

Geoshields assessment of the Ground Gas Protection system for 20A Chorlton Villas

Photographs of Installation

📍 4100 Park Approach
Thorpe Park
Leeds
LS15 8GB



Photographs of Installation

📍 4100 Park Approach
Thorpe Park
Leeds
LS15 8GB



Geoshields Summary of GGS Findings

First Survey: Methane was detected in the void but not inside the property

Please see below extract from the GGS Summary Report (4. Technical Commentary) -

The first survey identified above background methane within the void, but not within the internal spaces. This is likely due to the temporary passive venting of the property through the opening of the front and rear doors, with any above background methane in the property likely diluted and liberated to atmosphere. Methane concentrations were slightly elevated on the eastern elevation, but not the western elevation, which is likely due to void functionality and the prevailing wind conditions during the survey.

Second Survey: Methane was detected in both the void and internal spaces. No clear gas entry points were found, and it is unclear if methane was residual from an earlier event.

The methane concentrations were low and detected only due to high-resolution instruments. The highest recorded level (112 ppmv) is well below the safety threshold (1% v/v or 10,000 ppmv).

Please see below extract from the GGS Summary Report (4. Technical Commentary) -

The second survey identified slightly above background methane concentrations simultaneously in both the void and the internal spaces. No discrete ground gas entry points were identified, and it is not clear whether ongoing ingress was occurring during the survey, or whether the above background methane concentrations in the property represent residue gas from a previous ingress event.

Geoshields Summary of GGS Findings Continued

The continuous monitoring showed no significant gas accumulation, even during falling atmospheric pressure.

Please see below extract from the GGS Summary Report (4. Technical Commentary) - Continuous ground gas monitoring targeted an exhaust vent considered likely to present worst case in terms of capturing void gas which is least diluted. During the continuous monitoring period, methane remained below detection limits and carbon dioxide peaked at 0.05% v/v, which is typical of ambient air. No response in measured gas concentrations was observed during falling atmospheric pressure (likely to be a key ground gas driver).

Geoshields Conclusion

It is of Geoshields opinion that the ground gas protection measures in place are functioning effectively in mitigating ground gas ingress into the building.

From the images provided it is clear that the installation has been carried out as per the manufacturers guidelines. Methane concentrations detected were low and well below health and safety thresholds, with no evidence of significant accumulation in the subfloor void or internal spaces. Continuous monitoring further confirmed that ground gases are not building up to concerning levels, even during variable atmospheric conditions.

Based on this assessment, the existing ground gas protection measures are effectively preventing hazardous gas ingress, ensuring there is no risk to future occupants.

Annex One – GGG DataPack® Plus GGS3743 20A Chorlton Villas

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GGs site photograph (July, 2024)

Prepared for:
Burrows Graham Ltd.

Burrows
Graham

For: Burrows Graham Ltd.
Ref No.: GGS3743DPP01
Date: 05/09/2024

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Document Control Page

Client	Burrows Graham Ltd. 5 Ambassador Place, Stockport Road, Altrincham, WA15 8DB.
Project Title	GGG DataPack® Plus GGG3743 20A Chorlton Villas
Report Ref	GGG3743DPP01
Issue Status	FINAL

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GGGS3743 20A Chorlton Villas

FOREWORD

This report has been prepared based on information made available to Ground-Gas Solutions, trading as GGS, at the time of the reporting using all reasonable skill, care and diligence and within the limitations of the scope of works agreed with, and resources provided by, the client.

GGGS has relied on information provided by others and has prepared this report on the basis of this information being accurate.

The report and recommendations therein are provided based on information available to GGS at the time of preparing the report and completed to recognised UK guidance and legislation. GGS will not accept any liability for inaccurate or incomplete information provided to GGS or any liability arising from the future change of any such guidance or legislation.

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Air Sentinel® Specifications & Overview

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1 Introduction

GGG Limited has been commissioned by Burrows Graham Ltd. to provide ground gas monitoring and consultancy services for 20A Chorlton Villas, Hardly Lane, Manchester (the Site), and prepare a DataPack® Plus report, containing the following information:

- Methodologies.
- Gas sweep survey results.
- Continuous ground gas monitoring data and graphs.
- Wind speed and direction analysis.
- Atmospheric pressure trend analysis.
- Technical commentary.
- Calibration certificates.

1.1 Scope of works

The scope of the works is set out below:

- A site visit by GGS on 23rd July 2024 to undertake a high-resolution gas sweep survey of the site and deploy continuous ground gas monitoring instruments at 1 No. sub floor void locations.
- A site visit by GGS on 21st August 2024 to undertake a high-resolution gas sweep survey of the site and collect 1 No. continuous ground gas monitoring instruments.
- Provision of a GGS DataPack® Plus report.

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1.2 Site context

Table 1.1 below provides a brief site description and overview. GGS selected site photographs are presented in Appendix B.

Table 1.1 Site description

Description	Details
Address	20A Chorlton Villas, Hardy Lane, Manchester
Postcode	M21 8DN
National Grid Reference (approximate centre of site)	SJ 81518 92590
Overview	The Site comprises a single detached, newly constructed residential property, built to completion. GGs understands that Characteristic Situation 2 (CS2) gas protection measures, including a ventilated sub floor void and gas resistant membrane, were incorporated within the construction of the property. However, no validation report for installation of the gas protection measures is available. As such, an outstanding planning condition remains. A ground gas receptor monitoring programme has been proposed to provide evidence to the functionality of the sub floor void and identify whether there is any unacceptable pollutant linkage with respect to ground gas (methane and carbon dioxide), in the sites current form.

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2 Methodology

2.1 Gas sweep surveys

High resolution gas sweep surveys of the Site were undertaken on 23rd July and 21st August 2024. Handheld monitoring instruments were used to record methane and carbon dioxide concentrations at parts per million by volume (ppmv) level.

During the gas sweep surveys, GGS specialists targeted areas within the building of likely potential ground gas ingress (such as service entry points), along with areas of likely ground gas accumulation (such as cupboard spaces and small rooms). GGS also took measurements from all sub floor void vent locations.

A summary of the gas sweep survey results is presented in Section 3.1 and the detailed records are presented in Appendix A. Figure 1 below presents a selection of photographs taken during the detailed gas sweep survey.



Figure 1 Selected GGS site photographs taken during the high-resolution gas sweep surveys undertaken at the site. Left: Photograph of measurements taken from a selected air brick via semi rigid sample tubing. Right: Photograph taken during the internal gas sweep survey.

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2.2 Continuous ground gas monitoring

For sub-floor voids, the worst potential gas concentrations that can occur from surface emissions will be located on the down-wind side of the properties, where the least amount of dilution from fresh air will occur. Thus, monitoring on the prevailing down-wind side of such properties is most appropriate. This approach was adopted for the sub-floor void monitoring at this site. This approach is considered to be measuring the 'pathway' within a source-pathway-receptor investigation.

GGG undertook high resolution continuous ground gas monitoring at 1 No. sub-floor void locations for a 4-week period between 23rd July and 21st August 2024.

At the selected downwind monitoring location, GGG inserted a length of semi-rigid sample tubing through the telescopic/snorkel sleeve and into the sub-floor void. The sample tubing was then connected to the sample inlet port of the Air Sentinel® instrumentation. For the duration of the monitoring period, the Air Sentinel® instrumentation was fixed to the external wall adjacent to the selected air brick.

Air Sentinel® instruments recorded atmospheric pressure, temperature, and gas concentrations; methane (CH₄), carbon dioxide (CO₂), oxygen (O₂), carbon monoxide (CO) and hydrogen sulphide (H₂S), at a 60-minute monitoring frequency for the duration of the monitoring period.

Table 2.1 below details the schedule of continuous ground gas monitoring at the site. GGG site photographs of the instruments deployed on site are presented in Figure 2 below. A monitoring location plan is presented in Appendix A, whilst the full time series data is presented in Appendix C.

Table 2.1 Continuous ground gas monitoring schedule

Location ID	Instrument Serial No.	Dates monitored
CM01	03000023	23/07/24 - 21/08/24

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Figure 2 GGS site photographs of the Air Sentinel® instrumentation deployed at the Site. The instruments were secured to the walls and connected to the selected sub-floor void locations via air bricks using a length of semi rigid sample tubing.

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3 Results

3.1 Gas sweep survey results

GGG undertook detailed high resolution gas sweep surveys of the site on 23th July and 21st August 2024. A summary of results and observations is presented in Table 3.1 below, whilst the full gas sweep survey records are presented in Appendix A.

Table 3.1 Summary of gas sweep survey results and comments

Date	Max. CH ₄ (ppmv)	Max. CO ₂ (ppmv)	Comments
23/07/2024	44.4	1034	Survey undertaken during rising atmospheric pressure conditions and pressure above mean sea level pressure (MSLP). Prior to commencement of the survey, the front doors and rear sliding door were opened for approximately 30-minutes and the property was passively vented to a degree. Within the internal spaces of the property, methane and carbon dioxide concentrations were typical of ambient air and no discrete ground gas entry points were identified. Within the sub floor void, concentrations of methane and carbon dioxide were measured slightly above background. Above background measurements of methane and carbon dioxide were measured exclusively on the eastern elevation of the property, whilst concentrations on the western elevation were consistent with ambient air.
21/08/2024	112	602	Survey undertaken during slow falling pressure, with pressure approximate to MSLP. Property understood to have been under closed conditions since 23rd July 2024. Within the internal spaces of the property, carbon dioxide concentrations were typical of ambient air. Methane concentrations inside the property were measured slightly above background, to a maximum of 18.1ppmv, which indicates that a methane source is present. No discrete ground gas entry points were identified. Within the sub floor void, carbon dioxide concentrations were typical of ambient air. Methane concentrations were measured above background in the void, to a maximum of 112ppmv at vent number 4 on the south western elevation.

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To provide additional context to the site visits, in terms of atmospheric pressure, GGS has presented the site visits alongside graphs of the atmospheric pressure trend and 3-hour pressure tendency in Figure 3 below. Within Figure 3, GGS has included pressure data from one week before the first gas sweep survey and one week after the second gas sweep survey.

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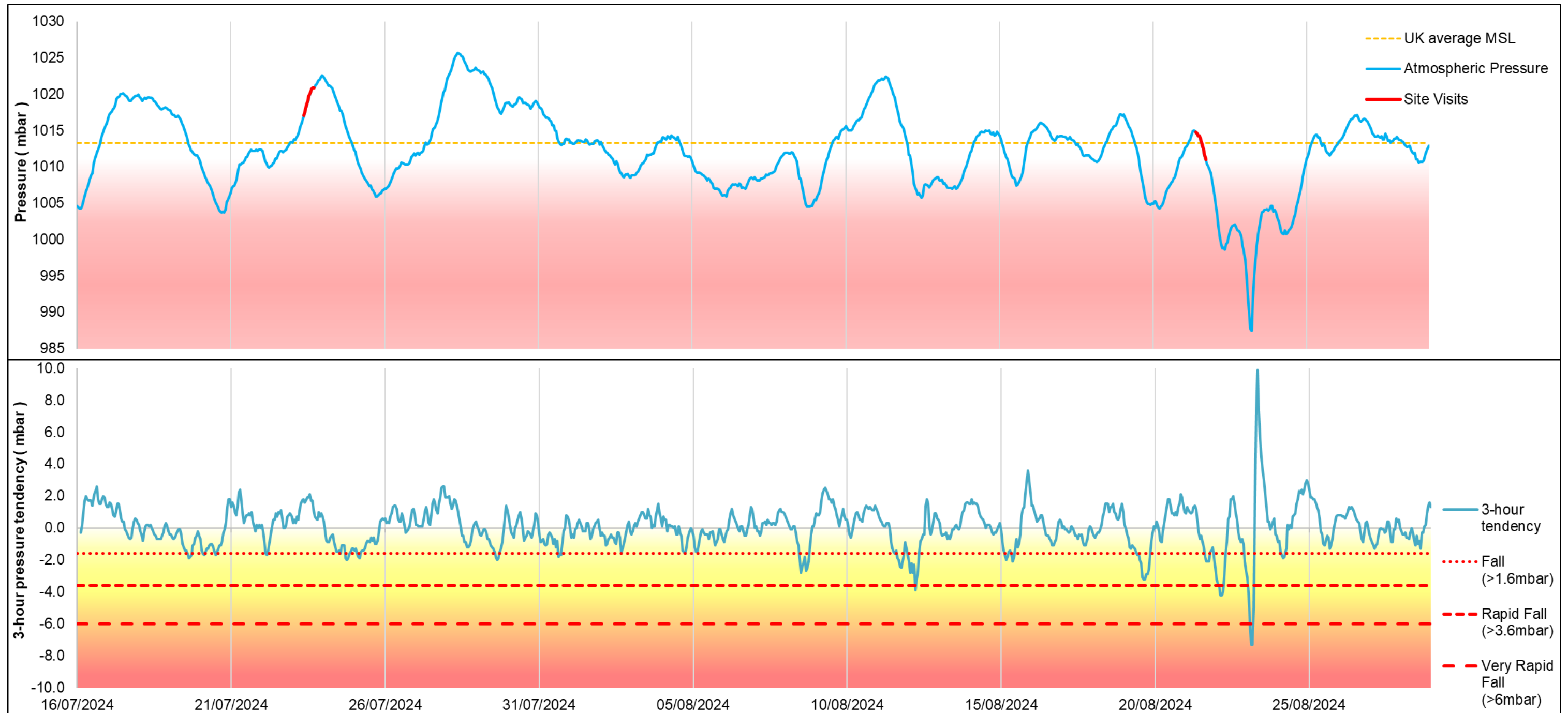


Figure 3 Atmospheric pressure regime and 3-hour tendency for the site from 16/07/24 00:00 to 28/08/24 23:00.

As evidenced in Figure 3 above, the first gas sweep survey was undertaken during rising atmospheric pressure conditions, whilst atmospheric pressure was above MSL pressure. The second gas sweep survey was undertaken during slow falling atmospheric pressure conditions, with atmospheric pressure approximate to MSLP.

