

Our Ref: JG/61647/GML
Your Ref:

03 November 2022

Mark Roberts
Chapter Build Group Ltd

BY EMAIL ONLY TO:
info@cbgroup.ltd

Dear Mark

Re: Home Farm, Bedfield, Suffolk, IP13 7EE - Gas Monitoring

As you are aware ground gas monitoring has been on-going at the above site. This letter report should be read in conjunction with the previously issued Ground Investigation Report, ref. 61647 rev A dated July 2022.

This letter report presents the results of the gas monitoring, comprising six separate visits completed between 01/06/2022 and 31/10/2022.

Gas Monitoring

Semi-permanent gas monitoring standpipes were installed in 6no. small diameter windowless sampler(WLS) boreholes, referenced WS01, WS03, WS04, WS06, WS08 and WS09, for use in the monitoring of potentially hazardous ground gases. Monitoring wells were installed in accordance with the methodologies detailed in BS 8576: 2013, 'Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)'. The exploratory hole location plan appended to this report, indicates the location of the monitoring standpipes with respect to the existing site layout.

The wells were monitored on six occasions over a period of five months, at a range of atmospheric and weather conditions in line with current guidelines as given in CIRIA document 665, 'Assessing risk posed by hazardous ground gases to buildings', (2007).

The standpipes have been monitored for the presence of methane, carbon-dioxide and oxygen using an infra-red portable gas analyser, the calibration certificate for which is included with this letter. Ground gas flow, atmospheric pressure, standing water levels (SWL) and measurements to the base of the well installations were also recorded during each visit.

A photo-ionisation detector (PID) was also used during each of the 6no. monitoring visits, to monitor potential volatile organic compound (VOC) concentrations at the site. During the second monitoring visit on 13/06/2022 three of the monitoring wells, WS01, WS03 and WS06 were unable to be monitored due to the presence of a vacuum in the monitoring well. The calibration certificate for the PID is also enclosed.

Cont'd.../



It should be noted that during the final monitoring visit undertaken on 31/10/22 gas readings were not able to be taken from monitoring wells referenced WS04, WS08 and WS09 due to surface water levels on site flooding the wells at WS04 and WS08 and obstructions stopping access to WS09.

Table 1, provides a summary of the gas monitoring results. The full results of the gas monitoring programme are enclosed.

Table 1: Summary of Gas Monitoring Results

Borehole No.	Range of Peak CO₂ conc. (%v/v)	Range of Peak CH₄ conc. (%v/v)	Range of Min O₂ conc. (% v/v)	Range of Peak VOC conc. (ppm)	Range of Peak Positive Flow Rates (l/hr)
WS01	0.3 – 5.8	0.0 – 0.6	6.2 – 20.2	0.0 – 0.1	0.0 – 42.9
WS03	1.0 – 6.1	0.0 – 0.1	15.0 – 20.2	0.0 – 0.4	0.0 – 43.2
WS04	1.8 – 5.7	0.0 – 1.4	14.7 – 18.7	0.0 – 0.6	0.0
WS06	0.4 – 2.7	0.0	12.4 – 20.8	0.0 – 1.4	0.0 – 29.4
WS08	1.1 – 4.5	0.0	15.3 – 20.0	0.0	0.0
WS09	1.7 – 4.5	0.0	16.0 – 19.6	0.0 – 55.0	0.0
*Bold denotes worst case reading					

Gas Protection Measures

Gas monitoring results have recorded:

- Carbon dioxide (CO₂) concentrations of up to 6.1% at location WS03 in the north of the site;
- Methane (CH₄) concentrations of up to 1.4% in WS04 in the centre of the site;
- Peak Flow rates of up to 43.2 l/hr have also been detected at location WS03 in the centre of the site, although these reduced to 11.0l/hr rapidly and the reduced to 0.0l/hr;
- Depleted oxygen concentrations as low as 6.2% were detected at location WS01 in the north-east of the site;
- Peak Volatile Organic Compound (VOC) concentrations of 55.0ppm were detected at location WS09 in the south of the site, reducing to 3ppm during monitoring;

Carbon-dioxide is a heavier gas than air, which affects the respiratory and central nervous systems. It can cause unconsciousness at concentrations of 5% by volume and death at concentrations of 10% to 15% by volume. Methane is a flammable asphyxiant gas, which is within explosive limits of 5% to 10% by volume in air.

Table 8.5 of CIRIA Report 665 (2007) provides information on current UK practice with respect to gas control measures based upon a Gas Screening Value (GSV). It should be noted that this document only provides guidance with

respect to bulk ground gases carbon-dioxide and methane), it does not include guidance relevant to VOC.

A GSV is calculated by multiplying the maximum concentration of gas by the maximum flow rate recorded at the site.

The following GSV have therefore been calculated on the basis of the results recorded:

- Carbon dioxide GSV = 2.6352 l/hr
- Methane GSV = 0.6048 l/hr

For the purposes of characterising the site the more conservative GSV for carbon dioxide of 2.6352 l/hr has been adopted.

