	Laboratory Analysis	Headspace (ppm)	SPT 'N' or Su (kPa)	Description
0.00 - 1.50								0.00m - 1.50m Made Ground Brown clayey SAND with frequent medium gravel inc. red brick fragments, glass, rootlets, chert, organic materials (not decomposed).
1.50 - 10.00								Borehole terminated at 1.50m


	Well Diameter	50mm	Depth of Borehole	1.50m
	Well Casing Length	0.50m	Depth to Groundwater	
	Well Screen Length	1.00m	Page	One of One

**ATTACHMENT THREE:
LABORATORY CERTIFICATES**

Client: Willowwalk (Thaxted)
Developments Ltd

Report	FI03088 CL 022
Date	November 2022
Page	Attachment Three - 1


Report No 11620

Project	FI03088 Southgate Service Station	Sampled	20th June 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Soil	Duty Reporting Manager	

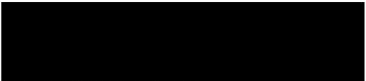
Soil - TPH CWG - 20th June 2022

Analyte	Unit	Method Detection Limit	Sample Details									
			BH002	BH004	BH004	BH005	BH005	BH005	BH006	BH006	BH006	
			S2	S5	S14	S12	S15	S18	S3	S11	S13	
			1.40m	3.20m	10.80m	7.80m	10.20m	11.80m	2.30m	9.80m	11.00m	
C6-8 Aliphatic TPH	mg/kg	2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	7.34	<2.5	<2.5
>C8-10 Aliphatic TPH	mg/kg	2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
>C10-12 Aliphatic TPH	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
>C12-16 Aliphatic TPH	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
>C16-21 Aliphatic TPH	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
>C21-35 Aliphatic TPH	mg/kg	20	<20	134	<20	<20	<20	<20	<20	<20	<20	<20
C6-8 Aromatic TPH	mg/kg	2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
>C8-10 Aromatic TPH	mg/kg	2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	5.63	<2.5	<2.5
>C10-12 Aromatic TPH	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
>C12-16 Aromatic TPH	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
>C16-21 Aromatic TPH	mg/kg	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
>C21-35 Aromatic TPH	mg/kg	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20

Method: Analysis is carried out on samples as submitted. Results are reported on a dry weight basis. Determination of BTEX by headspace GC-FID; Determination of hexane/acetone extractable hydrocarbons by GCxGC-FID.; The results reported relate only to the material supplied to the laboratory. Soil dried at 110oC. Moisture content calculated as dry weight of sample. Method based on BS1377

	Chain of Custody	23848	Analysed	KC 27/06/22
	Received	BO 27/06/22	Reported	KC 29/06/22
	Prepared	BO 27/06/22	Page	One of One

Report No 11621

Project	FI03088 Southgate Service Station	Sampled	20th June 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Soil	Duty Reporting Manager	


Soil - BTEX and MTBE - 20th June 2022

Analyte	Unit	Method Detection Limit	Sample Details									
			BH002	BH004	BH004	BH005	BH005	BH005	BH006	BH006	BH006	
			S2	S5	S14	S12	S15	S18	S3	S11	S13	
			1.40m	3.20m	10.80m	7.80m	10.20m	11.80m	2.30m	9.80m	11.00m	
MTBE ²	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.94	<0.5	<0.5
Benzene ²	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene ²	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.149	<0.1	<0.1
Ethylbenzene ²	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.377	<0.1	<0.1
p+m Xylene ²	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.52	<0.1	<0.1
o Xylene ²	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.342	<0.1	<0.1




Method: Analysis is carried out on samples as submitted. Results are reported on a dry weight basis. Determination of BTEX by headspace GC-FID; The results reported relate only to the material supplied to the laboratory. Soil dried at 110oC. Moisture content calculated as dry weight of sample. Method based on BS1377

2. UKAS 17025

	Chain of Custody	23845	Analysed	KC 27/06/22
	Received	BO 27/06/22	Reported	KC 30/06/22
	Prepared	BO 27/06/22	Page	One of One

Report No 11634


Project	FI03088 Southgate Service Station	Sampled	20th June 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Soil	Duty Reporting Manager	