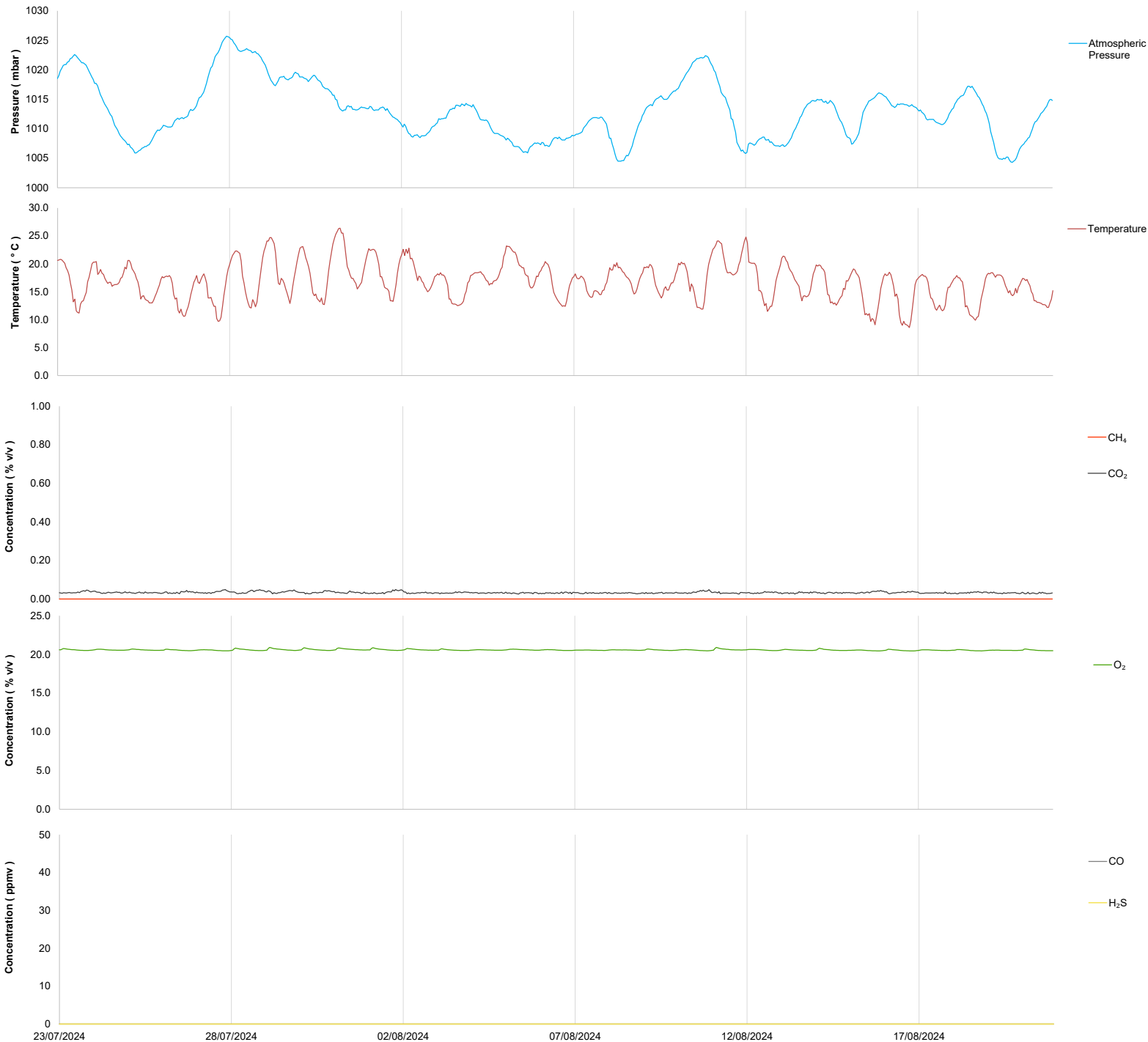
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3.2 Continuous sub-floor monitoring results

Continuous monitoring graphs are presented below, and the raw data is presented in Appendix C.

The calibration certificates for the instruments used are presented in Appendix D, whilst an overview of the GGS Air Sentinel® instruments is presented in Appendix E.



Title:

CRM01 - Time Series Graphs

Project:

GG3743 20A Chorlton Villas, Hardy Lane,
Manchester

Client:

Burrows Graham Limited

Minimum / Maximum Table		
Parameter	Minimum	Maximum
CH ₄ (% v/v)	0.00	0.00
CO ₂ (% v/v)	0.03	0.05
O ₂ (% v/v)	20.5	20.9
Hydrogen Sulphide (ppmv)	0	0
Carbon Monoxide (ppmv)	0	0
Atmospheric Pressure (mbar)	1004.3	1025.7
Temperature (° C)	8.6	26.4

These graphs form part of the GGS DataPack® which is a registered trademark.

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3.4 Wind speed and direction analysis

It is key to the sub-floor void monitoring methodology adopted for this investigation, that monitoring is undertaken from an exhaust vent located on the prevailing down-wind side of each property.

Within a UK context, the prevailing winds are from the southwest and largely driven by the jet stream. As such, the prevailing down-wind side will predominantly be to the north-east corner of UK properties. GGS deployed the continuous monitoring instrument via selecting a sub floor void vent on the north-eastern facade of the property under investigation.

To evidence the wind speed and direction during the continuous sub-floor void monitoring period, GGS obtained weather data from Open Meteo. Figure 4 on the following page presents the obtained wind speed and direction data for the continuous sub-floor void monitoring periods.

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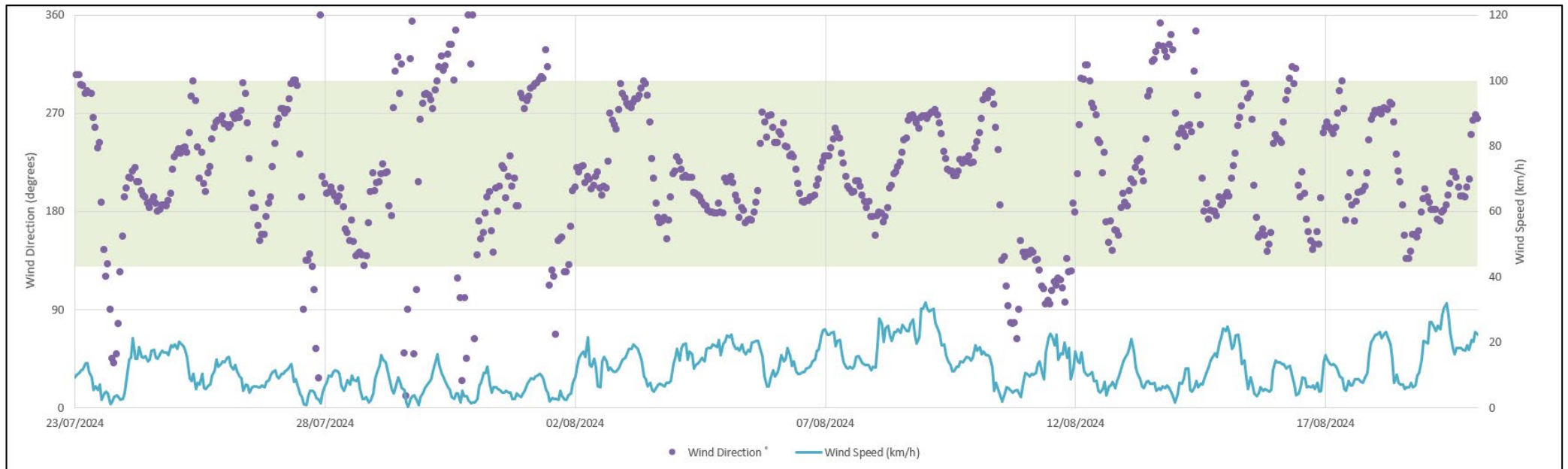


Figure 4 Wind speed and direction during the continuous sub-floor void monitoring period (23/07/2024 – 21/08/2024).

For: Burrows Graham Ltd.
Ref No.: GGS3743DPP01
Date: 05/09/2024

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Figure 4 demonstrates the variable wind speed and direction throughout the continuous monitoring period. The wind direction was predominantly from the southwest, as evidenced by most of the data points falling within the light shaded zone (135-315 degrees – reference North 0 degrees). As such, the continuous monitoring instrument deployed would have been on the downwind side of the properties for the majority of the monitoring period.

The wind speed data indicates that during the continuous monitoring periods, the zone of negative pressure/suction phenomenon would likely be active. As such, the least diluted gas from the sub-floor void would be directed towards, and captured by, the deployed continuous monitoring instruments.

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3.1 Atmospheric pressure analysis

Atmospheric pressure is often a dominant ground-gas driver and as such, monitoring should include sampling during falling and rising pressure events. Specifically, it is the rate of a pressure fall and the duration of the fall that are the two factors considered most important.

To capture potential 'worst case' conditions with respect to falling atmospheric pressure, monitoring should include both short and longer duration falling pressure events at a rate of 1.15 millibars per hour and above¹. This is calculated as an average fall over an 8-hour reference period. The rate of change in atmospheric pressure over an 8-hour reference period is presented in Figure 5 on the following page/s.

For weather forecasting in the UK, The Meteorological Office² records falling pressure tendency over a 3-hour period, whereby every hour the change in atmospheric pressure over the proceeding 3 hours is noted as being:

- Stable <0.1 millibars
- Falling (or rising) slowly >0.1 millibars
- Falling (or rising) >1.6 millibars
- Falling (or rising) rapidly >3.6 millibars
- Falling (or rising) very rapidly >6 millibars

Similarly, The British Coal Technical Department³ considered a sharp fall in pressure to be between 4 and 8 millibars over a 3-hour period. GGS has used the time series data to reference a 3-hour tendency throughout the continuous monitoring period using the Met Office criteria listed above. A time series graph of the 3-hour pressure tendency is also presented in Figure 5 on the following page/s, which provides time reference/occurrences to atmospheric pressure falling, falling rapidly and/or falling very rapidly.

The standard mean sea level pressure (MSLP) in the UK is defined as 1013.25 millibars⁴, which provides a common value to compare atmospheric pressure across different locations

¹ CL:AIRE Technical Bulletin 17, August 2018. Ground Gas Monitoring and 'Worst-Case' Conditions

² https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/library-and-archive/library/publications/factsheets/factsheet_8-shipping-forecast.pdf

³ British Coal Technical Department. 1990. Hazardous Gases Underground: Notes for Guidance NG/9. British Coal Technical Department.

⁴ <https://www.metoffice.gov.uk/weather/learn-about/weather/how-weather-works/high-and-low-pressure>

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and elevations. Atmospheric pressure above or below MSLP can therefore be considered either higher or lower than the average pressure for that geographical location. Table 3.4 below provides a summary of the atmospheric pressure regime, including the percentage time in which pressure was below average and below average and falling.

With consideration to The Met Office pressure change criteria, the percentage distribution of the atmospheric pressure regime in terms of 3-hour tendency during the continuous monitoring period is presented in Figure 6 below. Although rising pressure will have a similar distribution to falling pressure, this is listed together. The percentage distribution of the atmospheric pressure regime in terms of very low to very high is presented in Figure 7, also below.

Table 3.4 Atmospheric pressure regime

Atmospheric Pressure Analysis 23/07/24 – 21/08/24	
Range in atmospheric pressure (mbar)	1004.3 – 1025.7 (21.4 millibars)
Maximum average rate of fall over an 8-hour reference period	0.94 millibars per hour (11/08/2024 21:00 1015.3 mb - 12/08/24 05:00 1007.7 mb)
Maximum change in pressure over a 3-hour period (pressure tendency)	3.9 millibars (12/08/24 02:00 1011.6 mb – 12/08/24 05:00 1007.7 mb)
Most significant atmospheric pressure greater than 8 hours	15.7 millibars over 25 hours (0.63 mbar/hour) (1021.5 11/08/24 10:00 – 1005.8 12/08/24 11:00)
% time low or very low pressure and falling	11.1
Average pressure during the monitoring period (millibars)	1013.02

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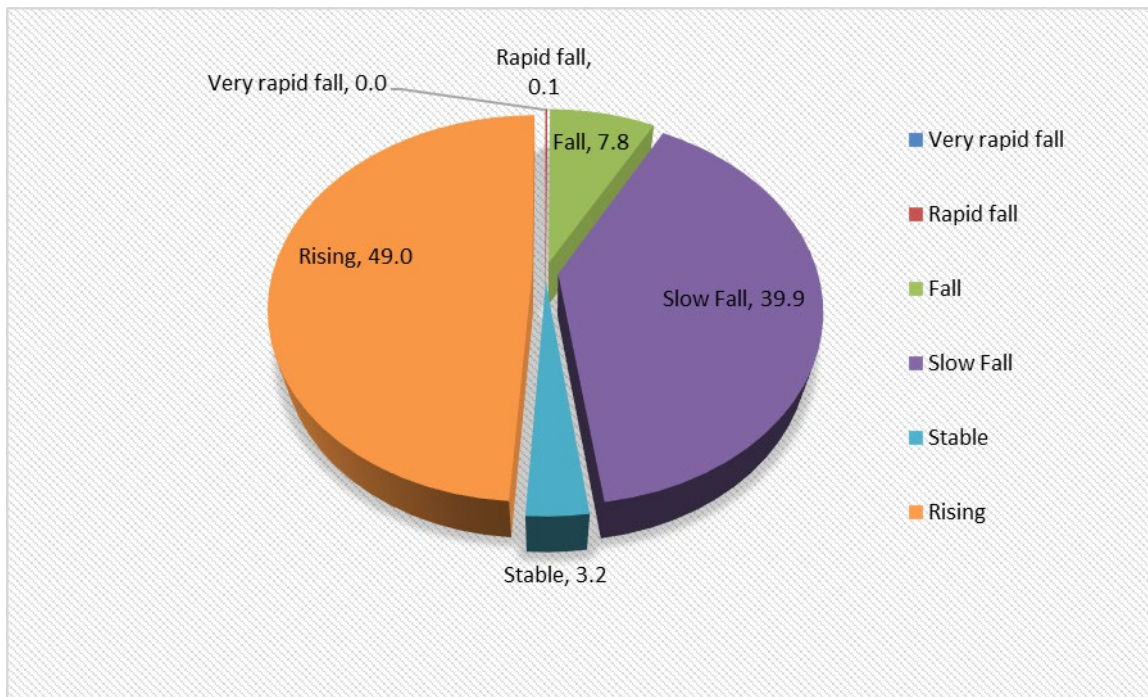


Figure 6 % distribution pressure regime in terms of 3-hour tendency between 23/07/24 – 21/08/24.

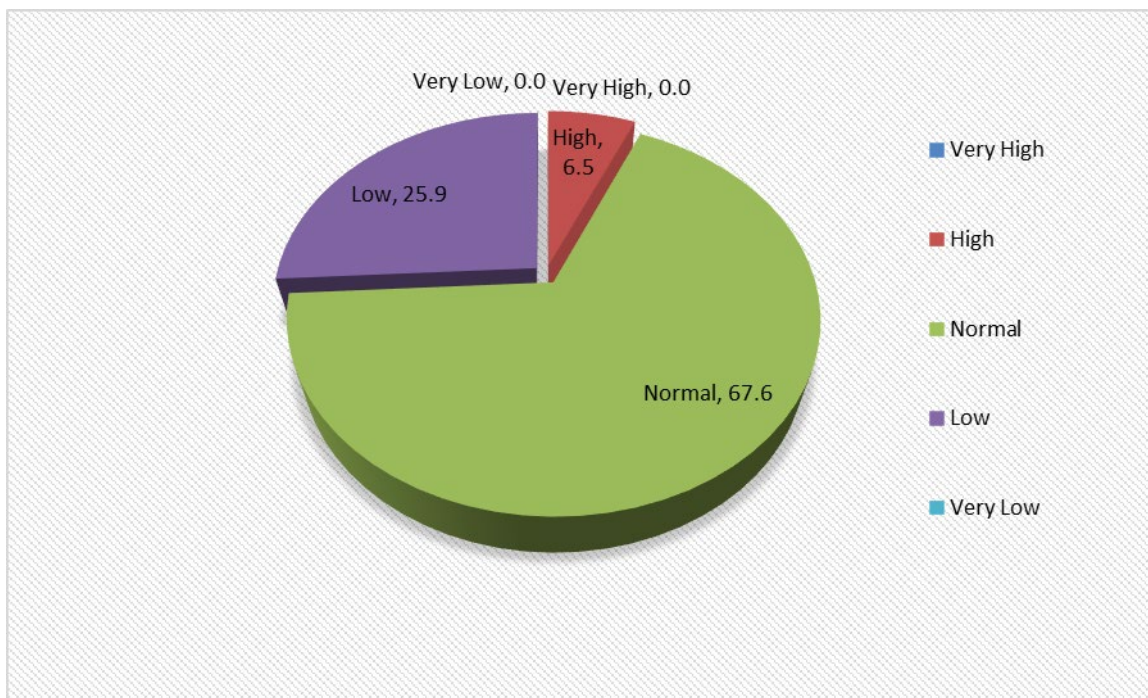


Figure 7 % distribution pressure regime between 23/07/24 – 21/08/24.