The ground gas monitoring undertaken on site has been shown to be variable throughout the monitoring period. The high peak flow rates recorded during the final monitoring visit on 31/10/22 were not recorded during previous visits and it is considered that these may be the result of rising water levels within the boreholes prior to the final visit being undertaken, causing a build-up of pressure in the plain section of installed pipework.

Whilst these high peak flow rates have contributed to the final GSV calculated for the site, concentrations of carbon dioxide have been noted above 5% at three locations, WS01, WS03 and WS04 in the north and centre of the site. Concentrations of methane have also been recorded which exceed 1% at location WS04 in the centre of the site during the monitoring period.

Typically, where carbon dioxide concentrations exceed 5% or where methane concentrations exceed 1%, consideration is given to the adoption of Characteristic Situation-2 (CS-2). When also considering the maximum GSV calculated, CS-2 is recommended for adoption at the site.

A CS-2 classification requires the adoption of protective measures to mitigate the risks posed by ground gases. Reference should be made to British Standard 8485, 'Code of Practice for the Design of Protective Measures for Methane and Carbon-dioxide ground gases for New Buildings' (2015), to determine which protective measures are appropriate for adoption in the proposed scheme.

Typically, protective measures for a CS-2 will include:

- The installation of a gas resistant membrane, the type is dependent on the proposed building construction;
- All joints and penetrations to be sealed;
- The provision of underfloor venting.

It should be noted that if low-rise residential development only is proposed for the site, then the gassing regime should be assessed and the protection measures determined in accordance with the traffic-light classification system defined by the NHBC in 'Guidance on Evaluation of Development Proposals in Sites where Methane and Carbon-dioxide are Present' (2007). The site would be classified as amber-2 based on the calculated GSV using the NHBC traffic-light system.

An amber-2 classification requires similar measures to the CS-2 classification; however, it is necessary that all membranes are fitted by a specialist contractor and should be fully certified.

It is recommended that CIRIA Report No. C735(2014), 'Good Practice on the Testing and Verification of Protective Systems for Buildings Against Hazardous Ground Gases' is consulted for guidance on the testing and verification of gas protection measures which are to be installed.

Although peak VOC concentrations of up to 55.0ppm were recorded during monitoring at one location, WS09 in the south, these concentrations were quickly noted to level off to a steady recording of 3.0ppm. Based on this observation and the remaining VOC recordings, VOCs on site are not considered to be significant and are considered unlikely to pose a risk to end users of the site.

It should be noted that depleted oxygen concentrations as low as 6.2% were recorded in the north of the site at location WS01. Excavations should therefore be monitored for the presence of anoxic/explosive gases prior to entry by operative during the development works, to ensure that safe working conditions are maintained throughout.

The results of the gas monitoring undertaken have identified areas in the north and centre of the site to be impacted by concentrations of carbon dioxide and methane, including high peak flow rates, which subsequently categorise the site as CS-2/Amber-2.