Soil - PAHs (EPA16) - 20th June 2022

Analyte	Unit	Method Detection Limit	Sample Details									
			BH001	BH004	BH005	BH006	BH006					
			S2	S3	S3	S2	S12					
			1.40m	2.00m	1.20m	1.50m	10.50m					
Naphthalene ³	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Acenaphthylene ³	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Acenaphthene ³	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Fluorene ³	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Phenanthrene ³	mg/kg	0.1	0.17	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Anthracene ³	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Fluoranthene ³	mg/kg	0.1	0.62	< 0.1	< 0.1	0.34	< 0.1	< 0.1				
Pyrene ³	mg/kg	0.1	0.65	< 0.1	< 0.1	0.35	< 0.1	< 0.1				
Benzo(a)anthracene ³	mg/kg	0.1	0.42	< 0.1	< 0.1	0.20	< 0.1	< 0.1				
Chrysene ³	mg/kg	0.1	0.36	< 0.1	< 0.1	0.19	< 0.1	< 0.1				
Benzo(b)fluoranthene ³	mg/kg	0.1	0.47	< 0.1	< 0.1	0.24	< 0.1	< 0.1				
Benzo(k)fluoranthene ³	mg/kg	0.1	0.15	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Benzo(a)pyrene ³	mg/kg	0.1	0.42	< 0.1	< 0.1	0.22	< 0.1	< 0.1				
Indeno(1,2,3-cd)pyrene ³	mg/kg	0.1	0.30	< 0.1	< 0.1	0.14	< 0.1	< 0.1				
Dibenzo(ah)anthracene ³	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Benzo(ghi)perylene ³	mg/kg	0.1	0.23	< 0.1	< 0.1	0.13	< 0.1	< 0.1				
Total PAHs (EPA16) ³	mg/kg	1.6	3.8	< 1.6	< 1.6	1.8	< 1.6	< 1.6				

Method: The results reported here relate only to the material supplied to the laboratory Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS

3. Subcontracted

	Chain of Custody	23846	Analysed	
	Received	BO 27/06/22	Reported	KC 05/07/22
	Prepared		Page	One of One

Report No 11635



E: lab@fastanalysis.co.uk T: 01296 739 423
13 Triangle Business Park, Stoke Mandeville, HP22 5BL

Project	FI03088 Southgate Service Station	Sampled	20th June 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Soil		Duty Reporting Manager

Soil - TOC - 20th June 2022


Analyte	Unit	Method Detection Limit	Sample Details											
			BH003	BH004	BH005	BH005	BH006							
			S2	S11	S4	S8	S10							
			1.20m	8.20m	1.90m	4.60m	9.20m							
TOC ³	%	0.1	0.7	3.0	0.4	0.4	0.4							

Method: Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate

3. Subcontracted

 www.prismerp.co.uk	Chain of Custody	23847	Analysed	
	Received	BO 27/06/22	Reported	KC 05/07/22
	Prepared		Page	One of One

Report No 11743


Project	FI03088 Southgate Service Station	Sampled	14th July 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Water		Duty Reporting Manager

Water - TPH CWG - 14th July 2022

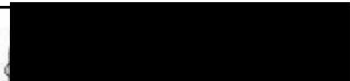
Analyte	Unit	Method Detection Limit	Sample Details										
			MW1										
			2.19m										
C6-8 Aliphatic TPH ³	ug/l	10	<10										
>C8-10 Aliphatic TPH ³	ug/l	10	<10										
>C10-12 Aliphatic TPH ³	ug/l	50	<50										
>C12-16 Aliphatic TPH ³	ug/l	50	<50										
>C16-21 Aliphatic TPH ³	ug/l	50	<50										
>C21-35 Aliphatic TPH ³	ug/l	50	<50										
C6-8 Aromatic TPH ³	ug/l	10	10.2										
>C8-10 Aromatic TPH ³	ug/l	10	<10										
>C10-12 Aromatic TPH ³	ug/l	50	<50										
>C12-16 Aromatic TPH ³	ug/l	50	<50										
>C16-21 Aromatic TPH ³	ug/l	50	<50										
>C21-35 Aromatic TPH ³	ug/l	50	<50										

Method: Determination of hexane extractable hydrocarbons in water by GCxGC-FID.; The results reported relate only to the material supplied to the laboratory. Determination of BTEX and MTBE in water by headspace GC-FID. IH Method E9.