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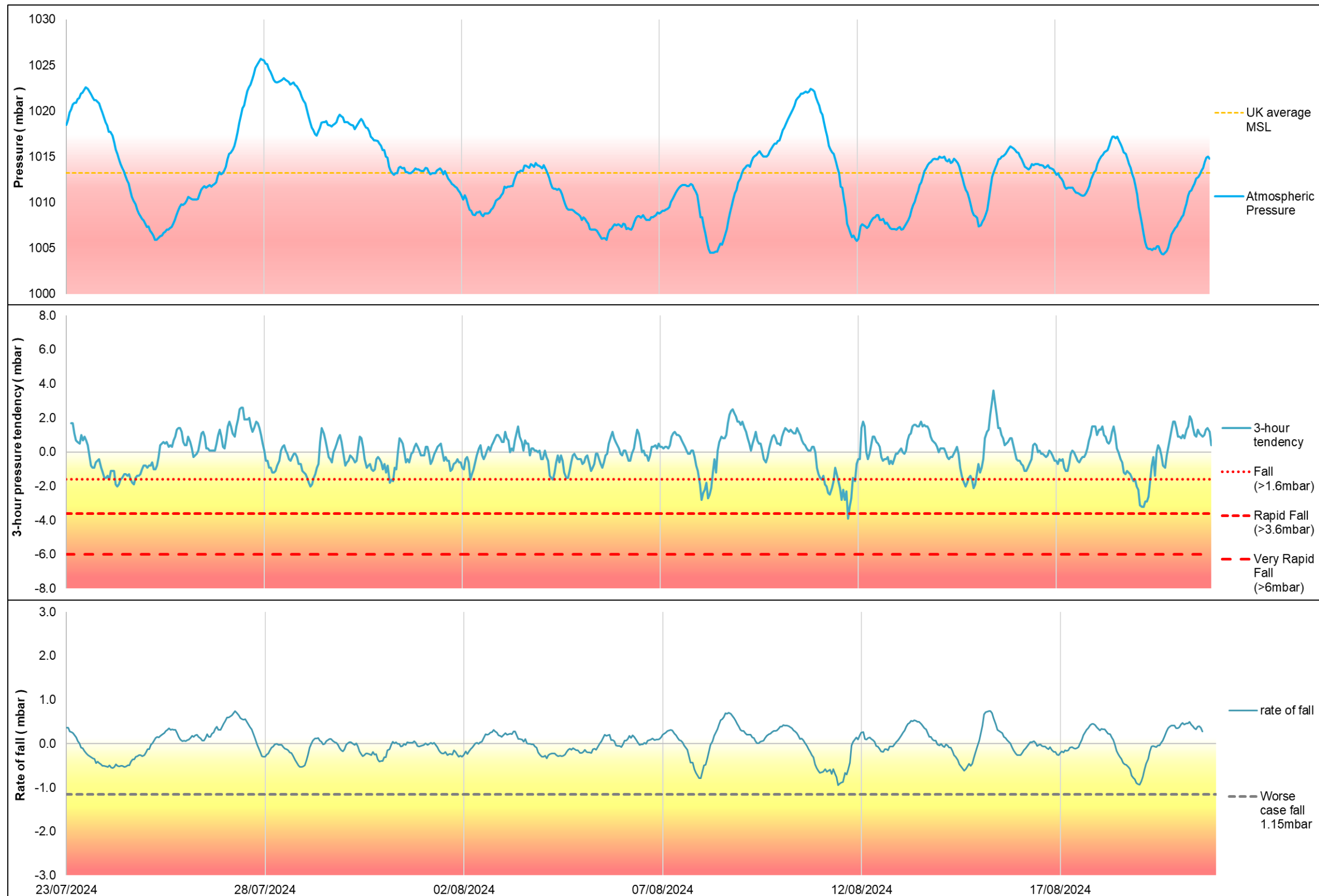


Figure 5 Atmospheric pressure regime during monitoring period (23/07/24 – 21/08/24).

4 Technical Commentary

During the gas sweep surveys undertaken at the site, GGS identified slightly above background concentrations of methane within the sub floor void and within the internal spaces of the property. The above background detections of methane indicate that a methane source is present.

The first survey identified above background methane within the void, but not within the internal spaces. This is likely due to the temporary passive venting of the property through the opening of the front and rear doors, with any above background methane in the property likely diluted and liberated to atmosphere. Methane concentrations were slightly elevated on the eastern elevation, but not the western elevation, which is likely due to void functionality and the prevailing wind conditions during the survey.

The second survey identified slightly above background methane concentrations simultaneously in both the void and the internal spaces. No discrete ground gas entry points were identified, and it is not clear whether ongoing ingress was occurring during the survey, or whether the above background methane concentrations in the property represent residue gas from a previous ingress event.

Methane concentrations measured on site are considered relatively low-level and have only been detected due to the high-resolution methane specific TDL-500 instrument used. To provide context, 20% lower explosive limit (LEL) is often used as a precautionary health and safety trigger to prompt action. For methane, which is considered to have an LEL of 5% v/v (depending on gas composition, temperature and pressure), 20% of LEL is 1% v/v (10,000ppmv). Therefore, the maximum recorded methane concentration of 112ppmv is well below any levels which would prompt an immediate health and safety concern.

Lines of evidence indicate that the source of the methane is most likely to be present within the ground. Occasionally, leaks to the mains gas system can cause above background concentrations of methane within properties, however, a leak from the mains would be unlikely to cause above background methane concentrations in the sub floor void at the same time. Therefore, if methane from an in-ground source is entering the property, there must be viable ground gas pathways present.

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Continuous ground gas monitoring targeted an exhaust vent considered likely to present worst case in terms of capturing void gas which is least diluted. During the continuous monitoring period, methane remained below detection limits and carbon dioxide peaked at 0.05% v/v, which is typical of ambient air. No response in measured gas concentrations was observed during falling atmospheric pressure (likely to be a key ground gas driver).

Atmospheric pressure during the continuous monitoring period was variable and captured multiple falling pressure events, including rapid falling pressure. However, pressure remained above 1000mb throughout, and a worst case fall of 1.15mb over an 8-hour reference period was not captured. It is considered likely that any significant emissions of ground gas from the soils accumulating in the void will have been captured by the continuous monitoring should they have been occurring.

Although the recorded methane concentrations inside the property do not present any immediate concern, they provide evidence that there are viable pathways for ground gas to enter the property. The void is evidenced to be functional as continuous monitoring demonstrates that methane and carbon dioxide is not accumulating in the void to unacceptable levels. However, a degree of uncertainty remains that potentially, ground gas may accumulate inside the property to higher concentrations not captured during the latest assessment completed by GGS. This could occur if ground gas bypasses the void via preferential pathways, for example through the cavity or via service ducts.

To provide a higher confidence level that there is no unacceptable ground gas pollutant linkage, GGS recommends that additional internal monitoring is undertaken. Suitable monitoring would include continuous ground gas monitoring at an internal location considered approximate to worst case (such as an enclosed cupboard space), supplemented by additional gas sweep surveys, with particular attention given to potential preferential pathways.

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5 Instrument Specifications

All GGS instrumentation is maintained in accordance with the manufacturer recommendations and is serviced and calibrated annually. An overview of the instruments used on site and their specifications is presented below, whilst calibration certificates are presented in Appendix E.

Note that for some instrumentation cross sensitivity to other gases and significant environmental changes, such as temperature, pressure and humidity, should be taken into consideration when considering all site monitoring data.

5.1 Air Sentinel®

An overview and specification sheet for the Air Sentinel® instrumentation is presented in Appendix F.

5.2 Gazomat Inspectra® Laser portable gas detector

The Gazomat Inspectra® laser (TDL-500) is a portable gas detector that uses the principle of infrared laser light absorption of methane molecules. The detection principle allows the detector to be highly selective, and sensitive to a single ppm of methane gas. The laser technology is intrinsically safe, as it does not generate hot points. In addition, the TDL-500 does not affect the sample and is not sensitive to flow fluctuations, it is the only portable gas detector in the world to offer this kind of technology for detecting traces of methane gas.

Table 5.2 TDL-500 Specification

Feature	Sensor	Range	Accuracy
Methane	Infrared	0-10,000 ppm and 0.1% to 100% v/v	1 ppmv

5.3 Gas Data GFM226 series

The Gas Data GFM 226 series gas analyser measure carbon dioxide to parts per million level.

The specification range of the GFM 226 series is as follows:

Table 5.2 GFM226 Specification

Feature	Method / Type	Range	Resolution
Carbon Dioxide	Infrared	0 – 10,000 parts per million (ppm)	1ppm

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6 Limitations

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GGG accept no responsibility for the interpretation of this factual data. A reviewer of the data provided must take into account other available information and the context in which this data was collected. For example, site setting, conceptual site model, environmental conditions, gases present (that are not monitored as part of this contract, but may interfere with the sensors used), building design and construction practices during the monitoring period.

GGG accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Appendix A

Monitoring Location Plan

23/07/2024



Weather: Sunny intervals, 23°C. 9km/h winds, gusts 27.
10:00 1017mbar - 17:00 1021mbar (rising trend).

Fresh air reading prior to internal
sweep survey: 1.4 360



Experts in
Continuous Monitoring

Ground Gas Solutions (GGS) Ltd.
Pythia House (Unit 10), Bamford Business Park
Hibbert Street, Stockport, SK4 1PL

Title:
GGS3743 Internal Gas Sweep
Survey 23/07/24

Project:
GGS3743 20a Chorlton Villas

Drawing No:
GGS3743_IGSS_23/07/24

Key:

CH₄: XX
CO₂: XXX

0-11 Sub floor void vent
locations

Continuous monitoring
instrument location

Rev.	Date	Dwn.	Description	App'd
0	24/07/2024	MT	FINAL	DN

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Note: All methane (CH₄) and carbon dioxide (CO₂) measurements
are to ppmv level.
Drawing not to scale - for illustrative purposes only.

21/08/2024



Weather: Overcast, 18°C, 20km/h winds, gusts 51.
10:00 1012mbar - 17:00 1012mbar (falling trend).

Fresh air reading prior to internal
sweep survey: 1.4 370



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Ground Gas Solutions (GGS) Ltd.
Pythia House (Unit 10), Bamford Business Park
Hibbert Street, Stockport, SK4 1PL

Title:
GGS3743 Internal Gas Sweep
Survey 21/08/24

Project:
GGS3743 20a Chorlton Villas

Drawing No:
GGS3743_IGSS_21/08/24

Key:

CH₄: XX
CO₂: XXX

0-11 Sub floor void vent
locations

Continuous monitoring
instrument location

Rev.	Date	Dwn.	Description	App'd
0	24/07/2024	MT	FINAL	

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Note: All methane (CH₄) and carbon dioxide (CO₂) measurements
are to ppmv level.
Drawing not to scale - for illustrative purposes only.

Appendix B

GGs Site Photographs

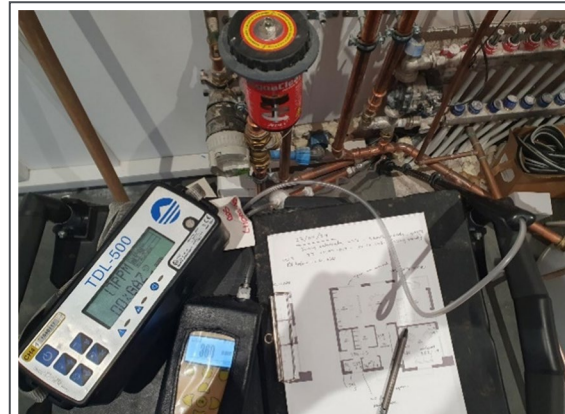
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GGs3743 20A Chorlton Villas



1. Front (north) side of site.



2. Internal sweep survey set-up.



3. Monitoring of service entries in plant room.



4. Air brick on site.



5. Methane measurement of an air brick.



6. Continuous monitoring instrument deployed and secured on site.

Appendix C

Continuous Ground Gas Monitoring Data

Time Series Data

Project Ref:	GGS3743
Project Name:	20A Chorlton Villas, Hardy Lane, Manchester
Location ref:	CRM01
Instrument Name and ID:	Gas Sentinel*03050023
Start Date:	23/07/2024 11:00
End Date:	21/08/2024 09:00
Days of monitoring:	29
Monitoring Frequency (mins):	60
Total samples taken:	695



Experts in Continuous Monitoring

Summary Table

	CH	CO	O	CO	H S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Temperature
Minimum	0.00	0.03	20.5	0	0	1004.3	-0.95	8.6
Maximum	0.00	0.05	20.9	0	0	1025.7	0.75	26.4
Range	0.00	0.02	0.5	0	0	21.4	1.70	17.8