General

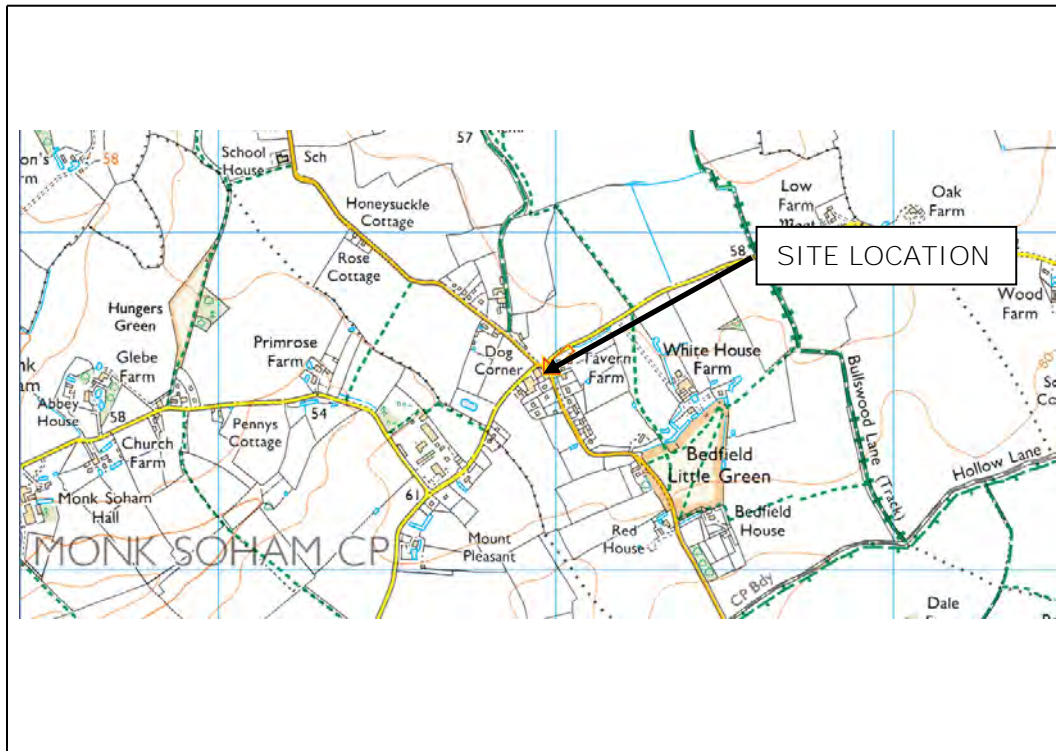
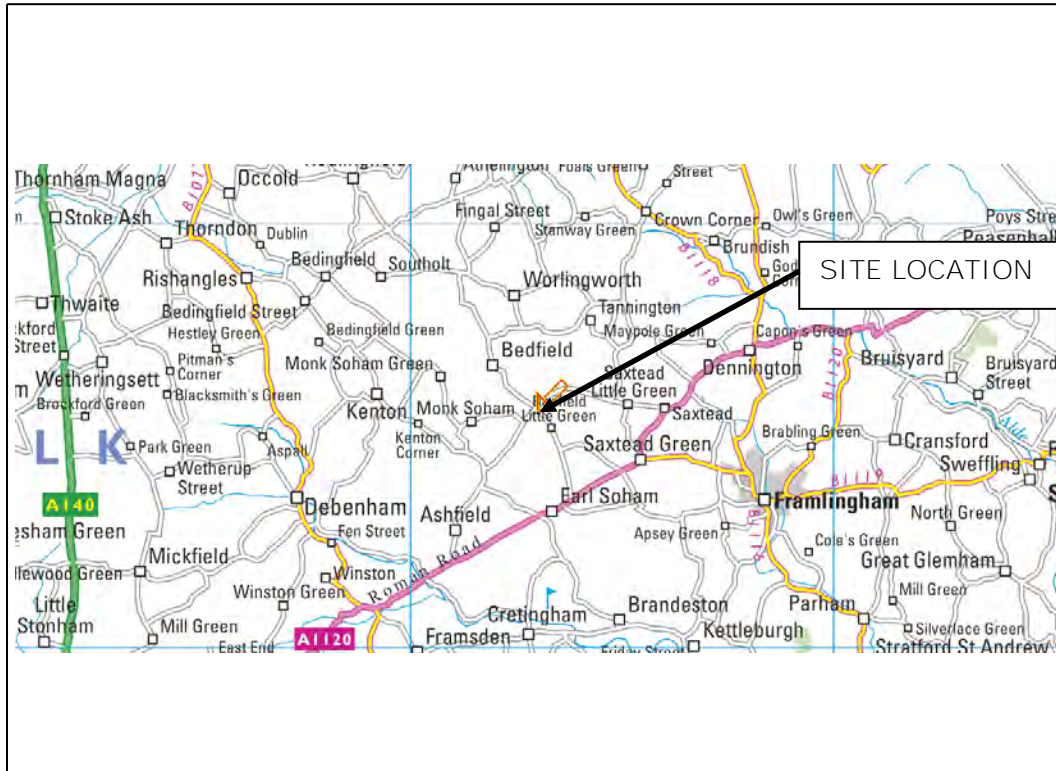
We trust that the above is clear and acceptable, however, should you have any further questions or queries please do not hesitate to contact us.

Yours sincerely

Joe Gooch BSc (Hons) FGS

Senior Geo-Environmental Engineer
on behalf of Richard Jackson Limited

Enc. Figure 1 – Site Location Plan
Figure 2 – Exploratory Hole Location Plan
Figure 3 – Proposed Development Plan
Gas Monitoring Results
Calibration Certificates



REPRODUCED FROM ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE, © CROWN COPYRIGHT RICHARD JACKSON LTD – ACC No. 100002572

Richard Jackson
Engineering Consultants

consulting civil & structural engineers
847 The Crescent, Colchester, CO4 9YQ
Tel: 01206 228 800