3. Subcontracted

	Chain of Custody	23979	Analysed	WS 19/07/22
	Received	BO 15/07/22	Reported	KC 02/08/22
	Prepared	WS 19/07/22	Page	One of One

Report No 11756


Project	FI03088 Southgate Service Station	Sampled	14th July 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Water		Duty Reporting Manager

Water - TPH Banded - 14th July 2022


Analyte	Unit	Method Detection Limit	Sample Details															
			BH004	BH005	BH006													
			2.25m	2.59m	2.07m													
C6-C8 TPH Band ³	ug/l	10	<10	<10	<10													
>C8-C10 TPH Band ³	ug/l	10	<10	<10	<10													
>C10-12 TPH Band ³	ug/l	10	<10	<10	<10													
>C12-16 TPH Band ³	ug/l	10	<10	<10	<10													
>C16-21 TPH Band ³	ug/l	10	<10	<10	<10													
>C21-35 TPH Band ³	ug/l	10	<10	<10	<10													

Method: Determination of hexane extractable hydrocarbons in water by GC-FID. IH Method E10.; The results reported relate only to the material supplied to the laboratory. Determination of BTEX and MTBE in water by headspace GC-FID. IH Method E9.

3. Subcontracted

	Chain of Custody	23980	Analysed	WS 19/07/22
	Received	BO 15/07/22	Reported	KC 25/07/22
	Prepared	WS 19/07/22	Page	One of One

Report No 11742


Project	FI03088 Southgate Service Station	Sampled	14th July 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Water		Duty Reporting Manager

Water - BTEX and MTBE - 14th July 2022

Analyte	Unit	Method Detection Limit	Sample Details																	
			MW1																	
			2.19m																	
MTBE ³	ug/l	25	29.6																	
Benzene ³	ug/l	5	20.5																	
Toluene ³	ug/l	5	<5																	
Ethylbenzene ³	ug/l	5	<5																	
p+m Xylene ³	ug/l	10	<10																	
o Xylene ³	ug/l	5	<5																	

Method: The results reported relate only to the material supplied to the laboratory. Determination of BTEX and MTBE in water by headspace GC-FID. IH Method E9.

3. Subcontracted

	Chain of Custody	23977	Analysed	WS 20/07/22
	Received	BO 15/07/22	Reported	BO 21/07/22
	Prepared	WS 19/07/22	Page	One of One

Report No 11744



E: lab@fastanalysis.co.uk T: 01296 739 423
13 Triangle Business Park, Stoke Mandeville, HP22 5BL

Project	FI03088 Southgate Service Station	Sampled	14th July 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Water		Duty Reporting Manager

Water - DW BTEX and MTBE - 14th July 2022


Analyte	Unit	Method Detection Limit	Sample Details															
			BH004	BH005	BH006													
			2.25m	2.59m	2.07m													
MTBE ³	ug/L	1	28.4	38	29.6													
Benzene ³	ug/L	1	<1	<1	<1													
Toluene ³	ug/L	1	<1	<1	<1													
Ethylbenzene ³	ug/L	1	<1	<1	<1													
p+m Xylene ³	ug/L	1	<1	<1	<1													
o Xylene ³	ug/L	1	<1	<1	<1													

Method: Determinations of BTEX and in water by HS-GC-MS based on US EPA 624

3. Subcontracted

	Chain of Custody	23981	Analysed	WS 19/07/22
	Received	BO 15/07/22	Reported	BO 21/07/22
	Prepared	WS 19/07/22	Page	One of One

Report No 11745


Project	FI03088 Southgate Service Station	Sampled	14th July 2022
Client	Subadra Consulting Ltd/James May	Report Approved By	
Sample Type	Water		Duty Reporting Manager

Water - PAHs (EPA16) - 14th July 2022

Analyte	Unit	Method Detection Limit	Sample Details										
			BH004	BH005	BH006	MW1							
			2.25m	2.59m	2.07m	2.19m							
Naphthalene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Acenaphthylene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Acenaphthene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Fluorene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Phenanthrene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Anthracene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Fluoranthene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Pyrene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Benzo(a)anthracene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Chrysene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Benzo(b)fluoranthene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Benzo(k)fluoranthene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Benzo(a)pyrene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Indeno(1,2,3-cd)pyrene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Dibenzo(ah)anthracene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Benzo(ghi)perylene ³	ug/l	0.01	<0.01	<0.01	<0.01	<0.01							
Total PAHs (EPA16) ³	ug/l	0.16	<0.01	<0.01	<0.01	<0.01							

Method: Determination of PAHs in water by extraction in DCM followed by GC-MS with the use of surrogate and internal standards based on US EPA 8270

3. Subcontracted

	Chain of Custody	23978	Analysed	WS 20/07/22
	Received	BO 15/07/22	Reported	BO 21/07/22
	Prepared	WS 19/07/22	Page	One of One