Date and Time	CH % v/v	CO % v/v	O % v/v	CO ppm/v	H S ppm/v	Atmospheric Pressure mbar	Average 8-hour atmospheric pressure change mbar	Temperature °C
23/07/2024 11:00	0.00	0.03	20.6	0	0	1018.5	N/A	20.6
23/07/2024 12:00	0.00	0.03	20.6	0	0	1019.0	N/A	20.7
23/07/2024 13:00	0.00	0.03	20.7	0	0	1019.8	N/A	20.8
23/07/2024 14:00	0.00	0.03	20.8	0	0	1020.2	N/A	20.7
23/07/2024 15:00	0.00	0.03	20.7	0	0	1020.7	N/A	20.4
23/07/2024 16:00	0.00	0.03	20.7	0	0	1020.9	N/A	20.1
23/07/2024 17:00	0.00	0.03	20.7	0	0	1020.9	N/A	19.3
23/07/2024 18:00	0.00	0.03	20.7	0	0	1021.3	N/A	18.8
23/07/2024 19:00	0.00	0.03	20.6	0	0	1021.4	0.36	18.0
23/07/2024 20:00	0.00	0.03	20.6	0	0	1021.9	0.36	16.5
23/07/2024 21:00	0.00	0.03	20.6	0	0	1022.0	0.28	15.3
23/07/2024 22:00	0.00	0.03	20.6	0	0	1022.3	0.26	13.2
23/07/2024 23:00	0.00	0.03	20.6	0	0	1022.6	0.24	13.7
24/07/2024 00:00	0.00	0.04	20.6	0	0	1022.4	0.19	11.6
24/07/2024 01:00	0.00	0.03	20.5	0	0	1022.1	0.15	11.3
24/07/2024 02:00	0.00	0.04	20.5	0	0	1021.8	0.06	11.2
24/07/2024 03:00	0.00	0.04	20.5	0	0	1021.5	0.01	12.8
24/07/2024 04:00	0.00	0.04	20.5	0	0	1021.2	-0.09	13.3
24/07/2024 05:00	0.00	0.04	20.5	0	0	1021.2	-0.10	13.4
24/07/2024 06:00	0.00	0.05	20.5	0	0	1021.0	-0.16	14.2
24/07/2024 07:00	0.00	0.05	20.5	0	0	1020.8	-0.23	14.9
24/07/2024 08:00	0.00	0.04	20.5	0	0	1020.3	-0.26	16.8
24/07/2024 09:00	0.00	0.04	20.5	0	0	1019.8	-0.29	17.6
24/07/2024 10:00	0.00	0.04	20.6	0	0	1019.3	-0.31	18.8
24/07/2024 11:00	0.00	0.04	20.6	0	0	1018.8	-0.34	20.0
24/07/2024 12:00	0.00	0.04	20.6	0	0	1018.4	-0.35	20.3
24/07/2024 13:00	0.00	0.04	20.7	0	0	1017.7	-0.44	20.3
24/07/2024 14:00	0.00	0.03	20.7	0	0	1017.7	-0.41	20.4
24/07/2024 15:00	0.00	0.03	20.7	0	0	1017.3	-0.44	18.1
24/07/2024 16:00	0.00	0.03	20.7	0	0	1016.6	-0.46	18.4
24/07/2024 17:00	0.00	0.03	20.7	0	0	1015.8	-0.50	19.0
24/07/2024 18:00	0.00	0.03	20.6	0	0	1015.3	-0.50	18.3
24/07/2024 19:00	0.00	0.03	20.6	0	0	1014.7	-0.51	18.1
24/07/2024 20:00	0.00	0.03	20.6	0	0	1014.2	-0.52	17.4
24/07/2024 21:00	0.00	0.03	20.6	0	0	1013.8	-0.49	16.9
24/07/2024 22:00	0.00	0.03	20.6	0	0	1013.4	-0.54	16.5
24/07/2024 23:00	0.00	0.03	20.6	0	0	1012.9	-0.55	16.7
25/07/2024 00:00	0.00	0.03	20.6	0	0	1012.4	-0.53	16.7
25/07/2024 01:00	0.00	0.03	20.6	0	0	1012.1	-0.46	16.0
25/07/2024 02:00	0.00	0.03	20.6	0	0	1011.3	-0.50	16.2
25/07/2024 03:00	0.00	0.04	20.6	0	0	1010.6	-0.51	16.3
25/07/2024 04:00	0.00	0.03	20.5	0	0	1010.2	-0.50	16.3
25/07/2024 05:00	0.00	0.03	20.5	0	0	1009.8	-0.50	16.4
25/07/2024 06:00	0.00	0.03	20.5	0	0	1009.2	-0.52	16.7
25/07/2024 07:00	0.00	0.03	20.5	0	0	1008.8	-0.51	17.4
25/07/2024 08:00	0.00	0.03	20.5	0	0	1008.5	-0.49	17.6
25/07/2024 09:00	0.00	0.04	20.6	0	0	1008.2	-0.49	18.4
25/07/2024 10:00	0.00	0.03	20.6	0	0	1008.0	-0.41	19.4
25/07/2024 11:00	0.00	0.03	20.6	0	0	1007.7	-0.36	19.1
25/07/2024 12:00	0.00	0.04	20.6	0	0	1007.3	-0.36	20.6
25/07/2024 13:00	0.00	0.03	20.7	0	0	1007.4	-0.30	20.6
25/07/2024 14:00	0.00	0.03	20.7	0	0	1006.9	-0.29	20.1
25/07/2024 15:00	0.00	0.03	20.7	0	0	1006.7	-0.26	19.1
25/07/2024 16:00	0.00	0.03	20.7	0	0	1006.4	-0.26	18.7
25/07/2024 17:00	0.00	0.03	20.7	0	0	1005.9	-0.29	18.2
25/07/2024 18:00	0.00	0.03	20.6	0	0	1005.9	-0.26	17.4
25/07/2024 19:00	0.00	0.04	20.6	0	0	1006.1	-0.20	16.8
25/07/2024 20:00	0.00	0.03	20.6	0	0	1006.3	-0.13	15.6
25/07/2024 21:00	0.00	0.03	20.6	0	0	1006.4	-0.13	13.7
25/07/2024 22:00	0.00	0.03	20.6	0	0	1006.7	-0.02	14.2
25/07/2024 23:00	0.00	0.04	20.6	0	0	1006.8	0.01	14.3
26/07/2024 00:00	0.00	0.03	20.6	0	0	1007.0	0.08	13.7
26/07/2024 01:00	0.00	0.03	20.6	0	0	1007.0	0.14	13.5
26/07/2024 02:00	0.00	0.03	20.6	0	0	1007.2	0.16	13.4
26/07/2024 03:00	0.00	0.03	20.5	0	0	1007.3	0.15	13.0
26/07/2024 04:00	0.00	0.03	20.5	0	0	1007.7	0.18	13.0
26/07/2024 05:00	0.00	0.03	20.5	0	0	1008.1	0.21	13.0
26/07/2024 06:00	0.00	0.03	20.5	0	0	1008.6	0.24	13.5
26/07/2024 07:00	0.00	0.03	20.5	0	0	1009.1	0.29	14.2
26/07/2024 08:00	0.00	0.03	20.5	0	0	1009.5	0.31	14.8
26/07/2024 09:00	0.00	0.03	20.5	0	0	1009.8	0.35	15.5
26/07/2024 10:00	0.00	0.03	20.5	0	0	1009.7	0.31	16.2
26/07/2024 11:00	0.00	0.03	20.5	0	0	1009.9	0.33	17.2
26/07/2024 12:00	0.00	0.03	20.6	0	0	1010.2	0.31	17.7
26/07/2024 13:00	0.00	0.04	20.7	0	0	1010.6	0.31	17.5
26/07/2024 14:00	0.00	0.04	20.7	0	0	1010.5	0.24	17.7
26/07/2024 15:00	0.00	0.03	20.7	0	0	1010.4	0.16	17.8
26/07/2024 16:00	0.00	0.03	20.6	0	0	1010.3	0.10	17.7
26/07/2024 17:00	0.00	0.03	20.6	0	0	1010.3	0.06	17.9
26/07/2024 18:00	0.00	0.03	20.6	0	0	1010.3	0.07	17.5
26/07/2024 19:00	0.00	0.03	20.6	0	0	1010.4	0.06	16.5
26/07/2024 20:00	0.00	0.03	20.6	0	0	1010.9	0.09	14.5
26/07/2024 21:00	0.00	0.03	20.6	0	0	1011.4	0.10	13.7
26/07/2024 22:00	0.00	0.03	20.6	0	0	1011.6	0.14	13.9
26/07/2024 23:00	0.00	0.03	20.5	0	0	1011.8	0.17	11.7
27/07/2024 00:00	0.00	0.04	20.5	0	0	1011.6	0.16	11.2
27/07/2024 01:00	0.00	0.04	20.5	0	0	1011.8	0.19	11.9
27/07/2024 02:00	0.00	0.04	20.5	0	0	1011.9	0.20	11.0
27/07/2024 03:00	0.00	0.04	20.5	0	0	1011.7	0.16	10.6
27/07/2024 04:00	0.00	0.04	20.5	0	0	1011.9	0.13	10.7
27/07/2024 05:00	0.00	0.04	20.5	0	0	1012.0	0.08	11.6
27/07/2024 06:00	0.00	0.04	20.5	0	0	1012.2	0.08	12.3
27/07/2024 07:00	0.00	0.04	20.5	0	0	1012.9	0.14	13.3
27/07/2024 08:00	0.00	0.04	20.5	0	0	1013.3	0.21	14.6
27/07/2024 09:00	0.00	0.03	20.5	0	0	1013.1	0.16	15.6
27/07/2024 10:00	0.00	0.03	20.5	0	0	1013.2	0.16	16.7
27/07/2024 11:00	0.00	0.04	20.5	0	0	1013.5	0.22	17.2
27/07/2024 12:00	0.00	0.03	20.6	0	0	1013.9	0.25	17.9
27/07/2024 13:00	0.00	0.03	20.6	0	0	1014.7	0.34	16.7

Date and Time	CH	CO	O	CO	H S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Temperature
	% v/v	% v/v	% v/v	ppm/v	ppm/v	mbar	mbar	°C
27/07/2024 14:00	0.00	0.03	20.6	0	0	1015.3	0.39	16.5
27/07/2024 15:00	0.00	0.03	20.6	0	0	1015.4	0.31	17.2
27/07/2024 16:00	0.00	0.03	20.6	0	0	1015.8	0.31	17.8
27/07/2024 17:00	0.00	0.03	20.6	0	0	1016.2	0.39	18.2
27/07/2024 18:00	0.00	0.03	20.6	0	0	1016.9	0.46	17.5
27/07/2024 19:00	0.00	0.03	20.6	0	0	1017.7	0.53	16.5
27/07/2024 20:00	0.00	0.03	20.6	0	0	1018.7	0.60	13.9
27/07/2024 21:00	0.00	0.03	20.6	0	0	1019.5	0.60	13.9
27/07/2024 22:00	0.00	0.03	20.6	0	0	1020.3	0.63	14.0
27/07/2024 23:00	0.00	0.03	20.5	0	0	1020.6	0.65	13.1
28/07/2024 00:00	0.00	0.04	20.5	0	0	1021.4	0.70	12.4
28/07/2024 01:00	0.00	0.04	20.5	0	0	1022.2	0.75	12.4
28/07/2024 02:00	0.00	0.04	20.5	0	0	1022.6	0.71	10.2
28/07/2024 03:00	0.00	0.04	20.5	0	0	1022.9	0.65	9.7
28/07/2024 04:00	0.00	0.04	20.5	0	0	1023.4	0.59	9.8
28/07/2024 05:00	0.00	0.05	20.5	0	0	1024.0	0.56	10.4
28/07/2024 06:00	0.00	0.05	20.5	0	0	1024.7	0.55	12.3
28/07/2024 07:00	0.00	0.05	20.5	0	0	1025.1	0.56	14.4
28/07/2024 08:00	0.00	0.04	20.5	0	0	1025.4	0.50	16.1
28/07/2024 09:00	0.00	0.04	20.5	0	0	1025.7	0.44	17.8
28/07/2024 10:00	0.00	0.04	20.5	0	0	1025.6	0.37	19.1
28/07/2024 11:00	0.00	0.04	20.5	0	0	1025.5	0.33	19.9
28/07/2024 12:00	0.00	0.04	20.5	0	0	1025.2	0.23	20.8
28/07/2024 13:00	0.00	0.04	20.7	0	0	1025.1	0.14	21.5
28/07/2024 14:00	0.00	0.03	20.8	0	0	1024.6	-0.01	21.9
28/07/2024 15:00	0.00	0.03	20.8	0	0	1024.3	-0.10	22.3
28/07/2024 16:00	0.00	0.03	20.7	0	0	1023.9	-0.19	22.3
28/07/2024 17:00	0.00	0.03	20.7	0	0	1023.4	-0.29	22.1
28/07/2024 18:00	0.00	0.03	20.7	0	0	1023.2	-0.30	21.9
28/07/2024 19:00	0.00	0.03	20.7	0	0	1023.1	-0.30	20.5
28/07/2024 20:00	0.00	0.03	20.7	0	0	1023.2	-0.25	17.8
28/07/2024 21:00	0.00	0.03	20.6	0	0	1023.3	-0.22	16.6
28/07/2024 22:00	0.00	0.03	20.6	0	0	1023.4	-0.15	15.0
28/07/2024 23:00	0.00	0.04	20.6	0	0	1023.6	-0.09	13.8
29/07/2024 00:00	0.00	0.04	20.6	0	0	1023.4	-0.06	12.9
29/07/2024 01:00	0.00	0.05	20.6	0	0	1023.3	-0.01	12.2
29/07/2024 02:00	0.00	0.05	20.5	0	0	1023.2	0.00	12.1
29/07/2024 03:00	0.00	0.04	20.5	0	0	1022.9	-0.03	13.6
29/07/2024 04:00	0.00	0.04	20.5	0	0	1023.0	-0.03	13.1
29/07/2024 05:00	0.00	0.05	20.5	0	0	1023.1	-0.02	12.3
29/07/2024 06:00	0.00	0.05	20.5	0	0	1022.8	-0.08	13.1
29/07/2024 07:00	0.00	0.05	20.5	0	0	1022.7	-0.11	15.1
29/07/2024 08:00	0.00	0.05	20.5	0	0	1022.4	-0.13	17.2
29/07/2024 09:00	0.00	0.04	20.5	0	0	1022.1	-0.15	19.2
29/07/2024 10:00	0.00	0.04	20.5	0	0	1021.6	-0.20	21.1
29/07/2024 11:00	0.00	0.04	20.5	0	0	1021.2	-0.21	22.3
29/07/2024 12:00	0.00	0.04	20.6	0	0	1020.8	-0.28	23.1
29/07/2024 13:00	0.00	0.04	20.8	0	0	1020.1	-0.38	24.1
29/07/2024 14:00	0.00	0.04	20.9	0	0	1019.4	-0.42	24.1
29/07/2024 15:00	0.00	0.04	20.9	0	0	1018.8	-0.49	24.7
29/07/2024 16:00	0.00	0.03	20.8	0	0	1018.2	-0.52	24.7
29/07/2024 17:00	0.00	0.03	20.8	0	0	1017.9	-0.53	24.2
29/07/2024 18:00	0.00	0.03	20.7	0	0	1017.5	-0.51	23.6
29/07/2024 19:00	0.00	0.03	20.7	0	0	1017.3	-0.49	22.0
29/07/2024 20:00	0.00	0.03	20.7	0	0	1017.7	-0.39	18.9
29/07/2024 21:00	0.00	0.03	20.7	0	0	1018.1	-0.25	16.5
29/07/2024 22:00	0.00	0.03	20.6	0	0	1018.7	-0.09	16.3
29/07/2024 23:00	0.00	0.04	20.6	0	0	1018.8	0.00	17.4
30/07/2024 00:00	0.00	0.04	20.6	0	0	1018.8	0.07	17.1
30/07/2024 01:00	0.00	0.04	20.6	0	0	1018.9	0.13	16.5
30/07/2024 02:00	0.00	0.04	20.6	0	0	1018.5	0.13	15.6
30/07/2024 03:00	0.00	0.04	20.6	0	0	1018.4	0.14	14.8
30/07/2024 04:00	0.00	0.04	20.6	0	0	1018.3	0.07	13.9
30/07/2024 05:00	0.00	0.04	20.5	0	0	1018.5	0.05	12.9
30/07/2024 06:00	0.00	0.04	20.5	0	0	1018.6	-0.01	14.1
30/07/2024 07:00	0.00	0.05	20.5	0	0	1018.8	0.00	16.0
30/07/2024 08:00	0.00	0.04	20.5	0	0	1019.3	0.06	17.6
30/07/2024 09:00	0.00	0.04	20.5	0	0	1019.6	0.09	18.9
30/07/2024 10:00	0.00	0.03	20.6	0	0	1019.4	0.11	20.4
30/07/2024 11:00	0.00	0.03	20.6	0	0	1019.3	0.11	21.7
30/07/2024 12:00	0.00	0.03	20.6	0	0	1018.8	0.06	22.8
30/07/2024 13:00	0.00	0.03	20.8	0	0	1018.8	0.04	23.0
30/07/2024 14:00	0.00	0.03	20.9	0	0	1018.8	0.02	23.1
30/07/2024 15:00	0.00	0.03	20.8	0	0	1018.6	-0.02	22.3
30/07/2024 16:00	0.00	0.03	20.8	0	0	1018.5	-0.10	21.1
30/07/2024 17:00	0.00	0.03	20.7	0	0	1018.4	-0.15	20.4
30/07/2024 18:00	0.00	0.03	20.7	0	0	1018.0	-0.17	19.5
30/07/2024 19:00	0.00	0.03	20.7	0	0	1018.3	-0.13	18.3
30/07/2024 20:00	0.00	0.03	20.7	0	0	1018.6	-0.02	16.5
30/07/2024 21:00	0.00	0.03	20.6	0	0	1018.9	0.01	14.8
30/07/2024 22:00	0.00	0.03	20.6	0	0	1019.1	0.04	14.3
30/07/2024 23:00	0.00	0.03	20.6	0	0	1018.9	0.04	14.6
31/07/2024 00:00	0.00	0.03	20.6	0	0	1018.5	0.00	13.8
31/07/2024 01:00	0.00	0.03	20.6	0	0	1018.2	-0.02	13.5
31/07/2024 02:00	0.00	0.03	20.6	0	0	1018.1	0.01	13.2
31/07/2024 03:00	0.00	0.03	20.5	0	0	1017.8	-0.06	13.9
31/07/2024 04:00	0.00	0.04	20.5	0	0	1017.2	-0.17	12.8
31/07/2024 05:00	0.00	0.04	20.5	0	0	1017.0	-0.24	12.7
31/07/2024 06:00	0.00	0.04	20.5	0	0	1016.8	-0.29	14.2
31/07/2024 07:00	0.00	0.04	20.5	0	0	1016.8	-0.26	16.5
31/07/2024 08:00	0.00	0.04	20.5	0	0	1016.7	-0.22	18.7
31/07/2024 09:00	0.00	0.04	20.5	0	0	1016.4	-0.23	20.5
31/07/2024 10:00	0.00	0.04	20.5	0	0	1016.2	-0.24	22.1
31/07/2024 11:00	0.00	0.04	20.6	0	0	1015.7	-0.26	23.5
31/07/2024 12:00	0.00	0.03	20.6	0	0	1015.7	-0.19	24.5
31/07/2024 13:00	0.00	0.03	20.8	0	0	1015.0	-0.25	25.3
31/07/2024 14:00	0.00	0.03	20.8	0	0	1014.9	-0.24	25.8
31/07/2024 15:00	0.00	0.03	20.8	0	0	1013.9	-0.36	26.3
31/07/2024 16:00	0.00	0.03	20.8	0	0	1013.4	-0.41	26.4
31/07/2024 17:00	0.00	0.03	20.8	0	0	1013.2	-0.40	25.5
31/07/2024 18:00	0.00	0.03	20.7	0	0	1013.0	-0.40	25.5
31/07/2024 19:00	0.00	0.03	20.7	0	0	1013.2	-0.31	24.0
31/07/2024 20:00	0.00	0.03	20.7	0	0	1013.2	-0.31	21.7
31/07/2024 21:00	0.00	0.03	20.7	0	0	1013.8	-0.15	19.5
31/07/2024 22:00	0.00	0.04	20.7	0	0	1013.9	-0.13	18.9
31/07/2024 23:00	0.00	0.04	20.7	0	0	1013.7	-0.02	18.0
01/08/2024 00:00	0.00	0.04	20.6	0	0	1013.8	0.05	17.4
01/08/2024 01:00	0.00	0.03	20.6	0	0	1013.3	0.01	17.4
01/08/2024 02:00	0.00	0.03	20.6	0	0	1013.3	0.04	16.9
01/08/2024 03:00	0.00	0.03	20.6	0	0	1013.2	0.00	16.5
01/08/2024 04:00	0.00	0.03	20.6	0	0	1013.2	0.00	15.5
01/08/2024 05:00	0.00	0.03	20.6	0	0	1013.3	-0.06	15.9
01/08/2024 06:00	0.00	0.03	20.6	0	0	1013.5	-0.05	16.3
01/08/2024 07:00	0.00	0.03	20.6	0	0	1013.7	0.00	16.7
01/08/2024 08:00	0.00	0.04	20.6	0	0	1013.6	-0.02	18.2
01/08/2024 09:00	0.00	0.03	20.6	0	0	1013.6	0.04	19.5
01/08/2024 10:00	0.00	0.03	20.6	0	0	1013.5	0.03	20.7
01/08/2024 11:00	0.00	0.03	20.6	0	0	1013.4	0.02	21.8
01/08/2024 12:00	0.00	0.03	20.6	0	0	1013.4	0.02	22.7
01/08/2024 13:00	0.00	0.03	20.8	0	0	1013.8	0.06	22.4
01/08/2024 14:00	0.00	0.03	20.9	0	0	1013.7	0.03	22.5
01/08/2024 15:00	0.00	0.03	20.8	0	0	1013.3	-0.05	22.6