Home Farm, Bedfield, IP13 7EE

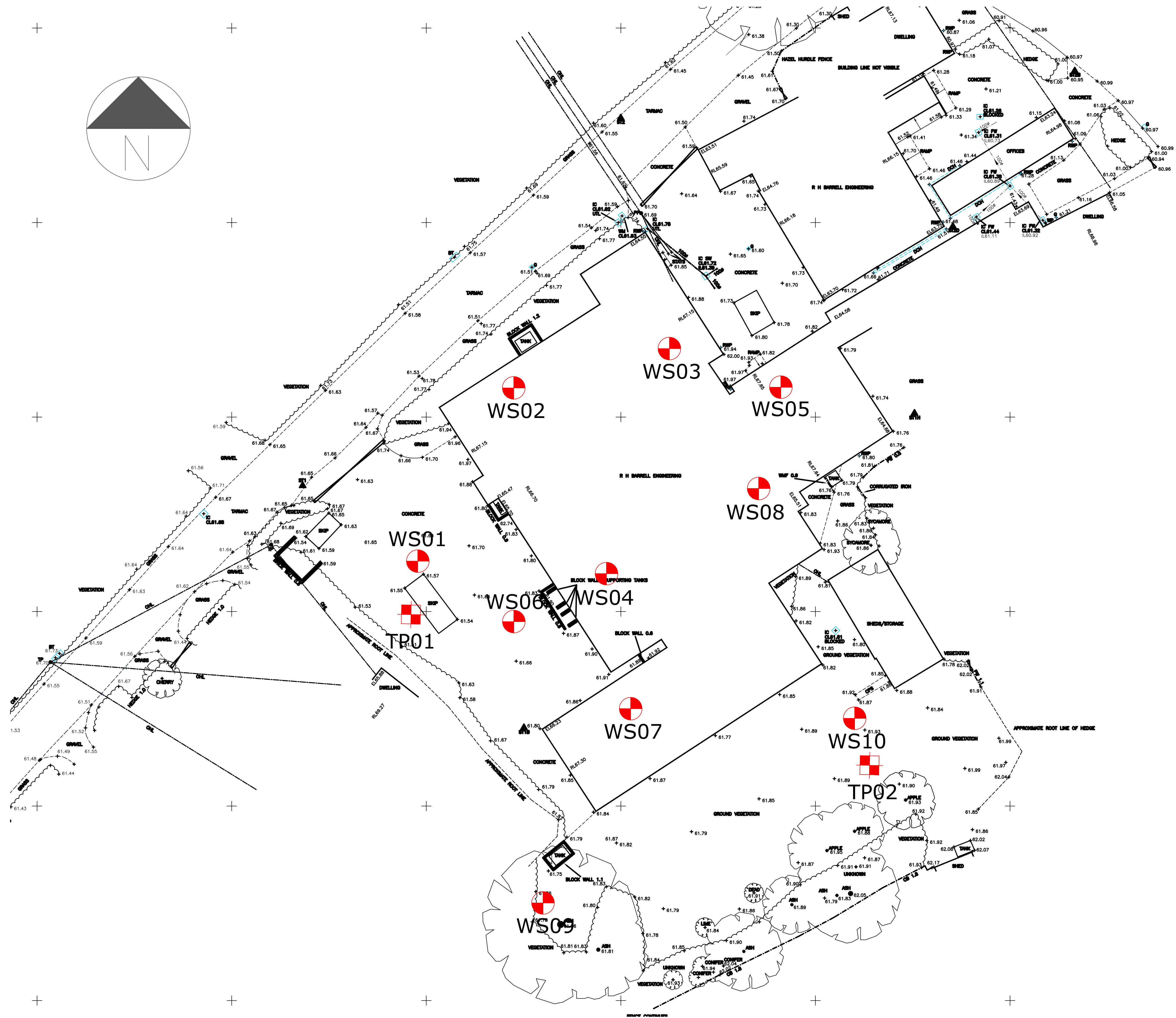
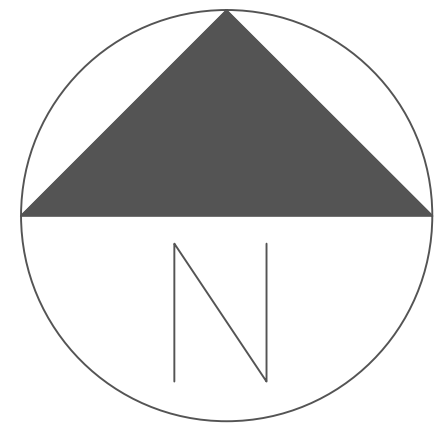
FIGURE 1

SITE LOCATION PLAN

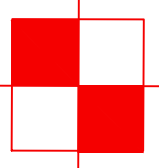
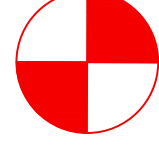
SCALE: N.T.S.

JOB NO: 61647

DO NOT SCALE



KEY

-  INFILTRATION TEST LOCATIONS (TP01-TP02)
-  WINDOWLESS SAMPLER LOCATIONS (WS01-WS10)

REV	DATE	DESCRIPTION	DRAWN	CHKD

REVISIONS
 This drawing is to be read in conjunction with all other Engineer's drawings and all other project information. Any discrepancy between the Engineer's drawings and other project information is to be reported to the Engineer immediately.



Project
**HOME FARM, BEDFIELD
 SUFFOLK, IP13 7EE**

Title
**EXPLORATION HOLE
 LOCATION PLAN**

Client
CHAPTER BUILD GROUP LTD

Scale 1:250 @ A3	Drawn MB	Date 04/04/22
Job Manager KO	Checked GB	Approved GB

Richard Jackson
 Engineering Consultants

847 The Crescent, Colchester, Essex CO4 9YQ Tel: 01206 228800
 Unit 06CL30, 6th Floor, 1 St. Katherine's Way, London, E1W 1UN Tel: 020 7448 9910
 5 Quern House, Mill Court, Great Shelford, Cambs CB22 5LD Tel: 01223 314794
 4 The Old Church, St. Matthews Road, Norwich, Norfolk NR1 1SP Tel: 01603 230240
 The Wheelhouse, Bonds Mill, Stonehouse, Gloucestershire GL10 3RF Tel: 01172 020070
 Email Address: mail@rj.uk.com Website: http://www.rj.uk.com

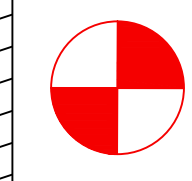
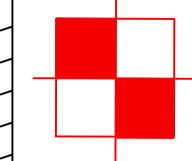
Drawing No. 61647-G-FIG02	Revision
-------------------------------------	----------

Drawing Status		
<input checked="" type="checkbox"/> INFORMATION	<input type="checkbox"/> APPROVAL	<input type="checkbox"/> COSTING
<input type="checkbox"/> TENDER	<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> AS CONSTRUCTED

DO NOT SCALE



KEY

-  WINDOWLESS SAMPLER LOCATION (WS01 - WS10)
-  TRIAL PIT LOCATION (TP01 - TP02)

REV	DATE	DESCRIPTION	DRAWN	CHKD

REVISIONS
 This drawing is to be read in conjunction with all other Engineer's drawings and all other project information. Any discrepancy between the Engineer's drawings and other project information is to be reported to the Engineer immediately.



Project
HOME, FARM, BEDFIELD SUFFOLK, IP13 7EE

Title
EXPLORATORY HOLE LOCATION PLAN

Client
CHAPTER BUILD GROUP LTD

Scale 1:250 @ A1	Drawn MB	Date 13/05/22
Job Manager KO	Checked CW	Approved CW

Richard Jackson Engineering Consultants
 847 The Crescent, Colchester, Essex CO4 9YQ Tel: 01206 228800
 Unit 86C130, 6th Floor, 1 St. Katherine's Way, London, E1W 1UN Tel: 020 7448 9910
 5 Queens House, Mill Court, Great Shelford, Cambs CB22 2LQ Tel: 01223 314794
 4 The Old Church, St. Matthews Road, Norwich, Norfolk NR1 1SP Tel: 01603 230240
 The Wheelhouse, Bonds Mill, Stonehouse, Gloucestershire GL10 3RP Tel: 01172 620070
 Email Address: mail@rj.co.uk Website: http://www.rj.co.uk

Drawing No. **61643-G-FIG03** Revision

<input checked="" type="checkbox"/> INFORMATION	<input type="checkbox"/> APPROVAL	<input type="checkbox"/> COSTING
<input type="checkbox"/> TENDER	<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> AS CONSTRUCTED

Ground Gas Monitoring

61647 – Home Farm, Bedfield, Suffolk, IP13 7EE

Date: 01/06/2022 Weather: Cool, cloudy, damp, calm
 Instrument No: 10820 / MiniRAE 3000 Engineer: TS

Exploratory Hole	CO ₂ Conc. (% by volume)		CH ₄ Conc. (% by volume)		O ₂ Conc. (% by volume)		Length of monitoring (mins)	Peak VOC Conc. (ppm)	Flow Rate (l/hr)		Atmospheric Pressure (mb)	Standing Water Level (m bgl)	Depth to base (m bgl)	Time of Reading	Remarks
	P	S	P	S	Min	S			P	S					
WS01	0.3	0.3	0.0	0.0	20.2	20.2	15	0.0	0.0	0.0	1002	0.38	2.45	07:00	DP = 0pa, LEL= 0%
WS03	4.8	4.4	0.1	0.0	18.1	18.1	15	0.0	0.8	0.0	1001	0.65	3.99	07:20	DP=0pa, LEL = 0%
WS04	4.7	4.7	1.4	1.4	16.2	16.2	15	0.0	0.0	0.0	1001	0.70	1.73	07:40	DP = 30pa, LEL= 0%
WS06	2.2	1.2	0.0	0.0	18.5	18.5	15	0.0	0.0	0.0	1005	0.53	4.03	08:00	DP = 0pa, LEL= 0%
WS08	2.1	2.1	0.0	0.0	19.5	19.5	15	0.0	0.0	0.0	1005	0.63	2.44	08:20	DP = 0pa, LEL = 0%
WS09	4.5	4.5	0.0	0.0	17.0	17.0	15	55*	-0.9	-0.4	1000	1.20	4.35	08:40	DP = 0pa, LEL= 0%

P = Peak, S = Steady, DP = Differential Pressures, LEL = Lower Explosive Limit

*Reduced to 3ppm during monitoring period

Atmospheric Pressure 01/06/2022 (World Weather Online): 12am: 1015mb, 3am: 1016mb, 6am: 1017mb, 9am: 1018mb, 12pm: 1019mb, 3pm: 1020mb, 6pm: 1020mb.