Date and Time	CH	CO	O	CO	H S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Temperature
	% v/v	% v/v	% v/v	ppm/v	ppm/v	mbar	mbar	°C
01/08/2024 16:00	0.00	0.03	20.8	0	0	1013.1	-0.06	22.5
01/08/2024 17:00	0.00	0.03	20.7	0	0	1013.2	-0.05	22.1
01/08/2024 18:00	0.00	0.03	20.7	0	0	1013.2	-0.04	21.1
01/08/2024 19:00	0.00	0.03	20.7	0	0	1013.2	-0.02	19.9
01/08/2024 20:00	0.00	0.03	20.7	0	0	1013.5	0.01	17.7
01/08/2024 21:00	0.00	0.03	20.6	0	0	1013.6	-0.02	17.7
01/08/2024 22:00	0.00	0.03	20.6	0	0	1013.7	0.00	16.9
01/08/2024 23:00	0.00	0.03	20.6	0	0	1013.5	0.03	15.8
02/08/2024 00:00	0.00	0.04	20.6	0	0	1013.1	0.00	15.6
02/08/2024 01:00	0.00	0.04	20.6	0	0	1013.4	0.02	15.5
02/08/2024 02:00	0.00	0.04	20.6	0	0	1013.0	-0.03	15.1
02/08/2024 03:00	0.00	0.04	20.6	0	0	1012.6	-0.08	13.4
02/08/2024 04:00	0.00	0.05	20.5	0	0	1012.3	-0.15	13.4
02/08/2024 05:00	0.00	0.04	20.5	0	0	1012.0	-0.20	13.3
02/08/2024 06:00	0.00	0.05	20.5	0	0	1011.9	-0.23	14.7
02/08/2024 07:00	0.00	0.05	20.5	0	0	1011.7	-0.22	16.3
02/08/2024 08:00	0.00	0.04	20.5	0	0	1011.6	-0.19	18.3
02/08/2024 09:00	0.00	0.05	20.5	0	0	1011.3	-0.26	19.9
02/08/2024 10:00	0.00	0.05	20.5	0	0	1011.1	-0.24	21.0
02/08/2024 11:00	0.00	0.04	20.6	0	0	1010.7	-0.24	21.7
02/08/2024 12:00	0.00	0.04	20.6	0	0	1010.3	-0.25	22.6
02/08/2024 13:00	0.00	0.04	20.7	0	0	1010.8	-0.15	21.5
02/08/2024 14:00	0.00	0.03	20.8	0	0	1010.4	-0.19	22.6
02/08/2024 15:00	0.00	0.03	20.8	0	0	1009.7	-0.25	21.9
02/08/2024 16:00	0.00	0.03	20.7	0	0	1009.2	-0.30	22.8
02/08/2024 17:00	0.00	0.03	20.7	0	0	1009.1	-0.27	20.9
02/08/2024 18:00	0.00	0.03	20.7	0	0	1008.7	-0.30	21.0
02/08/2024 19:00	0.00	0.03	20.7	0	0	1008.6	-0.26	20.4
02/08/2024 20:00	0.00	0.03	20.7	0	0	1008.9	-0.17	19.3
02/08/2024 21:00	0.00	0.03	20.6	0	0	1008.9	-0.24	18.2
02/08/2024 22:00	0.00	0.03	20.6	0	0	1009.0	-0.17	17.0
02/08/2024 23:00	0.00	0.03	20.6	0	0	1008.7	-0.13	17.8
03/08/2024 00:00	0.00	0.03	20.6	0	0	1008.5	-0.09	17.6
03/08/2024 01:00	0.00	0.03	20.6	0	0	1008.8	-0.04	16.9
03/08/2024 02:00	0.00	0.03	20.6	0	0	1008.8	0.01	16.6
03/08/2024 03:00	0.00	0.04	20.6	0	0	1008.8	0.02	15.9
03/08/2024 04:00	0.00	0.03	20.6	0	0	1008.9	0.00	15.5
03/08/2024 05:00	0.00	0.03	20.5	0	0	1009.2	0.04	15.0
03/08/2024 06:00	0.00	0.03	20.6	0	0	1009.4	0.05	15.2
03/08/2024 07:00	0.00	0.03	20.5	0	0	1009.7	0.13	15.6
03/08/2024 08:00	0.00	0.03	20.5	0	0	1010.2	0.21	16.2
03/08/2024 09:00	0.00	0.03	20.5	0	0	1010.4	0.20	16.9
03/08/2024 10:00	0.00	0.03	20.6	0	0	1010.5	0.21	17.7
03/08/2024 11:00	0.00	0.03	20.5	0	0	1010.8	0.25	17.9
03/08/2024 12:00	0.00	0.03	20.6	0	0	1011.0	0.26	18.2
03/08/2024 13:00	0.00	0.03	20.7	0	0	1011.7	0.31	18.0
03/08/2024 14:00	0.00	0.03	20.7	0	0	1011.6	0.28	18.4
03/08/2024 15:00	0.00	0.03	20.7	0	0	1011.7	0.25	18.0
03/08/2024 16:00	0.00	0.03	20.7	0	0	1011.7	0.19	18.0
03/08/2024 17:00	0.00	0.03	20.6	0	0	1011.8	0.17	17.7
03/08/2024 18:00	0.00	0.03	20.6	0	0	1011.8	0.16	17.0
03/08/2024 19:00	0.00	0.03	20.6	0	0	1012.4	0.20	16.2
03/08/2024 20:00	0.00	0.03	20.6	0	0	1012.9	0.24	13.7
03/08/2024 21:00	0.00	0.03	20.6	0	0	1013.3	0.20	13.7
03/08/2024 22:00	0.00	0.03	20.6	0	0	1013.3	0.21	12.9
03/08/2024 23:00	0.00	0.03	20.5	0	0	1013.5	0.22	12.8
04/08/2024 00:00	0.00	0.04	20.5	0	0	1013.4	0.21	12.8
04/08/2024 01:00	0.00	0.03	20.5	0	0	1014.0	0.28	12.7
04/08/2024 02:00	0.00	0.04	20.5	0	0	1014.0	0.28	12.5
04/08/2024 03:00	0.00	0.04	20.5	0	0	1013.9	0.19	12.6
04/08/2024 04:00	0.00	0.03	20.5	0	0	1013.8	0.11	12.7
04/08/2024 05:00	0.00	0.03	20.5	0	0	1014.2	0.11	12.9
04/08/2024 06:00	0.00	0.04	20.5	0	0	1014.1	0.10	13.3
04/08/2024 07:00	0.00	0.04	20.5	0	0	1013.9	0.05	14.5
04/08/2024 08:00	0.00	0.03	20.5	0	0	1014.3	0.11	15.1
04/08/2024 09:00	0.00	0.03	20.5	0	0	1014.1	0.01	16.6
04/08/2024 10:00	0.00	0.03	20.5	0	0	1014.0	0.00	16.9
04/08/2024 11:00	0.00	0.03	20.6	0	0	1013.9	0.00	17.9
04/08/2024 12:00	0.00	0.03	20.6	0	0	1013.7	-0.01	18.0
04/08/2024 13:00	0.00	0.03	20.6	0	0	1014.1	-0.01	18.2
04/08/2024 14:00	0.00	0.03	20.6	0	0	1013.6	-0.06	18.4
04/08/2024 15:00	0.00	0.03	20.6	0	0	1013.2	-0.09	18.4
04/08/2024 16:00	0.00	0.03	20.6	0	0	1012.7	-0.20	18.4
04/08/2024 17:00	0.00	0.03	20.6	0	0	1012.1	-0.25	18.5
04/08/2024 18:00	0.00	0.03	20.6	0	0	1011.6	-0.30	18.6
04/08/2024 19:00	0.00	0.03	20.6	0	0	1011.5	-0.30	18.2
04/08/2024 20:00	0.00	0.03	20.6	0	0	1011.5	-0.28	18.0
04/08/2024 21:00	0.00	0.03	20.6	0	0	1011.4	-0.34	17.5
04/08/2024 22:00	0.00	0.03	20.6	0	0	1011.5	-0.26	17.0
04/08/2024 23:00	0.00	0.03	20.6	0	0	1011.3	-0.24	16.9
05/08/2024 00:00	0.00	0.03	20.6	0	0	1010.9	-0.23	16.2
05/08/2024 01:00	0.00	0.03	20.6	0	0	1010.3	-0.23	16.5
05/08/2024 02:00	0.00	0.03	20.6	0	0	1009.8	-0.23	16.4
05/08/2024 03:00	0.00	0.03	20.5	0	0	1009.4	-0.26	16.9
05/08/2024 04:00	0.00	0.03	20.5	0	0	1009.2	-0.29	17.0
05/08/2024 05:00	0.00	0.03	20.5	0	0	1009.2	-0.27	17.1
05/08/2024 06:00	0.00	0.03	20.5	0	0	1009.2	-0.29	17.5
05/08/2024 07:00	0.00	0.03	20.5	0	0	1009.1	-0.27	18.1
05/08/2024 08:00	0.00	0.03	20.5	0	0	1008.9	-0.25	19.0
05/08/2024 09:00	0.00	0.03	20.6	0	0	1008.8	-0.19	19.4
05/08/2024 10:00	0.00	0.03	20.6	0	0	1008.7	-0.14	21.3
05/08/2024 11:00	0.00	0.04	20.6	0	0	1008.5	-0.11	21.9
05/08/2024 12:00	0.00	0.03	20.6	0	0	1008.1	-0.14	23.2
05/08/2024 13:00	0.00	0.03	20.6	0	0	1008.4	-0.10	23.1
05/08/2024 14:00	0.00	0.03	20.7	0	0	1008.2	-0.13	23.1
05/08/2024 15:00	0.00	0.03	20.7	0	0	1007.9	-0.15	22.8
05/08/2024 16:00	0.00	0.03	20.7	0	0	1007.7	-0.15	22.4
05/08/2024 17:00	0.00	0.03	20.7	0	0	1007.1	-0.21	22.1
05/08/2024 18:00	0.00	0.03	20.7	0	0	1007.0	-0.21	22.1
05/08/2024 19:00	0.00	0.03	20.7	0	0	1007.0	-0.19	21.5
05/08/2024 20:00	0.00	0.03	20.7	0	0	1007.0	-0.14	20.4
05/08/2024 21:00	0.00	0.03	20.6	0	0	1006.9	-0.19	19.7
05/08/2024 22:00	0.00	0.03	20.6	0	0	1006.6	-0.20	19.6
05/08/2024 23:00	0.00	0.03	20.6	0	0	1006.3	-0.20	19.3
06/08/2024 00:00	0.00	0.03	20.6	0	0	1006.0	-0.21	19.3
06/08/2024 01:00	0.00	0.03	20.6	0	0	1006.1	-0.13	18.2
06/08/2024 02:00	0.00	0.03	20.6	0	0	1006.1	-0.11	17.9
06/08/2024 03:00	0.00	0.03	20.6	0	0	1005.9	-0.14	17.8
06/08/2024 04:00	0.00	0.03	20.6	0	0	1006.6	-0.05	16.2
06/08/2024 05:00	0.00	0.03	20.6	0	0	1007.0	0.01	15.7
06/08/2024 06:00	0.00	0.03	20.6	0	0	1007.1	0.06	15.7
06/08/2024 07:00	0.00	0.03	20.5	0	0	1007.4	0.14	16.1
06/08/2024 08:00	0.00	0.03	20.5	0	0	1007.6	0.20	16.9
06/08/2024 09:00	0.00	0.03	20.5	0	0	1007.5	0.17	17.8
06/08/2024 10:00	0.00	0.03	20.5	0	0	1007.6	0.19	17.7
06/08/2024 11:00	0.00	0.03	20.6	0	0	1007.5	0.20	18.5
06/08/2024 12:00	0.00	0.03	20.6	0	0	1007.3	0.09	18.8
06/08/2024 13:00	0.00	0.03	20.6	0	0	1007.7	0.09	19.4
06/08/2024 14:00	0.00	0.03	20.6	0	0	1007.6	0.06	19.7
06/08/2024 15:00	0.00	0.03	20.6	0	0	1007.1	-0.04	20.4
06/08/2024 16:00	0.00	0.03	20.6	0	0	1007.2	-0.05	20.1
06/08/2024 17:00	0.00	0.03	20.6	0	0	1007.1	-0.05	19.9

Date and Time	CH	CO	O	CO	H S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Temperature
	% v/v	% v/v	% v/v	ppm/v	ppm/v	mbar	mbar	°C
06/08/2024 18:00	0.00	0.03	20.6	0	0	1007.0	-0.08	19.2
06/08/2024 19:00	0.00	0.03	20.6	0	0	1007.4	-0.01	18.0
06/08/2024 20:00	0.00	0.03	20.6	0	0	1007.9	0.08	16.3
06/08/2024 21:00	0.00	0.03	20.6	0	0	1008.3	0.07	14.9
06/08/2024 22:00	0.00	0.03	20.6	0	0	1008.5	0.11	14.3
06/08/2024 23:00	0.00	0.03	20.6	0	0	1008.5	0.17	13.8
07/08/2024 00:00	0.00	0.03	20.5	0	0	1008.3	0.14	13.4
07/08/2024 01:00	0.00	0.03	20.5	0	0	1008.6	0.19	13.0
07/08/2024 02:00	0.00	0.04	20.5	0	0	1008.3	0.16	12.7
07/08/2024 03:00	0.00	0.03	20.5	0	0	1008.1	0.09	12.4
07/08/2024 04:00	0.00	0.03	20.5	0	0	1008.1	0.03	12.5
07/08/2024 05:00	0.00	0.04	20.5	0	0	1008.1	-0.02	12.4
07/08/2024 06:00	0.00	0.03	20.5	0	0	1008.4	-0.01	13.4
07/08/2024 07:00	0.00	0.03	20.5	0	0	1008.4	-0.01	14.8
07/08/2024 08:00	0.00	0.03	20.5	0	0	1008.5	0.03	16.1
07/08/2024 09:00	0.00	0.03	20.5	0	0	1008.6	0.00	16.8
07/08/2024 10:00	0.00	0.03	20.5	0	0	1008.9	0.08	17.5
07/08/2024 11:00	0.00	0.03	20.5	0	0	1008.8	0.09	17.7
07/08/2024 12:00	0.00	0.03	20.6	0	0	1008.9	0.10	18.2
07/08/2024 13:00	0.00	0.03	20.6	0	0	1009.1	0.13	17.5
07/08/2024 14:00	0.00	0.03	20.6	0	0	1009.1	0.09	17.3
07/08/2024 15:00	0.00	0.03	20.6	0	0	1009.2	0.10	17.4
07/08/2024 16:00	0.00	0.03	20.6	0	0	1009.3	0.10	17.8
07/08/2024 17:00	0.00	0.03	20.6	0	0	1009.5	0.11	17.6
07/08/2024 18:00	0.00	0.03	20.6	0	0	1010.1	0.15	17.3
07/08/2024 19:00	0.00	0.03	20.6	0	0	1010.4	0.20	16.6
07/08/2024 20:00	0.00	0.03	20.6	0	0	1010.7	0.23	15.2
07/08/2024 21:00	0.00	0.03	20.6	0	0	1011.1	0.25	14.6
07/08/2024 22:00	0.00	0.03	20.6	0	0	1011.4	0.29	14.2
07/08/2024 23:00	0.00	0.03	20.5	0	0	1011.6	0.30	14.0
08/08/2024 00:00	0.00	0.03	20.5	0	0	1011.8	0.31	14.1
08/08/2024 01:00	0.00	0.03	20.5	0	0	1011.9	0.30	15.1
08/08/2024 02:00	0.00	0.03	20.5	0	0	1011.9	0.22	15.2
08/08/2024 03:00	0.00	0.03	20.5	0	0	1011.9	0.19	15.1
08/08/2024 04:00	0.00	0.03	20.5	0	0	1011.8	0.14	14.9
08/08/2024 05:00	0.00	0.03	20.5	0	0	1011.8	0.09	14.5
08/08/2024 06:00	0.00	0.03	20.5	0	0	1012.0	0.08	14.5
08/08/2024 07:00	0.00	0.03	20.5	0	0	1011.9	0.04	15.2
08/08/2024 08:00	0.00	0.03	20.5	0	0	1011.5	-0.04	15.3
08/08/2024 09:00	0.00	0.03	20.5	0	0	1011.2	-0.09	16.2
08/08/2024 10:00	0.00	0.03	20.5	0	0	1010.8	-0.14	16.7
08/08/2024 11:00	0.00	0.03	20.6	0	0	1009.6	-0.29	18.0
08/08/2024 12:00	0.00	0.03	20.6	0	0	1008.4	-0.42	19.3
08/08/2024 13:00	0.00	0.03	20.6	0	0	1008.4	-0.42	18.9
08/08/2024 14:00	0.00	0.03	20.6	0	0	1007.4	-0.58	18.9
08/08/2024 15:00	0.00	0.03	20.6	0	0	1006.6	-0.66	19.9
08/08/2024 16:00	0.00	0.03	20.6	0	0	1005.7	-0.72	19.5
08/08/2024 17:00	0.00	0.03	20.6	0	0	1004.9	-0.79	20.2
08/08/2024 18:00	0.00	0.03	20.6	0	0	1004.5	-0.79	19.3
08/08/2024 19:00	0.00	0.03	20.6	0	0	1004.5	-0.64	19.4
08/08/2024 20:00	0.00	0.03	20.6	0	0	1004.5	-0.49	19.1
08/08/2024 21:00	0.00	0.03	20.6	0	0	1004.6	-0.47	18.6
08/08/2024 22:00	0.00	0.03	20.6	0	0	1004.6	-0.35	18.4
08/08/2024 23:00	0.00	0.03	20.6	0	0	1005.1	-0.19	17.9
09/08/2024 00:00	0.00	0.03	20.6	0	0	1005.5	-0.03	17.6
09/08/2024 01:00	0.00	0.03	20.6	0	0	1005.4	0.06	17.4
09/08/2024 02:00	0.00	0.03	20.6	0	0	1005.9	0.17	17.0
09/08/2024 03:00	0.00	0.03	20.6	0	0	1006.5	0.25	16.4
09/08/2024 04:00	0.00	0.03	20.6	0	0	1007.1	0.33	15.3
09/08/2024 05:00	0.00	0.03	20.5	0	0	1008.1	0.44	14.6
09/08/2024 06:00	0.00	0.03	20.5	0	0	1008.9	0.54	14.8
09/08/2024 07:00	0.00	0.03	20.5	0	0	1009.6	0.56	15.5
09/08/2024 08:00	0.00	0.03	20.5	0	0	1010.4	0.61	16.5
09/08/2024 09:00	0.00	0.03	20.5	0	0	1011.0	0.70	17.4
09/08/2024 10:00	0.00	0.03	20.5	0	0	1011.4	0.69	18.0
09/08/2024 11:00	0.00	0.03	20.6	0	0	1012.2	0.71	18.4
09/08/2024 12:00	0.00	0.03	20.6	0	0	1012.6	0.69	19.4
09/08/2024 13:00	0.00	0.03	20.7	0	0	1013.2	0.64	19.3
09/08/2024 14:00	0.00	0.03	20.7	0	0	1013.6	0.59	19.5
09/08/2024 15:00	0.00	0.03	20.7	0	0	1013.8	0.52	19.3
09/08/2024 16:00	0.00	0.03	20.7	0	0	1014.0	0.45	19.9
09/08/2024 17:00	0.00	0.03	20.6	0	0	1014.1	0.39	19.7
09/08/2024 18:00	0.00	0.03	20.6	0	0	1013.9	0.31	19.1
09/08/2024 19:00	0.00	0.03	20.6	0	0	1014.5	0.29	17.5
09/08/2024 20:00	0.00	0.03	20.6	0	0	1014.9	0.29	16.2
09/08/2024 21:00	0.00	0.03	20.6	0	0	1015.1	0.24	15.5
09/08/2024 22:00	0.00	0.03	20.6	0	0	1015.2	0.20	14.9
09/08/2024 23:00	0.00	0.03	20.6	0	0	1015.4	0.20	14.4
10/08/2024 00:00	0.00	0.03	20.6	0	0	1015.6	0.20	13.9
10/08/2024 01:00	0.00	0.03	20.5	0	0	1015.3	0.15	14.4
10/08/2024 02:00	0.00	0.03	20.5	0	0	1015.0	0.14	15.5
10/08/2024 03:00	0.00	0.03	20.5	0	0	1015.0	0.06	15.9
10/08/2024 04:00	0.00	0.03	20.5	0	0	1015.0	0.01	15.3
10/08/2024 05:00	0.00	0.03	20.5	0	0	1015.2	0.01	15.3
10/08/2024 06:00	0.00	0.03	20.5	0	0	1015.6	0.05	16.0
10/08/2024 07:00	0.00	0.03	20.5	0	0	1015.9	0.06	16.6
10/08/2024 08:00	0.00	0.03	20.5	0	0	1016.2	0.08	16.6
10/08/2024 09:00	0.00	0.03	20.5	0	0	1016.4	0.14	17.2
10/08/2024 10:00	0.00	0.03	20.5	0	0	1016.4	0.17	18.2
10/08/2024 11:00	0.00	0.03	20.6	0	0	1016.7	0.21	18.9
10/08/2024 12:00	0.00	0.03	20.6	0	0	1016.8	0.22	20.1
10/08/2024 13:00	0.00	0.03	20.6	0	0	1017.3	0.26	19.8
10/08/2024 14:00	0.00	0.03	20.6	0	0	1017.9	0.29	20.3
10/08/2024 15:00	0.00	0.03	20.6	0	0	1018.2	0.29	20.0
10/08/2024 16:00	0.00	0.03	20.6	0	0	1018.6	0.30	20.1
10/08/2024 17:00	0.00	0.03	20.6	0	0	1019.1	0.34	19.5
10/08/2024 18:00	0.00	0.03	20.6	0	0	1019.5	0.39	18.6
10/08/2024 19:00	0.00	0.03	20.6	0	0	1019.8	0.39	16.9
10/08/2024 20:00	0.00	0.03	20.6	0	0	1020.2	0.43	15.1
10/08/2024 21:00	0.00	0.03	20.6	0	0	1020.6	0.41	16.4
10/08/2024 22:00	0.00	0.04	20.6	0	0	1021.2	0.41	15.9
10/08/2024 23:00	0.00	0.03	20.6	0	0	1021.4	0.40	14.8
11/08/2024 00:00	0.00	0.03	20.5	0	0	1021.6	0.38	13.4
11/08/2024 01:00	0.00	0.04	20.5	0	0	1021.9	0.35	12.2
11/08/2024 02:00	0.00	0.04	20.5	0	0	1021.9	0.30	12.2
11/08/2024 03:00	0.00	0.04	20.5	0	0	1022.0	0.28	12.1
11/08/2024 04:00	0.00	0.04	20.5	0	0	1022.1	0.24	11.9
11/08/2024 05:00	0.00	0.05	20.5	0	0	1022.0	0.17	11.9
11/08/2024 06:00	0.00	0.04	20.5	0	0	1022.1	0.11	13.3
11/08/2024 07:00	0.00	0.04	20.5	0	0	1022.4	0.13	16.0
11/08/2024 08:00	0.00	0.04	20.5	0	0	1022.3	0.09	18.2
11/08/2024 09:00	0.00	0.05	20.5	0	0	1022.1	0.03	19.9
11/08/2024 10:00	0.00	0.04	20.5	0	0	1021.5	-0.05	20.9
11/08/2024 11:00	0.00	0.03	20.5	0	0	1021.0	-0.13	21.8
11/08/2024 12:00	0.00	0.03	20.6	0	0	1020.6	-0.19	22.6
11/08/2024 13:00	0.00	0.04	20.8	0	0	1019.9	-0.26	22.9
11/08/2024 14:00	0.00	0.03	20.9	0	0	1019.6	-0.31	23.4
11/08/2024 15:00	0.00	0.03	20.8	0	0	1018.7	-0.46	24.1
11/08/2024 16:00	0.00	0.04	20.8	0	0	1017.9	-0.55	24.1
11/08/2024 17:00	0.00	0.03	20.8	0	0	1017.2	-0.61	23.8
11/08/2024 18:00	0.00	0.03	20.7	0	0	1016.2	-0.66	23.6
11/08/2024 19:00	0.00	0.03	20.7	0	0	1015.8	-0.65	22.0