Ground Gas Monitoring

61647 – Home Farm, Bedfield, Suffolk, IP13 7EE

Date: 13/06/2022 Weather: Warm, sunny, dry, breezy
Instrument No: 10820 / MiniRAE 3000 Engineer: TS

Exploratory Hole	CO ₂ Conc. (% by volume)		CH ₄ Conc. (% by volume)		O ₂ Conc. (% by volume)		Length of monitoring (mins)	Peak VOC Conc. (ppm)	Flow Rate (l/hr)		Atmospheric Pressure (mb)	Standing Water Level (m bgl)	Depth to base (m bgl)	Time of Reading	Remarks
	P	S	P	S	Min	S			P	S					
WS01	0.5	0.5	0.0	0.0	18.9	18.9	15	**	0.0	0.0	1020	0.40	2.41	07:30	DP = 0pa, LEL = 0%
WS03	1.6	1.6	0.0	0.0	19.9	19.9	15	**	-5.3	0.0	1009	0.69	3.99	07:50	DP= -35pa, LEL = 0%
WS04	2.2	2.0	0.0	0.0	18.7	18.7	15	0.6	-2.2	0.0	1008	0.74	1.76	08:10	DP = -9pa, LEL = 0%
WS06	2.1	0.8	0.0	0.0	20.0	20.0	15	**	-9.6	0.0	1008	0.46	4.02	08:50	DP= -5pa, LEL = 0%
WS08	1.1	1.1	0.0	0.0	20.0	20.0	15	0.0	-3.2	0.0	1009	0.73	2.43	08:30	DP = -99pa, LEL = 0%
WS09	4.4	4.4	0.0	0.0	17.9	17.9	15	0.0	0.0	0.0	1011	1.31	4.32	09:10	DP = 0pa, LEL = 0%

P = Peak, S = Steady, DP = Differential Pressures, LEL = Lower Explosive Limit

** no reading due to vacuum in monitoring well

Atmospheric Pressure 13/06/2022 (World Weather Online): 12am: 1023mb, 3am: 1023mb, 6am: 1024mb, 9am: 1025mb, 12pm: 1025mb, 3pm: 1024mb, 6pm: 1023mb.

Ground Gas Monitoring

61647 – Home Farm, Bedfield, Suffolk, IP13 7EE

Date: 29/06/22 Weather: Warm, Overcast, Wet, Calm
Instrument No: 10820 / MiniRAE 3000 Engineer: TS

Exploratory Hole	CO ₂ Conc. (% by volume)		CH ₄ Conc. (% by volume)		O ₂ Conc. (% by volume)		Length of monitoring (mins)	VOC Conc. (ppm)	Flow Rate (l/hr)		Atmospheric Pressure (mb)	Standing Water Level (m bgl)	Depth to base (m bgl)	Time of Reading	Remarks
	P	S	P	S	Min	S			P	S					
WS01	2.0	0.9	0.0	0.0	18.5	19.4	15	-	-10	-3.6	1003	0.42	2.28	09:10	DP = -60pa, LEL = 0%
WS03	1.7	1.7	0.0	0.0	19.1	19.1	15	-	-4.6	0.0	1005	0.76	3.93	09:30	DP = -30pa, LEL = 0%
WS04	1.9	1.6	0.0	0.0	17.9	18.0	15	-	-5.0	0.0	1005	0.75	1.76	09:50	DP = -42pa, LEL = 0%
WS06	1.9	1.6	0.0	0.0	18.5	19.6	15	-	-8.0	0.0	1003	0.54	3.96	10:10	DP = -80pa, LEL = 0%
WS08	1.6	1.1	0.0	0.0	19.6	19.9	15	-	-7.6	0.0	1006	0.82	2.31	10:30	DP = -56pa, LEL = 0%
WS09	4.0	3.9	0.0	0.0	16.0	18.2	15	-	0.0	0.0	1005	1.50	4.20	10:50	DP = 0pa, LEL = 0%

P = Peak, S = Steady, DP = Differential Pressures, LEL = Lower Explosive Limit

Atmospheric Pressure 29/06/2022 (World Weather Online): 12am: 1015mb, 3am: 1014mb, 6am: 1013mb, 9am: 1012mb, 12pm: 1012mb, 3pm: 1011mb, 6pm: 1011mb.

Ground Gas Monitoring

61647 – Home Farm, Bedfield, Suffolk, IP13 7EE

Date: 18/07/22 Weather: Cool, Sunny, Dry, Calm
Instrument No: 10820 / MiniRAE 3000 Engineer: TS

Exploratory Hole	CO ₂ Conc. (% by volume)		CH ₄ Conc. (% by volume)		O ₂ Conc. (% by volume)		Length of monitoring (mins)	VOC Conc. (ppm)	Flow Rate (l/hr)		Atmospheric Pressure (mb)	Standing Water Level (m bgl)	Depth to base (m bgl)	Time of Reading	Remarks
	P	S	P	S	Min	S			P	S					
WS01	0.7	0.7	0.0	0.0	20.2	20.2	15	0.0	0.0	0.0	1003	0.59	2.31	07:25	DP = 0pa, LEL = 0%
WS03	1.0	0.8	0.0	0.0	20.2	20.2	15	0.0	0.0	0.0	1000	0.95	3.99	08:15	DP = 0pa, LEL = 0%
WS04	5.7	5.7	0.0	0.0	14.7	14.7	15	0.0	0.0	0.0	1005	0.99	1.77	09:50	DP = -42pa, LEL = 0%
WS06	0.4	0.4	0.0	0.0	20.8	20.8	15	0.0	0.0	0.0	1003	0.83	4.03	07:10	DP = 0pa, LEL = 0%
WS08	2.5	2.5	0.0	0.0	18.2	18.2	15	0.0	0.0	0.0	1005	1.16	2.39	08:30	DP = 0pa, LEL = 0%
WS09	2.3	2.3	0.0	0.0	19.6	19.6	15	0.0	0.0	0.0	990	1.72	4.30	07:45	DP = 0pa, LEL = 0%