Date and Time	CH	CO	O	CO	H S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Temperature
	% v/v	% v/v	% v/v	ppm/v	ppm/v	mbar	mbar	°C
11/08/2024 20:00	0.00	0.03	20.7	0	0	1015.5	-0.64	20.6
11/08/2024 21:00	0.00	0.03	20.7	0	0	1015.3	-0.58	19.2
11/08/2024 22:00	0.00	0.03	20.7	0	0	1014.5	-0.64	18.4
11/08/2024 23:00	0.00	0.03	20.6	0	0	1013.8	-0.61	18.4
12/08/2024 00:00	0.00	0.03	20.6	0	0	1013.2	-0.59	18.5
12/08/2024 01:00	0.00	0.03	20.6	0	0	1011.7	-0.69	18.2
12/08/2024 02:00	0.00	0.03	20.6	0	0	1011.6	-0.58	18.0
12/08/2024 03:00	0.00	0.03	20.6	0	0	1010.4	-0.67	18.1
12/08/2024 04:00	0.00	0.03	20.6	0	0	1009.4	-0.76	18.3
12/08/2024 05:00	0.00	0.03	20.6	0	0	1007.7	-0.95	18.7
12/08/2024 06:00	0.00	0.03	20.6	0	0	1007.2	-0.91	19.8
12/08/2024 07:00	0.00	0.03	20.6	0	0	1006.7	-0.89	20.5
12/08/2024 08:00	0.00	0.03	20.6	0	0	1006.2	-0.88	21.9
12/08/2024 09:00	0.00	0.03	20.6	0	0	1006.4	-0.66	23.0
12/08/2024 10:00	0.00	0.03	20.6	0	0	1006.0	-0.70	24.1
12/08/2024 11:00	0.00	0.03	20.6	0	0	1005.8	-0.58	24.8
12/08/2024 12:00	0.00	0.03	20.6	0	0	1006.0	-0.42	23.8
12/08/2024 13:00	0.00	0.03	20.6	0	0	1007.4	-0.04	20.3
12/08/2024 14:00	0.00	0.03	20.6	0	0	1007.6	0.05	20.2
12/08/2024 15:00	0.00	0.03	20.6	0	0	1007.5	0.10	20.1
12/08/2024 16:00	0.00	0.03	20.6	0	0	1007.4	0.15	20.1
12/08/2024 17:00	0.00	0.03	20.6	0	0	1007.2	0.10	20.1
12/08/2024 18:00	0.00	0.03	20.6	0	0	1007.4	0.17	19.7
12/08/2024 19:00	0.00	0.03	20.6	0	0	1007.8	0.25	18.2
12/08/2024 20:00	0.00	0.03	20.6	0	0	1008.1	0.26	15.2
12/08/2024 21:00	0.00	0.03	20.6	0	0	1008.3	0.11	15.2
12/08/2024 22:00	0.00	0.03	20.6	0	0	1008.4	0.10	14.8
12/08/2024 23:00	0.00	0.03	20.6	0	0	1008.6	0.14	13.6
13/08/2024 00:00	0.00	0.04	20.6	0	0	1008.6	0.15	12.5
13/08/2024 01:00	0.00	0.03	20.5	0	0	1008.1	0.11	12.9
13/08/2024 02:00	0.00	0.04	20.5	0	0	1008.1	0.09	11.5
13/08/2024 03:00	0.00	0.04	20.5	0	0	1008.2	0.05	11.9
13/08/2024 04:00	0.00	0.03	20.5	0	0	1007.7	-0.05	12.4
13/08/2024 05:00	0.00	0.04	20.5	0	0	1007.8	-0.06	12.4
13/08/2024 06:00	0.00	0.03	20.5	0	0	1007.5	-0.11	13.6
13/08/2024 07:00	0.00	0.04	20.5	0	0	1007.2	-0.17	15.3
13/08/2024 08:00	0.00	0.04	20.5	0	0	1007.1	-0.19	17.0
13/08/2024 09:00	0.00	0.03	20.5	0	0	1007.1	-0.13	18.0
13/08/2024 10:00	0.00	0.03	20.5	0	0	1007.1	-0.13	18.9
13/08/2024 11:00	0.00	0.03	20.6	0	0	1007.0	-0.15	19.8
13/08/2024 12:00	0.00	0.03	20.6	0	0	1007.2	-0.06	21.0
13/08/2024 13:00	0.00	0.03	20.6	0	0	1007.3	-0.06	21.4
13/08/2024 14:00	0.00	0.03	20.7	0	0	1007.0	-0.06	21.3
13/08/2024 15:00	0.00	0.03	20.6	0	0	1007.1	-0.01	20.6
13/08/2024 16:00	0.00	0.03	20.6	0	0	1007.4	0.04	20.3
13/08/2024 17:00	0.00	0.03	20.6	0	0	1007.7	0.08	19.3
13/08/2024 18:00	0.00	0.03	20.6	0	0	1008.1	0.13	18.8
13/08/2024 19:00	0.00	0.03	20.6	0	0	1008.5	0.19	18.5
13/08/2024 20:00	0.00	0.03	20.6	0	0	1009.2	0.25	17.9
13/08/2024 21:00	0.00	0.03	20.6	0	0	1009.7	0.30	17.2
13/08/2024 22:00	0.00	0.03	20.6	0	0	1010.1	0.39	16.8
13/08/2024 23:00	0.00	0.03	20.6	0	0	1010.7	0.45	16.4
14/08/2024 00:00	0.00	0.04	20.5	0	0	1011.2	0.48	16.0
14/08/2024 01:00	0.00	0.03	20.5	0	0	1011.9	0.52	14.5
14/08/2024 02:00	0.00	0.04	20.5	0	0	1012.2	0.51	13.4
14/08/2024 03:00	0.00	0.03	20.5	0	0	1012.8	0.54	14.2
14/08/2024 04:00	0.00	0.03	20.5	0	0	1013.4	0.52	14.3
14/08/2024 05:00	0.00	0.03	20.5	0	0	1013.7	0.50	14.1
14/08/2024 06:00	0.00	0.03	20.5	0	0	1014.1	0.50	14.2
14/08/2024 07:00	0.00	0.03	20.5	0	0	1014.3	0.45	14.5
14/08/2024 08:00	0.00	0.04	20.5	0	0	1014.4	0.40	15.3
14/08/2024 09:00	0.00	0.03	20.5	0	0	1014.7	0.35	16.9
14/08/2024 10:00	0.00	0.04	20.5	0	0	1014.8	0.32	18.2
14/08/2024 11:00	0.00	0.04	20.5	0	0	1014.7	0.24	18.9
14/08/2024 12:00	0.00	0.03	20.6	0	0	1014.7	0.16	19.8
14/08/2024 13:00	0.00	0.03	20.7	0	0	1015.0	0.16	19.6
14/08/2024 14:00	0.00	0.03	20.8	0	0	1014.9	0.10	19.8
14/08/2024 15:00	0.00	0.03	20.8	0	0	1014.9	0.08	19.7
14/08/2024 16:00	0.00	0.03	20.7	0	0	1015.0	0.08	19.2
14/08/2024 17:00	0.00	0.03	20.7	0	0	1014.6	-0.01	19.0
14/08/2024 18:00	0.00	0.03	20.7	0	0	1014.5	-0.04	18.5
14/08/2024 19:00	0.00	0.03	20.6	0	0	1014.7	0.00	16.5
14/08/2024 20:00	0.00	0.03	20.6	0	0	1014.3	-0.05	14.5
14/08/2024 21:00	0.00	0.03	20.6	0	0	1014.4	-0.08	14.4
14/08/2024 22:00	0.00	0.03	20.6	0	0	1014.8	-0.01	13.0
14/08/2024 23:00	0.00	0.03	20.6	0	0	1014.6	-0.04	13.2
15/08/2024 00:00	0.00	0.03	20.6	0	0	1014.3	-0.09	12.8
15/08/2024 01:00	0.00	0.03	20.5	0	0	1013.9	-0.09	13.0
15/08/2024 02:00	0.00	0.03	20.5	0	0	1013.2	-0.16	12.6
15/08/2024 03:00	0.00	0.03	20.5	0	0	1012.6	-0.26	13.0
15/08/2024 04:00	0.00	0.03	20.5	0	0	1011.9	-0.30	13.6
15/08/2024 05:00	0.00	0.03	20.5	0	0	1011.4	-0.38	14.0
15/08/2024 06:00	0.00	0.03	20.5	0	0	1011.1	-0.46	14.3
15/08/2024 07:00	0.00	0.03	20.5	0	0	1010.5	-0.51	15.6
15/08/2024 08:00	0.00	0.03	20.5	0	0	1009.8	-0.56	15.4
15/08/2024 09:00	0.00	0.03	20.5	0	0	1009.0	-0.61	17.0
15/08/2024 10:00	0.00	0.03	20.5	0	0	1008.6	-0.58	16.9
15/08/2024 11:00	0.00	0.03	20.5	0	0	1008.5	-0.51	17.4
15/08/2024 12:00	0.00	0.03	20.5	0	0	1008.3	-0.45	18.0
15/08/2024 13:00	0.00	0.03	20.5	0	0	1007.4	-0.50	18.6
15/08/2024 14:00	0.00	0.03	20.6	0	0	1007.5	-0.45	19.1
15/08/2024 15:00	0.00	0.03	20.6	0	0	1007.9	-0.33	18.9
15/08/2024 16:00	0.00	0.03	20.6	0	0	1008.2	-0.20	18.3
15/08/2024 17:00	0.00	0.03	20.6	0	0	1008.7	-0.04	18.0
15/08/2024 18:00	0.00	0.03	20.6	0	0	1009.2	0.08	17.5
15/08/2024 19:00	0.00	0.03	20.6	0	0	1010.4	0.24	16.0
15/08/2024 20:00	0.00	0.03	20.6	0	0	1011.6	0.41	14.6
15/08/2024 21:00	0.00	0.03	20.5	0	0	1012.8	0.67	12.7
15/08/2024 22:00	0.00	0.03	20.5	0	0	1013.3	0.72	10.9
15/08/2024 23:00	0.00	0.03	20.5	0	0	1013.8	0.74	11.1
16/08/2024 00:00	0.00	0.04	20.5	0	0	1014.2	0.75	10.8
16/08/2024 01:00	0.00	0.03	20.5	0	0	1014.7	0.75	11.1
16/08/2024 02:00	0.00	0.03	20.5	0	0	1014.8	0.70	9.7
16/08/2024 03:00	0.00	0.04	20.5	0	0	1015.0	0.58	10.2
16/08/2024 04:00	0.00	0.04	20.5	0	0	1015.1	0.44	10.0
16/08/2024 05:00	0.00	0.04	20.5	0	0	1015.3	0.31	9.1
16/08/2024 06:00	0.00	0.04	20.5	0	0	1015.6	0.29	10.6
16/08/2024 07:00	0.00	0.04	20.5	0	0	1015.9	0.26	11.9
16/08/2024 08:00	0.00	0.04	20.5	0	0	1016.1	0.24	13.6
16/08/2024 09:00	0.00	0.04	20.5	0	0	1016.0	0.16	15.6
16/08/2024 10:00	0.00	0.04	20.5	0	0	1015.9	0.14	16.7
16/08/2024 11:00	0.00	0.04	20.5	0	0	1015.7	0.09	17.7
16/08/2024 12:00	0.00	0.04	20.5	0	0	1015.5	0.05	18.2
16/08/2024 13:00	0.00	0.04	20.6	0	0	1015.4	0.01	17.9
16/08/2024 14:00	0.00	0.03	20.7	0	0	1015.0	-0.08	18.0
16/08/2024 15:00	0.00	0.03	20.7	0	0	1014.7	-0.15	18.5
16/08/2024 16:00	0.00	0.03	20.6	0	0	1014.3	-0.23	18.1
16/08/2024 17:00	0.00	0.03	20.6	0	0	1013.9	-0.26	17.1
16/08/2024 18:00	0.00	0.03	20.6	0	0	1013.8	-0.26	16.0
16/08/2024 19:00	0.00	0.03	20.6	0	0	1013.6	-0.26	14.2
16/08/2024 20:00	0.00	0.03	20.6	0	0	1013.8	-0.21	14.6
16/08/2024 21:00	0.00	0.03	20.6	0	0	1014.2	-0.15	13.7

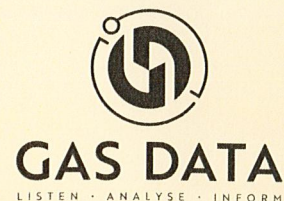
Date and Time	CH	CO	O	CO	H S	Atmospheric Pressure	Average 8-hour atmospheric pressure change	Temperature
	% v/v	% v/v	% v/v	ppm/v	ppm/v	mbar	mbar	°C
16/08/2024 22:00	0.00	0.03	20.5	0	0	1014.1	-0.11	10.9
16/08/2024 23:00	0.00	0.03	20.5	0	0	1014.2	-0.06	9.5
17/08/2024 00:00	0.00	0.04	20.5	0	0	1014.2	-0.01	9.0
17/08/2024 01:00	0.00	0.04	20.5	0	0	1014.2	0.04	9.7
17/08/2024 02:00	0.00	0.03	20.5	0	0	1014.1	0.04	9.2
17/08/2024 03:00	0.00	0.03	20.5	0	0	1014.1	0.06	9.1
17/08/2024 04:00	0.00	0.04	20.5	0	0	1014.0	0.03	8.9
17/08/2024 05:00	0.00	0.04	20.5	0	0	1013.8	-0.05	8.6
17/08/2024 06:00	0.00	0.04	20.5	0	0	1013.9	-0.03	9.8
17/08/2024 07:00	0.00	0.04	20.5	0	0	1014.1	-0.01	11.9
17/08/2024 08:00	0.00	0.04	20.5	0	0	1013.8	-0.05	14.2
17/08/2024 09:00	0.00	0.04	20.5	0	0	1013.7	-0.06	16.3
17/08/2024 10:00	0.00	0.03	20.5	0	0	1013.6	-0.06	17.1
17/08/2024 11:00	0.00	0.04	20.5	0	0	1013.3	-0.10	17.4
17/08/2024 12:00	0.00	0.03	20.5	0	0	1013.0	-0.13	17.7
17/08/2024 13:00	0.00	0.03	20.6	0	0	1013.2	-0.07	17.9
17/08/2024 14:00	0.00	0.03	20.6	0	0	1012.8	-0.14	18.1
17/08/2024 15:00	0.00	0.03	20.6	0	0	1012.6	-0.19	17.8
17/08/2024 16:00	0.00	0.03	20.6	0	0	1012.3	-0.19	17.8
17/08/2024 17:00	0.00	0.03	20.6	0	0	1011.7	-0.25	17.5
17/08/2024 18:00	0.00	0.03	20.6	0	0	1011.5	-0.26	16.7
17/08/2024 19:00	0.00	0.03	20.6	0	0	1011.6	-0.21	14.9
17/08/2024 20:00	0.00	0.03	20.6	0	0	1011.6	-0.17	13.9
17/08/2024 21:00	0.00	0.03	20.6	0	0	1011.6	-0.20	13.7
17/08/2024 22:00	0.00	0.03	20.6	0	0	1011.6	-0.15	12.9
17/08/2024 23:00	0.00	0.03	20.5	0	0	1011.3	-0.16	12.0
18/08/2024 00:00	0.00	0.03	20.5	0	0	1011.1	-0.15	11.7
18/08/2024 01:00	0.00	0.03	20.5	0	0	1011.0	-0.09	12.2
18/08/2024 02:00	0.00	0.03	20.5	0	0	1010.9	-0.08	12.6
18/08/2024 03:00	0.00	0.03	20.5	0	0	1010.8	-0.10	11.9
18/08/2024 04:00	0.00	0.03	20.5	0	0	1010.7	-0.11	11.6
18/08/2024 05:00	0.00	0.03	20.5	0	0	1010.8	-0.10	11.8
18/08/2024 06:00	0.00	0.04	20.5	0	0	1011.0	-0.08	12.6
18/08/2024 07:00	0.00	0.03	20.5	0	0	1011.4	0.01	14.6
18/08/2024 08:00	0.00	0.03	20.5	0	0	1011.8	0.09	15.8
18/08/2024 09:00	0.00	0.03	20.5	0	0	1012.5	0.19	15.8
18/08/2024 10:00	0.00	0.03	20.5	0	0	1012.9	0.25	16.4
18/08/2024 11:00	0.00	0.03	20.5	0	0	1013.3	0.31	16.8
18/08/2024 12:00	0.00	0.03	20.5	0	0	1013.5	0.35	17.3
18/08/2024 13:00	0.00	0.03	20.6	0	0	1014.2	0.43	17.5
18/08/2024 14:00	0.00	0.03	20.6	0	0	1014.6	0.45	17.9
18/08/2024 15:00	0.00	0.03	20.6	0	0	1015.0	0.45	17.5
18/08/2024 16:00	0.00	0.03	20.6	0	0	1015.2	0.43	17.5
18/08/2024 17:00	0.00	0.03	20.6	0	0	1015.5	0.38	17.0
18/08/2024 18:00	0.00	0.03	20.6	0	0	1015.6	0.34	16.8
18/08/2024 19:00	0.00	0.03	20.6	0	0	1015.7	0.30	15.2
18/08/2024 20:00	0.00	0.03	20.6	0	0	1016.2	0.34	12.3
18/08/2024 21:00	0.00	0.03	20.6	0	0	1016.8	0.32	12.5
18/08/2024 22:00	0.00	0.03	20.5	0	0	1017.2	0.33	11.9
18/08/2024 23:00	0.00	0.03	20.5	0	0	1017.2	0.28	10.9
19/08/2024 00:00	0.00	0.04	20.5	0	0	1017.0	0.22	10.7
19/08/2024 01:00	0.00	0.03	20.5	0	0	1017.2	0.21	10.5
19/08/2024 02:00	0.00	0.04	20.5	0	0	1016.8	0.15	10.2
19/08/2024 03:00	0.00	0.04	20.5	0	0	1016.4	0.09	9.9
19/08/2024 04:00	0.00	0.03	20.5	0	0	1016.0	-0.03	10.4
19/08/2024 05:00	0.00	0.04	20.5	0	0	1015.5	-0.16	10.6
19/08/2024 06:00	0.00	0.04	20.5	0	0	1015.3	-0.24	11.9
19/08/2024 07:00	0.00	0.03	20.5	0	0	1014.8	-0.30	13.7
19/08/2024 08:00	0.00	0.03	20.5	0	0	1014.2	-0.35	14.8
19/08/2024 09:00	0.00	0.04	20.5	0	0	1013.8	-0.43	15.9
19/08/2024 10:00	0.00	0.04	20.5	0	0	1013.1	-0.46	17.3
19/08/2024 11:00	0.00	0.04	20.5	0	0	1012.6	-0.47	18.0
19/08/2024 12:00	0.00	0.03	20.5	0	0	1011.8	-0.53	18.3
19/08/2024 13:00	0.00	0.03	20.5	0	0	1010.9	-0.58	18.2
19/08/2024 14:00	0.00	0.04	20.5	0	0	1009.5	-0.72	18.4
19/08/2024 15:00	0.00	0.03	20.6	0	0	1008.6	-0.77	18.4
19/08/2024 16:00	0.00	0.04	20.5	0	0	1007.7	-0.81	18.0
19/08/2024 17:00	0.00	0.03	20.6	0	0	1006.6	-0.90	17.6
19/08/2024 18:00	0.00	0.03	20.6	0	0	1005.7	-0.92	18.0
19/08/2024 19:00	0.00	0.03	20.6	0	0	1005.1	-0.94	18.0
19/08/2024 20:00	0.00	0.03	20.5	0	0	1004.9	-0.86	18.0
19/08/2024 21:00	0.00	0.03	20.5	0	0	1004.9	-0.75	17.9
19/08/2024 22:00	0.00	0.03	20.5	0	0	1004.8	-0.59	17.6
19/08/2024 23:00	0.00	0.03	20.5	0	0	1005.0	-0.45	16.9
20/08/2024 00:00	0.00	0.03	20.5	0	0	1004.9	-0.35	16.1
20/08/2024 01:00	0.00	0.03	20.5	0	0	1005.2	-0.17	15.5
20/08/2024 02:00	0.00	0.03	20.5	0	0	1005.2	-0.06	14.8
20/08/2024 03:00	0.00	0.03	20.5	0	0	1004.7	-0.05	15.2
20/08/2024 04:00	0.00	0.03	20.5	0	0	1004.4	-0.06	14.5
20/08/2024 05:00	0.00	0.03	20.5	0	0	1004.3	-0.08	14.3
20/08/2024 06:00	0.00	0.03	20.5	0	0	1004.5	-0.04	14.6
20/08/2024 07:00	0.00	0.03	20.5	0	0	1004.7	-0.04	15.6
20/08/2024 08:00	0.00	0.03	20.5	0	0	1005.1	0.03	14.8
20/08/2024 09:00	0.00	0.03	20.5	0	0	1005.8	0.07	15.8
20/08/2024 10:00	0.00	0.03	20.5	0	0	1006.5	0.16	16.3
20/08/2024 11:00	0.00	0.03	20.5	0	0	1006.9	0.27	16.9
20/08/2024 12:00	0.00	0.03	20.6	0	0	1007.2	0.35	17.4
20/08/2024 13:00	0.00	0.03	20.7	0	0	1007.4	0.39	17.3
20/08/2024 14:00	0.00	0.03	20.7	0	0	1007.8	0.41	17.0
20/08/2024 15:00	0.00	0.03	20.7	0	0	1008.0	0.41	17.2
20/08/2024 16:00	0.00	0.03	20.6	0	0	1008.4	0.41	16.6
20/08/2024 17:00	0.00	0.03	20.6	0	0	1008.6	0.35	16.1
20/08/2024 18:00	0.00	0.03	20.6	0	0	1009.3	0.35	15.0
20/08/2024 19:00	0.00	0.03	20.6	0	0	1009.9	0.38	14.6
20/08/2024 20:00	0.00	0.03	20.6	0	0	1010.7	0.44	13.4
20/08/2024 21:00	0.00	0.03	20.5	0	0	1011.2	0.48	13.4
20/08/2024 22:00	0.00	0.03	20.5	0	0	1011.3	0.44	13.1
20/08/2024 23:00	0.00	0.03	20.5	0	0	1011.7	0.46	13.1
21/08/2024 00:00	0.00	0.03	20.5	0	0	1012.1	0.46	13.0
21/08/2024 01:00	0.00	0.03	20.5	0	0	1012.6	0.50	12.9
21/08/2024 02:00	0.00	0.03	20.5	0	0	1012.8	0.44	12.7
21/08/2024 03:00	0.00	0.03	20.5	0	0	1013.1	0.40	12.7
21/08/2024 04:00	0.00	0.03	20.5	0	0	1013.5	0.35	12.6
21/08/2024 05:00	0.00	0.03	20.5	0	0	1013.8	0.32	12.2
21/08/2024 06:00	0.00	0.03	20.5	0	0	1014.4	0.39	12.2
21/08/2024 07:00	0.00	0.03	20.5	0	0	1014.9	0.40	13.0
21/08/2024 08:00	0.00	0.03	20.5	0	0	1015.0	0.36	13.7
21/08/2024 09:00	0.00	0.03	20.5	0	0	1014.8	0.27	15.2