P = Peak, S = Steady, DP = Differential Pressures, LEL = Lower Explosive Limit

Atmospheric Pressure 18/07/2022 (World Weather Online): 12am: 1021mb, 3am: 1020mb, 6am: 1020mb, 9am: 1019mb, 12pm: 1017mb, 3pm: 1016mb, 6pm: 1015mb.

Ground Gas Monitoring

61647 – Home Farm, Bedfield, Suffolk, IP13 7EE

Date: 06/09/22 Weather: Cool, Sunny, Dry, Calm
 Instrument No: 10820 / MiniRAE 3000 Engineer: AH

Exploratory Hole	CO ₂ Conc. (% by volume)		CH ₄ Conc. (% by volume)		O ₂ Conc. (% by volume)		Length of monitoring (mins)	VOC Conc. (ppm)	Flow Rate (l/hr)		Atmospheric Pressure (mb)	Standing Water Level (m bgl)	Depth to base (m bgl)	Time of Reading	Remarks
	P	S	P	S	Min	S			P	S					
WS01	4.8	4.8	0.0	0.0	14.2	14.2	15	0.0	-4	-1	996	0.54	2.23	13:30	DP = -20*, LEL = 0%
WS03	2.8	2.7	0.0	0.0	17.4	17.4	15	0.0	0.0	0.0	992	1.04	3.90	14:31	DP = 0pa, LEL = 0%
WS04	1.8	1.8	0.0	0.0	17.7	17.7	15	0.0	0.0	0.0	992	Dry	1.66	14:04	DP = 0pa, LEL = 0%
WS06	1.1	1.0	0.0	0.0	18.4	18.7	15	1.4	0.0	0.0	992	0.89	3.95	14:50	DP = -1pa**, LEL = 0%
WS08	4.5	4.4	0.0	0.0	15.3	15.3	15	0.0	0.0	0.0	994	1.28	2.31	14:18	DP = 0pa, LEL = 0%
WS09	1.7	1.7	0.0	0.0	19.6	19.7	15	0.0	0.0	0.0	994	2.10	4.24	14:45	DP = 0pa, LEL = 0%

P = Peak, S = Steady, DP = Differential Pressures, LEL = Lower Explosive Limit

*Peak DP, reducing to -3pa steady state. **Peak DP, reducing to 0pa steady state.

Atmospheric Pressure 06/09/2022 (World Weather Online): 12am: 1014mb, 3am: 1011mb, 6am: 1011mb, 9am: 1013mb, 12pm: 1013mb, 3pm: 1013mb, 6pm: 1012mb.

Ground Gas Monitoring

61647 – Home Farm, Bedfield, Suffolk, IP13 7EE

Date: 31/10/22 Weather: Cool, Sunny, Dry, Calm
Instrument No: 10820 / MiniRAE 3000 Engineer: MB

Exploratory Hole	CO ₂ Conc. (% by volume)		CH ₄ Conc. (% by volume)		O ₂ Conc. (% by volume)		Length of monitoring (mins)	VOC Conc. (ppm)	Flow Rate (l/hr)		Atmospheric Pressure (mb)	Standing Water Level (m bgl)	Depth to base (m bgl)	Time of Reading	Remarks
	P	S	P	S	Min	S			P	S					
WS01	5.8	5.7	0.6	0.2	6.2	6.4	15	0.1	42.9 ¹	0.0	1006	0.25	2.18	13:20	DP = 230pa, LEL = 0%
WS03	6.1	5.8	0.0	0.0	15.0	15.5	15	0.4	43.2 ²	0.0	1005	0.75	34.80	13:40	DP = 542pa, LEL = 0%
WS04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Well flooded – no data
WS06	2.7	2.5	0.0	0.0	12.4	13.1	15	0.1	29.4 ³	0.0	1004	0.62	3.96	14:15	DP = 200pa, LEL = 0%
WS08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Well flooded – no data
WS09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Unable to locate for monitoring – no data


P = Peak, S = Steady, DP = Differential Pressures, LEL = Lower Explosive Limit

¹Flow reduced quickly to 11l/hr and then steadily to 0l/hr after 3mins. ²Flow reduced to 0l/hr after 1min. ³Flow reduced to 0l/hr after 10seconds.

Atmospheric Pressure 31/10/2022 (World Weather Online): 12am: 1018mb, 3am: 1017mb, 6am: 1017mb, 9am: 1017mb, 12pm: 1016mb, 3pm: 1015mb, 6pm: 1014mb.

TEST DATE AND CONDITIONS	
Date	18.10.21
Atmospheric Pressure	997 mB
Ambient Temp	22.7 °C
Enviroics Serial No.	5029

GAS DATA LTD
 Unit 4, Fairfield Court
 Seven Stars Estate
 Wheler Rd
 Coventry
 CV3 4LJ
 Tel 02476303311 Fax 02476307711



GFM430 -1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS			
SO Number	Instrument Type	Instrument Serial Number + SW Version	Job Number(s)
329578	GFM430	10920 G430-24/13	122766

Calibration Technician J. [Signature] Date 19.10.21

Inspection Technician LSA [Signature] Date 19.10.21

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable (NA)	INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P	Instrument		✓
	Keyboard Test (All Keys)	P	Leather Case		X
	Backlight	P	Instrument Strap		✓
	Clock Set / Running	P	AC Battery Charger (UK)		✓
	Comms Test	P	AC Battery Charger (EURO)		X
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		X
	Overall Leak Test (30mB)	n/a	AC Battery Charger (AUS)		X
	Battery Charge Test	P	Hard Carry Case		✓
	Service Date set to?	18.10.22	Gas Sample Tube - (new issue)		✓
Channel Test	Data Logging Enabled?	P	Flow Sample Tube - (new issue)		✓
	Verify CH4/LEL	P	Spares Pot		X
	Verify CO2	P	Allen Key		X
	Verify O2	P	Temperature Probe		X
	Verify LEL	P	Vane Anemometer		X
	Verify 1 st Option Gas	N/A	USB Cable		X
	Verify 2 nd Option Gas	N/A	USB Memory stick		✓
	Verify 3 rd Option Gas	N/A	SiteMan Software	Ver 4.15	X
	Verify 4 th Option Gas	N/A	Internal Filter Pack	Qty	X
	Verify Atmospheric pressure	P	External Filter Pack	Qty	X
	Verify static pressure	N/A	Field Guide		X
	Verify differential pressure	P	Operation Manual (hard copy)		X
	Verify flow	P	Extra Items:		
	Verify temperature probe input	P			
Verify vane anemometer input	P				
DataBase Checks	Jobcard(s) completed and signed	P	Comments:		
	Jobcard(s) booked off database	P			
	Calibration certificate completed	P			
	Complete & print QI record	n/a			
Label Checks	No. of Calibration label fitted	GDC 13279			
	Warranty label fitted	P			
H2S Range	H2S Range from Sales Order	N/A	ppm		
	H2S Range from Cal Cert	N/A	ppm		
	Over-range value correct?	N/A			

TEST DATE AND CONDITIONS			
Date	18/10/2021		
Atmospheric Pressure	997	mB	
Ambient Temperature	22.2	°C	
EnviroNics Serial No.	5089		

**GFM430 Final Inspection & Calibration
Check Certificate**

GAS DATA LTD

Unit 4, Fairfield Court

Seven Stars Estate

Wheler Rd

Coventry

CV3 4LJ

Tel 02476303311

Fax 02476307711



Customer	Richard Jackson Ltd
Certificate Number	122766
Order Number	329578

Serial Number	10820
Software Version	G430-00.0024/0013

Recalibration DUE Date	18/10/22
------------------------	----------

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	450	Accept > 200 cc/min	Pump Flow @ -200mB	250	Accept > 200 cc/min
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %
	Readings %		Readings %		Readings %	
		59.6	60	40	40	20.9
	Accept ±3.0	Accept ±3.0		Accept ±0.5		
	5	5	5	5	6	6
	Accept ±0.3		Accept ±0.3		Accept ±0.3	
Zero Reading 100% N ₂	0	0	0	0	0	0
	Accept ±0.0		Accept ±0.0		Accept ±0.1	

Pressure Checks						
Atmospheric Pressure [AP] (mB)				Static Pressure [SP] (mB)		
Current Atmospheric	Instrument Atmospheric			Applied Pressure (mB)	Instrument Pressure (mB)	
Pressure (mB)	Pressure Reading (mB)					
All Ports	Open Ports	997	Accept ±2.0	0.0mB	N/A	Accept ±0.0
AP Port (Internal)	+800 mB	800	Accept ±5.0	+50mB	N/A	Accept ±2.0
AP Port (Internal)	+1200mb	1200	Accept ±5.0	-100mB	N/A	Accept ±2.0




Life-saving solutions

CERTIFICATE OF CALIBRATION

MiniRAE 3000

CALIBRATION CERTIFICATE NO: 73857

ISSUED BY: SHAWCITY LIMITED
DATE: 7.6.22

APPROVED SIGNATORY: 

NAME: D House

CUSTOMER: Richard Jackson Ltd
INSTRUMENT: MiniRAE 3000
SERIAL NUMBER: 592-932995

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Isobutylene	WO347195-1	100 ppm	100 ppm

COMMENTS:

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2 %
The results indicate that the instrument conforms to the applicable parts of the published specification.

LTH & SAFETY, OCCUPATIONAL HYGIENE AND ENVIRONMENTAL MONITORING INSTRUMENTS