Appendix D

Calibration Certificates

TEST DATE AND CONDITIONS	
Date	01/09/23
Atmospheric pressure	996mb
Ambient Temp	21.6°C
EnviroNics Serial No.	2518

GAS DATA LTD
Unit 4 Fairfield court
Seven Stars Estate
Coventry
CV3 4LJ, UK
+44 (0) 24 7630 3311



GFM226-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

INSTRUMENT DETAILS	
Serial No	Customer
13792	Ground Gas Solutions Ltd

INSTRUMENT CHECKS			
Keyboard	✓	Pump Flow	450cc/min
Display / Backlight	✓		
Clock Set / Running	✓	S/W Version	G226.0029/0002
Labels Fitted	✓	Recalibration Date	01/09/24

GAS CHECKS							
Calibration Gas		Instrument Gas Channels Read					
Gas Type	Applied Conc.	CO2 (ppm)	tol. (ppm)	CO2 (%)	tol. (% vol.)	O2 (%)	tol. (% vol.)
N2	100%	0	+10		0.0		+0.1
CO2	400ppm	386	+/-40		+/-1.0		+0.1
	1500ppm	1470	+/-100		+/-1.0		+0.1
	10000ppm	9939	+/-500		+/-1.0		+0.1

Notes:

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to: BS EN ISO 9001:2015
 BS EN ISO 14001:2015
 BS EN ISO 45001:2018

Stability Test for GFM22x serial number: 13792 has passed

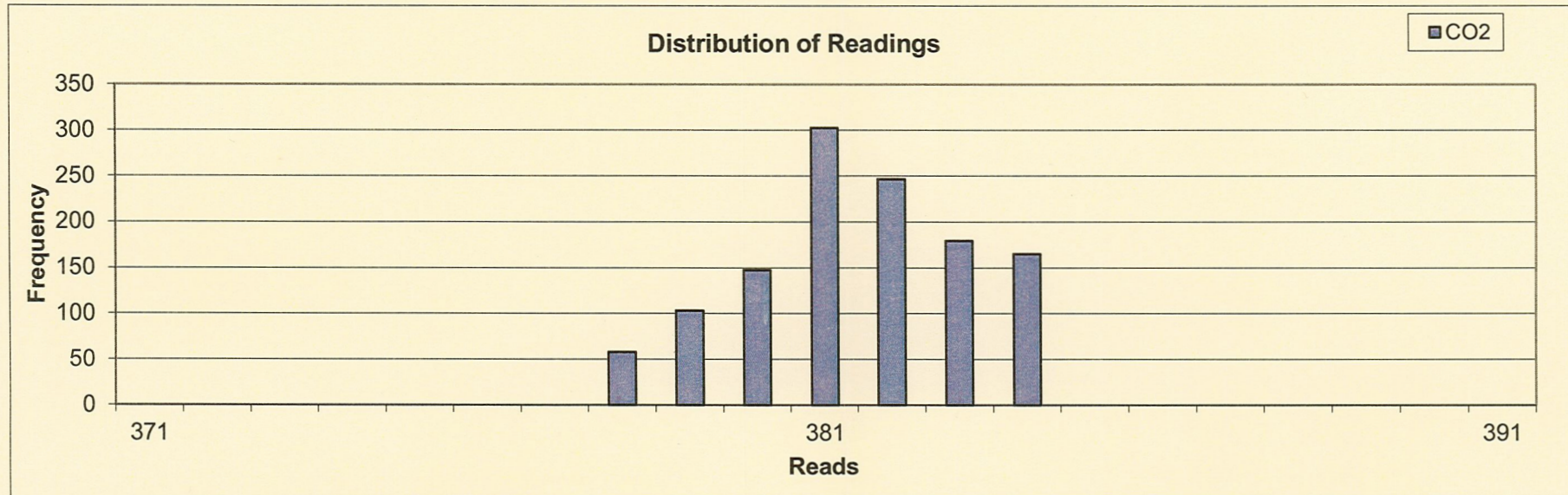
Import

Save

Print

Stability Test:	10 minutes (1200 tabs) of 400ppm CO2 flowing through the instrument.	
Date:	September 1, 2023	
Instrument:	13792	CO2 Reads
	Max Reads:	384
	Average Reads:	382
	Min Reads:	378

Frequency Distribution Results		
Within 1ppm	Within 5ppm	Within 10ppm
58.0%	100.0%	100.0%



CERTIFICATE OF CALIBRATION

Issued By: Ecotec Solutions, Inc.

Calibration Date: June 13, 2024

Recommended Calibration: June 13, 2026

850 S Via Lata, Suite 115
Colton, CA 92324
909-906-1001

Certificate #: 202413061540117

www.ecotecco.com

Customer: Gas Data, Ltd.

Description: Gas Analyzer
Serial Number: 1540117

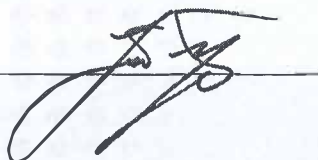
Model: TDL-500

Calibration Results: The analyzer is considered to be in conformity with the specifications of reference.

Units	Gas	Certified Gas Concentration	Gas Traceability (Lot Number)	Instrument Reading	Tolerance
%	N ₂	99.999	N70181330642	0 PPM	± 2.5%
PPM	CH ₄	10.0 PPM	70086129308	9.8 PPM	± 2.5%
PPM	CH ₄	500 PPM	70086030712	493.2 PPM	± 2.5%
PPM	CH ₄	2499 PPM	70086234202	2473.9 PPM	± 10%
PPM	CH ₄	10000 PPM	109631206	10083.9 PPM	± 10%
PPM	CH ₄	20000 PPM	70086800812	20136.2 PPM	± 10%
PPM	CH ₄	999700 PPM	MET-092622-UHP	1010420 PPM	± 10%

Calibration Technician: Jose Munoz

Signature: _____



Date: June 13, 2024

This certificate is issued in accordance with laboratory requirements of the National Institute of Standards and Technology. It provides traceability of measurement to recognized national standards, and to units of measurement realized at the National Institute of Standards and Technology or other recognized national standards laboratories. Certification only applies to results shown. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

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CALIBRATION CERTIFICATE:



Certificate ref.	GSCAL00422
Issued By:	VA
Date:	18/07/2024
Staff No.	-
Instrument:	03050023

Calibration Results			
Sensor	Lot No.	Ref. value	Indicated value
Carbon monoxide	C24438	42	41.57
Hydrogen sulphide	C22238	124	126.81
Methane	C322626	59.04	61.72
Carbon dioxide High	C322626	40.96	42.32
Carbon dioxide Low	C322726	2.01	2.04
Carbon dioxide Low ppm	C24338	503	499.73
Isobutylene ppb	C322826	-	-
Oxygen	C24438	0	0

Comments:

Prior to calibration the sensors were allowed to stabilise in ambient air for 1 hour.

The Instrument was calibrated by exposing the sensors to known values of gas concentrations.

The reference values are those generated by the certified source and indicated values are those measured by the Gas Sentinel.

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%

Ambient conditions	
Temperature	21.2
Relative Humidity	59.3

Appendix E

Air Sentinel® Instrumentation Overview & Deployment Information

GGs Gas Sentinel® Instrumentation

Overview & Deployment Information



Introduction

GGs Gas Sentinel® is a transportable, continuous, multi-gas analyser; with 2-way telemetry capability. It is easy to use for both short term and long term monitoring of landfill, contaminated land and existing buildings. Versatile remote data acquisition through an intuitive dashboard provides cost effective regulatory compliance. The equipment is designed to be ATEX* and IP68* rated and can operate safely in explosive atmospheres and survive flooding environments (*awaiting certification).

GGs Gas Sentinel® devices can be configured to carry an extended range of gas sensors but is normally available to monitor methane, carbon dioxide, oxygen, TVOC, hydrogen sulphide and carbon monoxide. Sensors for both full range and high resolution 0-5% methane and 0-2,000ppm carbon dioxide are available. The device also records atmospheric pressure, borehole pressure and temperature and borehole gas flow as standard.

GGs can also provide high frequency water level logging in conjunction with Gas Sentinel deployments

Gas Sentinel® Sensor Specifications, Service and Maintenance

The GGS instruments are serviced and calibrated annually. Routine maintenance including the replacement of filters and operational checks are carried out at regular intervals and prior to deployment at a site. Copies of the calibration certificates for the instruments used on site are included as standard within reporting. Details of the sensor specification are provided below:

Sensor	Method / Type	Range	Resolution & Tolerance
Methane (0-100%)	Infrared	0 - 100%v/v	0.1% v/v 2%FSD or $\pm 10\%$ of reading whichever is the greatest
Methane (0-5%) High Resolution	Infrared	0-5%v/v	0.01% v/v or 2%FSD or $\pm 10\%$ of reading whichever is the greatest
Carbon Dioxide (0-100%)	Infrared	0 - 100%v/v	0.1% v/v or 2%FSD or $\pm 10\%$ of reading whichever is the greatest
Carbon Dioxide (0-2,000ppm) High Resolution	Infrared	0-2,000ppmv	10ppm or 2%FSD or $\pm 10\%$ of reading whichever is the greatest
Oxygen	Electrochemical	0 - 25%v/v	0.1% v/v or $\pm 10\%$ of reading whichever is the greatest
Hydrogen Sulphide	Electrochemical	0 - 100ppmv	1ppm ± 4 ppm or $\pm 10\%$ of reading whichever is the greatest
Carbon Monoxide	Electrochemical	0 – 1,000ppmv	1ppm ± 6 ppm or $\pm 10\%$ of reading whichever is the greatest
Total Volatile Organic Compounds	PID	0 – 4,000ppmv	1ppm ± 10 ppm or $\pm 10\%$ of reading whichever is the greatest
Atmospheric Pressure	Piezoelectric	800 – 1,200mb	± 1 mbar
Borehole Pressure	Piezoelectric	800 – 1,200mb	± 1 mbar
Temperature	Internal chip	-5°C to +50°C	0.1°C ± 0.5 °C of reading
Humidity	Capacitive Internal chip	0-100%RH	1%RH ± 1.8 %RH
Gas Flow	Thermal sensor	0–60 Ltr/hr	0.1ltr/hr ± 0.1 ltr/hr or 10% of reading whichever is the greatest

The GGS Gas Sentinel® is powered by re-chargeable batteries that can provide 4 weeks to several months depending on how many sensors are switched on and the frequency of monitoring. Please discuss your requirements with GGS for the optimum configuration for your site.

Deployment Requirements (IMPORTANT)

The GGS Gas Sentinel® is designed for deployment with standard 50mm installation standpipes but can be used with both larger and smaller diameter standpipes. Secure headworks with sufficient clearance are required for the Gas Sentinel®. GGS recommends a 10 inch diameter flush fit. A minimum 250 mm clearance is required from the top of the 50mm standpipe to the underside of the cover. GGS recommends a minimum distance of 0.25m between the top of the standpipe and standing water level to allow gas sampling. The device is also easily fitted to either inside or to the outside of buildings. Other bespoke deployment options are available. Please contact GGS to discuss options.

Gas Sentinel® Insurance

GGs can provide insurance to cover instruments against theft from site or acts of vandalism.